

1887.

(SECOND SESSION.)

NEW SOUTH WALES.

VOTES

AND

PROCEEDINGS

OF THE

LEGISLATIVE ASSEMBLY

DURING THE SECOND SESSION

OF

1887,

WITH THE VARIOUS DOCUMENTS CONNECTED THEREWITH.

IN FIVE VOLUMES.

VOL. IV.

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(With Supplementary Cover containing Plans.)

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1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

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OF

1887.

FIVE VOLUMES.

(Opened 8th March, prorogued 13th July, 1887.)

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1887.

(SECOND SESSION.)

NEW SOUTH WALES.

ANNUAL REPORT

OF THE

DEPARTMENT OF MINES,

NEW SOUTH WALES,

FOR THE YEAR

1886.

Presented to Parliament by Command.

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1887.

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ANNUAL REPORT.

TO THE HONORABLE FRANCIS ABIGAIL, ESQ., M.P., SECRETARY FOR MINES, &c., &c.

Sir,

I do myself the honor to submit to you the following Report upon the working of the Department under your charge, and also upon the progress and results of Mining in this Colony during the year 1886.

The following statement indicates to some extent the amount of work performed in this Department during the past year, and shows an increase upon the preceding year.

STATEMENT of the Number of Papers Registered and of Letters Despatched by the various Branches of the Department of Mines.

Branch.	Papers registered.	Letters written.
Mines	15,376	7,653
Forest	12,083	3,502
Rabbit	8,574	5,198
Stock	12,372	4,301
Drills.....	6,467	1,710
Public Watering-places.....	6,112	3,420
Roads	3,987	3,048
Parks	2,210	902
	67,181	29,734*

* Exclusive of printed circulars, notices, &c., &c.

The number of applications to lease Crown lands for mining purposes during the year 1886 was 1,123, being a decrease of 936 as compared with the number of such applications made in 1885.

Of the 1,123 applications so made, 489 were for auriferous land, and 634 for mineral land.

The number of applications dealt with in 1886 was 1,903, which, compared with the number dealt with in 1885, shows an increase of 89. My efforts to reduce the time occupied in dealing with applications to lease have not yet been rewarded with the success I anticipated, still the number of applications on hand has been reduced. For example, in 1885, the number dealt with was less by 245 than the number received, while in 1886 the number dealt with exceeded the number received by 780.

Of the 1,903 applications dealt with in 1886, 329 were for gold-mining leases comprising an area of 2,493 acres, and 1,574 were for mineral leases comprising an area of 54,059 acres.

The area of auriferous land applied for under lease in 1886 is greater than that applied for in 1885 by 942 acres, but the area of mineral land applied for in 1886 is less than the area applied for in 1885 by 30,127 acres.

The following table shows the quantity of land applied for to lease during the year 1886, and the minerals to be mined for therein:—

<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">a.</th> <th style="text-align: center;">r.</th> <th style="text-align: center;">p.</th> </tr> </thead> <tbody> <tr><td>Diamonds.....</td><td style="text-align: right;">440</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Tin and diamonds</td><td style="text-align: right;">840</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Tin</td><td style="text-align: right;">6,354</td><td style="text-align: right;">1</td><td style="text-align: right;">1</td></tr> <tr><td>Tin and silver.....</td><td style="text-align: right;">580</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Silver</td><td style="text-align: right;">1,792</td><td style="text-align: right;">3</td><td style="text-align: right;">25</td></tr> <tr><td>Silver and copper.....</td><td style="text-align: right;">40</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Silver and lead</td><td style="text-align: right;">8,127</td><td style="text-align: right;">3</td><td style="text-align: right;">35</td></tr> <tr><td>Silver, lead, and spar.....</td><td style="text-align: right;">40</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Silver, lead, and copper</td><td style="text-align: right;">192</td><td style="text-align: right;">2</td><td style="text-align: right;">32</td></tr> <tr><td>Silver and antimony</td><td style="text-align: right;">20</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Copper</td><td style="text-align: right;">260</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Limestone</td><td style="text-align: right;">120</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Marble</td><td style="text-align: right;">100</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> </tbody> </table>		a.	r.	p.	Diamonds.....	440	0	0	Tin and diamonds	840	0	0	Tin	6,354	1	1	Tin and silver.....	580	0	0	Silver	1,792	3	25	Silver and copper.....	40	0	0	Silver and lead	8,127	3	35	Silver, lead, and spar.....	40	0	0	Silver, lead, and copper	192	2	32	Silver and antimony	20	0	0	Copper	260	0	0	Limestone	120	0	0	Marble	100	0	0	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">a.</th> <th style="text-align: center;">r.</th> <th style="text-align: center;">p.</th> </tr> </thead> <tbody> <tr><td>Antimony.....</td><td style="text-align: right;">130</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Alum.....</td><td style="text-align: right;">480</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Manganese, cobalt, and copper</td><td style="text-align: right;">80</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Iron</td><td style="text-align: right;">260</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Cobalt and nickel</td><td style="text-align: right;">85</td><td style="text-align: right;">2</td><td style="text-align: right;">0</td></tr> <tr><td>Graphite</td><td style="text-align: right;">40</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Coal</td><td style="text-align: right;">6,295</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Coal and shale.....</td><td style="text-align: right;">1,260</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Kerosene shale</td><td style="text-align: right;">650</td><td style="text-align: right;">0</td><td style="text-align: right;">0</td></tr> <tr><td>Not specified ..</td><td style="text-align: right;">19</td><td style="text-align: right;">1</td><td style="text-align: right;">0</td></tr> <tr><td>Gold</td><td style="text-align: right;">2,954</td><td style="text-align: right;">1</td><td style="text-align: right;">25</td></tr> <tr> <td></td> <td style="text-align: right; border-top: 1px solid black;">31,191</td> <td style="text-align: right; border-top: 1px solid black;">3</td> <td style="text-align: right; border-top: 1px solid black;">38</td> </tr> </tbody> </table>		a.	r.	p.	Antimony.....	130	0	0	Alum.....	480	0	0	Manganese, cobalt, and copper	80	0	0	Iron	260	0	0	Cobalt and nickel	85	2	0	Graphite	40	0	0	Coal	6,295	0	0	Coal and shale.....	1,260	0	0	Kerosene shale	650	0	0	Not specified ..	19	1	0	Gold	2,954	1	25		31,191	3	38
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This shows a large aggregate decrease, mainly due to the fact that during 1885 such a large extent of land was applied for for silver-mining; and the want of capital to provide the necessary appliances for treating ores, coupled with the fact that some ores cannot be properly treated by any process known to the mine-owners, has somewhat damped the ardour of the rush upon silver-mines. This is to some extent compensated for by the area of coal and shale lands applied for; also by the increase in the area of auriferous land; while the area applied for to work alum points to a new industry which may prove of great advantage to the Colony.

The following table shows the area of land held under application to lease on the 31st December, 1886:—

	a.	r.	p.		a.	r.	p.
Gold	2,986	2	16	Marble	40	0	0
Silver	11,064	3	5	Lead	40	0	0
Silver and lead	11,086	3	27	Limestone	120	0	0
Silver and tin	490	0	0	Cobalt	20	0	0
Silver and bismuth	40	0	0	Cobalt and nickel	85	2	0
Silver and copper	300	0	0	Tin	6,007	3	5
Silver, copper, and tin	40	0	0	Tin and diamonds	986	0	0
Silver, lead, and asbestos	40	0	0	Diamonds	360	0	0
Silver and antimony	20	0	0	Copper	260	0	0
Silver, lead, and copper	120	0	0	Tin and bismuth	120	0	0
Silver, lead, and spar	40	0	0	Antimony	202	0	0
Kerosene shale	760	0	0	Chrome iron	120	0	0
Coal	1,279	0	7	Ironstone and limestone	20	0	0
Coal and shale	1,660	0	0	Alum	480	0	0
Manganese	140	0	0				
Manganese, cobalt, and copper	40	0	0				
					38,968	2	20

The aggregate area of land held under application to lease on the 31st December, 1886, is less by 30,822 acres than the area so held on the 31st December, 1885. The reduction is due to the fact that the area applied for in 1886 is less, and that the number of applications disposed of in 1886 is greater, than in 1885.

The following table shows the area of land held under lease, and the minerals to be mined:—

Mineral.	Mining Act, 1874.			Mining Act Further Amendment Act 1884			Gold Fields Act, 1866.			Crown Lands Occupation Act, 1861.			Total.		
	a.	r.	p.	a.	r.	p.	a.	r.	p.	a.	r.	p.	a.	r.	p.
Gold	2,306	2	2	73	2	15	7	0	12*				2,387	0	29
Antimony	300	0	0										300	0	0
Bismuth	45	0	0										45	0	0
Coal	2,759	0	9	12,388	0	19				2,604	0	0	17,751	0	28
Cobalt	60	0	0										60	0	0
Copper	553	2	4	40	0	0							593	2	4
Copper and tin															
Coal, shale, and iron															
Diamonds	359	0	0	475	0	23							834	0	28
Diamonds and tin				874	1	5							874	1	5
Kerosene shale															
Manganese	85	0	0	20	0	0							105	0	0
Slate	90	0	0	60	0	0							150	0	0
Shale, copper, &c.															
Silver	5,305	0	32	1,326	2	16							6,631	3	8
Silver and lead	24,239	0	10	300	0	0							24,539	0	10
Silver and copper	140	0	0	60	0	0							200	0	0
Silver, lead, and copper	1,476	2	15	60	0	0							1,536	2	15
Silver, lead, copper, and tin	80	0	0										80	0	0
Silver and tin	80	0	0										80	0	0
Silver, lead, and tin	389	1	21										389	1	21
Tin	5,182	3	37	2,766	3	1							7,949	2	38
Not specified	20	0	0							37	1	33	57	1	33
Bismuth, silver, and lead	40	0	0										40	0	0
Bismuth and silver	40	0	0										40	0	0
Silver, manganese, cobalt, and copper	120	0	0										120	0	0
Limestone	40	0	0	250	0	0							290	0	0
Silver, lead, and limestone	20	0	0										20	0	0
Coal and shale	320	0	0										320	0	0
Silver, tin, and copper	80	0	0										80	0	0
Mineral salts	40	0	0										40	0	0
	46,871	1	10	18,694	2	4	7	0	12	2,641	1	33	68,214	1	19

*2,300 yards river-bed.

The above table shows a large increase upon the area of land under lease at the end of 1885, the increase being mainly due to the quantity of land leased for the purpose of working deposits of silver. The table also shows that the provisions of the Mining Act Further Amendment Act have been largely availed of. The aggregate increase exceeds 28,000 acres. During 1886, 6 applications were received for special gold-leases under the aforesaid Act, comprising 465 acres.

The number of applications for authorities, under section 28 of the Mining Act, to mine under reserves received during 1886 was 144, being an increase of 28 as compared with the number received during 1885. The number of such applications dealt with in 1886 was 171, being less by 36 than the number dealt with in 1885.

The

The following table shows the areas of reserves, &c., comprised in authorities granted under section 28 during 1886, and the minerals to be mined thereunder :—

	a.	r.	p.
Coal	5,180	1	24
Coal and shale	15,514	1	8
Coal, iron, and shale	30	0	0
Tin	162	2	20
Silver	50	0	0
Tin and emery	40	0	0
Manganese.....	10	0	0
Gold	146	0	0
	21,133	1	12

In the bulk of the cases the authorities in respect of above areas had not issued prior to 31st December last.

The aggregate area comprised in the authorities granted in 1886 is less by 8,233a. 2r. 28p. than in 1885. This is due to the fact that reserved lands can now be leased.

The following table shows the areas comprised in authorities granted under section 28 prior to 1886, and still in force, and the minerals to be mined thereunder :—

	a.	r.	p.
Coal	66,393	1	0
Coal and shale	20,140	0	0
Shale	8	2	32
Tin	243	3	38
Copper	42	3	12
Copper and silver.....	2	2	16
Silver	80	0	0
Silver and lead.....	7	3	5
Limestone	10	0	0
Bluestone and gravel	12	0	0
Marble	5	0	0
Gold	311	1	17½
	87,257	2	0¾

Since the passing of the Mining Act Further Amendment Act numerous holdings under section 28 have been converted into leases.

The following table shows the areas comprised in authorities which were in force on the 31st December, 1886, and the minerals to be mined thereunder :—

	a.	r.	p.
Coal	73,952	2	20
Coal and shale	24,872	1	9
Shale	8	2	32
Coal, iron, and shale	18	2	16
Ironstone	79	3	7
Tin	429	2	23
Copper	42	3	12
Copper and silver.....	2	2	16
Silver	100	0	0
Silver and lead.....	15	3	5
Limestone	10	0	0
Bluestone and gravel	12	0	0
Marble	5	0	0
Gold	316	0	24
	99,866	0	4

The above table shows a decrease, as compared with the aggregate area so held at the end of 1885, equal to 7,399a. 31p.

A return of the holdings under the 28th section, in force at the end of June and December, 1886, was published on the 24th July, 1886, and the 3rd February, 1887, respectively.

In the months of May, July, and October, 1886, and in March, 1887, particulars of gold and mineral leases in force in the several mining districts, for the quarters ending March, June, September, and December, 1886, respectively, were published in the Government Gazette, and copies thereof forwarded to the several Wardens' and Mining Registrars' offices throughout the Colony, in order that the public may know what lands are so held, and the conditions attached to such holdings. The Wardens have been urged to cause all cases of non-work to be reported, and the Inspector of Mines, during his visits of inspection, renders valuable aid in this direction; and such inducements as can be with safety are held out to miners to report breaches of the labour conditions of leases. Notwithstanding these efforts, it is asserted that large tracts of mineral land are held without being worked, and this may in some cases be true, but it frequently happens that upon investigation it is found that the holdings the subject of such complaints are mineral conditional purchases; and as regards these, if the required amount has been expended upon them, they can be locked up from the miner indefinitely. Fortunately the sale of mineral lands as such has been discontinued, and there is now a better chance of enforcing the labour conditions attached to mining holdings.

The foregoing tables do not represent all the land occupied for mining purposes, as they do not include holdings under miners' rights or mineral licenses on Crown lands, nor the lands which have been purchased, and upon which mining operations are being carried on.

GEOLOGICAL SURVEY.

The following records of work done during 1886 by the Geological Surveyor-in-charge and his staff is, I venture to think, highly satisfactory. The Department is fortunate in having at the head of this important branch a gentleman of such high attainments and unremitting zeal as Mr. C. S. Wilkinson, F.G.I., F.L.S. Of Mr. David, his first assistant, I cannot speak too highly—indeed his work bears ample testimony to his ability and industry. Mr. Anderson has, by his work, already justified his selection for the position of second assistant. Mr. Robert Etheridge, junr., as Palæontologist, will be a most valuable addition to the Geological Branch.

The Geological Survey Staff have examined various mining districts, including Bingara, Gunnedah, Jerrara, Hunter River, Molong, King's Plains, Mudgee, Uralla, Sunny Corner, &c.

The Geological Surveyor-in-charge and the Inspector of Mines accompanied me, as members of the Prospecting Board, to the Bingara District, to make arrangements for assisting parties to prospect the district with Government aid.

It was decided to test by boring the deep wet alluvial deposits forming the river flats at Bingara, commencing on the south edge of the flat. Several bores were bottomed, and a little gold obtained; but in the deeper ground the auger could not cope with the loose coarse pebbles in the wet drift. As shallow gold-bearing deposits have proved payable on the adjacent hills, it is believed that a rich lead exists beneath the flats. Two other sites were selected for prospecting the Tertiary drifts which extend from the basaltic Bald Hills towards the "Bobby Whitlow" diggings; but the work on these has not yet been completed. We also inspected the ground on the diamond-field where Mr. Low proposed to put down a diamond-drill bore at his present deep shaft; but, on account of the great thickness of basalt here, and the existence of deeper ground near the creek to the south, where the basalt had been removed by denudation, it was considered that it would be more advantageous to test this deeper ground by sinking. It is probable that both gold and diamonds occur in payable quantity in this lead.

In April the Geological Surveyor accompanied me to the Jenolan Caves, to ascertain what improvements were necessary to be made. We recommended certain improvements, and these have since been completed, and the different caves may now be easily inspected by visitors with safety. Arrangements were made for the electric lighting of the caves. Mr. E. C. Cracknell, Superintendent of Telegraphs, has kindly undertaken the carrying out of this work, which, when completed,* will enable the natural objects in the caves to be seen to great advantage, and enhance their attractiveness, so that a large increase in the number of visitors may be anticipated. The keeper's register shows that 1,140 persons visited the caves during 1886.

Mr. Wilkinson's report upon the auriferous and argentiferous ironstone lodes in the Jerrara district, between Goulburn and Marulan, encourages the belief that payable ore deposits will be opened in that locality.

The Molong District was also reported upon. The remarkable tin and copper lodes at Gumble have not proved very workable, the ore varying much in quality, and being difficult of treatment.

In view of the future development of the gold-bearing reefs at King's Plains, where the Confidence Gold-mining Co. have opened a large auriferous lode, it has been decided, on the recommendation of Mr. Wilkinson, to construct a dam for mining purposes, owing to the scarcity of water on this field. It is believed that quartz-reefing on this gold-field will be permanent. The extensive alluvial deposits that have been worked afford evidence of the existence of gold-bearing reefs that have not yet been prospected.

The Geological Surveyor also examined the Mudgee and Gulgong Gold-fields, and in his report has indicated the localities in which prospecting operations should be conducted. He is of opinion that the gold resources of this district are far from being exhausted, and that diamonds, coal, kerosene shale, and possibly antimony, will also be profitably worked. Hitherto this field has yielded 1,072,752 oz., or over 32 tons of gold, valued at £4,162,550.

A geological examination of the Mitchell or Sunny Corner Silver-mining field has been made. From the mode of occurrence of the silver lodes it is certain that they will vary much in thickness, but will be found to continue to great depths. The more easily worked gossan portions of the lodes occur
within

* *NOTE.*—These works were completed early in 1887.

within about 100 ft. from the surface, and below that level the ores consist of the base ores or sulphides, which will require to be concentrated before smelting. Mr. Wilkinson expresses his confidence in the permanence of the ore deposits, and that with efficient methods of treatment, silver-mining here can be profitably carried on for a long time.

Mr. Geological Surveyor David, is engaged upon a survey of the coal formations in the Hunter River District, and has furnished a preliminary report upon the coal measures of East and West Maitland.

During the progress of his survey he discovered a valuable seam of coal 13 ft. thick, on Deep Creek, 8 miles S.W. from Maitland. The Crown lands embracing this seam were at once reserved for coal-mining, and since then 1,998 acres of the reserve have been leased by Messrs. Smith & Co., who are about to open a new colliery. I entertain the hope that the Geological Staff will ere long be able to undertake a thorough examination of the northern coal-field, and map out all the seams and faults.

Mr. David also examined the newly discovered seams of coal at Gunnedah, and ascertained that two valuable seams occur there of 6 ft. 4 in. and 7 ft. thickness respectively. It is believed that these seams will be capable of affording the supply for the service of the railway lines and towns north of the Liverpool Range. Mr. David also examined and reported upon the Uralla and Rocky River Gold-field, and his report, with geological map, indicates the direction in which the auriferous deep leads trend. He has also furnished a report on the recent gold discoveries at Fairfield, where rich pyritous reefs occur, and he is of opinion that this will become an important gold-field.

A vacancy of Geological Surveyor having occurred, the Agent-General in London was requested to ask the Director-General of the Geological Survey of England to nominate a competent person for the appointment. Mr. W. Anderson, of the Edinburgh University, was recommended and appointed, and commenced duty on the 20th September. He partly surveyed the Mitchell silver-field, and afterwards inspected and reported on the Yarrangobilly Caves and the Kiandra Gold-field, and is now making a geological survey of the Bingera and Inverell diamond-fields.

Mr. J. E. Carne, Curator of the Mining and Geological Museum, has been very assiduous in his duties connected with the examination, assays, and analyses of mineral samples submitted to the department; with the registration and arrangement of the collections of minerals and fossils in the Museum, and with the preparation of collections for the Indian and Colonial Exhibition.

From Mr. Carne's report it will be seen that 1,799 samples of minerals forwarded from various parts of the Colony by prospecting parties have been assayed and reported upon, besides numerous samples that have been examined without assay, for persons seeking information regarding them. Particulars of these assays are inserted under the heads of the several minerals.

The Curator reports that during the year 2,706 additions have been made to the collections, which now include 19,417 registered specimens. Many of the specimens, both of minerals and fossils, are of special interest. Amongst them may be mentioned the large collection of fossil plants from the tin-bearing deep leads of New England, and the splendid specimens of fossil fishes obtained by the geological collector from the Hawkesbury formation at Gosford. The former having been described by the distinguished palæontologist, Baron C. Ettingshausen, of Gratz, now forms a valuable collection for reference; whilst the collection of fishes and other fossils await the examination of Mr. Robert Etheridge, junr., F.G.S., who has been appointed Palæontologist to the Geological Survey of this Colony. Amongst the different series of minerals of commercial value, illustrating the mineral resources of New South Wales, the Museum possesses some rare and valuable specimens.

In the Museum have also been arranged an extensive collection of polished samples of the timbers indigenous to New South Wales. Some of the samples are exhibited in the form of turned articles, &c., showing the suitability of the woods for various purposes. These timber specimens were obtained through the officers of the Forest Branch of the Department.

MINING SURVEYS.

During the year 1886, twenty-one Mining Surveyors were employed, and 1,400 surveys were made by them under the supervision of the Chief Mining Surveyor (E. F. Pittman, Esq.) viz., 311 gold-mining leases, 707 mineral leases, 141 mining tenements, 59 mining permits, 97 tenants' leases, and 85 public watering-places.

The number of surveyors employed and the number of surveys made during 1886 were less than in 1885. Of these surveyors 11 were paid by salaries and fees, and 7 were paid by fees only.

In the Charting Branch 1,817 applications for gold-mining and mineral leases were dealt with, besides 28th section applications and a large number of miscellaneous papers. This is slightly less than the record for 1885, but the number of maps compiled shows a slight increase. Twenty-five maps were compiled and published, and locality maps were kept charted up for the use of the wardens clerks, &c.

I understand that the current work is well in hand, and I am satisfied the Chief Mining Surveyor has spared no pains to prevent the accumulation of arrears.

The following is a list of the maps compiled and published during the year 1886, together with a complete list of mining maps published to date :—

List of Mining Maps compiled and published during 1886.

Parish.	County.	Mining District.	Parish.	County.	Mining District.
Yancowinna	Yancowinna...	Albert	Guntawang	Phillip	Mudgee
Tara	"	"	Baring	Westmoreland	Bathurst
Edgar	"	"	Wood's Reef	Darling	Peel and Uralla
Soudan	"	"	Hall	"	"
Sebastopol	"	"	Bullongong } Captain's Flat	Murray	"
Bligh	Farnell	"	Ballallaba }	"	"
Corona	"	"	Coventry	Clarke	"
Badjerrigara	"	"	Hanning, Sara, Hall &	Clarke and	"
Jocelyn	Westmoreland	Bathurst	Worra (part of)	Gresham	"
Langdale	"	"	Purnamoota, 2nd edition...	Yancowinna...	Albert
Bolton	"	"	Naradin	"	"
Gulgong	Phillip	Mudgee			

The following maps were also prepared for the Geological Branch and the Indian and Colonial Exhibition, viz., Newcastle Coal District (Red Head and Lake Macquarie), Southern Coal District, Western Coal District, and a map showing the ear-marks for the Colony for the Stock Branch and the Exhibition.

The following is a list of Mining Maps in use, showing which have been published, and date of publication :—

Parish or Locality.	County.	Mining District.	Published.
Parish of Tent Hill. Second edition	Gough	New England	— Sept., 1884.
" Highland Home. "	"	"	21 March, "
" Arvid. "	"	"	"
" Wellington Vale. "	"	"	3 Nov., 1883.
" Strathbogie. "	"	New England, and Peel and Uralla.	"
" " North } One map. Second edition	"	New England	16 Feb., 1884.
" Hamilton	"	New England, Peel and Uralla.	7 " "
" Scone	"	Peel and Uralla	8 Dec., 1883.
" Clive	"	"	7 Jan., 1884.
" Herbert	"	"	"
" Muir	"	New England	6 April, 1881.
" Land's End } One map	"	"	"
" Dumaresq	"	"	4 Feb., "
" Frazer	"	"	"
" Haystack	"	"	"
" Paradise North } One map	"	"	1 Oct., "
" Wellington	"	"	"
" Bundar	"	"	"
" Flagstone	"	"	9 June, "
" Strachan	"	"	6 April, 1880.
" Anderson. Charted Survey Office, Lithograph...	"	Peel and Uralla	"
" Clare. Second edition	Hardinge	"	4 March, 1884.
" Mayo	"	"	30 July, "
" Cope's Creek	"	"	9 April, "
" Darby	"	"	31 July, "
" Swinton	"	"	15 May, "
" Aston	"	"	18 Aug., "
" Tienga	"	"	6 Oct., "
" Stephen. Third edition	Yancowinna	Albert	— May, 1885.
" Albert. Second edition	"	"	— Feb., 1886.
" Bomangaldy	"	"	— Dec., 1885.
" Bray	"	"	"
" Ruby. Second edition	Buller	New England	— Oct., "
" Wylie	"	"	"
" Maryland	"	"	"
" Marsh	"	"	"
" Corry (part of)	"	"	"
" Undercliff	"	"	"
" Cullendore	"	"	"
" Bookookoorara	"	"	"
" Annandale	Clive	"	— Nov., 1884.
" Astley (one roll)	Arrawatta	"	Not published
" Athol	"	"	"
" Hawthorn (part of)	"	"	"
" Gordon	Gough	Peel and Uralla	"
" Craven } One map. Third edition. Bar-	Gloucester	Hunter and Macleay	5 Dec., 1884.
" Bindera	"	"	"
" Teleraree (part of) Gloucester Gold-field	"	"	Not published.
" Bootowaa (part of)	Gloucester	Hunter and Macleay	"
" Cooloongolok (part of)	"	"	"
" Wangat	"	"	"
" Irralong	"	"	"
" Topi	"	"	"
" Sara	Gresham	Peel and Uralla	"
" (The Gulf)	"	"	"

Parish or Locality.	County.	Mining District.	Published,
Parish of Corona	Farnell	Albert	March, 1886.
„ Jocelyn } One map.....	Westmoreland	Bathurst	— May, 1886.
„ Langdale }			
„ Bolton }	Phillip	Mudgee	— Feb., 1886.
„ Gulgong }			
„ Badjerrigarn	Farnell	Albert	— May, 1886.
„ Edgar	Yancowinna	„	— July, 1886.
„ Soudan	„	„	„
„ Sebastopol	„	„	— May, 1886.
„ Baring	Westmoreland	Bathurst	— July, 1886.
„ Wood's Reef	Darling	Peel and Uralla	„
„ Guntawang. Gulgong Gold-field	Phillip	Mudgee	„
„ Bullongong } One map { Captain's Flat	Murray	Tumut and Adelong	— Oct., 1886.
„ Ballalaba }	Clarke	Peel and Uralla	— Sept., 1886.
„ Coventry }			
„ Hanning	Inglis	„	— Dec., 1886.
„ Sara	Clarke and Gresham	„	— Nov., 1886.
„ Hall } (Part of) } One map	„	„	„
„ Worra }	„	„	„
„ Hall	Darling	„	— Dec., 1886.
„ Byjerkerno	Farnell	Albert	— Jan., 1887.

DIAMOND DRILLS AND WATER AUGERS.

Owing to proposed changes in regard to the work of this branch, during the early part of 1886, the amount of boring performed during the year is considerably less than it otherwise would have been, and the performance of the work was to some extent retarded. Nevertheless, so much energy was thrown into the work, and so much vigilance was exercised by the superintendent, that the result of the year's operations is not altogether unsatisfactory. It is due to the officers of the branch to say that they have ably seconded the efforts of the superintendent. The total depth bored by the Diamond Drill during the year was 6,539 ft. 7¼ in. being 4,786 ft. 3¼ in. less than was bored in 1885. The total cost to the Department in 1886, inclusive of all expenses, was £5,796 7s. 2d., while for the field work alone (that is to say, exclusive of office salaries, store wages, and superintendent's travelling expenses), but including wages, diamonds, materials, wear and tear, carriage, and other field expenses, the cost was £4,899 12s. 5d. The average cost per foot to the Department (including all expenses) in 1886 was 17s. 8½d., which is 1s. 4⅞d. per foot less than the cost in 1885, while the average cost per foot in 1886 (field expenses only) was 14s. 11⅞d., being 2s. 0⅞d. per foot less than the cost in 1885. The total earnings of the drills during 1886 was £6,264 12s. 5d., showing a balance in favour of the Department for the year equal to £468 5s. 3d. The average cost per foot to the persons employing the drills in 1886 being 19s. 1⅞d., as against 16s. 3¼d. in 1885; but the average cost to persons employing the drills in 1885 was reduced by reason of the Minister having in terms of the regulations granted reductions in certain cases. The report furnished by the superintendent shows that a great saving in the cost of wear and breakage of diamonds has been effected. In 1883 the destruction of diamonds equalled 3s. 8d. per foot bored, while in 1884 it was reduced to 2s. 0⅞d. per foot, in 1885 it was further reduced to 1s. 5⅞d., and in 1886 it amounted to only 8¼d. The percentage of core saved in 1886 was 80·07, which is 1·01 greater than in 1885. During the year one of the drills was engaged upon the deepest bore yet put down in the Colony, and though it was not completed by the end of the year, it was finished early this year, the total depth reached being 2,300 ft. These figures I venture to think furnish conclusive proof of the efficiency of this branch and of the ability of the superintendent and the staff under him. I am glad to notice that an inclination to employ the drills in testing metalliferous lodes is beginning to manifest itself.

As regards water augers, eleven were in the field during the year, two of which during part of the year were engaged in prospecting for gold, namely, one at Bingera for a short time, and one at Forbes which is still employed there. The augers engaged in boring for water on the road from Wilcannia to Silverton were not successful and the search has been discontinued. The same result attended the auger at Baringun. The augers at the Mongulla Reserve, Collarindebri, have not yet struck artesian water, and the search there will probably be abandoned. The bore on the Gunbar Road has been so far successful that a valuable well has been formed. At 75 miles from Bourke on the road to Wanaaring, the deepest bore yet sunk by means of a water auger has been completed most successfully, artesian water having been struck at a depth of 942 ft. and the bore having been continued to a depth of 960 ft. A supply of water equal to 33,000 gallons per 24 hours rises to a height of 30 ft. above the surface. The value of such a supply in the dry country back of the Darling can scarcely be over-estimated. It is only fair to Mr. Slee, the superintendent, and to Mr. Carmichael, the foreman, to say that this discovery is due to their energy and perseverance in face of very great difficulties. Efforts will now be made to complete the chain of bores to supply the road from Bourke to Mount Browne with water. If this can be accomplished

a great boon will have been conferred upon stock owners. The number of feet bored in 1886 was only 2,185 ft. 3 in., but this was due to the fact that several of the augers were withdrawn during the year with a view to reduce the expenditure. The average cost per foot of boring in 1886 was (including all expenses) £2 1s. 0½d., exclusive of office expenses but inclusive of carriage £1 12s. 8½d., exclusive of office expenses and carriage, but including all other working expenses £1 7s. 8d. The high average cost per foot is due to delays arising from proposed changes in regard to this branch.

ROADS, STREETS, AND GATES.

The ordinary work done in this branch during 1886 shows an increase upon the work done in 1885 as will be seen from the statement following.

The following is a comparative statement of the work done in Roads, Streets, and Gates Branch for the years 1885 and 1886:—

	1885.	1886.
Papers registered.....	3,858	3,987
Letters written.....	2,660	3,078
New roads and streets.....	133	207
New public gates.....	42	61
Plans sent to Executive Council.....	186	191
Plans and books of reference sent for exhibition.....	168	180

In addition to the ordinary work of the branch, which was most efficiently and expeditiously done under the supervision of the chief clerk (Mr. G. E. Herring), Mr. Ormiston, and the gentlemen under him have performed a large amount of work in preparing returns and papers for Parliament, compiling returns for the Civil Service Board, preparing papers for deputations, issuing and checking advertisements, custody and issue of stores, &c., &c.

I have very great pleasure in again acknowledging the able assistance rendered by the chief clerk (Mr. G. E. Herring). I regret to have to report that Mr. T. C. Binny, who has ably filled the position of Registrar of the Department since its establishment, and who rendered such valuable assistance in connection with the Colonial and Indian Exhibition, has owing to ill-health been compelled to retire from the service. To Mr. Farr, the accountant, and Mr. Primrose, who during Mr. Binny's absence performed most of the duties of Registrar, my thanks are due. I am much indebted to the Geological Surveyor in charge, the Chief Mining Surveyor, the Inspector of Mines, the Curator of the Museum, and the wardens for the valuable assistance they at all times render me.

MINERAL PRODUCTS.

The aggregate value of the mineral products of this colony to the end of 1886 is £69,772,187 8s. 1d., the value of such products for the year 1886 being £2,928,427 19s. 10d., showing an increase as compared with the production of 1885 of £153,352. This increase is mainly due to the larger output of silver, silver-lead ore and shale, and the higher price of tin. Gold, coal, copper, and iron show a decrease. The export of silver-lead ore in 1886 is more than double that of 1885; this may be partly due to increased production, but it is also due in part to the difficulty of treating some of our silver ores in the Colony. The produce of our silver-mines in 1886 exceeds in value that of 1885 by £225,216, which may, in view of all the circumstances, be regarded as highly satisfactory.

The following table shows the aggregate value of minerals the produce of New South Wales for the years 1885 and 1886 respectively compared:—

Minerals.	Quantity.		Value.		Quantity.		Value.		Increase in value.		Decrease in value.	
			£	s. d.			£	s. d.	£	s. d.	£	s. d.
Gold	103,736.36	oz.	378,665	0 3	101,416.82	oz.	366,294	7 7	.....	.....	12,370	12 8
Silver	794,173.80	„	159,187	0 0	1,015,433.50	„	197,544	0 0	38,357	0 0	.....	.....
Coal	2,878,863.23	tons.	1,340,212	13 7	2,830,175.00	tons.	1,803,164	4 1	.....	.....	37,048	9 6
Shale	27,462.00	„	67,239	0 0	43,563.00	„	99,976	0 0	32,737	0 0	.....	.....
Tin	5,192.80	„	415,626	0 0	4,967.80	„	467,653	0 0	52,027	0 0	.....	.....
Copper	5,746.00	„	264,920	0 0	4,026.80	„	167,665	0 0	.....	.....	97,255	0 0
Iron	4,175.79	„	25,792	19 9	3,685.87	„	19,068	8 2	.....	.....	6,724	11 7
Antimony	292.75	„	4,296	0 0	273.15	„	3,381	0 0	.....	.....	915	0 0
Bismuth	14.17	„	3,700	0 0	20.90	„	3,870	0 0	170	0 0	.....	.....
Sundry Minerals..	456.76	„	7,820	0 0	69.22	„	5,327	0 0	.....	.....	2,493	0 0
Silver-lead Ore ...	2,286.20	„	107,626	0 0	4,802.10	„	294,485	0 0	186,859	0 0	.....	.....

The value of the output of minerals in 1886 exceeds the value of the average annual output by £374,750.

The following Return shows the quantity and value of Gold, Coal, Shale, Copper, Tin, Silver, Silver-lead Ore,

Year.	Gold.		Coal.		Shale.		Copper and Regulus.		Tin and Tin Ore.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Oz.	£	Tons.	£	Tons.	£	Tons.	£	Tons.	£
1877.....	124,111	471,418	1,444,271	858,998	18,963	46,524	4,513	324,226	8,054	508,540
1878.....	119,665	430,033	1,575,479	920,936	24,371	57,211	5,219	345,158	7,210	395,822
1879.....	109,650	407,219	1,583,381	950,879	32,519	66,930	4,142	257,352	5,921	372,349
1880.....	118,600	441,543	1,466,180	615,337	19,201	44,725	5,394	364,059	6,159	471,337
1881.....	149,627	566,513	1,769,597	603,248	27,894	40,748	5,494	355,062	8,200	724,003
1882.....	140,469	526,521	2,109,282	948,965	48,065	84,114	4,958	324,727	8,670	833,461
1883.....	123,806	458,509	2,521,457	1,201,942	49,250	90,861	8,957.7	577,201	9,125.5	824,552
1884.....	107,199	395,292	2,749,109	1,303,077	31,618	72,176	7,305.4	416,179	6,665.9	521,587
1885.....	103,736	378,665	2,878,863	1,340,213	27,462	67,239	5,746	264,920	5,193	415,626
1886.....	101,417	366,294	2,830,175	1,303,164	43,563	99,976	4,027	167,665	4,968	467,653
	1,198,280	4,442,007	20,927,794	10,046,759	322,906	670,504	55,756.1	3,396,549	70,166.4	5,534,930

GOLD.

The continued decrease in our gold yield cannot, I think, be due to exhaustion of our auriferous deposits, but must be ascribed to lack of energy or means to search for new deposits, or to develop those already discovered. Since the breaking up of the drought there are slight evidences of a desire to prospect new country, and in view of the extent of gold-bearing country it is unlikely that any extensive and persistent explorations would be barren of good results. We may, therefore, be justified in looking forward to the opening of some new fields if those who are inclined to prospect can procure the means to continue operations while feed and water are plentiful. The discovery of an extensive gold-field, though only moderately rich, would, in view of the large number of unemployed, prove especially acceptable at the present time.

The output of gold in 1886 is, I regret to say, less than that of 1885, but the decrease in quantity amounts to only 2,319 oz., and in value to £12,371. Each year I have been hoping that the lowest point had been reached and that the development of our auriferous deposits would have again attracted the attention of capitalists, but, perhaps partly on account of the drought, and partly on account of the general depression, the hope has not yet been realized. During the year, a few discoveries more or less important were made, but with the exception of the deposits at Fairfield, they have not attracted much attention. The late abundant rainfall may, it is hoped, lead the further testing of many of our older gold-fields, which have for some years past been neglected in consequence of the scarcity of water. The following extracts from the Wardens' and Mining Registrars throughout the Colony indicate the condition of gold-mining in the several districts during the past year:—

In the Bathurst District the Wardens' and Mining Registrars report:—At Dark Corner, Cook & Co. crushed 1,100 tons quartz for 660 oz. of gold. Sixty men are working at the Lagoon, 4 miles north of Mitchell, 1,272 oz. of alluvial gold has been sold in the locality. 120 oz. of gold valued at £462 was won in the Burruga division. At Oberon only one mine was working at which ten men were employed; 1,500 tons of stone treated, yielded 975 oz., equal to 13 dwts. per ton, value £3,412 10s. At Tuena, 116 men are working, they sold locally 609 oz. 6 dwts. of gold for £2,300. At Trunkey the Bathurst Company was engaged the whole year sinking a perpendicular shaft, and it is estimated another year will be occupied in sinking before the depth will be reached at which the company expect to cut the reef. Several parties were working alluvial, and Knowles & Co. were sluicing when water was available. Gold to the value of £2,462 12s. was sold in the locality, being 484 oz. 11 dwts. 10 grs. from alluvium, and 150 oz. 18 dwts. 9 grs. from quartz. At Mount M'Donald sixty-seven men were working. From the Bobby Burns mine, 65 tons stone yielded 476 oz. gold; the average from this mine for the year was 7 oz. per ton. Butchers' obtained 680 oz. of gold from 140 tons, and the tributors in the Balmoral mine obtained 491 oz. from 130 tons. The total quantity of gold obtained from quartz during the year was 3,390 oz., valued at £11,899, the average yield per ton for the year being 3 oz. 5 dwts. 19 grs. In the Carcoar division the escort returns show an increase upon those of the preceding year to the extent of 1,537 oz. gold, the quantity sent away being 10,610 oz.; this is ascribed to the abundant rainfall during the latter half of the year 1886. At the mine known as "The Junction," at the junction of the Belubula River and Mandurama Creek two trial crushings were had of 150 and 110 tons respectively, yielding 40 and 46 oz., which, considering the quantity of stone in view and the facilities for working, should pay well. The Brown's Creek mine is said to have paid handsome dividends during the year; the quantity of gold won at this mine being 4,173 oz. 9 dwts. Some good cakes of gold have been sent away from Galley Swamp. At Ophir, in the Orange

Iron, Antimony, Asbestos, and Bismuth produced in the Colony of New South Wales during the last ten years:—

Silver.		Silver-lead Ore		Iron		Antimony and Ore.		Asbestos.		Bismuth.		Sundry Minerals.		Total.
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
oz. dwts.	£	t. c.	£	t. c.	£	t. c.	£	t. c.	£	t. c.	£	t.	£	£
31,409 0	6,673	20 12	325	2,600 0	7,600	69 12	1,131	...	...	...	...	231	7,725	2,233,160
60,563 0	13,291	5 0	258	900 0	6,666	64 0	1,964	...	...	...	...	77	1,082	2,172,421
83,164 0	18,071	18 13	535	1,118 0	10,550	76 16	1,046	...	...	...	...	25	525	2,085,456
91,419 0	21,878	27 14	890	2,322 0	15,335	99 19	1,652	12 8	323	...	...	21	795	1,977,874
57,254 0	13,026	52 14	1,625	6,560 0	47,871	539	417,346	...	...	12 10	2,728	15½	1,020	2,373,190
38,618 0	9,024	11 19	360	7,476 0	37,224	1,068	1816,732	7 10	75	2 14	162	7	979	2,782,344
77,065 18	16,488	136 4	2,075	3,434 3	26,908	375 11	5,555	...	...	3 14	650	31	160	3,204,901
93,660 5	19,780	9,167 11	241,940	3,759 2	24,572	433 12	6,458	...	...	14 7½	2,770	...	...	3,003,831
794,174 0	159,187	2,286 0	107,626	4,176 0	25,793	293 0	4,296	6 0	90	14 0	3,700	457	7,320	2,775,175
1,015,433 10	197,544	4,802 2	294,485	3,685 17	19,068	273 3	3,381	...	...	20 18	3,870	69	5,327	2,928,427
2,342,760 13	474,962	16,528 9	650,119	36,031 2	221,587	3,293 15	59,561	25 18	488	68 3½	13,880	933½	25,433	25,536,779

Orange division, the mines are at a stand-still for want of sufficient capital to work on a suitable scale. The Warden is of opinion that with sufficient capital the results from these mines would be surprising. The Forest Reefs and Lumpy Swamp mines are improving. At Lucknow the New Reform Company is adding to the machinery. This company has during the past two years, paid £15,750 in dividends, besides sinking main shaft 100 feet deeper, and paying all expenses connected with machinery, &c. At Carangara, gold and silver are found in large quantities in the copper ore. At King's Plains, the North Confidence Company have sunk their main shaft 260 feet; the deposit is said to be 40 feet wide from the surface down to the bottom of the shaft. 2,000 loads of dirt were raised during the year, the yield of gold being 3 dwts. per ton. The Inspector of Mines reports—at the Gordon mine (the principal mine in the Buckinbah Gold-field) a mass of quartz veins occur in a circular form, containing gold, carbonate of copper, copper pyrites, blend, and molybdenite; at present the mine is worked for gold only, owing to the low price of copper. The monthly crushings average about 150 tons, and the yield of gold varies from 3 to 7 dwts. per ton. Some hills near the Wellington contain surface drifts in which gold is found. It is thought to be auriferous, though in sinking near this creek heavy drifts may be met with. The discovery of a new gold-field may be expected in the vicinity of the road between Buckinbah and Molong.

In the Mudgee District, the Wardens and Mining Registrars report:—At Gulgong some more of the important mines have been abandoned. The Nil Desperandum at the Canadian continues to yield payable gold from the "pug," found in the cavities of the limestone rock; the present depth of the workings is 220 feet, but the company intend sinking 300 feet, or to the slate bottom on which they expect to find payable gravel. At Slasher's Flat some twenty or thirty men are earning fair wages. Payable prospects have been obtained by Fletcher and party in the vicinity of the diamond mines. The quantity of gold won during the year is 1,724 oz. 15 dwts. 5 grs., valued at £6,652. At Apple Tree Flat, in the Mudgee division, some good results have been obtained. Rochester and party obtained a nugget weighing 102 oz., and another party a nugget weighing 20 oz. The quantity of gold purchased locally was larger by nearly 400 oz. in 1886 than in 1885. At Hargraves, most of the claims were abandoned during the year, mainly owing to the want of means to procure machinery. Towards the end of the year some comparatively large areas were taken up by Mr. Coghlan who proposes to test the reefs by boring with the diamond drill. In the Dubbo division, gold-mining is carried on only at Tomingley, where the population and the yield of gold were somewhat larger in 1886 than during the previous year. According to the returns furnished by the owners of the crushing mills, 3,778 tons crushed yielded 2,820 oz. 7 dwts. 7 grs., valued at £10,927.

In the Tambaroora and Turon District, the Wardens and Mining Registrars report:—The Cornelian Company, Hawkin's Hill, raised and crushed 517 tons of quartz for 320 oz. 15 dwts. 16 grs. retorted gold. They also crushed for tributors 222 tons, which yielded 200 oz. 4 dwts. 15 grs., and 103 tons for the public which yielded over an ounce per ton. A main shaft, 8 ft. x 6 ft. has been sunk to a depth of 150 feet, and is to be sunk 400 ft., and it is proposed to construct a tunnel from Oakey Creek to drain the water from the mine at a low level. Some good yields have been obtained from small parcels of stone. The quantity of gold sent from Hill End by escort (including the gold from Hargraves and Windeyer) was 3,375 oz. 14 dwts. 9 grs. Carver and Porter's mine, from which such rich stone was raised, is flooded, and they have not the necessary appliances to keep the water down. The Red Hill Company, at Tambaroora, have sunk a shaft 9 ft. x 3 ft. to a depth of 250 ft. They cut five veins, three showing gold, the last one cut at 240 ft. is 14 inches thick, a trial crushing from which gave 12 dwts. per ton. Since the rain commenced considerable sluicing has been done at Hargraves and Windeyer. At the Root Hog, on the Macquarie, a party of miners have erected a battery to be worked by water-power, the quartz yields from

from 8 to 16 dwts. per ton. At Sofala some good yields have been obtained from small parcels of stone. Grice and Clark obtained 150 oz. 16 dwts. from 7 tons, and Prince & Hibberd, 52 oz. from 10 tons. Mr. Howard discovered a rich vein at Back Creek, 2 tons of stone, from it yielded 15 oz. of gold. Owing to the abundance of water during the last quarter of the year, there was some activity in sluicing, &c. Total yield for the year at Sofala, 2,234 oz. 7 dwts. 21 grs. from alluvium, and 1,520 oz. from quartz. At Ironbarks, Scott's machine crushed 324 tons stone for 176 oz. 15 dwts. retorted gold. At Buckinbah Messrs. Veitch and party crushed 1,480 tons of stone for 384 oz. The Muckerawa Junction Company, on the Macquarie River, erected expensive pumping gear capable of pumping 70,000 gallons per hour, and now seems to be in a fair way to work the deposits in the river bed. The quantity of gold won in the division was 1,549 oz. 4 dwts. 1 gr.

In the Lachlan District the Wardens and Mining Registrars report:— At Forbes the Nil Desperandum Co., on the south lead struck payable wash-dirt from 2 to 3 ft. in thickness, average 6 dwts. per load, from 120 loads. On the same lead the Crinoline Co. have bottomed on wash-dirt, but have not washed, as they were engaged in erecting machinery and buildings. On the same lead the Forbes Alluvial Co., the shaft has not yet bottomed. In all these mines great difficulty has been experienced in sinking through the drifts. On the Britannia Reef a company has raised some stone estimated to contain 2 oz. per ton; but operations are stopped pending the arrival of machinery. If this mine prove payable other miners may be attracted to this reef, which has been traced to a considerable distance, but has not been tested to any great depth. A party on Strickland's Reef has had some stone crushed at Parkes, which yielded 16 dwts. per ton. A plant is being erected to work the old Pinnacle Reef, a shaft has been sunk 70 ft. into the reef showing gold all the way down. The reef is 8 ft. wide at the bottom of the shaft, the average width being 5 or 6 ft. The yield of gold at Forbes during the year was 496 oz. 1 dwt. 19 grs. At Parkes there has been a great improvement upon previous years in alluvial workings, and several new quartz reefs have been discovered. On the Buchanan Reef Quayle and party obtained 1,512 oz. from 504 tons, equal to 3 oz. per ton; and Haselhurst and party obtained 1,755 oz. from 351 tons, equal to 5 oz. per ton; and very handsome returns were obtained from some of the newly opened reefs. There are a number of parties prospecting for alluvial deposits; and some of the claims of newly discovered deposits are payable, and though not rich are likely to provide employment for a number of men. Appliances are being erected for the treatment of tailings; samples from a heap at the Currangong have been tested and found to contain 6 dwts. per ton. The quantity of gold won at Parkes was 5,234 oz. 8 dwts. 1 gr., namely, 655 oz. 12 dwts. 11 grs. from alluvium, and 4,578 oz. 15 dwts. 14 grs. from quartz. There are about twelve miners prospecting about 30 miles from Condobolin; the gold they find is in alluvium, but the quantity is nothing to speak of. At Grenfell there are a few parties prospecting and a few working alluvial and quartz claims. The quantity of gold won from alluvium was 227 oz., and from quartz 193 oz. 5 dwts. The highest average yield from quartz was 1 oz. 5 dwts. per ton from Lawson's Reef; and highest from alluvial was 13 dwts. per ton from Quondong Gully. At Canowindra 629 tons of quartz crushed during the year, yielded 801 oz. 12 dwts. of gold, and 80 oz. were obtained from alluvial workings, chiefly by fossickers. At Paling Yard Creek, about 9 miles from Cudal, a gossan lode has been discovered, the lode varies in width from 6 ft. to 18 in. Six claims are at work upon it. The prospectors had 63 tons crushed, from which they obtained 13 dwts. per ton; another party had 11 tons crushed from which they obtained 11 dwts. per ton; but the lode stuff has to be sent 10 miles over rough country to Cargo to be crushed. The cost of carting and crushing is 25s. per ton, consequently the other parties have a quantity at grass awaiting treatment. At Boney's Rock, near Toogong, 48 tons were crushed for 168 oz. for one party, and other parties are on gold. A party is raising stone from Bevan's Reef, near Toogong, 201 oz. 10 dwts. were obtained from quartz. At Young several companies have been or are about to be formed to work large mines on the Burrangong Creek; these mines have been tested at various points with most satisfactory results, and it is anticipated that these mines when opened up will yield large returns. During the year the quantity of gold won, was 1,654 oz. 16 dwts. 15 grs., being an increase upon the previous year. At Murrumburrah, the Cunningar Quartz Mining Company during the year completed their extensive plant, which with labour has cost upwards of £20,000. The reef worked by this company contains no free gold, the pyrites which contains the gold is concentrated and then smelted, from 100 tons of quartz 138 oz. of gold was obtained. 460 oz. 10 dwts. 7 grs. was won during the year from alluvium. At Temora most of the alluvial mines were flooded during the heavy rains, and after they had been drained it was found that owing to the soft nature of the country the shafts and drives had been destroyed, so that the works had to be started afresh. The quartz mines have been steadily but surely progressing. The South Australian Co's., mine has continued to yield steadily payable returns; at the same time lodes have been disclosed which it is thought will be permanently profitable. Attempts are being made to form companies with capital to work the Hidden Star, Mother Shipton, and other mines at Temora; also the mines at Sebastopol, Muttama, and Barmedman. The quantity of gold which passed through the Gold Receivers' hands at Temora, in 1886, was 7,161 oz.

10 dwt. 5 gr.; this includes gold from Sebastopol and Barmedman. The quantity of gold that passed through the Banks at Temora during the year was 7,547 oz. It is not known what proportion of the gold was from alluvial and quartz mines respectively; but it is known that one of the Banks purchased some 1,360 oz. from alluvial workings, and some 1,431 oz. from the quartz workings, at Barmedman. Owing to the stoppage of the works of the Barmedman United Company, the miners were unable to get stone crushed without sending it to Temora during the first half of the year. In June last the Company sold their mine and plant, which were purchased by Mr. Cassin and other local storekeepers. Since then 1,616 tons of quartz have been crushed, for a yield of 2,054 oz. 10 dwt. 1 gr. The last crushing of 329 tons, taken from thirteen different claims, gave an average of 2 oz. 12 gr. of gold per ton. The whole of the stone raised was taken from above the water level 80 feet. It is regretted that the Barmedman United Co., which had the requisite appliances, did not explore their mine at greater depth, as it is thought that the mine if thoroughly tested below the water level would prove payable. At the "Hard to Find" mine an engine and pumps have been placed on the ground with a view to testing below water level. At Muttama some rich stone was discovered in one of the old workings, and further workings have induced hopes that the locality will prove a valuable quartz-mining district. Sebastopol should be a prosperous mining centre, but the mines have been ruined by bad management and litigation. At Wantiool very little work has been done, the quantity of gold won being 113 oz. 7 dwt. 8 gr. At Mitta Mitta there is a fairly good mine; but it has not been properly opened. At Adelong large tracts of valuable auriferous land have been alienated, which, if open to them, would provide profitable employment to many hundreds of miners.

The New Mount Hope Co. are employing a few men to prospect for gold at Ironstone Hill, near Mount Hope.

In the Albert District the Wardens and Mining Registrars report:—At Mount Brown, on Billy-goat Hill, steady work, with satisfactory results, has been done in the claims where the water was not too heavy, the yield being about 1 oz. per ton. In two of the claims they have not been able to overcome the water sufficiently to ascertain the value of the wash. The Warden thinks handsome returns will be obtained as soon as the miners get machinery to overcome the water. The lead found at the One-mile, at a depth of 16 ft., under cement, has been traced in a southerly direction to a depth of 165 ft. Four claims are on wash which yields from 1 oz. to 4 oz. per load. At the Four-mile one puddling machine has been steadily employed washing surface dirt which yields about 5 dwt. per load. At the Warratta Reefs, the claim of the late Whittabrennah Company has been let to tributors, who, during four months, crushed only 40 tons for 23 oz. It is thought much of the gold is lost owing to the defective machinery. At Tibbooburra the puddling machines are yielding good returns from surface dirt. Thos. Stevenson puddled 2,000 loads of surface, which averaged 1 dwt. to the load. The quantity of gold won was 3,839 oz., valued at £15,164.

In the Wilcannia Division there are about fifteen to twenty men prospecting for gold on the Nuntherungee Run, between Wilcannia and Milparinka; some of them are earning rations by surfacing.

In the Tumut and Adelong District the Wardens and Mining Registrars report:—At Tumbumba the want of water during the early part of the year retarded sluicing operations. A new reef was opened at Paddy's River, but, after testing, was given up, the return being about 6 dwt. per ton. But little prospecting was done. The quantity of gold won was about 1,380 oz. At Albury, the Bungowanah Co. made a valuable discovery of quartz near the falls to Jindera, and north-west from Splitter's Creek. The deposit is an immense dyke reef which has been driven into 25 ft. without touching the opposite wall. The stone is quarried out, and will pay at 3 dwt. per ton, but averages 10 dwt. The Company have erected a 15-head battery, and constructed other important works. The manager estimates that he can crush 250 tons per week. The Soudan Co. has a dyke reef of large size at Splitter's Creek, and are pushing on their preliminary works, but have not yet tested the stone. Several parties are prospecting in the adjoining hills. Messrs. Pye & Wealands, of May-day Hill, Black Range, crushed 75 oz. from 21 tons of stone. Mr. Polkinghorne, of Hawkview, obtained 268½ oz. from 59 tons stone. The quantity of gold obtained in the division during the year was 650 oz. At Adelong there has been much depression, especially at the quartz mines. 2,408½ tons quartz crushed yielded 1,715 oz. 7 dwt. 9 gr. From alluvial mines, 4,085 oz. 9 dwt. 6 gr. of gold was won. Preparations are being made to work Mr. A. D. Shepard's mine by the aid of a hydraulic injector. At Reedy Flat, 760 oz. 4 dwt. 1 gr. of gold was obtained from alluvium. At Tarcutta, 263 tons of quartz crushed yielded 140 oz. 10 dwt. of gold. At Kiandra, during the first seven months of the year, the water supply was insufficient. At Kiandra, the Kiandra Gold-mining Company obtained 1,672 oz. of gold from 6,358 yards of earth. In consequence of the exceptionally dry weather up to the beginning of August, sluicing was not commenced till quite late in the year.

In the Southern Mining District the Wardens and Mining Registrars report:—Messrs. Dunstan & Co. at Diggers Creek, in the Berrima District have recently erected a puddling machine with a view to test their mine for gold and gems. A little gold and some diamonds have been obtained, but the works are not sufficiently advanced to determine the value of the deposit. At the Carrington mine, near Marulan, the lode which is being tested is said to contain gold, silver, galena, copper, and iron; and it is thought it will prove remunerative, but considerable capital will be required. In the Braidwood District the want of water retarded sluicing operations, notwithstanding the spring rains; quantity of gold won at Braidwood, 310 oz. At Araluen, where the deposits can best be worked in dry seasons, there was a slight increase of gold upon the output of the previous year. Races are about to be constructed from the Corang and Shoalhaven Rivers to work some ground in the Nerriga Division; the yield of gold in this division was 400 oz. At Spring Creek a 10-head battery has been erected to work Plum's Reef, which is 14 ft. wide, 370 tons crushed averaged a little over 2 dwt. 12 gr. per ton. Mr. Carter has crushed 630 tons from Dargue's Reef, including surface, for a yield of 68 oz. of gold. He has also treated 20 tons of mundic tailings left by previous owners, from which he obtained 40 oz. smelted gold. Total for Major's Creek Division—500 oz. from alluvium, and 129 oz. 12 dwt. 3 gr. from quartz. The quantity of gold won from alluvium in the Little River Division was 999 oz. At Araluen there was at times scarcely enough water to wash with at the stripping claims, and ground sluicing was practically at a standstill. The quantity of gold won during the year was—Alluvium, 5,500 oz.; quartz, 20 oz. 2 dwt. 9 gr. In the Nowra District the Homeward-bound Co., at Yalwal, obtained 1,282 oz. from 800 tons of quartz; the average is somewhat lower than usual in consequence of the Company having to clear low-class stone out of the way; some of the stone yielded $3\frac{1}{2}$ oz. per ton. The Pinnacle Co. crushed 642 tons for 680 oz. 10 dwt., besides saving pyrites for treatment. The Pioneer Co. crushed 240 tons for 77 oz. 6 dwt. There is a large percentage of silver in the gold from these mines. In the Nerrigundah Division, what is thought to be a payable reef, was discovered in Tom North's Gully. The quantity of gold won during the year was 420 oz. In the Moruya Division a rush of about 200 miners to a flat called Cabbage-tree Creek was caused by the bottoming of a shaft by prospectors, and the finding of about 30 oz. of gold. This was the first shaft that had been bottomed on the flat, owing to the quantity of water. Nothing of importance has since been found, although several parties have made good wages. Some of the quartz reefs show as much as 2 to 3 oz. per ton, but there is no battery on the ground for crushing. The quantity of gold won was 281 oz. At Wagonga there are distinct gold-bearing reefs. The Belle of Australia, which has an average width of 3 feet, has been proved by trial crushings to be payable. It is intended to form a Company to work the three amalgamated claims on this line, and to erect machinery thereon. The battery erected on the Lady Carrington Reef has been enlarged and the latest improvements added, and it is thought the claims when opened out will give employment to a number of miners. The John Forster Reef shows good gold; the width of the reef is 18 to 20 in.; numerous trials of the stone taken from different depths in sinking the main shaft indicate that the stone will yield from $2\frac{1}{2}$ to 3 oz. per ton. At Mount Dromedary no main reef has yet been discovered; the veins, varying from 2 to 8 in., carry gold; as much as 4 oz. to the ton having been obtained. At Tin-pot the Tuross Co. are opening up their mine by sinking shafts and tunnelling; 80 lb. of stone, unpicked, yielded at the rate of $56\frac{1}{2}$ oz. of gold per ton. At the junction of Delegate and Little Plain Rivers, in the Bombala Division, several good stream claims are being worked with good results. The quantity of gold won in this division was 254 oz. 16 dwt. 21 gr. In the Cooma Division, 104 oz. of gold was won from the Snowy, Umaralla, and Murrumbidgee Rivers.

In the Hunter and Macleay Mining District the Wardens and Mining Registrars report:—At Copeland, owing to the want of capital, economy of labour cannot be studied, and in the absence of labour-saving appliances the miners have adopted a primitive process of working, nevertheless the yield of gold for the year shows an increase of 600 oz. As an evidence of the disadvantage under which miners without capital labour, stone containing less than 2 oz. per ton barely pays for raising, carting, and crushing, whereas the tributors in the Hidden Treasure mine, who are able to work systematically, say they can make a good profit out of stone containing 1 oz. to the ton. It is thought that taking all the stone on a face from the working claims on the field, it would yield 15 dwt. per ton, and with proper appliances it could be raised and treated for 12 dwt. per ton. 958 $\frac{1}{2}$ tons of stone crushed from the various mines during the year yielded 1,600 oz. of gold.

In the Bulladelah Division several new claims have been taken up, and payable stone has been found in all of them; but there is no battery in the district for crushing stone. Machinery has, however, been placed on a site on the Coolongolook River, and will be erected as soon as the title to the site is complete. Machinery has also been placed on another site. On the Mountain Maid and Currecki, day and night shifts are engaged trying to overcome the influx of surface water caused by the late rains. The Mountain Maid has 30 tons of stone at grass supposed to be equal to some tons sent to Sydney, which
realized

realized 2 oz. per ton. The Currecki has 5 tons at grass equal in quality to 6 tons sent to Sydney, which realized upwards of 4 oz. per ton. At Bunker's Hill, some 3 miles, and Paddy's Creek, 7 miles, from Coolongolook, good stone has been found.

In the Kempsey Division there are several prospecting parties in the neighbourhood of Mount Sea View, on the various creeks running into the branch of the Hastings known as the Forbes River; rough shotty gold has been found in the washdirt near the surface, but not yet in paying quantities. At Lower Wangat, in the Dungog Division, the Golden Spur Co. crushed 117 tons for yield of 190 oz. 14 dwt. 18 gr.; the deepest level is 300 ft.; the lode is 8 in. wide. At Upper Wangat, Gurr & Co. crushed 93 tons for 74 oz. 16 dwt.; deepest level, 175 feet; width of lode, 12 in.

In the Peel and Uralla Mining District the Wardens and Mining Registrars report:—At Moonan Brook about 230 tons of quartz have been crushed, yielding an average of 1 oz. per ton. Barber & Co. are sinking on Crow's Nest Hill, the highest point of which is nearly 5,000 ft. above sea level. They have raised 10 tons of quartz, estimated to yield $1\frac{1}{2}$ oz. per ton. From another part of the same hill they raised $6\frac{1}{2}$ tons, which yielded 7 oz. of gold per ton, and $5\frac{1}{2}$ tons which yielded 3 oz. per ton. The cost of conveying stone to the battery is so great that less than 1 oz. per ton will not pay. There is any quantity of stone both at Moonan and Stewart's Brook that would yield from 5 to 10 dwt. per ton, but this will not pay under existing circumstances. At Stewart's Brook the battery was idle all the year; but there are about 200 tons of quartz at grass now ready for crushing, 100 tons of which is estimated to contain 4 oz. per ton. Two good reefs were found during the year between Nundle and Bowling Alley Point. From one 70 tons have been crushed for 120 oz. of gold; the width of this reef is 12 inches; from the other no crushing has yet been had, but the stone looks well. From the large reef at the Hanging Rock the results obtained by the prospectors varied from 4 to 14 dwt. per ton. This would pay with crushing machinery near at hand, as the reefs are large and easily worked; but the prospectors have not the necessary capital. The same may be said of the Lady May and other reefs, the stone having to be carted 9 or 10 miles. Mount Ephraim.—The claim has been worked upwards of ten years without having been bottomed, on account of the water; fine gold has, however, been obtained from the surface, to a depth of 70 ft., and to a width of 150 feet. The quantity of gold won was 3,235 oz. 5 dwt., namely, 2,460 oz. from alluvium, and 775 oz. 5 dwt. from quartz. In the Armidale Division, owing to the rainfall, the output of gold has improved, though the heavy rains at intervals retarded alluvial and sluicing operations. The quantity of gold obtained is estimated at 4,000 oz. At the Duval Gold-field a reef has been discovered, from which rich specimens have been obtained, and it will shortly be tested by a battery. The Eleanora Co., having purchased the Isabella mine, has crushed 3,301 tons of quartz for 1,841 oz. 19 dwt 21 gr. of gold. Several parties of prospectors were out searching for gold. Terry and party crushed 85 tons of quartz from a new reef at Tin River; yielded 27 oz. George and party crushed 90 tons from the same reef; yielded 26 oz. At Uralla the heavy rainfall had the effect of increasing the yield of gold obtained by sluicing, the yield for the year being 1,607 oz. At Barraba, 221 tons of quartz crushed yielded 490 oz. 13 dwt. 13 gr., equal to 2 oz. 4 dwt. 10·8 gr. per ton. There were about seventy miners working and prospecting at Wood's Reef, Crow Mountain, and Tea-tree Creek. Some rich ground has been opened up at Wood's Reef. Withers and party succeeded in getting on gold at the Ballarat lead, at Upper Bingara, but were beaten out by an influx of water. The quantity of gold won at Bingara was 600 oz. from alluvium, and 45 oz. from quartz. In the Glen Innes Division, 220 oz. of gold were won from alluvium; total for division, 350 oz., valued at £1,312 10s. Some extensive works have been constructed at Glen Elgin with a view to work a large area of land held under special lease. The Warden is of opinion that the country on the eastern fall of the tableland from Timbarra to Oban presents a promising field for the operation of prospectors.

In the New England District the Wardens and Mining Registrars report:—A number of new reefs and some old ones had been opened at Boonoo Boonoo before the heavy rains set in, and many of the reefs have been proved to be gold-bearing—some good; but none of the stone could be crushed owing to there being no battery on the ground. Since the rain, operations have been much retarded; but it is expected that a battery will be erected as soon as the state of the country will admit of it, and it is thought Boonoo Boonoo will then prove a most important gold-field. At Poverty Point and Timbarra a number of miners are prospecting, and are likely to be successful. A fair amount of gold was obtained by sluicing. At Fairfield a rich deposit of gold was found on private land in March of last year, which led to a great deal of prospecting on Crown lands, the result being that a large area of auriferous country has been opened up. Mount Pleasant, distant about $1\frac{1}{2}$ miles from the property where the gold was discovered, is the chief centre of mining operations, gold having been found in nearly every place that has been tried; but so far only a few tons of picked stone from some of the principal claims have been crushed and treated. The deposits have been traced about 8 miles north of Mount Pleasant, and about 4 miles south. Some rich discoveries have been made at Red Rock, about 8 miles north of
Fairfield.

Fairfield. It is proposed to work a large area of this land as one mine, and to erect a battery on the Cataract River to be worked by water-power. At Violet Creek, between 3 and 4 miles south-east of Fairfield, a number of claims are considered payable. The deposits differ from those at Fairfield and Red Rock, and, according to assays, contain both gold and silver in payable quantities. The veins or lodes are said to vary in width from 6 in. to 20 ft. Very little stone has been crushed, as the only battery on the field is upon the private land on which the gold was discovered, and is employed exclusively upon stone raised from that land. The yield of gold in division was 440 oz. 14 dwt. from alluvium, and 1,333 oz. from quartz. In the Solferino Division some rich patches were found during the year. The gold won from alluvium was 118 oz. 2 dwt. 3 gr., and from quartz 92 oz.

In the Clarence and Richmond District the Wardens and Mining Registrars report:—There are some ten men employed on the reefs at Nana Creek, who raised 164 tons of quartz, which yielded 268 oz. 13 dwt. 4 gr., the highest yield being 5 oz. 5 dwt. 21 gr. per ton, and the lowest 18 dwt. per ton. Some 13 or 14 men were working alluvium in the vicinity of the little Nymboi and Little Plain Creeks, and won about 50 oz. At Dalmorton, 122 tons of quartz were crushed for 32 oz. 8 dwt., and 100 oz. were obtained from alluvium.

The following information has been kindly furnished by R. Hunt, Esq., F.G.S., the Deputy Master of the Royal Mint.

QUANTITIES of gold, the produce of New South Wales, received into the Royal Mint, Sydney, during 1885 and 1886 compared.

District.	Division.	1886.	1885.	Increase.	Decrease.
		oz.	oz.	oz.	oz.
Bathurst.....	Bathurst.....	788.29	761.47	26.82	.....
	Carcoar.....	9,358.84	10,358.26	.....	999.42
	Orange.....	5,939.45	4,352.78	1,586.67	.....
	Trunkey Creek.....	79.28	31.11	48.17	.....
	Tuena.....	190.60	60.72	129.88	.....
	Mount M'Donald.....	.....	5.76	.....	5.76
Tambaroora and Turon.....	Hill End.....	3,580.69	4,949.55	.....	1,368.86
	Tambaroora.....	246.06	363.80	.....	117.74
	Sofala.....	432.09	486.28	.....	54.19
	Stony Creek.....	161.24	79.52	81.72	.....
Mudgee.....	Mudgee.....	2,240.51	3,334.26	.....	1,093.75
	Gulgong.....	1,597.00	201.36	1,395.64	.....
	Hargraves.....	99.97	4.77	95.20	.....
	Wellington.....	97.48	12.10	85.38	.....
Lachlan.....	Parkes.....	5,471.89	5,649.94	.....	178.05
	Forbes.....				
	Grenfell.....	259.75	377.47	.....	117.72
	Young.....	366.45	162.92	203.53	.....
	Temora.....	4,816.87	6,170.19	.....	1,353.32
Albert..... Southern.....	Wilcannia.....	3,390.02	1,536.17	1,853.85	.....
	Goulburn.....	119.57	106.55	13.02	.....
	Braidwood.....	1,445.95	1,076.03	369.92	.....
	Araluen.....	141.51	89.25	52.26	.....
	Shoalhaven.....	1,911.08	1,743.28	167.80	.....
	Nerrigundah.....	372.13	419.78	.....	47.65
Tumut and Adelong.....	Bermagui.....	3.85	43.97	.....	40.12
	Adelong.....	4,689.74	6,725.02	.....	2,035.28
	Tumut.....	.....	40.70	.....	40.70
	Tumbarumba.....	1,287.62	1,238.15	49.47	.....
	Wagga Wagga.....	856.29	895.15	.....	38.86
	Gundagai.....	72.17	78.21	.....	6.04
Peel and Uralla.....	Cooma.....	132.11	.....	132.11	.....
	Kiandra.....	377.87	467.98	.....	90.11
	Armidale.....	96.33	4.68	91.65	.....
	Rocky River.....	363.08	84.95	278.13	.....
	Nundle.....	181.27	186.16	.....	4.89
	Tamworth.....	314.33	419.96	.....	105.63
Hunter and Macleay.....	Bingera.....	657.83	538.41	119.42	.....
	Copeland.....	1,555.81	1,069.82	485.99	.....
Clarence and Richmond.....	Grafton.....	769.34	608.55	160.79	.....
New England.....	Tenterfield.....	1,270.10	488.37	781.73	.....
Localities unknown.....	.....	36,120.26	38,766.96	.....	2,646.70
Total.....		91,854.72	93,990.36	8,209.15	10,344.79

SUMMARY.

District.	1885.	1886.
	oz.	oz.
Bathurst	15,570·10	16,356·46
Tambaroora and Turon.....	5,879·15	4,420·08
Mudgee	3,552·49	4,034·96
Lachlan	12,360·52	10,914·96
Albert	1,536·17	3,390·02
Southern	3,478·86	3,994·09
Tumut and Adelong	9,445·21	7,415·80
Peel and Uralla	1,234·16	1,612·84
Hunter and Macleay	1,069·32	1,555·81
Clarence and Richmond	608·55	769·34
New England	488·37	1,270·10
Localities unknown	38,766·96	36,120·26
	93,990·36	91,854·72

From the above statement it would appear that the quantity of gold sent to the Mint in 1886 was less by 2,135·64 oz. than in 1885.

The following table is compiled from information kindly furnished by the Collector of Customs:—

EXPORT OF GOLD—1886.

Gold.			Quartz tailings and Pyrites.		Total.		
Quantity.			Quantity.	Value.	Quantity.		
Value.				Value.	Value.		
oz. dwt. gr.					oz. dwt. gr.		
6,616 11 0	£24,918		Tailings, 1,616 pkgs	£10,694	9,587 2 0		£35,612

The quantity of gold sent to the Mint plus the quantity exported in 1886 was 101,441·82 oz., but the Deputy Master of the Mint informs me that the gold exported includes 25 oz. which had passed through the Mint and been included in the return furnished by him, consequently the gold yield for 1886 may be set down at 101,416·82 oz., valued at £366,294 7s 7d., which, as compared with the output of 1885, shows a decrease of 2,319·54 oz.

According to the returns furnished by the Mining Registrars the output of gold for the year was less by 10,073 oz. than the quantity sent to the Mint, showing that of the actual output 19,635 oz. is not included in their returns

RETURN of Gold for 1886 from Mint and Mining Registrars compared.

District.	Mint.	Mining Registrars.	Excess.	Deficiency.
	oz.	oz.	oz.	oz.
Bathurst	16,356	12,942	3,414	.....
Tambaroora and Turon	4,420	8,712	.....	4,292
Mudgee	4,035	7,712	.....	3,677
Lachlan	10,915	15,855	.....	4,940
Albert	3,390	3,830	.....	449
Southern	3,994	10,971	.....	6,977
Tumut and Adelong	7,416	8,238	.....	822
Peel and Uralla	1,613	8,646	.....	7,033
Hunter and Macleay	1,556	1,600	.....	44
Clarence and Richmond	769	1,126	.....	357
New England	1,270	2,140	.....	870
Localities unknown	36,120	.....	36,120	.....
			39,534	29,461
			29,461	
			10,073	

The quantity sent to the Mint exceeds the returns by the Mining Registrars by ...

Comparing the returns furnished by the Mining Registrars of the gold won in 1885 with those for 1886, there is an apparent decrease for 1886 of only 1,735 oz., but it is quite certain that these returns are incomplete.

MINING

MINING Registrars' Returns of Gold for 1885 and 1886 compared.

District.	1885.	1886.	Increase.	Decrease.
	oz.	oz.	oz.	oz.
Bathurst	16,157	12,942	.....	3,215
Tambaroora and Turon	9,374	8,712	.....	662
Mudgee	6,402	7,712	1,310	.....
Lachlan	16,616	15,855	.....	761
Albert	1,712	3,839	2,127	.....
Southern	11,331	10,971	.....	360
Tumut and Adelong	12,294	8,238	.....	4,056
Peel and Uralla	6,490	8,646	2,156	.....
Hunter and Macleay	1,017	1,600	583	.....
Clarence and Richmond	988	1,126	138	.....
New England	1,135	2,140	1,005	.....
			7,319	9,054
Less increase.....			.....	7,319
Decrease in yield for 1886 .....			.....	1,735

The following table shows the results obtained from the treatment of certain parcels of alluvium in a few of the mining districts. The returns, I regret to say, contain the results of so few washings that they are almost worthless for purposes of comparison, otherwise the average yield per ton is very high.

COMPARATIVE Statement of Average Yields from Alluvial Mines for 1885-86.

1885.				1886.			
District.	Quantity.	Average per ton.	Yield of Gold.	District.	Quantity.	Average per ton.	Yield of Gold.
	Tons	oz. dwt. gr.	oz. dwt. gr.		Tons	oz. dwt. gr.	oz. dwt. gr.
Mudgee	184	0 10 12 52	96 16 0	Tumut and Adelong	6,358	0 5 6 23	1,672 0 0
Lachlan	25,636	0 3 15 16	4,655 10 12	Lachlan	3,838	0 16 0 40	3,073 2 0
Tumut and Adelong	2,500	0 1 10 51	179 15 7	Albert	2,506	0 4 16 63	538 0 0
Albert.....	10,741	0 1 9 86	753 0 0				
	39,061	0 2 21 92	5,690 1 19		12,702	0 8 7 64	5,283 2 0

The following table, showing the yields obtained from certain parcels of quartz crushed, is, I am happy to say, more complete, and indicates greater and more successful efforts on the part of the Mining Registrars in collecting detailed information. The average yield per ton in 1886 is not nearly so high as that of the parcels reported in 1885, but it is a very satisfactory average.

COMPARATIVE Statement of Average Yields from Quartz-mines for 1885-6.

1885.				1886.			
District.	Quantity.	Average per ton.	Yield of Gold.	District.	Quantity.	Average per ton.	Yield of Gold.
	Tons. cwt. gr.	oz. dwt. gr.	oz. dwt. gr.		Tons. cwt. gr.	oz. dwt. gr.	oz. dwt. gr.
Bathurst ..	6,012 0 0	0 15 2 02	4,534 7 17	Bathurst	24,242 0 0	0 6 14 52	8,005 13 22
Tambaroora and Turon	2,972 0 0	1 1 9 13	3,177 3 12	Tambaroora and Turon	3,111 0 0	0 8 1 62	1,254 13 7
Lachlan ..	8,592 10 0	1 2 19 83	9,856 12 0	Lachlan	6,609 0 0	1 10 11 83	10,076 7 1
Southern ..	1,487 2 0	2 0 12 07	2,971 2 0	Southern	2,816 0 0	0 15 21 58	2,238 13 0
Tumut and Adelong	3,966 0 0	0 17 23 18	3,562 14 0	Tumut and Adelong	2,963 0 0	0 15 3 95	2,246 13 9
Peel and Uralla	539 0 0	0 15 16 56	422 17 0	Peel and Uralla	1,152 0 0	1 2 20 39	1,316 3 0
Hunter and Macleay	1,333 10 0	0 15 6 16	1,017 5 2	Hunter and Macleay	210 0 0	1 5 6 94	265 10 18
Clarence and Richmond	407 10 0	0 16 8 91	333 11 9	Clarence and Richmond	1,670 0 0	0 4 5 44	352 13 15
New England	112 2 1	2 7 5 07	264 13 0	New England	264 3 0	1 5 15 64	338 13 0
Albert	50 0 0	0 11 4 80	23 0 0	Albert	40 0 0	0 11 12 00	23 0 0
Mudgee ..	2,210 10 0	1 0 5 77	2,237 2 5	Mudgee	2,590 0 0	0 17 0 00	2,201 10 0
	27,662 4 1	1 0 12 02	28,355 7 21		45,667 3 0	0 12 9 67	28,320 11 0

The number of miners engaged in gold-mining in 1886, according to the returns furnished by the Mining Registrars, was 6,767 (which is 856 more than in 1885); of these, 5,750 were Europeans, and 867 were Chinese; 3,942 were engaged in alluvial and 2,675 in quartz mining.

Taking the quantity of gold won, and dividing it by the number of miners employed, the following results are obtained:—Dividing the quantity of gold as returned by the Mining Registrars, the result is 12 oz. 1.7 dwt. per man, valued at £43 10s. 1.67d. Dividing the quantity of gold won, as ascertained from the returns of the Mint and the Customs House, the result is 14 oz. 19.73 dwt., valued at £54 2s. 7.08d., representing, according to this mode of estimating, the average earnings of each man for the year. It must be borne in mind in regard to these estimates of earnings that a large number of those set down as miners are not working as miners continuously during the whole year, but devote considerable time to other pursuits.

Before

The following comparative statement shows that in the Northern District the output in 1886 was considerably larger, both in quantity and value, than in 1885, while in the Western and Southern Districts the decrease was considerable, both in quantity and value. The decrease in the former was probably due to the depression in certain trades; and the decrease in the latter district may be to some extent accounted for by the strike at the Southern mines. The strike in the South probably had the effect of increasing the output at the Northern Collieries.

COMPARATIVE Statement of Output of Coal in the Northern, Western, and Southern Districts.

	1882.		1883.	
	Tons.	Value.	Tons.	Value.
Output, Northern District.....	1,569,517 0 0	£ 715,937 3 6 s. d.	1,890,619 16 0	£ 928,026 13 5 s. d.
Increase as compared with previous year	217,044 18 0	278,667 5 4	330,102 16 0	212,089 9 11
Decrease do. do. ....	.....	.....	.....	.....
Output, Western District	197,639 0 0	62,915 1 2	232,418 3 0	77,780 18 6
Increase as compared with previous year	33,796 16 0	15,253 2 8	34,779 3 0	14,865 17 4
Decrease do. do. ....	.....	.....	.....	.....
Output, Southern District	342,126 0 0	170,113 8 0	389,419 2 0	196,134 1 0
Increase as compared with previous year	83,216 0 0	51,794 19 0	47,293 2 0	26,020 13 0
Decrease do. do. ....	.....	.....	.....	.....

	1884.		1885.		1886.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
Output, Northern District	2,055,342 10 3	£ 3,011,933 13 7 s. d.	2,113,372 13 0	£ 1,032,904 13 4 s. d.	2,178,116 0 0	£ 1,084,554 17 1 s. d.
Increase as compared with previous years.	155,722 14 3	83,907 0 2	58,030 2 1	20,970 19 9	64,743 7 0	51,650 3 9
Decrease do. ....	.....	.....	.....	.....	.....	.....
Output, Western District	273,823 14 0	74,161 9 7	311,762 16 0	76,836 13 3	281,229 0 0	68,615 15 0
Increase as compared with previous year.	41,405 11 0	.....	37,939 2 0	2,675 3 8	.....	.....
Decrease do. ....	.....	3,619 8 11	.....	.....	30,533 16 0	8,220 18 3
Output, Southern District	419,942 9 0	216,981 16 9	453,727 15 3	230,471 7 0	370,830 0 0	149,993 12 0
Increase as compared with previous year.	30,523 7 0	20,847 15 9	33,785 6 3	13,489 10 3	.....	.....
Decrease do. ....	.....	.....	.....	.....	82,897 15 3	80,477 15 0

In the Northern District the average price per ton was 9s. 11⁵d. in 1886, as compared with 9s. 9²9d. in 1885. In the Western District the average price per ton was 4s. 10⁵5d. in 1886, as compared with 4s. 11¹5d. in 1885. In the Southern District the average price per ton was 8s. 1⁰7d. in 1886, as compared with 10s. 1⁹d.

The number of Coal and Shale Mines under inspection, during 1886, was 40 in the Northern District, and 26 in the Western and Southern Districts—total 66, and 4 opening out; whereas in 1885 there were 67 under inspection, and 11 opening out.

During the year there were 72 accidents in collieries; of these, 29 were fatal, and 43 non-fatal. 8 of the fatal accidents occurred at Lithgow Valley Colliery, and 1 at Ferndale. The number of fatal accidents is more by 18 than in 1885, and the non-fatal in 1886 exceed those in 1885 by 3.

During

During the year the Department caused the following analyses to be made:—

COAL.

Locality.	Description of Mineral.	Analysis.	Coke %	Sulphur %	Specific Gravity.
Congola	Bituminous coal	Hygroscopic moisture 0·05 Volatile hydrocarbons, &c. 32·10 Fixed carbon 52·40 Ash 15·45 <hr/> 100·00	67·85	1·08	1·328
Catherine Hill Bay	Coal from a seam on the coast, 11 ft. 6 in. thick	Hygroscopic moisture..... 3·05 Volatile hydrocarbons, &c. .. 19·95 Fixed carbon 59·10 Ash 17·90 <hr/> 100·00	77·0	0·28	1·43
Dapto	Splint coal from West Dapto...	Hygroscopic moisture 2·89 Volatile hydrocarbons, &c. 16·60 Fixed carbon 58·20 Ash 22·31 <hr/> 100·00	...	1·58	1·450
Gunnedah	Coal taken from upper part of James Pye's 6-ft. seam, and from 72 ft. 4 in. to 74 ft. 6 in. from surface, portion 53, parish Black Jack, county Pottinger.	Hygroscopic moisture 3·00 Volatile hydrocarbons, &c. 29·50 Fixed carbon 58·80 Ash 8·70 <hr/> 100·00	67·5	0·61	1·291
Do	Coal from 2 ft. below the above do.	Hygroscopic moisture 1·75 Volatile hydrocarbons, &c. 14·75 Fixed carbon 76·76 Ash 6·74 <hr/> 100·00	83·5	0·64	1·255
Do	Coal from lower half of seam from 75 ft. to 78 ft. from surface do. do.	Hygroscopic moisture 2·80 Volatile hydrocarbons, &c. 30·47 Fixed carbon 56·83 Ash 9·90 <hr/> 100·00	66·73	0·52	1·278
Do	Coal from 95 ft. deep, J. Darcy's well, in portion 16, parish Black Jack, county Pottinger	Hygroscopic moisture 3·10 Volatile hydrocarbons, &c. 39·60 Fixed carbon 48·23 Ash 9·07 <hr/> 100·0	57·3	0·78	1·281
Do	Bituminous coal from a seam between 6 and 7 ft. thick, 78 ft. from surface, Springfield, near Gunnedah— $\frac{3}{2}$ miles from nearest point on G.N. Railway	Hygroscopic moisture 2·30 Volatile hydrocarbons, &c..... 39·73 Fixed carbon 52·47 Ash 5·50 <hr/> 100·00	57·97	0·52	1·308
Heathcote....	Splint coal from top of seam struck in Diamond drill Bore at a depth of 1,513 ft., seam 4 ft. 8 in. thick.	Hygroscopic moisture 1·34 Volatile hydrocarbons, &c..... 16·16 Fixed carbon 70·87 Ash 11·63 <hr/> 100·00	82·50	0·352	1·360
Do	Splint and bituminous coal from the middle of the above seam.....	Hygroscopic moisture 1·40 Volatile hydrocarbons, &c 15·23 Fixed carbon 68·64 Ash 14·73 <hr/> 100·00	83·37	0·350	1·384
Do	Bituminous coal from the bottom of the above seam	Hygroscopic moisture..... 1·38 Volatile hydrocarbons, &c. 18·82 Fixed carbon 64·47 Ash 15·33 <hr/> 100·00	79·80	0·356	1·366
Lake Macquarie...	Coal from an unworked seam.	Hygroscopic moisture 0·98 Volatile hydrocarbons, &c..... 37·72 Fixed carbon 55·14 Ash 6·16 <hr/> 100·00	61·3	0·48	1·228

Locality	Description of Mineral.	Analysis.	Coke %	Sulphur %	Specific Gravity.
Lake Macquarie.	Coal from an unworked seam.	Hygroscopic moisture 0·88 Volatile hydrocarbons, &c. 32·12 Fixed carbon 54·20 Ash 12·80 <hr/> 100·00	67	0·49	1·285
Mount Westmacott.	Bituminous coal, being part of the core obtained from No. 2 seam in diamond-drill Bore, at a depth of 1,584 ft.	Hygroscopic moisture 0·40 Volatile hydrocarbons, &c. 18·91 Fixed carbon 66·99 Ash 13·70 <hr/> 100·00	80·69	0·48	1·45
Maitland	Coal from Deep Creek, Bishop's Bridge	Hygroscopic moisture 2·35 Volatile hydrocarbons, &c. 40·79 Fixed carbon 52·76 Ash 4·10 <hr/> 100·00	56·86	0·839	1·243
West Maitland.	Clippings of coal obtained by jumping-rods from coal seam 50 ft. below the Homeville seam	Hygroscopic moisture 2·21 Volatile hydrocarbons, &c. 36·45 Fixed carbon 51·51 Ash 9·83 <hr/> 100·00	61·34	0·68	1·318
Do.	Bituminous coal from Homeville Colliery	Hygroscopic moisture 2·10 Volatile hydrocarbons, &c. 40·27 Fixed carbon 51·80 Ash 5·83 <hr/> 100·00	57·63	0·89	1·270
Western District.	Semi-bituminous coal	Hygroscopic moisture 3·40 Volatile hydrocarbons, &c. 30·60 Fixed carbon 55·17 Ash 10·83 <hr/> 100·00	66	0·76	1·316
Lake Macquarie.	Bright bituminous coal from block 16, held by Messrs. Parbury, Lamb, & Saddington, parish Wallarah, county Northumberland.	Hygroscopic moisture 0·49 Volatile hydrocarbons 31·15 Fixed carbon 59·46 Ash 8·90 <hr/> 100·00	68·36	0·8	1·330
Do.	Layers of splint and bituminous coal, with a little pyrites, from block 19, at do. do.	Hygroscopic moisture 0·50 Volatile hydrocarbons, &c. 31·01 Carbon 59·47 Ash 9·02 <hr/> 100·00	68·49	0·88	1·340

Fuller particulars concerning the composition of the Coals of this Colony may be found in the Annual Report of this Department for the year 1880.

SHALE.

Though kerosene shale is found in various parts of the Colony, and there appears to be a disposition to open up the deposits in some of the most promising localities, there are only two mines in which this mineral is wrought to any extent. The output from these two mines for the year 1886 is nearly double that of the preceding year, and the average price per ton is very satisfactory. The Warden reports that the owners of the mine at Joadja Creek are engaged in extending and improving the manufacture of the various products extracted from the shale.

The following table shows the quantity and value of Kerosene Shale produced during the years 1865 to 1886.

Year.	Quantity.	Average price per ton.	Total value.	Year.	Quantity.	Average price per ton.	Total value.
	Tons.	£ s. d.	£ s. d.		Tons.	£ s. d.	£ s. d.
1865	570	4 2 5·47	2,350 0 0	1877	18,963	2 9 0·81	46,524 0 0
1866	2,770	2 18 10·48	8,150 0 0	1878	24,371	2 6 11·40	57,211 0 0
1867	4,079	3 14 9·21	15,249 0 0	1879	32,519	2 1 1·96	66,930 10 0
1868	16,952	2 17 7·11	48,816 0 0	1880	19,201	2 6 7·03	44,724 15 0
1869	7,500	2 10 0·00	18,750 0 0	1881	27,894	1 9 2·59	40,748 0 0
1870	8,580	3 4 3·18	27,570 0 0	1882	48,065	1 15 0·00	84,114 0 0
1871	14,700	2 6 3·91	34,050 0 0	1883	49,250	1 16 10·77	90,861 10 0
1872	11,040	2 11 11·91	28,700 0 0	1884	31,618	2 5 7·86	72,176 0 0
1873	17,850	2 16 6·55	50,475 0 0	1885	27,462	2 8 11·62	67,239 0 0
1874	12,100	2 5 1·48	27,300 0 0	1886	43,563	2 5 10·79	99,976 0 0
1875	6,197	2 10 2·22	15,500 0 0				
1876	15,998	3 0 0·00	47,994 0 0		441,242	2 5 1·42	995,412 15 0

The following samples have been analyzed during the year :—

SHALE.

Locality.	Description of Mineral.	Analysis.	Specific Gravity.
Mudgee District	Shale from close to the Mudgee Railway Line beyond Capertee	Hygroscopic moisture 0.50	1.220
		Volatile hydrocarbons, &c. 58.47	
		Fixed carbon 15.43	
		Ash 25.60	
		100.00	
Port Stephens	Shale from Port Stephens.....	Hygroscopic moisture 0.39	1.121
		Volatile hydrocarbons, &c. 61.16	
		Fixed carbon 20.20	
		Ash 18.25	
		100.00	
		Sulphur, a trace.	
Rylstone	Shale from Rylstone	Hygroscopic moisture 2.10	1.118
		Volatile hydrocarbons, &c. 66.90	
		Fixed carbon 12.63	
		Ash 18.37	
		100.00	

SILVER.

Notwithstanding the failure to treat successfully the ores obtained in some of our silver-mines, and the depression consequent thereon in certain quarters, it is very cheering to find that the result of our operations in 1886 shows an increase of more than a quarter of a million in excess of the preceding year. In view of the fact that the treatment of silver ores is new to us, it is no wonder that attempts to treat some of the more difficult ores have not been successful, and it would not be surprising if some of the mines now regarded with disfavour should, as our experience and appliances increase, prove exceedingly valuable.

The Warden's and Mining Registrar's report:—The silver won by the Sunny Corner Company from gossan was 547,589 oz., valued at £123,207, being the yield from 27,501 tons of ore treated. The ores from the lode have been reduced and the bullion, 23,601 oz., shipped to Wales for final treatment. Four hundred men were employed on this mine. The Nevada mine, which had been a long time idle, because the ores were so refractory they could not be treated in the ordinary way, the smelter having been pulled down and rebuilt, was run twenty-four consecutive days, treating 350 tons of ore, from which bullion to the value of £3,000 was obtained. Fifty-six men are employed on this mine. The Silver King mine is idle. 500 tons of gossan were purchased from this mine by the Sunny Corner Company, the return from which was considered good. 2,489 tons of ore was treated on the mine, returning 34,967 oz. silver, valued at £9,480. At Back Creek, Rockley, some work is being done in silver, but the ore is not treated locally. 43 tons of ore sent to Melbourne for treatment yielded 3,700 oz. silver, valued at £740, and 30 oz. of gold, valued at about £112. Land has been taken up between Emu Swamp Creek and Lewis Ponds for working silver ores, and two or three lodes of silver ore have been recently discovered on private property, 3 or 4 miles north-east of Orange, and it is thought that silver-mining will soon be added to the local industries.

In the Silvertown Division very satisfactory progress was made during the year, though most of the mines are in their infancy, and will require a considerable amount of capital and labour to develop them. The magnificent results obtained by the Broken Hill Company have induced a considerable amount of prospecting, which is likely to result satisfactorily. During the year this Company raised and treated 14,750 tons of ore, from which 36½ tons of silver, valued at £228,519 were obtained. To the end of 1886 this Company had paid £64,000 in dividends. Work has been resumed at the Pinnacle's mine, and it is thought that with the aid of concentrating machinery, which is being erected, the Company will be able to treat the refractory ores effectively, and then, with the improved water supply, this mine will be second only to the Broken Hill. This Company had 450 tons of ore left from 1885, and raised during the year 800 tons; of this, 88 tons were sold for £1,100, and 511 tons were smelted, yielding 18,937 oz. of silver, valued at £3,800, leaving 651 tons of ore, valued at £2,604. At the Day Dream the men were engaged prospecting the mine at a greater depth, and they have met with fair success. The Umberumberka Company may now be regarded as established as a first-class mine. This Company raised during the year 1,389 tons of ore, which was sold for £31,026, and added 1,246 tons of second-class ore, valued at £7,476, to their stock. Several of the small chloride veins which are to be found all over the field, especially in the vicinity of Purnamoota, have been steadily worked during the year. Two small smelters are about to be erected at Purnamoota for the treatment of the ore from these veins. The large manganese outcrops at Corona are again attracting attention.

The

The South Australian Railway has been completed to the Border; and it is expected the tramway to Silverton will be completed very shortly, when it is thought a large quantity of low-grade lead ores, carrying from 30 to 40 oz. of silver per ton, will be sent away.

There are now seven smelters on the field.

410,256 oz. of refined silver, valued at £81,910, were sent through the Customs during the year, and the exports of silver ore, lead, &c., brought up the value of the exports to £370,423.

A very full and interesting description of the mines in the Silverton District is given in the report (herewith) of the Inspector of Mines.

At Captain's Flat a large amount of work has been done at the El Capitan mine, and also at the Kohinoor mine. At the former the smelting works were completed early in the year. Smelting commenced in February, and continued, with the exception of stoppages from want of water, &c., until September, with results said to be fairly payable. It is reported that during the period about 100 tons of lead bullion were produced; since then the furnace has not been at work, but work has been continued in the mine. At the Kohinoor mine some 400 tons of ore have been raised, and a smelting furnace similar to the one at El Capitan mine is being erected. The lode in this mine, at a depth of 100 feet below the surface, is 42 feet wide.

At Bredbo, in the Cooma Division, land has been taken up for the purpose of mining for silver and lead; assays made of the ore varied from 20 oz. to 60 oz. per ton.

The Inspector of Mines reports that the silver mines in the New England District are progressing favourably, but no smelting works have yet been erected.

At Well's mine, Vegetable Creek, the lode at the 150-foot level is 7 feet wide. The Company has been engaged two years in testing the lode, which appears to improve in size and quality at deeper levels, and will soon erect machinery for treating the ore, of which they have 900 tons at grass, estimated to contain 30,000 oz. of silver. The ore which has been treated from the lodes at Pye's Creek has proved rich, but the mines are almost deserted, owing to the absence of the necessary plant to treat the ore, and the want of capital to procure the requisite appliances.

The quantity and value of silver and of silver and lead ore exported to end of 1886 has now reached a total of £1,221,939.

QUANTITY and Value of Silver and Silver and Lead Ore exported.

Year.	Silver.		Silver and Lead Ore.				Total Value.
	Quantity.	Value.	Quantity.		Value.		
			Ore.	Metal			
Up to	Oz.	£ s. d.	Tons cwt. qrs. lb.	Tons cwt.	£ s. d.	£	
1881.....	726,779-14	178,405 0 0	191 13 0 0	.....	5,025 0 0	183,430
1882.....	38,618	9,024 0 0	11 19 0 0	.....	360 0 0	9,384
1883.....	77,065-18	16,488 0 0	136 4 0 0	.....	2,075 0 0	18,563
1884.....	93,660-25	19,750 0 0	9,167 11 1 7	.....	241,940 0 0	251,720
1885.....	794,173-80	159,187 0 0	2,095 16 0 0	190 8	107,626 0 0	266,813	
1886.....	1,015,433-10	197,544 0 0	4,802 2 0 0	.....	294,485 0 0	492,029
	2,745,728-47	580,428 0 0	16,405 5 1 7	190 8	651,511 0 0	1,221,939	

THE following assays of Silver Ores and Lead Ores were made during the year:—

SILVER.

Locality.	Description of Mineral.	Per ton.		Per cent.	
		Silver.	Gold.	Lead.	Copper.
Armidale	Ferruginous carbonate of lead, from between Armidale and M ^d Donald River.	oz. dwt. 50 12½	oz. dwt.		
„	Quartz and mispickel	10 17½			
„	Galena, from 8 miles north of Armidale ..	196 16			
Barrier Ranges ...	Ferruginous carbonate of lead and quartz, from parish Bolaira, county Yancowinna.	16 6½		39·96	
„ ...	Ferruginous carbonate of lead, from ditto	20 8		27·43	
„ ...	Quartz containing galena and carbonate of lead, from ditto	11 8½			
„ ...	Ferruginous quartz with galena and carbonate of lead, from west of Broken Hill, near Silverton.	73 10	0 3		
„ ...	Ferruginous quartz and earth, from ditto	59 12	0 3		
„ ...	Ferruginous carbonate of lead	17 18½			
„ ...	Galena, from Wilcannia	13 1			

Locality	Description of Mineral	Per ton		Per cent	
		Silver	Gold	Lead	Copper
Lewis Ponds Ck	Porous gossan, western wall of lode	oz dwt 227 6	oz dwt 1 7		
Mitta Mitta	Quartz and galena, Mitta Mitta, 20 miles from Gundagai	21 4½			
Mudgee	Earthy carbonate of lead, Bora Creek, 12 miles from Mudgee	22 17			
"	Siliceous porous iron ore, "	14 15½			
"	Ferruginous porous quartz and arseniate of iron, from Bara	16 17½			
"	" claystone with carbonate of lead, "	20 2			
"	" quartz and gossan with carbonate of lead, from Baia, Gap Reefs	11 8½			
Marulan	Porous iron ore and a little pyrites	11 1	1 2½		
"	Claystone with a little iron pyrites, galena, and carbonate of lead, from Carrington Mine	28 11½		8 5	
"	Sulphide and oxide of antimony with lead and quartz, from Carrington Mine (metallic antimony, 16 75%)	164 3	2 17	22 27	
"	Quartzite containing carbonate and sulphide of lead, trace of antimony and arsenical pyrites, from Carrington Mine	197 4	2 17	24 8	
"	Arsenical pyrites and porous gossan, from Carrington Mine, 70 ft level	62 6½	0 16		
Muttama	Concentrated pyrites with a little quartz, from Cowong Reef	10 1½	0 5		
"	Quartz and iron pyrites and galena, New Year's Gift Reef, from 180 ft level	21 15½	3 5		
Molong	Quartzite with native and red oxide of copper, from Gumble Mine	17 19		9 6	
Milparinka	Ferruginous carbonate of lead	1,019 4			
Mount Grosvenor	Galena and pyritous quartz, from near Bathurst	17 19		45½	
"	" and quartz, from "	41 13			
Mole Station	Ferruginous felspathic rock with galena and a little zinc blende, from between Mole Station and Glen Creek	10 12			
Mitchell	Lodestuff, from No 2 drive, Nevada Mine	13 12			
	Insoluble siliceous matter (gaugue)	46 63			
	Oxides of iron and alumina	24 18			
	Lead	9 34			
	Copper	5 06			
	Bismuth	0 88			
	Antimony	0 43			
	Arsenic	0 90			
	Sulphur	12 42			
	Manganese	trace			
	Undetermined, loss, &c	0 16			
		100 00			
"	Lodestuff, from stope No 2 south drive, from Nevada Mine	2 14½			
	Insoluble silicious matter (gaugue)	51 02			
	Oxides of iron and alumina	26 31			
	Lead	6 25			
	Copper	4 02			
	Bismuth	trace			
	Arsenic	"			
	Antimony	"			
	Sulphur	9 32			
	Manganese	trace			
	Chromium	"			
	Undetermined, loss, &c	4 08			
		100 00			
"	Lodestuff, Tonkin's lease	22 1	0 3	45 6	
"	Black ore, Silver King Mine	13 1	8 0	0 5	
"	Lodestuff, from end of No 2 level, Sunny Corner Mine	37 10½	0 4	14 60	1 65
"	Quartz with a little pyrites and galena, from Monte Christo Reef	90 2	1 7		
"	Waste pyrites tailings	13 17½	1 7		
"	Ferruginous quartz and pyrites, Monte Christo Mine	16 6½	0 5		
Nowra	Iron pyrites and galena in jasperoid veinstone, from 10 miles from Nowra	22 17			
New England	Green carbonate and a little grey sulphide of copper, from Lottery Creek, Ball Tableland	14 14	0 3	39 9	
Newbridge	Crushed sample	119 10	1 4		
"	"	81 4½	1 10½		
Oberon	Quartz and mispickel, from 4 miles from Oberon	14 3	0 3		
Ophir	Porous ferruginous quartz showing a little chloride of silver, 60 ft deep.	213 19	0 4		
Orange	Porous brown iron ore, from Swamp Creek, 9 miles from Orange	14 14	0 3		
Pye's Creek	Sulphide of antimony and lead, &c, occurring in nodular pieces	283 4¾			
	Sulphide of antimony	16 250			
	" lead	63 280			
	" iron	13 716			
	" silver	1 124			
	Silica (gaugue)	5 630			
		100 000			
"	Blende and pyrites	17 19			
"	Galena blende and magnetic pyrites	17 3			
"	Earthy oxide of lead	15 10			
"	Felspathic rock with ferruginous claystone and quartz containing fahlerz	64 10			
"	Galena and ferruginous quartz from block 434	41 13		21 3	
"	Galena, iron pyrites, and blende in quartzose claystone, Homeward Bound Mine	19 12		1 25	
"	Claystone and earthy gossan	27 15			
"	Galena and carbonate of lead, from a new lode	146 3			

Locality.	Description of Mineral.	Per ton.		Per cent.	
		Silver.	Gold.	Lead.	Copper.
Pye's Creek	Galena and sulphide of zinc	oz. dwt. 26 2½	oz. dwt.		
"	Siliceous brown iron stone, with galena in irregular patches, from portion 424, 14-ft. level.	76 15			
"	Brown iron and quartz	11 16½			
"	Quartz and felspathic rock, with green carbonate of copper	11 8½			
"	Sulphides of lead, antimony, and iron, 20 ft. deep	40 16½			
"	Ferruginous gossan	35 2			
Peelwood	Porous siliceous gossan, with carbonate of lead, 100 ft. deep, lode 11 ft. wide.	35 7½	0 3	34·2	
"	Ironstone with quartz fragments	138 0			
Rockley	Crushed ferruginous sample	20 8	0 3		
"	"	36 15	0 3		
Spicer's Creek	Grey sulphide and carbonate of copper	21 4½	0 3		
Severn River	Red and greenish yellow iron oxide	36 15			
"	Quartz, iron, and arsenical pyrites, and a little zinc blende and galena, 30 ft. deep.	14 3			
"	Galena, zinc blende, iron, arsenical and copper pyrites, Seaforth Mine, near Emmaville.	38 7½			
"	Galena and carbonate of lead, Campbell's Reef	35 18½		45	
Silverton	Ferruginous carbonate of lead and galena	42 9			
Tuena	Ferruginous carbonate of lead, 90 ft. deep, Maguire's Prospecting Shaft, Costigan's Mount, Tuena.	60 18½	1 3	43·5	
"	Porous iron ore, 100 yds., north of the above shaft, 60 ft. deep at, do.	492 9			
"	Porous ferruginous gossan, Costigan's Mount	42 9			
"	"	30 4	0 3		
"	Galena, carbonate of lead and brown iron ore, from do.	116 15½			
Tinda Mountains	Earthy ferruginous quartz veinstone	17 3			
Tarago	Quartz containing galena and iron pyrites.	10 12			
Tenterfield	Carbonate and sulphide of lead, from a new find, 11 miles from Tenterfield.	65 6½		71·2	
"	Galena, from 11 miles from Tenterfield	59 12		75·1	
Tent Hill	Porous ferruginous gossan.	122 1½			
Trunkey	Black sand, principally magnetic iron sand, between Trunkey and the Abercrombie Road.	10 4	8 3		
Tarrabandra	Ferruginous quartz vein with iron pyrites, galena, and a little zincblende, Victoria Reef, South Gundagai.	10 7			
Wiseman's Creek	Earthy veinstone, chiefly quartz, 5 miles S.	71 1	0 4		
"	Carbonate of lead, arsenic, and calcose slate, from do.	12 5			
Wagga Wagga	Crushed ferruginous quartz, a new discovery	46 4½			
"	Crushed iron ore slightly magnetic	4,308 14½			
"	"	862 8			
"	Crushed iron ore and quartz	864 0½			
"	Crushed iron ore.	715 8			
"	Porous brown iron ore, Big Springs, near Wagga Wagga	11 8½			
Yarrowford	Galena, arsenical pyrites, from 20 miles, from Yarrowford	17 3			

LEAD.

Locality.	Description of Mineral	Lead Per cent	Gold per ton.	Silver per ton.	Copper percent
Binalong	Galena and a little quartz	76·5	oz. dwt.	oz. dwt.	
Bombala	Ferruginous gossan and galena, from 18 miles W. of Bombala	43·5		4 1½	
"	Ferruginous galena, 20 miles W. of Bombala	67·2		7 7	
"	Ferruginous quartzite with galena and carbonate of lead, and thin veins of calcite, from W. of Bombala.	25·2		8 14½	
"	Quartz and calcite with galena and copper pyrites, and a slight trace of green carbonate of copper.	30·0		3 5	
"	Ferruginous galena and carbonate of lead, from 15 miles from Bombala.	36·7		4 1½	
"	Galena and a little ferruginous carbonate of lead, from 20 miles from Bombala.	42·1		4 18	
"	Quartz and calcite containing iron pyrites and galena	24·0		22 17	
"	Ferruginous felspathic lodestuff and galena	30·3		10 12	
"	"	28·2		3 5	
Burrowa	Crushed sample	59·5		32 5	
"	"	47·45		67 15	15·80
Barrier Range	Ferruginous carbonate of lead, from parish Bolaira, county Yancowinna.	31·63		6 10½	
"	Ferruginous carbonate of lead with quartz, from do.	39·96		16 6½	
"	"	36·72		5 14	
"	Ferruginous carbonate of lead, from do.	27·43		20 8	
Bathurst	Galena and pyritous quartz, from Mount Grosvenor	45½		17 19	
Bollara	Ferruginous quartz and galena, from footwall, from Bollara, Collington, near Queanbeyan.	42·5		18 15½	
"	do. from Hanging Wall, at do do	29·5		8 3	
Braidwood	Schist rock with carbonate of lead, from 12 miles from Braidwood	42·5		1 12½	
"	Carbonate of lead	49·5		22 1	
Cooma	"	52·0		11 8½	
"	Galena, from Cooma District	74·0		37 11	
"	"	70·2		26 19	
Candelo	" county Auckland	75·5		6 10½	

Locality.	Description of Mineral.	Lead. per cent.	Silver. per ton.	Gold. per ton.	Copper per cent.
Emmaville	Ferruginous felspathic gossan with galena, from Hell Hole, 4 miles from Emmaville.	35.2	oz. dwt.	oz. dwt. 23 13½	
"	Galena with carbonate of lead, Severn River Mine, 9 miles from do (60 ft. deep).	58.5	.....	23 13½	
"	Galena with a little quartz and decomposed felspathic rock, from do	66.2	.....	5 14½	
Fairfield	Ferruginous carbonate of lead	51.5	0 3	14 14	
"	" " "	37.18	.....	5 14	
"	" " "	65.0	.....	4 1½	
"	Galena	60.2	.....	9 16	
Lewis Ponds Ck.	Earthy carbonate of lead, from near Orange (60 ft. deep)	50.2	.....	101 5	
Marulan	Sulphide and oxide of antimony, with lead and quartz, Carrington Mine; metallic antimony, 16.75 per cent.	22.27	2 17	164 3	
"	Quartzite, containing carbonate and sulphide of lead, a trace of antimony and arsenical pyrites, from do.	24.8	2 17	197 4	
Mitchell	Carbonate of lead, from Great Western Mine	65.5	.....	
"	Galena, from lode at prospecting drive, at do	60.8	.....	4 1½	
Pye's Creek	Galena and ferruginous quartz, from block 434	21.3	.....	41 13	
Peelwood	Porous gossan with crystals of cerussite, from lode 8 ft. wide, 2½ miles north of Peelwood.	25.4	.....	
"	Porous siliceous gossan with carbonate of lead, depth 100 ft., lode 11 ft. wide.	34.2	0 3	35 7½	
Severn River	Galena and carbonate and sulphate of lead, from Campbell's Reef	35.0	.....	5 1	
"	Galena and carbonate of lead, from do	45.0	.....	35 18	
Severn River Silver Mine.	Galena in felspathic rock	40.4	.....	4 2½	
Tenterfield	Carbonate and sulphide of lead, from a new find about 11 miles from Tenterfield.	71.2	.....	65 6½	
"	Galena, from do	75.1	.....	59 12½	
Tuena	Ferruginous carbonate of lead, 90 ft. deep, Maguire's prospecting shaft, Costigan's Mount, Tuena.	43.5	1 3	60 18½	
Yass	Galena	70.1	.....	
"	Fine-grained galena and a little quartz, from Yass	55.4	.....	4 1½	

TIN.

Though the export of tin and tin ore during 1886 was slightly less than in 1885, the value was greater by nearly £50,000, indicating the improvement in the price of tin. This should have the effect of attracting more attention to our tin deposits, and it is to be hoped will lead to the resumption of work in some of the mines that were stopped some time since in consequence of the fall in price.

The Warden's and Mining Registrar's report:—The tin deposits near Poolamacca Station are now being tested, and there is a strong probability of some good mines being opened up.

The Inspector of Mines reports that several parties are working the deposits of lode tin discovered at Poolamacca, about 60 miles north of Silvertown, and that the granite ridges in the vicinity should be prospected.

In the Tingha Division the higher price of tin has induced more prospecting, and the numerous reefs are attracting attention, and are being tested with good prospects. 1,649 tons of tin were obtained, valued at £89,940.

At Vegetable Creek the quantity of tin raised was 1,894 tons 2 cwt. 0 qr. 13 lb., value £107,964
At Glen Innes, 227 tons 18 cwt. 0 qr. 17 lb., value £12,990 13s.

At Wilson's Downfall only deposits of stream tin have been worked, but prospecting for tin lodes has been carried on. The quantity of tin ore won was 307 tons, valued at £17,800.

The report (herewith) of the Inspector of Mines upon the tin mines in the Vegetable Creek District is worthy of attention.

It is thought that it is due to the fact that almost all the shallow ground had been worked out that the required capital for developing the deep leads was not forthcoming. At the Torrington mine 43 tons 13 cwt. of tin were raised. The width of the lode is 1 ft., the depth of the shaft 116 ft., and the deepest level 100 ft. At the Dutchman Tin Lode Company's mine the quantity of tin raised is about 45 tons; the width of the lode, about 2 ft. 6 inches. The quantity of tin raised at the Great Britain mine was 124 tons. At Kangaroo Flat, Hall Brothers raised nearly 67 tons; at Six-mile they raised about 3¼ tons; at Grampians they raised about 12½ tons; and at Vegetable Creek they raised about 6½ tons. Moore and party, at Y Waterholes, raised nearly 65 tons of tin ore from the reworking of old ground. The Rothschild Company raised about 92 tons, also from old ground. At Rose Valley, Bailey & Co. blocked out 637 ft. in length of the lead by 60 ft. in width, the average depth of wash being 5 ft., the quantity of ore raised being 223½ tons. The Wesley Company in Rose Valley raised about 55½ tons of ore; the depth of the leads varies from 50 ft. to 190 ft., the depth of the wash from 1 to 4 ft., and the width from 3 to 5 ft. Most of the lodes at Nine-mile have
given

given good returns; a crushing of 25 tons of stone gave over 7 tons of tin. From Mr. Cadell's mine, at Y Waterholes, the output was about 230½ tons. Prospecting has been carried on to discover the continuation of the Old Vegetable Creek and Graveyard Creek, but hitherto without success. The Vegetable Creek Company raised 99¼ tons of ore during the year. The Nonpareil Company raised about 12 tons of ore. A large amount of work has been done in prospecting for the deep lead. The quantity of ore received at the smelting works during the year was 1,261 tons, namely,—from shallow workings, 631 tons 1 cwt.; from deep leads, 490 tons 2 cwt.; from lodes, 140 tons; and during the same period 858 tons of refined metal were forwarded to Sydney. The battery was continuously at work during the year crushing stone chiefly from the Ottery reef; the quantity crushed was 2,419¼ tons, from which 79 tons of ore were obtained. The quantity of tin ore obtained in the Vegetable Creek Division during the year was 1,89¼ tons 2 cwt. 13 lb. valued at £107,964, namely,—from lodes, 169 tons 13 cwt.; from shallow workings, 761 tons 1 cwt.; and from deep leads, 962 tons 8 cwt. 13 lb.; and from the shallow workings in the Glen Innes Division, 227 tons 18 cwt. 17 lb. of tin ore were won.

TABLE showing the quantity and value of Tin exported from, and the produce of, the Colony of New South Wales, since the opening of the Tin-fields in 1872.

Year.	Ingots.		Ore.			Total.		
	Quantity.	Value.	Quantity.	Value.		Quantity.	Value.	
	Tons cwt.	£ s. d.	Tons cwt.	£ s. d.		Tons cwt.	£ s. d.	
1872	47 0	6,482 0 0	849 0	41,337 0 0		896 0	47,819 0 0	
1873	911 0	107,795 0 0	3,660 0	226,641 0 0		4,571 0	334,436 0 0	
1874	4,101 0	366,189 0 0	2,118 0	118,133 0 0		6,219 0	484,322 0 0	
1875	6,058 0	475,168 0 0	2,022 0	86,143 0 0		8,080 0	561,311 0 0	
1876	5,449 0	379,318 0 0	1,509 0	60,320 0 0		6,958 0	439,638 0 0	
1877	7,230 0	477,952 0 0	824 0	30,588 0 0		8,054 0	508,540 0 0	
1878	6,085 0	362,072 0 0	1,125 0	33,750 0 0		7,210 0	395,822 0 0	
1879	5,107 2	343,075 0 0	813 15	29,274 0 0		5,920 17	372,349 0 0	
1880	5,476 6	440,615 0 0	682 6	30,722 9 0		6,158 12	471,337 0 0	
1881	7,590 17½	686,511 0 0	609 6	37,492 0 0		8,200 3½	724,003 0 0	
1882	8,059 0	800,571 0 0	611 0	32,890 0 0		8,670 0	833,461 0 0	
1883	8,680 1	802,867 0 0	445 4	21,685 0 0		9,125 5	824,552 0 0	
1884	6,315 16	506,726 0 0	349 13	14,861 0 0		6,665 9	521,587 0 0	
1885	4,657 18	390,458 0 0	534 18	25,168 0 0		5,192 16	415,626 0 0	
1886	4,640 18	449,303 0 0	326 18	18,350 0 0		4,967 16	467,653 0 0	
	80,408 18½	6,595,102 0 0	16,480 0	807,354 9 0		96,888 18½	7,402,456 0 0	

THE following assays of Tin Ore have been made during the year:—

TIN.

Locality.	Description of Mineral.	Metallic Tin %
Ashford	Greisen with crystals of tinstone	30·8
Bendemeer	Black sand with stream tin ore, from Watson's Creek	58·2
"	" " " " " "	15·8
Bundarra	Black sand with stream tin ore, from Long Arm Creek	65·2
Gilgai	Lode tin ore	52·2
Inverell	Stream tin ore	70·3
"	"	53·4
"	"	63·5
Gumble	Greenish felspathic rock and quartz veins with carbonate of copper, from a shaft 40ft. distant from Gumble Mine, near Molong	1·25
"	Stanniferous and cupriferosus lodestuff, from Gumble Mine, near Molong, with 13 % of metallic copper ..	10·3
"	Stanniferous ferruginous lodestuff, from Gumble Mine, near Molong.....	10·26
"	Fine sample obtained by crushing and washing lodestuff at Gumble Tin and Copper Mine	69·4
"	Felspathic lodestuff with tinstone and carbonates of copper—copper, 3·85 %; silver, Soz. 19½dwt. per ton.	58·70
Moree	Stream tin ore, from 40 miles N.E. of Moree	67·25
Shoalhaven	Black sand from beach	1·65
Stannifer	Lode tin ore	51·70
Tenterfield	Lode tin ore, from near Tenterfield	63·35
"	" " " " " "	33·4

COPPER.

I regret to say the depression in copper-mining continues, owing to the low price of copper, and only the very best mines can, under existing circumstances, be worked at a profit. It is much to be desired that some means or appliances may be devised whereby the cost of raising and treating ores might be reduced, so that the mines now lying idle may again be brought into active operation.

The Burrage mine has been idle since the 30th September, owing to the low price of copper, notwithstanding a splendid face of ore. During the nine months 281 tons of copper, valued at £14,000, was sent away from the mine. From the Belaire mine, in the Wellington Division, 300 tons of ore were raised, yielding 40 tons of copper, valued at £1,720. From the Gordon mine, Buckinbah, 300 tons crushed concentrated ore were obtained, which assayed—gold, 10 dwt.; silver, 2 oz.; copper, 10 per cent.

Notwithstanding the depressed state of the copper market, the Great Cobar Company employed 500 men and boys. During the year they raised 25,887 tons of ore, which, smelted on the mine, yielded 2,044 tons of copper, valued at £80,951. The ore consists of grey oxide and blue and green carbonates, the percentage being 7·88. The Nymagee mine employs 300 men and boys. 14,782 tons of ore were raised and smelted on the mine, yielding 1,478 tons of copper, valued at £60,967 10s. The average of the ore for the year was 10 per cent., and the general average since the commencement of the mine 14 per cent.

A party of four men have sunk a shaft on the Hermitage Plains, about 30 miles east of Cobar, 30 feet deep. At 13 feet they struck some very good ore, consisting of grey sulphides with blue and green carbonates. The width of the lode is about 5 feet, strike north, dipping 1 in 30 feet west. This locality is said to abound in copper ore. It is said that Captain Williams, of the Great Cobar Company, intends shortly to commence work on the land about 6 miles north-west of Cobar, recently occupied by Cohn and party.

At the New Mount Hope mine only a few men are employed opening up, as at the present price of copper it would not pay to resume active operations. The Great Central mine is altogether closed, said to be due to bad management, as the mine is said to be rich, as much as £3,000 a year having been offered for the right to work it on tribute.

Some rich copper specimens have been found at Buddawang Range, about 16 miles from Braidwood, but no lode has yet been found.

The Inspector of Mines reports that at the Gordon mine, Buckinbah, there is about 1,000 tons of concentrated copper ore at grass, which assays 9 per cent. copper and 12 dwt. of gold and 2 oz. silver per ton.

TABLE showing the quantity and value of Copper, the produce of the Colony, exported from the Colony of New South Wales, from 1858 to 1886.

Year.	Ingots.		Ore and Regulus.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons cwt.	£	Tons cwt.	£	Tons cwt.	£
1858			58 0	1,400	58 0	1,400
1859	30 0	578			30 0	578
1860			43 0	1,535	43 0	1,535
1861			144 0	3,390	144 0	3,390
1862			213 0	5,742	213 0	5,742
1863	23 0	1,680	114 0	420	137 0	2,100
1864	54 0	5,230			54 0	5,230
1865	247 0	15,820	22 0	545	269 0	16,365
1866	255 0	18,905	23 0	1,885	278 0	20,790
1867	393 0	30,189	0 2	5	393 0	30,194
1868	644 0	23,297	172 0	4,000	816 0	27,297
1869	1,980 0	74,605	104 0	2,070	2,084 0	76,675
1870	994 0	65,671	6 0	60	1,000 0	65,731
1871	1,350 0	87,579	94 0	1,297	1,444 0	88,876
1872	1,035 0	92,736	417 0	13,152	1,452 0	105,888
1873	2,795 0	237,412	51 0	1,690	2,846 0	239,102
1874	3,638 0	311,519	522 0	13,621	4,160 0	325,140
1875	3,520 0	297,334	157 0	4,356	3,677 0	301,690
1876	3,106 0	243,142	169 0	6,836	3,275 0	249,978
1877	4,153 0	307,181	360 0	17,045	4,513 0	324,226
1878	4,983 0	337,409	236 0	7,749	5,219 0	345,158
1879	4,106 15	256,437	36 7	915	4,143 2	257,352
1880	5,262 10	359,260	131 18½	4,799	5,394 8½	364,059
1881	5,361 0	350,087	132 16	4,975	5,493 16	355,062
1882	4,865 3	321,887	93 1	2,840	4,958 4	324,727
1883	8,872 17	574,497	84 10	2,704	8,957 7	577,201
1884	7,286 6	415,601	18 18	578	7,305 4	416,179
1885	5,745 5	264,905	0 15	15	5,746 0	264,920
1886	3,968 18	166,429	57 18	1,236	4,026 8	167,665
	74,668 14	4,859,390	3,461 5½	104,860	78,129 9½	4,964,250

The following assays of copper ore we made during the year :—

COPPER.

Locality.	Description of Mineral.	Copper.	Gold.	Silver.
		Per cent.	Per ton.	Per ton.
Bombala.....	Iron pyrites and carbonate of lead and copper, from 80 miles south-west of Bombala	26·4	oz. dwt.	oz. dwt.
„	Ferruginous grey and yellow sulphide and green carbonate of copper, from 18 miles from Bombala	23·45	.....	2 9
Barrier Ranges ..	Grey sulphide and traces of green carbonate of copper	57·35	.....	2 9
„	Do. do. with gypsum	48·85	.....	3 5
Bermagui River...	Copper pyrites and quartz and traces of green carbonate of copper.	28·25	.....	10 6½
Cobar	Blue and green carbonates of copper, from 3 miles from Cobar	32·95	.....
„	Green carbonate of copper (fibrous malachite), from 70 miles west of Cobar	55·2	.....
Fairfield	Crushed sample of copper and iron pyrites coated with a thin film of black oxide of copper	36·75	1 19	6 4
„	Ferruginous grey sulphide of copper, from Kelly's claim	53·84	0 4	3 5
Gulgong	Ferruginous carbonates and sulphides of copper, Old Gulgong Reefs.	27·55	.....	4 18
Gundagai	Red oxide of copper and a little quartz and green carbonates of copper	72·05	.....
Molong	Earthy lodestuff, 60-ft. level	21·75	.....
„	Yellowish earthy felspathic lodestuff, with carbonates of copper ...	20·5	.....	1 12½
„	„	25·3	.....	2 14½
Mitchell	Lodestuff from Tonkin's mine	45·6	0 3	22 1
New England ...	Green carbonate and grey sulphide of copper, from Lottery Creek ...	39·9	0 3	14 14
Razorback	Ferruginous copper gossan, from 6 miles from Razorback	37·85	.....	1 12½
Shoalhaven River	Quartz and grey sulphide of copper	33·85	.....

IRON.

The production of iron during 1886 is less than during the previous year. This is, no doubt, due to the general depression.

The following analyses of iron and manganese ores were made during the year :—

Locality.	Description.	Analysis.
Colo Vale	Earthy iron oxides, from 3 miles S.E. of Colo Vale.....	Moisture and organic matter, &c. %
		Peroxide of iron
		Alumina
		Silica
		Lime
		Magnesia
		100·00
Muswellbrook	Calcareous magnetite, from Upper Muswell Creek, near Muswellbrook	Gaugue
		Ferric oxide
		Ferrous oxide
		Alumina
		Lime
		Magnesia
		Moisture, undetermined.....
		100·00
Port Stephens District ..	Magnetic and hematite iron ore	Water of hydration
		Ferric oxide
		Alumina
		Manganese
		Silica (gauge).....
		Phosphoric oxide
		Sulphuric oxide
		100·14

*Equal to 48·14 per cent. of metallic iron.

MANGANESE.

Locality.	Description.	Manganese. %	Cobalt. %
Bendemeer.....	Ferro-manganese oxide.....	88·4	
„	„ „ from Blair's Ground.....	62·3	
„	„ „ from Rowland's Ground	44·1	
„	Manganese oxide	75·0	
Bowning.....	„	91·0	
Mudgee	Earthy manganese oxide	23·6	·49
Newbridge	„	61·17	
„	Ferro-manganese oxide, from 4 miles from Newbridge	54·35	
Newcastle District ..	Earthy, compact, manganese oxide	53·0	
Pentecost Island	Manganese oxide	88·4	
Sutton Forest	Earthy, compact, manganese oxide.....	46·64	1·05
Walcha	Manganese oxide	82·85	

ANTIMONY.

The output of antimony during the year 1886 was less than that of the previous year. This is to some extent due to the fact that in some cases where payable gold is associated with antimony the latter mineral is sacrificed. There is a prospect that some of the antimony mines which were idle during 1886 will shortly resume work.

Oppenheimier's mine, in the Bathurst District, was working with satisfactory results. The ore, which contains antimony, gold, and silver, cannot be treated locally, but is sent to Europe for treatment. Dr. Claudet, Assayer to the Bank of England, gives the following result of an assay of the ore:—Antimony, 61·50%; gold, 3 oz. 12 dwt.; silver, 1 oz. per ton. Messrs. Johnson, Mattley, & Co.:—Antimony, 41%; gold, 2 oz. per ton. J. S. Vale, of Sydney:—Gold, 19 oz. 1 dwt. 3 gr. per ton. 116 tons 16 cwt. of picked ore, valued at £1,881, was sent to Europe during the year, and several hundred tons are at grass, not being considered rich enough for shipment.

The following assays have been made during the year:—

ANTIMONY.

Locality	Description.	Per cent.	Per ton.		Per cent.
		Antimony.	Gold.	Silver.	Lead.
Bellinger River ...	Sulphide of antimony, Peckett Hill	69·97	oz. dwt.	oz. dwt.	
Coolongolook	Stibnite and quartz, from Wanga, 6 miles from Coolongolook	31·29			
Carangula	Stibnite and a little quartz	61·55	0 5		
"	" " cervantite	45·0	0 5		
Crudine	Breccia, from crudine antimony lode	48·8			
Gulgong	Antimony oxide	68·9			
"	" breccia, from head of Ford's Creek	36·3			
"	Stibnite and a little quartz, from 2 miles from Gulgong	27·5			
McDonald R.	Quartz and stibnite, from the head of the McDonald River	43·75			
Marulan	Sulphide and oxide of antimony with lead and quartz, Carrington mine	16·75	2 17	164 3	22·27
Razorback	Oxide and sulphide of antimony and a little quartz, from between Razorback and Crudine Creek, about 9 miles from Razorback	67·30			
"	Ferruginous sulphide and oxide of antimony, from Back Creek, 8 miles from Razorback	55·33			
Sofala	Quartz and stibnite	46·3	0 14½	0 7½	
Shoalhaven	" " " "	28·52			
Talbragar	Oxide of antimony	70·4			
Temora	Quartz and stibnite	34·14	3 16		

BISMUTH.

In the Glen Innes Division the quantity of bismuth raised during the year was 82 tons 2 qr. 15 lb., valued at £20,656 5s.

The following assays of Zinc and bismuth were made during the year:—

ZINC AND BISMUTH.

Locality.	Description.	Metallic Zinc, per cent.
Bredbo	*Calamine, from Bredbo, Cooma District	51·28
Fairfield	Zinc blende, from Fairfield, near Boorook	69·98
Pye's Creek	Zinc blende and copper pyrites, from Perseverance Mine	18·17
	BISMUTH.	
Gumble, near Molong	Crushed sample	Bismuth. 11·76

* First discovery of this ore in the Colony.

COBALT, NICKEL, &C., &C.

The following analyses were made during the year:—

COBALT AND NICKEL.

Locality.	Description.	Cobalt, per cent.	Nickel, per cent.
Boro	Black oxide of manganese in claystone	0·15	
Bungonia	Concretionary cobaltiferous manganese oxide	2·53	
"	Cobaltiferous manganese oxide	2·65	
"	Grit cemented with cobaltiferous manganese oxide	1·42	
"	Black oxide of manganese oxide	0·5	
Bombala	Concretionary cobaltiferous manganese oxide, from 31 miles from Bombala	3·95	0·80
Glen Morrison	Porous oxide of manganese	2·54	
Lake George	Concretionary cobaltiferous manganese oxide	5·04	
Lismore	Decomposed felsite, with joints coated with slickenside of black oxide of manganese	2·46	0·20
Mudgee	Earthy manganese oxide	0·49	
Port Macquarie	Cobaltiferous manganese oxide	5·8	
"	" " " "	3·21	
Sutton Forest	Earthy manganese oxide	1·05	
Trial Bay (near)	Cobaltiferous manganese oxide, from between Trial Bay and Nambucera River	2·9	

CHROMIUM.

Locality.	Description of Mineral.	Sesquioxide of Chromium. Per cent.
Grafton District ...	Chromite, from 80-acre lease at Oaky Creek, parish of Yankalkiana	28·44
“ “ “ “ “ “ “ “	“ “ “ “ “ “ “ “ “ “ “ “ “ “ “ “ “	47·70
“ “ “ “ “ “ “ “	“ “ “ “ “ “ “ “ “ “ “ “ “ “ “ “ “	37·43
“ “ “ “ “ “ “ “	Chromite, from portion 7, parish of Pucka	41·99

TUNGSTEN.

Locality.	Description of Mineral.	Analysis.
Armidale	{ Scheelite (tungstate of lime) from near Gara Falls, about 12 miles from Armidale. }	Tungstic trioxide % 47·9
Peelwood		{ Tungstic trioxide 69·31 Lime 19·35 Silica 4·88 Oxide of copper 4·05 Oxide of iron 2·01 99·60
Severn River, near Emmaville. }	{ Wolfram (tungstate of iron and maganese) from a lode 7 ft. wide ... }	Tungstic trioxide 74·41

LIMESTONE AND GYPSUM.

Locality.	Description of Mineral.	Analysis.
Bungonia	Limestone	{ Carbonate of lime 86·70 Carbonate of magnesia 85 Oxide of iron and alumina 3·60 Silica 7·55 Protoxide of manganese trace. Phosphoric oxide (P ₂ O ₅) trace. Moisture, organic matter, &c. 1·30 100·00
Ben Bullen	Limestone	Carbonate of lime 95·32
Myall River.....	Argillaceous limestone	{ Carbonate of lime 52·52 Carbonate of magnesia 2·04 Silica 30·80 Oxide of iron and alumina 10·21 Sulphuric acid 2·10 Moisture, alkaline salts, organic matter, trace of phosphoric acid, &c. 2·33 100·00
Muswellbrook ...	{ Oolitic limestone, from yellow rock, Upper Muswell Ck., near Muswellbrook. }	{ Hygroscopic moisture at 100° C. 1·10 Combined moisture 1·29 Carbonate of lime 66·55 Carbonate of magnesia 1·66 Alumina and oxide of iron 7·65 Silica 21·75 Phosphoric oxide (P ₂ O ₅) strong trace. 100·00
Bourke	{ Gypsum from Lake Tank, 20 miles north of Bourke. }	{ Sulphate of lime 75·66 Water of crystallization, hygroscopic moisture 20·20 Sulphate of magnesia 61 Oxide of iron and alumina 60 Silica 2·90 99·97

DIAMONDS.

I regret to say very little is being done at Bingera to develop the diamond mines, but it is to be hoped that the examination by Mr. Geological Surveyor Anderson, of the diamondiferous drifts in that part of the Colony, may lead to the re-opening of some of the mines that have of late been idle. In the Tingha division heavy finds of small diamonds have been made in some of the claims, but it is thought many of the stones are lost through defective appliances.

Some time ago I called attention to the difficulty experienced by miners in finding a ready market for their diamonds, and suggested that advantage might be taken of the exhibit of our diamonds at the Colonial and Indian Exhibition to obtain through the Agent-General some information concerning the prospect of a market in London for the products of our mines. The Agent-General was good enough to obtain and forward the following valuable reports:—

REPORT ON NEW SOUTH WALES DIAMONDS.

To Sir Saul Samuel, K. C. M. G., C. B., Agent-General for New South Wales.

Sir,

London, 16 November, 1886.

In response to your request that we should examine and report to you on the Collection of Diamonds in the New South Wales Court of the Colonial and Indian Exhibition, we have the honor to inform you that we have carefully examined the 285 crystals comprising it, and have fully gone into the literature bearing on the occurrence of the Diamond in New South Wales, so far as known to us.

The mode of occurrence, physical characters, accompanying gems, and the general history of the Diamond in New South Wales have been so ably treated by Messrs. Norman Taylor and the late Professor A. M. Thomson (*Trans. R. Soc. N. S. Wales for 1870*, p. 94), Mr. Norman Taylor (*Geological Magazine*, 1879, vol. vi., pp. 399 & 444), and Professor A. Liversidge (*Trans. R. Soc. N. S. Wales for 1873* [1874], pp. 91 & 102; *Quart. Journal Geol. Soc.*, 1875, xxxi, p. 489), and the equally full description of the deposits yielding the gem, given by the same authors, and Mr. E. F. Pittman (*Annual Report, Dept. of Mines N. S. Wales for 1881*, p. 141), that it is quite superfluous for us to do more than briefly refer to these parts of the subject.

With regard to the crystallographic form, we have recognised all those described by Messrs. Taylor and Thomson and Professor Liversidge. When compared with those of South Africa, we find that the New South Wales forms are more varied, *i.e.*, the crystals partake more of the dodecahedral with its numerous modifications, than of the octohedral habit, which is so marked a feature in those from the Cape. In this respect the New South Wales stones bear a remarkable resemblance to those from Brazil, and also differ from the Indian gems. Another peculiarity of the Cape diamond is the large proportion of cleaved stones, or "cleavage," which appear to be entirely absent in the parcel submitted to us from the Crown Jewel Mine. Speaking of those from Bingera generally, Professor Liversidge says, "no fractured specimens have been detected;" whilst among those from Cudgegong Mr. Taylor remarks, "it is very rare to meet with fractured stones." Again, amongst the Cape diamonds a fairly large number of "macles," or twinned-crystals, are met with, and these, as we have elsewhere pointed out, are found to present difficulties in cutting through the planes of contact. Now, in the present collection, these macles appear to be exceptional, but Mr. Taylor has described twinned-crystals from the Cudgegong, although not obtained in any quantity. Flattened octahedra, known in the trade as "flats," appear to be rare, although we have noticed a few. They are converted into "rose diamonds," a form of cutting formerly much practised in oriental countries, but only used in the case of imperfect stones. It naturally follows that the comparative absence of stones with these crystallographic characters will tend to reduce the cost of preparation, loss of material and necessity for the production of a less saleable gem.

The black specks so frequently met with not only in the Cape, but also in Brazilian diamonds, appear in those from Inverell to be more or less confined to the surface planes, not extending to any depth within the crystals, and would doubtless be eliminated in the cutting without detracting to any great extent from the value of the stones as gems. On the other hand, speaking of the Cudgegong diamonds, Messrs. Taylor and Thomson say that "black specks within the crystals are not uncommon," and Professor Liversidge remarks on those from Bingera, "it is rather common to find them with . . . internal black specks." The above observers have fully described the various colours characteristic of the New South Wales diamond, but in the present parcel we have only noted the colourless, shades of yellow, and a peculiar light yellowish brown, or light cinnamon colour. A small number are so slightly tinged as to practically come within the term "byewaters," whilst a very considerable proportion are of that straw-yellow tint known as "off-colours," but it is satisfactory to note that, as we have elsewhere stated, these off-colour stones far eclipse, when seen by artificial light, those regarded as of pure water.

On analyzing the colour of 275 stones from Inverell, we find the following proportions:—

Colourless	100
Straw-yellow ("off-colours").....	126
Slightly tinted yellow ("byewaters").....	39
Cinnamon-yellow	6
Dirty gray hue ("rejections")	4
	275

Messrs. Taylor and Thomson, Mr. Taylor separately, and Professor Liversidge make particular mention of shades of green as sometimes occurring. Mr. Taylor speaks of "light or dark bottle green" stones, and Professor Liversidge mentions "light green" gems. We have no information what proportion such colours occupy in comparison with the others just enumerated, but we would point out that the commercial value of stones so tinted is enormously augmented, if of any size, and we cannot impress too strongly on those engaged in diamond mining the importance of this point.

We are likewise unfurnished with information as to the quantity of "Boart" yet obtained in the Colony, but considering the numerous uses to which this variety of the diamond has been put of late years, more particularly as applied to the diamond drill, and considering the important part this machine is now playing in water borings throughout the Australian Continent—we would strongly recommend this variety to the attention of the mining community. Several crystals of a dirty grey hue, and known in diamond circles as "rejections," are present in the collection, and these with a few irregular malformed crystals may be taken as types of stones which could be successfully used for this purpose. "One or two opaque black" diamonds are mentioned by Mr. Taylor, and Professor Liversidge cites an example of Boart, which was exhibited in the New South Wales Court, and is said to have been found at Mudgee.* It is described as black in colour, and with graphitic lustre, of the size of a large pea, and with a few small crystallographic processes projecting from the surface, 7.352 grains in weight, and Sp. Gr. 3.56, at 70° F. This description strongly recalls to mind the true Brazilian Boart, which is in such request for diamond drills, and as distinguished from that of the Cape Diamond Fields. The latter consists simply of badly crystallized and dark coloured stones, similar to those previously referred to as of a dirty grey hue from the Crown Jewel Mine. The importance of these facts will be at once perceived when it is remembered that the true or Brazilian Boart consists of more or less spherical aggregations of acicular crystals, radiating from a centre, and possessing an external aspect with which Professor Liversidge's description seems to correspond. We have examined the stone in question, and beyond exhibiting a smoother surface it appears to us to fulfil these conditions. We need not say more on this point than by reminding those interested that the true Boart is now worth 7s. 6d. per carat, and the Cape or false Boart, 3s. 6d.

The lustre of the crystalline faces, which is not to be differentiated from that of Brazilian stones, is chiefly adamantine, but at times somewhat dull, but this in no way detracts from their beauty when cut, the exterior crystal irregularities having little or no connection with the structure below the surface. The dullness appears to be partly due, as pointed out by Mr. Taylor and Professor Liversidge, to certain crystallographic irregularities, and certainly is not owing, as suggested by some, to abrasion or attrition. The rounding of the faces, visible on many of these crystals, is entirely due to the well known peculiarities of diamond crystallization, and that it is not due to attrition is evident by the sharply defined character of the edges bounding these rounded faces.

The equally noticeable pitting of the surfaces of the crystal planes is characteristic of the diamond in all hitherto known localities, and cannot therefore be used as a means of comparison with those of one field as against those of another. The pitting is very irregular both in position and shape, more so in fact than is generally seen in examples from other fields. The colourless stones are not only pitted to a greater extent than the yellow, but the crystal planes are more unequally developed,

* In another place (Liversidge, *The Minerals of New South Wales*, 2nd Edition, p. 122), this is stated to have come from Bathurst.

developed, imparting to the crystals a much more distorted appearance. The brilliancy of the white and yellow stones when the gems are good is about equal, and before cutting this feature is more pronounced the nearer they approach the octahedron in form, a fact holding good both for the yellow and white stones, and one quite in accord with theory.

Some of the colourless are very beautiful stones, and the quality quite justifies the manner in which parcels have been brought into the London market, a fact to be referred to hereafter.

Amongst the stones cut for you by Messrs. Ford & Wright is one of a very peculiar, and, so far as we know, original structure, to which our attention was drawn by their Manager, Mr. L. Atkinson. The prepared facet exhibits triangular markings which appear to correspond with some of the surface pittings. These markings, so far as we were able to judge, seem to extend through the whole of the crystal, and unless removable by polishing, stones of a similar structure to this, judging from a trade point of view, would be of little value, but we are of opinion that this is an isolated instance of a peculiar crystallographic growth.

Hardness is a physical feature upon which much stress is laid by lapidaries and diamond-cutters, and it is stated by Messrs. Ford & Wright that the New South Wales diamonds are much harder than those from the Cape, judging by the time necessary for the preparation of the facets. But, as a matter of fact, in other precious stones the relative hardness depends, to a great extent upon the direction in which a stone is cut with regard to its crystalline form, and until many more careful observations are recorded, we hesitate to pronounce any opinion as to the value of this. If proved, we would call attention to the necessary increase in the cost of cutting the diamonds from your Colony, but, as a set-off to this, the probable increase in brilliancy. One thing is quite apparent, when cut, some of these stones produce most exquisite gems.

Messrs. Taylor and Thomson, and Professor Liversidge also, have determined the specific gravity to vary between the limits of 3.42 (Bingera) and 3.44 (Mudgee), but with an average of 3.42. We find the mean of a series of experiments with the Crown Jewel diamonds to be 3.46. The following table of specific gravities gives a comparison with that of those from Brazil, India, and Borneo, the data of the latter being taken from Mr. Harry Emmanuel's work, and that of MM. Jacob and Chatrain:—

Country.	White Stones.	Yellow Stones.
India	3.524	3.556
Brazil	3.442	3.520
Cape	3.520	...
Borneo	3.492	...
N. S. Wales	3.42	

The analogy in density between the white Brazilian stones and those from New South Wales, irrespective of colour, is at once apparent.

The average weight of the Mudgee stones was estimated at 0.23, or nearly one carat grain each, by Messrs. Taylor and Thomson, and this has received corroboration from Mr. C. S. Wilkinson in the case of diamonds from the Borah Creek Tindirfts (*Mines and Min. Statistics, N. S. Wales, for 1874, p. 79*). On the other hand, those from Bingera are said by Professor Liversidge to be "for the most part small in size." We have made two series of determinations of the weights of the Crown Jewel Mine diamonds, with the following results:—

20 1st size stones (a) =	$16\frac{1}{2} + \frac{1}{16}$ carats	Mean $\frac{3}{4} + \frac{1}{8}$
" " (b) =	$12\frac{1}{2} + \frac{1}{8} + \frac{1}{16}$	" $\frac{1}{2} + \frac{1}{8}$
20 medium stones (a) =	$10\frac{1}{2} + \frac{1}{32}$	" $\frac{1}{2} + \frac{1}{16}$
" " (b) =	$8\frac{1}{2} + \frac{1}{16} + \frac{1}{32}$	" $\frac{1}{4} + \frac{1}{8} + \frac{1}{32} + \frac{1}{64}$
20 small stones (a) =	$3\frac{1}{2} + \frac{1}{8}$	" $\frac{1}{2} + \frac{1}{16}$
" " (b) =	$2\frac{1}{2} + \frac{1}{8} + \frac{1}{32} + \frac{1}{64}$	" $\frac{1}{8} + \frac{1}{16}$

Mr. Harrie Wood, in the Annual Report of the Department of Mines for 1885 (p. 40), gives the total weight of this parcel as 104½ carats. He states that "280 ranged from $\frac{1}{8}$ to 1 carat each in weight, and five from 1 to 1½ carat."

As a fair average of the diamonds found in the Cudgegong field, Messrs. Taylor and Thomson give the following statistics:—

106 diamonds weighed 74½ carats, the largest 1½ carats.
81 " " 19 " " 1½ "
110 " " 26½ " "
16 " " 6 " "
700 " " 151½ " "

Large diamonds appear to be quite the exception in New South Wales; at any rate, definite data are wanting on this branch of the subject. The largest stones of which we have been able to find reliable record are the following:— Messrs. Taylor and Thomson give the largest found at 5½ carats, a perfectly colourless octahedron, discovered in the Cudgegong River, between the "Two-mile-Flat" and the "Rocky Ridge;" another of 3½ carats at the former locality. Two very excellent stones were lately exhibited in the New South Wales Court by Mr. R. H. D. White, weighing, respectively, in the cut form 3 and 3½ carats. Professor Liversidge states that at Bald Hill, Hill End, one stone slightly over 3 carats, and another 1½ carat, were obtained. On the other hand, Mr. C. S. Wilkinson records the discovery in the stream-tin washings of the Borah Tin and Diamond Mining Company, Borah Creek, of a diamond weighing 5.5 carats, and another 7.5 carats at the Bengonover Mine, in the same creek. From the Crown Jewel Mine the largest stones we noticed were the following:—

1 large colourless stone = $1\frac{1}{4} + \frac{1}{16}$	1 large yellow stone = $\frac{3}{4} + \frac{1}{8}$
" " " = $\frac{3}{4} + \frac{1}{16} + \frac{1}{32}$	" " " = $\frac{3}{4} + \frac{1}{16}$

As compared with the stones of other localities, the size is somewhat small, although it is stated that Brazilian diamonds frequently take from 15 to 20 to weigh a carat. This smallness of size is compensated, however, by the fact, as we are informed by an excellent trade authority, that medium sized diamonds are now more in request than large ones, for mounting in conjunction with other gems, such as rubies and sapphires. In form, size, and physical character, the New South Wales diamonds appear to agree better with those of the country just mentioned than of any other; but, of course, they cannot vie in size or quantity with Cape stones. In brilliancy and fire when cut, they are, however, stone for stone, quite able to hold their own with those from the latter Colony. In fact, it appears, from information gathered through most reliable sources, that a large proportion of New South Wales gems have found their way to the London market as Brazilian stones. Otherwise we would ask what has become of the 12,000 which are officially returned as found up to the end of 1885, especially when it is distinctly stated by Mr. E. F. Pittman, Chief Mining Surveyor for New South Wales, that in 1872-73, the Sydney jewellers declined to buy Bingera stones. We are quite aware that some small parcels have reached certain eminent firms in London, in a genuinely open manner, as New South Wales diamonds; but we believe that the other course has been more frequently adopted. If this be the case, what more satisfactory certificate could be adduced in favour of the diamonds yielded by the tertiary drifts of New South Wales.

Whilst preparing the present Report, we have been asked on several occasions two very pertinent questions—questions which appear to us to have a very important bearing on the future development and permanency of the diamond industry in New South Wales. The first of these was, what is the area of the diamantiferous ground, and the approximate thickness of the drift in the several fields? The second and equally important question related to the yield of stones. Unfortunately, beyond the general statement that 12,000 diamonds have been found, we are unacquainted with any official return dealing with such details, and even until within the last two years this subject does not appear as one of the items in your excellent "Reports of the Department of Mines;" and the same remarks may be applied to the question of area. Many statements have appeared in the public press on the first of these points, but they are so utterly unreliable as to be quite useless for statistical purposes.

With

With the view of pointing out how difficult it is for an estimate to be formed, even within several degrees of accuracy, the following brief and imperfect description of the diamantiferous deposits may not be out of place, abstracted from the several excellent authorities we have before referred to.

The diamond in New South Wales occurs in outliers of drift and cement representing old river accumulations of more than one geological age, lying at various distances from the present river channels, and once forming portions of widespread and continuous deposits, resting on the bed rock of the country. The older drifts have been protected from total destruction by cappings of basaltic rock, but the isolated condition of these clearly shows the enormous amount of denudation which has gone on, and the quantity of diamantiferous drift removed. The latter is usually loose and coarse, but in places passes into a compact conglomerate. There are six of these drifts at Mudgee, occupying different levels, resulting from the successive denudations of one another, and we believe all diamond-bearing. At Bingera, on the other hand, the drift is described as a "small-grained siliceous brecciated conglomerate, strongly agglutinated together by a ferruginous cement." The younger drifts have in every case been derived from the destruction by fluvial agencies of the older. Mr. Taylor describes the older drift as a "coarse and heavy deposit—some boulders in it weighing several hundredweights—for the most part loose, but portions of it united into a compact conglomerate. It varies greatly in thickness, from a few inches to 30 feet . . . The newer drift derived from the above is composed of the same contents as the older drift, with the addition of boulders of greenstone and basalt . . . The newer drifts (upper and lower) comprising the present river bed, and older and deeper channels, contain pebbles, boulders, and shingle of the neighbouring sandstones, slates, &c." Throughout these drifts the diamonds are described as occurring in rich patches. The drift at Bingera is said by Professor Liversidge to vary from 3 to 60 feet.

It will be readily understood from this that without a detailed official survey of all the likely diamond bearing drifts, it would be impossible to give even an approximate idea of the areas capable of yielding the precious stones; but that such deposits are numerous throughout New South Wales, is itself evident to any one who has perused the able geological reports of Mr. C. S. Wilkinson and his assistants. It can naturally be roughly ascertained from the geological maps prepared by these gentlemen, but we believe it would greatly stimulate diamond mining if a detailed report could be prepared furnishing the information in question. As an indication to parties interested, we can only refer to what has been done, and for this purpose we quote certain of the ascertained areas of the Cudgegong (Mudgee) Diamond Field, as given by Messrs. Taylor and Thomson, thus—

Name of Claim.	Area in Acres.	Thickness of Drift.
Two Mile Flat	70	.....
Jordan's Hill	40	18 feet.
Miller's Claim	100	12 "
Junction of Reedy Creek with Cudgegong River	100	.....
Rocky Ridge (older drift)	40	.....
Horse-shoe Bend do	20	.....
Hassall's Hill do	340	? 12 to 30 feet.
	610	

Touching the second point—the number of diamonds found—the following reliable data are extant:—

Claim.	Diamonds.	No. per Load.	Carats.	Authority.	Date.
Australian Diamond Mining Company (Mudgee) ...	1,765	From 1 in to 2 loads, to 4 or 5 in 1 load.	.....	Taylor	1867
Messrs. Scott & Allen (Mudgee).....	700	8 to 12 or 15 loads .....	.....	" .....	"
Messrs. Cooney and Party (Mudgee).....	1,000	1 to 15 to 1 load, average 5.	.....	" .....	"
Falk & Co. (Bingera).....	400	From 100 loads .....	.....	Wood	1883
Gwydir Diamond Company (Bingera)	690	" 34½ " .....	.....	Liversidge ..	1873
Australian Diamond Mining Company (Bingera) ...	1,193	" 418* "	254	"	1884
Craddock and Party (Bingera)	17	" ½ " .....	.....	Wood	"
Australian Diamond Mining Company (Bingera) ...	1,134	" 87 "	209	"	1885
Crown Jewel Mine (Tingha)	285	.....	104½	"	"

These, of course, represent but a small proportion of those found, and the numbers are only quoted as indicating the relative richness of average claims. Had all the statements been accepted to which we have had access, doubtless the total of 12,000, given in the New South Wales official catalogue, Colonial and Indian Exhibition (p. 149), could be much exceeded.

The distribution of the diamond throughout New South Wales is widespread. It has been recorded as occurring at the undermentioned places:—

	Authority.	Date.
Turon River	Stutchbury	1851
Reedy Creek, near Bathurst	Hargraves	"
Burrendong	Clarke	1859
Pyramal Creek	"	"
Calabash	"	1860
Suttor's Bar, Macquarie River	"	"
Cudgegong River (Mudgee)	Taylor and Thomson	1867
Bingera	Liversidge	1873
Bald Hill, Hill End	"	1875
Borah and Bengonover Tin Mines.....	Wilkinson	"
Trunkey Creek, Tuena	Taylor	1879
Brook's Creek, Gundaroo, near Goulburn	Liversidge	1882
Lachlan River	"	"
Monkey Hill, and Sally's Flat	"	"
Big River, Auburn Valley, Tingha	Wood	1884
Berrima District	"	"
Crown Jewel Mine, Inverell	C.I.E.	1886

The diamond has likewise been found at a few localities in Victoria, chiefly in Gippsland, and it is said by the late Dr. J. J. Bleasdale to have also been discovered at the Echunga diggings in South Australia (*Colonial Monthly*, 1868, Vol. II, p. 436). At the latter place it is reported to occur in "Itacolomite," but from the description given the matrix is evidently an ordinary auriferous drift.

We

* 5,000 tons of drift were raised, and waiting to be washed.

We have seen it stated that certain claims at Bingera show "good wash of the proper kind, and of the same sort as yields well in South Africa." Now a statement of this kind, if true, would naturally do more perhaps for diamond mining in New South Wales than any other fact which could be adduced in its favour. On the other hand, if erroneous, a corresponding amount of harm will be done by inducing investors to speculate in the hope of obtaining similar gratifying results. We have neither seen or read of any diamantiferous soil from New South Wales having even the faintest resemblance to the peculiar rock forming the matrix of the diamond at Kimberley and neighbouring mines, nor occurring in a like manner. We presume the Kimberley deposit is referred to in such a paragraph as we have quoted, and not the Vaal diggings, which are now comparatively worked out. We cannot too strongly condemn such statements, as having no foundation in fact. We have already briefly described the diamond matrices in New South Wales, which are *drifts*, widely distributed horizontally. In South Africa, on the other hand, the origin of the diamantiferous rock has given rise to much speculation, and is still a subject for discussion, although it probably results in a great measure from a peculiar form of hydrothermal action. Instead of a wide-spread distribution it occupies restricted areas, having no semblance to drift deposits at all, but is an agglomerate filling strange pipe-like depressions, or elliptical cavities extending vertically to unknown depths, the exact nature of which have yet to be explained. This is the celebrated "blue" of the South African miners, and it is a "distinct agglomerate, consisting of fragments of all shapes and sizes of many rocks which vary much in mineral composition, enclosed in a base of serpentinized material, which appears to have largely resulted from the alteration of enstatite and olivine. The enclosed rocks, or some of their mineral constituents, have partaken, to a considerable extent, of the same chemical alteration. The texture varies very much, and depends upon the size and abundance of the enclosed fragments; sometimes it resembles a breccia, sometimes a conglomerate, and sometimes partakes of the character of both. In some parts the blocks are very much rounded, and present the aspect of water-worn pebbles; this is especially the case in many of the doleritic rocks, though we have seen blocks of mica-schist in it which it was difficult to believe were not true pebbles. In others the fragments are more angular, but all that we have seen appear to have had their sharp edges more or less removed by some mode of attrition."* No such rock has ever been described to our knowledge from New South Wales, diamantiferous or otherwise, and to say therefore that the conditions are similar in the two countries is both misleading and erroneous. With the view of showing the relations of the New South Wales diamond matrix, we here append a list of some of the more frequent rocks and minerals constituting those of Brazil, India, Borneo, and the Cape, from which the resemblance it bears to the two former will be at once apparent.

Brazil.—Gold, lydian stone, quartz, red ironstone (siliceous), cassiterite, topaze, spinel, garnet, lazulite, chrysoberyl, carbonado, tourmaline, andalusite, beryl, rutile, anatase, brookite, tantalite, hematite, kyanite.

India.—Quartz, jaspers, hornblende, corundum.

Borneo.—Mostly red clay, which contains pebbles of serpentine, diorite, and quartz, interbedded with marl, containing fossils, magnetite, platinum, black quartz.

New South Wales.—Quartz, quartzites, cassiterite, jasper, lydian stone, topaz, sapphire, ruby, varieties of zircon, spinel (varieties of), gold, tourmaline, flinty slate, shale, sandstone, ilmenite, magnetic iron sand, brookite, rutile (Bald Hill), garnet, osmiridium (newer drift of Mudjee).

Cape.—Garnets, green, ruby-red, and brown; smaragdite, bronzite, enstatite, olivine, ilmenite, zircon, vaalite, hornblende, zeolites, calcite, opal, staurolite, iron pyrites, pegmatite, talc schist, mica schist, augite rock, amphibolite, eclogite, serpentine, gneiss, peridotite, granite, dolerites, basalt, melaphyre (with agates) and others, amounting to over eighty in number.

With regard to the source of the diamond in New South Wales we do not see any other course than to unhesitatingly accept the explanations offered by Mr. Norman Taylor, so far as the facts bearing on this branch of the subject have been yet gathered. He believes that they were chemically formed in the older tertiary drifts, and in support of this view adduces the following cogent reasons:—

1. The older rocks of the various diamantiferous districts have not been proved to be diamond bearing.
2. The older tertiary drifts or cements are derived from the denudation of these, and contain diamonds.
3. The younger drifts are only diamantiferous when resulting from the destruction of the latter, and similarly the recent alluvium again from them.
4. The natural conclusion is that the diamonds have been formed in the drifts, and not derived from any pre-existing rocks.

Mr. Taylor was further of opinion that the "fluctuating yield, small average size of the gems, the expense in extracting the drift from beneath the basalt, cartage to water, and washing effectually, are the drawbacks which have hitherto stood in the way of the successful investment of capital in this direction." We imagine that some of these difficulties will in the future be overcome by stricter attention to the details of at least two of these points. For instance, we have it on record that in certain claims, when chiefly worked for gold only, the lower portions of the drift, or that near the "gutter" was removed, leaving what was perhaps the richest diamond-bearing portion behind. Mr. Taylor distinctly states that the gems do not appear to occur much on the bottom with the gold, and also from the fact, in the Cudgegong field, at least, they appear to be found in "runs" or "veins," at various levels in the drift. It is not improbable, therefore, that in a number of the tertiary deposits which have been explored simply for gold, diamonds have unconsciously been overlooked. We think that a remark of Messrs. Taylor and Thomson's to the effect that—"the mere fact of the not unfrequent discovery of diamonds on the waste heaps round old shafts which were sunk for gold, is enough to suggest that the diamonds may occur in the higher portions of the deposit, since the bottom layer has been invariably carted to the river for gold-washing," to some extent proves this, and even opens up the far wider question touched on in the preceding paragraph. The small average size of the stones, as we have previously pointed out, ought not to mitigate against a successful prosecution of the industry, under present circumstances. On the other hand, the expense of mining and question of water supply are so entirely matters of local detail as to be quite out of place in the present remarks.

Washing effectually can only be carried out by thoroughly good machinery, and there is evidence to show that such is now being introduced. In all probability the machine best suited to the diamond drifts of New South Wales would be a slight modification of the "Washing Gear and Pulsator," as used by the Griqualand West Diamond Mining Company, Dutoit's Pan, in 1885, a model of which was exhibited at the late Exhibition.

In bringing our Report to a termination we beg to emphasize the following conclusions, which the foregoing remarks bear out:—

1. The diamonds of New South Wales in their physical characters are more nearly allied to those of Brazil than any other country.
2. They have been very largely sold in London as such.
3. As regards colour, they differ practically but little from those of other fields.
4. The general absence of "cleavage" and "macles" is a point much in their favour.
5. Stones of the rarer colours assumed by the diamond should be particularly sought for.
6. The greater hardness of the New South Wales gems will probably raise the cost of cutting, but this will be compensated for by their extra "brilliance."
7. "Boart" should be eagerly sought for.
8. Detailed statistics of the area and thickness of drifts likely to prove diamantiferous, and the number hitherto found so, should be prepared officially.
9. All auriferous drifts should be prospected for diamonds.
10. The matrix of the diamond in New South Wales bears no resemblance to that at the Cape.

We are, &c.,

THOS. DAVIES, F.G.S.

R. ETHERIDGE, JUNR.

A

A REPORT TO THE NEW SOUTH WALES GOVERNMENT UPON ITS DIAMONDS.

THE four Australian diamonds selected by myself in the New South Wales Court at the Colonial and Indian Exhibition by the request of Sir Saul Samuel, K. C. M. G., C. B., to make a report upon after being cut and polished, during which process I had thoroughly and closely investigated them with this result that :—

No. 1 parcel contains one diamond which had the ordinary dodecahedron crystallization, the crust or coat of the stone was perfectly naturally polished with very few indentations, and no indication whatever of triangular indentations or markings as so frequently found in the African diamond ; it was cut into the shape most suitable to show to the greatest advantage, and on the polisher commencing to put the first facet on it called the table, it was found on careful examination that there was a triangular formation which is generally found on the outer coat or crust but very rarely indeed right inside the stone, and it is so remarkable that on the heads of the Mineral Department of the British Museum hearing of it and after examining it, expressed a strong desire to possess the stone, as being of such a wonderful and interesting formation ; therefore, I thought it advisable to stop the polishing process of it and submit the stone for inspection with the desire of the Mineral Department of the British Museum, South Kensington.

No. 2 parcel contains the diamonds which were most carefully selected by myself out of the 286 Australian diamonds exhibited in the New South Wales Court at the Colonial and Indian Exhibition, that they might be as near a match as it is possible to get in every respect such as size, shape, colour, and appearance. One has been cut and polished and proves a brilliant of the finest water ; the other diamond is left in its natural rough shape just as it was found, so as to show at once the practical difference between the two diamonds.

No. 3 parcel contains one diamond, which, in its rough state, weighed $1\frac{1}{2}$ carats, the crystallization, a hexakis octahedron of a dull white colour after being cut and polished ; it now weighs the $\frac{2}{3}$, $\frac{3}{8}$, $\frac{1}{10}$ of a carat, and is about as fine a brilliant as it is possible to get, be it from Golconda, Borneo, Brazil or Jagersfontein.

The market price of the Australian diamonds in the rough state is liable, like all other diamonds, to great fluctuations, and on the whole are generally lower than the African diamond, for this important reason that they are a great deal harder to cut and polish ; as, if it were possible to pick out an Australian and an African diamond exactly the same size, weight, shape, and appearance, and given to one man to polish, the African stone would be finished in six days, whilst the Australian stone would take eight days, with this vastly important difference that the Australian diamond would be of greater brilliancy and refracting power than the African stone ; and might I suggest that these cut stones might be handed over to some skilled gentleman who would carefully test in every way the refracting powers and polarization of light in comparison with an African diamond.

There is always a good market open for Australian brilliants, as although they are at present small in size in comparison to the African diamond, with regard to colour in proportion to their production, Australia finds the most white diamonds, and there is always a great demand for fine white stones, and always will be, as being small they are the most suitable to set round all other coloured gems and different kinds of ornaments and decorations connected with jewellery, more especially for the future, as China and Japan are commencing to introduce diamond jewellery into their countries.

The market price at the present time for parcels of diamonds, containing such stones as the one cut and polished in No. 2 and also No. 3 parcels, varies from £8 to £9 per carat.

There is another very great market open for all inferior diamonds, especially rounded stones, commonly called ball boart, as it is used now so universally in large quantities for rock drilling, mill dressing, and for turning all hard metals and stones, and the supply at the present time is not sufficient for the demand, as the inferior diamonds from Africa rarely answer the purpose, being of a softer nature than the Brazilian diamond, which on careful examination, I have come to this most important conclusion, is the same in every respect with the Australian diamond. Australia has a very important market open for its diamonds that are too small to cut and polish, as natural stones are largely used for glass cutting and china drilling, &c.

In examining the different collections shown in the New South Wales Court at the Exhibition, I found one piece of carbon which is the hardest mineral known, and is greatly needed, and for which there is an immense market. I believe that on the diamond mines in Australia being thoroughly and properly worked with the immensely improved machine that we have now, there will be found paying quantities of this stone, and I am also firmly convinced that the deeper the mines are sunk, not only a larger quantity but finer, and most important of all, the diamonds will be found larger in size.

After thoroughly and exhaustively going into the matter, I am so satisfied that there is a large and wealthy industry to be developed in Australia that, although I am in a good position, still if the Government would offer on certain conditions I would willingly go out to the Colony and enter thoroughly into the whole matter ; as, having been connected practically with the cutting and polishing of diamonds for fifteen years, and being the expert and sole manager in directing the whole of the diamond washing at the Exhibition, I know exactly what ground the diamonds are to be found, and could at once see to proper machinery being erected, and I am perfectly satisfied that the result would be a great development of a new industry and a source of wealth to the Colony.

LEWIS ATKINSON,
33, Brook-street, Grosvenor Square, London, W.

The following analyses were made during the year :—

MISCELLANEOUS ANALYSES.

Burra Burra.—Sediment obtained from wood-ash lye.

Analysis.		
Moisture		10·80
Carbonate of potash		53·06
" of soda		5·42
" of magnesia		5·20
Sulphates and traces of phosphates		8·76
Insoluble		3·18
Alkaline chlorides		13·58
		<hr/> 100·00

Southern District.—Beans from the Moreton Bay Chestnut or " Bean Tree " (*Castanospermum Australe*), examined with a view to ascertain the cause of their poisonous effect upon stock.

NOTE.—These beans have been examined, and found to be non-poisonous. Analysis shows that they are composed of digestible fibre, woody fibre, mineral matter or ash, and starch (in considerable quantity), and what appears to be a glucoside, soluble in rectified spirits of wine, but not poisonous. I am of opinion that if any ill effects have been observed in cattle or horses eating them, it has been owing to their very indigestible nature, and not from their supposed poisonous qualities.

W. M. HAMLET, F.C.S.,
Assistant Government Analyst.

Weddin Mountain.—Black substance derived from the decomposition of animal excrement, mixed with sand.

Analysis.		
Moisture		1·31
Organic matter		18·84
Oxide of iron and alumina		8·43
Phosphate of iron		1·02
Insoluble siliceous matter		70·40
		<hr/> 100·00

WATER.

WATER.

Curlewis Station, New England.—Water from H. Pike's well, about a mile S.W. of Curlewis Station, G.N. Railway line; 25 ft. of water in well 150 ft. deep. Used for steam and drinking purposes, but is not very suitable owing to its hardness.

Analysis.	
Total solid matter.....	179·2 grains per gallon.
Soluble saline matter	48·75 " "
Insoluble inorganic matter	14·25 " "
Volatile at a red heat	116·20 " "
	179·20
Chlorine	46·5

NOTE.—This sample of water contains much suspended matter, and was found to be in all respects very unsuitable for household and other purposes. Of course it would be improved by careful filtration, nevertheless it is doubtful whether it could be rendered even passable for ordinary purposes.

Denison Town.—Water from well on Patrick's Station, 20 miles from Denison Town; said to be poisonous to stock.

Analysis.	
Total solids.....	283·82 grains per gallon.
Soluble saline matter	73·50 " "
Insoluble mineral matter.....	80·92 " "
Volatile at a red heat	129·40 " "
	283·82
Chlorine	42·65

NOTE.—The symptoms to which this water gives rise when supplied to cattle are not stated. It is thought however, that they may be due to excess of salts of magnesia.

Denison Town.—Water from a well on Patrick's Station, 3 miles from the above; said to be drinkable, but to affect the bladder.

Analysis.	
Total solids.....	47·00 grains per gallon.
Soluble saline matter	15·60 " "
Insoluble mineral matter.....	28·56 " "
Volatile at a red heat	2·84 " "
	47·00
Chlorine	6·18

NOTE.—So far as regards organic matter, this can hardly be called a bad water for drinking purposes, although it may be unsuitable in particular cases. Boiling and subsequent filtration would improve it.

Mossgiel.—Water from Holy Box Well.

Analysis.	
Total solids.....	437·2 grains per gallon.
Soluble saline matter	408·4 " "
Insoluble matter	25·2 " "
Volatile at a red heat	3·6 " "
	437·2
Chlorine	135·0
Saline ammonia, parts per 100,000	none.
Organic ammonia " "	0·002

NOTE.—This water, when viewed through the standard 2 ft. tube, was clear and bright, but not free from suspended matter. The organic impurity is very small indeed, and were it not for the abnormal quantity of saline matter the water might be used for domestic purposes. The solid saline matter, however, is so great that its use must be prohibited for drinking either raw or as tea. It may be used for boiling vegetables and for washing. Distillation would be the only means of rendering the water drinkable.

In conclusion, I have much pleasure in submitting the following summary of the mineral products up to the end of 1886, the value of which has reached nearly seventy millions.

SUMMARY.

	Quantity.		Value.		Total Value.	
			£	s. d.	£	s. d.
Quantity and value of gold prior to 1st January, 1886						
Quantity and value of gold raised in 1886..	9,673,389·37 oz.		36,102,844	5 3		
	101,416·82 "		366,294	7 7		
Totals.....	9,774,806·19 oz.		36,469,138	12 10	36,469,138	12 10
Quantity and value of silver raised prior to 1st January, 1886						
Quantity and value of silver raised in 1886	1,730,296·37 oz.		382,884	0 0		
	1,015,433·50 "		197,544	0 0		
Totals	2,745,729·87 oz.		580,428	0 0	580,428	0 0
Quantity and value of coal raised prior to 1st January, 1886.....						
Quantity and value of coal raised in 1886.	34,140,189·97 tons		17,049,504	12 9		
	2,830,175·00 "		1,303,164	4 1		
Totals ..	36,970,364·97 tons		18,352,668	16 10	18,352,668	16 10

SUMMARY—continued.

	Quantity.	Value.	Total Value.
		£ s. d.	£ s. d.
Quantity and value of shale raised prior to 1st January, 1886.....	397,679 tons	895,437 5 0	
Quantity and value of shale raised in 1886.....	43,563 ,,	99,976 0 0	
Totals.....	441,242 tons	995,413 5 0	995,413 5 0
Quantity and value of tin exported prior to 1st January, 1886.....	Ingots 75,768 tons	6,934,803 0 0	
	Ore and Regulus 16,153 ,, 2 cwt. }		
Quantity and value of tin exported in 1886.....	Ingots..... 4,640 ,, 18 ,,	467,653 0 0	
	Ore 326 ,, 18 ,, }		
Totals.....		7,402,456 0 0	7,402,456 0 0
Quantity and value of copper exported prior to 1st January, 1886.....	Ingots 70,699 tons 1 cwt. }	4,796,585 0 0	
	Ore and Regulus 3,402 ,, 18½ ,, }		
Quantity and value of copper exported in 1886.....	Ingots 3,968 ,, 18 ,,	167,665 0 0	
	Ore and Regulus 57 ,, 18 ,, }		
Totals.....		4,964,250 0 0	4,964,250 0 0
Quantity and value of iron made prior to 1st January, 1886.....	29,745 tons 9 cwt. 0 qr. 22lb.	231,853 11 3	
Quantity and value of iron made during 1886.....	3,685 ,, 17 ,, 1 ,, 8 ,,	19,068 8 2	
Totals.....	33,431 tons 6 cwt. 2 qrs. 2 lbs.	250,921 19 5	250,921 19 5
Quantity and value of antimony exported prior to 1st January, 1886.....	Metal..... 371 tons 3¼ cwt. }	62,217 0 0	
	Ore and Regulus 2,903 ,, 4 ,, }		
Quantity and value of antimony exported in 1886.....	Metal 55 ,, 12 ,,	3,381 0 0	
	Ore..... 217 ,, 11 ,, }		
Totals.....		65,598 0 0	65,598 0 0
Quantity and value of asbestos exported prior to 1st January, 1886.....	25 tons 18 cwt.	488 0 0	
Quantity and value of asbestos exported in 1886.....			
Totals.....	25 tons 18 cwt.	488 0 0	488 0 0
Quantity and value of bismuth exported prior to 1st January, 1886.....	47 tons 9 cwt.	10,010 14 0	
Quantity and value of bismuth exported in 1886.....	20 ,, 18 ,,	3,870 0 0	
Totals.....	68 tons 7 cwt.	13,880 14 0	13,880 14 0
Quantity and value of silverlead exported prior to 1st January, 1886.....	Metal... 190 tons 8 cwt. 0 qr. 0lb. }	357,026 0 0	
	Ore..... 11,603 ,, 3 ,, 1 ,, 7 ,, }		
Quantity and value of silverlead exported in 1886.....	Ore..... 1,753 ,, 1 ,, 0 ,, 0 ,,	294,485 0 0	
	Metal... 3,049 ,, 1 ,, 0 ,, 0 ,, }		
Totals.....		651,511 0 0	651,511 0 0
Value of sundry minerals exported prior to 1st January, 1886.....		20,106 0 0	
Value of sundry minerals exported in 1886.....		5,327 0 0	
Totals.....		25,433 0 0	25,433 0 0
			£69,772,187 8 1

Department of Mines, Sydney, 14 May, 1887.

HARRIE WOOD,
Under Secretary for Mines.

WARDENS' AND MINING REGISTRARS' REPORTS.

BATHURST DISTRICT—TRUNKKEY, TUENA, BURRAGA, ROCKLEY, MOUNT M'DONALD, BATHURST, OBERON
AND MITCHELL DIVISIONS.

(*Mr. Warden Smith, P.M., Trunkkey.*)

I HAVE the honor to forward my report for 1886. I cannot say that mining has improved during the year, but rather the contrary.

When last I reported Mitchell was apparently at its best, but during this year has not held its own. There seems to have been great difficulty in treating the silver ores.

The silver obtained from the Sunny Corner mine was 547,589 oz., valued at £127,123, being the return from 27,501 tons of ore treated. I am informed that the gossan in this mine has been nearly worked out, consequently the Company have now to work the lode. This has been done by reducing the ores and shipping the bullion to Wales for final treatment. 23,601 oz. have been thus treated.

Four hundred men are employed on this property.

The Nevada mine was for a long time idle. From the start the ores were refractory, and could not be treated in the ordinary way. The difficulty has apparently been overcome. The first smelter has been taken down and rebuilt on a smaller scale; when finished it ran twenty-four consecutive days, and treated 350 tons of ore, the return in bullion being valued at £3,000. Fifty-six men are employed in this mine.

The Silver King mine is idle. There seems to be a mystery about this property. The Sunny Corner Company purchased 500 tons of gossan from the Company; the return obtained from same was considered good. 2,489 tons of ore have been treated on the mine, returning £9,480.

The Silver Queen, Monte Christo, and the Big Hill have all been prospecting, but the results have not been satisfactory.

At Dark Corner, Cook & Co. have crushed 1,100 tons of quartz, for 660 oz. of gold. Alluvial gold has been sold locally to the amount of 1,272 oz. Most of this was got at the lagoon 4 miles north of Mitchell. Sixty men are working here, on payable gold. 122 acres of land have been taken up under gold leases; 337 miners' rights, 110 business licenses, and sixteen mineral licenses have been issued during the year at Mitchell.

Oberon.—Only one mine is being worked, viz., the Homeward Bound lease, held by a co-operative Company. Ten men are employed. The battery is of ten stampers. 1,500 tons of stone have been treated, returning 13 dwt. to the ton; result being £3,412 10s., for which the gold, 975 oz., was sold. Fifty-two miners' rights were issued for the year.

Tuena.—116 men are working about here, who have sold locally 609 oz. 6 dwt. of gold, valued at £2,300.

Burraga.—This mine has been abandoned for the present. Work was suspended on account of the low price of copper in London. A good many men are fossicking about for gold. Eighty-nine miners' rights were issued for 1886.

Bathurst.—111 miners' rights were issued for the year. There is no mining in the immediate neighbourhood.

Trunkkey.—150 miners' rights issued. The Bathurst Company have been sinking a straight shaft all the year. It will take another year to reach the depth at which it is expected to cut the reef that was formerly worked on the underlie. Knowles & Co. have been sluicing when they had water. Rutherford & Co. have been working the lode at Pine Ridge, but the result has not been made known. M'Vicar & Co., M'Kenzie, and several others, have been doing well in the alluvial during the dry weather. Gold has been sold locally to the value of £2,462 12s., but this does not cover more than half of that obtained.

Rockley.—130 miners' rights issued for the year. Back Creek is the only place where work is being done. Silver and manganese are mostly sought after. Several shipments of the latter have been made to England. The Silver mining Co. is not treating the ore locally. Forty-three tons of ore were sent to Melbourne for treatment, the return being 3,700 oz. of silver, valued at £740, and 30 oz. of gold, valued at about £112.

Mt. M'Donald.—Sixty-seven men are working the gold leases here. 141 miners' rights however, were issued. 3,390 oz. of gold have been obtained from quartz, valued at £11,899. The Bobby Burns lease crushed best, viz., 65 tons for 476 oz. gold. Butcher's came next, with 140 tons for 608 oz. Then the Balmoral Tribute; 130 tons yielded 491 oz.

The rainfall for the year was 30.74 inches.

Recapitulation.

No. of Men.	Value, Gold.	Value, Silver
1,243	£26,937 12 0	£135,600 3 6
Grand total ...	{ Silver	£135,600 3 6
	{ Gold	26,937 12 0
		£162,537 15 6

BATHURST DISTRICT—ORANGE DIVISION.

(*Mr. Warden J. T. Lane, P.M., Orange.*)

OUR "Parent Gold-field," Ophir, continues a struggling existence. The Bluff Amalgamated Company have ceased operations for the purpose of arranging to increase the means to carry on. If this Company had money equal to the magnitude of their undertaking I believe the results would be something surprising. There are two or three other claims being worked, and this is about all I can say of Ophir at the present moment.

The Forest Reefs are improving somewhat. Inquiries are being made about the Two Mile, and something is being done on one of the old leases.

Lumpy Swamp is looking better, and the shareholders are sanguine *re* the result of their labours. Lucknow is promising great things. The New Reform are adding to their machinery, with the view of extending operations; and they purpose sending their bonanzas straight to Germany in the state in which

which they are blown out. The fact of this Company paying £15,750 dividends, after sinking main shaft 100 feet deeper—in all 400 feet—and clearing all expenses in connection with machinery, pumping &c., &c., during the past two years, says wonders. When the new stampers are completed there will be twenty heads. The financial position of the Company favours the working of the mine in the most efficient manner. £5,000 worth of ore is now in transit, against which no advance has been taken.

The Jack Ass Flat Gold-mining Company are down 150 feet with the new shaft, and the promises are very encouraging.

Carangara is presenting a new feature in gold-mining in these districts. Gold and silver are being found in large quantities in the copper ores. I have been unable to procure particulars as regards the proportions, but I know the precious metals are so plentiful as to inspire Dr. Codrington (the owner of the estate) and the practical workers with bright hopes as to the future.

The other copper-mines are practically dead, and indeed, so are most of the gold-mines. Silver-mining promises to assume an importance amongst our local industries. Several claims have been taken up between Emu Swamp Creek and Lewis Ponds, a few miles north of Byng; and two or three lodges of silver ore have recently been discovered on Mr. J. B. Lane's property, 3 or 4 miles north-east of Orange. The indications at each of these places are considered sufficient to warrant the conclusion that we may have Sunny Corners here as well as on the eastern side of Bathurst. When the harvesting is all out of the way I presume we shall soon hear something of these silver finds.

BATHURST DISTRICT—CARCOAR DIVISION.

(*Mr. Warden Connolly, P.M., Carcoar.*)

I HAVE the honor to forward my annual report of the Carcoar Division of the Bathurst Mining District.

The gross yield of gold from this division for the year 1886, as per escort returns, was 10,610 oz. 7 dwt. and 3 gr., showing an increase of 1,537 oz. on the returns of the previous year.

This gratifying increase must be attributed mainly to the splendid rainfall of the last half of 1886, which has enabled the whole of the crushing plants in this division to continue in constant work, and has induced miners generally to more than usual activity, in view of the certainty of there being no delay in getting their stuff put through.

I am glad to report that the claim formerly known as "The Junction," about 12 miles from Carcoar, on the Belubula River, at its junction with Mandurama Creek, is again being worked, and with most favourable prospects. The present proprietors, Messrs. W. H. Binsted & Co., have removed the crushing plant of the old claim about 400 yards nearer to the waterfall in the Belubula River, and have thereby been enabled to utilise the water-power derived from this fall as a motor for a turbine wheel, which is now capable of driving the whole of the machinery without entailing, as formerly, an immense outlay for fuel, when the crushing was performed by an engine.

Two trial crushings towards the end of the year of 150 and 110 tons yielded respectively 40 and 46 oz. each, which, considering the facility of working the claim, and the immense quantity of stuff in view known to be auriferous, leaves no doubt that the prospects are most satisfactory, and that with improved gold-saving appliances a much larger yield will be obtained.

The assay of the stuff put through lately before crushing was 1 oz. 6 dwt. per ton, showing that more modern appliances are required to save the gold which is at present lost; and there can be very little doubt that with the improved prospects of the Company, these will be soon on the spot.

The Brown's Creek mine, situate on Church and School Lands, which has one of the most complete and powerful plants in the Colony, has also, I am glad to say, during the past year paid its shareholders handsome dividends, with every prospect of a continuance, as the yield of gold seems to be increasing with the depth of the workings.

Some excellent prospects have also been obtained at the Burnt Yards, near the old Prince of Wales claim, from which upwards of £40,000 worth of gold has been taken at various times; and there is a rumour of the persons who have obtained these prospects having sold their claim for a large sum. This locality has always been looked upon as containing the richest gold deposits in the district.

BATHURST DISTRICT—MITCHELL DIVISION.

(*Thomas G. Wright, Mining Registrar.*)

IN forwarding my report for 1886, which has been delayed through not being able to obtain from the managers of the different Companies the required information, as the greater part of the Companies and leases at this place are not represented in any way whatever. Mining in general, if anything, is firmer than when my previous report was forwarded, as everything appears to be on a firmer footing.

There has not been that great rush for land this year as there was last, neither for gold nor mineral. The Sunny Corner Company still employ some 400 men, which is the mainstay of the place. The output of gossan for the year was 27,501 tons, yielding 547,589 oz. of silver, with a small percentage of gold, valued at £123,207 3s. 6d.

The New Nevada Company have started work again, and appear to be doing well, having found the way to treat the ores, which are of a very refractory nature. This Company employs 56 men.

The Silver King Company ran their furnaces for a short time, the results of which were very satisfactory, but, after treating all the refuse that was about the mine, shut down the furnaces in a most mysterious way, and have been idle ever since. 500 tons of gossan out of this mine were sold to the Sunny Corner Company, which gave a good return. The gossan furnished at the Silver King furnaces during their short run was 2,489 tons, yielding 34,967 oz. of silver, with a small percentage of gold, value £9,480.

Cook and party are still working the Paddy Lack, at Dark Corner, which is paying very well, as there is abundance of quartz and easily got. They have crushed 1,100 tons of stone, which yielded 660 oz. of gold.

There is a place about 4 miles in a westerly direction from Mitchell, called the Lagoon, where some good gold has been got. There are about sixty men at work there, the most of whom are getting fair gold.

The amount of alluvial gold purchased by the Banks and storekeepers at this place during the year was 1,272 oz.

There have been seven applications for mineral leases, 205 acres, and eight applications for gold leases, 122 acres, during the year. There

There have been 337 miners' rights, 110 business licenses, and 16 mineral licenses issued during the year. The present population is about 2,500. The want of water is still felt very much during the summer months, no provision having been made for its conservation. The sanitary condition of the place is good.

BATHURST DISTRICT—BATHURST DIVISION.

(*H. H. Hutchinson, Mining Registrar.*)

In forwarding my report for the year 1886, I have to state that very little has been done in my portion of the Bathurst Mining Division during the past twelve months.

At the Napoleon reef, Ainsworth and party have been at work for the past few months, but have only met with indifferent success. Their last crushing was not payable, and they have consequently stopped work for the present.

At the Old Fontana reef, Rumsay and party, who have been prospecting there for some time past, have succeeded in striking a rich leader, some 50 yards distant from the old workings, which they believe to be identical with the old reef worked many years ago, which proved to be immensely rich. From this leader Rumsay sent 1 ton of stone to the Mint in Sydney, which gave a return of 21 oz. to the ton.

At Clear Creek, Cooke and party have erected a 6-head stamper battery, for crushing the stone from a 3-ft. reef on their property, the first and only crushing they have had gave a return of $\frac{1}{2}$ oz. to the ton, which will pay them handsomely.

Suttor and party have had crushings at the Root Hog and Randwick claims, but with only poor results, and at present work on these claims is suspended.

A few miners are still prospecting on Winburndale Creek, but with what results it is hard to say, the miners being very reticent about giving information.

I have issued during the past year 111 miners' rights, 13 business and 13 mineral licenses. I also received 8 applications for gold leases, but none for mineral.

BATHURST MINING DISTRICT—BLAYNEY DIVISION.

(*William Roche, Mining Registrar.*)

I HAVE the honor to submit my report for the year 1886. I took office on the 16th June last, which will account for the small number of miners' rights issued from this office, the miners having been supplied from Carcoar, Orange, and Bathurst.

The prospects of the field are fairly good, and a considerable amount of work done during the past twelve months. At the North Confidence Gold-mining Company, King's Plains, they are down with their main shaft 260 feet, and opened out 222 feet; the lode is 40 feet wide from the surface down to the bottom of the shaft. They have raised 2,000 loads of dirt for twelve months, the average yield of gold being 3 dwt. to the ton. This mine has a great deal of broken time for the want of water. The Company have expended £7,000 in machinery and making dams for the storage of water. There is erected on the ground one 16-h.p. engine, one 12-h.p., and one 20-h.p. Tangey engine and boiler, 19 head of stamps. With the present plant, and a sufficient supply of water, this Company would be able to put through 2,000 tons of dirt monthly, instead of twelve months, which would be one of the best paying mines in the Colony. Tanner and party, in their 10-acre lease adjoining the Confidence, have struck the lode, and it is looking well, and they estimate that it will go 5 dwt. to the ton. They are now driving across the lode to see its width. This lode can be traced for a considerable distance. Now that the Government are about erecting a dam at King's Plains, it will be a great service to miners to test the ground about King's Plains, the great drawback being the want of water. About twenty miners are employed on the old alluvial workings, some doing fairly well. A good deal of prospecting has been done within the last six months on private property with good results. In fact, mining about the locality is looking better than it has been for some years.

The Blayney Copper-mine is still idle on account of the low price of copper in the English market.

Miners' rights issued for the twelve months.....	49
Business licenses " "	Nil.
Mineral licenses " "	Nil.
Gold-mining leases " "	2

BATHURST DISTRICT—ROCKLEY DIVISION.

(*Thomas C. Cromie, Mining Registrar.*)

DURING 1886, with the exception of Back Creek, mining has been very dull in this division. Wiseman's Creek and neighbourhood, which was all bustle and excitement for silver in the latter part of 1885, has after all been a castle in the air. There were over 3,000 acres applied for, for silver; out of that only a very few have been completed for leases, and at present there are now only two men at work. It is said that the South Wiseman's Company will try and float again with English capital.

There have been three applications during the year for gold-mining leases. Owing to such a favourable spring and summer for rain, several parties during that period have made fair wages ground-slucing about Stony and Wiseman's Creeks. During 1886 I have issued 64 miners' rights and 55 business licenses—a decrease on previous year.

There have been twelve applications for silver leases at Back Creek during 1886 by Messrs. Withers, Gibbs, and party, who have now secured a large quantity of land there, and intend to increase their operations during 1887. Up to date they have raised 43 tons of silver ore, which has been sold to a smelting company at Melbourne, and which, when smelted, turned out 3,700 oz. of silver, and 30 oz. of gold; the former valued at £740, and the latter at £112 10s.

The Manganese Mining Company at Back Creek, Rockley, have been at work there since April, 1886, and after doing a great deal of dead work the output has been 300 tons. Two parcels have been forwarded to England, and assayed by Professor Dixon, viz.:—26 tons 10 cwt. and 2 qr., which went 83.3 per cent., and 62 tons 9 cwt. and 3 qr., which went 78.3 per cent., which is considered very favourable. The prospects to date are very favourable, splendid ore going down at No. 1 and No. 2; at No. 3 the quality does not look so rich, but a greater quantity can be raised, as it spreads over the surface for about 3 chains wide. The Company anticipate sending away about 300 tons per month. There is a variety of the manganese ores interspersed in and throughout the lode, which is about 40 feet wide—

if

if a lode it may be called—which is very like a metamorphic dyke. There are specimens of pyrolusite diallogite, rhodonite, manganite, with others. I am much indebted to the manager, James Russell, Esq., for so much valuable information about the Mangnese Mining Company, Back Creek.

During the year 1886 there were 225 oz. of gold bought in Rockley by our local Bank.

BATHURST DISTRICT—OBERON DIVISION.

(*J. O'Connor, Mining Registrar.*)

THE only mine which has been fully at work has been the Homeward Bound Extended quartz claim, ten men's ground, on Blackman's line of reef, near Oberon. The Company crushed during the year 1,500 tons of quartz, yielding a return of 975 oz. of gold. There is little doubt that plenty of gold exists in this claim, but it requires machinery to work it for the purpose of keeping the water down. Twenty acres of land have been applied for during the year for silver, 40 acres for tin, and 5 acres for gold.

BATHURST DISTRICT—MOUNT M'DONALD DIVISION.

(*G. A. Gunning, Mining Registrar.*)

I HAVE the honor to submit herewith my annual report for the year ending 31st December, 1886, and regret it is not as complete as I would wish. Owing to the system adopted during the year by the local batteries of crushing by the hour, instead of at a rate per ton, I am unable to obtain the gross quantity of stone crushed, but from what I have obtained I find the average yield per ton has almost doubled the average of the preceding year, the amounts being—average per ton:—

	oz. dwt. gr.
1885.....	1 14 0
1886.....	3 5 19

During the year there have been several very rich returns, the most notable being from Matheson's Bobby Burns. 5 cwt. of the best stone from this claim has just been treated at the Mint, and returned 37 oz. 9 dwt. 10 gr., or an average of over 150 oz. to the ton. This claim has averaged over 7 oz. to the ton for the year.

The following are the several results for the year's operations:—

	No. of Tons.	oz. dwt. gr.
Hawkins' Tribute	130	491 12 10
Ferguson and Fifield.....	37	28 1 0
Cash and party.....	57	181 12 12
Woolston & Co.....	66	129 3 17
Punch's lease	8	4 8 0
Fitzgibbons's	10	5 0 2
Fifield and Mullen	40	35 12 0
Woman's lease.....	21	28 17 0
Butcher's.....	140	608 3 0
Bobby Burns	65	476 9 10
	574	1,988 9 3

From other claims, including Eureka, Oliver's Company, and Balmoral, 1,402 oz. 1 dwt. 20 gr., making a total for the year of 3,390 oz. 10 dwt. 23 gr.

Work has been suspended on the Eureka owing to the quantity of water. This claim has produced 2,378 oz. 14 dwt. 13 gr., and I feel confident would still prove remunerative if the shareholders went to the expense of purchasing machinery.

I have issued during the year 116 miners' rights and 25 business licenses.

The returns for the past twelve months indicate permanency, and should induce the claim-owners to prove the claims at a depth.

In consequence of the heavy rains and flooded state of Lachlan River very little alluvial digging has been done.

BATHURST DISTRICT—TRUNKY DIVISION.

(*W. T. Lee, Mining Registrar.*)

DURING the year 1886 the revenue from this division amounted to £96 7s. 6d. 110 miners' rights were issued, also 43 business licenses. Generally the mining industry is very much depressed; prospects are, however, brightening. I am indebted to Mr. Licensed Surveyor Ryan for return of rainfall, which was greater than for many years past, being 30.098, but it was so equally distributed that nearly the whole soaked into the land, thus giving very little for sluicing.

BATHURST DISTRICT—CARCOAR DIVISION.

(*W. B. Warner, Mining Registrar.*)

I BEG to forward my annual report for the Carcoar Division of the Bathurst Mining District for the year 1886. The break up of the drought in the middle of the year, and the consequent abundance of water for sluicing and other mining purposes during the latter half of the year, tended very materially to brighten the prospects of our mining population. There has been a considerable increase in the gold yield in consequence, although the total, 10,610 oz., is still much below the product of that very successful year 1884. The last three years the yield has been as follows:—

	oz. dwt. gr.
1884.....	12,040 3 14
1885.....	9,073 6 3
1886.....	10,610 0 0

Of this amount, the Brown's Creek mine returned 4,173 oz. 9 dwt., being, I believe, the largest amount yet returned by that celebrated mine, which is likely to be worked for years to come. The Junction gold-mine, situated on the Belubula River, is now in the hands of a powerful Company, who have lately discovered several new reefs on their property containing enormous quantities of payable stone, easily worked, and within easy distance of the crushing plant of twenty head of stampers driven by a turbine water-wheel. This mine is likely to yield a good deal of gold during the coming year, as the directors seem determined to enlarge their operations and work the mine with vigour. From assays made of the stone

stone in the different reefs, it has been found that a great loss of gold takes place in the crushing operations. Every modern improvement will be taken advantage of to minimize this loss, so as to render productive the large amount of capital sunk in the mine and plant. The Burnt Yards still retains its character for rich patches of gold. One of these was discovered during the year by Owens and party, and it is considered probable that in consequence the mine will be floated into a Company, to the advantage of the fortunate Welshmen. Some good cakes of gold have been brought from Gally Swamp by Digby and party, Lane and party, and others, but there is a feeling abroad that Gally Swamp has, unfortunately, seen its best days, and that the field is nearly worked out.

No copper is being worked in my division. During the year I sold 129 miners' rights and 5 business licenses.

BATHURST DISTRICT—BURRAGA DIVISION.

(*William Ritchie, Mining Registrar.*)

I HAVE the honor to report for your information that mining in this district for the past year has not been prosperous, owing to the low price of copper.

For nine months, ending the 30th September, 1886, there were 281 tons of copper, valued at £14,000, despatched from the Burraga mine. Since then the mine, which shows a splendid face of ore, has been closed, awaiting a rise in the price of copper.

There are a few men mining for gold about the Isabella and Abercrombie Rivers who appear to be making wages.

The revenue collected at this office for the sale of miners' rights and business and mineral licenses for the past year amounted to £35.

BATHURST DISTRICT—COWRA DIVISION.

(*W. G. B. Smith, Mining Registrar.*)

IN forwarding my returns for 1886, I regret to state that mining in all its branches in my portion of the Bathurst District is still in a very backward state, and though there has been a good deal of prospecting during the year, no results favourable to those engaged have ensued. A small rush took place in May last to Wood's Flat, about 16 miles from Cowra. A number of claims were pegged out, but after a few days' work the place was abandoned.

That portion of the district between Cowra and Canowindra has been added to the Lachlan District, thus enabling miners living in the neighbourhood of Canowindra to do business at that place.

TAMBAROORA AND TURON DISTRICT—HILL END, HARGRAVES, WINDEYER, AND SOFALA DIVISION.

(*Mr. Warden Steel, P.M., Hill End.*)

I HAVE the honor to submit for the information of the Honorable the Minister for Mines my report for the past year on the Turon and Tambaroora and Mudgee Mining Districts under my charge.

I regret that I am unable to report any mining discoveries of importance during the year, nor has any improvement taken place in the yield of gold, which has been falling off more and more every year. The inducements offered for earning fair wages at Sunny Corner have attracted many of the old Hill End miners, who still remain here.

Hill End Division.—Since my last report many leases have been cancelled for non-observance of labour conditions and other causes, which has not effected any improvement in mining; in only a few instances has the land been taken up or worked. The Hawkins Hill Consolidated Company, now the Cornelian Gold-mining Company, Hawkins Hill, has been working continuously during the past year. The quartz raised and crushed by this Company has been 517 tons, yielding 320 oz. 15 dwt. 16 gr. retorted gold; the quantity raised and crushed for tributors, 222 tons, yielding 200 oz. 4 dwt. 15 gr. The Company also crushed 103 tons for the public, which yielded over an ounce per ton. The number of men employed during the last half-year and now, is from twenty to twenty-four. The wages paid by the Company amounted during the year to £2,289 10s. 5d. A first-class winding engine, and an air compressor for working rock-drill, &c., have recently been erected. A shaft 8 x 6 feet is being sunk, and is securely timbered in two apartments for a distance of 150 feet, which is intended to go 400 feet. The water is extremely difficult to contend with, partly owing to the adjoining leases not being worked. It is proposed to drive a tunnel in from Oakey Creek, on the west side of Hawkins Hill, to drain one of the leases at a low level, and thus dispense with the heavy cost of pumping, as nothing beats drainage by gravitation through a tunnel. Some of the yields have been barely payable, while others have been very good. Clemens and O'Reilly crushed 4 tons, yielding 18 oz. Again, O'Reilly and party, in the Venus claim adjoining, obtained 40 oz. from about 9 tons. The total amount of gold forwarded by escort from Hill End, including that sent in from Hargraves and Windeyer, was 3,375 oz. 14 dwt. 9 gr. Since the escort from Mudgee has been discontinued very little comes from the latter places. This shows a decrease of 517 oz. 16 dwt. 1 gr. from the previous year. The number of miners' rights issued for the year was 295, being only a slight decrease from 1885.

Carver and Porter's claims, from which so much gold has been taken, are now idle, owing to an influx of water, and the want of necessary appliances to keep it under. The miners have experienced a serious loss by the A.J.S. Bank closing here a few weeks since, and are now dependent on the storekeepers for the purchase of their gold.

Hargraves and Windeyer Divisions.—Nothing of importance has been discovered during the year, and, with the exception of Bond's lease, no other has been worked. Considerable sluicing has been carried on, owing to a plentiful supply of water, both at Hargraves and Windeyer, in a few instances with fair results. Many leases have been cancelled in this division. Bond and party have recently transferred their leases on the old Eureka lead, and from which so much gold has been taken, to Mr. John Coghlan, of Sydney, diamond-drill proprietor, and that gentleman arrived on the ground a few days since with the diamond-drill machinery for the purpose of thoroughly testing it. 289 miners' rights and 14 business licenses have been issued during the year, which includes Windeyer, now collected by the Mining Registrar at Hargraves. Gold-mining leases amounting to 50 acres have been applied for since November last.

Sofala Division.—Owing to abundance of water during the last quarter of the year much activity by sluicing and fossicking has been carried on. The yield of gold from all sources, as far as I have means of ascertaining, has not decreased during the year. The Spring Creek mine is again idle. The old Surface Hill

Hill leases have recently obtained suspension of labour with the object of forming an English Company for working it on a more extensive scale than hitherto; it is believed it will be highly remunerative. The Garnet Wolsley proprietors have formed a Company and will commence work at once.

Oppenheimer's mineral lease, antimony, is working with satisfactory results. Considerable litigation has taken place over this property by Flynn and party, applying for a gold lease, contending that a mineral lease cannot be legally held on a proclaimed gold-field. Some stir has recently been made by the discovery by Howard and party of a rich gold-reef on the Crudine Creek, about 10 miles from Sofala. Very rich specimens have been procured, and several leases have been applied for, for the adjoining land. H. L. Beyers and party are about to erect a crushing plant in the vicinity without which it could not be made to pay.

TAMBAROORA AND TURON DISTRICT—WELLINGTON AND IRONBARKS DIVISIONS.

(*Mr. Warden R. Hare, P.M., Wellington.*)

IN furnishing the annual report on the mining interest in this district I have the honor to intimate that very little change has taken place during the past year. There was a slight rush to Pipe Clay Gully, but the result could not have been satisfactory, as those who obtained miner's rights and worked in that vicinity have left the ground, with the exception of the prospectors who have applied for a two-acre lease. Several parties have been working alluvial grounds on the Macquarie River.

The only quartz crushing machines in this, the Wellington Division, two in number, have been idle during the year, but from what cause I am unable to state. The quantity of copper ore raised in the Belaire Mine will be, no doubt, noted in the Mining Registrar's Report. I trust the mining industry in this division will be more satisfactory during the present year.

In the Ironbarks Division I regret to say that the year just closed has not been a prosperous one. The very heavy and incessant rains during the winter months caused several diggers to resort to ground-slucing on a small scale with not very good results. Reefing during the months referred to was at a standstill, several of the claimholders doing little else except bailing water, whilst others had to avail themselves of the labour extension clause. Only one of the Macquarie River companies did any work—the Muckerawa Junction Company—and this Company through some reason or other, has not been so successful as was anticipated. The Old Perseverance Claim has been floated into a company, chiefly with Victorian capital.

Scott's machine crushed 324 tons of stone for different owners, yielding 176 oz. 15 dwt. retorted gold. Messrs. Veitch and Burney's machine put through 1,480 tons of stone; result, 384 oz. for the owners. As correctly as I can gather the amount of gold from all owners quartz and alluvial, amounted to 1549 oz. 4 dwt. 1 gr. for the year. About 198 miners' rights and 23 business licenses have been issued at Ironbarks during the year.

TAMBAROORA AND TURON DISTRICT—IRONBARKS DIVISION.

(*J. S. Hayes, Mining Registrar.*)

IN submitting my annual report for the Ironbarks Division of the Tambaroora and Turon Mining District for the year 1886, I wish to state that only having entered upon my duties on the 19th June, 1886, I am not as well versed in mining matters as I would desire. The past year has been an uneventful one in this division. The incessant rains during the winter months entirely retarded quartz-mining, as, unfortunately, adequate provision had not been made to overpower the inrush of water to the mines, thereby causing stoppage of work. Some of the claimholders had to fall back upon the suspension of labour clause, whilst others more persevering were unceasing in their efforts to cope with the water, in hopes of keeping their mines dry. Some of the mines had the water running out of the mouths of the shafts.

The well-known Perseverance has lately been floated into a company, a manager from Melbourne being placed in charge. A prominent shareholder in this claim took a block of stone to Melbourne weighing 118 lb., which, having been put through a new pulverising process, gave extraordinary results. The assayers (Messrs. Parker Bros.) assert that this particular species of stone would lose 75 per cent. in the ordinary method of crushing. Three tons of poor stone were this week sent away to undergo similar treatment, and should this turn out anything near the mark a great rush to this field is anticipated. Acting on the strength of the return from the 118 lb. of stone the shareholder just alluded to has taken up no less than nine leases of from five to twelve acres each upon almost every line of reef on this field. The circumstances at present surrounding this field are by no means discouraging.

During the past year nine gold-leases have been applied for, representing 63 acres to be leased.

Scott's machine, twelve-head stampers, ten horse-power, did but little work for the year, only crushing 324 tons stone for 176 oz. 15 dwt. retorted gold.

At the Gordon Mine, Buchinbah, Messrs. Veitch and party put through 1,480 tons for a yield of 384 oz. This machine does not crush for the public.

The Muckerawa Junction Company, on the Macquarie River, is the only claim at present at work on the river. This is a sluicing claim, upon which is erected expensive pumping gear, capable of pumping 70,000 gallons per hour, and now seems to be on a fair way to unearth some of the rich deposits known to exist on the river.

It would be very difficult to give anything like an accurate return of gold won from all sources, inasmuch as miners take their gold to different places—wherever the best returns are derivable from. The total number of ounces of gold won, both quartz and alluvial, as accurately as can be obtained, for the past year, is 1,549 oz. 4 dwt. 1 gr. The number of miners' rights issued was 198 and 23 business licenses.

I may here state that a rush took place on the Nubrygan Creek, 10 miles from here, last winter, which rush, I am sorry to add, ended fruitlessly.

TAMBAROORA AND TURON DISTRICT—SOFALA DIVISION.

(*M. Fagan, Mining Registrar.*)

I HAVE the honor to forward my report relative to the mining interest in this division for the year 1886.

Spring Creek Reef.—On tribute—plant on the ground—25-h.p. engine with crushing pumping and winding gear. Total depth of mine, 300 ft., breaking down stone at various levels. Average width of stone, 7 in. Yield of gold not payable; work suspended for further development of mine.

Sir Garnet Wolsely.—Originally very rich to a depth of 40 or 50 ft.; been unworked for some two years back; now formed into a company. Present depth of shaft in the underlay, about 70 ft. Four men at work at about 60 ft., level. Vein increased from old workings 9 in. to 3 ft., with gold showing freely through stone.

Razorback, Upper Turon.—Under the name of the Turon Gold-mining Company, now being formed; five men at work on a vein of about 18 in.; working from adit covering about 300 ft.; perpendicular depth, about 200 ft. Machinery for crushing about to be erected, and one hundred tons of stone raised.

Box Ridge Homeward Bound Company.—A party of 14 working men.—No work being done at present pending further appliances in piping for one 10-h.p. engine working 2 batteries of 5 stamps each. Water heavy at 130 ft., level, on an 8 in., vein with an average yield 1 oz. per ton.

Wattle Flat, Old Caledonian Reef.—Davidson and party of three men raised about 50 tons at a depth of 100 ft. from a vein 3 ft. in width, averaging $9\frac{1}{2}$ dwt. per ton. Last crushing of 16 tons went 11 dwt. per ton.

Old Surface Hill.—Only small parties of 2 or 3 have been working on small veins during the year. At present no work being done.

Bright's Hill.—On this ground there are no defined reefs or veins. In the small veins averaging about 3 in.—at different shoots or breaks—really rich deposits of decomposed quartz with patches of blue stone, rich in gold, have been obtained, as by following returns:—

William Borifield, during the year, from 3 tons of quartz, obtained 15 oz. of gold.

Grice and Clark, during same time have raised 7 tons in all—having sunk to a depth of 100 ft.; lately working at 80 ft. level. Yield of gold from 7 tons, 150 oz. 16 dwt. Ground now abandoned, two men only have worked on this claim, and the chief portion of the gold obtained has been by hand crushing.

Prince and Hibberd, since Easter, have had 2 crushings at Davidson's engine. Raised about 10 tons altogether from a depth of 80 ft.; yielding at each crushing of 5 tons, 26 oz.; total, 52 oz. Value of gold at this hill, £3 17s. per oz. This is the only party at work at present, although others intend prospecting further after the holidays.

Solitary Creek Gold-mining Company.—Six men have been employed day and night on this mine during the year and have raised 500 tons of quartz, yielding only 150 oz. Value of gold in this mine, £3 14s. per oz. Value of machinery for pumping, winding, and crushing, £2,000.

At Back Creek a rich vein has been discovered by Mr. Albert Howard, and several leases have been applied for in the same line. 2 tons of quartz raised from this vein and crushed at the Sydney Mint, gave the handsome return of $7\frac{1}{2}$ oz. per ton.

Razorback Gold and Antimony Mines.—This property consists of 2 acres gold lease and of 40 acres mineral lease. The mineral lease was applied for in 1885 and issued to Mr. Adolphus Oppenheimer in October last, after which he started work with 13 men on this lease, and soon discovered that the ore (antimony) raised therefrom contained a quantity of gold, in consequence of which he applied to have the lease converted into a gold lease in accordance with the 46th section of the Mining Act. He also applied for a further lease of 10 acres north of and adjoining his 40 acres for the purpose of mining thereon for gold, making a total of 52 acres in all.

Several men have been employed on the 2 acre gold lease during the year. The following quantity of ore has been raised from this lease and shipped to Europe:—Ore containing antimony, gold, and silver, viz., 86 tons 6 cwt., valued at £1,523. This is all picked ore, but variable in quality as to the gold it contains.

Owing to the nature of the ore it cannot be treated in the Colony, but has to be shipped to Europe for treatment.

Some of the assays of the ore shipped are as follows, viz.:—By Dr. Claudet, assayer to the Bank of England, London: antimony, 61.50 per cent.; gold, 3 oz. 12 dwt.; silver, 1 oz. per ton. By Johnson, Makhey, & Co.: antimony, 41 per cent.; gold, 2 oz. per ton. By T. S. Vale, assayer, Sydney: gold, 19 oz. 1 dwt. 3 grs. per ton. Taking the valuation of £1,523 for the 86 tons 6 cwt. shipped during the year, averages close on £18 sterling per ton. Besides the ore shipped there remain at grass several hundred tons of ore and quartz thrown out as not being rich enough for shipment, containing from 15 dwt. to 2 oz. of gold per ton. As to the 40 acres mineral lease which has been converted into a gold lease, 30 tons 10 cwt. of quartz and antimony ore, valued at £358, have been raised from the lease during the month of December, containing, as per assay, 2 oz. 7 dwt. 23 gr. per ton of gold, and 10 oz. 18 gr. of silver. There are about 40 tons of similar ore remaining at grass ready for bagging and shipment. The working expenses paid away during the year amounted to £1,231, as against ore shipped valued at £1,881, leaving an estimated profit of £650.

Mr. Oppenheimer is about to erect extensive machinery at the mines for the effectual working of this valuable property.

At the Crudine, Palmer's Oakey, Wattle Flat, and Upper Turon, there have been several parties of fossickers at work in various old workings, from whom I have been unable to obtain any information as to the amount of gold won, but it is believed that the greater number of them have made good wages.

The following amount of gold from all sources has been transmitted from this division during the year, viz.:—

	oz.	dwt.	gr.
By Gold Escort	2,868	7	21
By other means	886	0	0
Total	3,754	7	21

Market value of same, £14,360 11s.

Miners' rights issued during the same period, viz.....	394
Business licenses	19

Nineteen applications for gold-mining leases have been received by me during the year.

Total value of mining plant in the division, £4,300.

The outlook for the coming year is fairly prosperous.

TAMBAROORA AND TURON DISTRICT—HILL END DIVISION.

(James Watt, Mining Registrar.)

I do myself the honor to submit, for the information of the Honorable the Minister for Mines, the following Report on mining matters in the Hill End Division of the Tambaroora and Turon Mining District.

Excepting the operations of the Cornelian Gold-mining Company, Hawkins Hill, and the Red Hill Company at Tambaroora, mining matters in this District are in a very depressed state.

Owing to the copious rains which fell in the latter half of the year alluvial digging, chiefly by Chinamen and old fossickers, has become a trifle more animated, but as most of the ground has been thoroughly worked and abandoned years ago, the amount gained has been but small.

Adverting to quartz-mining operations, a shaft 250 feet deep has been sunk by the Red Hill Company on the old M'Mahon lease at Tambaroora, 9 ft. by 3, having three partitions. Five veins have been cut, three showing gold. The last one, cut at a depth of 240 ft., is 14 in. wide, from which a trial crushing realized 12 dwts. to the ton.

This mine is unfortunately reported to be making water at the rate of 1000 gallons an hour. Further operations are, of course, suspended.

On a three acre lease taken up by this Company, north-east of the M'Mahon mine, an 80 ft. shaft has been sunk, and a vein met with at that depth 2 ft. wide. Eighty-two tons of quartz taken from this yielded 5 oz. 18 dwts.

Upwards of £1700 have been already expended by the Red Hill Company in machinery, wages, &c., and under the able superintendence of the Manager, Mr. Charlton, good results are anticipated in the near future.

At the Cornelian Gold-mining Company, Hawkins Hill, good work has been done during the year. Several vexatious delays occurred owing to accidents to the machinery, but as 739 tons of quartz have been raised, yielding 521 oz. 0 dwt. 7 gr., and representing £2,084, the result may be considered on the whole as satisfactory.

O'Riley and party of the Venus Claim, Red Hill, Hill End, have been getting moderately rich stone at a depth of 212 ft., yielding at the first crushing 44 oz. to ten tons of quartz. Owing to the foul air (which unfortunately in July last caused the death of one of the party, Patrick O'Riley), an air shaft has been sunk, and the prospects of this claim are considered promising.

A number of other claims have been working, but the results in general were insignificant.

In July last Messrs. Clymo commenced crushing at the Root Hog, with a 5-head stamper water-power battery. The average yield to the ton up to the present time has been about 16 dwt., which is considered satisfactory, as the supply of quartz is steady—obtained by driving into the side of the mountain—and the cost of carriage to the battery is trifling.

Escort return for the year is—3,375 oz. 14 dwt. 9 gr. for 1886, as against 3,903 oz. 10 dwt. 10 gr., for 1885.

The number of miners' rights and business licenses sold was 296 and 12 respectively, as against 304 and 10 sold in 1885.

TAMBAROORA AND TURON DISTRICT—WELLINGTON DIVISION.

(W. Carson, Mining Registrar.)

I HAVE the honor to forward herewith my annual report upon the Mining industry of the Wellington Division of the Tambaroora and Turon Mining District, for the year 1886.

My last report showed an improvement in mining matters during the year 1885, but I regret to say that the only crushing plants in this Division have been idle all the year, and for several years previously. I have also to state that, during the year, one of the two sluicing claims that had been worked for some years has ceased working, the cause apparently being the working out of the ground.

I may however state, that in the month of June a small rush was made to a place known as "The Pipeclay Gully," by a few of the surrounding residents, it being stated that some quartz specimens had been found there, but after a short time the ground was abandoned, since which the prospectors have applied for a two acre lease in the locality.

Copper.—The return of copper for the year is as follows:—Ore raised 300 tons, ore smelted 40 tons—value, £1,720.

From inquiry made I have ascertained that the quantity of gold received in Wellington during the year is 432 oz. 13 dwt. 16 gr.; but I have reason to believe that the whole of it has not been won in my Division, but brought from other parts of the district.

In conclusion I may add, that 55 miners' rights and 2 business licenses, have been issued from this office during the year.

MUDGEE MINING DISTRICT—DUBBO DIVISION.

(Mr. Warden W. S. Caswell, P.M., Dubbo.)

I HAVE the honor to make the sixth annual mining report for this sub-division of the Mudgee District.

The mining interest here is still progressive. The gold won from Tomingley reefs in 1884 was of about the value of £7,000—in 1885, £8,000, and in 1886 it has increased to between £9,000 and £10,000.

No coal has yet been obtained for marketable purposes. The Dubbo Coal Mining Co.'s ground remains unworked pending the results of a diamond drill bore now being made by the Great Western Coal Mining Company on adjoining land. The manager of the latter Company reports, a depth of over 530 ft., at which depth a core of coal 5 ft. 2 in. was brought up. This was resting on a bed of fire-clay 4 ft. 1 in. thick.

The works of the Copper Mining Co., at Girilambone, are still suspended.

The population of Tomingley, including Myall has increased. In 1884 it was estimated at 200; in 1885 at 210; in 1886 at 250. The average attendance at the Public School was 33 for 1886. There are two public-houses, two stores, two butchers, one baker and one bootmaker—all doing fairly well; there is a Post-office, but no telegraph office. A mail coach runs from Dubbo once in each week; but there are cross country mails on horseback which afford sufficient convenience.

The

The water supply for mining purposes is ample. For domestic purposes the miners are dependent on the mill reservoirs, the water in which contains more or less of house drainage. A tank for town and travelling stock use was promised but never constructed.

Of the three crushing machines at Tomingley and Myall two are worked as fitfully as the claims about Tomingley. These latter appear to be taken up for a few weeks at a time by different parties; and held only so long as moderate success crowns their efforts. The best stone is picked, and the mine probably so injured as to deter others from similar attempts.

There were 76 miner's rights issued at Tomingley during the year; and 21 at Dubbo, being a total of 97.

There were 12 business licenses taken out at Tomingley, and one mineral license at Dubbo.

Mining Registrar Farquharson was succeeded by Senior-constable Murphy, who also was removed at the end of the year. These frequent changes furnished the only objection which can be raised against the appointment of police officers as Mining Registrars.

There are only fifty men actually working at the reefs at Tomingley and Myall.

I have obtained returns from the claim holders, the mill owners, and the banks; but as usual there is great discrepancy which I cannot reconcile:—Claim returns, 3,930 tons; yielding 2,962 oz. 13 dwt. 2 gr. of the value of £11,477. Mill returns, 3,778 tons; yielding 2,820 oz. 7 dwt. 7 gr., of the value of about £10,927. Bank returns, 2,486 oz. 7 dwt. 17 gr., of about value of £9,274.

The returns from the several claims as supplied to me are as follows, viz. :—

Tomingley Reefs.

Tomingley Prospecting Claim, 8 men's ground, 4 ft. reef, 160 ft. deep, Croft and party crushing 59 tons, yield 13 oz. 5 dwt. at present unworked.

No. 1 North, Reakes and party, 4 men's ground, width of reef 4 ft., varying, crushed 471 tons for yield of 289 oz. 7 dwt. 17 gr.

No. 2 North, Fenton and party, 6 men's ground, 120 ft. deep, 98 tons crushed for yield of 75 oz. 2 dwt. 12 gr.

No. 3 North, Berry, now Blackwood and party, 70 ft. deep, 9 ft. wide, crushed 477 tons, yield 139 oz. 7 dwt. 7 gr.

Spare ground unworked, 120 ft. deep, 10 ft. wide, containing a little gold.

Tailings crushed by Tomingley Co., 125 tons, yield 25 oz. 4 dwt. 13 gr.

Myall Reefs.

Prospector's Claim, 8 men's ground, Golding and party abandoned.

No. 1, South, Petersen, and party, 3 men's ground, 60 ft. deep, 2 ft. wide, abandoned.

Spare ground, Quirk and party, 4 men's ground, crushing 50 tons, yield 10 oz. 4 dwt., now held by M'Donald and party.

Spare ground adjoining No. 1, North, Mooney and party, 4 men's ground, crushed 1,290 tons, 1,168 oz., 180 ft. deep, 2 ft. 6 in. wide.

No. 1 North, Mooney and party, 8 men's ground, crushed 1,300 tons, yield 1,103 oz. 16 dwt., 140 ft. deep, 2 ft. 6 in. wide.

No. 2 North, Ring and party, 4 men's ground, 10 tons, yield 5 oz. 10 dwt., now abandoned.

No. 2 Block Claim, M'Donald and party, 4 men, 109 tons, yield 91 oz. 17 dwt., abandoned, formerly Horl and party.

No. 3 South Myall, Porter, now Hayes and party, 66 tons, yield 41 oz. 15 dwt. 19 gr., now abandoned.

There are no alluvial workings so far as I am aware in this division (Dubbo.)

The sudden removal of the Mining Registrar will preclude the possibility of his report, and you will not receive any from the Acting Mining Registrar at Dubbo, who has only been here a short time, and has only just recovered from a serious illness.

In conclusion I may state there is every prospect of a bright future for the mining interest in this district.

MUDGEES DISTRICT—MUDGEES DIVISION.

(*R. H. Acheson. Mining Registrar.*)

I have the honor to submit, in the following, my annual report on the mining industry of the Mudgees Division of the Mudgees District, for the year 1886. Compared with the last three years in the division, mining, especially for gold, has, during 1886, rather improved, which fact is probably due to the depression in agricultural and pastoral labour throughout the Colony. Labourers and others have turned to Mining. The number of miners' rights issued by me during the year 1886, viz., 183, compared with the year 1885, during which were issued 150, indicates an increased activity in mining pursuits, as also do the local purchases of gold—3,501 oz., in 1886, against 3,148 oz. in 1885.

During the year some good results have come of the old and well-known alluvial workings at Apple-tree Flat. On inquiry, however, I find the miners reticent as to exact results, but one party, Rochester's, presented to my view a beautiful nugget of 102 oz., unearthed in their tenement, which they have been working with average good results for many years.

The Rhobardah Gold-mining Company, near Cudgegong, has, during the year, re-let its property and valuable plant to Mr. Edward Strike, Mr. Thomas Chappell having relinquished it. Very hopeful prospects were entertained of this mine during 1885-6, but late in Mr. Chappell's management the value of the production lowered until it became quite unpayable. I am glad, however, to be able to state that Mr. Strike's success is much better, but I have not ascertained the result of his crushings to the ton.

In November a slight rush took place to the Reserve at Cullenbone, on the Cudgegong River. I visited the locality during December, and found about twenty men on the ground, working in a stiff cement formation to a depth of from eight to fifteen feet.

Some reported themselves as doing well, and others as only making a living.

The

The well-known diggings on the Meroo and Merrendee yet maintain the old mining population, principally Chinese, but no extraordinary finds have been made known from there during the year.

The Cheshire Copper Mine, near Dungaree, let on tribute to a Mr. Jeakins during 1885, has suspended work, and nothing has come of the leases for silver taken up in Barra and Mullahuddy.

MUDGEES DISTRICT—GULGONG DIVISION.

(*H. De Boos, Mining Registrar.*)

No improvement has taken place in mining matters in this portion of the Mudgee District since my last report, nor does there appear any present prospect of a change for the better.

The Canadian Gold-mining Company, after struggling against numerous difficulties, have ceased working, in fact, nothing has been done on the Company's property during the last twelve months. The plant is now advertised for sale, and the Company is to be wound up, and one more unsuccessful venture added to the records of the Gulgong Gold Field. Scully's Prospecting Reserve is just as it was this time last year, nothing has been done, and from all appearances, nothing is likely to be done with it for some time.

Some work has been done by Fletcher and party on their leases in the vicinity of the diamond mines, payable prospects have been obtained, and it is intended to form a Company and work the ground by means of machinery and requisite appliances.

The Nil Desperandum Mine, at the Canadian, formerly the White Horse Extended Claim, is now owned for the most part by Victorian shareholders. From a mining point of view this claim is a subject of importance and consideration, from being something unusual in the history of Gold Fields. The gold is disseminated through a tenacious clay called "pug" by the miners, and found, not in water channels, but in caverns in the limestone rock, which are of various dimensions and extend to unknown depths, the lowest reached being 200 feet, at which level a monkey shaft was put down to a further depth of twenty feet, through pug, and good prospects obtained. It is the intention of the Company to sink to a depth of 300 feet, when they expect to reach the slate bottom, and anticipate that the limestone will be found to rest on gravel. Should these anticipations be realised, it is the opinion of persons qualified to judge, that a large area of auriferous country will be opened up and so help to the revival of the mining industry of this portion of the gold field. This mine has been in work since the discovery of this field, now about fifteen years ago, and has yielded large quantities of gold, in fact, several of the former proprietors have retired with moderate competencies from the dividends obtained. The mine was purchased by the present syndicate from the last party of miners who owned it for the sum of £2,000.

About six months ago a small rush took place to Slasher's Flat, near Belinfante bridge on the Mudgee River. Some twenty or thirty men are now working there and most of them earning fair wages. The sinking is from twelve to twenty feet.

The Ellan Vannin claim, formerly known as the Britannia, near Home Rule, is not at work at present; but it is reported that steps are being taken to float a company, with a large capital, for the purpose of developing this mine, which is considered, by many who have a knowledge of this locality, as being one of the most promising ventures in this district. The Star Lead has been taken up by a syndicate who intend to start operations as soon as the necessary arrangements can be made for the erection of machinery sufficiently powerful to overcome the heavy flow of water, which has hitherto proved a hindrance to the prospecting of this lead, which is considered by many of the Old Gulgong miners to present better chances of good returns than any ground, immediately adjoining Gulgong, as the Leads from Happy Valley and adjacent country all seem to tend towards the Star.

No mining of any consequence is being carried on in the other parts of this Division of the Mudgee Gold Field. There are a number of men scattered over the district, some making a living and others doing fairly well, and it is to be hoped that as we have had a bountiful fall of rain at intervals during the last six months, prospecting parties will be equipped and some new country opened up, and revive the almost stagnated mining industry.

Eight gold mining leases and two mineral leases have been applied for during the past year, and 218 miners' rights, 11 business licenses and 22 mineral licenses have been issued from this office during the same period.

The amount of gold purchased by the banks for the last twelve months is 1724 oz. 15 dwt. 5 gr.

MUDGEES DISTRICT—HARGRAVES DIVISION.

(*T. O'Brien, Mining Registrar.*)

I HAVE the honor to submit for the information of the Honorable the Minister for Mines, my report for the year 1886, upon the mining industry of this Division of the Mudgee Mining District. Gold-mining here during the year has been all but abandoned as a means of livelihood. None but what is termed old fossickers remaining on the field. Most of the gold-mining leases in existence at the commencement of the year have been cancelled through non fulfilment of the labour conditions. I am of opinion that this was caused by the want of means to provide machinery, as without such nothing can be accomplished in the line of quartz-reefing in this locality, as there is a strong body of water only a few feet from the surface to be encountered.

Notwithstanding the depressed state of mining here during the year, I have hopes that an improvement will take place in 1887, as a diamond drill will in all probability be on this field in January, 1887, for the purpose of boring for gold-bearing reefs.

Mr. Coghlan has bought Bond and party's interest in their prospecting claim, and gold mining leases at Hargraves, and he has applied for gold mining leases amounting in all to twenty acres, on which land he purposes placing the diamond drill at once. Milton and another have taken up twenty-two acres, and Scott and another have taken up eight acres. The above ground has been taken up during the last few weeks of the year 1886. The various persons named are very sanguine as to their success in developing their mines with profitable advantage to themselves.

There has been an increase in the sale of miners' rights and business licenses as compared with the previous year.

I sold 289 miners' rights, and 28 business licenses during the year.

LACHLAN

LACHLAN DISTRICT—FORBES, PARKES, AND GRENFELL DIVISIONS.

(Mr. Warden Sharpe, P.M., Forbes.)

I have the honor to submit, for the information of the Honorable the Minister for Mines, my annual report for the year 1886, on the Forbes Division of the Lachlan Mining District.

The only places where any mining is being carried on at or near Forbes are at the south lead, close to the town, on the Britannia Reef, which is west of the south lead, and very near it; at the Caledonian lead, near the Parkes Road, one mile north of Forbes; at Judd's Reef, which is near the last mentioned lead; at Strickland reef, eight miles north of Forbes; and at the Pinnacle reef, twenty miles south. On the south lead there are three different companies at work. The Nil Desperandum Gold-mining Company holds three leases of 25 acres each in area, and embracing both sides of the river. The main shaft is 215 feet deep to the wash dirt, and a further depth of twenty feet to the bottom. The main drive is 284 feet long, west of the shaft, with a cross drive fifty feet from the shaft, bearing north seventy-eight feet. East drive 120 feet from shaft, driven ninety feet; north drive 150 feet from shaft. At this point two cross drives were opened out east and west. The east drive ninety-six feet; the west drive, eighty-two feet. These last drives are on payable gold. For 140 feet of their length the wash dirt is from two to three feet in thickness, and averaged six dwt. to the load for about 120 loads. The machinery employed on this mine consists of a 20-horse power horizontal steam engine, for winding and puddling; also, two Tange pumps. Twenty-eight men are employed on the mine at present, in three shifts of eight hours each shift. Coming north, on the same lead, is the mine known as the Crinoline Gold Mining Company. This Company holds two extended claims. Their main shaft is sunk 160 feet to wash dirt, through thirty-five feet of sand drift. For getting through the drift, forty feet of watertight boxes of sawn timber were used, at a heavy cost. For the last six weeks the Company have been erecting engine-shed, out-houses, and puddling machines. An 18-horse power boiler is fixed, and a 16-horse power engine is now in course of erection. No wash dirt has been, as yet, taken from this claim, awaiting the erection of machinery for washing, &c.

The third claim at work on the south lead is that called the "Forbes Alluvial Gold Mining Company." The area is 25 acres. The main shaft is sunk thirty feet to sand drift, thirty-five feet through that, and then twelve feet to bottom. In this mine also water-tight boxes had to be used, the men working in a diving dress. The machinery to be used in this mine is one 16-horse power portable engine, one Tange pump, puddling machines and winding gear. To get through the drift the boxes used are single, and all the sand drift had to be raised by divers, using the proper dress for the purpose. The drift to be gone through was forty-five feet in thickness. Now the shaft is down to the clay, sinking should proceed more rapidly. On the Britannia Reef a small crushing plant has been erected, but at present the mine is idle, owing to some dispute among the owners. Some payable stone has been raised from this reef, which is a fair sized one, and, should it come up to expectations, doubtless other claims will be taken up on the same line. The Britannia reef has been traced to a considerable distance, and worked to shallow depths, the deepest shaft being, I am informed, but 100 feet. I am also informed that the Company contemplate getting better machinery for crushing purposes.

At Strickland's reef only one party of miners are at work. They raised some stone and sent it to Parkes. The yield was 16 dwt. This would pay well if machinery for crushing were at or near the mine. I am informed that endeavours are being made with this object. I think this line of reef is well worth the attention of mining capitalists.

At the Pinnacle, Messrs. Nicolas & Raymond have erected, or are erecting, a crushing plant to work the old Pinnacle reefs. They have sunk a shaft some seventy feet on a reef, showing gold all the way down. It is eight feet wide in the bottom, and will average five or six feet. The country is not hard; two men can raise twelve or fourteen tons of stone per week, which it is reckoned should yield 7 dwt. per ton, and this would give satisfactory returns. Messrs. Raymond & Co. have not been afraid of expending capital. They have a ten-stamper battery, with power to make it twenty, if necessary. They have also a 4,000 yard tank, to supply water.

Parkes.

This is the only part of this District where gold is being obtained in any quantity, and the returns from some of the reefs are very handsome. For instance in the claims known as Hazelhurst's and in Quayle and Company's, the fortunate owners obtained in the first mentioned mine 1,667 oz. during the past year, and in the second 1,260 oz. In 1885 these two claims crushed respectively 390 tons and 750 tons, with a result of 4 oz. to the ton. I am informed that on the adjoining land, which is freehold, a considerable amount of capital will be expended in prospecting reefs supposed to be rich.

I presume, because more miners were at work, the alluvial gold obtained during the past year in this division is a good deal more than usual, amounting to 653 oz. 12 dwt. and 11 gr., but the total amount of gold, alluvial and quartz, is considerably less than in 1885. During the year 1886, 5,234 oz. 8 dwt. 1 gr., according to the Mining Registrar's report, were obtained. During 1885, the return was 6,045 oz. 16 dwt. 14 gr., leaving a deficit of 811 oz. 8 dwt. 13 gr.

Still, mining in this division is in a healthy condition and prospecting is always being carried on. During the past year several new reefs have been proved payable, and some of them have given very handsome returns. Several alluvial rushes have also taken place, in some instances without any result except colors, in others a few claims paid wages for a time. On the scrubby plain between Forbes and Parkes, a rather extensive rush took place in June last, about 450 miners being on the ground at one time, the prospecting was carried on with Government aid, and on the 1st of June last, the prospectors reported that payable gold had been discovered by them. The depth of the shaft was 56 ft., and the depth of wash from 3 to 9 in. Mr. Mining Inspector Slee visited the rush, and saw 11 dishes washed for a return of 4 dwt. 6 gr. of coarse gold. He thought the lead was payable, but I regret to have to state that it was not, and in a very short time was wholly abandoned. As regards the facilities for treating quartz raised in or near Parkes, a private company have a battery of 20 head of stampers, with proper apparatus for saving gold, and a very large supply of water for crushing purposes, this has been obtained by enlarging a dam, the carrying capacity of which was found to be insufficient. The Company crush, I believe, at very reasonable rates, and I hear no complaints about losing gold, a fault batteries are seldom free from. This battery is very centrally situated, being near nearly all the reefs from which stone is raised, at or near Parkes.

Grenfell.

Grenfell.

In the Grenfell Division of this District very little mining is being carried on. The gold obtained from reefs during the year 1886 was only 204 oz. 6 dwt., from alluvial, 217 oz. 8 dwt., in all 421 oz. 14 dwt. *Canowindra.*

The Warden's clerk informs me that in this division 629 tons of quartz have been crushed during the past year, for a yield of 801 oz. 12 dwt. of gold. Alluvial mining in this locality is confined to fossicking, mostly at a place called Gum Flat, a few miners are working here and probably they have won about 80 oz. during the year. At the Paling Yards Creek, which is about 9 miles east of the township of Cudal, a gossan lode has been discovered by Messrs. Woodgate and party. The lode is from 6 to 10 ft. wide, and easily worked. The prospectors took 63 tons to Cargo and got an average of 13 dwt. to the ton.

The adjoining party crushed 11 tons for an average of half an ounce to the ton. What is required is a battery near the mine, and capital to provide this should be easily obtained, the prospects being sufficiently encouraging.

At Boney's Rocks, near Toogong, Mallon and party lately crushed 48 tons of stone for the handsome return of 168 ounces. Besides this claim others are at work, and apparently with good prospects. In my last and previous reports I mentioned several places where minerals, chiefly copper, had been discovered. I have heard nothing further of these discoveries, and probably beyond surfacing and prospecting, nothing further has been done to ascertain whether a payable lode exists or not.

In the beginning of this report I had occasion to mention the chief lead at Forbes in the early days of mining, on which were many very rich claims, and which is known as the South Lead. This lead extends for a considerable distance and was worked until drift depth and water made the expenses too heavy. As I have already stated some large claims and leases have been taken up and are being worked, where, I am informed, the lead was lost, or became poor. Should the difficulties attending the working of the leads be overcome and the ground prove payable, no doubt many claims and leases will be taken up and worked, chiefly I expect, as at present, with local capital. The contention of the old miners here is that when the first rush took place all or nearly all, the claims were hastily and imperfectly worked, and that working expenses were very heavy. For instance chaff was £60 a ton; it is now £3 10s., or at most £6. Corn was 30s. a bushel; now it is 5s., or 5s. 6d. There can be little doubt of this, that if the present ventures are not a success, Forbes must look to its pastoral resources for support, and not to its minerals. I may mention before concluding this report that there are very large areas of land in the neighbourhood of Forbes and Parkes which are supposed to be auriferous, and have therefore been reserved from sale. Much of this land has been thoroughly prospected. Much of it contains, in all probability, no minerals of value and only serves as a grazing ground for stock. Many people contend, and their contention is not without reason and strength, that the prosperity of the district would be greatly increased if certain of these reserves, or part of them, were revoked and the land thrown open to selection. Many of these restricted gold-fields are near towns or villages and consist of excellent agricultural and pastoral land, and if available, I feel sure the land would be at once taken up and would support many families. It seems that under the present Land Act there would be little risk in doing this as ample power is given to the Crown to allow prospecting, and if payable gold is discovered to resume the area or part of it.

In conclusion I may state that although no new discoveries of any moment have been made during the past year, still I believe a larger amount than usual of prospecting has been carried on. Many were compelled to take to mining as an employment, because in the depressed state of the colony other work was not obtainable. Perhaps good may come from this and discoveries may be made of importance most probably in quartz reefs which have been only superficially tried, but are now being thoroughly tested, both for depth and quality.

LACHLAN DISTRICT—YOUNG DIVISION.

(*Mr. Warden Robinson, P.M., Young.*)

I HAVE the honor to forward to you a statement of Gold-mining operations in this Division for the year 1886. Any one of my reports for the last five or six years, with 1886 inserted therein, would convey a pretty correct presentation of our mining transactions during the year just ended, with this important and notable difference—that the gold won has quadrupled the yield of the preceding twelve months. Approximately the same number of miners' rights, business licenses, &c., have been issued from this office each succeeding year for the past half of last decade.

About Young some of the original diggers still follow the occupation of gold-mining. At Wombat a few of the old identities are yet to be found sluicing occasionally; and at Murrumburrah there are about a hundred miners doing reasonably well; they are mostly domiciled about Blind Creek.

Our issue of miners' rights shows a total of 454, sixty-four of which go to the credit of Murrumburrah; business licenses, 37, four of them were also taken out at Murrumburrah; mineral licenses, 4; gold-mining leases, 3, comprising 19 acres, and one mineral lease of 40 acres. A review of the above figures shows increase in miners' rights, 55; business licenses, 3; mineral licenses, 3; and a decrease in gold-mining leases of 13, with a decrease in area to the extent of 180 acres.

The gold won in 1885 was estimated at 505 oz. 14 dwt. 23 gr., and of the value, say £1,953 12s. 10d. The yield for 1886—taken from reliable data—amounts to 2,253 oz. 6 dwt. 22 gr., and of the value of £8,737 7s. 3d., showing an increase over the yield of the previous year of 1,747 oz. 11 dwt. 23 gr., and an increase in value of £6,783 14s. 5d.

I may here mention that most of the miners' rights and business licenses taken out in Young are in no way associated with gold-mining; they are simply used as media for land purchases and residences. Notwithstanding this, there are at least two great mining ventures actively at work in this division which have been for some time past prosecuted with much vigour, and backed up liberally with both capital and scientific appliances.

The New Burrangong Gold-mining Company's property and plant are situated about 3 miles from Young, at 'Possum Flat. During the year a fourth and fifth shaft have been put down at the main workings. The old machinery has been replaced by new plant of greater power. Several experts from other colonies have been brought here at great cost to advise in surmounting difficulties connected with working the mine. No doubt at any time has arisen as to the ultimate success of this undertaking. At

twenty different points tests have been taken, and always with excellent results. A Melbourne syndicate—of wealth—and local capitalists are heartily co-operating and working together with a will to perfect the various appliances connected with these extensive works. The monthly disbursement for labour alone amounts to £250; and up to date £9,000 have been laid out upon the works.

The Cunningham Mine at Cunningham Creek is of still greater magnitude. This property is also owned by a Victorian syndicate, and up to date £20,000 have been spent on plant and labour connected with the establishment.

LACHLAN DISTRICT—TEMORA, BARMEDMAN, JUNEE, AND COOTAMUNDRA DIVISIONS.

(*Mr. Warden Baker, P.M., Temora.*)

In submitting my report for the year 1886 of Mining Divisions in my charge I have to ask pardon for apparent delay. Absence from my office several times during January on special Warden's duties, followed by a severe attack of sickness during which my ordinary work was accumulating, &c., has caused the delay which has been unavoidable.

Temora.

Population.—During the year 1886 there has been a decrease in the number of the mining population as shown by the falling off in the number of miners' rights issued in the district. In the year 1885, 516 were issued; in the year 1886, 395 were issued, being a decrease of 121. For the month of January, 1886, there were issued 253 miners' rights; but in January of this year 160 only were issued, or 101 less than in January of the previous year. In the year 1885, 111, and in 1886, 83 business licenses were issued or a decrease of 28. As stated in my report for 1885 the decrease in the number of miner's rights and business licenses issued should not be accepted as correctly indicating the decrease either of the mining population or of the business people about Temora. A considerable number of both kinds of these documents have been held for the purposes of residence and business, and of legally holding the land occupied for these purposes, and as these holdings are converted into freehold the necessity for holding these documents ceases in a proportionate degree. The Kimberley and Tetulpa rushes have taken a few of our miners; but as far as general appearances go the population remains as to numbers about stationary. There is a great desire expressing itself ever and anon for the Narraburra and other reserves to be thrown open for selection, and I think it is a pity that this had not been done some three years ago when I first recommended it. The land is of excellent quality, almost every acre well suited for either agricultural or horticultural purposes, and capable of supporting a large population. At the present time there are some thousands of acres of this fine land lying practically useless. They are truly "waste" lands, and I may add "wasteful" lands of the Crown for while they are not producing anything of a useful character, they are affording excellent shelter for vermin and a home for the pine scrub sifting bush, and yet while we have all this land for cultivation and the labour necessary for its cultivation, we are sending to other districts, and indeed to other parts of the world for a large amount of the bread, the meat, the fruit, &c., consumed by us. We do not even grow our horse feed—surely this is not as it should be.

Gold.—The alluvial miners have been seriously impeded in their work by the frequent heavy rains which have otherwise been so valuable to the country, most of the alluvial workings are in the low lying parts of the district, in other words in the drainage course of the water-shed; consequently when heavy rain comes the workings are soon flooded, and as the country is soft, subsidence soon takes place and the mines are practically shut up for a time, and when the water drains away sufficiently to make mining again practicable, it is frequently found that the shafts and drives are destroyed, so that operations have to start as from the beginning, and it will be readily seen that these circumstances cause a large expenditure of labour, time and money, upon what is called in mining parlance dead work. In quartz mining we have been quietly, but I think surely progressing. The South Australian Company's Mine has continued to yield steady payable returns, while at the same time it has been gradually disclosing lodes which the manager thinks will be very permanent and profitable. This Company has by its steady perseverance rendered good service to this district. It has had in the first place to struggle for existence. When it was first formed in the early days of Temora wild and extravagant hopes were entertained of its richness and prospects, and when sober facts—actual yields—destroyed those wild fancies, despondency and disgust took their place, shareholders who had been expecting to receive fabulous dividends could not brook having to pay large calls. The mine and works had never been put in proper form for economical and effective working. Money was required to enable this to be done, but the shareholders declined to find the money necessary, and the result was that the works had to be carried on from hand to mouth. Mr. Thomas Eyre, the then manager, kept plodding on and on, getting gold where he could find it and developing the mine as best he could as the mine itself yielded the means, and I am told that on more than one occasion he has paid the wages with his own cheque. The difficulties were further increased by legal disputes and litigation with which the Company was beset for a long time. However, through all—want of funds, low yields, and hand to mouth working—the works were kept going and Mr. Eyre was able to give a small sixpenny dividend—and what was, perhaps, even better than the dividend, confidence—to the shareholders. Mr. Eyre, however, resigned, having accepted the management of the Sunny Corner Silver Mine, and Mr. Thomas Elsbury succeeded him. Mr. Elsbury soon found that he was in charge of a mine of great promise and worthy of much better treatment than it had received. I understand that he advised the mine ought to be worked upon a larger and better system and with greater economy, and that its prospects fully justified the necessary outlay. The South Australian management sent a deputation to inspect and report upon the mine and Mr. Elsbury was authorized to work the mine in the manner he had advised, and in accordance therewith he has for some months past been sinking a large main shaft, large enough for winding and pumping purposes, and in a position to well and cheaply work the lodes to a great depth. A winding engine is in course of erection, and it is intended to put up a crushing machine in such proximity to the mine as will enable them to run the quartz direct from the mouth of the shaft to the receiver at the battery; and I sincerely hope everything will go on satisfactorily and to great success. The operations of such companies as the South Australian Company have great influence beyond themselves. While they result in paying dividends to their shareholders they are great indicators—beacon lights—showing, in a practical way, the road to success, and hard plodding and skilful perseverance conquer difficulties. To bring a quartz mine to a financial success involves the expenditure of large capital in preliminary mining operations and in providing suitable appliances and machinery. It also involves

involves good and careful management. There must be a combination of capital and skill to ensure success. By "skill" I mean good business habits, as well as good management of the mine. Neither capital without the skill, nor skill without the necessary funds can succeed. Unfortunately these do not always go together, and herein lies the cause for mining failures in connection with our quartz-mining industry. Under very favourable circumstances the development of the quartz-mining in any district will be slow as compared with ordinary alluvial mining, and when great mistakes are made in management, whether from want of skill or want of funds, or want of both, the results are often fatal to mining progress, and at best seriously retard it. This district has suffered and is still suffering from the bad management of former times, but the development of the South Australian Company's mine, at Upper Temora, is slowly, but I hope surely, causing a growing confidence in the future of Temora as a quartz-mining district. The Hidden Star, Mother Shipton, and other mines have been, to use the ordinary phrase, "sent to England;" in other words, syndicates have been formed for the purpose of getting English capital necessary to work these mines. The same has been done in respect to the Sebastopol, Muttama, and the Barmedman mines. I hope the capital will be obtained and that it will be honestly and judiciously expended in the legitimate development of the mines, and not for the special purpose of inflating the share market. There can be no objection to a good and growing share market, if such be the result of growing prosperity of the mines; indeed, under such circumstances a good market for shares very largely assists mining enterprise, and the two do very well together. But there is always a fear that the "floating syndicates" may make the mine subservient to the market, which is just a reversal of the proper order of things, and is at once both foolish and unjust. To teach as a moral maxim that "honesty is the best policy" is taking very low grounds indeed; nevertheless, as an abstract truth, the doctrine of that old saying is thoroughly sound, and applies to mining with as much force as to any other pursuit.

During 1886 twenty-five gold-mining leases, covering an area of 150 acres, were applied for at Temora office, including land at Sebastopol.

Yield of Gold.—I am indebted to Sergeant Buckley, the Gold Receiver at Temora, for the statement given below. That return includes yield from Sebastopol and Barmedman as well as of Temora.

RETURN showing the quantities of Gold received by the Gold Receiver at Temora during the year 1886.

1886.	oz. dwt. gr.
27 January.....	512 16 15
24 February.....	637 2 20
24 March.....	417 11 9
21 April.....	157 16 11
19 May.....	449 17 0
16 June.....	448 3 0
14 July.....	1,217 17 23
11 August.....	274 7 9
8 September.....	462 14 0
6 October.....	557 9 8
3 November.....	703 10 22
1 December.....	291 16 14
29 December.....	1,030 6 18
Total for the year.....	7,161 10 5

For ready reference and comparison the following table of gold sent by escort from Temora, will perhaps be interesting:—

	oz. dwt. gr.
1881.....	29,652 14 4
1882.....	33,348 0 7
1883.....	17,347 8 6
1884.....	14,351 16 1
1885.....	7,865 15 9
1886.....	7,161 10 5

By the courtesy of the officers of the Bank of New South Wales and the Australian Joint Stock Bank, at Temora, I find there passed through those Banks, during the year 1886, 7,547 oz. of gold, or some 386 oz. more than was sent down by escort. The Bank returns (as do also the Gold Receiver's returns) include gold taken from alluvium and from quartz at Temora, Barmedman, and Sebastopol, but I have been unable to ascertain how much came from quartz or how much from alluvium, or the quantity produced by each of the districts named. I know that one of the Banks purchased some 1,360 oz. of gold taken from the alluvial workings at Temora, and some 1,431 oz. of gold from the quartz workings at Barmedman, and some 76 oz. from quartz workings at Sebastopol, but that does not account for half the gold passed through the Banks; nor am I able to explain the difference of 386 oz. between the amount passed through the Banks and the amount sent by escort. I can but give the figures as they are given to me. The minimum price of gold was £3 15s. per oz., the maximum £3 18s., the average £3 17s.

BARMEDMAN.

This division is so essentially connected with Temora that in dealing with the latter one must of necessity partly deal with the former place. I regret very much the fact that the Barmedman United Gold-mining Company have thought it advisable to retire from this field, and that, too, at a very great loss to themselves. The district has been greatly benefited by that Company's outlay. It has placed in the district one of the largest, and in some respects, most complete plants the Colony can boast of. Three steam engines, one for pumping, one for winding, and one for driving the battery of twenty-five heads of stampers, together with the necessary pumping and winding appliances, including a "Tangye" pumping engine and pumps for surface purposes. I am informed that the Company expended some £5,000 over and above what the mine produced, and that this large amount was nearly all expended on the machinery; and yet the Company sold this valuable plant, and what I venture to hope will yet prove itself to be a valuable mine, at the absurdly low price of £1,050. It is not for me, perhaps, to find fault with Companies for giving their property away, nor should I refer to the matter but for the fact that the failure of the Barmedman United Gold-mining Company, and the heavy losses sustained by its shareholders, may probably

be improperly debited to the district in a way likely to injure it. It is exceedingly difficult to understand upon what commercial principles the Company sold its really valuable plant for the small sum of £1,050. One of its large engines, with its boiler, must have cost about that sum before it left the manufacturer's premises. It is, however, gratifying to note that the present proprietors are meeting with fair success in the mine. The adjoining mines also, Fiery Cross, Hunted to Death, Jackson's, &c., are yielding fairly well, and some of them splendidly. Still they are only "scratching," so to speak. The future of this district, as a permanent mining district, very much depends upon the value of the quartz below water-level. Some time since, I was speaking to one of the best practical mining experts in New South Wales about the Barmedman United Company's mine. He strongly condemned the way it had been managed; that, commercially speaking, there had been great extravagance in the matter of supplies, both as to quantity and price; and, as to mining, there had been but little done worthy the name. To use an expressive phrase, they had been "rooting and scratching," not mining. He specially condemned the non-exploration of the mine at lower depths than the Company had worked, and expressed great faith in the future of the mine, if a reasonable amount of capital were expended in well testing it below water-level; and, as there is on the ground all the mechanical appliances required, I am hopeful that the work will not be much longer neglected.

About the end of 1886 Barmedman was at a very low ebb. The Barmedman United Gold-mining Company's crushing machine, during the greater part of 1885, had been kept idle, for want of fresh water for steaming purposes, and as this battery is the only one in the district, the next nearest, at Temora, about 23 miles away, the quartz-miners at Barmedman were not able to get their stone crushed, and, in consequence, mining operations were all but suspended. Population dwindled away, and the little town began to have a woe-begone, deserted appearance, and, but for the faith, pluck, and enterprise of Mr. Robert Cassin and some other tradesmen, the town as a place of business would have collapsed. In averting this catastrophe Mr. Cassin did grand service. Others would perhaps have done as much if they had had the means. Be that as it may, Mr. Cassin supported a large number of miners, and the mines too, and for some time the commercial clouds were black and threatening. The storm, however, was weathered. Mr. Cassin organized a party to purchase the Barmedman United Gold-mining Company's plant, and succeeded in almost begging it. Then came the cheering rains. The stored stone, what little there was, was crushed, and gave yields which satisfied all parties. Then the miners went to work with more heart, and a goodly number of them have been well, and some others of them excellently well, paid during the year, and at its close it was found that mining and ordinary business told a much better tale than at the close of 1885. A small portable engine and pumps have been placed in position at the Hard to Find for the purpose of pumping out the water. The shareholders think the yields obtained above water-level are sufficiently good to justify giving the lode a good testing below water-level, and if the result should be as good as is expected, it is not improbable that a crushing machine will be erected near the mines in such position as would answer for crushing the stone raised at the Phoenix Reef also. I understand that the gentlemen who purchased the B. U. G.-M. Co.'s plant are large shareholders at the Hard to Find, and that they think of taking ten heads of stampers from the twenty-five at Barmedman and placing them at the Hard to Find. Others advise the erection of the small battery which did duty before the B. U. G.-M. Co. put up its plant. One thing appears to be looked upon as all but certain, and that is that a crushing machine of some kind will be put up.

The following figures, *re* miners' rights, business licenses, and gold-mining leases applied for, have been supplied to me by the Mining Registrar:—

Miners' Rights issued—		
Year 1885	.....	121
„ 1886	.....	107
Issued during January 1885	.....	53
„ „ 1886	.....	66
Business Licenses—		
Year 1885	.....	36
„ 1886	.....	19

During the year five applications for gold-mining leases were received, covering an area of 19 acres, against three applications for 11 acres in the preceding year.

Clarendon Division.

In this division, Muttama, Junee Refcs, Junee, Wantiool, Mitta Mitta, and Sebastopol have been under my charge. At all of these places mining has been at a low ebb during the year. Towards the end of the year, at Muttama, some rich stone was discovered in one of the old workings, and further workings have given great hopes that the district will prove itself to be valuable as a quartz-mining district. Its past history, however, shows that it has been "patchy"; that it contains some very rich and some very poor stone; that its management has not been of the best; that great care should be taken to provide sufficient capital in the first place to put the mine in thorough order, and for providing necessary machinery for economical working, and after that to keep a reserve fund to allow the Company to prosecute its operations with system and vigour during the times it will be working in poor stone. Mr. Travers Jones has taken up two gold leases of 80 acres each. He is a thoroughly experienced practical gold-miner, of some thirty years standing, has resided for many years at, and conducted large mining operations in the district. He has, moreover, the reputation of being a shrewd and honourable man of business. One may, therefore, reasonably presume that the prospects of, and concerning these mines are good, and that they will prove profitable both to those who shall work them and also to the district; indeed, they cannot be profitable to one without benefiting the other. Mr. Jones informs me that he is placing these mines upon the English market for the purpose of raising ample capital for their successful working, and that he has fair prospects that the Company will be "floated."

Sebastopol.

This district ought to be a prosperous mining centre; and in its earlier days one or two gentlemen made large sums of money from the mine now known as the Morning Star and land adjoining, indeed it is rumoured, and I think correctly, that one man netted some £5,000 clear profit. But like most quartz-mines, the stone proved not to be uniform as to richness; the stone became—to use a mining term

term—poor, and the work was abandoned. Since then a good deal of work has been done—enough to prove two things: First, that with, good management, economical working, and necessary appliances, including a good crushing plant, sufficiently near the shaft to permit the stone being run direct from the shaft to the hopper, these mines are likely to pay all expenses and give fair dividends; but, in the second place, enough has been disclosed to show that, unless properly worked, they will not pay expenses. These remarks also apply to the Evening Star and other mines thereabout. The La Mascotte, late "Homeward Bound" mine, is still under the curse of the Fury "Litigation" and is paying the lawyers while it is about ruining the shareholders. When I took charge of this district, over four years ago, the then proprietors were fighting several triangular legal battles. Week after week in one form or other they were working in the Warden's Court, so much so that I was called upon to express an opinion as to what was meant by the words "efficient mining." I stated in a joking way, but with much meaning, that if the shareholders of that claim worked in the mine with as much skill, energy, perseverance and determination as they worked in the Warden's Court, the mine would certainly be "efficiently worked." While they were thus at legal war, the mine was practically neglected. This went on month after month, during which time I had the painful experience of hearing more perjury committed than I had heard in all my life, albeit for some 30 years fairly conversant with mining and other Courts. The proprietary was changed largely, but the incomers took up the fight and so continued. After a time Dembecki bought out all but one other shareholder, and then the fight waxed furiously between these two. Then it was rumoured that Dembecki held the whole mine himself, and had again sold it to one Joseph Tucker who was going to work the ground properly. He had scarcely commenced to work when a dispute arose between him and his manager, then another manager came, and then several quarrels found their way into the Warden's Court, in which proprietor, manager, workmen, tradesmen, &c., were litigants. Then came the third manager, and at the same time Dembecki again turns up, this time as plaintiff in an equity suit against Tucker, in which suit Dembecki claimed half the mine, and the fight went on in the Equity Court, and the mine was closed for several months by injunction, and so the litigation has gone on, and I see by the newspapers the mine is still "in Equity"; and while the two litigants are equitably ruining each other they are iniquitously ruining a good mine and slighting the district. I refer to these matters by way of showing how a really good district can be ruined by bad management, especially when accompanied by litigation. At Wantiool near Junee, very little work was done during the year. At Mitta Mitta there is a fairly good mine, if one may call a number of "scratchings" a "mine." There is, I mean, some ground which with proper working would make a good mine. This is, as far as it is proved on private lands, the property of the Clarke family there. Mr. Dobbys, of Junee, and a Mr. Percy have put up a crushing machine in the neighbourhood, with a view of working this land. But here litigation has put down its baneful foot and stopped for months all progress, and locked good payable country that would, if reasonably well managed, find profitable employment for at least fifty miners.

During the year I, by special instructions, visited Adelong, Tumut and Reedy Flat to report—to put the business briefly—upon the "cause and cure" of mining depression there. The evidence taken by me and my report upon what I heard and saw, I shall furnish in separate form. I shall therefore say but a few words here about it. But this I do say, with all force and emphasis, that the land on the banks of the Adelong Creek, from its source, in the neighbourhood of Reedy Flat, to its junction with the Murrumbidgee, never ought to have been alienated, and that from Grahamstown to the Murrumbidgee both banks of the creek ought to be thrown open to mining by the State resuming a strip of land at least half a mile wide. If this were done I have no hesitation in saying that many hundred men would find not merely profitable but highly remunerative employment. And my report will, I think, show that the State could resume this land, and pay a fair price for it, without any financial difficulty and with actual advantage and monetary profit on the transaction itself, altogether apart from the advantage to the community of a large number of men finding remunerative labour and putting in circulation some thousands of ounces of gold. I say "thousands" of ounces quite advisedly, feeling quite sure the gold is there in very large quantities, and that if the land were open to mining the yield would fully justify my opinion.

LACHLAN DISTRICT—BARMEDMAN DIVISION.

(*Thomas Love, Mining Registrar.*)

THE last crushing ending the 23rd December, 1886, was the best average crushing yet obtained on the field. 329 tons taken from 13 different claims gave an average yield of 2 oz. 12 gr. of gold per ton. The stone was all taken out above water-level (80 ft.). All the claims on the Ada Hill, amounting to about 40 acres, are about to be placed in the English market for the purpose of floating into a strong Company, to get funds to enable the miners to work the stone below water-level.

LACHLAN DISTRICT—JUNEE DIVISION.

(*Alfred Elliott, Mining Registrar.*)

I HAVE the honor to report, for the information of the Honorable the Minister for Mines, that the mining industry here has made very little progress during the past year. Some small attempts have been made to work the reefs at Wantiool, but the want of capital has, to a very great extent, retarded the attempts made.

The amount of gold won during the year (as far as I could ascertain) has been 113 oz. 7 dwt. 8 gr., which was purchased by Mr. Ross, the Manager of the Bank of New South Wales, the minimum price being £3 15s., and the maximum £3 17s. 6d. per oz. I believe several small quantities have been purchased by the Union Bank, but I have been unable to ascertain the amount.

During the year I issued 29 miners' rights and 1 business license, and received 1 gold lease application.

LACHLAN DISTRICT—YOUNG DIVISION.

(*W. Rodgerson, Mining Registrar.*)

I HAVE the honor to report that during the past year some improvement has taken place in mining operations. The Burrangong Mining Syndicate had previously to the date of my last report successfully floated the New Burrangong, and a large and valuable machinery plant has been erected at this mine. A new manager has recently arrived on the scene (Mr. Ryan, late of Shepard's Mine, Adelong), and he, with a number of Adelong miners, is at work, driving on a level with the wash, and hopes of ultimate success in working this undoubtedly rich mine are confidently entertained.

In addition to its interest in the above mine, the syndicate has secured other valuable mining properties, viz. :—The North Burrangong, comprising 64 acres 2 roods 33 perches; the South Burrogon, 30 acres, upon which operations are about to be commenced. This ground has been extensively bored, and the prospects, I am informed, are quite equal to any boring in the New Burrangong. Mr. John Illiffe, the managing director, states that this property will shortly be placed in the market for the formation of a Company.

On the Hidden Star, 10 acres, lying parallel with the New Burrangong, on the opposite side of the creek, a bore has been put down with splendid prospects, but operations are in abeyance until the arrival of the requisite machinery and appliances.

During the year I have issued 390 miners' rights, being an increase of 61 over last year, 33 business licenses, and 4 mineral licenses. The increase in the sale of miners' rights has been caused by a number of persons taking up mining tenements for residence areas.

Through the courtesy of the officers of the Union Bank and Bank of New South Wales, I am enabled to give the following figures *re* gold won :—

	oz.	dwt.	gr.
Union Bank	1,250	0	0
Bank of New South Wales.....	404	16	15
Total.....	1,654	16	15

or a total value of £6,412 9s. 1d., showing an increase of £5,429 18s. over the previous year.

My Warden's report will deal more in detail with the mining operations of the division, so that I have confined my remarks solely to my portion thereof.

LACHLAN DISTRICT—MURRUMBURRAH DIVISION.

(*Charles Cutcliffe, Mining Registrar.*)

I HAVE the honor to make my report for the year ending 31st December, 1886.

The Gold-mining interest in the Murrumburrah Division has improved considerably during the past year, which in a degree may be attributed to the rainfall, which has given a good supply of water. The increase on the previous year has been 346 oz., and value £1,333.

The gold won during 1886 amounted to 598 oz. 10 dwt. 7 gr., representing £2,324 18s. 2d.

The number of miners' rights has been sixty-four, and of business licenses four. The price of gold according to the Bank returns has been uniform—£3 17s. per oz.

The Cunningar Quartz-mining Co., have been busy during the past year, in completing their extensive plant. This Company have spent up to the present upwards of £20,000 in machinery and manual labour, they have erected the most approved and latest concentrating machinery to be obtained in America; and there is little doubt with their present complete appliances for the saving of pyrites, and its after treatment by smelting, that a very prosperous year is before them. There is no free gold in this mine, the gold is all in the pyrites which consist of iron sulphides and arsenic, with a small percentage of galena.

LACHLAN DISTRICT—CUDAL DIVISION.

(*W. H. Souter, Mining Registrar.*)

I HAVE the honor to forward my annual report of the Cudal Division of the Lachlan Mining District for the year 1886.

In addition to the gold reefs reported as being worked during the year 1885 in this division of the Lachlan District, I beg to report that a new reef or lode has been discovered at the Paling Yard Creek, distant about 9 miles from Cudal, in an easterly direction. The stuff being worked is from a lode consisting of decomposed quartz, or as the miners term it "gossan," it runs through the various claims now being worked at a width of from 6 ft. to 1 ft. 6 in., and requires blasting by powder. The prospectors, Woodgate and party, have had 63 tons of the lode crushed at Cargo, averaging 13 dwt. to the ton; Bohringer & Co. crushed 11 tons, yielding 11 dwt. to the ton; other parties have got a quantity of gossan on the grass. There are in all six claims at work. The difficulty to be got over is the want of a crushing plant, the nearest battery being at Cargo, 10 miles distant, over rough country, at a cost including the crushing of 25s. per ton. The prospectors are now arranging to get a battery on the ground, and, as there is plenty of water in the Paling Yard Creek close by, there is no doubt that good returns can be made from the lode. At Boney's Rocks, near Toogong, Mallon and party lately crushed 48 tons for 168 oz.; Hadley and party are now forwarding 16 tons to Canowindra to be crushed, from which they expect a good result, they sent 2 tons to Sydney for trial, which realized 2 oz. to the ton; Spottiswode and party are also on gold; and Shields and party have taken up a claim adjoining. At near Toogong, Falvey and party are working the old reef, known as Bevan's Reef, they have 16 tons on grass, which, from the prospect obtained, they expect will yield a good return. On the whole, mining matters in this division are prosperous, and there is no doubt that the country round will be thoroughly tested for gold, as the prospectors about are steady practical men. Four mining leases have been applied for at this office, two applications for extended quartz claims, and one miner's right during the past year. As this branch of the Mines Department was only opened in September last, nearly all the miners' rights, &c., were applied for at the Mining Registrar, Canowindra.

LACHLAN DISTRICT—CANOWINDRA DIVISION.

(*Wm. Cook, Mining Registrar.*)

I HAVE the honor to report as follows of the mining carried on in this division during the year 1886. There have been no fresh discoveries made during the year, but the mines have yielded better and steadier returns, than during the previous year. The amount of stone crushed is 629 tons for a return of 801 oz. 12 dwt. From alluvial workings the amount obtained was 80 oz., making a total of 801 oz. 12 dwt., as against 303 oz. last year.

During the year there were issued at this office, 139 miners' rights, seven mineral licenses, and four business licenses.

There is every appearance of a still greater increase in the returns for the current year, as several of the mines in the division have been purchased by capitalists who intend to erect machinery and thoroughly test their resources.

LACHLAN

LACHLAN DISTRICT—GRENFELL DIVISION.

(W. H. Hazelton, Mining Registrar.)

I HAVE the honor to furnish my report for 1886, upon the state of Mining in the Grenfell Division of the Lachlan Mining District, and in doing so I regret to say, that I have very little of importance to communicate either in quartz or alluvial mining.

During the first part of the year mining was almost at a stand still, which, I think, may fairly be attributed to the want of proper care not being observed by the miners in making provision for storing water for gold mining purposes.

Alluvial.—In July there was a small rush at the Quondong (an old lead which had been worked about 14 years ago), which turned out to be part of the old lead that had been missed at the time of the first working. Ten or twelve claims were taken up and worked, but only four are paying wages.

At the Seven-mile very little work has been done during the year. At present there are two parties prospecting the lower end of the old Seven-mile lead, but have not reported anything payable as yet.

On the main lead, east of the town, two parties of miners are working. One obtained 40 oz. of gold during the year, the other has not been long at work and has not washed any dirt.

On the Star lead there is one party prospecting.

Quartz.—The Consols, Fitch & Sons, 4-acre lease. From this claim there is very little to report. As reported by me last year, the shareholders tried to form this property into a local Company, but did not succeed. They now inform me that they are going to work the claim themselves, and appear sanguine of success.

The Enterprise Reef, Pettet and party, 3-acre lease. In this claim very little has been done during the year. The shareholders now state that they intend to erect machinery, by which they anticipate good returns.

The Homeward Bound Reef, Matthews and party, Extended Claim. At present this party is engaged in raising stone.

Lawson's Reef, Hinchcliffe and party. This claim still keeps up its reputation. During the year 75 tons of stone were crushed, which gave a yield of 1 oz. 5 dwts. to the ton.

Accidents.—During the year one accident occurred in this division in connection with gold-mining, which caused the death of a lad, named William James Eagar. A full report of the sad accident was forwarded by me to the Department of Mines immediately after occurrence.

During the year I have issued 160 miners' rights and six business licenses.

LACHLAN DISTRICT—PARKES DIVISION.

(W. C. Weston, Mining Registrar.)

I HAVE the honor to forward my annual report for the Parkes portion of the Lachlan Gold-field. I have every reason to believe that Gold-mining is steadily increasing, and that the field has not been in such a prosperous state for the past 10 years.

Mining generally has shown much improvement during the past year. Several new payable reefs have been discovered, notably Dean, Pritchard and party, at the south-west of the Caledonian Hill, and T. A. Fitzgerald & Co., in Possum Gully, near the Racecourse Reserve; both claims have been returning handsome dividends to the shareholders, and show no appearance of falling off. The latter is situated very close to the old alluvial workings, which proves that the old ground is worthy the attention of the prospectors; in fact, the majority of the best paying reefs now working have been discovered either in or near the old alluvial workings.

The returns from Hazelhursts, Quayle and party, Janson and party, Dudley and party, &c., show no falling off; the first named, especially, continues if anything to improve, the last crushing taken out yielding a little over 6 oz. per ton.

Of outside localities, The Macgregors, Cunningham and party, north of the Eight-mile, have proved payable, and the parties are doing well. Several parties, too, are working on Rose's selection, but the stone has not yet borne the test of the battery.

In alluvial mining the improvement has been most marked, as this class of mining industry was practically dead. In the early part of the year several rushes took place to Scrubby Plains, and notably the J. P. Abbott rush, which, though giving every promise of being a payable lead, eventually proved, like its predecessors in that locality, to be nothing more than a patch. Following this was the discovery of a payable patch at the Batchelors, several claims proving payable. The gold here occurs in patches, is of a good sample; and beside the one or two claims which are returning payable results there are a number prospecting, and it is more than probable that, during the coming year, a payable run will be discovered. Later in the year Messrs. Bergin, Tynan & Co., whilst prospecting for a reef which had been left in the old days, near the junction of the Shallow and Bushman's leads, discovered payable wash; the ground was rushed, and a different run of wash was discovered, which though not very rich, will afford work for a number of men, with the chance of a good patch at times.

The Bank returns for the year will show a large increase in the amount of alluvial gold purchases between this and the previous year.

The Parkes Quartz-crushing Company took advantage of their dam being dry at the beginning of the year, and had it cleaned out and the storage capacity increased by additional excavation, so that an almost permanent supply of water is secured, and crushing operations may now be continued as regards water supply. They have also added an additional set of five stampers, with an improved table, making in all (20) twenty head of stampers available. This points to a practicable improvement in the reefing industry here.

Since writing the above I have ascertained that the heap of tailings at the Currajong are to be operated on by the New South Wales Gold Recovery Co., for recovering gold and silver, amalgam and pyrites, from battery and alluvial tailings. Samples of the tailings have been sent to Sydney and passed through Harrison's patent concentrator, at the Pyrites Company's works, Pymont, with a yield of 12 dwts. from two tons. The Company are erecting sheds to receive the concentrators, six of which are to be placed on the ground at once. It is expected they will be in full working-order in about three months from this.

In

In conclusion, I may state more miners' rights were issued in 1886 than in any single year for the last 10 years. The number issued was 503. Twelve business licenses were issued, and 174 claims were registered.

Thirteen applications for gold-mining leases were received at this office.

5,234 oz. 8 dwt. 1 gr. of alluvial and retorted gold were purchased by the Banks, valued at £19,599 Os. 1d.; but this does not, in my opinion, represent all the gold won, as many people take it down themselves.

LACHLAN DISTRICT—FORBES DIVISION.

(*Edmund A. T. Pery, Mining Registrar.*)

I HAVE the honor to submit my report for the Forbes Division of the Lachlan Mining District for 1886.

The amount of gold won in this division last year was 496 oz. 1 dwt. 19 gr., showing a decrease of about 704 oz. on the amount won in 1885. This decrease is chiefly attributable to the Bald Hills Company having ceased work.

The Britannia Reef Company, worked by Snow and party, have, during the past year, been formed into a Limited Liability Company, and at present their operations are stopped pending the arrival of pumping and other machinery. During the year they erected a small crushing plant, which, though totally inadequate for gold-saving purposes, proved the mine to be highly payable, as some of the stone crushed was estimated to average over 2 oz. per ton.

The Nil Desperandum Alluvial Gold-mining Company, situated on the South Lead, near the old South Lead Gold-mining Company's workings, has been in operation about nine months; the plant erected on this claim was brought from the Bald Hills. The shafts bottomed at 215 feet on good, coarse, water-worn gold, with an average of two feet of wash, yielding 5 dwt. from three bags of dirt. Main drives have been opened out some depth below the wash preparatory to "blocking." The only dirt washed from this claim has been from the main drives on touching the wash, which averaged from 3½ dwt. to 8 dwt. per load. This Company expects shortly to have a number of men employed "blocking," when they trust, and have every reason to believe, that their returns will be considerable. The machinery for driving the winding gear and puddling machines is a powerful plant; a pumping plant will also be shortly erected. This Company has also lately been placed under the Limited Liability Act.

The Forbes Alluvial Gold-mining Company (Limited), on the South Lead, Forbes, are at present sinking a new shaft, and they are down about 80 feet, and have met with considerable difficulty in going through the drift, owing to a second layer with heavy water in it. This Company has arranged for the purchase of the plant of the late British Standard Gold-mining Company at Bald Hills. They expect to bottom on good gold on the Western Reef of the South Lead, where they suppose the Britannia Lead joins with the South Lead.

The Crinoline Gold-mining Company (Limited), also on the South Lead, are erecting a large plant for winding and puddling at the old Crinoline shaft, which will be at work during the present month. Good wash has been found close to the shaft which was missed in the early days. From the well-known character of this portion of the South Lead the above Company expect good returns. No washing from the lead has as yet been effected, the Company being determined to have all machinery in place before opening out below.

At Strickland's Reef, on Parkes Road, worked by Ramsay and party, a trial crushing has been sent to Parkes from a new reef which averaged 16 dwt. to the ton. As there is plenty of stone this would be a valuable property if machinery were on the ground.

Judd's Reef, near the Caledonian Lead, on the Parkes Road. A lot of prospecting has been done here, sometimes with encouraging results, but the want of machinery precludes it being profitably worked.

Lawler and party, on the Caledonian Lead, who sunk a shaft but were unable to work with a windlass owing to the amount of water, are now erecting a "whim," and trust to ultimately overcome their difficulties.

Various small parcels of gold have been obtained by "fossickers" amongst the old workings of which I can get no record.

Altogether the prospects of the present year, as regards gold-mining, are more encouraging here than in the last.

Copper.—In June last a 40-acre mineral lease was applied for at Euroa, near Eugowra, but I have heard nothing of any work being done in that direction.

Owing to the present Companies being not yet in working order, I am unable this year to supply statistical information, but trust to send a complete report next year.

Miners' rights issued during year	342
Business licenses " "	15
Mineral " " "	3

SOUTHERN DISTRICT—ARALUEN, BRAIDWOOD, LITTLE RIVER, MAJOR'S CREEK, AND NERRIGA DIVISIONS.

(*Mr. Warden Aldcorn, P.M., Braidwood.*)

I HAVE the honor to state, regarding mining operations in the divisions of the Southern District under my charge, viz.:—Braidwood, Little River, Major's Creek, Nerriga, and Araluen, for the year 1886, that matters have proceeded in very much the same manner as reported by me for 1885, so that it is almost unnecessary that I should now make any report at all.

In all the divisions referred to, except Araluen, the scarcity of water which has been increasingly felt for four or five successive years has prevailed during the past year, for, although in common with other parts of the Colony this district had a fair share of rain in the spring months, the quantity which fell was quite inadequate to creating a good supply of water for sluicing purposes. There was, therefore, no inducement for the miners who have been away for years at work on the railway lines to return to the district.

The dry weather, as I have previously stated, is favourable for the deep workings in Araluen, and operations there have been carried on pretty steadily during the year, with the result that there is a small increase (about 450 oz.) on the quantity of gold won during 1885.

There

There is a decrease of about 600 oz. in the returns from the other divisions referred to, as compared with the previous year, but any increase cannot be looked for until the water supply becomes more permanent.

I may here state that two parties, with outside capital, are about to cut and construct races from the Corang and Shoalhaven Rivers to work some ground in the Nerriga Division. These races will be very expensive. One of them is being cut now, and considerable progress has been made with the work. This race will, I understand, be about 25 miles in length.

As regards quartz-mining, very little has been done. Several parties have come from outside of the district with the view of working the reefs at Little River, Major's Creek, and Bell's Creek. Claims have been taken up, and hopes held out that Companies would be formed to carry on operations, but little or nothing has been done. Capitalists seem indisposed to risk money, although from time to time opinions have been expressed by supposed competent judges that there is a large amount of undeveloped wealth in these localities.

In conclusion, I may add, that there has been very little done in the way of prospecting for minerals. Within the last few weeks a discovery of copper was made near the Buddawang Range, about 16 miles from Braidwood. Some rich specimens have been brought in, but, so far as I can learn, no lode has yet been found.

SOUTHERN DISTRICT—NOWRA DIVISION.

(*Mr. Warden Lovegrove, P.M., Nowra.*)

THE gold-mines in this district have been carried on in an easy-going style of former years, very little scientific work being done. The Homeward Bound again heads the list with 1,282 ounces obtained from their quarry. The average is not so high as before, because they have been clearing low quality stone out of their road by sending it through the mill, but part of it went $3\frac{1}{2}$ ounces to the ton or more.

The Pinnacle comes next with 680 ounces, average 1 oz. 1 dwt. 4 gr. In this case also low stone has followed good quality, and reduced the average, which is, nevertheless, a handsome return. This claim is saving pyrites for treatment.

The Pioneer has got on low quality stuff.

No one has yet taken up the river shaft, or the abandoned copper shaft in the Bundundah Creek.

I now have the pleasure of reporting a new enterprise, which will be of public value at all events.

A Company has been formed to test the shores of Jervis Bay for coal, and under the management of Mr. Sands, has already sunk 559 feet through the following strata:—Sand, 3 ft.; clay, 9 ft.; imperfect shale, 4 ft.; compact shale, 433 ft.; coarse sandstone, 30 ft.; quartzose conglomerate, 80 ft. (similar to the stratum found at Dora Creek, Lake Macquarie, on the surface). Total, 559 ft.

Beyond losing a diamond, nothing unusual has yet happened, and the bore is dry.

No other mineral is being searched for or won within my limits.

The proportion of silver to gold in the Yalwal product is still very marked, reducing the value of the bullion to £3 per oz. and even less occasionally.

SOUTHERN DISTRICT—BERRIMA DIVISION.

(*Mr. Warden Wilshire, P.M., Berrima.*)

REFERRING to your circular of the 3rd November ult., requesting my report for the year 1886 on the mining interests in the division under my charge, I have the honor to inform you that the mining interests of the locality in question are not, by any means, in a very flourishing or progressive condition—rather, indeed, the contrary.

With regard to gold-mining, a small quantity of the precious metal was obtained by a "fossicker" in Bundanoon Creek, near its junction with the Kangaroo River; and a few parties were induced to visit the locality, but nothing came of it; and, beyond being able to get the colour here and there, it does not appear likely that anything more than that will be found there.

Messrs. Dunstan & Co., who hold a gold-mining lease at Digger's Creek, near Mittagong, have recently erected a puddling machine, and are engaged testing the value of their claim, as to the existence of both gold and gems. A little gold and some diamonds have been obtained, but work is not sufficiently advanced to admit of a decided opinion being yet given as to the prospect of profitable workings being carried on there.

With regard to the Carrington Mineral Lease, near Marulan, to which I recently paid a visit, shaft sinking and test-tunnelling is being slowly proceeded with, and with various results, some of the ore giving, I am authoritatively informed, excellent assays—various metals, viz., gold, silver, galena, copper, and iron being found in curious combination. The owners are very sanguine of success, and there does seem, some good reason for believing that this particular mine, with some others in the same lead or lode, will, at least, prove remunerative, if not extremely rich; but owing to the mixture of metals, &c., &c., considerable capital will be required to even thoroughly test its capabilities. The owners are, I believe, endeavouring to sell out to capitalists prepared to run the risk or to float a Company for the purpose. At Wingello Creek a little prospecting is being done, but I have not heard results.

The only other mining worth mentioning is that of coal and shale. Borings for coal, &c., are still being proceeded with near Barber's Creek, but results are not made known; though I hear, and know from inspection, that the coal seams in the locality are pocketty and irregular.

The Berrima Colliery, which opened with such prospects of success some four or five years ago, has now closed, having, among other difficulties, become greatly involved with the Oriental Bank in pecuniary matters, out of which the Directors found it impossible to extricate the colliery.

The closing of this mine leaves the district without a colliery putting out coal; and, although there are several embryo colliers here engaged in preliminary preparations for working, it will be some time yet before the mineral from any of them will be a marketable commodity. The Berrima mine will probably soon start again under new (and it is to be hoped) more favourable auspices; but the keen competition, &c., &c., of the Western Collieries, forms a large factor in the difficulties met with in opening successfully collieries on this (the Southern) line; and it will require a strong back and long purse to contend with the monopoly alleged to exist in connection with this important industry on the Western line.

The Joadja Shale-mine is, I need scarcely say, still flourishing, and the proprietors busily engaged in extending and improving this important manufacture in all its various branches and products.

SOUTHERN

SOUTHERN DISTRICT—BOMBALA AND COOMA DIVISIONS.

(Mr. Warden Giles, P.M., Bombala.)

I HAVE the honor to submit, for the information of the Honorable the Minister for Mines, my report for the year 1886 upon the Cooma and Bombala divisions of the Southern Mining District, of which I am Warden, and which embrace the following gold-fields, viz.:—Kiandra, Crackenback, Snowy River, Collinton, Nimitybelle, Delegate, and Towomba.

As previously instructed, I presume the Mining Registrars and Wardens' Clerks in my divisions, and who are stationed at Kiandra, Cooma, Nimitybelle, Bombala, and Eden, have already furnished their reports for the past year, giving detailed accounts of the various workings, proceeds, &c., also the number of miners' rights, business and mineral licenses issued within their respective divisions, to the 31st December last.

At Kiandra, the gold won during the past year did not exceed 1,200 oz., being considerably less than the yield for 1885.

There were 117 miners' rights issued by the Mining Registrar, but a number of rights held by miners were obtained in other districts.

The continued scarcity of water has interfered materially with the successful working of the mines in Kiandra division, sluicing operations having been suspended for a considerable period of the year.

The mining population of Kiandra, Crackenback, and Snowy River gold-fields may be estimated at 400, consisting of Chinese and Europeans.

Nimitybelle Gold-field.—At Kydea, mining interests have not progressed favourably during the past year, mainly owing to the continued drought.

Collinton Gold-field.—Several mineral leases have been applied for. I anticipate a fair yield of silver will be obtained from the claims at Bredbo. At Michelago, application has been made for permission to search for gold upon reserve 962, under section 23 of Mining Act of 1874.

I have heard of one prospecting party on this gold-field.

Towomba Gold-field.—There has not been any favourable progress made in gold-mining operations on this field during the past year.

Delegate Gold-field.—The aspect of mining business on this gold-field is more promising than it has been for some years past. In the neighbourhood of Quidong, and at Bombala, mineral leases have been applied for, with a view to searching for silver. A Company is being formed to work the land at and near Quidong and Bombala.

SOUTHERN DISTRICT—BRAIDWOOD DIVISION.

(C. E. Oslear, Mining Registrar.)

I REGRET to state that there has been little or no improvement in the mining industry here during the past year. Owing to the continued dry seasons, claimholders have been compelled to avail themselves of the suspension of labour conditions, and no fresh discoveries have been made of anything payable, though I have little doubt, under favourable circumstances, such will be. The late rains will doubtless give this industry an impetus, and will, I trust, enable me during the coming year to give a very favourable report.

SOUTHERN DISTRICT—MAJOR'S CREEK DIVISION.

(John Heazlett, Mining Registrar.)

IN preparing this my statistical report for the year ending the 31st December, 1886, I find that very little progress has been made with regard to alluvial mining within my division during the past year. A succession of dry seasons has prevented the possibility of anything being done in the shape of ground-sluicing.

In quartz-mining there are slight signs of improvement, and in proof whereof may state that the Messrs. Thomas Keyte and party have recently erected a battery of ten stamp heads, at Spring Creek, for the purpose of working what is known as Plum's Reef, or any other reef available which they may find to be payable, and have already put through the battery about 370 tons for a yield of 48 oz. of gold, averaging a little over 2 dwt. 12 gr. to the ton. The reef is about 14 ft. wide, moreover they can utilize the surface, which is easily got at, and is nearly as rich per ton as what the reef is. The party are hopeful that if they can get a permanent supply of water the venture will pay wages in addition to the expense they have been under in the purchase and erection of their plant.

Mr. Robert Carter, whose name I mentioned in my last year's report in connection with quartz-mining, has, during the past year, crushed about 630 tons, some of which was surface from Dargue's Reef, for a yield of 68 oz. of gold, which may be a small return, but, as he does not complain, it may be inferred that he is satisfied. He has also treated 20 tons mundic tailings from same mine, and which was left as next to worthless by former proprietors of the mine, and from which he obtained 40 oz. smelted gold—equal to 2 oz. to the ton; the mode of treatment will be found in tabular form herewith. Mr. D. Stuart and party crushed 27 tons from old workings at Commissioner's Hill for a yield of nearly 13 oz., and which gave them wages; the abovenamed mines are situate on private land.

At Long Flat, the puddling mills have been idle during the greater part of the year, consequent on a scarcity of water, and nearly, if not all, the diggers had to seek employment elsewhere, but during the month of December they returned; yet so little has been done that it is impossible to form even an approximate estimate as to what stuff has been put through their puddling machines, in fact they have no idea of it themselves.

The Major's Creek portion of my division, with one or two exceptions, will only pay for working during wet seasons; and, as the past six years have been very dry, no flooding-off or ground-sluicing has been done, nor can be done, until the seasons alter very much.

During the year 1886 I sold sixty-one miners' rights, being an increase of thirty over and above the number sold in 1885. It is, however, only right to say that a few of these were taken out by miners working at Captain's Flat, it being nearer by 10 miles than what Queanbeyan is.

From what I have already written in regard to mining, generally, within my division, it will appear rather strange that the quantity of gold purchased shows an increase of about 315 oz. in excess of the quantity purchased in 1885. The crushings at Spring Creek would assist only a little, as in 1885 only

48 oz. were obtained from quartz, and in 1886, 129 odd oz. or about 81 oz. over the quantity won during 1885. It is therefore probable that some parcels have been sold here which were produced from without this division, and gold-buyers do not feel inclined to divulge or betray the confidence reposed in them by diggers. On the other hand, some parcels have gone from here to Braidwood, and also to Sydney, for sale, and in which case would be a set-off against the quantity brought here for sale, though obtained without this division. I may therefore, with much show of truth, assert that, notwithstanding the protracted drought, this field has improved a little, both as regards the quantity of gold won, and in the number of miners' rights sold. Some months back a party of miners from Sunny Corner (Mitchell) came here with the view of taking up the Snob's Reef at Big Hill, and on finding it to be in the possession of another person they tested, or got tested, a few samples from the Rise and Shine Reef, Red Hill, and from one piece, obtained from myself, the assay showed a yield of 3 oz. 12 dwt. gold and 36 oz. silver to the ton, and on the strength of which they started work to get out 5 tons, but before this had been completed there occurred a rupture amongst the full party, when work stopped. This mine is now under application for lease by one Gustavus Plater Clayton. The Snob's Reef, Big Hill, has not been worked since 1880, yet has been held for the greater portion of the period by registration for suspension of the labour conditions, and I have heard diggers say that if open to be taken up they were confident that with a party of thorough miners good wages could be made, and would have been, and I am of the same opinion, and that for the reason that good miners would rather work in the mines than on the roads, besides the advantage of being at home.

In conclusion, I will venture to say that by being allowed to hold a good claim for six years without working it is not the way to develop the resources of the gold-fields, and so say many of the miners of Major's Creek.

SOUTHERN DISTRICT—LITTLE RIVER DIVISION.

(P. James Galway, Mining Registrar.)

WHEN I had the honor to make my last report on the Little River Gold-fields I was in hopes that I should have been able in this year to report a marked improvement in mining; but from the continued absence of water men have not been able to prosecute the vocation of diggers to advantage.

With the exception of some thunder showers during the last quarter of the year no rain has fallen, so that during the year ground-slucing has been a thing of the past.

As the Cooma railway is drawing to a finish, and with the exception of the road work there is little if any employment in the district, the probability is that the mining population will once more come back to its old standard.

On the river-bank there are a few claims at work, and back from the river no work of any extent can be done from want of water. The Dawn and Earl Granville Quartz Reefs have been idle during the year, the working shareholders being unable to procure machinery to contend with the water, and it is useless to attempt to induce the monied men of the district to try and develop any mining venture.

An offer has been made to some Sydney capitalists to work the reef, which I have reason to believe will be accepted.

The reefs at Little River are as promising as any in the Colony, and having already given good returns, and being situated in a highly auriferous country, it seems strange that nothing has been done to develop them.

All that is wanted is that a commencement should be made under good intelligent management. Then, should the venture prove a success, which is very probable, from past efforts, there is little doubt but that the whole line of reefs will again be taken up and worked.

Some time back the Homeward Bound Co. took up some 40 acres in different reefs. Having expended a large sum on the surface, and taken out a quantity of surface quartz from the only reef on which any under-ground work was done, and without seeing the bottom of the old shaft by 40 ft., the money being wasted, the leases were abandoned, and the plant for working the reefs, together with the sheds, houses, and tanks, are rotting on the ground.

The discovery of a copper lode in the Buddawang Ranges, about 6 miles from the Little River township, has caused some stir in the district. I am given to understand that the lode assays from 50 to 75 per cent., and ground adjoining has been taken up. The lode has been found on one of the blocks, and assays as well as that in the original find.

SOUTHERN DISTRICT—NERRIGA DIVISION.

(P. James Galway, Mining Registrar.)

I AM glad to state in furnishing annual report for 1886 that a great change for the better in the developing of this division has taken place. The Corang Company having commenced cutting their race from the Corang River to their 25-acre alluvial lease at the head of Sailor's Gully.

The Company also hold 45 acres for sluicing at same place under the Mining Board Regulations.

The length of race will be about 25 miles, and in crossing gully and low ground fluming will have to be erected, which in some places will be 70 ft. in height.

There are eighty men at present employed, and as the entire race is pegged and levelled and the cutting let out by contract, as many parties as wish to take a lot will be put on, the manager wishing to have it completed as quickly as possible.

A reservoir to cover some 200 acres will be erected in a gulch at the head of race, so as to impound all storms that would otherwise go to waste.

The portion of race already cut is first class, being 4 ft. by 2 x 2, and the ground appears well adapted to hold water.

I have visited the ground on which the sluicing operations will take place, and from the prospects obtained have no doubt that with sufficient water the Company have a grand property.

Another water-race from the Little River, about 1 mile above its junction with the Shoalhaven, to a 25-acre sluicing-claim near the Oalin Crossing, Shoalhaven River, is being levelled and laid out for cutting. The length will be 21 miles, and will command the watershed of the Buddawang Ranges, also the watershed of the entire length of the Little River. This race will always have a more permanent water supply than that from the Corang River.

The ground to be worked was before in the hands of a Company, and was worked with a Blake pump and a 30 horse-power boiler. A fine stream of water was raised 90 ft., and the prospects were payable; but bad management or want of experience spoiled the venture. The gold is in the ground, and only requires water and mining skill to pay for an economical expenditure of capital. If those ventures succeed no doubt water-races or pumping machinery will be introduced on many other parts of this division, as there is an almost unlimited supply of ground for sluicing.

My own idea is that raising water by steam-power is the quickest, cheapest, and most certain mode when the height the water is to be raised is under 100 ft.

Some years back I mentioned in the annual report from Little River that some miners bringing water through private ground here charged £50 yearly, this being far in excess of the entire value of the ground.

The Corang Co. have been blackmailed to the extent of £300 for permission to bring a portion of their race through some private land now let to a grazier for £20 yearly.

Should an Amending Mining Bill be introduced this power of extortion should be modified.

The dry year passed has prevented the miners washing up the dirt stacked during last and previous years, and also prevented any prospecting being done. A new discovery of gold was reported from Windellama, but scarcity of water has prevented the further development of the find.

SOUTHERN DISTRICT—ARALUEN DIVISION.

(*E. F. Carlile, Mining Registrar.*)

THE drought during the greater part of the year 1886 prevented a great deal of work being done, ground-slucing having been practically at a standstill, and several of the stripping claims having often not had enough water to wash with. When rain at last came there was not a sufficient downfall to make the lead-races run for more than a day or two at a time. The yield of gold, however, has been larger than that reported for 1885, to the extent of 332 oz., thus verifying the anticipation mentioned in my last report. This increase is to be placed to the credit of the alluvial workings, and an additional 205 oz. besides (total 537 oz.) for the yield from quartz fell off that much during the year. The actual returns are:—Gold won during 1885, 5,187 oz. 9 dwt. (being 4,962 oz. from alluvial, and 225 oz. 9 dwt from quartz), valued at £19,971 13s. 6d.; 1886—5,520 oz. 2 dwt. 9 gr. (being 5,500 oz. from alluvial and 20 oz. 2 dwt. 9 gr. from quartz), valued at £21,252 9s.; showing a gain in favour of the latter year of 332 oz. 13 dwt. 9 gr., valued at £1,280 15s. 6d.

No new ground has been occupied during the year; but at Bell's Creek a fresh Company has been formed for the purpose of extracting gold from pyrites. Some work has been done, and machinery erected in connection therewith, and a trial parcel sent to the Pyrites Works, Pymont, for treatment, the returns from which have not yet been received.

Most of the claims bid fair to maintain the present rate of yield for the coming year.

SOUTHERN DISTRICT—EUROBODALLA DIVISION.

(*Henry J. Lea, Mining Registrar.*)

I HAVE the honor to report that there has been very little progress in this division during the last twelve months.

M'Carthy and party have been prospecting about Nerrigundah for some time looking for reefs. They have come across what they consider a payable reef, situate on Tom North's Gully, Nerrigundah, and are sinking a shaft with a view of testing the stone, which looks well. Should it prove to be payable they will endeavour to erect a battery on the ground; if they do so it will cause a stir. There are a number of diggers, European and Chinese, fossicking about the old ground at Nerrigundah and the Deep Creek.

I sold during the year 36 miners' rights and 11 business licenses.

SOUTHERN DISTRICT—MORUYA DIVISION.

(*H. N. Barton, Mining Registrar.*)

I HAVE the honor to enclose herewith returns for the year ending 31 December, 1886, rendering you as accurate information as I am able respecting the district during the year.

In consequence of a claim, called the Prospectors, sunk at Mogo, on a flat called the Cabbage-tree Creek (a creek, by the way, until this year never bottomed on account of the water), in September last there was a rush of about 200 miners and others, and a good deal of excitement was occasioned in the district, especially when about 30 oz. were unearthed in the prospecting claim, but notwithstanding this find and some small results in the adjacent claim, after turning up nearly all the Cabbage-tree Gully, nothing of any great importance has been found, although good wages have been made by several parties, who still hope for great results. There are now about fifty diggers still on the ground, quite sanguine that with perseverance they will come on payable wash-dirt. This ground has always been patchy, but good finds have been made, and nuggety gold found all over the field at intervals.

All the ground at Mogo and the locality has been very dry for three years, hence the working of the Cabbage-tree, which could not have been touched before.

In the quartz several leases have been granted, and some of the shafts, which are down a considerable depth, show some excellent returns—as much (with primitive crushing) as 2 to 3 oz. to the ton.

One Company has been formed to erect machinery, and two others are talked of. I must say, although no rush has been called for, that mining pursuits in the Moruya subdivision and the district generally look more favourable than last year. The returns of gold through the Bank of New South Wales have been 304 oz. 12 dwt. 6 gr. from the district generally; but this can only be considered a small portion of the gross returns, as there are no means of ascertaining what has come by hand.

SOUTHERN DISTRICT—COOMA DIVISION.

(*D. E. Troughton, Mining Registrar.*)

GOLD-MINING during the past year has been very slack in this division, and confined to operations on a small scale on the Snowy, Umeralla, and Murrumbidgee Rivers. From these sources about 104 oz. have been purchased in Cooma during the year.

Silver and Lead.—Four applications for mineral leases were made at this office during the year, all for ground at Bredbo, for the purpose of mining for silver and lead.

The

The assays made of ore taken from this ground varied from 20 oz. to 60 oz. of silver to the ton. As yet little work has been done, but it seems probable that capital will be forthcoming to work the ground.

Miners' rights issued, 46; mineral licenses, 3.

SOUTHERN DISTRICT—BOMBALA DIVISION.

(*W. A. Dovers, Mining Registrar.*)

I HAVE the honor herein to tender my report as Mining Registrar of this district for the year now past. On the occasion of the last annual report it was with no small regret that I furnished evidence of great stagnation in our local mining industry, and I am pleased to be able on this occasion to refer to circumstances which show evidence of present activity, and clearly point to a further and renewed prosecution of the search for gold here.

The issue of miners' rights and mineral and business licenses is in marked increase on that of the past year, and, which is still more to the point, the amount of gold purchased bears a similar comparison.

Early in the year some excitement was caused by a small party of miners chancing upon good prospects in a creek flowing into the Little Plain River, about half-way between Bombala and Delegate. This discovery has not as yet been fully followed up, owing to the fact that the proposed claims are situated within a reserve, and come within the provisions of the 28th section; some delay, therefore, is inevitable; but I have gathered from the parties that they intend to start work shortly.

Further on, towards Delegate and amongst the old claims in and about China-town, some of the Chinese are working, but not, I think, with very great results.

The best find has taken place quite lately in the beds of the Delegate and Little Plain Rivers, at the point of their junction. In this spot there are several good stream claims being actively worked, and in most instances with markedly good results.

A new Company promising very active and systematic working is in process of establishment, for the purpose of mining for several metals, but principally for gold, on Cambalong Run, distant about 10 miles from Snowy River. The bulk of the land worked will not at first be Crown land. It consists of portions held conditionally or in fee-simple, but this will of course lead to the opening up of the adjacent country, which is at present unalienated. In fact the promoters of the scheme have applied for a lease of 40 acres, which as yet has not been granted, and they are in every way possible completing their preparations for the actual commencement of work. This scheme will undoubtedly give an impetus to our local mining industry, and be directly and indirectly a benefit.

The amount of gold purchased by the Banks in the district during the year 1886 is 254 oz. 16 dwt. 21 gr., at a price of £978 17s. 6d., as against 180 oz. 15 dwt. 9 gr., at a price of £698 11s. 9d., for the year 1885.

This is a marked increase, corresponding with a similar improvement in respect of the issue of miners' rights, &c., during the past year; and I may state that present holders of rights and licenses show every inclination to renew the same with the new year. In 1885, 1 miner's right, 3 mineral licenses, and 16 business licenses were issued; but for the year 1886 the numbers have greatly increased, being as follows: 40 miners' rights, 6 mineral licenses, and 29 business licenses.

Measures have been taken to prevent mining or occupation without right or license; and I hope during the current year to see still greater activity, and intend, if possible, to collect some representative specimens of our minerals for departmental inspection.

SOUTHERN DISTRICT—WAGONGA DIVISION.

(*A. M. Smith, Mining Registrar.*)

I HAVE the honor to forward my report for the year 1886 of the mining industry in this division.

Wagonga.

About 2½ miles from Wagonga River, North Head, there are three distinct gold-bearing quartz reefs. The Belle of Australia, the first that was discovered, with an average width of 3 ft., gives promise of being a remunerative venture under judicious management, trial crushings having proved beyond a doubt the value of the three amalgamated claims held under lease by Mr. E. J. Coman, comprising an area of 12 acres. I am informed that this property is likely to be formed into a limited liability Company, when machinery would be placed on the ground, thereby avoiding the expense of carting stone to the battery erected by Mr. T. Carter, of Sydney, which has lately been greatly enlarged with the latest improvements. Messrs. Carter & Wiley will require the machinery themselves when their claims on the Lady Carrington reef are fairly opened out, which will be about the end of January, and give employment to a number of miners. The John Forster reef, half a mile north-west from the last-named reef, shows good gold. The width of the reef is 18 to 20 in., and although no crushing of any quantity of quartz has as yet been made the numerous trials of stone taken at different depths in sinking the main shaft have satisfied the lessee that it will yield 2½ to 3 oz. to the ton. There are at present three claims at work on this reef. About 50 tons of quartz at grass await the completion of improvements on Messrs. Carter & Wiley's battery.

Mount Dromedary.

No main reef has as yet been discovered on the mountain, the veins, which are very narrow, running from 2 in. to 8 in., carry payable gold, as high as 4 oz. to the ton, having in some instances been obtained from small crushings of about 20 tons of stone. It may be said that the miners are a settled population in constant work, making at least fair wages. It is not a likely place for the investment of much capital, the veins being so narrow as not to allow the employment of many miners to advantage. Why this portion of the gold-fields should be retained as a timber reserve I have been unable to discover.

Tin-pot.

Situated on the River Tuross, 10 miles south-east from the township of Nerrigundah, and about 15 miles north-west of the Dromedary Mountain, Mr. Lomas Smith, of Sydney, the lessee of 14 acres on the Tuross reef, after fairly testing the ground, successfully floated this claim, which is now being efficiently

efficiently worked, in the name of the Tuross Gold-mining Company, under the management of Mr. W. A. Hunt. The present operations are directed to developing the mine by sinking shafts and tunnelling. 80 lb. weight of unpicked stone yielded at the rate of 56½ oz. of gold to the ton. Water-power is available for crushing and pumping—machinery area, dam site, and water-right being secured to the Company.

Rats-head.

At this place alluvial has been worked off and on for the last ten years. The ground is patchy, and not much gold has been won at any time. The gold is coarse, and in value not far below that of Nerrigundah, which maintains its price of £4 per oz. Lately a reef was discovered here upon which a shaft is being sunk. No opinion can be given of its worth at present. All that may be said of it is that the quartz is gold-bearing so far as the sinking has gone.

During the year 100 miners' rights have been issued.

22 gold-mining leases, comprising an area of 117 acres, have been applied for.

In conclusion, I would respectfully submit that before any report be made of payable gold having been discovered to secure a prospecting claim certain conditions should be imposed, such as a stipulated depth from the surface, instead of a few feet, upon which the report has been based (and there is nothing in the Act to prevent it), let it be made compulsory that the test should be taken at a depth of not less than 25 ft., whereby the attempt to mislead would, in a measure, be guarded against. The assay of 1 lb. to 56 lb. of stone is no criterion to go by in estimating the return expected from the treatment of 50 tons; the quantity tested is obviously of the utmost importance in order to form a reliable opinion of the value of a mine.

It is generally believed that, as the mines are beginning to show indications of improvement, more hands will find employment. There is room enough for five times the number of men at present at work. As for alluvial ground, there is none, consequently the whole of this division may be looked upon as quartz-reefing country. Mount Dromedary is a net-work of small veins, no main reef having been discovered, and likely to remain so until the diamond drill is applied; for in no other way can it be proved, the mountain having been worked in all directions during the last twenty years, and still miners hold the belief that there must be a rich main reef at a considerable depth from the apex.

TUMUT AND ADELONG DISTRICT—TUMUT DIVISION.

(*Mr. Warden Vynner, P.M., Tumut.*)

I HAVE the honor to furnish you with my annual report upon that portion of the Tumut and Adelong Mining District under my charge. I regret to say that the mining interests continue in a very depressed state, and there seems to be no probability of any reaction at present. Nothing short of the discovery of new ground of a payable character will bring about a revival, and of that there are no indications observable.

TUMUT AND ADELONG DISTRICT—GUNDAGAI DIVISION.

(*Mr. Warden Gordon, P.M., Gundagai.*)

IN presenting my annual report upon the mining industry in this locality I regret that I cannot announce any improvement during the past year.

Prospecting is still going on in various places, but nothing of a payable nature has been discovered.

Several of the quartz reefs that were supposed to have been worked out many years ago are again being prospected, to ascertain if the gold is to be found at a greater depth.

More capital than the district can provide is required to properly test these reefs, some of which yielded from 5 to 10 oz. per ton in old times.

The number of miners' rights issued during the year was 137, the number of gold leases applied for during the same time being 3 for quartz and 1 special for alluvial.

TUMUT AND ADELONG DISTRICT—QUEANBEYAN DIVISION.

(*Mr. Warden Woore, Queanbeyan.*)

I HAVE the honor to submit, for the information of the Honorable the Minister for Mines, my report for the year 1886 upon the Queanbeyan Division of the Tumut and Adelong Mining District, Captain's Flat.

I inspected the mines at this place on the 6th instant. At Blatchford's leases, now known as the El Capitan mine, the smelting furnace mentioned in my last annual report and an assay furnace and office have been completed, at a total cost, I am informed, of about £3,000.

In February last the Company let the working and smelting on contract, and operations were commenced immediately afterwards, and continued, with occasional stoppages from want of water and other causes, until September, with results said to be "fairly payable."

I am informed that about 100 tons of lead bullion, containing a little gold and silver, a quantity of which I saw on the ground, were produced during the period mentioned.

In September the contractor discontinued operations, and smelting has not been resumed since; but work in the mine has been carried on by the Company.

The main or middle tunnel has been extended 226 feet, and is now in about 526 feet.

The upper tunnel, or 90-foot level, has been extended 134 feet, and is now in about 334 feet. A rise of 146 feet has been made from it to the surface, and a cross-cut is now being driven west with a view of intersecting other reefs.

The lower tunnel, which is about 420 feet long, has not been extended.

At Montgomery's 7-acre lease, now known as the Koh-i-noor mine, a tunnel has been driven 240 feet through rock, at a cost, I am informed, of about £300, cutting the lode at about 100 feet from the surface, where it is 42 feet wide. About 400 tons of ore have been raised for smelting.

A smelting furnace, similar to that at El Capitan mine, has been erected by a contractor at a cost, I am informed, of about £2,500, and is not quite completed.

One of the parties interested in this mine informed me that smelting operations will shortly be commenced.

The present adult population of Captain's Flat, ascertained through the police on the 8th instant, is 103 Europeans and 1 Chinese.

No other mining operations worth mentioning have been carried on during the past year within the division assigned to me.

TUMUT

TUMUT AND ADELONG DISTRICT—TUMBARUMBA DIVISION.

(Mr. Warden Makinson, P.M., Tumbarumba).

I HAVE the honor to report for 1886 that all mining matters have been exceedingly dull in this division. At the Bald Hill the Basaltic Gold-mining Company has been steadily at work proving its ground, and although the manager has from time to time confidently predicted that the property would shortly prove a highly payable one, still the mine is yet an expense to the shareholders. The Comstock Company, at Isabella Reefs, has done but little during the past year, and now no work at all is being done. At Paddy's River, Hulsten and party opened a new reef, and, after crushing about 200 tons, gave it up. The return was about 6 dwt. to the ton. The Burra Sluicing Company had not sufficient water during the early part of the year, and their return was only moderate. At Yarrara (cut off from this division and added to Albury Division a few months ago), the Rangatira Reef Company took out its pumps last November, and abandoned work. No mining of any importance has been going on in that locality, only a few fossickers, working for a scanty subsistence.

The number of miners' rights issued here during 1886 was 173, being less than for 1885. The yield of gold has been, as far as can be ascertained, about 1,380 oz., being a decrease on the 1885 quantity. But little prospecting has been done.

TUMUT AND ADELONG DISTRICT—GUNDAGAI DIVISION.

(Charles W. Weekes, Mining Registrar.)

NEARLY all the quartz leases which were being prospected at the date of my last report have proved unpayable, and many are since abandoned. At the present time there is not a single gold reef in this district proved to be payable. Some prospecting is still going on, but not to a great extent.

TUMUT AND ADELONG DISTRICT—ALBURY DIVISION.

(Charles A. Conley, Mining Registrar.)

I HAVE the honor to report that a marked change for the better has taken place in mining matters, owing principally to a valuable discovery made in the Bungowannah Ranges, near the falls to Jindera, and north-west from Splitter's Creek. This claim is the property of a Melbourne Company, "The Bungowannah Gold-mining Company, no liability." They employ forty men, and have erected a 15-head battery, with all the most modern appliances for saving gold. In addition, they have constructed a very large dam, and are now excavating a check dam. 2,000 ft. of a tramway from tunnel to the crushing machine has been made, the tunnel having been driven 130 ft., the tunnel giving 50 ft. of backs. It is an immense dyke reef, and though they are 25 ft. into the reef the foot-wall has not been reached. The stone is quarried out, and will pay at 3 dwt. to the ton, but averages 10 dwt. Now that everything is in going order the manager reckons he can crush 250 tons per week. The machinery comprises a 15-head battery, driven by one horizontal engine, and works to 20-horse-power; boiler, 23 ft. 6 in. x 5 ft. 6 in., Cornish tubes, with Galloway's tubes, fed by donkey engine.

Another Melbourne syndicate have purchased The Soudan, situated at Splitter's Creek, and have twenty-three men at work. The machinery taken over from the late owners, composed of 5-head battery, being altogether too small. The Company contemplate, if prospects warrant, to erect a 40-head crusher, which they reckon can be kept going, as the Soudan is also a dyke reef, and contains a vast body of stone.

This Company have completed their dam, and are hard at work with their tunnel.

Several parties of prospectors are busy in the adjoining hills, and two or three good shows have been found, but have not yet been proved.

Messrs. Pyc and Wealands, of May Day Hill, Black Range, have had a very good crushing, viz., 75 oz. for 21 tons, which were taken out in sixteen weeks by two men.

Mr. W. H. Polkinghorne, of Hawkesview, has also had two excellent returns—one 135½ oz. from 29 tons, and the other 133 oz. from 30 tons.

TUMUT AND ADELONG DISTRICT—ADELONG DIVISION.

(J. James, Mining Registrar.)

THE year has been noted as one of mining depression. In May last an inquiry was made by Mr. Warden Baker with a view to a possible solution of its causes. Subsequently suspensions were granted to the gold-mining leases held by the Perseverance Company, Great Victoria Company, and the Messrs. Amos Brothers.

Mr. A. W. Molineaux, manager for the above, reports that during the early part of the year a considerable amount of prospecting was done in the Great Victoria and Flagstaff mines, but no encouragement was met with, and the work was stopped since September, till a larger amount of capital can be brought to bear; if such can be accomplished, no doubt there will be better results.

The business transacted during the year consists in the issue of 175 miners' rights and 4 business licenses, the receipt of 5 applications for gold-mining leases; conditional registrations, 22; 4 registrations in tenement register, and 3 in unsurveyed tenement register.

The escort returns are as follow:—

	oz.	dwt.	gr.
Commercial Bank	4,641	18	0
New South Wales Bank	1,158	18	15
Total for the year	5,800	16	15

The crushing returns are as follow:—

	tons	cwt.	oz.	dwt.	gr.
Reefer battery	1,493	0	1,230	13	0
Perseverance battery	915	10	484	14	9
Totals.....	2,408	10	1,715	7	9

Issue of miners' rights compared:—

1885.	1886.	Decrease.	
No.	No.	No.	Quantities
261	175	86	

Quantities of gold, the produce of this division, compared :—

1885.			1886.			Decrease.		
oz.	dwt.	gr.	oz.	dwt.	gr.	oz.	dwt.	gr.
7,821	4	18	5,800	16	15	2,020	8	3

Quantities of quartz crushed and yield compared :—

1885.			1886.			Decrease.		
tons	cwt.	gr.	tons	cwt.	gr.	tons	cwt.	gr.
3,030	0	0	2,408	10	0	621	10	0
2,568	2	0	1,715	7	9	852	14	15

Quantities of alluvial gold, the produce of this division, compared :—

1885.			1886.			Decrease.		
oz.	dwt.	gr.	oz.	dwt.	gr.	oz.	dwt.	gr.
5,253	2	18	4,085	9	6	1,167	1	12

With reference to quartz-mining, the old bunches may be reckoned as fairly worked out to present depths. If there be a future for the lodes to prove the existence of other bunches sinking must be resorted to.

The Challenger, an old contributor, has developed nothing during the year. A party are now following a small leader in the hanging wall in the hope of striking a make of stone.

The Curragong, another old identity, has of late improved. A party of tributors are following a cross leader about 90 feet from the surface. So far it has paid them over wages, and there is a prospect of several small crushings.

On Donkey Hill, at the Band of Hope mining tenement, Barbour and party, and the Hodge Bros.' gold-mining lease, nothing new has transpired. The results of crushings are about the same as that obtained in 1885. An extended claim on the middle line taken up by Rodda and party numbers the third tenement on this hill.

Gibraltar Hill has contributed small lots of stone. At present it does not possess a single durable tenement. Bunches are found and worked out in a short space of time with varied results not exceeding wages.

At the Gap, Adelong, the Crown extended quartz claim, Messrs. Evans and party, in the early part of the year, created a little stir, as a reef in soft ground, from 4 to 7 feet in width, was worked, and about 250 tons, averaging a yield of 1 oz. per ton, were taken out from January to September. The heavy rains setting in caused an excessive inflow of water. Baling with horse-power was ineffectual to subdue the water, and the party sought suspension for three months to obtain and fix a pump. All other claims on the line were flooded, and suspensions were applied for and granted.

The depth of the Crown shaft is 150 feet. There is also a drive 60 feet in length northerly, at level, 140 feet.

While I am writing two claims have amalgamated, viz., Allen and party, and Wiles and party, in order to strengthen the labour on a fixed line, and with a pump and gear ordered to arrive shortly they will be in a position to try the ground at greater depths. Evans and party have commenced to sink a new shaft.

At the Sawpit, an extension of the Gap veins discovered in 1885, another attempt at prospecting was made, but as the party were not backed they had recourse to driving out surface stone. The yields of three lots averaged over 11 dwt. per ton. These were not sufficient, as the cartage to the machine and the crushing barely paid £1 per week per man. The work was abandoned. However, another party has applied of late for the same ground, so that the Sawpit is still held in repute as a hopeful place for the prospector.

Alluvial.

The total quantity of gold obtained is 1,167 oz. 1 dwt. 12 gr. less than that obtained in 1885.

In my last report it was stated that at Mr. A. D. Shepard's lease preparations were being made to work it by a different system, viz., hydraulic injector. The works are now nigh completion. The old system, driving and blocking, has in the meantime gone on, but not with the full-handedness of former years, hence the decrease of gold for the year is to be largely attributed to this cause. The present new system devised by the enterprising proprietor is a costly one, and it is to be hoped all its expectations will be realized.

Mining on private property below Mr. A. D. Shepard's lease about 1 mile is the latest addition.

A test shaft was put down and driven in Mr. Crain's freehold. The speculation proved expensive; and the proprietor now allows a party to work on conditions. They are now following the course of a run of gold in a cross-drive. The ground is alleged to be payable.

Half a mile below Mr. Crain's land, a shaft was put down on Mr. C. D. Bardwell's property. It was done imperfectly, without the aid of a pumping engine. However, the prospects are alleged to be encouraging. A party of twelve have applied to Mr. Bardwell for conditional permission.

The above are practical proofs of the existence of extensive alluvial deposits in the old course of the creek, on purchased land adverted to as lands needing resumption.

TUMUT AND ADELONG DISTRICT—REEDY FLAT DIVISION.

(Henry T. Dixon, Mining Registrar.)

THERE is nothing of importance to report from this place. Mining is very dull. The miners complain that there is no land to mine on, it all being taken up by selection. Plenty of reefs are known to exist, but they are on selected land.

TUMUT AND ADELONG DISTRICT—TUMUT DIVISION.

(Charles J. Lloyd, Mining Registrar.)

I HAVE the honor to report, for your information, that mining in the Tumut Division of the Tumut and Adelong Gold-field is very slack. There is no reef work going on at all; the only workings are alluvial, in old and abandoned ground that has been worked years ago. The local Banks report that they have bought no gold during the last year, the quantities offered being only a few dwts. at a time.

686 oz. 6 dwt. 10 gr. have been escorted from Tumut to Adelong during the year 1886. The Gold Receiver here informs me that over 300 oz. of this amount came from Kiandra.

Fifty miners' rights were issued during 1886. The Tumut Division is a large one, and it is very difficult to find out what the miners are doing; but the amount of gold sent from here through Adelong shows that there is not much found here.

TUMUT AND ADELONG DISTRICT—KIANDRA DIVISION.

(*W. D. Bailey, Mining Registrar.*)

I HAVE the honor to forward my report for 1886. Unfortunately I cannot record any improvement in mining matters.

The number of miners' rights issued was 117.

The amount of gold won was considerably less than in 1885, but I cannot give a full account, owing to the absence of the largest Chinese buyer. In the winter there was no water on the field, and nearly every person was out prospecting, but nothing payable was found. At the Eight-mile two parties were working on tribute—one washed up with fair returns for time engaged sluicing; the other will wash up in about a fortnight. They cannot give an opinion of the result of their labours. No work has been done on either North or South Bloomfield claims, the proprietors having obtained suspension of work.

At the 15-mile claim work was carried on while the water lasted. Result, medium.

Mr. Drummond, manager of the Empress Company, reports:—During 1886 I repaired and extended the head-races, tail-race, and dams, and other preparatory work. We had no water till August, since which time the season has been a fair one for water. I had a wash-up in December with very fair results.

Mr. Pallinson, manager of the Kiandra Gold-mining Company, reports:—During January we began to prepare for working the mine on a larger scale. All the races leading to the mine have been enlarged, and the embankment of the 3-mile dam was also raised 4 ft., making a total height of 44 ft. When full there is a depth of 40 ft. of water. The dam now has a capacity of over five million gallons.

We began sluicing with two nozzles on the 18th of March, but, unfortunately, we experienced a very dry season, and only sluiced 413 hours till the 31st July, but since that time we have had a good supply of water. We have 30 ft. in the dam at the present time. We usually have our general clean up about the end of December, but owing to the very short supply during the first seven months of the year we will not clean up till the first week in February. This accounts for the small yield of gold. In October we cleaned up 300 ft. of boxes for a yield of 386 oz. Since then we have run each nozzle 850 hours, washing away about 222,000 yards of earth.

Henry Hooper and party have applied for two leases on Township Hill—one of 25 acres, the other 14 acres. On this they have driven a tunnel 6 ft. high, 7 ft. wide, 464 ft. into the hill, the last 200 ft. passing through hard silurian slate intermixed with quartz veins. They sunk an air-shaft 50 ft. deep, which tapped the tunnel 180 ft. from its mouth.

No quartz-reefing in this division.

Mining is very dull, several Companies, not getting anything payable, have, to a great extent, suspended operations. One party has taken up two leases on Township Hill, and have tunnelled 400 ft., and they are now engaged putting in a jump-up. The Kiandra Gold-mining Company, at New Chum Hill, and the Empress, at the Nine-mile, are the only hopeful sluicing Company claims at present.

PEEL AND URALLA DISTRICT—GLEN INNES DIVISION.

(*Mr. Warden Martin, P.M., Glen Innes.*)

THE year just closed was a most favourable one for the miner in my division, in so far as an abundant rainfall could assist its operations. Forty-six inches fell at Emmaville during the twelve months, and, as running water was to be found in nearly every depression between the hills, advantage was taken of the supply to sluice much poor ground hitherto unworkable for want of water on the spot. Notwithstanding this favourable condition, however, and the added stimulus of an increased price for tin, the output, as compared with the previous year, fell off by 520 tons 4 cwt. 3 qr.

This falling off was wholly in the lode and shallow workings, the deep leads having slightly increased in productiveness. As bearing upon the present condition of tin-lode mining in this division, the manager of the Tent Hill Smelting Works reports that:—

“Our battery has been continuously at work during the year, principally in treating stone raised from our Ottery Reef.

“We cannot report any improvement in the quality of stone crushed, viz., 2,419 tons 6 cwt. 3 qr., from which we obtained 79 tons 21 lb. of tin ore.

“We are now putting in a large tunnel at the Ottery, which, at the end of the year, was about 200 feet in, and confidently expect to cut the reef at a greater depth than in any of the present shafts.”

The tin ore from all sources won during the twelve months was as under:—

	tons	cwt.	qr.	lb.
Vegetable Creek—Deep leads	962	8	0	13
Lode..... .. .	169	13	0	0
Shallow..... .. .	761	1	0	0
Glen Innes—Shallow workings..... .. .	227	18	0	17
Grand total..... .. .	2,121	0	1	2

Which, at £57 per ton (the average price at the smelting works), gives a value of £120,897 14s. 4d.

The manager at the smelting works reports having received 1,261 tons 3 cwt. 6 lb. of tin ore for reduction during the year, and that the output of refined tin forwarded to Newcastle was 858 tons 17 cwt. 3 qr. 1 lb.

The average number of miners engaged in tin-mining in the division was:—Europeans, 390; Chinese, 472—at wages unaltered from past years.

Silver.

Silver.

Systematic and sustained operations to test the value of the silver-bearing lodes in the division may be said to have been wholly confined to the claims at Little Plant Creek, held by Webb's Silver-mining Company.

The resident manager reports that:—

"Along the reef several shafts have been sunk, ranging from only a few feet to 210 feet in depth, making an aggregate of about 760 feet. Drives also have been extended at various levels to a distance, in all, of about 500 feet. In almost every case payable ore has been met with.

"The deep workings are most encouraging. At a depth of 150 feet the lode has been found to carry a well-defined wall, which continues unbroken to the present deepest point, 210 feet.

"The clearance also of the surrounding country (rock), which above is almost at right angles to the lode, is here almost parallel to it. The ore also holds its own in depth and bulk. Assays are equal to, and sometimes surpass, those which have been obtained nearer the surface.

"All these facts point to the permanence of the lode, and should, in my opinion, dispel all doubts as to the future prosperity of the field. The work hitherto has been strictly exploratory, with a view to testing, as well as developing, the lode in various parts.

"However, 900 tons (nearly) of ore, containing over 30,000 oz. of silver, have been raised and stacked to await erection of reduction works.

"The Company is contemplating the erection of concentrating and reduction plant, and it is hoped that larger returns will be made during the present year."

At Pye's Creek little has been done beyond putting down trial shafts on the various lodes, and work has for some time been in abeyance, pending the issue of attempts being made to float Companies to work the mines.

The lodes are of a most promising nature, and worthy of more attention by capitalists than has been bestowed upon them.

Beyond assay specimens, no silver has yet been produced from any part of the division.

Gold.

Increasing attention has been given to mining for this metal, in consequence partly of the overflow of labour from the tin mines, and partly from the inducement held out to capital under the regulations permitting the issue of special leases over large areas of old or abandoned ground.

At Oban tin and gold are found associated, and about sixty miners (principally Chinese) have been at work there during the year.

At Glen Elgin the Company formed to work the river-bed have been actively engaged in carrying out a well-planned scheme to drain the watercourse, and the managing director, Mr. Alfred Cadell, reports that:—

"The operations of the Glen Elgin Gold-slucing Company (no liability) have been carried on with a view to cutting a channel for the Glen Elgin (or Rocky) River, through a ridge on the eastern side of the watercourse to Curry's Gully, and thereby diverting the river and lowering the water about 10 ft. from the level at which it usually stands at that point, in consequence of being dammed back by hard granite bars. These bars also prevent the escape of sand and accumulated tailings, the result of sluicing for gold in the river before the field was abandoned.

"When the proposed cutting is completed this sand and tailings should be swept through the new channel, leaving but a small stratum in the bed of the river to be removed to get at the gravels, in which payable gold is expected to lie.

"The cutting is being sluiced out by means of a strong head of water raised by a centrifugal pump at the river, and flumed thence about 850 ft. through a pipe 10 in. in diameter, at an elevation of 47 ft. 6 in. above low-water level, to the ridge known as the Red Bank, through which the cutting is being carried.

"From the point where the fluming strikes the ridge a race about 1,200 ft. long, with a depth of about 10 ft., conducts the water to the other end of the cutting in Curry's Gully; and the drift from the cutting is thus carried by the water through Curry's Gully into the river at a spot some miles below that at which the pump is fixed.

"The supply of water from the pump is supplemented from a race known as 'Aked's race,' about 4 miles long, cut to convey the water, which in wet seasons is supplied abundantly from Stebbard's Gully. By these combined streams Curry's Gully is kept clear from all debris sluiced from the cutting."

"To concentrate the force of the water through Curry's Gully the upper part of the gully has been logged up to form a tail-race over 500 ft. in length, and varying in depth from about 5 ft. downwards.

"The stuff from the cutting is thus carried without difficulty through that part of the gully where the least fall exists, and beyond that the fall is more rapid to the river.

"At the Curry's Gully end of the cutting a granite bar was found, which required picking for a width of about 200 ft., and consequently the progress was but slow. After passing that bar, the granitic drift, of which the Red Bank is chiefly composed, was carried away by the water very readily, about 8,000 cubic yards being sluiced out during one month.

"The intention now is to sluice off the upper part of the cutting to a depth of 20 to 25 ft., and then to lower the delivery pipe of the pump to that extent. When at the reduced lift double the quantity of water nearly can be raised by the pump, and conducted by two fluming pipes (each 10 in. in diameter) to the face of the cutting, instead of by one only, as at present.

"With this increased flow the work should proceed much more rapidly, as the present level to which the water is raised is excessive for a 10-in. column. The pump in use is one of J. H. Gwynne's special 10-in. centrifugal pumps, driven by a 16-h.p. engine, and it does its work excellently. (For such high lifts I have found no pumps better than those of that firm's make, No. 3 pattern, with bearings and standards on each side of the driving pulley.)

"The engine is one of Ruston, Proctor & Co.'s 16-h.p. (portable), with all latest improvements, and the increased speed required is obtained by means of intermediate gear.

"The engine stands on bed-logs, and all the appliances are substantially fixed at a level beyond the probable reach of floods. The pump well is timbered and slabbed throughout (depth 21 ft. 6 in.), and a race also secured with timber throughout its entire length (132 ft.), conducts the water from the river to the well.

Engine

"Engine, gear, and pump are enclosed in buildings roofed with galvanised iron. The fluming is supported on trestles (stayed and braced) placed at intervals of 9 ft., and varying in height from about 45 ft. to 5 ft.

"Other buildings have been erected in connection with the works, *e.g.*, blacksmith's shop, manager's house, store-room, &c., and a paddock has been fenced for horses.

"Trial shafts have been sunk along the line of the cutting, and the ground tested with boring rods.

"All is in working order, and the work is being carried on with as many men as can be advantageously employed by the Company.

"Before taking the engine to the works the Company repaired and made the road in sundry spots through a distance of, say, 4 miles, between the Red Bank and Bald Nob Causeway, being constructed over gullies, and some culverts, &c., built.

"The whole of the subscribed capital of the Company has been exhausted in the works, and preferential shares have been issued to provide funds for the completion of the cutting, &c.

"The cutting will contain about 200,000 cubic yards."

About 350 oz. of gold were won during the year, from the alluvial, mostly at Oban—in value at £3 15s. per oz., £1,312 19s. From Timbarra to Oban gold is very generally disseminated in the broken granite country, on the eastern fall of the Tableland, and adventurous bands of miners in the early days of the gold-fields were well rewarded for their enterprise by the discovery of rich patches in the alluvial at Timbarra, Glen Elgin, Oakwood, and Oban.

As the colour can be obtained everywhere in this long stretch of country, it seems singular that none of the numerous reefs have as yet been proved to contain payable gold. Indications pointing to these reefs as the probable source of the free metal are not wanting, and some fortunate prospector may yet discover close at hand a mine of wealth which the average digger is accustomed to look for only in costly rushes to distant and often unhealthy localities. Years ago water-worn pebbles of quartz with gold freely exposed on their rounded surfaces were picked up in the bed of the Mann River, at Newton-Boyd; but although search was made upwards in the wild country through which the river flows the golden matrix whence the pebbles came was never dropped upon.

At Kookabookra a gold-bearing reef was opened, and samples tested at the Mint gave an ounce to the ton.

The stone tested was not rich, but as the deepest sinking was only 30 ft. it is quite within the bounds of probability that a timely assistance of capital might have enabled the needy prospector to reach at a greater depth a more valuable result of his labours.

The discovery of a payable reef on the line I have indicated would do much to open up a rich but neglected belt of mineral country, and it would be well to devote a portion of any money available for prospecting purposes towards a search in the direction I have pointed out.

Bismuth.

At the Kingsgate mine an average of about thirty men and boys have been at work, and the output, according to the returns of ore forwarded to Newcastle by railway, has been 82 tons 12 cwt. 2 qr. 15 lb. This, at the rate of £250 per ton (the ore being averaged at 50 per cent.), gives a total value of £20,656 5s. No reduction of this ore is attempted in the Colony, as it is found more profitable to have the work done in England.

PEEL AND URALLA DISTRICT—BINGERA DIVISION.

(*Mr. Warden Lawson, P.M., Bingera.*)

I HAVE the honor herewith to submit my annual report of the mining industry in the Bingera portion of the Peel and Uralla mining district. Although favoured with an unusually heavy rainfall this season, affording every facility for prospecting, results have not realized expectations. Mining matters are as follows:—

Copper.—The Prince of Wales mine all silent.

Silver.—The eleven leases at Upper Bingera abandoned.

Diamonds.—The machinery and plant of the A. D. M. Company still idle—a few men working testing ground. Only Craddock and party, who hold very good ground, have manifested the perseverance that merits success.

Gold.

Bingera.—H. Miller and party have reopened the All Nations reef on the hill. The returns from the trial tests have been so satisfactory that they intend to erect a battery to develop the reef.

Bobby Whitlow.—Still continues to support a few old residents, small consignments of gold coming in regularly. Tenders are invited for trial shafts on the Prospecting Reserves in this locality.

Upper Bingera.—Very little doing, although a number of leases have been cancelled.

Barraba, Tea Tree.—During the year the Pioneer G.M. Co. have erected a battery. In spite of finding some very rich patches of stone, the general result has not elated the proprietors. Some 3 miles distant Johnson and party struck some rich stone; leases are taken up some distance along the line.

Woods Reef.—Some rich ground has been opened up extending several miles. The Old and New England G.M. Co. have abandoned their lease, now reoccupied by new hands. The adjoining lease has yielded very rich specimens; the proprietors are erecting a battery. Several parties are on payable gold. During the past year more gold has been unearthed than in 1885. Greater activity and vitality exist, especially in the Barraba section.

PEEL AND URALLA DISTRICT—TAMWORTH DIVISION.

(*Mr. Warden Irving, P.M., Tamworth.*)

THERE being Wardens in charge at Uralla, at Nundle, and at Bingera and Barraba, and there being no proclaimed gold-field in my portion of the above mining division, I have but little to report.

Twenty-five miners' rights and three mineral licenses have been issued by me during the year 1886, but I am unable to state how many miners are working in my portion of the mining division.

Gold is occasionally found in the Swamp Oak and Mullah Creeks. No reef deemed payable has yet been found in that neighborhood.

Lately some prospecting for gold has been tried 2 or 3 miles from Tamworth, in the ranges behind the town. I have been shown some gold in minute specks, stated to have been taken from the casing of a small reef in those ranges.

There is no mining for copper now being carried on in this portion of the mining division. There is some mining for tin, I believe, pursued on the extreme border of what may be considered my district; but I have no knowledge of the amount of success such mining has achieved.

I may say the same of some manganese mines.

I regret I have not a better report to make, but I do not hope much, from all I know of the country round Tamworth, as to its being likely to afford employment for a mining population.

PEEL AND URALLA MINING DISTRICT—SCONE DIVISION.

(*Mr. Warden W. F. Parker, P.M., Scone.*)

I HAVE the honor to submit my report of the working of this gold-field for the year 1886, viz., at Moonan Brook and Stewart Brook, distant about 40 miles from Scone. At Moonan Brook about 230 tons of quartz-stone have been raised and crushed during the year, giving an average yield of about 1 oz. of gold per ton. There are only four claims being effectively worked here at present. One of these, Messrs. Williams, Barber, & Co.'s claim, situated on the Crow's Nest Hill (the highest point of which is nearly 5,000 ft. above the level of the sea), commenced sinking a new shaft, and have already raised about 10 tons of quartz, which they estimate will yield $1\frac{1}{2}$ oz. of gold to the ton, and with appearance of improvement. This shaft is distant about $2\frac{1}{2}$ miles from Moonan Brook township, on the brow of a very steep hill, about 800 ft. higher than Moonan. Mr. E. Williams, one of the prospectors, informed me that during the latter part of last year he had raised 12 tons of quartz from a spot on the same hill, distant about $\frac{1}{2}$ mile, $6\frac{1}{2}$ tons of which yielded 7 oz. of gold to the ton, and the remaining $5\frac{1}{2}$ tons 3 oz. to the ton; thus affording strong evidence that if the field was prospected to any extent good average returns would be obtained, and the water-power quartz-crushing machine now lying idle also would be fully and profitably employed. The chief difficulty that the miners here have to contend with is the large amount of labour required in conveying the quartz to the crushing mill, thus making it too costly for anything but good stone that would go at least 1 oz. to the ton. There is any quantity of stone to be raised both here and at Stewart's Brook that would yield from 5 to 10 dwt. of gold per ton, which, of course, would not pay for the cost of labour. The country around here at the present time looks beautiful, an unlimited supply of both grass and water. Messrs. Tegg and M'Laughlin are now engaged in sinking a shaft on Fuller's Reef Hill, being down about 50 ft., taking out stone for crushing, which they hope will yield well.

At Stewart's Brook, distant about 6 miles from Moonan, there are five claims working on quartz-ground, employing ten miners. The water-power quartz-crushing machine here has been idle during the whole year, with the exception of one crushing.

The claim of Messrs. Ahearn and party looks very well. They inform me that out of a small lot of 2 tons of quartz out of this claim 17 oz. of gold were obtained. There are about 200 tons of good quartz-stone at grass now awaiting crushing, 100 tons of which they estimate will go 4 oz. to the ton, and they expect the machine to be at work before the end of this month.

Respecting the prospect of the field generally, I regret to inform you that my anticipations for last year have not been realized; in place of an improvement there has been a falling off. If the quartz-stone raised at Stewart's Brook had been crushed before the end of the year, the yield of gold for the year would have been at least equal, if not in excess, of the return for 1885. As it is, about 300 tons of quartz have been crushed, realizing about 300 oz. of gold. There is no prospecting going on at present. If the claims at Stewart's Brook turn out well no doubt there will be a small influx of miners, which may lead to some prospecting being done. Respecting the other particulars, I beg to refer you to the report of the Mining Registrar forwarded by same post.

PEEL AND URALLA MINING DISTRICT—NUNDLE DIVISION.

(*Mr. Warden Jones, P.M., Nundle.*)

I HAVE the honor to submit my annual report upon the mining industry in the district under my charge, including Nundle, Bowling Alley Point, Dungowan, and the Hanging Rock, in the Peel and Uralla Mining District.

Although the expectations formed by me at the close of 1885 of the progress that would be made in this district during the past year have not been fully realized, I have the pleasure to report a decided improvement in the win of gold from quartz and alluvium, and a slight increase to the mining population, despite the allurements of Kimberley, Teetulpa, Fairfield, and other rushes. A few of the miners did leave this field, almost all of whom have returned, and more impressed than ever that their chances here are better than at any of the places they had visited, taking into consideration the advantages of a knowledge of the gold-bearing localities, a climate that cannot be surpassed in its salubrity, and situated in the centre of a rich agricultural district, insuring cheap supplies, and distant from the metropolis one day's easy travel.

Quartz.

This branch of mining shows an increase in tons crushed of 126 tons, with an increased average in the win of gold per ton of 10 dwt. 17 gr., totalling 287 oz. 10 dwt. in the quartz crushed at the machines, with the further substantial increment of 128 oz. from stone hand-crushed from the small veins near the Hanging Rock and other localities. During the year two very good reefs were found near Madden's Gully, between Nundle and Bowling Alley Point, and are now profitably worked, being situated about $1\frac{1}{4}$ mile from the Marquis of Lorne machine. These reefs are known as the Scandinavian and the Bonny Dundee. From the former 70 tons have been crushed, with a result of 120 oz. of gold of such fine quality that it realized at the Mint £3 17s. 6d. per ounce. The reef averages over 12 in. in width, and at present in easily-worked ground, but from its appearance will ultimately form between hard diorite walls. The Bonny Dundee have not yet had a crushing. From the look of the stone I expect the returns will be almost equal to the Scandinavian.

I regret having to report that a fair prospect of the large reefs found east of the Serpentine at the Hanging Rock has not been made during the past year. This has not occurred from the want of confidence by the miners in their being payable, but solely from the want of means to continue prospecting.

So

So far the returns are from 4 dwt. to 14 dwt. per ton. This would pay splendidly with crushing machinery near at hand, as the reefs are large and in easily-worked ground; but they cannot be prospected by the working miner without the aid of capital. These remarks are equally applicable to the Lady Mary and other reefs where the miner has worked for months to find that the whole returns of his labour have been absorbed in the heavy expenses incidental to quartz-mining, with a cartage of 9 to 10 miles in addition thereto. The miner has then to fall back upon the alluvium, and if fortunate enough to obtain another small rise he will probably return to his abandoned reef to face a lot of dead-work in accumulated water, shafts, drives, &c., fallen in, to end again, from the want of capital, in the previous result. Then, as instances have occurred here of others taking up the ground, being backed with capital, obtaining almost immediately profitable returns, assisted to the result by the unremunerated labour of the original holder.

There is a grand field here for the prospector and the capitalist, and I feel convinced that, after a residence of three years, this place will yet take a leading position in the reefing districts of the Colony.

Alluvium.

Having had a fairly good supply of water during the past six months, this class of mining shows an increase in the win of gold of 172 oz. 9 dwt. 6 gr. upon the year 1885. There has not been any systematic prospecting done in the alluvium, with the exception of Hale and party, on their 10-acre G.M. lease at Anderson's Flat, Bowling Alley Point. They made great efforts to contend against the large influx of water, and with the aid of a powerful Tangye pump succeeded in reaching the wash, and obtained an encouraging prospect of fine gold of good quality. Owing to the heavy rains continuing, it was found their machinery was not of sufficient power, and they were reluctantly compelled to suspend their operations to a more favourable time. I shall be glad to see work recommenced and a fair test given to the ground. It is the opinion of several old miners that if the water difficulty is once surmounted this will become a very valuable mine, open up a good piece of country, and give remunerative employment to a number of miners for many years. No prospecting for the lost rich cement leads has been made. The increase in the win of gold from the alluvium has been obtained principally by the Chinese from old and abandoned creek and river claims; and as they carry on with their workings a substantially constructed tail-race, they are enabled to command a large area of old ground, employing a considerable number of their countrymen beyond what is required by the regulations to hold the ground, but they do not take out miners' rights for the surplus labour; therefore the miners' rights issued do not show the actual number of miners employed on this field. The cement claims (leases): Henderson and party, abandoned their ground for the past four months, owing, I am led to believe, from a divergence of opinion among the shareholders as to the mode of continuing the working, and as neither side would give way, it resulted in the abandonment of the leases. I reported to you the non-compliance of the labour covenants, and recommended the cancellation of the leases. This ground will not be long idle after the cancellation is effected. Mt. Ephraim has been worked during the past year in its usual primitive mode of mining. Mr. Wilkinson's suggestion to sink or drive for bottom (the nature of the ground permitting of either) has not been carried out. This claim cannot, as I have previously reported, be efficiently or profitably worked without the necessary hydraulic appliances and other machinery. The present working shareholders are in the position to incur this expense. This claim has been worked by the present holders for upwards of ten years, and never bottomed. Fine gold has been obtained from the surface to a depth of 70 feet, and to a width of 150 feet.

Copper.

Nothing done in this section of mining with the exception that a good test was given to several tons of ore from the Mount Pleasant mine, Dungowan. It was found auriferous, but not payable.

Chrome-iron.

Mr. J. Balfour, of Sydney, took up 120 acres of abandoned leases, situated at Bowling Alley Point, containing quantities of this mineral upon the surface. Nothing towards the development of this class of mining has been done by the proprietor, either in removing ore or prospecting.

I have the pleasure to tender my best thanks to Mr. Isaacsohn, the largest gold-buyer on this field, to Mr. Paul Prisk, of the Hanging Rock, and to other buyers, who so unreservedly placed the records of their transactions at my disposal, to enable me to accurately estimate the gold won during the past year.

The Mining Registrar will furnish a report from the records of his office.

PEEL AND URALLA DISTRICT—ARMIDALE DIVISION.

(*Mr. Warden C. E. Smith, P.M., Armidale.*)

IN submitting my annual report of the gold won during 1886 in the portion of the Peel and Uralla Mining District under my charge, I have the honor to state my anticipation of a more prosperous season, alluded to in my last report, has been to a certain extent realized by an almost superabundant rainfall, which for considerable intervals retarded alluvial and sluicing workings, and, more or less, nearly all mining operations.

The quantity of gold obtained is estimated at 4,000 oz., and it is alleged that fair wages are earned by miners who are engaged in work at sluicing or in shallow alluvial deposits.

At the Duval Gold-field the find has been small, and too much water has interfered considerably with the work on alluvial claims. A reef has been discovered, and crushing machinery will shortly test the quality of the stone, which, if half as rich as the specimens exhibited, will give a handsome return to the proprietors.

The Eleanora Gold-mining Company having purchased the Isabella mine and plant, have increased the size of their battery by an addition of fifteen stampers, which are now ready for work. The Company report having crushed 3,301 tons of stone for a yield of 1,841 oz. 19 dwt. 21 gr. It is alleged £45,000 was offered for their mine, and refused.

Tin-mining appears to be on the decline, as only 10 tons of ore were raised by two Companies, and work is now at a standstill by all the Companies.

PEEL

PEEL AND URALLA DISTRICT—TINGHA AND INVERELL DIVISIONS.

(Mr. Warden Fraser, P.M., Inverell.)

I HAVE the honor to report on the mining industries in the divisions under my charge for the year ending 31st December, 1886.

The output of tin ore for the past year amounts to about 1,600 tons, being a decrease on the previous year's yield of some 200 tons. The ore thus obtained has been entirely got from alluvial claims. These claims are nearly worked out, and unless fresh finds are discovered our output must still decrease. Our mining population has decreased by the migration of about 500 Chinese miners.

The high price of tin has stimulated prospecting, and the numerous reefs on the field are attracting attention. At Sutherland's, Bull's Gully, the old Boliths, the Butchard, and along the range dividing the waters of Middle Creek from Cope's, the reefs are being tested with good prospects, and capitalists will find a good opening for investments.

The diamond-field in the parishes Mayo, Clare, Auburn Vale, Gum Flat, and Stag, is being largely taken up. Heavy finds of small diamonds have been got in several claims; but from defective appliances many stones are lost. By amalgamating interests and introducing improved machinery this industry should succeed, and result in the employment of a large number of miners. Gold and silver are also found in these parishes.

The average value of tin ore on the mines for the past year has been about £54 per ton.

During the year 675½ acres of land have been taken up at this office under mineral lease applications—chiefly for diamonds. Five miners' rights and fifty-five mineral licenses were taken out. This is exclusive of the business done at the Tingha office, which will appear in the Mining Registrar's report there.

PEEL AND URALLA DISTRICT—GLEN INNES DIVISION.

(Vere D. H. Bernard, Mining Registrar.)

I HAVE the honor to transmit herewith my annual report of the Glen Innes Division of the Peel and Uralla Mining District.

There were sold from this office during 1886, 76 mineral licenses, 75 miners' rights, and 4 business licenses; the numbers issued during the previous year being 41, 85, and 4 respectively.

The break up of the long drought has considerably stimulated mining matters here, 19 applications for mineral leases having been made to me, 520 acres in all having been applied for, as against 3 in 1885, with a total area of 80 acres.

Four gold leases, all at Glen Elgin, were applied for last year—in all 200 acres, 5 having been taken up in 1885, comprising an area of 117 acres.

It will be seen from these figures that a marked improvement exists with respect to mining matters in this division.

The difficulty of obtaining accurate information respecting the yields from mines still continues.

The shareholders in the Glen Elgin 80-acre lease, mentioned in my last report, have not been able, I am informed, to make such progress with the work at the creek as they expected, the difficulties to be overcome being considerably greater than they at first anticipated, but it is stated that there is about £600 worth of machinery on the ground.

PEEL AND URALLA DISTRICT—TINGHA DIVISION.

(W. Norton, Mining Registrar.)

I HAVE to report that during the past year there has been a falling off of 185 tons in the output of tin, though in consequence of the higher price obtained the value of the tin raised exceeded that of last year by £1,908.

In consequence of the working out of the shallow ground attention has been turned to the deep ground. Several shafts are being sunk with every hope of success. A good deal of ground has been taken up for the purpose of diamond-mining, and good results obtained, but the great drawback seems to be that there is no local market for the stones.

PEEL AND URALLA DISTRICT—URALLA DIVISION.

(Henry Roman, Mining Registrar.)

IN consequence of the death of Mr. A. M' Rae, late Mining Registrar, having been appointed temporarily his successor in that office, it devolves upon me to furnish the annual report for this gold-field, which I have now the honor to submit.

During the past year the heavy rainfall, and consequent abundant supply of storm and catch water, has had a marked effect in increasing the yield of gold from this gold-field, which, at the present time, is mainly worked by sluicing operations.

In other respects mining has not been carried on to any great extent.

At the close of the year the Long Tunnel Company decided to wind up its affairs, and the plant, mining tenements, and interests were sold to two locally resident miners.

Kingscote's Company for working Brown's Paddock (private property), is still in abeyance, and has not commenced working; the cause assigned for this is the non-arrival of machinery.

At Maitland Point machinery has been erected with which to rework the bed of the Rocky River. Messrs. Perry & Co., the proprietors, estimate that by their process, with seven men working, they will be able to excavate and sluice 300 tons per day, which, if accomplished, should give them very handsome returns. The machinery is not yet working, but is nearly completed, and in a week or two this party expects to be in full operation.

The official visit of Mr. David, Geological Surveyor, and Mr. Stonier, of the Mines Department, their survey, inspection, and report thereon, has caused some activity amongst the resident miners, and several blocks of ground have been taken up in the direction pointed out by Mr. David as the probable continuation of the Sydney Flat lead by Mount Doherty. One shaft (Rice's) has been sunk into the bottom drift, showing very favourable indications, as also gold. The water, however, is heavy, and pumping gear and machinery must be obtained before the ground can be fully tested and developed. The sinking is heavy (basaltic) and deep.

There

There has been reported a discovery of payable gold at Green Gully, near Uralla, but it proved to be only a small patch, and the prospectors have since deserted the ground. The country in this locality is shallow sinking, with patches of surface gold.

The gold which has been locally sold, so far as can be ascertained, amounts to 1,607 oz., the value of which, at Mint rate (£3 19s.), gives a total of £5,625. Beyond this other gold has been conveyed hence by private hand, the amount of which cannot be obtained.

The number of miners' rights issued during the year was 141; business licenses, 4; and mineral license, 1.

There are at present upon this field about 150 European miners and 25 Chinese miners.

PEEL AND URALLA DISTRICT—ARMIDALE DIVISION.

(Charles S. C. Badham, Mining Registrar.)

I HAVE the honor to submit my report of the operations of this portion of the mining division for the past year.

About thirty men are engaged upon the Tilbuster or Duval field in alluvial gold-mining, and seem to be doing well, and about fifteen are similarly employed at Puddlework.

Ten persons are working at claims on a quartz reef recently discovered at Tilbuster, said to contain very rich stone, but no crushing therefrom has yet been reported.

The following areas of ground were applied for under their headings:—

Gold-mining lease, quartz	27 acres.
Mineral lease	40 „

There were sold during the same period:—

Miners' rights	137
Mineral licenses	10
Business licenses	7

I am unable to quote any particulars of the average yield of gold from claimholders, owing to the reluctance of the miners to furnish such information, and the amount purchased at the local Banks and stores is no accurate guide, as the larger proportion is sent elsewhere for sale.

PEEL AND URALLA DISTRICT—WALCHA DIVISION.

(Edward Marriott, Mining Registrar.)

HEREWITH I have the honor to submit my annual report for the Walcha Division of the Peel and Uralla Mining District for the year 1886.

2. Although the yield of gold in this district during the past year shows very little improvement there has been considerable activity, several prospecting parties having been out searching for gold; many claims have been registered and several leases taken up in various parts of the district, as will be seen from the increase in the number of miners' rights issued, as compared with previous years.

3.—Glen Morrison Gold-field.

From a report received from the mining manager of the Glen Morrison Prospecting Company, I am informed:—“The work done up to the present time by the Company has been chiefly sinking the main shaft to a depth of 185 ft., with the intention of cutting the reef at a deeper level—up to present time unsuccessful.” See appendix No. 1.

The claim is intersected by numerous gold-bearing leaders with traces of silver.

The Company are opening out upon the Golden Bar line of reef on the Glen Morrison claim. Reef, about 2 ft. wide, running E. and W., dipping north; underlay, E.; quality of stone, estimated to yield from 1 oz. to 1½ oz. per ton.

(2) Several other claims were registered in the locality during the year, the principal one being the Walcha Gold-mining Company (James Farrell and party, prospectors). This Company have been working for some time past, and from reports received they appear to have a fair chance of success. See appendix No. 2.

4. Tia River Reefs.

(1) Matheson & McIntyre.—The proprietors of the principal claim in this locality report 12 or 14 tons of stone raised from the new reef, the old reef having taken off, which, after great difficulty in driving and sinking, was ultimately found. No stone has been crushed for the Company this year. Some trial crushings were conducted for the prospectors on a newly discovered reef known as the Sleeping Beauty, particulars of which are given in a report from the proprietors of that mine, as under. See appendix No. 3.

(2) John Jerry and party (prospectors), Sleeping Beauty Reef, Tia River.—In September last the prospectors reported payable gold in their claim, and several other claims and leases were taken up in consequence. Most of these have however been abandoned, whilst a few have registered for “suspension of work.” From various causes the prospectors' claim has changed hands, and the present proprietor (Mr. David George) will resume work shortly. Trial crushings from this mine, amounting in all from 80 to 90 tons of quartz, yielded about 27 oz. of gold, which did not quite come up to expectations. See appendix No. 4. See appendix No. 5.

5. Nowendoc Gold-field.

(1) Mr. Thomas Laurie, an old resident, reports:—“Mining in this locality is almost at a standstill, with the exception of a few of the old hands, who are earning from 20s. to 40s. per week. There is some new gold found about 20 miles east of Nowendoc, some pieces up to 1 oz. in weight having been obtained. Altogether gold-mining at Nowendoc just now is at a low ebb. See appendix No. 6.

(2) Mount Carrington Claim, situate at Nowendoc, on a tributary of the Coopera Curriba River, about 10 miles from Nowendoc Station. Proprietors, Messrs. Henry Whittam and B. A. Moses. Mr. Henry Whittam took up a prospecting protection area in the locality abovenamed some three years back. He has constructed a drive into the mountain about 300 ft. in length, 4 ft. wide, and 6 ft. high, clear of the timber, the drive being timbered right through from the entrance. The ground is of a sedimentary foundation. Whittam is following what is termed an “eruptive dyke,” and so far he has had encouraging prospects. He has done the whole of the work by himself, and he is deserving of every success. See appendix No. 7.

6. During the year 4 gold-mining leases were applied for; 31 claims were registered, and the number of miners' rights issued was 88, as against 29 for the previous year.

See appendix
No. 8.

7. The quantity of gold purchased in town, as far as can be ascertained, amounts to about 54 oz. Average value, £3 12s. to £3 14s. per oz.

PEEL AND URALLA DISTRICT—BINGERA DIVISION.

(*Thomas Connolly, Mining Registrar.*)

I BEG to submit to you my report for the year 1886 for the Bingera Division of the Peel and Uralla Mining District. Mining, on the whole, has been very dull, and the few miners working obtained very little gold, the first part of the year being too dry, and the remainder being too wet. Fourteen mineral leases have been applied for; but no work done. Fourteen gold-mining leases have been applied for; two worked with very good results. Withers and party, Upper Bingera, have succeeded in getting on the gold in Ballarat lead, but were beaten by the influx of water. An engine and powerful pump are now on the road for their claim; and I hope to be able to report next year a large return from this property. At Lower Bingera, Wearne and party are getting a crushing plant, with latest appliances, from Melbourne, for the All Nations reef—the assay from average stone, 5 oz. 12 dwt. 12 gr. per ton. The battery for this belongs to the Dunn Brothers. I have issued 151 miners' rights, 10 mineral licenses, and 2 business licenses for the year; and the gold won, so far as I can ascertain, is 645 oz.

PEEL AND URALLA DISTRICT—BARRABA DIVISION.

(*K. Theo. Garland, Mining Registrar.*)

IN submitting to you my report on the Barraba Division of the Peel and Uralla Gold-mining District for the year 1886 I have the honor to inform you that I have sold 98 miners' rights and 2 business licenses for the past year.

There are at present about seventy miners working and prospecting at Woodsreef and Crow Mountain, also Tea-tree Creek, many of whom are shareholders of leases lately taken up—twenty-seven leases in all. I find it difficult to furnish a complete and satisfactory report owing to the scattered way in which the miners are located, some of whom are free selectors, shearers, &c., seldom or ever to be found at home. At present there is every prospect of a large population coming here, if the rumour be true of the last find of gold, alleged to have been obtained at Woodsreef, 10 miles from here. Woodsreef is an old-established place, where formerly a large number of miners were working. Mr Salter, an old resident of Barraba, is now erecting a quartz-crushing battery there. During the past year the New and Old England Gold-mining Company (late of Woodsreef) sold their battery complete to the Barraba Pioneer Gold-mining Company of Tea-tree Creek, to which place the battery was removed, and is at the present time working there.

PEEL AND URALLA DISTRICT—BENDEMEER DIVISION.

(*L. S. Stumbles, Mining Registrar.*)

I HAVE the honor to report for your information that during the year ending the 31st December, 1886, there have been ten applications for mineral leases received at this office for the purpose of mining for tin, that being the only mineral at present worked in the district. There have been eight mineral licenses, six miners' rights, and one business license issued from this office. The Longford Tin-mining Company raised 5 tons of tin, which was disposed of at £56 per ton; Charles Allan and party raised 5 tons, which was disposed of at £56 per ton. There is no work at present going on at the creek, all the Companies having suspended work, the ground being too patchy to pay.

PEEL AND URALLA DISTRICT—NUNDLE DIVISION.

(*W. Hawley, Mining Registrar.*)

I HAVE the honor to submit my annual report upon mining in this district, with statistics compiled from the records of this office.

There were issued during the past year from this office—Miners' rights, 185; business licenses, 12; mineral licenses, 1; this shows an increase of 12 miners' rights and 3 business licenses upon the previous year. Number of leases applied for—Quartz, 3; alluvial, 3; mineral, 3. This shows an increase of 4 gold-mining leases and 3 mineral leases upon the former year. Number of claims registered—Quartz, 28; alluvial, 11; total, 39. This shows an increase of quartz claims registered of 26, and a decrease in alluvial claims of 12; with a total increase of claims registered, upon 1885, of 14.

Quartz.

Crushed at machines, 546 tons, realizing 647 oz. 5 dwt.; hand-crushed, 128 oz., = 775 oz. 5 dwt., showing an increase of tons crushed, 120; and an increase in the win of gold, 415 oz. 10 dwt.; being an increased average for tons crushed of 13 dwt. 17 gr. Total of gold won:—Alluvial, 2,460 oz.; quartz, 775 oz. 5 dwt.; total, 3,235 oz. 5 dwt. Increase of gold won upon the previous year:—Quartz, 415 oz. 10 dwt.; alluvial, 172 oz. 9 dwt. 6 gr.; total, 587 oz. 19 dwt. 6 gr. Estimated value of the gold won:—3,235 oz. 5 dwt., at £3 14s. 6d. per oz., £12,051 6s. 1½d.

Machinery.

Value of Quartz-mining machinery	£3,420	0	0
„ Alluvial „ „	150	0	0
	£3,570	0	0

This shows a decrease in the estimated value of machinery, in 1885, of £430.

By these returns it is a very pleasing duty to me to be able to report a very great improvement in mining in this district upon that of the previous year. This improvement is the more marked when you take into consideration the small number of miners employed on this field; and it was made under many difficulties in the first place. Alluvial mining, owing to the intermittent supply of water, was greatly retarded. I believe I shall over-estimate the period in which work was actually carried on in the alluvial in stating that the miners were fully employed during the past year for four months.

Quartz-mining

Quartz-mining is languishing from the want of capital. This section of mining is carried on solely by the working miners. I am unable to understand the cause of the capitalist holding off from venturing upon this *bona fide* field of enterprise, as on the only claim in quartz that received aid to develop it (of late years), paid off, in a very short period, the whole amount expended on machinery, &c., and has ever since paid handsome dividends.

I have a thorough knowledge of this district, having resided here for twenty-five years, and I believe that it will yet take a foremost position in the gold-reefing districts of New South Wales.

HUNTER AND MACLEAY DISTRICT—COPELAND DIVISION.

(Mr. Warden De Boos, P.M., Copeland.)

MINING affairs, which have been gradually ebbing for the last four or five years, have during the past year remained at about the same level. Things are dull, but the general aspect of affairs is not by any means so discouraging as it has been during the period I have mentioned. Hardly any outside capital has been brought upon the field, and the miners have been trusting entirely to their own individual and unaided efforts; and I am happy to say that in most instances their trust has not been misplaced. In this mode of working, however, there is, as I have too often had occasion to mention, the drawback that economy of labour cannot be studied, as the men, not having the capital wherewith labour-saving appliances may be procured, are obliged to have recourse to the means at their hands. Even with all the disadvantages attendant upon the primitive process of working, it is a satisfaction to be in a position to state that the yield of gold for the year has increased, whilst the number of miners has decreased, so that in this respect things may be regarded as looking more hopeful.

The tributors on the Hidden Treasure have shown a very good example, not only of energy and enterprise, but also of systematic working; and as they have been rewarded by a good return for their labour it is their intention to adopt several labour-saving appliances, which will be a guide to others who may be in a position to follow the example. This is really the only claim that calls for any notice at my hands, for, apart from this co-partnership of tributors, the work on the field has been entirely carried on by individual miners; and although there may have been a few unlucky individuals the work, on the whole, has been remunerative.

The number of miners' rights issued during 1886 was 126, as against 130 during 1885; but of this 126 about 10 have been issued for the Manning, where some new ground is undergoing trial; but with the number of miners' rights less than in 1885 the yield of gold during the past year has been greater by 600 oz. than in the year preceding.

The return herewith will show by the different localities whence the gold has been procured, how very generally the precious metal is diffused over the field, and how extensive an area is here offered for systematic and intelligent working. As I have pointed out almost yearly in my reports, the individual miner is very heavily handicapped: first, with working expenses, owing to the absence of all labour-saving appliances; and next, with the cost of carting and crushing. So much is this the case that a yield of anything under 2 oz. to the ton is barely payable.

Now the Hidden Treasure tributors assure me that by the system they have adopted of working the ground they can make a good profit out of 1 oz. to the ton, even with the drawbacks they still experience. When these are removed they will be able to make 12 dwt. to the ton payable. Taking the stone throughout on a face from all the working claims on the field, and putting it through the batteries would, I feel convinced, give a general return of 15 dwt. to the ton, with a chance of now and again coming across a rich patch such as those which were met with in the early days of this field.

Only by the outlay of capital could such an end as this be attained, and under the present aspect of affairs to look for capital would be hopeless, as the many small existing leases prevent any Company from obtaining such an extent of ground as would render a large outlay justifiable. The Department has done its utmost to clear away many of these speculative leases, but unfortunately the ground is taken up again and again, almost as soon as it has been declared forfeited.

The number of leases applied for during the past year has been small, as, I am glad to say, the miners have in many instances been working ground held under the Mining Board Regulations, thus showing an honest intention to work rather than to manoeuvre, as is too frequently the case under the lease-holdings.

I may add, in conclusion, that the reefs of the district are, at least, likely to be fairly tested, as a syndicate has taken up eleven 25-acre blocks of Church and School Land, which include the Prince Charlie, the Homeward Bound, and the Mechanics lines of reef. If these are worked under good and intelligent management there are hopes that the result will be such as to lead to other areas being similarly dealt with.

PARTICULARS relating to Mines producing Gold during the year 1886.

Compiled from Companies' returns.

Name.	Greatest Depth.	Deepest level.	Width of lode.	Quartz crushed.	Yield.	Value.	Dip in vein.	Strike of vein.	Value of plant.	Remarks.
	feet	feet	Inches.	Tons.	oz.	£	S. by E.	N.E. & S.W.	£	
Prince Charlie	205	150	12 to 48	100	14	49	S. by E.	N.E. & S.W.	600	Claim not working, only tailings put through.
Mechanics	250	250	9	17	40	140	E.	N. & S.	10	
Mountain Maid	512	420	6	59	376	1,316	S.	N.W. & S.E.	100	
Do. No. 1	270	260	6	27	96	336	S.	E. & W.	50	
Do. No. 2	210	205	4 to 15	23½	46	161	S.	E. & W.	50	
Do.				27	4	14				Refuse stone.
Hidden Treasure	401	401	24	239	304	1,064	W.	N. & S.	1,000	Hand-crushing, which gave 197 oz for 77 tons.
The Mint	140	140	10	69	182	637	N.E.	S.E. & N.W.	25	Bowman River, present stone promising well.
Homeward Bound	30	30	36	65	127	444	E.	N. & S.	10	
Town & Country (No. 2 central)	46	46	5	28	36	126	E.	N. & S.	10	
Golden Crown				12	37	129				Surface workings.
Morning Star	50	50	12	20	16	56	E.	N. & S.	20	Surface workings.
Golden Spur	350	350	30	40	7	24	E.	N. & S.	20	Bowman River.
Mountaineer Bowan	110	220	4 to 18	60	217	780	S.	E. & W.	50	
No. 1 Boranel	146	146	15	26	62	217	E.	S. by W.	40	
Lord of the Hills (refuse)				13	7	24				} Refuse stone.
Stockyard do				7	2	7				
Tailings (Thomas)				150	27	94				
				958½	1,600	5,626				

HUNTER AND MACLEAY DISTRICT—BULLADELAH DIVISION.

(Mr. Warden Fawcett, P.M., Bulladelah.)

I do myself the honor to report as follows respecting the Bulladelah portion of the Hunter and Macleay Mining District.

Several new claims have been taken up since my last report, and payable stone has been obtained in all of them.

The great desideratum on this field, the means of crushing, will soon be available, as Mr. James Stuart has machinery ready to be erected on M'Rae's old claim, as well as on a machine site applied for by him on the Maclean or Coolongolook River. The machinery on both places will be erected as soon as the claim referred to can be transferred to Stuart, and the machine site has been surveyed.

Suspension of work having been granted on the Mountain Maid and the Curreeki, day and night shifts are at work to master the influx of surface water caused by the almost continuous rain for weeks past. When the workings can be shown in a dry state it is intended that those claims should be amalgamated and placed in the hands of a Company. The former has 30 tons of stone at grass, reckoned to be as good as some tons sent to Sydney which realized 2 oz. to the ton. The Curreeki has 5 tons at grass, equal in quality to 6 tons sent to Sydney which produced upwards of 4 oz. to the ton. Stuart and party have struck rich stone in the cap of the reef, 80 ft. in "Who'd have thought it," and only wait for a lease to continue working.

The Mountain Widow has 30 tons at grass ready for the machine when erected.

At Bunker's Hill, some 3 miles from Coolongolook, good stone has been got, and the same may be said of Paddy's Creek, 7 miles from the same place.

All that is now waited for is the erection of machinery and the issue of leases.

I look forward to this being a prosperous gold-field, and always considered it a place which only required machinery, capital, skill, and economy to make it so.

Its drawbacks are the dreadful state of the road between Coolongolook and Bulladelah, and the want of a second mail in the week between those places. I do not speak of the necessity of a telegraph station, but that, it is to be hoped, will be granted in more prosperous times.

HUNTER AND MACLEAY DISTRICT—KEMPSEY DIVISION.

(Mr. Warden Ducat, P.M., Kempsey.)

I HAVE the honor to submit my annual report for the year 1886 for the Macleay Division, under my charge, and have the unpleasant duty of reporting almost a complete cessation of all mining workings within the division.

1. There are three or four prospecting parties out on the Hastings River, around the neighbourhood of Mount Sea-view, on the various creeks running into the branch named the Forbes River. Gold has been found at various localities, but not in sufficient quantity to be payable or to be reported as a gold discovery. The gold found is from the wash-dirt near the surface, and is of a rough shotty description, indicating a better field somewhere near the neighbourhood. No reef has yet been discovered by any of the parties prospecting.

2. No work is being done at the silver-mines, Warrell Creek, the lease not being yet issued for the ground applied for.

3. Owing to the fall in the price of antimony in the English market the several mines for such ore are at a complete standstill. The Corangula Antimony Company's works have not been worked for more than a year back, all the plant and machinery being laid up perfectly idle.

The fields at Missibotti and on the South Bellinger are likewise unworked, the leases not being yet issued, and the applicants do not see sufficient encouragement in the price for the metal to induce their spending more money and labour to fully develop the reefs and test the yield and quality of the ore.

4. The applicants for lease of ground at Port Macquarie to mine for nickel and cobalt are working and sinking a shaft. A test of some ore brought to grass gave satisfactory results.

Five applications were issued for mineral leases, twenty-two miners' rights, and ten mineral licenses were sold during the twelve months.

HUNTER AND MACLEAY DISTRICT—DUNGOG DIVISION.

(Chas. Graham Smith, Mining Registrar.)

I HAVE the honor to report that in this division of the Hunter and Macleay Mining District there are only two gold-mining claims being worked, viz. :—The Golden Spur Company's claim at Lower Wangat, and Gurr and Company's claim at Upper Wangat.

From the Golden Spur Company's claim 117 tons have been crushed during the past year, yielding 190 oz. 14 dwt. 18 gr., valued at £596 10s. The deepest level is 300 ft.; lode, 8 in. wide; dip, 1 in 4, bearing east and west; strike, north; six men employed.

From Gurr & Company's claim, at Upper Wangat, 93 tons gave 74 oz. 16 dwt., valued at £226 7s. 6d.; deepest level, 175 ft.; lode, 12 inches wide, bearing north and south; strike, east; four men employed.

These claims are 4 miles apart, but probably the same lode is worked in them.

There are two batteries near the workings, of ten and five stampers, respectively, of 14-horsepower, and valued at £1,200 and £600.

The plant of the Golden Spur Company is valued at £150, and that of Gurr & Company at £20.

Seventeen miners' rights have been issued by me from the 1st of this month, but there are only ten *bona fide* miners in the locality. The total population consists of 14 men, 7 females, and between 20 and 30 children.

NEW ENGLAND DISTRICT—TENTERFIELD DIVISION.

(Mr. Warden J. B. Graham, P.M., Tenterfield.)

I do myself the honor to submit my annual report on the portion of the New England Mining District under my control.

During the past year gold-mining has revived to a great extent in this district; rich discoveries have been made, and a great impetus given to prospecting, which has resulted in the opening up of important gold-fields. Early

Early in the year gold was discovered at Drake (or Fairfield), in a portion of private land, the property of Mr. George Smith; it turned out very rich, and a rush took place. A large area of land in the vicinity has been taken possession of for gold-mining purposes, and it being a new gold field, labour, in accordance with the regulations, has been employed. It is estimated that there are now about 700 miners engaged in the field. Several very valuable reefs have been opened. Some of the leases have been purchased by syndicates for the purpose of floating into Companies, and there is every prospect of the development of the mine by the expenditure of capital.

The reefs have not yet been sufficiently developed to enable me to report on them, except that in the majority of cases, as far as they have been tested, they show payable gold, and large reefs, some as wide as 10 feet. The average estimated yield of the principal reefs is about $2\frac{1}{2}$ oz. to the ton.

About 8 miles north from Fairfield another important field has been discovered; it is called the "Red Rock." I have not yet had an opportunity of visiting the place, but the reports are very satisfactory. There is likely to be a large Company floated there, and machinery erected to be driven by water-power. The Red Rock is a perpendicular cliff about 400 feet high, at the foot of which runs the Cataract River, in which there is plenty of fall and unlimited supply of water for machinery purposes. A number of leases have been taken up in this locality, and as the extent of auriferous rock is said to be very great, the cheapness of water-power and convenience of machinery sites should make this a valuable gold-field. There are many other finds in the locality, but the want of machinery prevents their development.

One hundred and two (102) gold leases have been applied for at Fairfield during the year, and 512 miners' rights and 37 business licenses have been issued, and 142 mining tenements registered. I would refer you to the report of the Warden's clerk, in which further particulars will be found.

The next most important find has been at the old abandoned gold-field at Boonoo Boonoo. Some rich gold has been discovered, and a number of leases have been applied for, some on the old abandoned workings, and some on new reefs in the vicinity. This field is also likely to be developed by capital; about 40 leases have been applied for on the field.

There have been 47 applications for gold-mining leases made at Tenterfield during the year. 363 miners' rights, 10 mineral licenses, and 20 business licenses have been issued.

The Surface Hill Crushing Company are carrying on operations at Poverty Point, and the results are said to be good. Ten head of stampers are kept at work, and I understand it is the intention of the proprietors to increase their machinery. The auriferous stone is unlimited; the gold is contained in granite, and the whole range of mountain contains more or less gold. The yield is about 5 dwts. to the ton, and with machinery that can put through large quantities the yield is payable.

Some very rich pockets of gold have been found at Lionsville; but I have not heard of any large or important finds. Very little is doing in any of the other gold-fields in my district. A few men are working at Pretty Gully and Tooloom, in old alluvial, and, as far as can be ascertained, the return of gold from there has been about 200 oz.

The tin-mines in the northern part of the district are still working, but the yield is small. Lodes have been discovered on the Queensland side of the Main Range which show rich stone, and in all probability they will soon be worked. In the event of their turning out profitable it will induce prospecting on the New South Wales fall of the mountains; and I have no doubt, judging from the vast amount of stream-tin ore that has been obtained from the creeks and gullies, heading from the portion of the range known as the "Sugarloaves," rich lodes exist. Nearly all the stream-tin ore found in Ruby, Wilson's Downfall, Wylie, and Cemetery Creeks, on the New South Wales side of the range, and Quart-pot Lode and Sugarloaf Creeks, on the Queensland side, has come from a portion of the range about 1 mile in extent. This portion is well worth prospecting, as the existence of lodes is almost a certainty.

NEW ENGLAND DISTRICT—EMMAVILLE DIVISION.

(*Jno. M. Sheahan, Mining Registrar.*)

I REGRET to have to state that the outlook I predicted in furnishing my last report has not been fulfilled as regards either the tin- or silver-mining industries in this district. I attribute this state of affairs to the fact that almost all the shallow ground having been worked out, the capital required to develop the deep leads has not been forthcoming, a fact much to be regretted, as owing to the high price at which tin has been selling during the last twelve months, I feel confident that in a short time capitalists would be amply repaid for their outlay in developing the deep leads which are well known to exist in this locality.

Another cause of the depression existing during the past year has been the exodus of miners from here to the newly discovered gold-field at Fairfield. Numbers who were making a fair living here, doubtless attracted by the reports of the rich finds at Fairfield, have left for the latter place, a fact which will be shown on comparison of the numbers of miners on this field at present with the number furnished in my last report. Another great drawback to the mining industry is that mentioned in my report last year—the delay in issuing mining leases. Many miners' ardour becomes considerably damped owing to the time they are kept waiting for a title to the land. If the leases were granted in a reasonable time, the ground would be at once tested, but in the present state of things, where a miner has to wait oftentimes more than twelve months for his title, he very often, as I mentioned in my last report, allows his ardour to sink into indifference.

Torrington Tin-mining Company.—This mine is still under the supervision of Mr. H. Marshall. The yield of tin for the past year, 43 tons 13 cwt.; twenty-four hands have been employed. The machinery consists of a 12-horse-power engine, 4 circular buddles, and 5 head of stampers, all valued at £2,000. The depth of the shaft is 116 feet, deepest level 100 feet, and the width of the lode about 1 foot.

The Dutchman Tin-lode Mining Company.—This Company's interests are now under the management of Mr. Alexander M'Gillivray. Twenty men, on an average, have been employed during the past year. The yield of tin has been about 49 tons. The deepest level is about 215 feet in depth, and the average width of the lode is about 2 feet 6 inches. The battery contains five head of stampers, which are driven by a 12-horse power portable engine; the dressing plant consists of 6 jiggers, 4 round buddles, and 1 dead buddle, which are self-acting; a steam-pump raises all the water required from a dam which has been constructed for the use of the plant.

Great Britain Tin-mining Company.—This mine has been worked during the past year on tribute, the number of miners employed being 110 Chinese and four Europeans. The quantity of tin raised amounted to 124 tons.

Hall Brothers, Kangaroo Flat.—A party of tributors, consisting of seventeen Europeans and two Chinese, have been working this mine during the past year, the yield of tin being 66 tons 17 cwt. 2 qr. 11 lb. Owing to a great portion of cement existing in the wash, it has to be manipulated by a battery to obtain the mineral.

Six-mile, Hall Brothers.—This mine has been worked on tribute by six Chinese. The yield of tin has been 3 tons 4 cwt. 2 qr. 27 lb.

Hall Brothers, Grampians.—A party of six Europeans and two Chinese have been working this mine during the past year. The quantity of ore won, 12 tons 9 cwt. 1 qr. 22 lb.

Hall Brothers, Vegetable Creek.—Eight Chinese miners have been employed. Quantity of tin won, 6 tons 9 cwt. 2 qr. 27 lb.

John Moore & Co., Y Waterholes.—This ground has all been worked by the Company. It has been let on tribute during the past year to a party of fifty-four Chinese, who have been employed reworking the old ground. The yield of tin for the past twelve months has been 64 tons 16 cwt. 3 qr. 2 lb. The ore in this mine, owing to the fact of its being impregnated with foreign matter, has to be dressed with a Willoughby machine. This property is still under the management of Mr. Thos. Chandler, Vegetable Creek.

Vegetable Creek and Rothschild Company, Moore & Co.—A party of seventy-three Chinese have been employed reworking the old ground on these two mines. The yield of tin from both mines amounted to 91 tons 17 cwt. 3 qr. and 2 lb.

Bailey & Co.'s, Rose Valley.—About forty men have been employed on an average during the past twelve months. The machinery consists of two engines—one 10-horse power, for raising the wash to the surface; the other a 6-horse power, working a centrifugal pump, for sluicing purposes. During the past year the Company have blocked out 637 feet along the lead at an average width of 60 feet, the average depth of wash being about 5 feet. The drives in different directions amount to about 1,200 feet. Total amount of ore raised during 1886, 223 tons 10 cwt. and 21 lb. Average, about 3 qr. to the load.

Wesley Tin-mining Company, Rose Valley.—This property is still under the supervision of Mr. J. Sales, and has been worked on tribute during the past year by a party of twenty European miners. The amount of ore raised was about 55½ tons. The depth of the deposit ranges from 50 to 190 feet, the height of the wash from 1 to 4 feet, and width from 3 to 5 feet.

Ruby Hill.—This property, which has hitherto been worked by the Ruby Hill Tin-mining Company, under the supervision of Captain Bryant, has lately been let on tribute to Mr. O'Donnell, who is personally supervising the development of the mine. He informs me that the present tunnel is not at a sufficiently low level to drain the water from the workings; the level is now being lowered, and when completed there is a good prospect of a satisfactory return being obtained, the lead of wash being about 14 ft. wide and over 2 ft. in depth, showing good tin.

Nine-mile.—Most of the lodes in this locality have given very good returns. Out of a crushing of 25 tons of stone, Robinson and party obtained over 7 tons of tin. A syndicate have applied for a large quantity of basaltic country in this locality. It is to be hoped that they will prospect the ground thoroughly, so that its value may be proved.

Y Waterholes Mines.—Mineral conditional purchase, 600 acres, formerly Cadell and Mitchell, but now the property of Mr. A. Cadell. During the year 1886 the output of ore was 230 tons 12 cwt. 3 qr. 17 lb., all raised by tributors, European and Chinese, chiefly the latter, who work the ground well, and succeed in making good wages out of land abandoned by European tributors, by their steadily facing out all the deposits, good and poor, frequently discovering rich patches which the inferior washdirt concealed. A large area remains unworked and many parties of men are busily employed in working the leads which still are found at depths varying from 30 to 50 ft. from grass. The mode of working is the same as described in my last report, and the wash raised has produced from 20 lb. to 100 lb. per cubic yard. It is usually dressed to assay 74% (but sometimes as low as 73%), which is easily done with the Willoughby dresser. The average number of men employed has been 13 to 30 Europeans and 60 to 90 Chinese. The claims look promising for the coming year, but the late heavy rains have made the ground rather difficult to work, as shafts have to be slabbed and puddled in some spots, but otherwise all progress satisfactorily.

Vegetable Creek Tin-mining Company, Limited.—No new discoveries have been made on this property, which comprises 1,960 acres, mineral conditional purchase, and several portions under mineral lease. Twelve parties of tributors have been employed, some of whom are simply prospecting either at their own risk or on half wages, with the promise of liberal terms if they strike anything payable. The Company have also their own prospectors employed on wages, but although a large tract of country remains in which deposits may exist all efforts to find a payable continuation of the old Vegetable Creek and Graveyard leads have so far failed. The surface deposits and unworked parts of the present watercourses and gullies have been worked by Chinese and Europeans with more or less success, but are now very poor in tin ore. The Company and their tributors still hope to light upon some new patches, and are searching for such continuously. The engine and working plant are the same as described in my report last year. The ore raised during the year was 99 tons 5 cwt. 1 qr. 5 lb. Average number of men employed, 28 Europeans, 16 Chinese.

Nonpareil Mine, 60 acres, Mineral Conditional Purchase.—This mine, which is the property of Mr. A. Cadell, has been worked by a party of Chinese miners by removing the old tailings which fill the bed of the creek, and, aided by the running water, have obtained sufficient to give them fair wages, although the claim was considered quite exhausted some years since. The number of men engaged has been 5, and the quantity of ore raised amounted to 12 tons 2 qr. 16 lb.

Gordon's Blocks, county Gough, parish Hamilton, 1 to 4.—Messrs. Hart, Cadell, Reid, & Company have systematically prospected parts of these blocks during the past year at considerable expense, but recently have concentrated their efforts in proving portion 4 (near the boundary of Mr. Lennon's conditional purchase, in which Moran and party have been sinking during the past five years to the water-level only). Every shaft sunk by Hart, Cadell, Reid, & Company has been bottomed or tested to the true bottom with boring-rods in tubes, so that a correct sample of the deposits of sand, &c., has been obtained. In two shafts only has washdirt been found carrying tin ore, and this Company are now sinking other shafts on all sides of those in which wash was touched, hoping to find the course of the lead. They sink through basalt and pipeclay, and to the water-level, say about 90 ft. from the surface, and then bore through the pipeclay, sediment, and drift-sand to the bed-rock, another 40 to 42 ft. Upon the result of their operations

operations hangs the future of the deep-lead mining of Vegetable Creek proper, as the continuation of the Vegetable Creek Company's, the Wesley, Bailey's, and Cuneen's lead can pass only through portion 4. The success of this Company's hopes is ardently desired by all the mining population, as nothing of great importance is being found to give employment to those now engaged in working the adjacent claims, which must ere long become exhausted. The cost of this Company's operations in sinking the lead in portions 1 to 4 has been so far about £6,000, and should they be unsuccessful it would be difficult to find the same number of private individuals to again speculate to such an extent in the face of such discouragement. It is to be hoped they will yet be compensated for their perseverance. The number of men constantly employed has varied from 4 to 8. The Company have a steam-pump and appliances ready, should they find sufficient to justify the cost of bottoming any shafts, for the purpose of working the ground.

Gordon's M.C.P., 320 acres, county Gough, parish Arvid.—This property, south of Mr. Wesley's M.C.P., has been steadily prospected, but hitherto without any deposit being found. Mr. Gordon is still sinking trial shafts across the land, and, with a view to bottoming the central rock shafts in the block, has fixed a 12-h.p. portable engine in position at it, and thus will have power at command to pump out the water, which no doubt will be found there (being on the same line as Mr. Wesley's wet shaft). The work is proceeding at considerable expense, but systematically, and it is to be hoped that success will reward the efforts now being made. It is hoped that a lead may be found on the eastern side of the ground at a higher level, and should such be discovered, it can possibly be worked at less cost, and help to pay for the developing of the deeper run, which no doubt will require considerable outlay to get into working order, although it may be rich through having passed through a belt of tin-bearing rocks south of this ground, as shown in Mr. David's geological map of this tin-field.

Glen Smelting Works, Tent Hill.—The quantity of tin ore received at these works during the year amounted to 1,261 tons 3 cwt. and 6 lb., and during the same period 858 tons 17 cwt. 3 qr. 1 lb. of refined metal were forwarded to Sydney. The battery has been continuously at work during the year, principally in treating stone raised from the Ottery Reef. No improvement I regret to say can be reported in the quality of the stone crushed, viz.:—2,419 tons 6 cwt. 3 qr., from which 79 tons 21 lb. of tin ore were obtained.

The ore received at the works may be classified as follows:—

	Tons.	cwt.	qr.	lb.
Shallow workings	631	1	0	0
Deep leads	490	2	0	0
Lodes.....	140	0	0	6

The Company are now putting in a large tunnel at the Ottery, which at the end of the year, was in about 200 ft., and they expect to cut the reefs at a greater depth than any of the present shafts.

Tin obtained during 1886.

	Tons.	cwt.	qr.	lb.
Lode workings.....	169	13	0	0
Shallow workings	761	1	0	0
Deep workings	962	8	0	13
	1,893	2	0	13

Silver.

Webb's Silver-mine.—The deep workings on the occasion of my visit were looking well.

At the 150-ft. level in one shaft the lode is 7 ft. in width, and produces large quantities of ore, from which really good assays are obtained.

At the 200-ft. level in another shaft the lode has a well-defined wall, and appears more permanent than hitherto. The Company for the last two years have employed a large amount of labour for the purpose of thoroughly testing the lode, and I am now informed that machinery will soon be on the ground to treat the ore. This is a matter for much congratulation, as the absence of such works has been the great drawback to the silver-mining industry in this district. No matter how confident people are of the richness of the ground, the absence of the smelting test has had the effect of keeping capital from being invested in silver land in this district.

I am indebted to the manager of the mine, Mr. J. G. Davey, for an elaborate report, which will be found herewith. (Appendix A.)

Fryer's Creek.—This field, which twelve months ago gave every promise of being one of the most extensive silver mines in the Colony, is now almost deserted. Very few even of the leases that were granted have been executed by the lessees. Notwithstanding this apathy, I have every reason to predict a great future for this portion of the district. The ore which has been tested from the different claims has proved very rich. The great drawback to the success of this field is the want of capital. Efforts have been made by different claimholders to "float" their properties, but all have failed, owing to the non-existence of any smelting works in the neighbourhood.

APPENDIX A.

The Mining Registrar, Emmaville,—
Sir,

Webb's Silver-mine, Emmaville, 5 February, 1887.

In compliance with your request, I have much pleasure in forwarding the following brief account of the progress made on the property of Webb's Silver-mining Co., Limited.

The lode, which is situated on the Little Plant Creek, at a distance of about 9 miles in a north-westerly direction from the township of Emmaville, was discovered about two and a half years ago. It has a bold outcrop, and can be traced, without difficulty, for a distance of over 2 miles. It exists in a highly metamorphosed slate formation, and consists principally of felstone, together with quartz, fluorspar, &c. The silver occurs in veins of fahl-ore (grey copper ore), copper pyrites, arsenical iron pyrites, galena, zinc, blende, &c., which vary in thickness from a quarter of an inch to 2 or 10 inches, and are disseminated throughout the lode, which, in its turn, varies from 18 inches to 20 feet in width.

Samples taken from various parts of the reef have assayed from 15 oz. to 1,150 oz. of silver per ton. Fine crystals of fahlerz (tetrahedrite) have recently been discovered in the deep workings, which contain 30 per cent. of copper, and 3·5 per cent., or 1,140 oz., of silver per ton.

Along the reef several shafts have been sunk, ranging from only a few feet to 210 feet in depth, making an aggregate of about 760 feet. Drives have also been extended to a distance (in all) of about 500 feet. In almost every case payable ore has been met with.

The deep workings are most encouraging. At a depth of 150 feet the lode has been found to carry a well-defined wall, which continues unbroken to the present deepest point, 210 feet. The cleavage also of the surrounding "country" rock; which above is almost at right angles to the lode, is here almost parallel to it. The

The ore also holds its own in depth, and bulk assays are equal to, and sometimes surpass, those which have been obtained nearer the surface.

All these facts point to the permanence of the lode, and should, in my opinion, dispel any doubts which may exist as to the future prosperity of the field.

The work hitherto has been strictly exploratory, with a view to testing, as well as developing, the lode in various parts. However, nearly 900 tons of ore have been raised and stacked—to await erection of reduction works—which contain over 30,000 oz. of silver.

The Company is contemplating the erection of concentrating and reduction plant, and it is hoped that during the present year large returns will be made.

Other mines on the same and parallel lodes are, I hear, about to be worked.

NEW ENGLAND DISTRICT—WILSON'S DOWNFALL DIVISION.

(*J. G. Draper, Mining Registrar.*)

I HAVE the honor to submit herewith my report upon the mining industry of Wilson's Downfall Division, which will tend to show that it has not decreased much in the yield of tin ore, compared with that of the previous year. No doubt the increase in the price of ore has given miners very great encouragement, still there is nothing but the stream tin worked in this locality, although applications have been received for leases for the purpose of prospecting for lodes, of which, perhaps, a good account will be given in next report.

At the head of Herding Yard Creek, on Messrs. A. & R. Amos's ground, remarkably rich prospects have been obtained. Other places which have been mentioned before are still worked with various results, with the exception of Maryland Half-mile, where a party of six Chinese are working. They had previously worked in the shallow ground, but are now following the tin into deep ground with improvement.

The mining population in this district is much about the same as returned for 1885, and the quantity of tin ore won during 1886 being 307 tons, valued at £17,800.

I issued during the year ending 31st December, 1886, 68 mineral licenses, 4 business licenses, and 22 miners' rights, and received 4 applications for mineral leases.

NEW ENGLAND DISTRICT—LIONSVILLE DIVISION.

(*Robert Wilkinson, Mining Registrar.*)

I HAVE the honor to transmit my annual report for the year 1886, just closed.

Quartz-reefing has been carried on vigorously by the few hands engaged at it, but very little success has attended the efforts of a greater part of them.

A new discovery was reported to me in latter part of October by a party of the name of Rose, the discovery being about half a mile south of Lionsville; yield 1 oz. loose gold to dish of rubble taken from a mullocky vein, which had also quartz specimens impregnated through it. This party (then two men), after a couple of weeks fossicking, took from out of a small hole some 6 feet deep by 5 in length on vein some three pounds weight of gold, and during this time secured a prospecting claim, and called it Golden Bar. As soon as this discovery became a little known quite a small rush set in for ground adjacent, the line being pegged off for some 6 or 8 chains. It, being new and unworked ground, came under the additional Gold-mining Lease Regulations of 1882, which compelled lease applicants to work from date of taking possession, and therefore most of the claims taken up were under Mining Board Regulations. After most of them sank a few holes and trenched, nothing being got, they were abandoned, and others went in, but most of them could get nothing on surface, and it has now decreased to only two claims, the prospectors' and No. 1 East. The former have two veins about 30 feet apart, and both carrying good gold. On first vein discovered they have sunk a shaft some 25 feet, and good gold so far, but vein is very narrow and into hard country, which requires the use of powder; but unfortunately the prospector (the only miner in it) has been confined to house for last three weeks of the year, and it has retarded the work a good deal, otherwise they should have seen to a depth of 50 feet. Miners are most anxious to see it sunk upon to give an idea of what it is going to turn out to be, a good many fearing it may only be a surface patch.

No. 1 East has been sunk some 30 feet, with every indication of gold, but gives only few colours in washing. Should either of these two claims get on to a good solid reef and carry gold it will revive the locality and give an impetus to others to prospect.

To begin with the old identities, the prospectors, Garibaldi (two men), put through the winze they were busy upon, as per my report of 1885, but did not meet with any gold. Then, stoping small block at 70-foot level, they met with a small patch of golden stone, 180 lb. of which yielded £50 worth of gold; stoped also an underhand piece, at 100-foot level, 50 feet by 10 feet deep, but not finding anything to induce them to go further they started clearing and securing some upper levels to get at some of the blocks that were left, and in shooting out a little of foot-wall (the hanging-wall reef only having been taken out) brought down in the shot some splendid specimens, estimated to turn out £100 worth of gold, and a splendid show still on face, but through them not being prepared to take block out it is left standing till the ground is thoroughly secured, which is, I believe, just completed, and this mine may now turn out some good gold in the ensuing year. There appears to be a good deal of the worked ground where this foot-wall vein is left, and it may turn out to carry the best of gold.

No. 1 North Garibaldi; C. Harkin has been steadily at work all through the year, and has come across some excellent patches, but will not divulge the full extent of same for reasons best known to himself.

The Band of Hope line, Solferino; six claims have been formed into a syndicate, and placed in hands of brokers, with the view of floating same in London market, but it seems nothing has come of it so far, still they are in hopes of it going off shortly, there being three months yet to complete the formation of a Company.

The several proprietors have all been busy engaged either driving, sinking, or stoping, and have come across a few small patches, but none sufficient to make it worth while to realize upon. The only exception, perhaps, may be the prospectors, Adams and party, who have some very good stone or specimens on hand.

On Old Lion, Lionsville, a couple of men took possession of Nos. 10 and 11, where some rich patches were got in early days, but after spending some eight months one of them left, and the other is still sticking to it hoping to come on to a little fortune. The only gold they got was some 3 oz. from a little dab, which is just sufficient to encourage one to try a little longer.

The

The famous Lion mine is still lying idle, it being held under lease application, just granted. Several mining capitalists have been inquiring for it of late, but it being locked up could do nothing. Still, now it is granted, the leaseholders will have to commence operations shortly, or make room for those who are likely to do some good with it.

In alluvial very little is doing, very few hands employed at it in this division, and those who are make from 30s. to £2 a week.

As far as I could gather, there has been won in my division 118 oz. 2 dwt. of alluvial gold and 200 oz. 2 dwt. of reef, valued at, conjointly, £629. This is not by far all the gold, as a good deal goes out of the division of which I can get no account. Price of gold during year has been from £3 to £3 14s. per oz. The number of miners at work are, 10 Europeans and 3 Chinese, alluvial, and 20 quartz miners—total 33. Number of miners' rights issued for the year, 53, being 20 in excess of present mining population, and tends to show how a diggings fluctuates, in its population. Number of applications to lease, 4.

NEW ENGLAND DISTRICT—FAIRFIELD DIVISION.

(*J. P. Curran, Mining Registrar.*)

I HAVE the honor to forward my annual report for the year just ended the 31st of December, 1886, on the present state and future prospects of the mining industry in this division.

In the early part of the year, and for a couple of years past, the mining industry was throughout the division in a languishing state. The mining localities, which had for years past given profitable employment to a number of men were gradually being worked out, and the miners were beginning to turn their attention to other and more profitable pursuits. Early in March this year, however, a healthy reaction set in, owing to the discovery of a rich auriferous deposit on the private land of Mr. George Smith, at Fairfield, which led to a great deal of prospecting in the adjoining Crown land, and has been the means of opening up a very large area of auriferous country in the neighbourhood of Fairfield.

Mount Pleasant, which is distant about $1\frac{1}{2}$ miles from Mr. Smith's property in a north-westerly direction, is the chief centre of mining operations. At the base of Mount Pleasant, on the western and eastern sides of Plumbago Creek, a large and busy town has sprung up. In the town and its environs there are at present about 1,400 inhabitants, and the number increasing daily. A great number of gold leases have been applied for on and around Mount Pleasant, and gold has been obtained in almost every place that has been tried. The value of anything yet discovered must, however, depend upon the result of further development. A few tons of picked stone from some of the principal claims have been crushed and treated, and the results have been satisfactory; but the returns obtained therefrom should not, I think, be taken as a gauge of the whole field. There is no doubt a number of the claims now opened up will in time be proved highly remunerative, whilst a greater number will be found valueless. A very large area of land has been proved auriferous, and has been traced to the north of Mount Pleasant about 8 miles, and south about 4 miles.

At Red Rock, a place distant about 8 miles north of Fairfield, and which takes its name from a bold bluff which overlooks the Cataract River, some apparently rich discoveries have been made. This locality is now attracting the attention of capitalists and mining speculators, and arrangements are being made with the various holders of land under application to lease to form the whole into one large mining syndicate. This locality affords great facilities naturally for carrying on mining on a large scale. The bluff, which has been proved auriferous, stands 400 feet perpendicularly above the cataract flowing beneath. A large mill could be erected at the base, and the whole of the mountain worked in a face.

At Violet Creek, between 3 and 4 miles south-east of Fairfield, a number of persons are in possession of what are considered payable claims. The general formation of this locality, I might remark, differs slightly from the formation of Fairfield proper and the formation at Red Rock on the north; and the veins contain, according to assay, gold and silver in payable quantities.

I shall now proceed to give a description of the principal mines at Mount Pleasant, Red Rock, and Violet Creek. The depth of shafts, width of lodes, quantity of ore raised, I give you in a tabulated form appended hereto.

1st. *Carmichael & Co.'s* is a gold lease of 8 acres of land. On this property there are six distinct auriferous veins, varying from 3 in. to $1\frac{1}{2}$ ft. in width.

2nd. *Shannon & Co.'s* is adjoining Carmichael & Co. on the north, and is held under application for gold lease of 4 acres. In this block there are four distinct veins. In some of the stone gold can be seen without the aid of a glass; and from stone in which no gold is visible fair shows of gold are obtained by crushing and washing.

3rd. *Horton & Co.'s* is the next important mine on the south side of Mount Pleasant, and contains an area of 10 acres, held under application to lease. In this property there are eight distinct lodes or veins, all of them gold-bearing. Five shafts have been sunk on this property, and are described on another form appended hereto.

4th. *Reale & Pinkerton's* adjoins the eastern boundary of Horton & Co., and contains 2 acres, held under application to lease. This, I am informed, is a valuable holding.

5th. *Bourke & Co.*—This is the next most important mine, and is situated on the crown of Mount Pleasant, and adjoins the north boundary of Horton & Co. Contains an area of 6 acres. Several rich veins traverse this land. Mining expert's estimate the average yield of gold per ton at 2 oz.

The holdings referred to, from 1 to 5, have been formed into one Company, and preparations are being now made for the erection of machinery for the purpose of working the property on an extensive scale.

6th. *Dillon & Co.*—This is a block of 6 acres to the north of the claim just described, and is apparently on the same line. At present they are driving a tunnel from the west side of the mountain, with a view to cut Bourke's lode at a depth.

7th. *Sageman & Co.* are the next on this line, and hold the land under application to lease. This party are on the northern slope of Mount Pleasant, and on the same reef that Bourke and party are on, and are driving a tunnel in the face of the mountain about 150 feet below the level of Bourke's claim. At the time that I visited this claim the tunnel had been driven in about 50 feet, and in that short distance seven or eight small veins had been met with, all carrying fair gold.

8th. *Brydon & Co.* are the next to Sageman & Co., on the northern slope of the mountain, but are on a distinct line of reef. This is not a very rich claim, but is nevertheless a promising property.

9th.

9th. *Pyers & Martin*.—This is a prospecting claim held under the Mining Board Regulations, and is considered one of the best properties on the north of the mountain. A number of trenches have been opened along the line of lode, and in each excavation a well-defined reef is exposed. The lode is composed chiefly of zinc blende, galena, specular iron, copper, and arsenical pyrites.

10th. *Strauss & Co.*—This is a 2-acre block held under application to lease. Some very rich samples of ore have been obtained from this claim. Six tons of general ore have been forwarded to Victoria for treatment, and a Company is formed for the purpose of erecting elaborate reduction works in connection with this property.

11th. *Boylard & Co.* have 4 acres of land under application to lease, and have a well-defined lode running through their property, besides many smaller veins which they are not at present operating on. Good prospects can be obtained from any portion of this reef.

12th. *J. W. R. Clarke & Co.* have a 2-acre block with not less than seven gold-bearing veins running across it.

13th. *Smith, Townsend, & Co.* have what is considered the best claim on the north-west slope of the mountain. It is certainly a large reef, but further exploration will prove whether the reports respecting it are correct or not.

14th. *Morgan & Co.*, on the same line, have very fair prospects in their claim, but I have not seen enough of it to say much about it.

15th. *Jordan & Co.*—This is another claim, near Morgan and party, that I cannot say much about, as the holders were away at the time of my visit; but they have a very nice-looking vein of ore in which the gold can be seen very clearly.

16th. *Wann & Townsend's* claim is situated on a spur to the east of Mount Pleasant, and is held under application to lease, and is, I believe, a very good property. Ore is composed of quartz and oxide of iron.

17th. *J. F. Pearman & Co.*, on the south of Wann & Co, are working on a good-looking lode, from which a fair prospect of gold is sometimes obtained. The ore consists of oxide of iron, carbonates and sulphide of copper, and arsenical pyrites.

There are many other claims working in the neighbourhood of Mount Pleasant that I cannot fairly describe, as work being done in connection with them is more of an exploratory nature than otherwise.

At Red Rock there are ten parties at work, and all say they are on gold, of which I give a description herewith.

Name of Company.	Number of Men Employed.	Amount of Ore Raised.	Width of Lode.	Bearing.
Rowan & Co.	2	4 tons	3 ft.	N. and E. 1
Orr & Co.	2	nil	5 to 7 ft.	N.E. and S.W.
Scott & Co.	2	100 tons	20 ft.	E. and W.
M'Guire & Co.	2	30 "	20 ft.	E. and W.
Kingdom & Co.	4	nil	18 ft.	N. and S.
Farrell & Co.	4	40 tons	15 ft.	N.N.E. S.S.W.
Muldoon & Co.	2	60 "	8 ft.	N. and S.
Pat Lee & Co.	2	40 "	8 ft.	N. and S.
Dempsey & Co.	2	50 "	5 ft.	N. and S.
Walsh & Kelly	2	13 "	2 ft.	N. and S.

The above claims are worked in open cuttings from the face of the hill.

From the mining centres outside of Fairfield the returns are small.

At Pretty Gully there are still about twenty men employed in alluvial workings.

The amount of gold won, 190 oz., value £680.

I have received 102 applications for gold-mining leases, and 1 application for mineral lease; and have issued 512 miners' rights and 37 business licenses, and have registered 142 mining tenements.

LIST of Mines, Depth of Shafts, Ore raised, Width of Lodes, &c.

Name of Company.	Men Employed.	Tons of Ore raised.	Depth of Shaft.	Width of Lode.	Dip of Lode.	Bearing of Lode.	Remarks.
Carmichael & Co.	3	...	50 feet	1½ feet	West	N. & S.	17 tons crushed; yield, 29 oz.
"	...	...	40 "	1½ "	"	"	
Shannon & Co.	2	10	24 "	1 "	"	"	
Reale & Co.	2	12	28 "	1½ "	"	"	
Horton & Co.	5	80	42 "	1½ "	"	"	7 tons from Horton & Co.'s, yielded 14 oz.
"	...	...	28 "	1 "	"	"	
"	...	...	26 "	2½ "	"	"	
"	...	...	32 "	½ "	"	"	
"	...	...	20 "	4 "	East	"	
Bourke & Co.	3	100	open cutting.	20 "	West	"	
Dillon & Co.	3	30	28 feet	6 "	"	"	
Sageman & Co.	3	50	tunnel	18 "	"	"	
Brydon & Co.	2	34	34 feet	2 "	"	"	
Pyers & Martin	2	50	35 "	3 "	"	"	
Strauss & Co.	4	40	35 "	9 "	"	"	
Mossman & Co.	2	...	20 "	...	"	"	
Boylard & Co.	2	15	38 "	4½ feet	East	"	
Clarke & Co.	2	20	20 "	2½ "	West	"	
Smith & Co.	2	20	30 "	10 "	"	"	
Morgan & Co.	2	10	20 "	2½ "	"	"	
Moses & Co.	2	nil	tunnelling	no lode	...	...
Jordan & Co.	2	15	30 feet	1 foot	West	N. & S.	
Wann & Co.	2	12	12 "	2 feet	"	"	
Pearman & Co.	3	20	34 "	4 "	"	"	
Fogwell & Co.	4	20	32 "	2 "	"	"	2 oz. per ton obtained from small parcel from this claim.
"	...	...	30 "	2 "	"	"	
Walker & Co.	2	24	30 "	2½ "	"	"	

LIST of Mines, Depth of Shafts, Ore raised, Width of Lodes, &c.—*continued.*

Name of Company.	Men Employed.	Tons of Ore raised.	Depth of Shaft.	Width of Lode.	Dip of Lode.	Bearing of Lode.	Remarks.
Sageman & Co.	3	50	tunnel	18 feet.	West	N. & S.	A tunnel is being driven on this lode 150 feet below the level outcrop on the mountain above.
Sullivan's	3	40	40 feet	4 "	North	E. & W.	
Sharp & Co.	3	11	30 "	1½ "	West	N. & S.	Assays from this mine give 4½ oz. gold; Arg. 37. oz.
M'Phee & Co.	2	150	45 "	5 "	South	N. & W.	Gold and silver; assays not known.
Peedle & Co.	2	10	21 "	2 "	"	"	Gold and silver.
Keats & Co.	3	300	60 "	2½ "	West	N. & S.	
"	"	"	63 "	3½ "	"	"	
T. E. Kelly & Co. ...	5	400	60 "	not known	"	"	30 tons crushed, 60 oz. 15 dwt.; value, £3 9s. per ounce.
"	"	"	60 "	.....	.....	.....

I have been, through the courtesy of Mr. Daniel Maher, of Timbarra, supplied with the following valuable information respecting Poverty Point and Timbarra:—
To the Mining Registrar, Fairfield,—

Sir,

During the past year the mining industry has much revived on this old established and at one time prosperous gold-field.

On the old Tableland, the scene of former extensive mining operations, gold-leases have been applied for, and prospecting is carried on to a great extent, with a view to discover the source of the rich alluvial deposits that have been worked out. A number of men are now engaged in this work with every prospect of success. A fair amount of gold is still obtained by means of sluicing.

Poverty Point, Surface Hill: The old Surface Hill Sluicing Company expended a vast amount of capital in their endeavours to bring on water for hydraulic sluicing—their efforts, however, proved abortive in consequence of the continued dry seasons. A new Company, styled the Surface Hill Gold-crushing Company, has now taken up the land.

The new Company have been working steadily under the management of Mr. K. Hutchison. Ten heads of stampers were erected, and it was decided to combine sluicing and crushing operations, and an additional ten heads of stampers are now in course of erection, and should favourable seasons continue there is every prospect of the new Company being rewarded for their outlay.

A short distance from the Surface Hill, Mr. Thomas Horton continued operations for the first half of the year. It is, I understand, the intention of Mr. Horton to resume work very shortly, when work will be carried on on a more extensive scale. It has been proved that there exists in this locality an almost unlimited supply of porphyritic and felspathic sandstone and granite heavily impregnated with gold, and which will yield at least 5 dwt. per ton. Since the wet season has set in small parties of men have been employed on the tributaries of Timbarra River, Nelson Creek, and at Sullivan's Lookout, and all seem to obtain fair wages.

On M'Leod's Creek there are several parties of men at work sluicing, and some searching for reefs. I have not heard of any case in which payable gold has been obtained from any of the reefs.

The population of Poverty Point and Timbarra I estimate at 200 persons. The amount of gold purchased by me for the year is 250 ounces, the smallest amount for the last twenty years.

Yours obediently,

DANIEL MAHER.

NEW ENGLAND DISTRICT—TENTERFIELD DIVISION.

(Frederick Burne, Mining Registrar.)

I HAVE the honor to forward my report of mining operations in this division for the year 1886, which shows a great improvement on that of the year 1885.

There have been 47 applications for gold-mining leases, out of which 40 were located at Boonoo Boonoo. On the majority of these claims work has been carried on more or less up to the commencement of the late heavy rains, which has caused a suspension of work throughout the field.

On the old M'Intyre line of reef six claims are at work, all on the reef, which shows gold in more or less quantities; the work is slow in consequence of the great influx of water. Of the claims on this reef I may state that Pascoe & M'Quaker have two shafts down—one about 40 ft., the other about 60 ft.—with the intention of sinking to a depth of 80 ft. Ellis and party are cleaning out an old shaft, about 50 ft. deep, with the intention of sinking deeper, and then driving to catch the reef again. Egan and party have two shafts down over 40 ft. each, besides having a considerable amount of other work done.

On the old Specimen Gully line of reef there has been a good deal of work done. Of the nine claims on this line of reef, Brown and party are down about 50 ft. in one shaft and 60 ft. in another; J. G. Dickson, about 60 ft.; William Mason, about 80 ft.; and Porritt and party about 30 ft., all on the reef showing good gold.

In Resurrection Gully, Brown and party have found a reef 2 ft. wide showing gold estimated to go 2 oz. to the ton.

On Roper's Gully several claims have been taken up. Peberdy and party are at work on a reef showing good gold. Stevenson and party have two shafts down, about 30 feet each; and Hurtz and party, two shafts; and Ellis and party, down about 20 ft., all on gold-bearing reefs.

There appears to have been no gold recovered as yet, in consequence of the want of machinery, but I am informed it is the intention of a Queensland Company to erect machinery at an early date.

During the past year I have issued 364 miners' rights, 20 business licenses, and 10 mineral licenses, against 32 miners' rights and 37 licenses, for 1885.

NEW ENGLAND DISTRICT—DALMORTON DIVISION.

(William F. Poole, Mining Registrar.)

MINING matters are in much the same position as they were this time last year. Several parties have been working in the river and creeks with varying success. One man got 11 oz. in a few days in Chandler's Creek, but this is the only patch I have heard of.

Quartz-mining.—The Union Gold Mining Company are now winding up. They have crushed during the year 113 tons for 26 oz. gold. In the early part of the year very rich specimens were obtained from the Just-in-time reef, but after sinking 30 ft. and driving about 80 ft. nothing more could be got.

The

The New Bendigo Company, Jackass Creek, have erected a 2-stamper battery (Marcolino's patent), but after a trial crushing, work was suspended.

Sperling & party's lease, adjoining the New Bendigo, has been idle, owing to the death, by accident, of one of the shareholders.

Sellon & party's Scottish Chief is also idle.

Marcolino & Son, Abercrombie Reef, Cunglebung.—A 2-stamper has been erected on this reef, and a trial crushing of 12 tons gave 16½ oz. gold. The stone now being raised is said to be of good quality.

I have issued during the year 39 miners' rights and 2 business licenses; and received 4 gold-mining lease applications and registered 2 machine sites.

CLARENCE AND RICHMOND DISTRICT—GRAFTON AND NANA CREEK DIVISIONS.

(*Mr. Warden McDougall, P.M., Grafton.*)

I now have the honor to send you my annual report as Warden for the Mining District of the Clarence and Richmond.

Mining in the district under my charge has been carried on to so small an extent during the year that I did not consider it necessary to visit either the Nana Creek or Dalmorton mines, and incur that expense. I have therefore obtained the following information from the Mining Registrar at Nana Creek as to that division, but the Mining Registrar at Dalmorton has not yet replied to my letters, requesting him to furnish me with all the information possible; but no doubt he has or will forward you his report for Dalmorton District.

The claims at present being worked at Nana Creek are the Illabo, Matilda, Advance Australia, Waratah, New Year's Gift, and Challenge. Besides these several other reefs have during the year been worked with the most favourable results. One, the Lady Carrington, for which a lease has been applied for by Denning and Dargue, yielded from 17 tons of quartz, 95 oz. of retorted gold. The number of men employed on the said reefs now is ten, and the number of tons of quartz crushed, and the quantity of gold extracted therefrom during the year is as follows, viz.:—16½ tons quartz, yielding 268 oz. 13 dwt. 4 gr. of retorted gold.

During the year there have been about thirteen or fourteen men working alluvial gold in the vicinity of the Little Nymboi and Little Plain Creeks, from 8 to 13 miles distant from Nana Creek township, but there are now only about six or seven at work. In all about 50 oz. of alluvial gold is estimated to have been obtained during the year.

Mr. Marcolini has erected one of his portable quartz-crushing machines at the Nymboi reefs, but after crushing a few tons of quartz, work has been stopped, pending a dispute as to the percentage of the gold-wash received in payment for crushing. The owners of the reef are willing to give men one-fourth of the gold, but he states that less than half will not pay men for carting and crushing &c.

The Matilda is out of repair at the Hidden Treasure reef and has not crushed any stone during the year, nor has the mine been worked.

The number of licenses, &c., issued at Grafton during the year has been 78 miners rights, 1 business license, and 1 mineral license, 1 gold-mining lease application at Chambigne, 2 mineral lease applications from Gordon Brook for chromite, 1 prospecting protection area for alluvial registered, and 1 machine site applied for. At Nana Creek 28 miners' rights have been issued during the year. As before stated, I am at present unable to give the number issued at Dalmorton during the year, but when received from Mr. Poole, the Mining Registrar and Warden's Clerk there, I will forward it on to you.

CLARENCE AND RICHMOND DISTRICT—GRAFTON DIVISION.

(*William Clarke, Mining Registrar.*)

No work of any consequence has been done in my division during the past year.

George Stone applied for a gold-mining lease of 5 acres, at Chambigne Creek, on the 12th of August last, and this lease is now the property of the Columbus Quartz-crushing Company.

But little work has been done. The shaft is down 20 ft., and about 200 tons of quartz have been raised, but no crushing has taken place. The particulars of the machinery are given in my returns.

Taylor and party, at the Mann River, have their shaft down about 60 ft., and have about 50 tons at grass, and a few tons were crushed with a 1-stamper "Dolly," which gave a fair yield.

The price obtained at the Mint for this gold was £3 17s. 10½d. per oz.

I believe the reefs at the Mann River will before long prove payable beyond doubt.

On the 5th April last, Messrs. Lewington and party applied for five mineral leases for chromite, situated in the parish of Yankalkiarra, but they have been abandoned, as the ore tested was not of sufficient value.

An alluvial prospecting protection area was applied for by John Kenny, jun., at Mount Double Duke, but no work has been done, and suspension of work was granted on account of the late heavy rains having rendered it impossible to work.

There is nothing to report about the coal-mining permit at Maclean, and I believe nothing has been done thereon since the "drill" was removed.

The return of gold is compiled from information received from the Banks, and a quantity of it was won outside of my division. The localities whence it was obtained are as follow:—Nana Creek, Cunglebung, Solferino, Mann River, Millera, Dalmorton, and the Clarence River (about 8 miles north of the Heads, and same distance back from the river.)

I issued seventy-eight miners' rights, one business license, and one mineral license. The following tenements were applied for:—One alluvial prospecting protection area, and one machinery area. The miners' rights were chiefly issued to persons interested in claims and leases outside of this division.

CLARENCE AND RICHMOND DISTRICT—NANA CREEK DIVISION.

(*George Geddes, Mining Registrar.*)

For the information of the Honorable the Minister for Mines, I have the honor to transmit my annual report of the condition of the mines that have been and are now being worked, for the year 1886, in the Nana Creek Division of the Clarence and Richmond District.

Illabo,

Illabo, Eleven-tree Creek, about 2 miles from Nana Creek township.—But little work has been done by Alexander Stout in this claim. Only 12 tons of ore from the 107-ft. level were crushed through the year, and that on the 19th June, giving 13 oz. 0 dwt. 4 gr., or 1 oz. 1 dwt. 16 gr. to the ton. Mr. Stout, with others, first worked this claim at the commencement of the year 1883, and only relinquished the undertaking after an immense amount of labour expended upon it, and an expenditure of over £300, in trying to make the venture a success. A good, experienced, and indefatigable miner is thus, I am sorry to have to write it, lost to the field.

Lady Matilda.—This claim is situated at Nana Creek, and was originally owned and worked by F. W. Chapman & Company. Recently, E. F. Sharpe applied for it, and then took out only a few tons of ore, and that from the surface. It requires far too much outlay to work it systematically with any prospect of success, and is, therefore, no claim for a man of even moderate means to attempt to work.

Waratah.—This claim, situated about 2 miles from the Nana Creek Quartz-crushing Company's battery, and adjoining the claim formerly known as the "Nymboi Prospecting Claim," was first taken up by Messrs. M'Leod and Forbes, on the 13th February, but they not having applied for its survey in terms of clause 2 of Regulation 63, they repegged and reapplied for it on the 23rd June. It was surveyed on the 7th September, and has been continuously worked. They sank a shaft about 45 ft., and after getting out valuable stone, some 60 tons—the reef about 12 in. wide, lying north and south—it, through being in loose ground and not sufficiently timbered, caved in. They had only ceased working it for about forty-eight hours when the collapse took place. Another shaft, but a short distance from the former one, has been put down to a depth of about 50 ft., well slabbed from the start. The reef runs north and south, well defined, and is, on the average, from 12 to 18 in. wide. Gold in both shafts got from the surface. A crushing of 52 tons of ore, put through Mr. Paulo Marcolino's battery, of which he is the patentee, was finished on the 5th November, giving a return of 53 oz. 11 dwt., or 1 oz. 0 dwt. 14 gr. per ton. There are some 80 to 90 tons of ore at grass awaiting the starting of the battery. The cause of the delay is that finer screens are being got from Sydney. The lot to go through is considered to be ounce stone. All the reefs, and they not a few, in the vicinity of the Nymboi, are gold-bearing, and deemed payable. All that is needed is the machinery and cheaper carriage. The reefs are distant from the above battery 59 chains 56 links, about $\frac{3}{4}$ of a mile. The result of the crushing was not at all satisfactory to the proprietors, they, from their trial tests, and the general appearance of the quartz, expecting to realize, at the very least computation, 2 oz. per ton, and such was the strongly expressed opinion of many others, and they, old experienced miners. There are, in the judgment of some here, whom I think to be competent of forming an impartial decision in the matter, objections of a *bona fide* character to the battery, they having reference more particularly to the boxes in which the stampers respectively work. They are considered to be much too small to crush large quantities of stone, as, when fed too freely the screens, it is thought, from the action of compressed air, burst, allowing the small pieces of uncrushed quartz, together with a quantity (more or less) of amalgam to escape with a rush through the sluice boxes, and over the ripple tables, the mass lodging in the tailings. Since the crushing a portion of the tailings has been overhauled, and the person who tested them assured me that he got as many as 14 grains of gold to the dish, besides amalgam. He also saw quicksilver scattered pretty freely through the heap of tailings. All this is very discouraging, and before the battery will again command the confidence of the mining community here, the boxes will most certainly have to be constructed upon a different plan to the one now in vogue. The screens also need to be much finer.

New Years Gift and Challenge.—These claims are in the possession of, and being worked by Oliver Anderson. They are situated near Tallewidgen Creek, and about a $\frac{1}{4}$ of a mile from the Advance Australia. The former was held by Messrs. Cooper, Anderson, and Geylic, originally as an ordinary claim, and reported upon for the year 1885. 46 tons of quartz was then crushed for 60 oz. retorted gold. Mr. Anderson applied on the 4th March for a lease of 4 acres of the land, and again on the 18th November for another lease of 4 acres adjoining the former plot, he having every confidence in the reefs examined and tested by him. The works in progress are:—No. 1, original shaft of 45 ft. is now down to 53 ft., and the tunnel piercing the hill along the line of reef on the north-west side, connecting with the shaft at the 45-foot level has been extended from 70 ft. to 86 ft. The reef lies to the east, and is about 18 inches wide. Another tunnel driven at the northern end of the reef is 43 ft. 6 in. in length. There is also a line of reef in an open cutting 16 ft. x 12 ft., and is from 7 ft. to 8 in. wide. Good prospects have been obtained by Mr. Anderson from the reefs, and to further assure himself of their value he sent recently 1 ton 15 cwt. of quartz, taken promiscuously from a stack, to the Sydney Mint for assay. The cost of transit, &c., was as follows:—Cartage to Grafton, £7; freight to Sydney at 15s. per ton, £1 10s.; cartage to Mint 10s., and cost of assay, £4 4s.; total, £13 4s. The Mint return gave 6 oz. smelted gold, value of same at £3 17s. 10 $\frac{1}{2}$ d per oz., £23 7s. 3d., thus leaving a profit of £10 3s. 3d. Survey of the New Year's Gift has been made, but Mr. Anderson being so satisfied of its incorrectness has applied for a resurvey of the ground.

Advance Australia.—This claim is distant about a quarter of a mile from Oliver Anderson's claims on the Tallewidgen Creek. It was first taken up by C. Sperling and party, then, on the 10th March, Geylic and Van came into possession. No. 1 shaft is down 45 ft., the reef being on an average 6 in. wide, and bears nearly north and south. A crushing from this shaft of 17 $\frac{1}{4}$ tons of stone was finished 17th September, yielding 24 oz. 13 dwt., or 1 oz. 8 dwt. 13 gr. per ton. Geylic then left the field, and the claim is now carried on by E. Van and his brother. No. 2 shaft is down to a depth of 30 ft.; the reef here runs north-east and south-west, and is about 6 in. wide; both reefs underlie to the east.

Homeward Bound, Tallewidgen Creek.—Thomas Wilkinson took this up on the 23rd January. The shaft he worked was originally sunk to the depth of 45 ft., but has been increased 15 ft., making it now 60 ft. The reef is about 2 ft. thick, and has borne gold from the surface, yet the results obtained are not looked on as payable, nor can they be when crushing is at £1 per ton, and cartage 27s. 6d. Two crushings on 18th June of 14 tons 16 cwt., yielded 15 oz. 12 dwt., or 1 oz. 1 dwt. 16 gr. per ton, and on the 23rd October 26 tons 9 cwt. yielded 15 oz. 14 dwt., or 11 dwt. 20 gr. per ton. He applied on the 10th May for 2 acres of land contiguous to the claim for a machinery area, but beyond that no steps were taken in the matter.

Nicholson Reef.—This is a prospecting claim taken up on the 30th April by John Nicholson. It is situated near the main Tallewidgen Creek in a westerly direction from the Homeward Bound claim. The shaft is down 34 ft., gold from the surface. The reef bears north-east and south-west, and its average thickness

thickness is 18 in.; 1 ton of surface stone gave 1 oz. 0 dwt. 11 gr., and 2 tons from the reef in the main shaft sent to the Sydney Mint for assay gave 3 oz. 15 dwt. or 1 oz. 17 dwt. 12 gr. per ton. Surveyor's remarks, 10th June:—"The reef in this ground has only been sunk on for about 10 ft., and cannot be said to be well defined at that depth. When reduced, the quartz shows a fair return of fine gold."

Day Dawn Reef.—This also is a prospecting claim, taken up on the 5th May by Andrew Nicholson, and is situated on the west side of Tallewidgen Creek, about $\frac{1}{2}$ a mile from John Nicholson's prospecting claim. In this ground there is a shaft to the depth of 36 ft. The reef about 15 in. thick bears north and south, carrying gold from the surface. Gold in this claim can be traced along the surface for fully 120 ft. 2 tons of quartz were sent to the Sydney Mint for assay, and yielded 1 oz. 12 dwt., or 16 dwt. per ton. Surveyor's remarks, 8th June:—"The reef in this ground has only been sunk on for a short distance, about 10 ft., and a well defined reef is showing, carrying fine gold in, I believe, payable quantity." Both these reefs are within $\frac{1}{2}$ a mile of permanent water in the main Tallewidgen Creek, a suitable site for a battery could, therefore, be readily fixed upon. The working the above prospecting claims up to the 13th September caused an outlay of about £250. The Rise and Shine, Homeward Bound, Red White and Blue, Caledonian, Miner's Bride, and Mountain Beauty claims are within about $1\frac{1}{2}$ mile of the Nicholson's claims, and are all gold-bearing, distant about $5\frac{1}{2}$ miles in a north-west direction from Nana Creek township, where Dargue & Company's battery is erected. The two first-mentioned claims were referred to in my reports for the year 1884-5.

Jones and Willoughby.—Claim unnamed. This was taken up by them on the 23rd June as an ordinary claim. It is distant in a north-west direction, about 60 ft. from John Nicholson's boundary line. Although good prospects were secured during their search, extending over several weeks, there was not sufficient inducement to keep them to the work. They are now prospecting in the vicinity of Back Creek, not far from Kangaroo Creek.

Red White and Blue.—This claim is situated about $\frac{1}{2}$ a mile west of the Homeward Bound, at Tallewidgen Creek, and was on the 21st June applied for by Messrs. Edward and Alfred Sharpe, of Nana Glen. The shaft is down about 40 feet. The reef is about 3 ft. 6 in. in thickness, and the bearing north and south. There are leaders in all directions, and of such a size as to lead one to the conclusion that they are reefs. They are known to contain a fair quantity of gold. Some 20 tons of stone were taken out, and then work had to be suspended for want of a team to cart the stone to the battery. That forced them to register their quartz on the 4th September, and they were unable, until the 10th November, to get a crushing; then they only put through 11 tons, fearing the result might not be favourable. It, however, turned out better than they anticipated, yielding 9 oz. 18 dwt. or 18 dwt. per ton.

Lady Carrington.—This was taken up as an ordinary claim on the 23rd June, by Messrs. Dargue and Denning. It is portion of the ground known as the Nil Desperandum claim, situated about 2 miles from Nana Creek, in a westerly direction. Subsequently they, on the 10th July, applied for a lease of 2 acres of the land, taking in the old shaft. A new shaft has been sunk to a depth of 30 ft., reef 8 in. thick, bearing nearly north and south, traced from the surface, and carrying rich gold. Two crushings of stone from this claim have taken place; one in June, of 17 tons for 90 oz. (some say it was 95 oz.), and the other on the 9th October, of 13 tons 10 cwt., for 46 oz. 5 dwt.; total, $30\frac{1}{2}$ tons for 141 oz. 5 dwt., or 4 oz. 12 dwt. 14 gr. per ton. And yet, with these excellent returns, they have actually abandoned the claim. The claim is nearly at the foot of a very steep hill, about a quarter of a mile in length, a gorge on either side, and the rain water, in its descent, lodges in large holes formed at intervals by the action of the current, and finally falls into a small basin at the foot of the range. Water could be very easily conserved in this locality for crushing purposes. There is also much soakage after heavy rain, and a depth of 12 feet of water has been found in the shaft, after a 24 hours fall of rain. A portable machine in the vicinity of such a claim as this, would quickly return the outlay; and the mine, to men of pluck and enterprise, would, I venture to predict, yield a small, if not a large fortune.

J. Dargue & Company's Battery, Nana Creek.—This has been at work, occasionally, during the year, and a detailed account of the crushings I give below.

Nana Creek Quartz-crushing Company's Battery is situated on Nana Creek, about 4 miles from the township, and about a quarter of a mile from the Hidden Treasure prospecting claim; it has been idle throughout the year. A general meeting of the shareholders was held in Grafton on the 10th November, when the sixth half-yearly report was submitted, from which I gather that the late Company's manager, Mr. James Denning, reports the battery (including the engine and boiler) to be in good order. There are some minor wants excepted, such as the replacement of the shoes and dies with new ones. The reason given for the cessation of operations is, the inadequate water supply, and inability of the management to procure stone for crushing in sufficient quantity. The former cause was, no doubt, a hindrance at times, but the latter reason is not, I think, a valid one, as I am aware that several claim holders offered to guarantee the Company over 200 tons of stone, if the battery was put in working order, and any further quantity that might be brought to grass. The board of management, I understand, purpose putting the battery in order at an early date, and, if they carry out that decision with promptitude, and providing the requisite supply of water be forthcoming, there need be no fear but that there will be an ample supply of quartz to keep the mill going for a time—at all events until more stone can be got out, and the starting the battery will be an encouragement for the miners to do so. There are about 100 tons of quartz in the vicinity of the Nymboi at grass, the owners of which are most anxious to have it crushed. But what most troubles the management is the fact of a number of the shareholders being in arrears with the payment of their calls, to the amount of £364 19s.

Little Nymboi Battery.—This is the property of Mr. Paulo Marcolino, of Grafton, for which he has taken out a patent. It has been erected about three-quarters of a mile, in a south-west direction, from the Waratah claim, at the Nymboi. A machine site of 2 acres was applied for by him, on the 18th August, and surveyed on the 6th September. The battery started work on the 21st October. It consists of four stampers, of 4 cwt. each, working in separate boxes, driven by a 4-horse power engine, No. 5 climax vertical, and boiler by David W. Robertson & Co., of London, and stamper boxes and crushing power by Sands & Co., of Sydney; the remaining portion of the work for saving the gold, has been designed and manufactured by Mr. Marcolino, of which I now attempt a description. In the first place, the screens in the stamper boxes are faced with copper plates, coated with quicksilver, to catch the gold from the pulverized quartz

quartz. Then the tops of the stamper boxes are loaded with quicksilver, and from these the water conveys the crushed ore into wooden boxes, thence through a sluice head into a receptacle, in form much similar to an ordinary cradle, the bottom being covered with small circular holes, rather more than an inch in diameter, filled with quicksilver. From these boxes or cradles (of which there are two), one to two stampers, the water and pulverized ore travel into the sluice boxes; they are about 8 ft. in length by 14 in. in width, and covered with quicksilver. Then there are three ripples charged with quicksilver, and at this point a fall takes place, of about an inch and a half, to another sluice box with a false bottom. This has a length of about 6 feet, and is covered with circular holes, of same diameter as those before mentioned, filled with quicksilver; and upon the bottom of the box are also diamond-formed breaks, which cause a temporary reversal of the water, at certain stages, and to all appearance ensure the arrest of the gold in the wells or holes constructed for its reception. At the foot of each sluice box a blanket is placed, to catch any fugitive particles of gold or quicksilver. It seems next to an impossibility that any gold can pass the many contrivances, to which the patentee has had recourse, in the construction of the tables, &c., in order to secure it.

Water Rate and Water Right.—Mr. Marcolino, to supply his battery with water, applied for the above, on the 1st October. It runs in a northerly direction from the Little Nymboi River, and distant from the Waratah claim about three quarters of a mile.

Alluvial Mining.

William Bourne.—This person, on the 8th November, applied for a creek claim. It is situated on the Dam Gully Creek, and distant about 2 miles, in a northerly direction, from the Nymboi reefs. Gold of an excellent quality has been got in small quantities, but the workings do not warrant the belief that they are likely to be of a permanent character. During the year there have been miners to the number of about twenty prospecting for gold in the vicinity of the Little Nymboi, Little Plain, and Back Creeks, from 8 to 13 miles distant from Nana Creek township. Some have been working near Tallewidgen Creek, and one and all have got gold, but in what quantity I cannot tell; yet, that won, must have been such as to return them fair wages for their labour, and, in many cases, much more. Still, the general opinion here is, that reefing on the whole is more profitable than alluvial workings. One man, a short time since, disposed of 25 dwt. of gold to the local storekeeper. It was coarse, shotty, very clean, of good quality, and should command a good price. The local price is 3s. 6d. per dwt. The sample was unearthed at Tallewidgen Creek, in shallow sinking. One of the pieces weighed over 20 gr. I have no means of ascertaining the exact quantity won in the aggregate, but it cannot be less than 50 oz.; and I feel persuaded my statement, although I am not in a position to prove it, is far below the mark. Some 30 oz. have passed through the local storekeeper's hands, and other lots which I know of, sufficiently justify me in the opinion I have given.

Return of gold won, the crushings in detail, during the year ending the 31st December, 1886, from the following quartz claims in the Nana Creek Division of the Clarence and Richmond District.

J. Dargue and Company's Battery.

			Quantity crushed.		Yield.		
			Tons.	cwt.	oz.	dwt.	gr.
June	Lady Carrington	Dargue and Denning	17	0	90	0	0
18 ,,	Homeward Bound	Thos. Wilkinson	14	16	15	12	0
17 September	Advance Australia ...	Geylic and Van	17	5	24	13	0
9 October ...	Lady Carrington	Dargue and Denning	13	10	46	5	0
23 ,,	Homeward Bound ...	Thos. Wilkinson	26	9	15	14	0
10 November	Red White and Blue	Edwd. and Alfred Sharpe	11	0	9	18	0
19 June	Illabo	Alexander Stout	12	0	13	0	4

Paulo Marcolino's Battery.

5 November	Waratah.....	M'Leod and Forbes.....	52	0	53	11	0
			164	0	268	13	4
	Alluvial Gold				50	0	0
					318	13	4

Sydney Mint Assays.

Oliver Anderson	1	15	6	0	0
John Nicholson	3	0	4	15	11
Andrew Nicholson	2	0	1	12	0
	6	15	12	7	11

Value at £3 17s. 10½d. per oz.—£48 3s. 6d.

Gold mining leases applied for					No.	Acreage.
					8	26
No. of Application.	Date.	Name.	No. of Acres.	Remarks.		
*72	4 Mar., 1886	Oliver Anderson.....	4	Being worked.		
73	8 May, ,,	John Archibald	2	Long since left the claim.	Approved 24 Dec., 1886.	
74	8 ,, ,,	William Pearce	2	" " " " " "		
75	10 ,, ,,	Henry Denning	2	" " " " " "		
76	10 July, ,,	J. Dargue and J. Denning..	2	Left the field a short time after the last crushing, on 9 October.		
77	24 ,, ,,	E. F. Rudder and M'Leod's	7	Very little work done.		
78	12 Aug., ,,	John Wood	3	On the field, but not working the claim.		
*79	18 Nov., ,,	Oliver Anderson	4	Being worked.		

* With reference to Mr. O. Anderson's claims, I deem it only just to state, that in addition to the works already carried out (See page 97), 8 chains of a cutting for a road with 4 chains of clearing, from No. 2 tunnel, has been completed to meet the main road coming to the shaft.

I have issued during the year: Miners' rights, twenty-eight; business licenses, nil; mineral licenses, nil. There is one storekeeper on the field, and he, I am informed, procured his business license from the Registrar, in Grafton.

For

For the purpose of comparison, I tabulate the following particulars, giving the quantity of reef gold won in this division during the years 1882 to 1886 inclusive, and the number of men recorded as being on the field at the expiry of each year :—

Year.	No. of men.	Quartz crushed.		Yield of Gold.			Value.		
		Tons.	cwt. qr.	ozs.	dwt.	gr.	£	s.	d.
1882	50	.....		909	0	1	3,454	4	0
1883	7	445	5 0	534	6	18	2,041	12	0
1884	33	452	10 0	410	4	21	1,374	6	4
1885	16	407	10 0	333	11	9	1,203	9	9
1886	17	164	0 0	268	13	4	940	6	1
				2,455	16	5	9,013	18	2
1883 to 1886		1,469	5 0	1,546	16	4	5,559	14	2

The above does not include any alluvial gold won.

The yield of gold has, it will be observed, decreased each year, still the average yield of 1 oz. 1 dwt. 1 gr. per ton for the years 1883 to 1886 is on the whole an encouraging return, and will, I think, bear favourable comparison with many of the other gold-fields of the Colony. I am, unfortunately, deterred from including the average for the year 1882, not being in possession of the quantity of quartz from which the 909 oz. 0 dwt. 1 gr. of gold was obtained.

The average for this year is 1 oz. 12 dwt. 18 gr. per ton, and that, in many localities, would be a most welcome return; but the great hindrance to success here, is the high price for crushing, and the exorbitant rates demanded for cartage.

A Mr. Alexander Nicholson, who has been a resident of this district for the past 35 years, informs me that he has travelled it repeatedly, and is intimately conversant with the country generally. From him I learn, that in the years 1872-3 there were found, and worked in this division, the following reefs :—

1. *Little Nell*.—Quartz sent to the Mint gave 13 dwt. per ton.
2. *Bushman*, now known as the "Lady Matilda."—Quartz when sent to the Mint yielded 11 dwt. per ton.
3. *Independent*.—Quartz got from this claim at a depth of 30 ft., but was abandoned owing to an influx of water.
4. *Morning Star*.—Quartz sent to the Mint returned 7 oz. odd per ton.
5. *Paddy Fury*.—Quartz showed good gold, but no crushing took place.

In addition, to the foregoing, there are some forty-five proved auriferous reefs on this field.

I am called upon to report the number of square miles of auriferous ground which is being, or may have been, actually worked upon. As to the number being worked, that I cannot tell, although I have made every inquiry; but, having sought to ascertain the boundaries of this division, and the number of square miles therein, I venture to give the result of that inquiry. The starting point is Red Rock, situated 15 miles north of Coff's Harbour, thence west 20 miles to intersect the Nymboi River; thence south 15 miles to Mount Nicholson, at the head of the Bo Bo River; thence east 14 miles to Coff's Harbour; thence north by the Pacific Ocean, to the point of commencement. From the above this division is thought to contain about 255 square miles of auriferous country, gold having been found in all parts of it, even to the Bellinger River.

In conclusion, I am sorry to have to make known the fact, that mining has been anything but brisk on this field during the year under review, and, that it has been retrograding rather than advancing; still, I am sanguine of a reaction yet for the better setting in. The absence of capital and other very necessary appliances is no doubt a serious, if not the chief, obstacle to mining ventures on this field; and, to write plainly and truthfully, there is far from an encouraging prospect here for a struggling digger, for he cannot cope with the many adverse circumstances by which he is met. In the first place, Nana Creek is distant about 50 miles from Grafton, and some 7 miles from a main road, and when the field is reached there is but a succession of ranges, barren almost of feed, and so steep that no ordinary teamster can be induced to travel them. This in itself heavily handicaps the miner in the matter of stores. Again, is the question anent the carriage of quartz to be studied, and that is thought so risky that it is with great difficulty the services of a good teamster can, unless at a heavy rate of carriage, be secured to convey the ore to a battery. The carting distances are from 2 to 8 miles, the exception being from the Waratah and Nymboi claims to Marcolino's battery, of recent erection, the distance about $\frac{3}{4}$ mile, and over the very roughest of roads.

When perusing the undermentioned journal, in which is discussed mining matters and speculations of every kind in all parts of the habitable globe, I incidentally met with a letter which, I think, as referring to mining at Nana Creek, deserves more than a cursory glance; I therefore take the liberty of inserting it, with the editor's introductory remarks and foot-note, in my report. It is one penned in September of this year by a miner, now residing on this field, to a friend of his in England, and from which a slight conception can be formed of what he, in common with many others who have been, and are now, residents of this place, think of the general state of mining here. His assertions are very pertinent and, to my knowledge, stamped with truth.

"Weekly Bulletin": A journal of finance and investment. Edited by Kenneth Ffarington Bellairs.

"ECONOMY."

No. 342. New Series. London, 13th November, 1886.

The following letter from New South Wales, and sent to us by the recipient, shows that the rock must be very rich, to pay a poor man who has neither mills nor appliances with which to work. All would-be emigrants must remember the fact that, although capital with labour may extract the precious metal, labour without capital cannot :—

"I am waiting for one of your epistles, but it does not come, but yesterday a regular shower of papers arrived (six), for which many thanks. I am still in this most stringing reef country, but begin to give up all hope of it doing any good; the poor people here cannot prove the ground. The way they work is like a lot of pigs, scratching about on the surface; they scratch about and find a golden reef, get out a few tons, and if the stone 'pinches out' they try some other place. One man got 95 ounces out of 16 tons, and left his shaft only 12 feet deep. The ground my brother was working is a most curious place, nothing but a network of leaders running to all points of the compass, but cannot find the reef, as we cannot afford

afford to sink, the country being so hard. He sank until he could not do it any longer, then took 17 tons out of some of the leaders, and crushed 1 oz. 14 dwt. per ton, but it was not good enough; expenses of carting and crushing 47s. 6d. per ton. The same leaders have given 2 oz. 10 dwt. per ton. I saw him try a prospect from about 3 oz. stone, and got 15 dwt. 16 gr. of coarse gold, all covered with mundic; obliged to waste and amalgamate it. Now, I think these batteries (only stampers and copper-plates), cannot save the gold from mundic reef, consequently more than half the gold is sent down the creeks. I was thinking of getting a ton or two and sending it to Swansea for treatment. Do you think it would answer, and how should it be sent, and to whom, also probable cost of working it per ton? Nana Creek, 26 September, 1886."

This refers to the Advance Australia. (See page 97.)
This refers to crushing from the Advance Australia of 8 tons 9 oz. in 1885. Average 2 oz. 7 dwt. 12 gr.

Nana Creek must be worth millions with proper mills up.—ED.

ALBERT DISTRICT—SILVERTON DIVISION.

(Mr. Warden Brown, P.M., Silverton.)

I now have the honor to hand you below, for the information of the Hon. the Minister for Mines, my report of the progress made in the mining industry of the Silverton Division of the Albert Mining District during the past year.

I am pleased to state that silver-mining has made steady progress during the year just ended, the work being considerably helped by a most favourable season; but as yet most of the mines in this district are only in their infancy, and will require a considerable amount of capital and labour to fully develop them. The magnificent results from the Broken Hill Prospecting Company's mine have induced prospecting to a large extent to be most vigorously carried on along the same line of country, and from present appearances likely to result in a satisfactory manner to the proprietors. At the Pinnacles, work has been resumed. This mine is considered, by most persons qualified to express an opinion, as second to none on the field, Broken Hill excepted, but hitherto the management has been greatly hampered by a short supply of water, refractory ores, and other evils, which perhaps could not be foreseen. Concentrating machinery is being erected which is thought will put an end to the difficulty experienced in smelting the ore.

At the Day Dream, comparatively little ore has been raised during the past year, the hands employed having been solely engaged in further prospecting the mine at a greater depth, and, I believe, with fair success. It is expected the number of men employed will be greatly increased, and the smelters shortly put in blast, the Company having taken advantage of the rise in the River Darling to secure a good supply of coke. The Umberumberka S. L. Company's property has, I think, fully established itself in the rank of first-class mines. The output has been steady, as will be seen by the manager's report attached. Prospecting by other Companies has been steadily pushed ahead on this line. As regards the small rich chloride veins which are to be found all over the field, more especially in the neighbourhood of Purnamoota, several of them have been steadily worked during the year just ended, more particularly the Lubra, Treasure, Maybell, Maybell North, Kate, Manola, War Dance, and several others. Two small smelters are now being erected at Purnamoota by private enterprise, but by different persons, who each maintain they can effectually treat these ores at a small cost per ton. It is to be sincerely hoped these (or one of them) undertakings will be successful; for until some method is devised by which the working miner can realize on small parcels of these rich ores, either by having them treated or bought on the ground, this branch of the silver-mining industry will be depressed.

The large manganese outcrops at Corona are again attracting attention. 180 acres have been applied for as mineral leases at this office during the last month, the applicants stating their intention to thoroughly test this country.

The tin deposits, near Poolamacca Station, are now being tested, several of these leases having been executed during the past year; all persons interested in these mines believe them to be good properties, but as work has only just been started on most of them only a small quantity of ore has been despatched from the field.

The S. A. Railway is now so far completed that mails, goods, and passengers are conveyed to the Border, some 20 miles from here, and, as the same contractors will continue the construction of the tramway line to Silverton, it is expected to be finished to this town in March next, which will place this field in direct railway communication with Adelaide and Port Pirie, and must cause a great impetus to be given to the mining industry of this district, as the supply of low grade lead ores, carrying from 30 to 40 oz. silver per ton, is unlimited, and with cheaper carriage, I fully expect to see during this year a large number of men employed on the galena lodes of Thackaringa, which, with one or two exceptions, have not been worked during the past year.

When writing my last year's report on this field, there were only two smelters at work; this number has now been increased to seven, and by the end of this year the latter number will be more than doubled.

The appearance of the town of Silverton has been much improved during the year by the erection of several substantial buildings. At present there is a splendid supply of water for all purposes. The population in and around the town, I should estimate at about 2,000.

The township at Broken Hill (official name, "Willyama"), has made rapid strides during the past year, the population in and about it I should say is near to 3,000 persons, the buildings are not so substantial as those at Silverton; this is easily accounted for by the unsatisfactory tenure of the land by the occupants who have settled there since October, 1885, when this land was exempted from occupation under miners' right or business license. This, I must say, with all due respect to the person who suggested this exemption, was a most unwise policy, as it seriously retarded *bona fide* settlement, and I have no doubt was a direct loss to the revenue for the past year, for if settlement had been allowed to go on, some thousands of pounds would have been received at the Treasury in payment for I.P.'s; it is to be hoped this important question will soon be settled, as, with about thirty exceptions, the whole population are merely trespassers; this town is badly supplied with water, and I would strongly urge the necessity of some provision being made by sinking tanks.

During the past year the following licenses were issued by the Mining Registrar:—

Business licenses	650
Mineral	285
Miners' rights	103
Mineral lease applications received	208

The declared value of the mineral exports from this field for the year 1886, kindly furnished me by the Sub-Collector of Customs, is as follows :—

		Value.		
		£	s.	d.
Refined silver	410,256 oz.	81,910	0	0
Silver ore.....	1,711 tons 2 cwt. 3 qr. 16 lb.	67,233	0	0
Argentiferous lead.....	2,556 „ 11 „ 1 „ 12 „	188,486	0	0
Do do via Menindie	474 „ 4 „ 0 „ 5 „	32,725	0	0
Tin ore	2 „ 1 „ 0 „ 0 „	69	0	0
Total value of export.....		£370,423	0	0

In addition to this, there is a large quantity of ore still remaining at the different mines, which has been raised during the past year, but not yet sold or treated, and would add considerably to the total amount of ore won.

I estimate the value of plant and machinery now at work on the field at £45,000.

I think I have now touched on all the principal features of this division, without traversing over the same matter as lately formed the excellent reports of the Inspector of Mines, who lately visited all mining centres on this field. In conclusion, I may state that, from present prospects I consider the field in a sound condition, and fully anticipate the exports at the close of the year (silver, lead, and tin), will reach in value one million sterling.

Accompanying this report are several returns from the different mining managers, giving valuable information as to depths of workings, &c. Some of them I must confess I can hardly understand, few of them showing the amount (which must have been considerable) of ore still at grass.

As the Broken Hill Prospecting Company's mine is, without doubt, the most extensive and valuable silver mine in Australia, perhaps a short resume of its history may not be out of place as an appendix to this report.

In September, 1883, one Charles Rasp, who was then a boundary rider on Mount Gipps station, marked out an area of 40 acres, believing the enormous outcrop of manganese to be tin. On reaching the station at night, he informed Mr. McCulloch, the general manager of the station, also his mates, of what he had done, when it was then and there determined to form a small syndicate, consisting of seven persons, all station hands, each putting £70 into the venture. The first thing done was to apply for a mineral lease of the land taken up by Rasp, together with six other 40-acre blocks on the same line. These seven blocks now constitute the Broken Hill proper, and were originally applied for by the following persons: George McCulloch, George Urquhart, Charles Rasp, James Poole, Philip Charley, David James, and George M. Lind. Work was soon commenced, and assays made for tin, but, I need hardly say, with no beneficial result. It was then decided to sink a shaft, and prospect for silver, which, by this time, had been proved to exist in the district. The country being hard, and the sinking not showing very encouraging prospects, coupled with the fact that the small amount of capital that had been subscribed was exhausted, caused some of the original shareholders to sell to others, Lind being the first to retire, his interest being taken by McCulloch and Rasp, Urquhart being the next to give in. It was now determined to increase the syndicate to fourteen, for the purpose of raising more funds for further prospecting. This arrangement was carried out, and the work continued until the latter part of 1884, when chlorides were first found in Rasp's shaft, at a depth of about 100 feet. Shortly after, rich chloride ore was found in the cap of the lode, at a different part of the mine. I may here state that the cap of this lode is discernible through the seven blocks owned by the Company, being about $1\frac{1}{2}$ mile in length, and rising in places fully 50 feet above the surface, while in the workings below it has been proved, in places, to be considerably over 100 feet wide. About the middle of the year 1885, it was determined by the then proprietors to offer a portion of this enormous property to the public, and on the 10th August, 1885, the present Broken Hill Proprietary Company was floated. The prospectus issued was to form a Company of 16,000 shares, of £20 per share, the fourteen shareholders receiving 1,000 shares each, paid up to £19, the remaining 2,000 were offered to the public at £9 per share paid on allotment, and then to be considered paid up to £19, after which all shares alike were liable to a call of 20s. on formation of this Company. £3,000 was to be paid (in addition to the shares) to the original proprietors, for expenses previously incurred. Thus, it will be seen that, on the formation of the present Company, only £15,000 was available for all purposes. Extensive operations were now commenced, machinery erected, and the first two smelters put in blast in May last, and the result so far, I think, may be considered highly satisfactory. Up to date £64,000 has been paid in dividends, and another of £1 per share is payable on the 19th January. Machinery and supplies of coke, firewood, explosives, &c., now on the mine exceed in value several thousands of pounds; substantial stone buildings have been erected for manager's residence, offices, and other purposes. All this has been paid for by the value of ore won from the mine whilst sinking shafts and driving levels, which, in ordinary cases, would be considered dead work. The supply of ore is, apparently, unlimited. The market value of the mine is now £1,520,000, the latest quotations being £95 per share, and few sellers at that figure. In June and July of 1884, a one-fourteenth in this property was worth about £100, some shares being sold for less than that amount.

Of the seven original proprietors four only now retain an interest in the Company, viz., Mr. George McCulloch, Philip Charley, Charles Rasp, and David James, the former gentleman, I believe, retaining the whole of his fourteenth interest.

By the printed report submitted to the shareholders in December last, I find that the result of a twenty-nine week's run, ending 25th November last, with two smelters, was as follows:—Ore treated, 10,397 tons, for 871,665 oz. fine silver and 1,990 tons 17 cwt. 3 qr. of lead, the average of silver being 83.83 oz. per ton of ore. From the same report I also find that the gross profits from the mine for the six months, from 1st June to 30th November last, were £89,912 11s. 2d.

ALBERT DISTRICT—WILCANNIA DIVISION.

(Mr. Warden Gower, P.M., Wilcannia.)

I do myself the honor to report, that during the past year prospecting operations for alluvial gold have been carried on at the Peak Tank, on Nuntherungee Run, half-way between Wilcannia and Milparinka, which, if successful, will give an impetus to mining in this district, and open up a large area of country. I am informed by some of the men from that locality, that there are now about fifteen to twenty men prospecting, and some of them are earning rations by surfacing, which gives them every hope of ultimately discovering payable ground. The

The season is in every way favourable for prospecting, as there is a quantity of water in most of the holes in the creeks throughout that locality.

I issued ten miners' rights in 1886, and ten up to date.

No other minerals are being prospected for, and I hope that my report for the current year will be a more favourable one.

ALBERT DISTRICT—MILPARINKA DIVISION.

(*Mr. Warden King, P.M., Milparinka.*)

I HAVE the honour to hand you herewith my report on the Milparinka Division of the Albert Gold District.

During the year 1886 12·75 in. of rain having fallen, the miners have been well supplied with water for all purposes, and the yield of gold, so far as can be ascertained, has been considerably increased—2,131 oz. were sent away by escort for the Commercial Bank up to the end of August, since which about 1,000 oz. have been purchased by the storekeepers, and although it was estimated that 600 oz. were on hand at the commencement of the year, it may be assumed that upwards of 3,000 oz. have been gained this year, as several of the puddlers do not sell to the storekeepers.

The number of miners' rights and business licenses issued compares favourably with last year's returns, but there has been a great falling off in the population during the last few months, many having left for the new field lately opened at Tetulpa, in South Australia.

At Mount Brown, on Billygoat Hill, steady work, with satisfactory results, has been done in the claims that have not had water to contend against—the yield being about 1 oz. per ton. Two only of the claims that obtained suspension resumed work, and so far they have not been able sufficiently to overcome the water to ascertain the value of the wash at the bottom of their shafts. Butler's party however perseveringly worked on and traced the lead of gold from the higher ground to the water's edge, about 100 ft., and obtained an average of 1 oz. per ton, but have now suspended work to obtain machinery to overcome the water. I am of opinion that when these claims can be efficiently worked handsome returns will be obtained. The Golden Lake Company have constructed a puddling machine so as to utilize the water from their shaft, and, but that water has been so plentiful at Mount Brown, it would have been much used by puddling surface ground for the public at a reasonable charge of 5s. per ton of wash-dirt. McClure's shaft is also on water, and is at present held only as a water shaft. This underground water is found at a depth of 210 ft.

At the One-mile the lead of gold which Portuguese Joe found at a depth of 16 ft. under the cement has been continuously traced in a southerly direction to a depth of 165 ft. Four claims are on good payable wash, yielding from 1 to 4 oz. per load. Brookway and party tried to pick up the lead further out, but failed. One puddling machine has been doing steady work at the Four-mile washing surface dirt, which returns about 1½ oz. per load.

At the Warratta reefs, the Milparinka Gold-mining Company having purchased the machinery and claims held by the Whittabrinna Company, have let the claim to tributors, who, during four months, have only crushed 40 tons for 23 oz. It is thought that owing to defective machinery more than half the gold is lost in the tailings. In other respects the Warratta is abandoned. During the winter months a little gold was obtained in Evans' gully, about 5 miles north of Warratta, and at this place also a shaft was put down searching for silver, and satisfactory assays said to have been obtained, but nothing further has been done.

The only new ground opened out this year was found by Thomas House in a gully on the south side of a low slaty ridge, about 6 miles north of Milparinka, from which about 20 oz. were obtained of heavy nuggetty gold, but, although the locality was well prospected, nothing further could be found, and it is now abandoned. Good Friday has found employment for about 15 miners, who have met with satisfactory success, ½ oz. per ton.

At Tibooburra, the principal work is now carried on with puddling machines, which are yielding very good returns by puddling the surface ground, and, owing to the good rainfall, they have continued steadily at work.

The rainfall having been so very propitious for the pastoral interests has enabled the Crown lessees to increase their stock very materially; for in 1885, the sheep returns showed 411,519, this year they amount to 525,000. In consequence of the unsettled state of the land question, particularly as regards the Western Division, the pastoral tenants are making no improvements, and consequently employing very little labour, and this causes business of all kinds in the township to be exceedingly dull.

There has been very little sickness in this district, the deaths (16) being mostly attributable to natural causes,—but two men perished for want of water. Twenty-three children have been born, and there has been no mortality among them. This climate, therefore, although so hot in the five summer months, cannot be looked upon as otherwise than very healthy.

I beg to append an extract from my meteorological journal for the year 1886.

Month.	Aneroid.		Thermometer in shade at 9 a.m.			Temperature.		Mean.		Rain.
	Temp.	Pressure.	Dry.	Wet.	Point of humidity.	Max.	Min.	Max.	Min.	
January	89·0	30·003	86·0	68·6	17·4	112·0	54·0	98·7	69·4	0·11
February.....	82·8	29·998	82·5	64·5	18·0	111·0	50·0	96·0	62·6	.....
March	74·9	30·157	75·5	60·4	15·3	104·5	45·0	91·8	59·3	.....
April	67·6	30·124	70·2	57·9	12·3	102·5	45·0	84·2	54·3	.....
May	59·4	30·209	61·2	54·0	7·2	86·0	36·0	73·1	45·0	0·77
June	50·0	30·260	50·5	47·6	2·9	74·0	32·0	66·1	43·0	0·72
July	51·8	30·013	49·0	46·8	2·2	75·0	34·0	62·8	43·7	3·23
August	55·8	29·944	53·6	49·8	3·8	79·0	41·0	65·5	46·7	2·82
September	61·0	30·118	61·4	54·4	7·0	85·0	41·0	73·1	50·2	0·36
October	65·9	30·018	64·5	54·7	9·8	99·5	41·5	79·0	52·3	1·62
November	79·3	30·105	77·8	63·7	14·1	108·0	51·5	89·1	63·0	0·62
December	82·3	30·037	79·9	65·7	14·2	102·0	55·5	89·5	67·9	2·45
Mean.....	68·3	30·081	67·6	57·3	10·3	112·0	32·0	80·7	54·8	12·75

ALBERT

ALBERT DISTRICT—MOUNT BROWNE DIVISION.

(Euston C. King, Mining Registrar.)

I HAVE the honour to report, that during the year 1886 I have issued 403 miners' rights, sixty-three business licenses, and thirty-seven mineral licenses. As compared with 1885, there is a decrease of twenty-seven miners' rights, one business license, and twenty-three mineral licenses.

The mining on this gold-field has in some instances slightly improved during the last twelve months, aided by the favourable rainfall of 12 $\frac{3}{4}$ inches, which fell at convenient seasons, leaving a good supply of water in the dams and reservoirs, and an abundant supply of grass.

At Mount Browne, the Billygoat Hill lead has been traced from 30 feet to a depth of 210 feet, at which depth a very large supply of good water was struck in several shafts—so great a supply that the claim owners have had great difficulty in keeping the water down with the ordinary miners' appliances, and have at last been compelled to give up following the lead under the water-level until they can procure machinery. Butler and party have proved this lead to be over 100 feet wide, and the thickness of the wash-dirt to be on an average of 18 inches, and dips 20 feet, almost perpendicular in some places, in others 1 in 6, towards the south and south-east, and yielding from 18 dwt. to 20 dwt. to the ton. M'Kenzie and party, the prospectors of this lead, are still doing well in their claim. The Sons of Freedom party have struck the lead, and driven 120 feet, following it south. The Golden Lake Company have not yet discovered the lead, but have struck the water at 208 feet, and found traces of gold; they are now making use of the water in puddling the surface dirt, which averages up to 3 dwt. to the ton. Howell and party, north of the prospectors, are getting payable gold at 50 feet. Morton and party, and Crammond and party, on this lead, are also doing well, getting gold at 30 feet. Some coarse gold is often picked up on the surface, after a shower of rain, in the vicinity of Mount Browne.

At the One-mile a rush took place in July, owing to a third claim picking up the lead there, and obtained 4 oz to the load at 50 feet. Several parties have since found the lead, and traced it towards a flat, about 300 yards, bearing to the south-east, and dipping at the rate of 1 in 8; but the yield is very patchy, for in one claim the yield is 2 oz. to the ton, and in a neighbouring claim only 8 $\frac{1}{2}$ dwt. to the ton.

A small rush took place in June to the slate ranges, 5 miles north of Milparinka, where a very rich patch of gold had been found by Thomas House, in a gully coming out of the range. This gully was worked out, the yield averaging 1 oz. to the load or ton, but no traces of gold could be found outside the gully, and it only continued about 400 yards down the water-course. Several large nuggets were found at this place, weighing from 1 to 8 oz.

At Albert (The Reefs) comparatively nothing has been done. The Milparinka Quartz-mining Company have let their machinery out on tribute; and the tributors have been crushing stone raised from the abandoned shaft, with the result of 40 tons crushed for 30 oz. Some very heavy coarse gold has also been found close to the reefs, in alluvial ground, at a depth of about 5 feet.

At Good Friday about 20 miners are making a living by fossicking, but up till now no rich lead of gold has been found there.

At Evans' gully, about six miles north from Albert, several small leads have been found, and while the small holes in the creek held water, the few miners there were able to make good wages by washing, but the dirt is not such that can be dry-blown as easily as that about Tibooburra.

At Tibooburra and the neighbourhood mining has greatly improved. There are fourteen puddling machines there, most of which have kept busily at work throughout the year; and, although the expenses of puddling are somewhat heavy, the returns of this year have been considerable, though it is very difficult to ascertain the true particulars. I have been informed that, in some instances, the puddlers made from £20 to £30 a-week. F. Valgoi, a puddler, at Easter Monday, near Tibooburra, has been puddling dirt from the surface, and obtains from 8 to 9 ounces a week, from about 266 loads. Thomas Stevenson has puddled 2,000 loads from the surface, which averaged 1 dwt. the load. Tibooburra is well supplied with water; several large dams and tanks have been constructed by private enterprise, and the rains in December have filled them all.

A little excitement prevailed in April on account of reports from Wompah, close to the Queensland border, of a rich find of silver. Several leases were taken up and applied for, but before any great rush took place it was proved to be a failure.

COBAR DISTRICT—HILLSTON DIVISION.

(Mr. Warden O'Neill, P.M., Hillston.)

I HAVE the honor to state, for the information of the Honorable the Secretary for Mines, that no change has taken place since my last report with respect to mining industries in this district.

At Mount Hope, and especially at the Great Central Mine, there is an abundance of copper, so I am informed; but the low price given for the ore, the cost of carriage, owing to the remoteness of the place from the railway, and the general depression resulting from long continued droughts, have militated against the successful working of the mines for the present. The stoppage of work at Mount Hope threw a large number of men and boys out of employment, and led to an almost abandonment of the locality, causing loss to storekeepers, property holders and others. It is believed that with a return of prosperous times, and under good management, the mines at Mount Hope would out-rival those at Cobar and Nymagee.

No improvement has been made as regards gold operations at Cudgellico. Undoubtedly gold is to be got in payable quantities at this place; but by some bungling in the management, a Victorian affair, and in consequence of disagreements between the directory and the local body in charge, things have been allowed to remain at a standstill. Were it not for farming pursuits in the neighbourhood of the town business interests would long since have been seriously damaged in this locality. Owing to the late floods in the Lachlan, the lake at Cudgellico is now full and steps, in my opinion, should be taken at once for the preservation of this grand supply of water in the interests of the residents in and around the township.

COBAR DISTRICT—COBAR DIVISION.

(Mr. Warden McKell, P.M., Cobar.)

I HAVE the honor to forward herewith my report as Warden and Mining Registrar for the Cobar Mining District, for the year 1886. Gold.

105

Gold.

Nothing has been done during the past year in the way of gold-mining. The number of miners' rights issued at Cobar being 78 less than the previous year.

Copper.

The Great Cobar Mine is still working under the able management of Captain R. N. Williams, and in spite of the very depressed state of the copper market, 500 men and boys are employed, and during the year 25,887 tons of ore were raised, which has been smelted on the works, yielding 2,044 tons of copper, valued at £80,951. The ore in this mine consists of grey oxides and blue and grey carbonates, the percentage being 7.88. The plant, which consists of buildings, smelting sheds, and machinery, appears in good order, and is valued at £85,000.

The Nymagee Copper Mine, which is situated at Nymagee, a township 70 miles south-east of Cobar, is under the supervision of Captain Blackmore, and employs 300 men and boys, being 50 less than last year, and has raised during the year 14,752 tons of ore, which was smelted at the mine, realizing 1,478 tons of copper, valued at £60,967 10s.; the yield being 10 per cent., and the average since the commencement of the mine being 14 per cent. The value of the plant is £82,371.

In June last a party of four men, Messrs. Frost and O'Mahoney, made application for a lease of 40 acres on Hermitage Plains, about 30 miles east of Cobar, on the Nyngan road, and have since sunk a shaft 30 ft. At 13 ft. they struck some very good ore, consisting of grey sulphides, with blue and green carbonates intermixed. The width of the lode is about 5 ft., striking north and south, and dipping one in 30 ft. west. They have about 30 tons of ore to grass, and out of some picked samples tested, a yield of 38½ per cent. was the result. I am informed that this locality abounds in copper ore, and it is the intention of one or two parties who now hold under mineral licenses to apply for leases.

The land known as the C.S.A. 60 acres, about 6 miles north-west of Cobar, originally occupied by Cohn and party, and which was forfeited a few months ago, has been applied for by Captain Williams, of the Great Cobar Company, and I believe it is his intention to commence work with as little delay as possible.

My numerous official duties preclude me from visiting the various mines in the district, so I have to trust to others for any necessary information. In conclusion, I might state that through the low price of copper ruling the last few years, combined with dry seasons, bad state of roads, scarcity of water and grass, and exorbitant rates of carriage, this enterprise has almost been stagnated, in so much so that men had to be dismissed, and wages reduced to a great extent so as to curtail the working expenses; but now that the drought has, to all appearance, broken up—the rainfall for the past season being 20.89 in. (the average for the previous four years being only 11.59 in.), filling all the tanks and drains, and giving an unlimited supply of water, and tenders having been called for the construction of the railway from Nyngan to Cobar, which when constructed will reduce the rate of carriage—there is every prospect of new lodes being opened up, the mining population becoming enlarged, and the whole of the mining industry in this portion of the district, assuming greater proportions than it has for the last few years.

COBAR DISTRICT—HILLSTON DIVISION.

(*M. Hogan, Mining Registrar.*)

PRESSURE of land agency and of other business has prevented me from furnishing you with my report for 1886 before this, and it is with regret that I have to announce that, as far as mining matters are concerned, this district has made no progress during the past twelve months. At the New Mount Hope Copper Mine there are just a few hands at work developing the mine; as, owing to the low price of copper, it would not pay the Company at present to resume active operations. This Company has also got a few men engaged prospecting a gold mine at Ironstone Hill, near Mount Hope.

The Great Central Copper Mine (South Mount Hope) is altogether closed, but I am told that this is due mainly to bad management. The mine is said to be a rich one, and under different management, it would doubtless prove a paying concern. Some time ago, in view of what profits had been made upon the outlay for the two years prior to the closing, £3,000 a year was offered to the Company for the mine, to be worked on tribute, but this offer was refused.

Gold-mining at Lake Cudgellico is at a complete standstill.

During 1886 there were issued from this office 48 miners' rights, and 14 business licenses, and during the same period applications were received for two gold leases of 10 and 8 acres respectively, and for one mineral lease of 40 acres. I would suggest that in any alteration of the Mining Law, the fees for business licenses and miners' rights, taken out to cover residential areas, be increased, as by this means the revenue will be benefited without inflicting hardships upon parties concerned.

During the late drought Lake Cudgellico was perfectly dry and the want of water was severely felt by the residents as well as by teamsters, carriers, drovers, and others. Cudgellico is on the highway to Whitton, and has a splendid common for pasturage purposes, so that for little or no expense to the Government the lake could be locked where the water from the Lachlan runs in, and a permanent supply of water thereby secured for that part of the back country.

COBAR DISTRICT—NYMAGEE DIVISION.

(*E. C. Day, Mining Registrar.*)

THE mining industry in this district has, during the past twelve months, been entirely confined to the copper-mining carried on by the Nymagee Copper-mining Company. This Company, on which the local township is entirely dependent, has, despite determined strikes amongst the wood-carting and smelting departments, kept its miners steadily at work throughout the year. The lengthened stoppage of work at some of the neighbouring copper mines has made many predict the early closing of this, but there does not appear to be any grounds for such an opinion. Undoubtedly a heavy fall in the price of copper would behove the directors to consider the advisability of shortening hands, but this is not at present anticipated.

INSPECTOR OF MINES' REPORT.

IN submitting my annual report for the year 1886, I have the honor to inform you that the following is a list of accidents which have occurred, during the year, in the Metallic Mines of New South Wales:—

No. of Accidents.	Date.	Name of Mine or Company.	Locality.	Persons killed	Persons seriously injured	Occupation	Cause of death or injury	Fatal					Non-fatal		
								Fall of earth	Falling down shaft	Exploded shot.	Fall of bucket on head while in shaft.	Inhaling foul air.	Using steel tamping bar.	Fall of earth.	Exploded shot.
1	Feb 21	No name	Braidwood	. . .	W. Walch	Miner	Using steel tamping bar with powder						1	.	
2	Mar. 3	Grand "Amalgamated.	Mount Macdonald.	A Fun	. . .	"	Killed by fall of earth	1						.	
3	Mar. 9			J Mullins	. . .	"	Killed by fall of earth	1							.
4	May 27	Great "Cobar Copper.	Cobar	T M'Millan	Gus Aubrey	"	Injured by fall of earth						1	.	
5							Killed by explosion of shot		1						
6	"	"	"		T H Walker	"	Injured by explosion of shot							1	
7	June 10	Pine Ridge	Trunkey Creek	J G Edgerton		"	Killed by fall of earth	1						.	
8	Aug. 4	Silver King	Mitchell	H. Trezise		"	Killed by bucket falling on his head				1			.	
9	Sept 7	Scandinavian	Bowling Alley Point, Nundle	G Bonallas		"	Killed by fall of earth	1						.	
10	Oct. 8	Verrisa Quondong	Hill End Grenfell	P O'Reilly		"	Killed by inhaling foul air					1		.	
11				J W Eager, 14 yrs of age	"	Killed through falling down shaft	1								
12	Nov. 27	Daylight Creek	Mitchell	J Rice		"	Killed by fall of earth	1						.	
13	Dec. 7	Broken Hill.	Silverton	W Ball		"	Killed by fall of earth	1						.	
14	"	"	"	T Stewart		"	Killed by fall of earth	1						.	
								7	1	1	1	1	1	1	1

A few accidents of a minor nature may have happened, but the above-mentioned are all on which reports have been received at this Department. During the year, I have inspected the metallic mines in several of the mining districts in the South, North, and West, and herewith furnish my report of the prospects and development of said mining districts.

GOLD.

Commencing with the Adelong gold-field, which for years past headed the list in the produce of gold, and from whose deep quartz mines such great results were expected.—Very little is doing in the development of these mines, owing principally, to want of capital. When this is once forthcoming, Adelong will again become one of the leading gold-fields of New South Wales, not only in quartz, but also in alluvial mining.

At Temora, no fresh discoveries worth any special note have been made during the year.

On Lambing Flat, about 3 miles from the township of Young, mining operations are still carried on with vigour, in the wet alluvial ground. Pumping and other machinery has been erected, and the auriferous drifts are exceptionally rich, but the heavy water-soaked drifts have, hitherto, greatly baffled this undertaking, which is a legitimate mining enterprise.

Grenfell has had a small alluvial rush at the Quondong, and, with the exception of that, very few miners are now employed on this once famed gold-field. Capital may, however, be well expended on some of the quartz reefs, such as the Lucknow or the Consols, and prove very profitable to those who undertake the enterprise. A company was formed in 1872, to test the Lucknow reef at a depth below 400 feet, but the company had not sufficient capital to complete the sinking of a perpendicular shaft; the latter could be enlarged, sunk deeper, and made use of as a main shaft.

Forbes.

Of the quartz reefs, the Britannia reef is the principal one at present at work in the neighbourhood of Forbes. It is situated about half-a-mile westerly of the town of Forbes, at the head of the Britannia lead. Rich quartz was obtained out of this reef some twenty years ago, by Snow and party, but it was afterwards abandoned, and remained so to within eighteen months ago, when another start was made by some of the very men who had abandoned said reef for twenty years. The Company have erected a small ten-stamp battery, which is driven by a 10-h.p. engine. They have crushed several large samples of quartz, with payable results. That from the 90-feet, or deepest level, has, so far, given the best return, viz., 1 oz 5 dwt. per ton. But to work this reef thoroughly, the shaft should be sunk to a greater depth, levels opened out, and back stoping should be adhered to. This reef occurs in the diorite formation, and as quartz veins, in this formation, generally occur in blocks, and the gold in shoots, there is a probability that when a greater depth is reached the country will become more settled, and the blocks of quartz and shoots of gold may greatly increase in extent and value. The diorite dyke in which the Britannia reef occurs, trends in a north-east and south-westerly direction, and it is, most probably, the source from which the several alluvial leads near Forbes derived their auriferous deposits, and if this dyke were thoroughly prospected, other gold-bearing veins, in addition to the Britannia, Fountain Head, Consols, &c., would, no doubt, be discovered, and quartz-mining become a permanent industry in the Forbes district. Judd's reef is at present idle, and on Strickland's reef some prospecting has of late been carried on, but both reefs are awaiting the erection of machinery. The former (Judd's reef), which is situated on the Parkes road, about 1 mile from Forbes, promised well when first discovered. The reef is large, and a crushing taken out yielded $\frac{1}{2}$ oz. of gold to the ton. It is several feet in thickness, and if the above-mentioned yield could be obtained, on an average, the reef ought to pay well. Alluvial.—A few parties are working near the head of the Caledonian lead, but, I am afraid, with not very bright prospects of success. On the Britannia lead, the Crinoline Gold-mining Company have cleaned out and fixed up an old shaft, and expect payable results, as the lead in the neighbourhood of the shaft has been but little worked, or even prospected.

The

The Forbes Alluvial Company (Mr. H. H. Cook, manager), is situated south of the Crinoline mine, and it is intended by the Company to work both the south and the Britannia leads. The depth of sinking is about 200 feet. A contract to sink the shaft has been let, at a cost of £600, the contractor finding all material and appliances. Heavy drifts had to be passed through, and a diving dress of the most improved pattern was made use of while sinking through the heavy flow of water and drifts. The Company's prospects are excellent. The Nil Desperandum Gold-mining Company is situated where the south lead crosses the Lachlan River. This Company bottomed a shaft (which had been partly sunk some years ago), and obtained payable prospects off the bottom. Indications are not wanting to predict this Company a successful career for years to come. Credit is due to this Company for their energy, perseverance, and enterprise, not only in the erection of their steam winding and puddling machinery, but also in the opening of their mine.

Parkes.

Quartz-mining has now become the principal industry of the Parkes gold-field. Hazelhurst, Quails, Stewart, Drummonds, and several others, are still obtaining gold in more than payable quantities, proving beyond doubt that the system adopted by the Mines Department in opposing the alienation of auriferous lands in or near the town of Parkes, has proved most beneficial, not only to the mining population of Parkes, but to the general public. Several new finds in quartz-mining have been made during the year, and indications point to the belief that new reefs will be discovered in future, as they have been in the past.

In alluvial there is nothing new to chronicle. Rushes which took place during the year have either turned into total, or partial failures, and I am sorry to state that the Prospecting Vote for 1885, which was partly expended in 1886, has borne no fruit.

In May last, Ginther and party reported payable gold, stating at the same time that they obtained 2 dwt. of gold per dish of stuff, the depth of sinking being 56 feet. I was instructed to proceed to Parkes, and to take such steps as was thought most advisable to prove the correctness of the report. On arrival on the scene of the prospecting claim, I found from 400 to 500 persons already on the ground, out of which I selected two miners who were disinterested in the prospecting claim, and, in company with them, went below to examine the underground workings and to take out some auriferous drift, to be washed publicly. The thickness of the wash was from 3 to 9 inches, and out of eleven dishes (or say six small tin buckets), 4 dwt. 6 gr. of gold were obtained; the prospectors had previously obtained 10 dwt. of gold out of four dishes, making a total of 14 dwt. 6 gr. of gold, out of fifteen dishes of stuff. I put it to the vote of the miners, whether or not they considered the prospects obtained to be payable, which they carried in the affirmative, and I then declared the valley to payable, and named it the J. P. Abbott Lead (or valley), in honor of a late Minister for Mines, under whose administration the prospecting votes were commenced. Although a great many shafts were sunk in all directions, I am sorry to state that no lead, or even an extensive patch of gold could be traced. The gold was of a coarse nature, impregnated with quartz and cement, and I am still of opinion that although no payable gold to any extent has been discovered in the tertiary drifts in the J. P. Abbott Valley, a narrow reef of gold or rich quartz vein might still be discovered; either in or in the immediate neighbourhood of Ginther's prospecting claim. The alluvial consists of tertiary drifts, and the geological formation of the rocks is diorites and slate.

Several attempts have been made to prospect for alluvial auriferous deposits north of Parkes, but so far with very little success.

Tomingley.

Here the quartz veins still employ a number of miners. Those at Tomingley proper have not yielded large returns, but some very good crushings have been obtained during the year at the Myall reefs, about 1½ miles from Tomingley.

Prospecting for auriferous alluvial deposits has also been carried on both by Government aided and private parties, but without any success, still there is a large area of country between the Myall and the Ten (10) Mile Ridges, which has not been prospected.

Buckinbah.

In September last I proceeded from Forbes *via* Parkes, towards Buckinbah, for the purpose of inspecting and reporting on the Buckinbah gold-field and neighbourhood, and found the principal mine working on the field to be the Gordon Mine, which is situated 5 miles easterly of the Buckinbah (Yowall) township, and is under the management of Mr. James Veitch. The formation in which this mine is situated is granite, and the lode or deposit occurs in an irregular mass of quartz veins in a circular form, which contain gold, carbonates of copper, copper pyrites, blend, and molybdenite. These veins have been taken out and crushed to a depth of 120 feet from the surface. The whole of the workings represents a pit or quarry 120 feet in depth, by about 70 feet in diameter. Everything, whether rock or quartz, has been crushed, and as the bottom of this pit is larger in circumference than the top, the walls or sides are therefore overhanging the lower workings, which gives it a rather dangerous appearance. There is a second circle of veins which appear to be quite distinct from the first, but whether they will join the first circle can only be proved by development. A main fissure or dyke about 40 feet in width, also traverses the Gordon Mine, trending for a considerable distance in a north-westerly direction. Although this dyke contains no gold from the surface down to the deepest or 120 feet level, it contains traces of other minerals, intermixed with quartz, and when greater depth is reached the mass of circular veins above-mentioned may be found to be connected with the main fissure, and form a valuable mineral lode. For the present the mine is being worked for gold only (copper being too low in price), the monthly crushings averaging about 150 tons, and the yield of gold from 3 dwt. to 7 dwt. per ton. There are also about 1,000 tons of concentrated copper ore lying near the crushing machinery. Mr. Veitch, the manager, informed me that assays from the said ore gave 9 per cent. of copper, 12 dwt. of gold, and 2 oz. of silver per ton. The machinery consists of a twenty-stamp battery, of which ten heads are only of late in use, a 25-h.p. engine, and four grinders, self-taking concentrating ties, constructed by the manager. Unfortunately the crushing machinery was idle at the time of my inspection. The machinery is erected near the Little River, and connected with the mine by a tramway about three-quarters of a mile in length. A National rock drill, driven by compressed air, is also at work.

Several other lodes have been partially worked in this district, such as the Buckinbah, the Upper and Lower Trinity copper, the Burgess, Bonfields, and other gold mines. A few crushings taken out of the

the above-mentioned reefs have returned payable results. The geological formation near the Buckinbah township is granite, some of which is likely to be stanniferous. About a mile from Buckinbah, near the Wellington road, and in granite formation, there are some hills on which gold has been discovered on the surface, in drifts or wash dirt, consisting of angular and round pebbles, ironstone, and conglomerates. Several dishes of this drift were washed in my presence, all containing more or less gold, and even such primitive appliances as a puddling machine, long tom, or a large-sized common cradle might be sufficient to prove, at least some of these deposits, payable. The Buckinbah Creek, which contained a fine stream of water at the time of my inspection, seems also to be auriferous, but probably in sinking near this creek heavy drifts and flow of underground water would have to be contended against. Auriferous indications can be traced in a southerly direction for a considerable distance, and there are likely-looking hills and gullies, with not one shaft in them; and, in addition to gold, very probably precious stones, such as diamonds, topaz, &c., will be discovered in this neighbourhood. On the Molong road, the granite disappears within three miles of Buckinbah, and then Devonian sandstone, slate, and conglomerate succeed, until Yallandry, about 9 miles from Buckinbah, is reached, where the Devonian rocks disappear under the basalt. From here the road passes over basalt, Devonian sandstone, slates, dykes of diorites, and porphyry, and conglomerates, and on a place known as the Gap, the road passes through a very steep, but narrow, range of red Devonian sandstone. After leaving this gap, the sandstone is the principal formation, until the limestone formations of Molong are met with. By indications on the surface, the discovery of a new gold-field may be looked forward to in the vicinity of the road between Buckinbah and Molong.

Lucknow.

The mining operations on the Lucknow or Wentworth gold-field are still progressing very satisfactorily under the able management of Mr. H. W. Newman, J.P. Additional and extensive winding, pumping, and crushing machinery has been added during the year. Other improvements, such as dams, have been erected, in addition to which the Company have been able to pay several dividends. Fully 100 men are employed in connection with these mines. Mr. Newman has also constructed new dams, which have increased the capacity for water storage very considerably. Eight additional stamps are now in course of erection, which will enable the Company to crush and treat several additional hundred tons of stuff per annum. The main shaft has been sunk and substantially timbered to the depth of 400 feet.

A full description has been given by me, in former reports, as to the veins and geological formation, and I have only to add that the Industry vein has now been worked down to the 370 feet level, but still shows well underfoot. It will, however, probably take another twelve months before the Perseverance vein is worked out from the surface to the 370 feet level. This vein also shows well underfoot.

The winding, pumping, air-compressing, ventilating, crushing, and concentrating machinery is all in good order. There are now on the field, under Mr. Newman's immediate supervision, two 25, two 20, two 16, one 10 and one 6 horse power engines at work, and, in all, thirty head of stampers, twenty in the Reform Gold-mining Company, and ten stamps in Frederick Valley Company. The whole of the works are carried on in a satisfactory manner, and every possible care is taken by the management to prevent any accident in or about the mines.

Mount M'Donald.

This gold-field still supports a population of about 200 persons. It is an essentially quartz-reefing district; the gold occurs in shoots through narrow quartz-veins, which is one of the reasons that individual miners succeed better than large companies. Some very rich quartz and payable crushings have of late been obtained out of a mine known as Matheson's, which had been formerly held but abandoned, by a company.

Trunkey Creek in the west, and Bingara in the north, were also inspected by me, but nothing of any importance has occurred on these gold-fields during the year.

SILVER.

In October last I started from head office for the purpose of making a thorough inspection of the silver and other mines in the Silverton District. The first mines inspected by me were those of Broken Hill.

The Broken Hill Proprietary S. M. Co.'s mine, which is under the general management of S. Wilson, Esq, and under the mining management of Captain R. Piper, is at present the best dividend-paying and the most extensive silver-mine in New South Wales, and on the future development and skilful management, both in the working of the mine and reduction and treatment of the ore, will greatly depend the future development and prosperity of this rich and extensive mineral district.

The hill on which this mine is situated rises about 150 ft above the level of the plains which stretch on each side, the lode forming the crest of the highest peak of a rugged ridge, and can be traced with an occasional break for about 2 miles, after which it runs into several lodes or branches. Course of lode north-east and south-west, and consists of iron coated with manganese, carbonates of lead, gossan, felspar, quartz, quartzite, and ferruginous drifts; some of the latter is very loose, and will require extra skill to secure, as it will give undoubtedly extra trouble, for the safety of persons employed in the mine.

Chlorides of silver in payable quantities are being raised from several parts of the mine; it is also well distributed in the southern part of the mine through the kaolin formation. In the northern part of the mine, out of a shaft known as Rasp's, carbonate of lead is being raised from an extensive deposit, and is associated with very high percentage of carbonates, oxides, and grey sulphides of copper ore, which occur in the shape of boulders, and which may be estimated to contain from 40 to 50 per cent. of copper, in addition to silver. The lode, as far as opened out, forms a striking similarity to those top levels of the Great Cobar Copper Mine, with the exception that the Broken Hill is argentiferous, whereas the Great Cobar deposit is cupriferos. No correct estimate can at present be formed as to the real value of this undoubtedly rich mine.

The first furnace started to work on the 6th May, 1886, and was run for sixteen weeks, after which two furnaces have been running. Up to the date of my inspection, the first week in November, 8,612 tons of ore had been raised and treated, yielding 1,731 tons 15 cwt. of lead, and 740,480 oz. (22 $\frac{3}{4}$ tons) of silver, to the value in round numbers of £148,000. Two more furnaces have since been completed and set to work, resulting in a large increase of the yield of silver.

There are five shafts and two tunnels on the mine, and the lode has been opened in different parts from north to south a total length of 2,092 ft., viz., Rasp's to M'Culloch's, 440 ft.; M'Culloch's to Broadribb's, 1,148 ft.; Broadribb's to Jamieson's 308 ft.; and Jamieson's to Knox's shaft, 196 ft. The whole of these shafts are, however, not as yet connected with each other. Nearly the whole of these shafts are down on the water-level. Rasp's shaft is 288 ft.; M'Culloch's shaft, 327 ft.; Broadribb's, 132 ft.; Jamieson's, 212 ft.; and Knox's, 196 ft. in depth. The contour of the country makes the apparent difference in depth of water-level.

Machinery

Machinery.—The Company has steam boilers equal to 100-h.p., and eight steam engines equal to 72-h.p.; also, four steam pumps equal to 24-h.p. They have also excavated a large tank, from which they obtain their water-supply; but which, unfortunately, is also the receptacle of all the filth and dust of the township. They have also erected substantial buildings, covering about 12,000 ft.; and their reducing plant is now equal to about 1,200 tons per week. About 500 men, inclusive of some boys, are directly employed on or about the mine and furnaces. This is exclusive of fuel getters, carriers, &c. The mine was inspected by me on the 8th and 9th instant, and I found ladder-way, and everything in connection with the mine in as safe a state as could be reasonably expected, considering that the rough timber in use for the securing of the mine cannot be obtained nearer than Menindie on the Darling, a distance of 90 miles.

The Broken Hill South Silver-mining Company, under the mining management of Captain Moorish, has several distinct lodes or branches, and is situated on the southern boundary of the Broken Hill Proprietary Mine. Some eight shallow shafts have been sunk, but sinking is now carried on in three shafts only. No. 1 shaft north was down 132 ft. on the eastern lode; No. 3 shaft 110 ft., on the bottom of which was a strong galena lode; and No. 8 shaft, intended for the main shaft of the mine, on the middle lode. The latter seemed greatly improving in depth, and if the shaft was made larger the three already known lodes could be worked by cross-cutting, and capital could be saved by discontinuing the many small shafts.

Nutt's Broken Hill, under the same mining management as Broken Hill South, and situated north-easterly of the Broken Hill Proprietary Mine, may be termed a prospecting company. A shaft is being sunk to the water-level, probably 160 ft. in depth, and a large lode consisting of iron, manganese, galena, and a small percentage of silver, has been discovered in the kaolin formation.

Very little prospecting has been done southerly of the Broken Hill South, with the exception of the Rising Sun, about 3 miles south-westerly from Broken Hill. Here the Rising Sun Silver-mining Company, under the management of Mr. Logan, is sinking a shaft on a promising iron capped lode; the depth of shaft is intended to be 180 ft. before cross-cutting is proceeded with, to intersect three different lodes known to exist, and out of which I was informed payable assays had been obtained.

Pinnacle Mines.

These mines are situated about 9 miles westerly of Broken Hill. Several shafts have been sunk on the Pinnacle Group Silver Mine, of which the deepest is 157 ft. Apparently there are two main lodes, the galena and the Minnie More lode. These lodes are 15 ft. apart on the surface, and 5 ft. in thickness, but at the greatest depth reached, there are indications that both lodes are likely to junction into one. There are also five (5) parallel branches or lodes, which appear to junction near the Minnie More, where a main shaft 10 ft. x 4 ft. is now being sunk. The length of lode so far proven, is about 850 ft., and the thickness varies from a mere film up to 30 ft. There were about 1,500 tons of ore at grass. I noticed that very lately great improvements had been made in the under-ground workings, as well as other parts of the mine, and that the mining manager, Mr. Edgar Rossman (for many years mining manager of the Catherine Mine, Sandhurst, Victoria), was getting the mine and everything in connection therewith in a safer and more systematical state.

An addition to the reducing and smelting plant was in course of construction in the shape of concentrators, as so far the treatment and smelting of the Pinnacle ores has been very unsatisfactory; but whether the ore can be successfully treated in the district or not (the scarcity of fuel and water will always be a great item against local treatment) I nevertheless think that it is only a matter of time before the Pinnacle Group Mines will become second only to the Broken Hill Proprietary Mine. There is ore sufficient in quantity and quality to pay, and if it cannot be treated with advantage on the spot, other methods may be adopted.

The Pinnacle South, Mr. Walter Granville, manager.—This Company is only driving a tunnel, which at the time of my inspection was 290 ft. in length in hard granite. By indications on the surface there are no better prospects ahead, but a lode of great width had been crossed about 60 ft. from mouth of tunnel; this lode, if sunk upon, would most likely bring better results than the farther driving of the tunnel is likely to do.

The Sterling Hill Mine is situated about 4 miles north of the Pinnacles. Two large outcrops of argentiferous deposits are observable on the surface, having a strike N. by E. with easterly underlay. These outcrops have been sunk upon, but to no great depth, and some very high assays have been obtained. The lode consists of iron gossan, siliceous clays, carbonates of lead, and ferruginous crystalline quartz; the geological formation being schist intersected by a hard belt of diorite. Considering the general indications, the lode should improve and the Sterling Hill become a valuable mine.

The Thackaringa Mines, situated about 15 miles south-westerly of the Pinnacles, have been greatly neglected of late. Three years ago they were the principal lodes opened up in this district and some thousands of tons of galena were forwarded to Europe.

There were only about four mines at work, viz, the Gipsy Girl, the Outward Bound, and two others. The Gipsy Girl Mine was 115 ft. in depth on the underlay, on the bottom of which is a galena lode about 18 in. in thickness; other mines have really excellent prospects, but the system at present adopted seems to be only to hold sufficient labour on the leases to comply with the conditions of the lease.

Rock Well Paddock.

These are apparently new discoveries, situated on the Kinchega Station, parish of Soudan, county of Yancowinna, about 9 miles easterly of Broken Hill, with which it runs almost parallel. The lodes occur in altered sandstone, schist and micaceous slates, several feet in thickness as seen on the surface. They are lenticular lodes of gossan, galena and carbonates of lead, some of which have yielded high assays of silver. In the Rockwell Paddock Silver-mining Company's land, these lenticular veins can be traced on the surface, having the appearance of three distinct lodes. A shaft was being sunk and had reached the depth of 90 ft., of which 20 ft. was not in the lode, the latter apparently having dipped to the westward; and it will be found after greater development that faults will occur in these lenticular lodes, both in depth and length, but that by careful observation and prospecting both in sinking and driving, blocks or bunches of ore will be met with probably as rich and extensive as near the surface. There is a large quantity of ore all along the surface.

Wright and Company, on the Alma Lode, have a shaft down 63 ft. in depth in a lode 30 ft. in width, the ore being of a similar character to that in the Rock Well Company's Mine.

Several leases have been applied for northerly of this, of which Maiden and Co.'s is the principal. In one of these leases they have a well defined quartzite lode in the micaceous schist formation, out of which I was informed high assays of silver had been obtained. Scarcity of fuel and water is a great drawback to the development of this part of the silver-field.

North

North of the Broken Hill Proprietary Silver-mining Company's mine, is the Junction mine. The latter has been prospected to the depth of 100 ft., which is on the water-level. It appeared to me at the time of my inspection that the cap of the lode had only been reached, and that the prospects of this mine would greatly improve when once the works are carried down to a greater depth, where the country is more settled, which is not the case above the water-level; and just before the water-level was reached, patches of chlorides, and high percentage of other silver ores were met with. This mine has therefore excellent prospects, and is most likely to come to the front as a payable mine. Mr. James Giles is the mining manager.

Broken Hill North S. M. Co., Mr. Zebina Lane, manager. This, like the Junction mine, is on the water-level at a depth of 150 ft. (the contour of country makes the apparent difference in depth). Several lodes are cropping up on the surface, which return high assays of silver.

Broken Hill Victoria Cross S. M. Co., Mr. J. H. Ellis, manager, has down two shafts, 75 ft. and 78 ft. respectively; both shafts are on the water-level. Several lodes are cropping up on the surface, and when deeper sinking and cross-cutting is adhered to, the Company's prospects may improve very considerably. The latter two Companies had it under consideration to conjointly sink a main shaft on their boundary, and to erect steam and pumping machinery on same. About 3 miles in a north-east direction are the Round Hill mines; the principal of which is the Round Hill S. M. Co., Captain W. H. Matthews, manager. Sinking in three shafts was being proceeded with at the time of my inspection, from which shafts it was intended to cross-cut into the lode at the depth of 100 ft. from surface. A large outcrop of the lode can be traced along the surface; this outcrop consists of patches of galena, carbonates of lead, gossan, and stains of copper. The prospects of this mine appear to be good, but a reliable estimate of the value of the mine cannot be obtained until it has undergone greater development.

The Consolidated S. M. Co.'s blocks or leases adjoin the Round Hill S. M. Co.; some excellent samples of galena ore were obtained from this mine by the manager, Mr. Lane, at a depth of 80 ft. from surface. Work was also carried on at the Copper Blow under the management of Mr. Harsen. By indications on the surface a payable silver lode is likely to be discovered here.

About 6 miles north-east of Round Hill is situated the Broken Hill United S. M. Co., Mount Gipps, Captain Dick, manager. Two shafts of 50 ft. each have been sunk on a large lode cropping up on the surface, and can be traced for a considerable distance.

The May Bell North, Mr. James Foster, manager, is the principal mine near Mount Gipps; it is situated about 2½ miles north-west from Mount Gipps Station, and has been at work for the last two years, during which time £15,000 have been paid in dividends. 215 tons of silver-ore have been shipped to Europe, out of which 70 tons of ore were in transit. Lately the value of the ore has reached £130 per ton. The vein containing the silver consists of iron gossan, galena, carbonates of lead, carbonate of copper, and little chlorides. It is from a mere film to 6 in. in thickness (the average being about 4 in.), and it lies rather flat. The greatest depth sunk upon is 200 ft. on the underlay, which is, however, only about 60 ft. perpendicular from the surface. On the southern boundary of the May Bell North, is the Kate mine, which is similar in formation to the former, but has not given such favourable results. 19 tons of ore have been shipped to Europe, valued at £80 per ton.

On the East and South May Bell, Rise and Shine, Caledonian, and others, there is very little work being done.

Purnamoota.

This part of the Silverton district is at present suffering from the reaction consequent on the over-excitement of two years ago. At that time every mineral lease which could embrace an outcrop of rock on the surface was thought to be the very Eldorado; expectations were rife and enormous dividends were looked forward to, but at the present time there is not one dividend-paying mine, and a great many of the mineral leases are either under suspension, have only sufficient men employed to comply with the labour conditions of the leases, or are abandoned. The consequence is that the population of Purnamoota has considerably dwindled down, and the township is only a remnant of its former prosperity, and the Black Prince, Terrible Dick, Lubra, Nolan's Treasury, Christmas, and one or two others, are now the only ones at work. At the Black Prince, a new contract had been let to sink the shaft below the depth of 190 feet. The lode consists of galena and carbonate of lead, from 8 inches to 2 feet in thickness, but, like the characteristics of the whole field, pinching out at times. At the Terrible Dick mine (Mr. W. H. Stanfield, manager), pumping and winding gear was in course of erection, which, owing to the total absence of local timber fit for mining and machinery purposes, is likely to cost, in erection, more than its original value. The greatest depth obtained in the mine is 50 feet, on a heavy flow of water. Very rich slugs and high assays of silver have been obtained from the lode; the latter averages from 3 to 6 feet in thickness. £2,000 worth of ore has also been shipped to England.

The Lubra mine, Mr. James Morgan, manager, is the only mine near Purnamoota which at present is clearing expenses. The ore occurs in bunches of galena, carbonates of lead, horn silver, steffinite, &c., &c., which varies from a mere film to 6 inches in thickness. The greatest depth obtained in this mine is 420 feet, on the underlay, or about 300 feet perpendicular from the surface. A heavy flow of water has been struck on the bottom of the underlay shaft. Considering the great cost of mining timber, Mr. Morgan takes all reasonable precautions for the safety of his men and benefit of all concerned.

Nolan's Treasury mine, which promised such great results on the surface, and from which some very rich slugs of carbonate of lead and other silver ores were obtained, is now only worked by two (2) men.

At the Christmas mine, I only found one man at work. There were no men at work on the One Tree and several other mines visited by me.

Smith & Co., the Kaiser, Second to None, and one or two other mines were at work, at the Nine-mile. Smith and Co. drove, from the bottom of their 50 feet shaft, on to a lode of galena and mispickel. At the Kaiser mine they were sinking, and intended driving under an outcrop, consisting of iron gossan, silicious clays, &c., &c.

The Day Dream, Hen and Chicken, Appollyon, and Juno, are in close vicinity of Silverton.

The Day Dream mine, Mr. James Buchanan, manager, is now carrying on simple prospecting works, which should have been done when the mine was paying dividends; but as it is, Mr. Buchanan has the satisfaction that his ability and practical knowledge, which were brought to bear on the prospecting of the Day Dream mine, for second shoots of ore, is likely to meet with favourable results. The mine has turned out a large quantity of silver, has paid several dividends, is in one part 450 feet in depth, on the water-level, and has now excellent prospects, and likely soon to become, once more, dividend-paying.

Prospecting

Prospecting works are also carried on at the Hen and Chicken and the Juno, but the Appollyon and a few other mines in this neighbourhood, were idle.

The Uumberberka mine, situated about 2 miles west of Silverton, Mr. Charles H. Wilson, manager, has paid some dividends, and is at present clearing all working expenses. The lode varies in width from 2 feet to 12 feet, but the ore only occurs in small bunches, consisting of iron gossan, carbonate of lead, galena, and antimonial galena, with a percentage of sulphites. The hanging wall of the lode is well defined, and coated with a black, glossy clay, or, to use a miner's phrase, black slate with greasy heads, very much resembling serpentine rock. Greatest depth obtained is 375 feet. During the half-year ending 30th September, 764½ tons of ore have been shipped. There were about 3,000 tons of second-class ore on the surface, which, if concentrated or jigged, would give payable returns. The average assay of the ore shipped from the mine yielded 50 per cent. of lead, and nearly 100 oz. of silver per ton; the future prospects of the mine are good. There is a 22-h.p. winding engine at work, and the Company are about to erect jiggers to concentrate their poorer ores, and use, for that purpose, the water in their underground workings. Mining timber is very scarce and dear, but the manager is doing his best for the safety of his men and the economical working of his mine. There are several other mines in this neighbourhood prospecting, but so far without payable results. Credit is due to the several mining managers throughout the district for the manner in which they have carried on the workings of their respective mines, in face of the scarcity of fuel, timber for mining purposes, and other difficulties they have to contend against.

In my report, August, 1883, on the Barrier Ranges Silver Mines, I stated that the strike of some of the lodes was in all directions of the compass, but that north-east was likely to be the strike of the most permanent lodes on the Barrier; and that when these deposits were more systematically worked, it would be found that they are not continuous lodes, but shoots or blocks, and bunches (lenticular veins) of ore going down a certain depth, trending along the line of lode a certain length, and then pinching out, or bulching and pinching; but miners should not be discouraged by these features, but sink and drive for fresh blocks, bunches, or shoots of ore. I have now visited, during the year, every mine of any note on the Barrier Ranges, and in every instance found that the opinion formed by me three years ago has, by practical development of the mines, and consequent results, proved correct. For years past I have advocated that when a mine is paying, advance works, such as sinking and driving, should be carried on; and that the system often adopted by companies, to take out all the rich stuff without prospecting ahead, for the mere sake of declaring large dividends, must ruin the very best of mines. In such cases, the scrip generally rises to a very high market value, and drops down correspondingly, the shareholders become disgusted, and the general public afraid to enter into even legitimate mining enterprises; hence the whole of our mining industry suffers. This system also places the mining manager in a false position; it gives him no justice, or opportunity to bring his ability and practical knowledge to bear on the true development of his mine. Companies should, therefore, carry on advance works while their mines are paying, and thereby not only retain the confidence of the general public, but advance their own interest. If a company were formed to buy up ore on a fair assay both for buyer and seller, all the smaller mines now idle would again be worked by individual miners, or small co-operative companies, because, as stated before, the ore occurs in shoots or bunches all over the field, which vary in size in accordance with the thickness of the lode.

In conclusion, I beg to state that, notwithstanding all the failures and disappointments, the Silverton District is the richest and most extensive silver-mining district so far opened in New South Wales; that it is permanently established, and will support a large mining population. The principal townships—Silverton, Broken Hill, Round Hill, and Purnamoota compare very favourably with some of our principal mining towns in the older mining districts of New South Wales. The town of Silverton has been formed into a municipality, which proves beyond doubt that the inhabitants of Silverton have great faith in the permanency of the silver mines. Broken Hill township, or as it is now named Willyama, is also most likely to be permanent, provided a water supply is obtained for the inhabitants, who of late had to undergo great sufferings and privation on account of the scarcity of water. The supply could be obtained by the sinking of wells and excavation of deep tanks.

The Poolamacca District, which is situated about 50 to 60 miles from Silverton, near the Euriowrie Mountains, is likely to form a distinct mineral field from that of Silverton, and that some of the Corona deposits, occurring as they do in large outcrops of iron and manganese, will sooner or later yield gold, silver or copper, probably richer than any mineral deposits hitherto worked in the Silverton District.

I also inspected the Sunny Corner Silver Mines, but as Mr. C. S. Wilkinson's (Chief Geologist) report will appear in the Annual Report for 1886, I will only add that the managers of the Sunny Corner Mines use every reasonable precaution to prevent mining accidents.

The silver mines in the Vegetable Creek District, New England, are progressing favourably. Several progressive works are carried on at the Plant Creek (Webb's) and other silver mines. Pye's Creek is also being prospected for silver. No smelting or reduction works have as yet been erected, but good results in the output of refined silver may be expected in the New England District during next year.

TIN.

As considerable interest has of late been taken by the general public in the stanniferous deposits discovered some 60 miles northerly from Silverton, in the county Farnell, about 16 miles from Poolamacca Station, near the Euriowrie Mountains, I thought it advisable, in the public interest, to make a personal inspection, which was done by me in the latter end of November. Here dykes of coarse granite (pegmatite) traverse the schist formation in which the ore occurs. These dykes vary in thickness from 1 to 6 ft., and can be traced for a considerable distance along the surface, with a general strike of east 35 north, showing the tin ore in patches. A large number of leases had been taken up but only about seven parties were at work. The principal deposit is that found two years ago by Messrs. Hodgson & March, but now held by Messrs. Pearson & Co., where the ore occurs in large crystals through the granite and in large flakes of white mica with quartz and felspar. There are also the Lady Don Mine, which is now raising tin to grass, similar in character to Pearson's; the Cobar Mine, where the deposit occurs as oxide of tin; Broadribb's, Sinclair & Murray's, Arnheim's, Gibson's, and one or two others, more or less bearing the same features. I was informed before my visit that stream tin had been found, and that basalt in large masses could be seen on the edge and on the large undulating plains; but I hardly think that stream tin in payable quantities will ever be discovered there. I could find no basalt, and am certain none will be found in the neighbourhood. As far as the present discoveries are concerned, there is nothing to

to warrant the outlay of costly crushing and tin-saving machinery and appliances; but the several lodes could be tested if a small battery (say) of four stamps were erected near Pearson's mine, and if this proved payable more extensive machinery might then be erected. The surrounding country, especially in the granite ridges, is well worthy the attention of the energetic, persevering prospector, as more extensive tin discoveries may be found.

New England Tin-fields.

Vegetable Creek proper still continues to be worked by Chinese principally, with payable results to themselves and the owners of the land

Y Water-holes, A. Cadell's property, still continues to yield handsome returns.

Moore & Co. are also working with payable results.

Rose Valley Deep Lead.—The Wesley mine continued to employ a few parties of tributors during the past year, with various results. One party have been prospecting all the year, and have cut wash-dirt, which they believe will repay them for their labour.

Reid & Co. (17 acres) have cut out the greater portion of the bottom level with wages men, and have now let the mine upon tribute.

Bailey & Co. have during the year erected improved working plant, which has considerably facilitated the working of their mine, and largely increased the profits. This party raised 223 tons of stream tin ore during the year, the bulk of which has been despatched to Sydney.

Cummins & Co. have obtained about 80 tons of ore during the year, and have done a great deal of propecting in the face of many difficulties, consequent upon the water being so heavy; they are now raising wash from their shallow dry levels.

Moran and party are driving in the bottom to tap the water, preparatory to the erection of their engine and baling plant.

Cadell & Co., Gordon's Land.—Several shafts have been sunk during the year through hard basalt to the water-level, and with the aid of boring rods, have tested the bottom in three shafts. In one of these shafts payable tin has been found. For the great energy and perseverance displayed by this Company, independent of capital spent, they deserve every possible success.

The Chance Company wound up during the year. It would have been much better for the owners of this mine to have given a little more consideration to this Company than they have done, and proved whether or not the main lead passed through their land, as it is evident the Chance Company were never on the main lead.

Barrie & Co. have met with a little success after a long spell prospecting, and are now raising payable wash.

Wesley & Co., off Three-mile, resumed work during the year, and appear to have got in the vicinity of the lead in the upper level of wash, at a depth of 250 ft. from surface. This shaft had been sunk to the depth of 297 ft. and not bottomed, basalt being still under foot. Another shaft has also been sunk to a depth of 80 ft. in basalt, on which work is at present suspended. An engine and winding gear has been erected during the year at this shaft.

Hall Brothers, Kangaroo Flat, have continued working during the year with payable results, they having raised 66 tons of stream-tin ore during the year.

Table Land.

On Dutchmen's lode, only prospecting works have been principally carried on to gain depth on lode, consequently only a moderate quantity of stone has been treated, yielding an average of 15 per cent. of ore.

A fair amount of work has been done at the Torrington lode during the year, but like most of the lode properties of this district, suffers from want of capital for development. The same remarks apply to the Butler and Dalcoath lodes.

The Ottery lode is still working with fairly payable results.

Cope's Creek.

Nothing fresh to note during the year. A great deal of tin is still obtained from the district, principally by Chinese labour.

I have, &c.,

W. H. J. SLEE,

Inspector of Mines.

COAL AND SHALE.

TABLE compiled from Reports furnished by Owners of Collieries, showing the quantity and value of Coal and Shale won during the year 1886, and the number of Men employed in the Collieries.

Company.	Locality.	Men Employed.			Quantity.	Value.			
		Above ground.	Under ground.	Total.			£	s. d.	
COAL.									
Australian Agricultural Co.	Newcastle	172	803	975	Tons. 387,084	£			
Wallsend	"	180	940	1,120	483,884	184,750	9	6	
Newcastle Coal Co.	"	93	400	493	183,573	240,000	0	0	
Lambton	"	65	445	510	113,972	83,181	5	1	
Co-operative	"	70	442	512	240,274	56,416	2	10	
Pride of Ferndale	"	4	17	21	1,500	116,105	9	9	
Tighe's Hill	"	6	17	23	11,596	450	0	0	
New Lambton	"	83	206	289	71,370	38,034	0	0	
New Duckenfield									
Greta	Maitland	43	221	264	79,727	33,454	16	0	
Greta Co.	"	7	33	40	18,555	39,864	0	0	
Duckenfield	Newcastle	47	221	268	113,474	9,277	10	0	
Brown's	"	58	280	338	114,324	54,928	4	6	
Waratah	"	2	8	10	7,149	55,309	2	0	
South Waratah	"	25	20	45	1,701	2,859	12	0	
East Waratah	"	36	132	168	37,371	790	0	0	
Goose	"	1	4	5	4,224	18,752	0	0	
New Park	Singleton	17	14	31	6,153	1,639	0	0	
Ellesmere	"	3	26	29	8,920	3,240	0	0	
Quarry Tunnel	"	1	4	5	1,800	4,695	0	0	
						810	0	0	

COAL AND SHALE.—Continued.

Company.	Locality.	Men Employed			Quantity	Value		
		Above ground	Under ground	Total		£	s	d.
Sunderland	Four mile Creek	2	3	5	3,000	650	0	0
Brookstown	Newcastle	4	15	19	14,830	7,037	16	0
Cray Cross	"	2	17	19	3,082	710	14	0
Dunkirk	"	4	30	34	12,203	5,990	0	0
Hill End	"	4	8	12	3,271	959	17	0
*Longworths	Singleton							
Riv's Creek	"	1	2	3	836	501	0	0
Wickham and Bullock Island	Newcastle	19	179	198	55,553	26,229	6	6
Morriset	Lake Macquarie	1	1	2	656	295	4	0
Rosedale	Newcastle	2	3	5	1,420	680	0	0
Burwood	"	47	225	272	72,566	39,911	10	5
+Lymington Wallsend	"	18	35	53				
Thornley Colliery	Four mile Creek	2	7	9	6,613	1,927	12	0
‡Young Wallsend	Newcastle	2	3	5				
Great Northern	"	10	9	19	205	71	10	0
Hillside	"	2	6	8	3,494	1,222	10	0
Maryville	"	11	78	89	24,500	12,000	0	0
Stockton	"	40	182	222	84,459	40,121	0	0
Homeville and Font Hill	Maitland	3	4	7	2,000	550	0	0
Rathluba	"	2	4	6	2,777	1,090	0	6
		1,089	5,044	6,133	2,178,116	1,084,554	17	1
¶Bull A	Wollongong	95	276	371	99,923	22,457	5	0
Bull B	"							
Osborne Wallsend	"	55	170	225	77,386	28,896	19	6
Coal Cliff	"	40	100	140	56,623	33,040	0	0
Illawarra Coal Co	"	59	134	193	71,913	28,355	9	0
Mount Kembla	"	40	150	190	51,794	31,076	8	0
North Illawarra	"	30	15	45				
Australian Kerosene Oil and Mineral Co.	Joadja Creek	20	90	110	9,318	4,705	0	0
Berima	Berima	3	6	9	2,262	896	11	6
Brokers Nose	Wollongong	9	6	15	1,611	565	19	0
		351	947	1,298	370,830	149,993	12	0
Vale of Clwydd	Lithgow Valley	6	60	66	51,558	12,649	14	10
Lithgow Valley	"	5	66	71	52,654	12,618	11	5
Eskbank	"	8	68	76	67,774	16,341	0	0
Eskbank old tunnel	"	1	12	13	7,500	1,875	0	0
Hermitage	"		11	11	9,019	2,063	11	11
Zig Zag	"	10	65	75	60,000	15,000	0	0
Cooerwull	"		1	1	450	120	0	0
Katoomba	Hartley	21	55	76	25,000	6,250	0	0
*Dubbo	Dubbo							
Carlo's Gap	Capertee	1	2	3	250	63	16	10
§Great Western	"	6		6				
N.S.W. Shale and Oil Co.	"	3	15	18	7,021	1,634	0	0
		61	355	416	281,229	68,615	15	0
Australian Kerosene Oil and Mineral Co	Joadja Creek	Sec Coal			27,700	64,250	0	0
N.S.W. Shale and Oil Co.	Hartley	30	70	100	17,863	35,726	0	0
		30	70	100	43,565	99,976	0	0

Not at work ¶ Sinking † Sinking for steam ¶ On strike since 13th September § Boring

REPORT of the Examiner of Coal-fields for the Colony of New South Wales for the year 1886.

In accordance with the provisions contained in the 26th section of the Coal Mines Regulation Act, 39 Vic No 31, I have the honor to submit reports from the Inspectors of Collieries, with this my general report, for the year ending 31st December, 1886. The report would have been furnished at an earlier date if it had not been delayed through my time being so fully occupied with the inquiry, &c, into the recent Bull Colliery disaster, and other urgent matters.

The information I have the honor to submit in respect to the condition and progress, &c, of the various coal and boghead mineral mines under my supervision during the year 1886 is as follows —

Number of accidents in 1885 and 1886

The number of lives lost is, I regret to say, more than those of the previous year by eighteen, and the non-fatal accidents exceed those of last year by five. In the year ending 31st December, 1885, there were eleven fatal and forty non-fatal accidents.

Two of the fatal accidents happened through "falls of stone", the third, fourth, fifth, sixth, seventh, eighth, and ninth by "falls of coal", the tenth by fall of a prop, and eleventh by being run over by a truck. Two of the non-fatal accidents occurred through falling from a trolley the third to fifteenth inclusive by "falls of coal", sixteenth and seventeenth by a fall from screens, eighteenth and nineteenth by a locomotive engine, twentieth to twenty-seventh inclusive by loaded skips, twenty-eighth to thirty-third inclusive by blasting powder, thirty-fourth through being crushed between buntings when in a cage in shaft, thirty-fifth and thirty-sixth by falls of stone, thirty-seventh by a waggon, thirty-eighth and thirty-ninth by empty skips; and fortieth by the explosion of a shot.

In the year under notice (1886) seventy-two notices of accidents were received, twenty-nine of them being fatal (eight of them resulting from the Lithgow Valley Colliery disaster, and one from the flooding of the Ferndale mine) and forty-five non-fatal accidents, all of which have been inquired into, the scene of the accidents inspected, inquests attended, and reports made thereon and forwarded for your information.

The names and occupations of the persons who died from injuries received and those who have been seriously injured, as well as the names of the collieries where the accidents occurred, are given in the following summary

SUMMARY showing the number of fatal and non-fatal accidents in 1886, the names and occupations of the persons

Number of accidents	Date.	Colliery	Where situated	Persons killed	Persons seriously injured	Occupation
1	Jan. 19	South Waratah	Charlestown	John Atkinson		Sinker . . .
2	" 25	Great Northern		John Smith		"
3	" 27	Wickham and Bullock Island	Bullock Island	John Templeton		Miner
4	" 27	Greta	Greta	John Sneddon		"
5	" 27	"	"		Robt Sneddon	"
6	" 28	Wallsend	Wallsend		Wm Dunlop	"
7	Feb. 4	A A Company	Newcastle		Joseph Grainger	"
8	" 9	"	"	George Cowan		"
9	" 10	Duckenfield	Minmi		David Haddow	Shiftsman
10	" 11	Stockton	Stockton		Alfred Buckley	Miner
11	" 14	Lithgow Valley	Lithgow	John Doig		Colliery Manager
12	" 14	"	"	William Rowe		Miner
13	" 14	"	"	C Younger		Banksman
14	" 19	Ferndale	Tighe's Hill	Wm. Banks		Miner
15	" 23	Burwood	Burwood		Robt Dawson	"
16	Mar 10	A A Company	Newcastle	Edwd Patterson		"
17	" 10	Stockton	Stockton		James Calverly	"
18	" 10	Co operative	Plattsburgh		Patrick O'Keefe	Driver
19	" 12	Wallsend	Wallsend		Wm Tiplady	Miner
20	" 18	Ferndale	Tighe's Hill	John Jenkins		"
21	" 24	A A Company	Newcastle		John Medows	Shiftsman
22	" 31	"	"	George Hughes		Miner
23	April 2	Mount Kembla	Wollongong		David Evans	"
24	" 5	Burwood	Burwood		Wm Hunter	Screenman
25	" 7	Duckenfield	Minmi		John Anderson	Miner
26	" 9	Wallsend	Wallsend		Wm Matthews	"
27	" 11	Mount Kembla	Wollongong		Richd Spowart	"
28	" 13	Bulli	Bulli		Thos B Metcalfe	"
29	" 19	Lithgow Valley	Lithgow	Isaiah Hyde		"
30	" 19	"	"	Thos Rowe		"
31	" 19	"	"	L Allison		"
32	" 19	"	"	J Mantle		"
33	" 19	"	"	Joseph Buzza		"
34	" 21	Wallsend	Wallsend	Wm W. Mills		"
35	" 30	Co operative	Plattsburgh		Thos Britten	Trapper
36	May 10	A A Company	Newcastle		James Shields	Screenman .
37	" 14	Wickham and Bullock Island	Bullock Island		Thomas Drake	Miner
38	" 18	Maryville	Wickham	Michl Gibson		Pumpsman
39	" 20	Burwood	Burwood		Ephraim Hargraves	Miner
40	" 20	"	"		Wm Dodd	Deputy
41	" 28	Bulli	Bulli	S Waterfield		Miner
42	June 14	Newcastle	Burwood	Frank Bray		"
43	" 18	Burwood	"		Geo Hinchcliffe	"
44	" 21	Brown's	Minmi		Alfd J Odgers	Wheeler
45	" 22	Wallsend	Wallsend	Archd Kay		Miner
46	" 24	New Park	Singleton		John Lindsay	"
47	" 30	Lymington, Wallsend	Near Charlestown	Wm Gardiner		Sinker
48	July 8	Wallsend	Wallsend		James Jones	Miner
49	" 19	Pride of Ferndale	Tighe's Hill		Wm Stevenson	"
50	" 20	A A Company	Newcastle		Chas Quiding	"
51	" 20	"	"		Edwd Pascoe	"
52	" 29	Wallsend	Wallsend	Thos Leach		Banksman
53	" 30	Wickham and Bullock Island	Bullock Island	William Lewis		Miner
54	Aug 21	A A Company	Newcastle		Hugh Montgomery	"
55	" 27	Lambton	Lambton	Robt Young		"
56	Sept 2	Wallsend	Wallsend		James Dodd	"
57	" 9	Wickham and Bullock Island	Bullock Island		Alex M'Lean	Miner
58	" 22	New Lambton C Pit	New Lambton		George Hogg	Underground
59	" 25	Bellambi	Wollongong		David Thomas	Viewer
60	Oct 1	Wallsend	Wallsend	John Virgo		Wheeler
61	" 28	Coal Cliff	Illawarra		William Walker	Miner
62	" 28	"	"		J Collins	"
63	Nov. 4	Brown's	Minmi		John Hindman	"
64	" 12	Mount Kembla	Wollongong		Charles Parker	Labourer
65	" 17	Greta	Greta	Andrew Watson		Miner
66	" 19	Stockton	Stockton		Thos Hunter	Wheeler
67	" 20	Mount Kembla	Wollongong	Felix Murphy		Miner
68	" 24	A A Company	Newcastle		William Lewis	"
69	Dec 1	Wallsend	Wallsend		Barras Robunson	Trapper
70	" 2	A A Company	Newcastle		David Reid	Miner
71	" 23	East Waratah	New Lambton		Wm Bowditch	Bank boy
72	" 23	Wallsend	Wallsend		Cuthoert Davison	Miner

The returns which have been collected and forwarded to me by the Mining Department show the following figures for the year 1886:—

COAL RETURN.

	Northern District.	Southern District.	Western District.	Total.
Tons of round and small coal raised	2,178,116	370,830	281,229	2,830,175
Value of round and small coal raised.....	£1,084,554 17s. 1d.	£149,993 12s. 0d.	£68,615 15s. 0d.	£1,303,164 4s. 1d.
Persons employed above ground	1,089	351	61	1,501
Persons employed under ground	5,044	947	355	7,847

PETROLEUM OIL CANNEL COAL OR BOGHEAD MINERAL RETURNS.

Western and Southern Districts.

Tons of boghead mineral or petroleum oil cannel coal	43,563
Value of boghead mineral or petroleum oil cannel coal raised	£99,976
Persons employed above ground	30
Persons employed under ground	70

Comparative statement of Returns for 1885-6.

	Men above ground.	Men under ground.	Tons of round and small coal.	Value.
			Tons cwt. qr.	£ s. d.
NORTHERN DISTRICT.				
Australian Agricultural, Newcastle Wallsend, Newcastle Coal Company, Lambton, Co-operative, Brown's, Duckenfield, New Lambton, New Duckenfield, Waratah, South Waratah, East Waratah, Goose, Pride of Ferndale, Tighe's Hill, Wickham and Bullock Island, Stockton, Burwood, Clay Cross, Dunkirk, Maryville, Hillside, Hill End, Quarry Tunnel, Brookstown, Morrisett, Lake Macquarie, Sunderland, Thornley, Rathluba, Homeville and Font Hill, Greta, Greta C, Rix's Creek, Ellesmere, Singleton, New Park and Rosedale	1,089	5,044	2,178,116 0 0	1,084,554 17 1
Total in 1886	1,089	5,044	2,178,116 0 0	1,084,554 17 1
„ 1885.....	980	4,400	2,113,372 13 0	1,032,904 13 4
Increase in 1886	109	644	64,743 7 0	51,650 3 9
SOUTHERN DISTRICT.				
Mount Kembla, Bulli A, Bulli B, Osborne Wallsend, Coal Cliff, North Illawarra, Australian Kerosene Oil and Mineral C. Company, and Brooker's Nose, and Berrima	351	947	370,830 0 0	149,993 12 0
Total in 1886	351	947	370,830 0 0	149,993 12 0
„ 1885.....	430	918	453,727 15 3	230,471 7 0
Decrease in 1886.....	79	.....	82,897 15 3	80,477 15 0
Increase in „ .....	.....	29	.....	.....
WESTERN DISTRICT.				
Vale of Clwydd, Lithgow Valley, Eskbank, Eskbank Old Tunnel, Hermitage, Coerwall, Hartley Vale, Carlo's Gap, Katoomba, Zig-Zag	61	355	281,229 0 0	68,615 15 0
Total in 1886	61	355	281,229 0 0	68,615 15 0
„ 1885.....	60	309	311,762 16 0	76,836 13 3
Increase in 1886	1	46	.....	.....
Decrease in 1886 .....	.....	.....	30,533 16 0	8,220 18 3

From these returns we find that in the Northern District, in the year under notice, there has been an increase of 64,743 tons in the quantity of coal raised, and an increase of £51,650 in the value of it, whilst in the previous year (1885) there was an increase of 58,030 tons, and in the value of the coal raised £20,971.

In the Southern District there has been a decrease of 82,898 tons and £80,478 in the value, owing to a strike at most of the collieries, which lasted about four months. In the Western District there has also been a decrease of 30,534 tons, and in the value of £8,221, which was caused by a general depression in trade, railway traffic being less, and brickworks not taking so much coal as in the previous year.

The following table shows comparisons between the year under notice and two preceding years, as regards the exports of coal to foreign and intercolonial ports; the quantity used for home consumption; total output and value; tons of round and small coal raised for each person employed in and about the collieries;

collieries; value of round and small coal raised for each person so employed; and the quantity of coal raised for each life lost.

Years.	Exports to Intercolonial Ports			Exports to Foreign Ports.			Total Exports.			Home consumption.
	Quantity.	Average per ton.	Value	Quantity.	Average per ton.	Value.	Quantity.	Average per ton.	Value.	
1884.....	Tons. 994,078	£ s. d. 0 10 8-66	£ 532,938	Tons. 696,676	£ s. d. 0 11 5-10	£ 398,107	Tons. 1,690,753	£ s. d. 0 11 0-16	£ 931,045	Tons. 1,053,345
1885.....	991,924	0 10 7-13	525,443	764,432	0 11 6-50	441,220	1,756,356	0 11 0-09	966,663	1,122,507
1886.....	1,027,775	0 10 7-22	544,824	708,000	0 11 4-31	402,178	1,735,865	0 10 10-93	947,002	1,094,310
	3,013,777	0 10 7-67	1,603,205	2,160,108	0 11 5-36	1,241,505	5,182,984	0 10 11-72	2,844,710	3,275,162

Years.	Total Output and Value.			Coal raised per each person employed in and about the Mines.			Value of Coal raised per each person employed in and about the Mines.			Tons of Coal raised per each life lost.		
	Quantity.	Average per ton.	Value.	Quantity.	Average tons per each person employed.	Persons employed.	Value.	Average value per each person employed.	Persons employed.	Quantity.	Average tons per each life lost.	Lives lost.
1884.....	Tons. 2,749,108	£ s. d. 0 9 5-76	£ 1,303,076	Tons. 2,749,108	Tons. 441	Number. 6,227	£ 1,303,076	£ s. d. 209 5 2	Number. 6,227	Tons. 2,749,108	Tons. 196,364	Number. 14
1885.....	2,878,863	0 9 3-72	1,340,212	2,878,863	405	7,097	1,840,212	188 16 10	7,097	2,878,863	261,714	11
1886.....	2,830,175	0 9 2-53	1,308,164	2,830,175	364	7,847	1,303,164	169 17 10	7,847	2,830,175	97,592	29
	8,458,146	0 9 3-98	3,946,452	8,458,146	399	21,171	3,946,452	186 8 7	21,171	8,458,146	156,632	54

From the above it will be seen that in the year under notice (1886) we exported 35,851 tons more coal to Intercolonial ports than in the preceding year, and 56,432 tons less to Foreign ports, owing no doubt to the general depression in trade; and that there has been a decrease of 28,191 tons in the Home consumption. There has been an increase of 84,136 tons shipped from Newcastle to Victoria, and a decrease of 14,254 tons to New Zealand, and of 23,788 tons to Queensland.

It will be seen that the quantity of coal raised during the last three years for each person employed above and under ground at the collieries has averaged 399 tons of round and small coal per year; and that each person so employed added £186 Ss. 7d. per annum to the wealth of the Colony. In the years 1884, 1885, and 1886, fifty-four lives were lost for 8,458,146 tons raised, viz., 156,632 tons were raised for each life lost. These figures may, perhaps, be sufficiently explanatory in themselves, so far as a comparison of our export trade and home consumption, &c., for the whole Colony is concerned; but it will no doubt interest each district to know the proportion the accidents and deaths bear to the persons employed, and the quantity and value of coal raised for each person employed in and about the mines, &c., which is as follows:—

NORTHERN DISTRICT.

Number of persons employed in and about the mines	6,133
Number of persons employed underground	5,044
Quantity of coal raised in tons	2,178,116
Number of non-fatal accidents	36
Number of lives lost by accidents	19
Persons employed per each non-fatal accident	170
Persons employed per each life lost	323
Tons of round and small coal raised per each non-fatal accident	60,503
Tons of round and small coal raised per each life lost	114,637
Tons of coal raised per each person employed in and about the mines	355
Tons of coal raised per each person employed underground	432
Value of coal raised	£1,084,554 17 1
Value of coal raised per each person employed in and about the mines	£176 16 9
Value of coal raised per each person employed underground	£215 0 4

SOUTHERN DISTRICT.

Number of persons employed in and about the mines	1,298
Number of persons employed underground	947
Quantity of coal raised in tons	370,830
Number of non-fatal accidents	7
Number of lives lost by accidents	2
Persons employed per each non-fatal accident	185
Persons employed per each life lost	649
Tons of round and small coal raised per each non-fatal accident	52,975
Tons of round and small coal raised per each life lost	185,415
Tons of coal raised per each person employed in and about the mines	286
Tons of coal raised per each person employed underground	390
Value of coal raised	£149,993 12 0
Value of coal raised per each person employed in and about the mines	£115 11 1
Value of coal raised per each person employed underground	£158 7 9

WESTERN DISTRICT.

Number of persons employed in and about the mines	416
Number of persons employed underground	355
Quantity of coal raised in tons	281,229
Number of non-fatal accidents	nil.
Number of lives lost by accidents	8
Persons employed per each non-fatal accident	No non-fatal accident.
Persons employed per each life lost	52
Tons of round and small coal raised per each non-fatal accident	No non-fatal accident.
Tons of round and small coal raised per each life lost	35,153
Tons of coal raised per each person employed in and about the mines	676
Tons of coal raised per each person employed underground	792
Value of coal raised	£68,615 15 0
Value of coal raised per each person employed in and about the mines	£167 6 1
Value of coal raised per each person employed underground	£193 0 0

The

The following table shows comparisons between the year under notice and the preceding year, as regards the proportion the accidents and deaths bear to the persons employed, the quantity and value of the coal for each person employed in and about the mines and underground, in the Northern, Southern, and Western Districts.

	Northern District		Southern District		Western District	
	1885	1886	1885	1886	1885	1886
Number of persons employed in and about the mines	5,330	6 133	1,348	1,298	369	416
Number of persons employed underground	4 400	5 044	918	947	309	355
Quantity of coal raised in tons	2,113,372 13 0	2,178 116	453,729 10 0	370,830	311,762 16 0	281,229
Number of non fatal accidents	31	36	9	7	Nil	Nil
Number of lives lost by accident	8	19	3	2	Nil	8
Persons employed per each non fatal accident	173	170	149	180	369 and no accident	No non fatal accident
Persons employed per each life lost	672	323	449	649	369 and no life lost	52
Tons of round and small coal raised per each non fatal accident	68 173	60 503	50,414	52 975	311,762 16 0 and no accident	No non fatal accident
Tons of round and small coal raised per each life lost	264,171	114,637	151,243	180,415	311,762 16 0 and no life lost	35,153
Tons of coal raised per each person employed in and about the mines	393	355	336	286	845	676
Tons of coal raised per each person employed underground	481	432	494	390	1,009	792
Value of coal raised	£ s d 1,032,904 13 0	£ s d 1,084,554 17 1	£ s d 230,431 7 0	£ s d 149,993 12 0	£ s d 76,836 13 3	£ s d 68,615 15 0
Value of coal raised per each person employed in and about the mines	191 19 0	176 16 9	170 18 0	115 11 1	208	167 6 1
Value of coal raised per each person employed underground	234 15 0	215 0 4	251 0 0	158 7 9	240 17 0	193 0 0

The following statistical return, furnished me by Mr W. R Logan, the Collector of Customs at Newcastle, shows that the greatest increase in the export of coal from that port has been:—To Victoria, 84,136, San Francisco, 36,279, Honolulu, 6,951, Mexico, 6,548, Singapore, 5,565, Fiji, 5,092; Portland O, 4,094, New Caledonia, 4,044, Wilmington, 3 807, and Iqui Iqui, 2,271. And the greatest decrease to New Zealand, 14,254, India, 38,875, Java, 27,538, Queensland, 23,788, South America, 19,237, Manila, 18,194, Guiana, 8,456, Hongkong, 7,623, China, 6 938, Japan, 3,748; and South Sea Islands, 3,814 tons

NEWCASTLE—New South Wales export of Coal during the years 1885 and 1886—

Countries	1885	1886	Increase	Decrease
	Tons	Tons	Tons	Tons.
Victoria	544,005	628,141	84,136	..
New Zealand	178,707	164,453		14,254
South Australia	139,337	139,476	139	
Western Australia	12,309	11,576		733
Queensland	44,205	20,417		23,788
Tasmania	45,155	46 269	1,114	
Fiji	15,627	20,719	5,092	
New Caledonia	4,913	8,957	4,044	
Honolulu	15,086	22,037	6,951	
Manilla	52,715	34,521		18,194
Mauritius	7,279	5,853		1,426
Hongkong	104,554	96,931		7,623
China	9,413	2,475		6,938
Japan	3,748			3,748
San Francisco	118,053	154,332	36,279	
	2,677	6,771	4,094	
South America	65,316	46,079		19,237
Java	53,986	28,448		27,538
India	106,684	67,809		38,875
Mexico	1,523	8,071	6,548	
Guiana	10,251	1,795		8,456
South Sea Islands	3,814			3,814
New Guinea	700	600		100
Wilmington	10,079	13,886	3,807	
Astoria		500	500	
Iqui Iqui		2,271	2,271	
Pugent Sound		500	500	
Humboldt Bay		500	500	
Cape of Good Hope		318	318	
Ilo Ilo		1,120	1,120	
Petropaulovsk		1,760	1,760	
Singapore		5 565	5,565	
San Jose De Quatemala		816	816	
Kahulm (Sandwich Island)		848	848	
Mahuconca (Havanah Island)		880	880	
Total increase for 1886 is 7,442 tons	1,552,136	1,544,694	167,282	174,724

DECENNIAL RETURN.—Port of Newcastle—Foreign and Intercolonial Ports.

Year.	Vessels cleared outwards for Foreign and Intercolonial Ports.		Total value of Imports from Foreign and Intercolonial Ports.		Quantity and value of Coal exported to Foreign and Intercolonial Ports.		Total value of Exports (inclusive of Coal) to Foreign and Intercolonial Ports.		Total amount of Revenue collected.		
	No. of Vessels.	Tonnage.			Tons.	Value.					
			£	s. d.		£	s. d.	£	s. d.	£	s. d.
1877	1,328	577,376	502,861	6 4	781,502	540,560	0 0	680,750	11 7	56,584	3 11
1878	1,407	655,885	444,760	18 9	871,985	602,557	0 0	699,252	13 0	60,511	14 0
1879	1,330	651,501	340,501	0 0	860,375	591,090	0 0	648,427	0 0	57,477	18 9
1880	1,023	516,480	527,905	0 0	673,393	372,378	0 0	477,486	0 0	57,883	4 6
1881	1,121	654,543	482,845	0 0	899,369	343,931	0 0	407,212	0 0	77,543	10 7
1882	1,143	737,772	632,073	0 0	1,080,446	527,575	0 0	618,586	0 0	76,799	12 7
1883	1,305	926,956	658,601	0 0	1,359,505	722,428	0 0	1,440,752	0 0	87,844	12 0
1884	1,433	1,066,462	788,653	0 0	1,505,395	835,070	0 0	1,699,047	0 0	108,720	0 0
1885	1,388	1,076,346	930,200	0 0	1,552,136	832,495	0 0	1,927,626	0 0	108,834	18 6
1886	1,335	1,097,382	843,474	0 0	1,544,694	828,189	0 0	1,398,728	0 0	119,131	15 0

RETURN showing the quantity raised, price per ton, and value of the boghead mineral or petroleum oil (cannel coal), commonly called kerosene shale, from 1865 to 1886 inclusive.

Year.	Tons.	Average price per ton.	Value.	Year.	Tons.	Average price per ton.	Value.
		£ s. d.	£ s. d.			£ s. d.	£ s. d.
1865	570	4 2 5.47	2,350 0 0	1877	18,963	2 9 0.82	46,524 10 0
1866	2,770	2 18 10.48	8,154 0 0	1878	24,371	2 6 11.49	57,211 0 0
1867	4,079	3 14 9.21	15,249 0 0	1879	32,519	2 1 10.96	66,930 10 0
1868	16,952	2 17 7.11	48,816 0 0	1880	19,201	2 6 7.03	44,724 15 0
1869	7,500	2 10 0.00	18,750 0 0	1881	27,894	1 9 2.59	40,748 0 0
1870	8,580	3 4 3.18	27,570 0 0	1882	48,065	1 15 0.00	84,114 0 0
1871	14,700	2 6 3.91	34,050 0 0	1883	49,250	1 16 10.77	90,861 10 0
1872	11,040	2 11 11.91	28,700 0 0	1884	31,618	2 5 7.85	72,176 0 0
1873	17,850	2 16 6.55	50,475 0 0	1885	27,462	2 8 11.62	67,239 0 0
1874	12,100	2 5 1.48	27,300 0 0	1886	43,563	2 5 10.79	99,976 0 0
1875	6,197	2 10 2.22	15,500 0 0				
1876	15,998	3 0 0.00	47,994 0 0		441,242	2 5 1.42	995,413 5 0

Complaints made of deficient ventilation, &c.—I have, as usual, inquired into many complaints made with respect to deficient ventilation and non-compliance with the provisions of the Coal Mines Regulation Act, 1876. Proceedings, where necessary, have been taken to enforce the provisions of the Act, and reports furnished thereon.

NEW MINES OPENED OUT OR IN COURSE OF DEVELOPMENT DURING THE YEAR 1886.

Stockton Colliery.

On January 15th.—Mr. John Evans, manager, notified that the sinking of the above Company's air-shaft commenced on Tuesday the 12th of January.

Morriset Point, Lake Macquarie.

On January 30th.—Mr. David Murray, for D. and P. Murray & Co., owners, notified having commenced to work their coal-mine at Morriset Point, for the purpose of supplying the Government dredge with coal.

South Waratah Colliery.

On March 25th.—Mr. James Hunter, colliery manager, notified that he intended reopening part of the workings of the South Waratah Colliery.

South Cumberland Coal-mining Company, Illawarra District.

On June 2nd.—Mr. C. Harper, manager, notified that the contractors commenced sinking the shaft at Camp Creek, for the above Company, with one shift of men and horse, until engine is fixed, when full shifts will be employed.

A.A. Company's Sea Coal Pit, Newcastle.

On June 8th.—Mr. William Turnbull, manager, notified having commenced to sink a new pit, near the old F pit, and at present only putting it down some 30 or 40 feet, to get a solid foundation for building the walls of a shaft upon, after which sinking will cease until a sinking engine is up.

The above new sinking will be called the "Sea Coal Pit."

Anvil Creek Colliery.

On June 19th.—Mr. Charles Horsfield, colliery manager, notified that he had commenced operations to open the Anvil Creek Estate, for the purpose of raising coal and shale, and putting down a shaft to the deep, from the old workings, and are now 30 feet down with the sinking.

Quarry Tunnel Colliery, Waratah.

On July 21st.—Mr. M. Thornton, for M. Thornton & Co., notified that they had cut a tunnel near Whiteman's Quarry, to work the old Waratah seam of coal.

Brown's

Brown's Colliery, Minni.

On September 4th.—Mr. J. Croft, manager, gave notice of having commenced to open out headings at tunnel, near Back Creek, in connection with the abovenamed colliery.

Reedy Creek, near Hartley Vale, Western District.

On September 19th.—Mr. John M'Mullen notified that he was driving two tunnels into a coal-seam, on his C. M. purchase, Reedy Creek, about 3 miles north of Hartley Vale township, parish of Lott, county Cook,

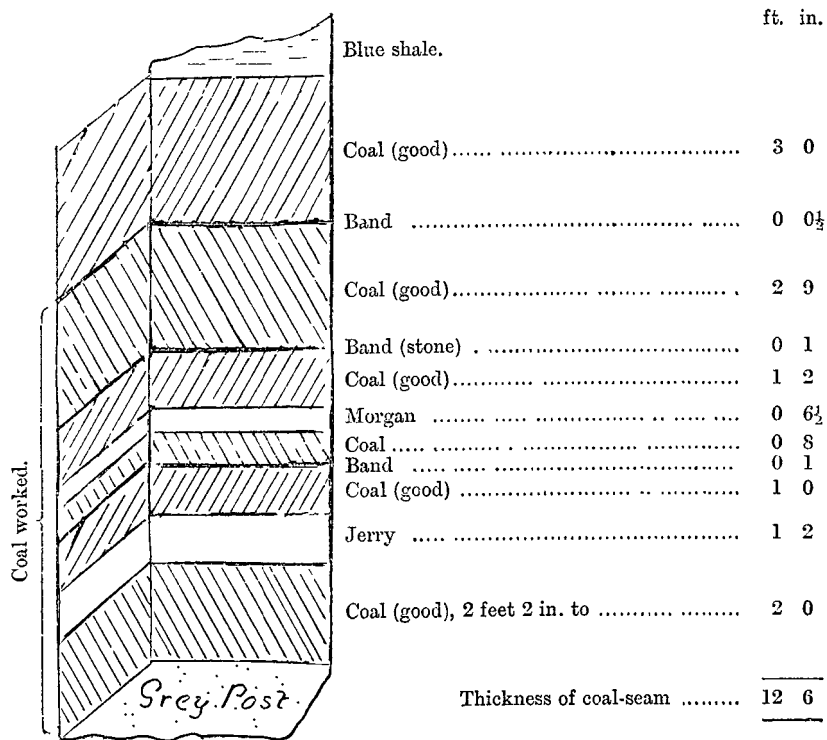
Young Wallsend Colliery, near Wallsend, county Northumberland

On October 30th.—Mr. Joseph Hardy, mining engineer to the Company, gave notice that sinking operations were begun at the abovenamed colliery.

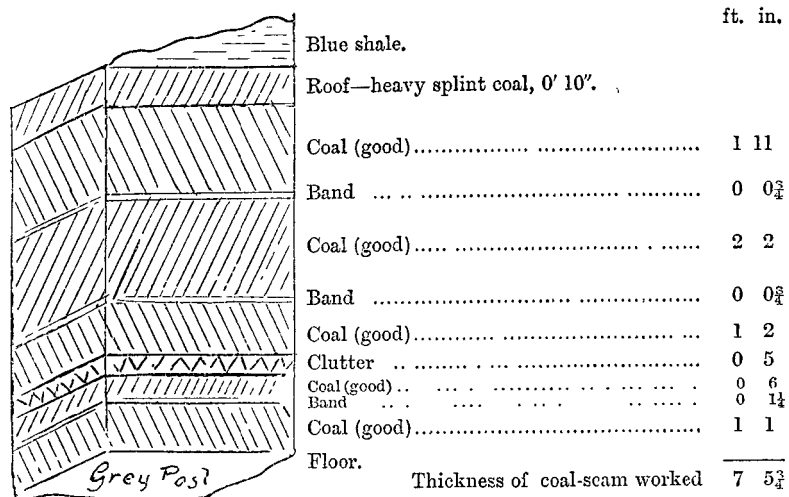
East Waratah Colliery.

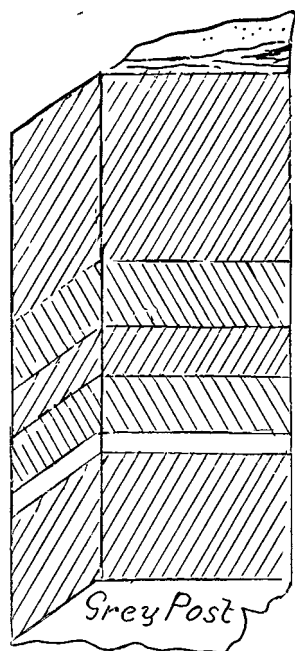
On November 16th.—Mr. James Hunter, colliery manager, notified that the abovenamed colliery will henceforth be worked by tribute, for the Company, by Thomas George Griffiths.

SECTION of the Newcastle Coal Company's Borehole Coal-seam, taken at 60 yards from their B pit.



SECTION of the Borehole Coal-seam sunk through by the Waratah Coal Company at a depth of 460 feet at their Flaggy Creek shaft, near Charlestown and Raspberry Gully Colliery.





Clay.

Coal (good)..... 4 0

Coal (good)..... 1 5

Band 0 1

Coal (good)..... 1 0

Band 0 0 1/2

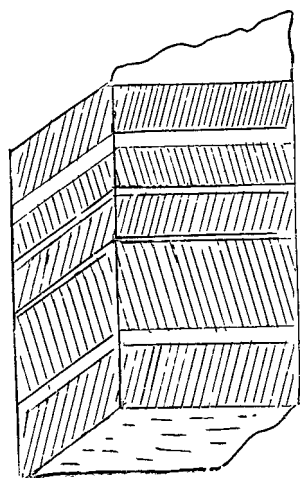
Coal (good)..... 1 4

Jerry 0 5

Coal (good)..... 2 8

Thickness of coal-seam 10 11 1/4

The above is a section of the Borehole Coal-seam worked by Messrs. Broughall & Morgan at Tighe's Hill, near Newcastle, in the county of Northumberland.



ft. in.
Basalt 50 0

Shale, decomposed sandstone..... 17 0

Roof—black shale (hard stony coal)..... 5 3

Coal (good).... 1 0

Black band..... 0 3 1/2

Coal (good)! 0 10

Black band..... 0 2

Coal (good) 0 9 1/2

Black band..... 0 1

Coal (good) 2 0

Soft coal 0 4

Bright coal (good) 1 4

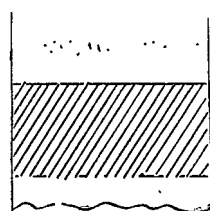
Sandy shale.

Total depth from surface to floor {
—bottom of coal-seam } 79 1

The above is a section of the strata and bituminous seam of coal proved by Mr. Pryor on his land at Black Jack, in the county of Pottinger, near Gunnedah.

The coal is of excellent quality, could be cheaply wrought from adits, and a tramway could be easily constructed from the mine to the North-western Railway, a distance of about 7 miles.

SECTION of the No. 1 Coal-seam sunk through by the New South Wales Shale and Oil Company at their Hartley Vale shaft, adjacent to the Great Western Railway, and 81 miles by rail from Sydney.



ft. in.
Sandstone.
Depth of shaft to top of coal 512 0

Coal 1 11

Thickness of coal-seam 1 11

SECTION at 345 yards north-west of shaft.

	Sandstone.	ft. in.
	Heavy coal.....	0 10
	Splint coal, worked	3 6
	Thickness of coal-seam	<u>4 4</u>

SECTION at 410 yards north-west of shaft.

	Sandstone.	ft. in.
	Black shale.	
	Heavy coal	1 2
	Splint coal, worked	3 10
	Thickness of coal-seam	<u>5 0</u>

	Blue rock.	ft. in.
	Roof.	
	Blue fire-clay	0 6
	Indurated clay	0 1
	Fire-clay	0 3
	Black shale or metal	1 3
	Indurated clay	0 1
	Ironstone	0 3
	Boghead mineral (best quality)	2 6
	Boghead mineral	1 3
	Indurated clay	0 1
	Floor—blue rock.	
	Thickness of boghead mineral seam	<u>6 3</u>

The above is an average section of the New South Wales Shale and Oil Company's boghead mineral taken near the centre of the deposit.

	Roof—blue rock.	ft. in.
	Blue fire-clay	0 10
	Black metal or shale	2 4
	Indurated clay	0 2
	Ironstone	0 2½
	Boghead mineral (best quality)	0 8
	Boghead mineral	1 0
	Clay	0 1
	Floor—blue rock.	
	Thickness of Boghead mineral seam	<u>5 3½</u>

The above is a section of the New South Wales Shale and Oil Company's boghead mineral taken near the edge of the deposit. In

In addition to my usual duties, I have visited numerous localities for the purpose of examining and reporting upon applications to mine coal from under Crown lands, the number of men and quarterly work afterwards employed and done thereon, checking and reporting on all quarterly royalties due for coal wrought from under Crown lands, and obtaining information for the Crown Solicitor, and giving evidence respecting the value of coal-lands resumed by the Government for railway and other purposes. And a considerable portion of my time has been occupied at the scene of the Lithgow Valley Colliery disaster, and in examining and reporting on the undermining of roads, streets, and railways by persons who, having extracted coal from under them, have, in many cases, caused damage to the surface thereof. I, however, hope that before another year elapses the Legislature will have passed a stringent Bill that will severely punish those who in future extract coal from under roads, streets, or railways, &c., without first having obtained permission to do so.

I have compiled plans of the Newcastle, Western, and Southern Districts, with sections thereon, showing the position and area of lands held by colliery owners, and the outcrops, thickness, and dip of the coal-seams where worked or opened out by them. Also a section of coal seams and strata, placed in their relative positions, and measured by me, where they outcrop in the Lake Macquarie cliffs, fronting the Pacific Ocean, and from a diamond rock-drill borehole put down on the southern side of the entrance to Lake Macquarie, and below the lowest coal-seam outcropping there.

In conclusion, I have only to add that there were 66 collieries under inspection, and that notices have been received of 11 new mines having been opened out, against 67 under inspection in the preceding year, and 11 opening out; and that the year's returns show an increase in the Northern District of 64,743 tons of round and small coal raised, and £51,650 in value; in the Southern District a decrease of 82,897 tons, valued at £80,477; and in the Western District a decrease of 30,533 tons, valued at £8,220.

I have, &c.,

JOHN MACKENZIE, F.G.S.,
Government Examiner of Coal-fields.

THE Half-yearly Report of the Inspector of Collieries for the Northern District in New South Wales, and Accidents therein, investigated by said Inspector, for the six months ending 31st December, 1886.

The Examiner of Coal-fields, Sydney,—
Sir,

Glebeland, 10 January, 1887.

Pursuant to the provisions of clause 26 in the Coal Mines Regulation Act, 1876, I have the honor to transmit to you this my six-monthly report on the state of the various collieries in the Northern District, for the half-year ending 31st December, 1886.

The total number of collieries under inspection in the Northern District during the term embraced in this report is 40. Burnley's Clay Cross Mine has not been worked during the term, owing to a labour dispute. The Great Northern, Teralba, West Wallsend, Young Wallsend, Hetton, and New Ferndale, are new collieries opening out.

PRESENT STATE OF MINES.

A.A. Company.—About 720 men, &c., are employed in this colliery during the day-shift, and the total quantity of air introduced into the mine per minute is about 100,000 cubic feet. The face-workings are divided into sixteen splits, each split being served with a separate and distinct current of fresh air. The Act is also complied with in other respects. This Company has now commenced a new winning to the east of the present colliery workings. Two large pits are being put down, and all the surface erections appear to be of a most substantial character.

Wallsend.—There are about 880 men, &c., employed in this colliery on both shifts; and the total quantity of air introduced into the mine per minute is about 170,000 cubic feet. In connection with the face-workings, there are eleven splits, each split being supplied with a separate and distinct current of fresh air. None of the splits are overcrowded. The requirements of the Act are also complied with in other respects.

Lambton.—About 420 men, &c., are employed in this colliery on both shifts, and about 70,000 cubic feet of air per minute are introduced into the mine. The splits are in accordance with the Act, and the Act is also complied with in other respects.

Newcastle Co.'s Colliery.—There are about 350 men, &c., employed in this mine on one shift, and the total quantity of air circulated in the mine is about 70,000 cubic ft. per minute. The face-workings are divided into eight splits, each being supplied with a separate and distinct current of fresh air. There are not more men in any split than the Act allows. The Act in other respects is also complied with.

New Lambton.—About twenty men, &c., are employed in this mine. Most of the miners are engaged in working pillars. A small shaft has lately been sunk for ventilating purposes, and the Act is now complied with in every respect.

New Lambton C. Pit.—About 120 men, &c., are employed in this colliery on one shift, and supplied with about 21,000 cubic ft. of air in two separate currents. In the tunnel in connection with this colliery about twenty-six men, &c., are employed, and supplied with about 5,000 cubic ft. of air per minute. The Act is also complied with in other respects.

South Waratah.—About twenty men, &c., are employed in the Charles and Flaggy Creek pits driving a communication cross-cut between the two places. The ventilation is good, and the Act complied with in other respects also.

East Waratah.—About eighty men, &c., are employed in this colliery, and supplied with about 11,000 cubic ft. of air per minute in one current. The provisions of the Act are complied with in other respects also.

Old Waratah.—About twenty men, &c., are employed in the three tunnels. The ventilation is good, and the Act complied with in every respect.

Hill

Hill End.—There are about nine men, &c., employed in this mine. The ventilation is good, and the Act is complied with in other respects also.

Goose Colliery.—About eight men, &c., are employed in this mine. The ventilation is good, and the Act carried out in every respect.

New Duckenfield.—About thirty-nine men, &c., are employed in the two mines in connection with this colliery. The ventilation is good, and the requirements of the Act fully carried out.

Tighes Hill.—There are about seventeen men employed in this colliery. The requirements of the Act are carried out, both as regards the ventilation and other matters.

Co-operative Colliery.—About 350 men, &c., are employed in this colliery on both shifts, and the total quantity of air introduced into the mine per minute is about 45,000 cubic ft. The ventilation of this colliery has been seriously interfered with during part of the six months, owing to a very extensive subsidence of roof which took place on 2nd September last. This unexpected crush completely altered the then existing ventilating arrangements which were fast nearing completion, and which would have been productive of splendid results. Since the crush took place a large sum of money has been spent in order to restore the ventilation, and it is expected that in the course of a short time the colliery will be in first-class condition. The number of splits are in accordance with the Act. The requirements of the Act are complied with in other respects also.

Brown's Colliery.—There are about 250 men, &c., employed in this colliery on both shifts, and the total quantity of air introduced into the mine is about 58,000 cubic ft. per minute. The face districts are according to the Act. In the little tunnel there are about seventeen men, &c., who are supplied with about 8,000 cubic ft. of air per minute in one current. The Act in other respects is also complied with.

Duckenfield.—There are about 220 men, &c., employed in this colliery on both shifts. The total quantity of air introduced into the mine per minute is about 45,000 cubic ft. The face-workings are divided into five splits, each being served with a separate current of fresh air. The requirements of the Act are complied with in other respects also.

Ferndale.—This is a new winning in the vicinity of Wickham, where sinking operations are being carried on. About thirty persons are employed, and the provisions of the Act are complied with.

Pride of Ferndale.—About seventeen men, &c., are employed in this mine. There are two distinct openings to the surface. The ventilation is good, and the Act complied with in other respects also.

Wickham and Bullock Island Colliery.—There are about 140 men, &c., employed in this mine on both shifts. The amount of air per minute introduced into the mine is below the requirements of the Act; but steps are being taken to remedy the matter as soon as possible. The Act in other respects is complied with.

Maryville.—About eighty men, &c., are employed in this colliery. The ventilation at the present time is barely up to the requirements of the Act. The second shaft in connection with this colliery has not yet been sunk, therefore sub-section 1, section 12, of the Coal Mines Regulation Act is not complied with.

Brookstown.—About fourteen men, &c., are employed in this colliery on the day-shift. The ventilation is good, and the Act complied with in other respects also.

Burwood.—There are about 227 men, &c., employed in this colliery. The total quantity of air circulated in the mine per minute is about 30,000 cubic ft. The face-workings are divided into four separate and distinct splits. The second opening to the surface has been completed, and preparations are being made for the erection of a large furnace for ventilating purposes. The Act in other respects is also complied with.

Stockton.—About 150 men, &c., are employed in this colliery on both shifts. The total quantity of air introduced into the mine per minute is about 50,000 cubic ft. The face-workings are divided into three separate splits, none of which are overcrowded. The second opening to the surface has been made, and arrangements are being completed in order to comply with the requirements of section 12, sub-section 1, of the Coal-mines Regulation Act.

Hillside, Burwood.—There are five men, &c., employed in this mine. The ventilation is fairly good, and the Act complied with in other respects also.

Dunkirk Colliery.—About thirty men, &c., are employed in this mine. The ventilation is good, and the Act complied with in other respects also.

Lymington.—Operations are at present suspended at this new winning, further than keeping the water out of the shaft. Only a limited number of men are employed. Everything in connection with the shaft appears to be in good order.

Great Northern.—About ten men are employed in this mine. As yet only winning work is being driven, but arrangements are being made to increase the output at an early date. The ventilation is good, and the Act is also complied with in other respects.

Teralba.—This is a new winning, and a splendid shaft is being sunk. About forty men are employed in connection with the sinking operations. Everything in and around the shaft appears to be in good order and fitted up with a view to safety.

West Wallsend.—Sinking operations are still being carried on at this place, and it is expected that the seam of coal will be reached at an early date.

Young Wallsend.—Sinking operations at this new winning are at the present time suspended until the necessary machinery is erected.

Hetton.—A very large shaft is being sunk in connection with this colliery. The rock has been reached, and there is now a fair prospect of striking the seam of coal at no distant date. Everything in connection with the shaft appears to be in good order.

Thornley.—There are eight men employed in this mine. The ventilation is good, and the Act complied with in other respects also.

Sunderland.—There are four men employed in this mine. The Act is complied with in every respect.

Rathluba.—There are six men employed in this mine, and the provisions of the Act are fully carried out.

Greta.—In this colliery there are about 230 men, &c., employed on the day-shift. The total quantity of air introduced into the mine per minute is about 30,000 cubic ft. The face-workings are divided into four distinct splits, none of which are overcrowded. The requirements of the Act are also complied with in other respects.

Anvil Creek.—About twenty men are employed in this colliery. The ventilation is good, and the Act is complied with in other respects also.

New Park Colliery, Singleton.—About fourteen men, &c., are employed in this colliery. The Act is complied with both in regard to the ventilation and other matters.

Ellesmere.—In this colliery there are about twenty-seven men, &c., employed. The ventilation is good, and the Act complied with in every respect.

Rix's Creek.—Only one man and boy employed in this mine. No cause for complaint.

Rosedale.—There are only two men employed in this mine. No cause for complaint.

ACCIDENTS IN MINES.

The accidents investigated by me in connection with the collieries in the Northern District of the Colony during the six months ending 31st December, 1886, are twenty-seven in number, nineteen of which I fully reported on at the time, and eight of which I did not report, as they were not considered serious.

Of the nineteen accidents in the annexed tabulated list, five, I regret to say, proved fatal—three by falls of coal, one by a collision of skips, and one by a blow from a prop which was knocked out by a fall of coal.

Some of the non-fatal accidents in the same list were of a serious nature; others were not so serious as they at first appeared.

The first of the fatal accidents happened to a young man named Thomas Leach, who was employed as a brakesman on a self-acting incline in the Wallsend Colliery. On 29th July last, he (Leach) was engaged in bringing some damaged skips up the No. 1 tunnel to the surface after drawing-hours, and whilst proceeding along the tunnel was met by some runaway skips loaded with bricks. The consequence was a collision, and the infliction of fatal injuries on the unfortunate young man. On the following day the Maitland District Coroner, A. Vindin, Esq., J.P., held an inquest on the body of deceased, at Wallsend. I attended the inquest and heard all the evidence, and fully agree with the verdict of "Accidental death."

The second fatal accident happened to a miner named William Lewis, by a fall of coal in the Wickham and Bullock Island Colliery, on 30th July last. The Maitland District Coroner held an inquest on the body of deceased, at Tighe's Hill, on the day following the accident. I was also present at this inquest, and after having heard the evidence fully agree with the following verdict as given by the jury:—"That the deceased's death was caused, on the 30th July, 1886, by an accidental fall of coal in the Wickham and Bullock Island Colliery, at Bullock Island."

The third fatal accident happened to a miner named Robert Young, by a fall of coal in the Lambton Colliery, on 27th August last. This poor man lingered in terrible suffering for about thirty-five hours after receiving the accident, and died at about 10 p.m. on the following day. The Maitland District Coroner held an inquest on the body of deceased, at Lunn's Hotel, New Lambton, on Monday 30th August. I attended the inquest and heard all the evidence, and fully agree with the verdict of "Accidental death."

The fourth fatal accident happened to a miner named John Virgo, by a fall of coal in the Wallsend Colliery, on 1st October last. This poor man lingered about twelve hours after receiving the accident, and expired at about 11:30 p.m. on the same day. The Maitland District Coroner held an inquest on the body of deceased, at Wallsend, on the day following the accident. I was present at the inquest, and heard all the evidence, and fully agree with the verdict of "Accidental death."

The fifth fatal accident happened to a miner named Andrew Watson, by a blow from a prop which was knocked out by a fall of coal in the Greta Colliery, on 17th November last. On the day following the accident the Maitland District Coroner held an inquest on the body of deceased, at the Court-house, Greta. I attended this inquest also, and fully agree with the verdict of "Accidental death" as returned by the jury.

The first of the non-fatal accidents happened to a miner named James Jones, by a fall of coal in the Wallsend Colliery, on 8th July, and resulted in severe fracture of the right ankle.

The second happened to a miner named William Stevenson, by a fall of loose stones from a dirt-box, in the Pride of Ferndale shaft, on 19th July,—the result being very severe injuries to back and chest.

The third was a thigh fracture to a miner named Charles Quiding, by a fall of coal in the A.A. Co's. No. 2 pit workings, on 20th July.

The fourth was by the same fall of coal as above-mentioned, and resulted in very severe internal injuries to a miner named Edward Pascoe, who was working with Quiding at the time.

The fifth resulted in compound fracture of right leg, to a miner named Hugh Montgomery, by a fall of coal in the A.A. Co's. No. 2 pit workings, on 21st August.

The sixth happened to a miner named James Dodd, by a fall of coal in the Wallsend Colliery, on 2nd September. Result, very severe internal injuries.

The seventh was a leg fracture to a miner named Alexander M'Leau, by a fall of coal in the Wickham and Bullock Island Colliery, on September 9.

The eighth happened to a miner named John Hindman, by coal blown from a shot in Brown's Colliery, Minmi, on 4th November, and resulted in fracture of thigh.

The ninth resulted in leg fracture and severe wound to a wheeler named Thomas Hunter, by a squeeze between the horse-limbers and a loaded skip in the Stockton Colliery, on 19th November.

The tenth happened to a miner named William Lewis, by a fall of jerry in the A.A. Co's. No. 2 pit workings, on 24th November, the result being very severe bruises on right leg.

The eleventh resulted in compound fracture of both bones of right leg, to a trapper boy named Barrass Robinson, by a loaded timber trolley in the Wallsend Colliery, on 1st December.

The twelfth happened to a miner named David Reid, by a fall of morgan in the A.A. Co's. No. 2 pit workings, on 2nd December, the result being a fracture of both bones of left leg and dislocation of left ankle.

The thirteenth happened to a boy named William Bowditch, whilst engaged taking the rope off a loaded train of skips, in the East Waratah Colliery, on 23rd December, and resulted in the dislocation of right hip and other injuries.

The fourteenth, and last, happened to a miner named Cuthbert Davison, by a blow from a prop in the Wallsend Colliery, No. 3 tunnel, on 23rd December, the result being severe fracture to ribs on left side.

The usual tabulated list of accidents is hereto appended.

I have, &c.,

JOHN DIXON,

Inspector of Collieries.

TABULATED

TABULATED List of Fatal and Non-fatal Accidents in the Northern Collieries of New South Wales, investigated by the Inspector of Collieries during the half-year ending 31st December, 1886.

No.	Date.	Colliery.	Sufferer.	Occupation.	Nature and extent of injuries.	Non fatalities.							Fatalis.		Total non-fatalis.	Total fatalis.		
						Falls of coal.	Falls of stone.	Loaded skips	Explosion of shot.	Fall of jerry	Loaded timber trolley	Fall of morgan	Blow from a prop	Loaded skips.			Falls of coal.	Blow from a prop.
1	July 8	Wallsend	James Jones	Miner	Fracture of ankle by a fall of coal	1											1	
2	" 19	Pride of Fern- dale	Wm. Stevenson	Miner	Injuries to back and chest by stone fall ing down a shaft		1											1
3	" 20	A.A. Co's	Charles Quiding	Miner	Thigh fracture by a fall of coal	1												1
4	" 20	A.A. Co's	Edward Pascoe	Miner	Internal injuries by a fall of coal	1												1
5	" 29	Wallsend	Thomas Leach	Brakesman	Fatal injuries by loaded skips									1				1
6	" 30	Bullock Isld	William Lewis	Miner	Fatal injuries by a fall of coal													1
7	Aug. 21	A.A. Co's	H. Montgomery	Miner	Leg fracture by a fall of coal	1												1
8	" 27	Lambton	Robert Young	Miner	Fatal injuries by a fall of coal													1
9	Sept. 2	Wallsend	James Dodd	Miner	Internal injuries by a fall of coal	1												1
10	" 9	Bullock Isld.	Alex. M'Lean	Miner	Leg fracture by a fall of coal	1												1
11	Oct. 1	Wallsend	John Virgo	Miner	Fatal injuries by a fall of coal													1
12	Nov 4	Brown's	John Hindman	Miner	Thigh fracture by the explosion of a shot			1										1
13	" 17	Greta	Andrew Watson	Miner	Fatal injuries by a blow from a prop.													1
14	" 19	Stockton	Thomas Hunter	Wheeler	Leg fractured and wounded by a loaded skip			1										1
15	" 24	A.A. Co's	William Lewis	Miner	Severe bruises on leg by a fall of jerry					1								1
16	Dec. 1	Wallsend	Barrass Robinson	Trapper	Leg fracture by a loaded timber trolley						1							1
17	" 2	A.A. Co's	David Reid	Miner	Leg fracture and dislocation of ankle by fall of morgan							1						1
18	" 23	E Warat h.	William Bowditch	Bankboy	Dislocation of hip and other injuries by loaded skips			1										1
19	" 23	Wallsend	Cuthbert Davison	Miner	Fractured ribs by a blow from a prop							1						1
Totals						6	1	2	1	1	1	1	1	1	3	1	14	5

THE Half-yearly Report of the Inspector of Collieries on the state of the various Collieries in the Southern and Western Districts of the Colony of New South Wales, and Accidents therein, for the half-year ending 31st December, 1886.

The Examiner of Coal Fields, Mines Department, Sydney,—

Wollongong, 12 January, 1887.

Sir, In compliance with the requirements of clause 26 in the Coal Mines Regulation Act, 1876, I have the honor to transmit to you this my six-monthly report on the state of the various collieries for the half-year ending 31st December, 1886.

The total number of collieries under inspection in the Southern and Western Districts during the last six months is twenty-six. The two prospecting mines at Avondale (near Dapto) and the two at Ruined Castle (Katoomba) are not included, no work having been done in them during the term of this report.

Western District	12 coal-mines and	1 shale-mine
Berrima ,,	2 ,,	1 ,,
Southern ,,	10 ,,	...
	24	2 = 26 collieries.

PRESENT STATE OF MINES.

Mount Kembla Colliery.—During the last four months the original miners who wrought in this colliery have been out on strike, on account of the hewing rate of coal being reduced 2d. per ton. During the term of the strike heavy falls of roof have taken place in the long-wall and No. 6 division of workings. The manager, Mr. Evans, has had great difficulty in connection with these falls of roof interfering with the return air-ways; but to overcome this, a new air-crossing has been constructed, and the return air-ways have been opened out so far that on my inspection I was (with difficulty) enabled to travel through them.

From the effects of the falls of roof referred to, and the heavy rains, a large quantity of water found its way through the falls into the dip-workings; this water has now been pumped out by means of a small pumping engine. An average of sixteen non-union men are employed underground, and served with about 5'200 cubic feet of air per minute.

The above number of men are unskilled coalminers, but the larger portion profess to have wrought on the gold-fields. And I find the timbering of the bords in general is very carefully attended to; and the management likewise exercising every care to ensure safety. The Act in other matters complied with.

Mount Pleasant Colliery.—The original miners at this colliery have been on strike during the last four months.

The dispute was caused by the manager discharging two miners from the colliery. The miners insisted to know the reason why these two men had been discharged. The manager would give no reason, but claimed the right or power to employ or discharge whomsoever he thought proper, whereas the miners, believing the two men were victimized on account of taking a leading part in the Miners' Union, refused to work until the two men were reinstated.

At present eighty non-union men are employed underground, and served with 13,500 cubic feet of air per minute, in two separate splits, viz.:—No. 1 tunnel, sixty-four men and horses employed, and supplied with 9,000 cubic feet of air per minute; Cantrill's heading, sixteen men, and served with 4,000 cubic feet of air per minute. On making my inspections I have insisted upon the management carefully examining the bords several times a day to ensure safety for the men, seeing that a large portion were unskilled miners. The manager informed me that the underground officials visited the bords several times a day to see that the timbering and other matters were attended to.

On my last inspection I found the bords were well timbered up to the working face. The Act in other matters complied with.

Bulli

Bulli Colliery.—The miners have been on strike for the last four months, owing to a reduction of 2d. per ton on the hewing rate of coal. Five men are employed underground doing general repairs.

During the strike heavy falls of roof have taken place in several districts of the colliery, obstructing the principal return air-ways. I drew the manager's attention to the condition of these air-ways, and he, the manager, informed me he could not get men during the strike to work and keep them (the air-ways) in repair; but as soon as the strike was settled it would be his first business to have the return air-ways put into a condition that persons could travel therein. A new ventilating furnace has been built, about 43 chains from the entrance of the tunnel, which has 100 square feet of heating surface. The air-shaft in connection with this furnace is 320 feet in depth, and 10 feet in diameter. The Act in other matters complied with.

South Cumberland Coal-mining Company.—The above Company are sinking a shaft at Camp Creek, parish of Heathcote, situated on the Illawarra Railway, 28 miles from Sydney. The surface arrangements are very substantial for sinking operations. The shaft is sunk to a depth of 315 feet, is 16 feet in diameter, and walled off with 9 in. brickwork and cement, to a depth of 28 feet from the surface. The ventilation is supplied by means of a fan wrought by a belt from the engine, with 6 in. diameter pipes. Sinking operations are carried on by three shifts of sinkers, eight sinkers being on each shift.

North Illawarra Coal-mining Company—No. 2 tunnel.—Thirty men are employed underground, and supplied with 8,000 cubic feet of air per minute. The surface arrangements are almost completed. The Company intend to ship coal from their new jetty about the month of February. The jetty is 850 feet long, and has a depth of water at high-tide of 25 feet. The Act complied with.

Broker's Nose Colliery.—About eight men are employed underground, and served with 1,000 cubic feet of air per minute.

Coal Cliff Colliery.—About 100 men and horses are employed underground, and supplied with 10,400 cubic feet of air per minute, in two separate splits. The north division of workings are supplied with 7,000 cubic feet of air per minute for eighty men. No. 6 heading, twenty men and horses, and served with 3,400 cubic feet of air per minute. The colliery throughout in general good condition, and the Act complied with.

Bellambi Colliery.—Four men employed underground, and supplied with 10,000 cubic feet of air per minute. The Act in all respects complied with.

WESTERN DISTRICT.

Carlo's Gap Colliery.—One man employed getting a few tons of coal weekly, no sale being for the coal.

Hermitage Colliery.—Six men employed underground, and served with 3,000 cubic feet of air per minute. Travelling roads and working faces safe. The Act in all respects complied with.

Zig Zag Colliery.—Seventy-five men employed underground, and supplied with 17,500 cubic feet of air per minute in one current. The colliery in a healthy condition throughout. The Act in all respects complied with.

Vale of Clwydd Colliery.—About seventy men and horses employed underground, and supplied with 14,000 cubic feet of air per minute, in one current. During the last six months a large ventilating furnace has been built at the bottom of the air-shaft. The Act in all respects complied with.

Esk Bank Pit.—Seventy-one men and horses are employed underground, and served with 14,500 cubic feet of air per minute in one current. The ventilation good throughout the colliery. The Act in other matters complied with.

Esk Bank Old Tunnel.—About twelve men employed underground, and supplied with 8,000 cubic feet of air per minute. The ventilation good in every bord. The Act is also complied with in all respects.

Cooverwill Mine.—One man employed getting coal. A new air-shaft has been sunk, and a travelling road made on the east side of the tunnel. The Act in all other matters complied with.

Lithgow Valley Colliery.—Sixty-two men employed underground, and served with 12,000 cubic feet of air per minute in one current. A new air-shaft has been sunk in connection with the No. 2 cross-cut. A travelling road has been made from the working faces to the shaft; a ladder is placed in the shaft from the bottom to the top, so that persons may travel at all times, thus making three separate and distinct ways to the day. The Act in all other respects complied with.

Main Camp (Hartley Vale).—Twenty men employed underground, and served with 12,500 cubic feet of air per minute. The colliery safe and well ventilated throughout. The Act in all respects complied with.

New South Wales Shale Mines (Hartley Vale)—No. 3 Tunnel.—Forty men employed, and served with 10,000 cubic feet of air per minute in one current. Twenty men are on pillar work. The pillars are being taken out systematically; both manager and miners are very careful as to the timbering of the bords. The Act in all respects complied with. *Western Tunnel.*—Fourteen men employed underground, and served with 5,100 cubic feet of air per minute. *No. 1 Tunnel.*—Eight men employed underground, and supplied with 4,000 cubic feet of air per minute. The Act in all respects complied with.

Retort Coal Mine (Hartley Vale).—Seven men employed underground, and supplied with 4,000 cubic feet of air per minute. The Act complied with.

Katoomba Colliery.—Sixty-two men are employed underground, and supplied with 10,500 cubic feet of air per minute in one current. A new furnace has been built during the last six months; also a new travelling road, driven out on to the mountain side at the extreme end of the working faces, thus making three separate and distinct openings to the day.

BERRIMA DISTRICT.

Mittagong Coal-mining Company.—Four men employed underground, and served with 4,000 cubic feet of air per minute. Only a few tons of coal going away weekly to Mittagong township. The Act complied with.

Berrima Colliery.—Six men employed underground, and supplied with 4,000 cubic feet of air per minute. The Act complied with.

Australian Kerosene Oil Company (Joadja Creek).—Sixty men are employed underground, and supplied with 12,000 cubic feet of air per minute. The colliery in a safe and healthy condition throughout. The Act complied with in all respects.

ACCIDENTS

ACCIDENTS IN MINES.

During the last six months I have investigated five separate accidents, one of which was fatal.

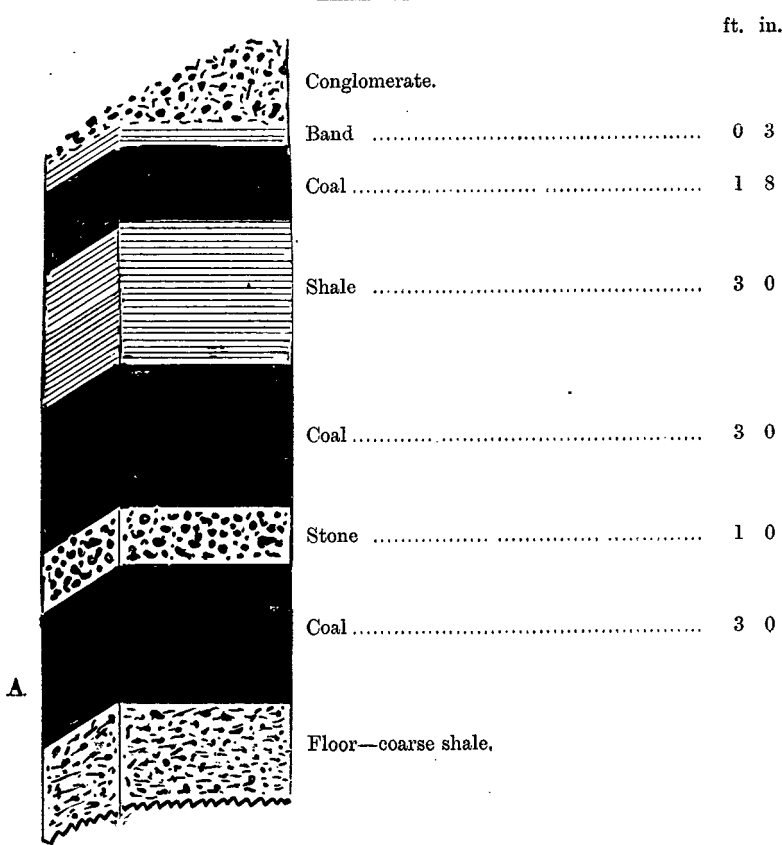
The first of the non-fatal accidents happened to a wheeler named David Thomas, at Bellambi Colliery, on the 25th September. His leg was broken by his horse stumbling and driving him against the side of the main tunnel.

The second and third accidents happened to two miners who were working mates, at Coal Cliff Colliery, on October 28th, named William Walker and John Collins, by a fall of roof, while engaged filling a skip at their working face. Walker was bruised about the head and chest, and Collins hurt about the back.

The fourth non-fatal accident happened at Mount Kembla colliery, on November 17th, to a surface labourer named C. Parker. He had his back bruised, by a loaded truck breaking away from the top of the incline.

The fatal accident happened on the 20th November, to a miner named Felix Murphy, at Mount Kembla Colliery, by a fall of tops from the roof. Three of his ribs were broken, and he was otherwise bruised about the head and shoulders. From the effect of the injuries received and shock to the system he gradually sank, and expired on the 24th of November, in the Wollongong hospital. The deceased was an aged man, about sixty-eight years of age, and it was his first day's work in the colliery. An inquest was held at Wollongong, as touching the death of deceased, by the District Coroner, C. F. Smith, Esq., which inquest I attended. The jury returned a verdict of accidental death, with which verdict I fully agree. The usual tabulated list of accidents is hereto appended, and a section of Mr. M'Mullen's coal-seam.

I have, &c.,
JAMES ROWAN,
 Inspector of Collieries.



The above is a section of the coal-seam recently opened out by Mr. M'Mullen.

The mine is situated about 3 miles from Hartley Vale, in the county of Cook, parish of Lett. Two adits have been driven 50 yards into the mountain.

The lower portion of the section marked A is good marketable coal.

From the nature of the floor, roof, and other surroundings, I would judge it to be the same seam of coal as that which is being wrought in the Lithgow District.

TABULATED List of Fatal and Non-fatal Accidents in the Southern and Western Districts of New South Wales Collieries investigated by the Inspector of Collieries during the half-year ending 31st December, 1886.

No.	Date.	Colliery.	Sufferer.	Occupation.	Remarks, &c., on the nature and extent of injuries.	Leg broken by a skip.	Bruised by a fall of roof.	Bruised by a fall of roof.	Bruised by a loaded truck.	Fatal injury by a fall of roof.	Fatal.	Non-fatal.
1	Sept. 25	Bellambi ..	David Thomas	Wheeler ..	Leg broken by a loaded skip	1	..	..	..	..	..	..
2	Oct. 28	Coal Cliff	Wm. Walker	Miner	Bruised about the chest by a fall of roof .....	..	1	..	..	..	..	..
3	Oct. 28	Coal Cliff	J. Collins	Miner	Hurt about the back by a fall of roof .....	..	..	1	..	..	..	..
4	Nov. 17	Mt. Kembla ..	Chas. Parker	Labourer ..	Back bruised by a loaded truck .....	..	..	1	..	..	..	..
5	Nov. 20	Mt. Kembla ..	Felix Murphy	Miner	Fatal injuries by a fall of stone from the roof .....	..	..	..	..	1	..	..
Totals .....						..	..	..	..	1	1	4

GEOLOGICAL SURVEY OF NEW SOUTH WALES.

Report of Progress for 1886 by the Geological Surveyor-in-charge.

Sir,—

I have the honor to submit the following report of progress of the geological survey for the year 1886.

The various mining districts examined include Bingera, Gunnedah, Jerrara, Hunter River, Molong, King's Plains, Mudgee, Uralla, Mitchell, Fairfield, &c.

I accompanied the Under Secretary for Mines and the Superintendent of Drills; members of the Prospecting Board, to the Bingera District to make arrangements for assisting parties to prospect for gold with Government aid.

The Gwydir River Valley, at Bingera, has been eroded through a belt of gold-bearing reef formation, and has subsequently been partly filled up with drifts and alluvial deposits, which form the wide alluvial flats on which the town stands. As the shallow drift deposits in the adjacent tributary valleys have been profitably worked for gold for some years past, it is considered that the deeper drifts under the Gwydir River flats must also contain extensive auriferous deposits. Various attempts have been made to prospect these; but owing to the heavy influx of water the work could not be carried out. It was, therefore, decided to test the deep wet ground by means of the water-auger. Several bores were bottomed near the southern edge of the flat, and a little gold obtained; but in the deeper ground it was found that the auger could not cope with the coarse boulders in the wet loose drift. Two other sites were selected for prospecting the tertiary drifts which extend from the Bald Hills towards the Bobby Whitlow diggings. These drifts are the remains of an ancient river-course which drained from the high lands on the east, and in the Pliocene period was overwhelmed by a flow of basaltic lava. The subsequent denudation of the country has in places left only patches of the basalt, such as those forming the Bald Hills, where the old river pebble-drift is seen cropping out from under the basalt on the sides of the hills, and resting on altered slate rocks with quartz veins. It is intended to drive in on the slate rock bottom to search for the deeper channel of the old lead. Two of the adjacent shallow gullies have been worked for gold, and it is evident that the gold has been derived from the denudation of the tertiary drift. At one place the Tingha Company had some time ago sunk a shaft about 75 ft. deep, passing through 15 ft. of columnar basalt and a little drift on altered shales; but this shaft appeared to be on the eastern shallow side of the lead. The other prospecting site is about 2 miles further to the north-west, near the head of Long Gully, where the tertiary drift, the continuation of that from the Bald Hills, comes to the surface without a covering of basalt; but as the bed-rock is not exposed the deep ground must here be tested by sinking one or more shafts. It is important that this locality should be thoroughly tested, as the old lead must extend for many miles in a westerly direction. The diamond-field was next inspected. Near Butler's Farm, Mr. Lowe had put down a deep shaft on a high basalt ridge (970 ft. by barometer above Bingera), and he desired to continue his prospecting on the same site by means of the diamond drill. But on examining the ground for about a half a mile to the east it was found, as seen in section in a deep gully, that the basalt was 300 ft. thick, underlaid by 80 ft. of tertiary clays resting on altered Devonian slates; and as there appeared to be deeper ground to the south, where the basalt had been removed by denudation, it was considered that it would be more advisable to test the lead in that direction by sinking. It is most important that this should be done, for this lead occupies what was, in the Tertiary period, the main drainage valley of the district, and as it has crossed the above-mentioned belt of gold-bearing formation, which extends southerly from Bingera, when traced out a short distance to the east, near to this belt, it may be found richly auriferous, as well as diamond-bearing. It is doubtful whether the deposits which have already been worked for diamonds, though evidently forming part of this Tertiary lead formation, really occupy the deepest channel, or are on the main lead. However, to determine this, Mr. W. Anderson is now engaged in making a geological survey of the field.

The country from Bingera to Inverell consists of altered, partly jasperoid, Devonian slates and sandstones, granite and basalt; the latter is in places covered by ferruginous volcanic ash, which, in its decomposed state, produces rich agricultural land. It forms, generally, the highest land in the district, attaining at 5½ miles from Inverell a height of about 2,500 feet above sea-level. Mr. MacDonal, of Myall Creek Station, showed me some bituminous coal, which occurs 8 miles west from the station; also, from the same locality, fossil bones of *Diprotodon*, &c., found in an old boggy spring deposit. At Dangar's Gate, about 16 miles west from Inverell, there is a massive outcrop of coarse porphyritic granite, with black mica and veins of eurite; it is probably stanniferous.

From Inverell to Glen Innes, the road passes over altered sedimentary (probably carboniferous and Devonian) formations, granite and porphyry, covered in many places with basalt; the denudation of the latter has given rise to the notorious "black soil," which so extensively covers this district and the plains to the westward.

With the Under Secretary for Mines, I inspected the Jenolan Caves, to ascertain what additional improvements were necessary to be made. These have since been completed, and the different caves may now be easily inspected by visitors, and with greater safety than formerly. Arrangements are now being made for the electric lighting of the caves. Mr. E. C. Cracknell, Superintendent of Telegraphs, has kindly undertaken the work, which, when completed, will enable the natural objects in the caves to be seen to great advantage. During the year 1,140 persons visited the caves.

I examined the gold- and silver-bearing ironstone lodes in the Jerrara District, between Goulburn and Marulan; my report thereon will be found in Appendix A.

The Molong District, in which the copper and tin lodes of Gumble occur, was also examined by me, and is described in my report herewith. (Appendix B.)

I inspected the King's Plains Gold-field, and recommended the construction of a dam for mining purposes, on account of the scarcity of water on the field, and to promote the development of the gold-bearing reefs. (See Appendix C.)

In my report (Appendix D) upon the Mudgee and Gulgong Gold-field I have chiefly made reference to those mineral resources which may be of commercial value—coal, kerosene shale, antimony, and diamonds, in addition to the gold which the district has yielded up to the end of 1886, 1,072,752 ounces, or over 32 tons, valued at £4,162,550—and have pointed out the localities which should be further prospected.

The Mudgee District presents several features of special geological interest. The base-rocks, or "bed-rocks," of the district consist chiefly of Upper Silurian and Devonian conglomerates, sandstones,

schists, and limestones, which have been much indurated and otherwise metamorphosed. These have been here and there intruded by granites, diorite, and porphyry. The auriferous veins are always more or less associated with the intrusions of diorite, occurring either in the diorite or in the adjoining altered sedimentary rocks; consequently, where these formations have suffered denudation, the derived gravels, whether of carboniferous age or of more recent date, are often payably auriferous. With the exception of the summits of some of the higher ranges, the whole district was at one time covered with the carboniferous formations, about 300 feet thick, containing seams of coal and kerosene shale, and overlaid by the Hawkesbury sandstone formation, also about 300 feet thick. The enormous amount of denudation that followed has not only eroded valleys through these formations, but has in places completely swept them away, laying bare the older base-rocks over large areas; while, in some localities, patches of the carboniferous gravels or conglomerates, and at the head of Cooyal Creek these pass under the coal-measures, and the Hawkesbury sandstones, which form high precipices of the same appearance as those in the Blue Mountains valleys. This vast denudation continued through the Tertiary period to the present day, and therefore, as we should expect, we find the various successive Tertiary deposits marking the relative time of their deposition in the valleys, as the latter were gradually eroded and deepened, or as they were partly filled up by outbursts of lava, which at different times flowed into some of them. I say some of them; for whereas a large stream of lava descended from the mountains on the east, flowing in the Cooyal Creek Valley, near Gulgong, thence into the Cudgegong Valley, covering up the river channels of the pliocene period. The upper part of the Cooyal Valley, where the Home Rule and Canadian leads occur, escaped this flood of molten lava. In the mode of occurrence these diversified formations may be plainly read the geological history of the districts, which is, therefore, one of peculiar scientific interest, as it is also one of considerable commercial importance, from its rich mining, agricultural, and pastoral resources.

About $4\frac{1}{2}$ miles north-east of the Bara Reef occurs a large intrusive mass, about a mile in width, of white felsite, containing angular boulders of quartz porphyry. In its structure it exhibits fluxion lines, and it is evidently an old volcanic agglomerate, probably of palæozoic age. It will be of interest to trace out the connection between these ancient igneous rocks and the coal-measures, for the transmutation effected by the intrusion of the former amongst the coal-bearing strata may have induced chemical conditions, under enormous pressure and heat, favourable for the formation of diamonds.

Another important geological question which may be determined in this district is the relation of the Devonian and the Silurian strata. This will necessitate the careful mapping out of the strata along a line running easterly for about 3 miles from the main road, near the Mudjee racecourse. This section would include the purple Devonian sandstones and conglomerates, overlying thick beds of marble limestone, beneath which appear the Silurian clay shales and altered sandstones. A similar favourable locality for working out the order of sequence of these formations is at Ilford. A line of section run for two miles east and west through the town of Ilford would embrace not only the Silurian and Devonian formations, but also the over-lying carboniferous and Hawkesbury strata. The marble limestones appear to form the uppermost beds of the Silurian series.

Assisted by Mr. Anderson, I made a geological examination of the Mitchell, or Sunny Corner, Gold-field, with special reference to the modes of occurrence of the silver-bearing lodes. My report thereon is given in Appendix E.

On 24th September, with Mr. W. H. J. Slee, Superintendent of Drills, I witnessed the boring through the 4-foot seam of coal which had been struck at a depth of 2,228 feet, in the diamond-drill bore, at Holt-Sutherland, near Port Hacking.

Mr. David, Geological Surveyor, has been chiefly engaged during the year upon a survey of the coal formations in the Hunter River District (Appendix F). From his preliminary report upon the coal-measures of East and West Maitland (Appendix G) it will be seen that during the progress of his survey he discovered a valuable seam of coal, 13 feet thick, on Crown lands, about 8 miles south-west from Maitland. The land was at once proclaimed a reserve for coal-mining, and has since been taken up, under lease, by a Company who are about to open a new colliery. Mr. Stonier, who was appointed field assistant, has been assisting Mr. David.

Mr. David has also examined and reported on the discovery of two workable seams of coal near Gunnedah (see Appendix H); the Uralla and Rocky River Gold-field, indicating the direction in which the deep leads trend (see Appendix I); and the Fairfield Gold-field (see Appendix J).

On the recommendation of Dr. Geikie, F.R.S., Director-General of the Geological Survey of Great Britain, through the Agent-General in London, Mr. William Anderson, of the Edinburgh University, was appointed Geological Surveyor to fill the vacancy on our staff. He commenced duty on the 20th September, and after assisting me on the survey of the Mitchell silver-field, inspected and reported on the Yarrangobilly Caves (see Appendix K) and the Kiandra Gold-field (see Appendix L).

Mr. J. E. Carne, Curator of the Mining and Geological Museum, has been most indefatigable in his duties. Besides conducting the correspondence regarding the examination, assays, and analysis of the mineral samples submitted to the Department, and the registration and arrangement of the Museum collections, he has been much occupied with the preparation of the collections for the Indian and Colonial Exhibition. During the year, 1799 mineral samples have been assayed, and numerous samples have been examined without assay, for persons soliciting information regarding them. There are now 19,417 registered specimens in the collections of the Museum. For detailed information, see Mr. Carne's report herewith (Appendix M).

At the request of His Excellency the Governor, Mr. H. T. Wilkinson proceeded on 5th July to Norfolk Island to investigate the matter of the proposed transfer of the Island to the Government of this Colony; his mission has not yet been completed. Owing to his absence my staff has been short-handed, and being put to inconvenience in consequence I have had to obtain assistance from another branch of the Department.

I am pleased to report that Mr. A. H. Taylor has been most assiduous in his work, and always willing to perform urgent work after office-hours, when required.

Some important palæontological discoveries have been made during the year. Mr. J. H. Maiden, Curator of the Technological Museum, forwarded to me a large fossil shell that had been found in the excavation for the new Government Docks at Biloela, Cockatoo Island. This being the first fossil shell found in the Hawkesbury sandstone formation, I submitted it to Mr. Robt. Etheridge, jun., F.G.S., assistant palæontologist to the British Museum, whose remarks thereon are given in Appendix N. I examined

examined the excavation in which this fossil had been discovered, and observing, from the occurrence of fossil plants, and the drift deposits resulting from contemporaneous erosion in the sandstone strata, that other fossil remains might be found, I sent our collector, Charles Cullen, to make further search, with the result that he brought to light a most interesting fossil, which Professor Stephens has identified as one of the thoracic plates of a *Mastodonsaurus*, and very similar to a specimen from Stuttgart in the collection of the Sydney University. The discovery of this *labyrinthodon* is of much scientific importance, as proving the Triassic age of the Hawkesbury formation. Soon afterwards other *labyrinthodon* remains were found in the Wianamatta Shales, near Bowral, by Mr. B. Dunstan, and in the Hawkesbury beds, near Gosford, by Mr. C. Lambert (see Appendix O). Professor Stephens kindly undertook the examination of these fossils, and he has described them in a paper read before the Linnean Society. See Proc. Linn. Soc., Vol. I (second series), Part III and IV.

At Gosford our geological collector found that the fossil, which had been obtained from a heap of rubble stone, had originally come from a lenticular bed of shale in the sandstone formation, where a quarry was being opened in connection with the construction of the Great Northern Railway. This bed of shale was about 4 feet thick, thinning out in a short distance on either side, and from it Mr. Blunt, the railway contractor, had already obtained specimens of fossil fishes, some of which he kindly lent to this Department. Our collector afterwards obtained over 400 other specimens of fishes, including some more *labyrinthodon* remains. This splendid collection is now in the Museum, and awaits the examination of Mr. Robt. Etheridge, who has been appointed Palæontologist to the Geological Survey of this Colony.

The large collection of fossil plants from the Eocene Tertiary deep leads of the New England tin-fields, which had been sent to Baron C. Ettingshausen, of Graz, has been returned by that distinguished palæontologist, and now forms a valuable collection for reference in our museum. The Baron's description and figures of them will shortly be received and published.

All of the mineral resources of the Colony are represented in the collections displayed in the Mining and Geological Museum; but owing to the small size of the museum, it is only possible to exhibit a few of the more characteristic specimens in each series of minerals. More room is urgently required, for the greater part of the collections which we possess has to be packed up and stored away, which is a source of great inconvenience when specimens for collections and exhibitions have to be prepared, the necessary unpacking entailing much loss of the time and labour of the Curator and his assistant. I trust that early provision may be made for more accommodation.

A second edition of the "Mineral Products, Geology, &c., of New South Wales" is now in the Government Printer's hands; and I am making arrangements for the publication of Professor de Koninck's and Dr. Feistmantel's works, with those of other authors, on the Palæontology of this country. Mr. David's voluminous report on the Vegetable Creek Tin-field will shortly be issued from the press. His large coloured geological map of that field has already been published.

I have, &c.,

C. S. WILKINSON,

Geological Surveyor-in-charge.

APPENDIX A.

The Geological Surveyor-in-charge to The Under Secretary for Mines.

Report on the Gold- and Silver-bearing Lodes at Jerrara.

Sir,

Department of Mines, 6 May, 1886.

In accordance with your instructions, I have examined the country about 12 miles east from Goulburn, in the direction of Marulan and Bungonia, where some gold- and silver-bearing lodes have been discovered.

The geological formations consist of altered Silurian clay slates and sandstones, having a general westerly dip; and on the Jerrara Creek there are some interbedded masses of coralline marble limestone, which have for years past been worked at Jobson's limekilns.

In a N.N.E. direction from this limestone, and for a distance of about 7 miles, with a width of from a half to one mile, the Silurian strata have been fissured in places, and the fissures filled with iron and arsenical pyrites and quartz. These fissure deposits constitute the lodes which crop out at the surface as masses of hydrous hematite, magnetic iron oxide, and a little quartz. They extend for only a few yards in length in some places, in others up to 200 and 300 yards, varying in width from a few inches to 60 ft., so that they are very irregular in shape, and are not continuous, though they outcrop at intervals along a general northern course.

The Carrington Company's shaft, sunk by Messrs. Tait, Grant, and party, gold lease No. 1, is at present the deepest that has been put down in any of these bores. It is 100 ft. deep, and from this level a cross-course has been driven through the lode, which dips west at an angle of about 70°, having clay slates on both sides.

The foot-wall is well defined with clay fluccan between it and the slate rock, and from it the lode-stuff, consisting of earthy brown hematite and magnetic iron oxide, with occasional patches of quartz, is 19 ft. thick, passing into 9 ft. of mixed iron ore and pipeclay to the hanging-wall. Some patches of undecomposed pyrites occur in the lode, and these will no doubt become more frequent at greater depths until the water-level is reached, when the lode will consist chiefly of unoxidized sulphides. A sample of the pyrites yielded on assay at the rate of a trace (under 2 dwt.) of gold and 4 oz. 1½ dwt. of silver per ton. An average sample of ore taken across the lode yielded a trace (under 2 dwt.) of gold per ton, and no silver; and a sample from near the foot-wall gave a trace of gold and no silver; and from the hanging-wall a trace of gold and no silver.

In the upper part of the lode porous quartz with arsenical pyrites occurs; and at the surface, a few yards to the north-east from the shaft, similar ore crops out, which gave on assay—gold a trace, and no silver. Further to the north-east, about 150 yards, the lode shows again as a massive outcrop of brown hematite and magnetic iron ore; and in the next claim beyond it is about to be opened by Rankin & Company. About 2 chains south from the Carrington Company's main shaft, a dyke of decomposed quartz porphyry occurs upon the line of the lode. The intrusion of this porphyry into the Silurian strata has probably been the primary cause of the formation of the lodes. On both sides of the Jerrara Creek, near the limekilns, are several ironstone gossan lodes of similar character. About half a mile north of the creek there are two well defined—one of them, the eastern lode, cropping out above the surface in

huge

huge blocks of iron ore for 200 yards in length: a small shaft has been sunk upon one side of it, but it has not been driven into. A sample taken from the surface yielded on assay neither gold nor silver. The western lode is now being opened from a shaft 35 ft. deep on the Iron Duke Company's ground, where it outcrops from 30 to 40 ft. wide, consisting of porous brown hematite or gossan and a little ferruginous quartz. An average sample taken from near the surface gave on assay—gold, a trace (under 2 dwt. per ton), and no silver. The lode outcrops for about 10 chains, narrowing in places to only a few feet. About half a mile to the north, and upon the same line, a lode of porous quartz from 1 to 4 ft. thick, containing arsenical pyrites is seen for about 10 chains; it has only been opened to a depth of 2 feet from the surface; a sample of it assayed at the rate of 3 oz. 5 dwt. of silver per ton, and gold a trace (under 2 dwt. per ton).

To the south-west of the Iron Duke shaft there is an outcrop of sandy ironstone about 45 feet wide and 100 feet long, which has not yet been tested. Adjoining the Iron Duke Company's ground on the south a massive ironstone lode, partly traversing limestone and schists, occurs in Mr. Leonard's portion 160 on Jerrara Creek: it also has not been opened. And for about a mile on the south side of the creek several more lodes outcrop. The principal amount of prospecting here has been done by Daniels and party, who have sunk a shaft 45 feet deep into their lode, which consists of ferruginous clay enclosing patches of brown hematite. An average sample gave on assay neither gold nor silver. On this Company's ground there is another lode to the west, consisting of siliceous brown hematite, which also assayed with like results.

About a mile east from the Carrington Company's mine occurs a gossan lode, the No. 2 Carrington said to be 30 feet thick, and sunk upon to a depth of 60 feet. I did not see this lode, but the prospectors' gave me an average sample of the ore, consisting of brown hematite, which yielded on assay, gold a trace (under 2 dwt. per ton) and no silver.

From the above it will be seen that the assays in each case give unfavourable results. This is somewhat surprising, seeing that six samples of precisely similar ore previously sent by the prospectors yielded on assay from traces of gold and silver in one case up to as high as gold 2 oz. 16 gr. and silver 6 oz. 18 dwt. 12 gr. per ton, the latter return being from a sample of yellow gossan with arsenical pyrites. It is also the more surprising, for the pyritous and general nature of the gossan lode-stuff, and the general formation of the country which the lodes traverse, would lead one to expect more favourable results; and I would recommend that the prospectors send large average samples to some works where the ore can be efficiently treated in bulk, and more reliable results obtained than by assay. It is to be hoped that this will be done, especially as the ore occurs in large quantities.

I have, &c.,

C. S. WILKINSON,

Geological Surveyor-in-Charge.

APPENDIX B.

The Geological Surveyor-in-charge to the Under Secretary for Mines.

Report on Mineral Reserves, Molong District.

Sir,

Department of Mines, Sydney, 23 August, 1886.

In accordance with your instruction I have the honor to submit the following report upon the tin and copper lodes and other geological features in the Molong District.

In this district very little mining, other than prospecting, is at present carried on.

At Gumble, 12 miles south-west from Molong, Mr. J. E. Kelly and the Messrs. Delaney Bros. have done a considerable amount of work in opening a lode which contains tin, copper, and silver, besides traces of gold and antimony. The lode commences at the junction of granite and altered Silurian shales, and traverses the latter for about 100 yards in a north 30° east direction. It varies in width from 1 to 8 ft., and consists of ferruginous felspathic and siliceous lodestuff, more or less impregnated with green and blue carbonates, grey sulphide and red oxide of copper, brown oxide of tin, and magnetite. The tin ore principally occurs in the central and southerly portion of the lode. The lode has been opened in three places. The north and middle shafts have been sunk to a depth of 100 ft., and connected at that level by drives, and the south shaft is being sunk to 60 ft. In a drive at the 100-ft. level on the eastern side of the lode, for a distance of 15 ft. the country rock, altered rubblely shales, with serpentine in the joints, is found to be impregnated with native copper in bright crystalline small grains and scales; and on the west side, at the 60-ft. level, the rock, for a distance of 14 ft. from the lode, is, in places, stained with copper carbonates. It is thus evident that the rock on both sides of the lode has been more or less affected by the agencies, probably thermal water holding minerals in solution, which formed the lode.

In the north shaft, at a distance of 60 ft., a singular cavity in the lode was met with, and at the 100-ft. level it is seen to pass near a mass of limestone, and to have been partly filled with rubble. It is a drainage passage for water from the surface, and may run through the lode to a considerable depth; the sides of it are coated with a film of hydrous oxide of iron. The lode is nearly vertical, but at the 60-ft. level it underlays for a few feet at a lower angle to the east.

Seven average samples taken by myself across the lode at different places yielded on assay at the rate of:—Copper, from traces up to 2.85 per cent.; tin, from traces to 0.50 per cent.; and silver, from traces to 4 oz. 1½ dwt. per ton, and no gold.

A sample of the country serpentinous rock, showing native copper, assayed 4.2 per cent. of copper, with traces of tin and silver; and one picked sample of brown ore, showing tin oxide and carbonates of copper, from the lode at the 60-ft. level, south drive, in the middle shaft, yielded, on assay: Copper, 3.85 per cent.; tin, 58.70 per cent.; silver, at the rate of 8 oz. 19½ dwt. per ton; no gold. It is thus seen that the ores occur in patches, and not disseminated regularly through the lode. The ores would, therefore, have to be sorted. The tin oxide might to a large extent be separated by first crushing the lodestuff and washing it in a buddle; but its complete separation by mechanical methods will be difficult; probably the conversion of the copper ore into soluble sulphate of copper by a wet process would be the most advantageous.

It is impossible to form an opinion as to whether the lode can be profitably worked until average bulk samples have been operated on. I understand that it is intended by Mr. Kelly, when the lode has been opened out from the middle of the south shafts, to have such bulk samples sent to England to be tested. There are now on the surface at the mine several tons of good ore showing both oxide of tin and green and blue carbonates of copper, with red oxide of copper. About

About half a mile north from the Gumble mine, at the Red Hill, there is a large mass of porous iron ore or gossan, situated upon the same line of junction of the granite and altered Silurian. It can be traced for about 200 yards, and in one place it crops out about 50 ft. wide; but towards the north end it narrows and changes into a ferruginous quartz reef. Near its south end a shaft has been sunk upon it to a depth of 40 ft. A sample of the gossan which I took from the heap on the surface gave, on assay, traces of tin, and neither gold nor silver; but I was informed that a sample of it previously assayed gave at the rate of 60 oz. of silver per ton. This lode should be further prospected.

About 100 yards to the east is another small lode of silicious gossan traversing altered Silurian shales.

Three-quarters of a mile south from the Gumble mine, and at the line of junction of the Silurian and granite, the Messrs. Sloggett Bros. are prospecting a lode somewhat similar to the Gumble lode. Two shafts have been sunk in it to depths of 33 ft. and 49 ft. respectively. It consists of soft felspathic lodestuff with yellowish green silicate of iron, silicious "clinker," and hard quartzite with quartz veins containing pyrites and a little fluorspar, together with carbonates and sulphides of copper. In the 33-ft. shaft a vein of porous brown iron ore has been struck, a sample of which, on assay, gave only traces of tin and bismuth. Two other samples of different ore gave the same result.

About 20 chains further south occurs another outcrop of quartz containing carbonates of copper and fluorspar, which should be prospected. Half a mile again to the south, Mr. Sloggett has sunk two shafts upon veins of magnetic iron in altered slate; but the ore is of no value.

Between Sloggett's and Gumble, several reefs of quartz occur in elvan granite, and much resemble the bismuth reefs near Glen Innes. I could not detect any metal of value in them.

About a mile west from Gumble there is a large quartz reef 25 feet wide in granite, and near it the granite is overlaid by Tertiary quartz pebble-drift, which does not appear to have been prospected.

Immediately north of the Red Hill the Silurian formation is cut off by a belt of granite; but about 1 mile further north a narrow strip of Silurian shales and limestone comes in again, striking N. 5° W. These rocks have been much altered by the intrusive granite, the limestone being partly converted into silicate of lime. Some of the beds contain carbonates of copper, but not in sufficient quantity to be of value; they also contain greenish garnet rock and ferruginous quartz-veins.

A few miles to the north the Silurian formation widens out, and is traversed by dykes of elvan, diorite, and felspar porphyry; and at its junction with the granite, 2½ miles east from Delaney's farm, occur altered silicious limestones and chloritic rocks dipping W. at 75°, and containing a little grey sulphide and carbonates of copper, the presence of which has tempted prospectors to sink several shafts; but the copper-ore does not exist in payable quantity. The adjoining porphyritic granite is of a pink colour, and in one place contains a patch 3 ft. in diameter of felspathic quartzite, containing numerous plates of molybdenite. In such reefs bismuth is likely to occur.

One mile east from this we leave the granite and come on to slate rocks overlaid by Tertiary-rounded quartz-drift which has accumulated in a valley about ½ mile wide; this drift deposit should be prospected. On the east side of the Killonbutta Creek there is an extensive deposit of this old drift containing water-worn boulders 2 ft. in diameter. A few holes have been sunk upon it, but I do not consider that it has been sufficiently prospected. I saw several dishes of the drift washed, and in one dishful eleven fine specs of gold were obtained. If water, which is now scarce in the locality, were stored, I believe that the drift would pay to ground-slucce. The deposit rests upon Silurian clay shales dipping W. at 57°. Between here and Molong, a distance of 8 miles, the country consists of hills of Silurian schists and limestones, and Devonian grits, purple shales, flagstones, and conglomerates; but in the valley of the Mandadgery Creek there is another deposit of Tertiary drift. The hills on the north side of Nora Creek, at Downey's Farm, are capped with similar drift and ironstone cement. Mr. Downey has sunk several shafts into it and obtained a little gold. Underneath it are Silurian limestone and shales, very fossiliferous.

The limestones are extensively developed in the town of Molong, where they dip W. at 33° to 50°, and, with a few interbedded shales, are about 1,500 ft. in thickness. Some of the beds consist of crystalline marble of various colours, from white, fawn, and dove colour to dark grey, with white markings of fossil shells and corals. The stone would take an excellent polish, and could be cut into slabs for mantel-pieces. These limestones appear to form the uppermost beds of the Silurian series.

Two miles west from Molong, at Bryan's Flat, on the Parkes Road, some of the Devonian beds yield flagstone of good quality. There are two beds, each about 3 ft. thick, which readily split into flags 2 ft. square; some flags have been obtained 6 ft. long, and with an even surface. The stone is fine-grained, hard, and far more durable than the Sydney sandstone flagging. Two miles further west, on the main road, another quarry has been opened in hard silicious sandstone, from which large flagstones may be obtained from 4 in. to 12 in. thick, and over 10 ft. long; but their surface is not quite smooth, being ripple-marked; yet for culverts and other purposes where large and durable flags are required this stone will prove very serviceable.

In many places in the Molong District, as on Mr. J. Rubie's land at Gara, &c., large masses of brown iron-ore are seen at the surface. At first sight they might be mistaken for the gossan caps of pyritous lodes, but on close examination they are seen to be associated with water-worn pebble-drifts, and to form part of the Tertiary deposits, and are therefore not indicative of lodes like those in the neighbourhood of Copper Hill, upon which I have previously reported.

Remains of the Tertiary drifts are to be found in all of the principal valleys, in which they were deposited by the ancient streams. In some instances, as at Molong, the present valley has not been eroded to the level of the older one, and therefore the lead or bed of the old water-course still exists, and wells sunk into it yield a large supply of water. In Molong it runs almost through the centre of the town, passing at the back of the Court-house. It is sure to be gold-bearing, but whether payably so can only be proved by prospecting.

In other instances the present valleys have been eroded deeper than those of the Tertiary period, and the drift deposits of the latter are seen cropping out on the sides of the hills. Some of these are very noticeable on the east side of the Bell River, about 10 miles north-east from Molong. In this locality there appear to be several leads connected with a main one which runs from near Sam's Mount and past Hyland's farm, where it is now being prospected. Should this lead prove payable it will be an important one, for it can be traced for several miles through the ranges. In one place, near Sam's Mount, it consists chiefly of very water-worn quartz-drift, filling a channel 150 yards wide, and at least 50 ft. deep, which

which has been eroded in Silurian schists and limestones. The Silurian rocks are traversed by some ferruginous quartz reefs; and in the alluvial, near one prospected by Mr. Millgate, gold has been found. A sample of this reef has been taken for assay.

Much of this country has been covered by basalt, which appears to have flowed from Mount Canobolas, near Orange. This ancient volcano rises to a height of 4,565 ft. above the sea, and forms one of the most conspicuous mountains in the Western District. When in eruption it must have presented a magnificent sight. On its summit are jagged masses of lava and scoria. It is sometimes covered with snow in the winter season. The railway from Molong to Orange passes over the northern slopes of it.

For about 3 miles east from Molong the formation consists of intrusive hornblende porphyry, in which the gold- and silver-bearing copper and gelsena lodes occur about Copper Hill.

The denudation of the old trap rock, together with that of the basalts, Silurian schists and limestones, and the sandy Devonian and Tertiary formations, has produced most fertile agricultural soils covering large areas in this district.

I have, &c.,

C. S. WILKINSON,

Geological Surveyor-in-charge.

APPENDIX C.

The Geological Surveyor-in-charge to The Under Secretary for Mines. Report on the King's Plains Gold-field.

Sir,

Department of Mines, Sydney, 31st August, 1886.

In accordance with your instructions, I have inspected the King's Plains Gold-field. My report on the water supply required for mining purposes you have already received.

The gold-field is situated about 8 miles north-east of Blayney. It is said to have been discovered about nineteen years ago, and that at one time there were about 500 miners upon it, who worked the shallow alluvial deposits (from 2 to 30 feet deep), in four small gullies which drain the eastern side of the dividing ridge between the Belubula River and Fitzgerald's Creek. The gold in these gullies has been derived from the denudation of some quartz reefs, which extend in a north and south line along the ridge for about a mile. Water for mining purposes on this field has been scarce, which is, no doubt, the reason why so little attention has been devoted to the reefs. The Confidence Gold-mining Company, however, under Mr. G. H. Newman, of Lucknow, as general manager, holds a 20-acre lease, and has gone to a large outlay in the erection of a battery of nineteen head of stampers, and the construction of three dams; but, owing to the long season of drought, water has only been available for crushing at intervals. The mine is a remarkable one. The quartz veins, from an inch to 4 feet thick, are found to intersect in an irregular course, but generally about east and west, a soft ferruginous silicious and felspathic dyke, which is from 15 to 45 feet wide, and runs north and south. Gold occurs both in the dyke and in the quartz veins, and the whole dyke mass, with the veins, is taken out and put through the battery. I was informed that 7,160 tons crushed had yielded at the rate of about 3 dwt. per ton. The dyke, being soft, is easily worked. Quite a large open quarry-like excavation, from 20 to 60 feet deep, and about 80 yards in length, has already been made, and at the bottom of it a shaft has been sunk, 170 feet deep, and several gold-bearing veins proved, of which samples showing free gold and pyrites were given me for the Mining and Geological Museum. A main shaft for working the mine is now being sunk to a depth of 220 feet. The country rock consists of Silurian clay shales, sometimes talcose. There is little doubt but that this dyke could be similarly worked along its whole course for about a mile, and that it would afford employment for a large number of miners if a good supply of water were made available. Other quartz reefs are seen cropping out in the same locality.

On the north side of the Bathurst Road, $4\frac{1}{2}$ miles from Blayney, gold has also been worked, some years ago, but on private property. This is near a creek which runs through an alluvial flat into the Belubula River. It is probable that a payable lead exists in this flat; the sinking, however, would be wet. The flat extends along the river to Blayney, and, as it passes over formations consisting of Silurian schists traversed by diorite and quartz reefs, it is likely that the bed of the old water-course, which the thick alluvial deposit has covered up, would be payable in places.

I have, &c.,

C. S. WILKINSON,

Geological Surveyor-in-charge.

APPENDIX D.

Report on the Mudgee and Gulgong District. (By S. C. Wilkinson, Geological Surveyor-in-charge.)

Department of Mines, Sydney, 29 December, 1886.

THE Mudgee District consists chiefly of metalliferous and coal formations, over which large areas are covered with rich soil most suitable for agricultural purposes. It is therefore essentially a mining, farming, and pastoral district.

The metals found are gold, copper, silver, tin, antimony, iron, and manganese. Of these the most important is gold. The country within miles around Mudgee, including Gulgong, Canadian, Home Rule, Hargraves, Two-mile Flat, Log Paddock, Pipeclay, Apple-tree Flat, &c., has been one of the principal gold-producing fields in New South Wales. According to the official returns, it has yielded no less than 1,072,752 oz. of gold, or over $44\frac{1}{2}$ tons, valued at £4,162,550. The Cudgegong River flows through the centre of it, with Lawson's Creek, Reedy Creek, and other smaller streams as tributaries.

The gold has been obtained from two sources—reefs and alluvial deposits, but chiefly from the latter.

The reefs occur in the Silurian formation, as at Hargraves, where the celebrated "Hundred-weight" nugget of reef gold was found in 1851, and also in diorite, where this igneous rock has in dyke masses intruded the Silurian, as at Red Hill and Specimen Hill, near Gulgong, old Gulgong reefs, and Mount Blatchford and other places.

Very little work other than prospecting is at present carried on in reef-mining. Mr. S. Blackman, at Cooyal, is about to work on his private property a well-defined promising reef, which traverses Silurian clay slates, and from which rich specimens, containing coarse pieces of gold, have been taken. It has been traced for a length of 250 ft., and sunk into for a depth of 30 ft., and where it is about 6 ft. thick, and dips

dips W. 5° S. at 24 ft. Other reefs not yet proved are seen cropping out at the surface in this locality; they are worthy of attention, as the alluvial deposits in the neighbourhood have yielded gold.

At Specimen Hill, near Gulgong, a little work is being done in raising quartz from some of the numerous veins which here, for about 2 chains wide, traverse a bed of altered schists, striking N. 30° W. From time to time rich patches of gold-bearing stone have been obtained from these, and there are doubtless others to be won. The belt should be proved at a depth by sinking into and driving across it in a N.E. and S.W. direction. It is on the edge of a spur from the main line of hills, which runs S.W. from the Red Hill, near Gulgong, south-easterly between Canadian and Goree, and forms the watershed of the Three Mile and other gold-bearing leads which trend westerly through Rouse's Paddock to the Cudgegong River, and of those going easterly through Canadian to Home Rule in the Cooyal Creek Valley. The formations of these hills are altered Silurian sandstones and limestones, with dykes of diorite, which are traversed by numerous quartz reefs, several of which have been found gold-bearing, such as those at Red Hill, old Gulgong reefs, and about the Three Mile. The rich deposits of gold in the leads derived by denudation from these formations prove that many of the reefs must be auriferous, and there is, therefore, reason to anticipate that some of them will yet be found payable. I have already described the auriferous deposits of this part of the Gulgong Gold-field in the Annual Report of the Department of Mines, 1876.

About Broombee, south of Mudgee, the Silurian sandstones, slates, and limestones have also been much disturbed by intrusive dyke masses of diorite in a north-westerly line; and in the gullies which have been eroded across this line of disturbance much gold has been got from the alluvial deposits—evidence of the occurrence of reefs from which the gold has been derived. Several of such reefs have been discovered and worked to some extent, as the Prince of Wales reef, on the Sydney Road, 7 miles from Mudgee, and a little beyond the old Broombee reef; these are now unworked. But at Mount Blatchford and Mount Norris, 10 miles from Mudgee, near the main road, some gold-bearing quartz veins and gossan lodes are now being prospected by Mr. Clarke and others of Mudgee. The Mount Blatchford reef was first opened some years ago, and consists of several ferruginous quartz veins up to 5 in. thick in whitish diorite, containing arsenical pyrites, galena, and free gold; but a sample I took of the pyritous part of the reef gave on assay neither gold nor silver. It dips E. 40° N. at 57 ft.; and in the direction of the dip it has been again opened at about 95 ft. lower level in a tunnel driven 250 ft. into the hill. Here it is from 6 in. to 12 in. thick, dipping N. 20° E. at 55 ft., and is well defined. As it appears to be a permanent reef it is worth trying, and I understand the Company are about to take out a sufficient quantity to crush to give it a fair trial.

A little up the hill another reef crops out for about 5 chains, dipping E. 10° N. at 47 ft., and is from 4 in. to 12 in. thick, but in places dividing into thinner branching veins. It contains sulphides of zinc, lead, iron, and copper, a sample of which gave on assay only 1 oz. $1\frac{1}{2}$ dwt. of silver per ton, and no gold.

Near this a porous gossan and quartz lode, about 10 ft. thick, crosses the range in an east and west strike; it has not been prospected.

About 10 chains S.W. from this is another silicious gossan lode, 1 ft. thick, containing galena and grey sulphide of copper and calcite; an assay of a sample of it gave neither gold nor silver.

Further to the S.W. are other similar lodes, in one of which gold is said to have been found; and it is no doubt from the denudation of these that the gold found in the alluvial in the gullies below has been derived. This, therefore, is a locality which should be prospected.

Within 20 chains north from the abovementioned tunnel occur four other gossan and quartz lodes, containing pyrites and galena, which have only been tested at the surface. From the most northerly of these, near M'Dermott's farm, a sample, containing galena, gave on assay—silver, 4 oz. 18 dwt. per ton, and no gold.

In Mr. Bell's paddock, near Broombee, some prospecting shafts have been sunk on the outcrop of some short ironstone lodes, striking N.N.W., at the junction of the diorite and limestone, but they have not succeeded in striking payable stone. Samples of the iron-ore lodes gave on assay neither gold nor silver. I would not advise further prospecting of these.

Crossing's reef, 3 miles N.W. from Mudgee, was worked some years ago to a depth of 78 ft., and I was informed that about 1,200 tons of quartz had been crushed from it, yielding from 3 dwt. to 30 dwt. per ton. It dips E. 30° S. at 65 ft., in porphyroid rock, and near the surface is from 6 in. to 12 in. thick. About half a mile east another reef, not opened yet, crops out near the junction of the altered schists and diorite. These reefs present favourable indications, and should receive the attention of miners.

Accompanied by Mr. Wall, M.P., and Mr. Stacy, both of whom take much interest in advancing the mining interests of this district, I inspected the gold-bearing locality about Budgee and the Pipeclay, where some reefs are being prospected; one of these consisting chiefly of quartzite, traversed by hard white quartz veins, has been sunk into for a depth of 60 ft. and driven upon. It is 11 ft. wide, very pyritous, and dips west 20° S. at 70 ft. It contains also blende and galena, of which I took a sample, giving on assay 2 oz. 14 dwt. of silver and 3 dwt. of gold per ton. The shaft is sufficiently deep to prove the reef, and before prospecting further it would now be advisable to have a bulk sample of say two tons treated for gold and silver. The reef, varying in width, can be traced on the surface about 100 yards on its northerly strike; and to the east of it a similar reef crops out. Half a mile to the north of these reefs is Walford's Gully, in which a lead of gold-bearing alluvial has been worked, so that auriferous reefs, probably the extension of the abovementioned, may be found in this locality, which lies in a line running northerly from the Pipeclay diggings to the Cooyal rush. Close to the deep lead in the Budgee paddock there occurs at the surface a quantity of broken angular quartz, evidently derived from reefs close by, from which the gold in the lead may have been derived. I expect that payable reefs will be found about the head of this lead; also at the Pipeclay diggings, especially near the head of Humbug Gully, where much alluvial gold-mining has been done in shallow (20 ft.) sinking for a distance of about 20 chains. In the hill, on the west side of the gully, are large outcrops of quartz, one being 30 ft. wide and 100 ft. long; also lodes of ironstone cropping out 4 ft. wide and 5 chains long. It is reported that a nugget weighing 40 oz. was got in this gully. On the east side of the gully also occur quartz reefs, with red jasperoid rock, pieces of which are seen in the gold-bearing gravels. A few miles from here, in a south-easterly direction, there are several quartz reefs in altered slates, near Bara Creek, just above where the gullies have been worked for gold, which has evidently been derived from these reefs. One of the reefs is being prospected by Pott's party. I consider it a very favourable locality for payable reefs.

At

At Bara Gap, altered slates and diorite occur traversed by quartz reefs and quartz-gossan lodes. One of the lodes, 18 in. to 2 feet wide, contains carbonate of lead; a sample of it gave on assay 11 oz. $8\frac{1}{2}$ dwt. of silver per ton and gold a trace; these lodes are too small to warrant further prospecting. A sample from one of the quartz reefs near them, 6 ft. thick of porous ferruginous slate quartz, yielded, on assay, neither gold nor silver.

A large amount of deep alluvial mining has been done on the Log Paddock lead, near and almost parallel with which runs a lode of iron or quartz veins. It crops out in places 4 ft. high above the ground, and is of irregular thickness up to 90 ft., thinning out at times. It is highly probable that this lode has been one of the chief sources of the gold found on the deep lead, for the alluvial drift in the gullies, such as Sapling Gully, immediately below where they cross the line of lode, has been worked for gold. In one place, on J. Tierney's farm, where the lode is 15 ft. or more wide, a tunnel has been driven into it, and the lode-stuff found to be a brecciated iron ore with patches of manganese oxide. Three samples of the lode-stuff I collected yielded, on assay, neither gold nor silver; notwithstanding these unfavourable returns, I am of opinion that the lode should be further prospected, especially in the parts where it is intersected by quartz veins.

On Tallewang Creek, about 12 miles north of Gulgong, occur massive outcrops of magnetic oxide of iron; the largest of these is an irregular oval-shaped mass about 200 yards long and 190 ft. in its greatest width. It lies partly within Mr. R. Rouse's, partly on Crown lands, where it has been secured by Mr. Mat. Orlovich to work for gold. From the various lodes I took five characteristic samples, which, on assay, yielded neither gold nor silver.

At the head of Ford's Creek, 6 miles south from Gulgong, three small breccia lodes or short "blows," containing sulphide and oxide of antimony and a little quartz, have been opened to a depth of 5 ft. They occur in irregular fissures formed where the strata (Silurian clay-slates and sandstones, S. 10° E. at 25 ft.) have been fractured. The antimony ore occurs in irregular branches; and as it is impossible to determine the extent of the rupture of the strata without sinking upon it the probable value of the lodes can only be ascertained by actual prospecting. A sample of the breccia lode-stuff gave on assay 36.37 per cent. of antimony, and neither gold nor silver; but the lode-stuff after crushing might be concentrated to yield about 60 per cent. of antimony. The large cost of carriage to Sydney, however, would, I fear, for the present militate against the profitable working of these lodes. Near the antimony lodes are several promising-looking quartz reefs, not yet prospected, and the alluvial in the creek from this point downwards has been worked for gold. It is probable that some of the gold may have been derived from these reefs.

In regard to alluvial gold-mining this has been a very extensive and important yield; not only has gold been found in the numerous localities in the recent shallow deposits, but also in the older Tertiary deep leads, which have yielded very rich returns. The former occur, as a rule, amongst the slate and diorite hills about the gullies or tributaries to the main creeks; while the latter occupy the ancient water-courses of the deep valleys, and are covered in places with several hundred feet of alluvial deposits, and sometimes with a great thickness of basalt, which, in a molten state, flowed down some of the valleys. These leads have been followed until working has been stopped by the heavy influx of water, or by the drift being not sufficiently rich to raise. In a previous report I have described these old alluvial deposits, but I may here point out several of the places which are specially worthy of the attention of prospectors. Near Gulgong the continuation of the Star lead to its junction with the Black lead should be tested. At the Standard claim the sinking is about 180 ft., passing through 60 to 70 ft. of basalt. Then the prospecting reserve on which Scully & Co.'s shaft has been sunk is a favourable position for proving the Black lead, which evidently extends under the basalt to the west of the old No. 44 claim, and enters Mr. Rouse's paddock, where it turns to the south-west and passes between two slate hills, crossing the Gulgong and Tallewang Road about 15 chains south-east from the south-west corner of the paddock. This would also be a good site for testing the continuation of the lead though the bed-rock formations in the hills on either side of it in the absence of diorite dykes do not present such favourable indications as do those about the Red Hill at the head of the Black and the Happy Valley lead. Then again the outlet of the leads through Mr. Rouse's woolshed paddock has not yet been proved, but here it is all in private property.

Along the valley of Cooyal Creek there is a large extent of unproved ground through which the deep leads from Canadian and Home Rule must pass to join the Black lead. In many parts of it prospecting shafts have been sunk, and a few runs of gold-bearing wash obtained, but the main drainage channel does not appear to have been struck.

In the east side of this valley the Ellan Vannin Company has sunk a shaft 203 ft. deep and struck one small lead; but the drive is being continued to the north-east, in which direction it is believed the David Buchanan lead will be met. Owing to the wide extent of the alluvial deposit, it is impossible without actual prospecting to determine with certainty the direction that the leads have taken in this locality. The bed-rock is soft chloritic schists with pyritous quartz veins.

At Home Rule the granite formation commences and extends up the Cooyal Creek to about a mile beyond Mr. S. Blackman's station, where altered Silurian schists again appear. Within the granite area, between the station and the schists formation, some payable leads have been worked for gold. These leads all run into the main Cooyal Valley, in which the alluvial flat, about $\frac{1}{2}$ mile wide, lies between granite hills.

The flat on the south side of the creek, opposite the Cooyal Station, would be a favourable site for testing the deep ground, for it has not only received the drainage from the Cooyal leads, but also from Stony Creek Valley, in parts of which occur promising deposits of Tertiary drift.

Near Mr. Lowe's Log Paddock, 4 miles north from Mudgee, it would be advisable to prospect the old channel leading out of Sapling Gully. This gully drains westerly from high slate hills, across which the above-mentioned large ironstone lode runs, and the alluvium along its bed has been worked for gold until it enters a wide alluvial flat, in which occurs the Log Paddock deep lead, which it must join, though its connection has not yet been proved. The shafts put down by Mr. Franca and others show that the alluvial at the mouth of Sapling Gully suddenly deepens from about 40 ft. to 120 ft., and at this depth the bottom not reached. In sinking, alternate strata of ferruginous clay and gravel were passed through, and in several of the layers of gravel a little coarse gold is said to have been found. It is probable that the bed of the old channel, which has received the drainage from Sapling Gully, will prove to be payable. The ground is private property.

The Log Paddock lead is evidently a tributary to the main drainage channel of the Cudgegong River Valley, and this main channel appears from the foundations not to run near the town of Mudgee along the course of the present river channel, but to have passed about $2\frac{1}{2}$ miles east of the town, and thence in a north-westerly direction, under the flat country near the race-course, between Mudgee and Pipeclay Creek, where there is a wide deposit of waterworn drift. Several prospecting shafts have been sunk in this deposit; but to prove the deep ground systematically a series of shafts should be put down along a line N.E. and S.W. across the gully. This would be a favourable locality to prospect, as it lies in the belt of auriferous country extending north-westerly from Cudgegong through Log Paddock and Canadian to Gulgong.

A very remarkable feature in connection with the deep lead is the deposit of auriferous wash in limestone caverns at the Canadian. Here some massive beds of marble limestone occur, and in the tertiary pliocene period contained caves into which the ancient river drained, just as the streams do at the present day at the Jenolan Caves and elsewhere. At length these old caves became filled up with the gold-bearing gravel and silt, and the valley also, to a level of about 80 ft. above that of the caves. At the White Horse claim, which is under the able management of Mr. Thompson, a shaft has been sunk below the level of the old river-bed or lead and into the cave deposit, to a depth of 236 ft. from the surface, without reaching the bottom of the cave. In one part the cave is oblong, measuring 110 ft. by 43 ft. and funnel-shaped, diminishing in size downwards with uneven walls, and smaller caves leading into it. It is filled with a stiff ferruginous clay, called by the miners "pug," and occasional floors or layers of wash with limestone boulders and a little quartz. The top layer at about the 80 ft. level is said to have been the richer, but the whole contents of the cave are sent to the puddling machine, and the manager informed me that the yield of 8,400 loads averaged 1 dwt. 21 gr. of gold per load; and that at the lowest level a piece of gold weighing 1 oz. 7 dwt. was found. I do not think that the cave will continue more than 50 ft. deeper, as this depth would be below the level of the valley which probably received the outflow from the caves. A deposit of drift, richer in gold than the overlying sediment, may be expected to be found at the bottom of the cave; but, judging from other cave deposits, it will be irregular and not extensive; yet it will probably pay to mine, and should therefore be sought for. A similar cavern deposit has been worked in the Canadian Prospecting claim, which is situated about half-a-mile S.S.E. from the White Horse claim.

Sedimentary deposits of the carboniferous period occupy an extensive area in this gold-field. They usually consist of coarse conglomerates, composed chiefly of pebbles and large boulders of altered sandstone, and in this respect differ much from the tertiary drifts, which consist almost entirely of waterworn pebbles of quartz. The latter are principally of fluvial origin, and have filled river channels, while the carboniferous deposits appear to be marine or lacustrine, and have filled irregular saucer-like hollows, and have been spread out over wide areas; consequently it is only where the deposits have been concentrated in such hollows, or formed alongside some auriferous reef that has been extensively broken up by denudation, that payable gold is likely to be found in them, and they will always be "patchy" deposits. These carboniferous conglomerates occur under the coal measures and sandstone hills on the north-east side of the Cooyal Creek, at Mr. Blackman's run, and in the Cudgegong Valley, resting on the silurian slates, from near Mudgee down to the junction of Reedy Creek with the Cudgegong River, and where the erosion of the present valleys has cut through them down to slate foundations, the gold derived from them has been redistributed and concentrated in the river gravels, which have been profitably worked. But there are places, as at Mr. George Rouse's station, Beau Desert, and near the Reedy Creek junction, where the conglomerates are *in situ* below the level of the present river bed, and as they here lie in a narrow valley between silurian hills, it is probable that the gold is sufficiently concentrated to pay for working.

At the Tallewang diggings not only have the conglomerates *in situ* been mined for gold, but also the tertiary and recent drifts derived from them have been extensively worked. For many years to come payable patches will from time to time be found in the sedimentary deposits of carboniferous age; but from the nature of their formation, unless discovered accidentally, they may be regarded as a permanent source of gold supply.

Some sixteen years ago attention was given to mining for diamonds on the Cudgegong River, from its junction with Reedy Creek down to the Two-mile Flat gold diggings. The diamonds, of which about 7,000 are estimated to have been found at the time, were obtained in washing the tertiary and recent drifts, of gold. Mr. Norman Taylor, F.G.S., whose report on this diamond-mining field was published in the *Geological Magazine*, 1879, and who, in conjunction with the late Professor Thompson, also read a paper before the Royal Society of New South Wales in 1870, in referring to the operations of the Australian Diamond-mining Company at Reedy Creek junction, says that the shafts were originally worked on a false bottom at a depth of 29 ft., where the best gold was obtained, but were afterwards worked by the Company on a true bottom at 35 ft. At first the ground yielded at the rate of 4 to 5 diamonds to the load, and 4 dwt. of gold to the load, but afterwards fell off to 1 to 2 loads; and there is no doubt but that numbers of diamonds were thrown out of the machines (Hunt's patent) by careless manipulation, and lost in the tailings; over a thousand tons of which were swept away by the disastrous floods of April, 1870. The total number of diamonds obtained by this Company, while operations lasted, was 1,765. At the Reedy Creek junction and south of the river were situated the works of the Mudgee Gold and Diamond Company. This Company had all their endeavours frustrated by the continuous floods, which destroyed their dams, races, and at last their machinery.

The diamond itself is distributed rather sparingly and rather irregularly through the older drifts, and does not appear to be confined to any particular level in the drift; though the lower 5 or 6 ft. are generally taken out by miners, in consequence of the certainty of finding gold in that portion.

The fact of the very frequent occurrence of diamonds on the waste heaps around the mouths of the old shafts sunk for gold, is enough to suggest that diamonds may occur in the higher portions of the deposit, since the bottom layers only have been carted away to the river for gold washings. One diamond (*in situ*) occurred 3 ft. from the bottom, embedded in a mass of loosely cemented quartz pebbles. As regards the weight of the diamonds the following parcels afford a fair average:—160 diamonds weighed $74\frac{1}{2}$ carats, largest, $1\frac{1}{2}$ carat; 81 diamonds weighed 19 carats; 110 diamonds weighed $26\frac{1}{2}$ carats; 16 diamonds weighed 6 carat; 700 diamonds weighed $151\frac{1}{2}$ carats; giving an average of 0.23 carats, or nearly one carat grain. The largest gem discovered was a colourless perfect octahedron, weighing $5\frac{1}{2}$ carats;

carats; it was found in the river between Two-mile Flat and the Rocky Ridge, at a spot where the older drift had been discharged in gold washing.

During the first five months of systematic washing, over several thousands more were afterwards discovered; but, as the collectors were generally rather reticent as to their finds, the exact number could not be ascertained.

Of late years the work has been abandoned, but I am glad to see that a Sydney Company has recently started operations on the land below the Reedy Creek junction; for I am of opinion that with efficient saving machinery, and under careful management, diamond-mining in this locality, especially in connection with working for gold also, will become a paying industry. Near the junction a remnant of the tertiary lead is indicated by a covering of basalt. A miner showed me a diamond and some sapphires which he had found in the gold drifts near the Cudgegong River, at Slasher's Flat.

Copper has been found in several places in this district, but, with the exception of the Balara Mine, not in sufficient quantity to work. Tin ore of the concretionary variety, called "Toad's eye," has been obtained in small quantities in gold-bearing leads in the granite country, on Mr. S. A. Blackman's Cooyal Station. Manganese oxide occurs about three miles N.E. of Mudgee, but the ore hitherto found is of inferior quality. Seams of coal crop out in sides of the ranges at the Cooyal diggings, where also the prospectors' shafts passed through a coal seam in sinking for the auriferous conglomerate beneath. Kerosene shale is said to have been found in the same coal measures. The carboniferous formation, with coal seams, extends from the western coal-fields of Lithgow and Wallerawang past Rylstone and the head of Cooyal Creek, almost without break to Tallewang, Spicer's Creek, Ballimore, and Dubbo. Near Rylstone a seam of coal occurs within a few miles from the railway line.

Iron ore occurs in many places, the largest deposit being the above-mentioned lode of magnetite at Tallewang. Another may be seen on the Cooyal Station; this should be prospected, as it may contain other metals.

Limestone is abundant in the district; at Broombee it is full of encrinites, which are well seen on the weathered surfaces of the rock. At Mr. Bell's Melrose Station, at the foot of Mount Frome, are massive beds of grey and yellowish white marble limestone, which would be suitable for mantelpieces and other ornamental purposes; these beds of limestone are together about 500 ft. thick.

Apart from its agricultural soils and mineral resources, the Mudgee district is one of special interest to the geologist. It embraces sedimentary formations, some of them containing numerous fossil remains, of the Silurian, Devonian, Carboniferous, Hawkesbury, Pliocene, Pleistocene, and Recent periods; and its igneous rocks include granites, diorites, and basalts with their associated minerals; while it affords splendid instances of the formation of lodes and veins; intrusion of igneous rocks, metamorphism of rocks, deposition of marine and fresh water strata, including the carboniferous great boulder beds, which appear to be partly of glacial origin; the effects of denudation and weathering of rocks, and of the origin of the many varieties of soil, from the poor silicious granite soils to those rich alluviums, which, derived from diorite, basalts, sandstones, shales, and limestones, form the fertile flats along the Cudgegong Valley, or cover the chocolate-coloured farm lands on the hill slopes about Gulgong. This is a most instructive field for the student of geology and agriculture; and no wonder that it proved a source of great attraction to the late Rev. W. B. Clarke and his congenial friend, the late Mr. C. B. Lowe, whose son, Mr. Herbert Lowe, of Goree Station, near Mudgee, now possesses the interesting collection of minerals and fossils, some of the fruits of their geological researches.

At the Canadian Lead, Mr. William Thew, a miner, kindly gave me for the Mining and Geological Museum, a collection of fossil bones found by him in the gold-bearing wash at a depth of 130 ft., in one of the buried limestone caverns in the prospecting claim. Among the specimens Dr. Ramsay has identified bones of the great horned lizard, megalania, kangaroo, birds, and of a gigantic echidna, or porcupine. Casts of these have been forwarded to Sir Richard Owen for determination. It is hoped that miners will always save, and transmit to Sydney, any fossils they may meet with, as they have such good opportunities of finding them; for in doing so they may greatly aid in making known the ancient life history of this continent.

I also visited the antimony mines of Razorback and Crudine, in the ranges between Ilford and Sofala. At Razorback an auriferous quartz reef, containing iron pyrites and sulphide of antimony, traverses black slate country, it occurs like the Eleanor mine near Armidale, with a trap dyke, and varies in thickness up to 3 ft. 6 in., dipping W. 25 degrees S. at an angle of 1 in 6. As it follows the trap dyke it will probably be permanent in depth. It has been traced not continuously, but at intervals for a distance of about 25 chains, and a considerable amount of work has for some years past been done in working it for gold, 10 shafts having been sunk along the line of reef, the deepest being about 130 ft.; but Mr. A. Oppenheimer, who now holds the greater portion of the line of reef, is having a shaft put down to 160 ft., with the expectation of striking the shoot of gold-bearing stone said to have been worked in No. 5 shaft.

A mixed sample of reef stone from the 130 feet level, where the reef is 18 inches thick, consisting of quartz, calcite, black slate, pyrites and sulphide of antimony, gave, on assay, at the rate of gold 3 dwt. per ton, and metallic antimony 4.1 per cent.; but this not being of a bulk sample cannot be considered as an average test, as the ore is irregularly distributed through the reef, causing portions of it to be poorer or richer than others. The gold is sometimes visible in the antimony, and the stone containing antimony is sorted and bagged up and forwarded to Europe for treatment. Mr. Oppenheimer informed me that a parcel of 96 bags, weighing about 5 tons, was culled from about 20 tons, and that two average bulk assays of it gave at the rate of 5 oz. and 7 oz. per ton, and the parcel was sold at the rate of 6 oz. per ton; it contained about 45 per cent. of antimony. The balance of 15 tons is said to have yielded about 1 oz. of gold per ton. Mr. Oppenheimer states that he has despatched from the mine 2,278 bags of ore, weighing 116 tons 16 cwt., which realized £1,881. Mr. Oppenheimer is taking a judicious course in having a quantity of ore crushed at the Atlas Company's works in Sydney, and passed through two of the Frue concentrators previous to the erection of these appliances, if found suitable for treating the ore, at the mine.

O'Brien and party are sinking on their claim which adjoins Oppenheimer's on the south; one of their shafts being 75 feet deep, on similar reef-stone, containing antimony ore.

The antimony mine, near the Crudine Creek, occurs in a line of fault of silurian shales. It is a breccia lode from 8 inches to 3 feet thick, with quartz veins, and the ore, sulphide, and oxide of antimony occur

occur in it in lenticular patches. It has only been prospected to a depth of about 30 feet. I was informed by Mr. Oppenheimer that from a quantity of about 65 tons of ore raised, there were culled 15 tons of oxide and 2 tons 18 cwt. of sulphide of antimony, yielding respectively 70 and 60 per cent. of metallic antimony. A sample which I took of the breccia lode-stuff gave on assay, metallic antimony 48.8 per cent., and neither gold nor silver. This return would of course have been higher had the lode-stuff been concentrated. The lode dips S.W. at 40 degrees in shales, which dip W. 5 degrees S. at 32 feet. 50 feet N.W. from where the antimony ore was raised, a shaft has been sunk 30 feet deep on ferruginous quartz veins, a sample of which gave, on assay, at the rate of 3 dwt. of gold per ton. This antimony lode, though varying much in thickness, will, I believe, continue to a great depth.

Approaching the deep valley of the Turon, from the Crudine Ranges, the silurian strata are observed to be highly altered and intruded by dyke masses of diorite and traversed by quartz reefs. Splendid sections may be seen in the road cuttings on the road from Hill End to Sofala, and especially in the natural cliff sections at the Wallaby Rocks, where the road crosses the Turon River, contortions in the strata are well exhibited. Only a little fossicking in the old alluvial workings is now carried on along the Turon, from which in the early days of the gold-mining era of the country so much gold was raised. Near the head of a gully in the ranges, about 6 miles east of Sofala, a quartz reef called the Little Razorback, is now being worked. The reef has been traced for a length of 10 chains across the gully, on the south side of which three tunnels (one 100 feet long) have been driven at different levels along the reef, which dips E.N.E. at 75 degrees with a well-defined foot wall, and is formed of several veins in a reef channel from 15 inches to 27 inches wide. Gold is visible in the crystalline cavities in the quartz as well as in the solid stone, and the reef has a permanent appearance. I was informed that 45 tons crushed from it yielded about 23 dwt. of gold per ton.

In the foregoing report the mineral resources of the district examined have been more particularly mentioned. The geological features will be referred to in greater detail in my annual report.

I have, &c.,

C. S. WILKINSON.

APPENDIX E.

Report on the Silver Lodes at Mitchell.

The Geological Surveyor in charge to the Under Secretary for Mines.

Sir,

Department of Mines, Geological Survey Branch, 14th December, 1886.

In accordance with your instructions I have examined the formations in which the silver-bearing lodes occur at Sunny Corner, in the Mitchell Gold-field, and I have the honor to submit the following observations thereon.

The primary or oldest formation of the district consists of sedimentary rocks, altered sandstone, and shales. These have been upheaved and intruded by igneous rocks composed of quartzitic elvan and quartz porphyry, which have burst through the sedimentary strata in various directions, but principally north and south, as masses 20 chains wide or as narrow dykes only 4 ft. thick, consequently the line of junction between the formations is most uneven and irregular. After the eruption of the igneous rocks, fractures or displacements in the rocks took place on at least two different occasions, resulting in the opening of irregular fissures from a few inches to 40 ft. wide, in which were deposited the gold and silver-bearing sulphides of iron, copper, lead, zinc, and arsenic and quartz, constituting the lode-stuff now worked.

Evidence of these displacements or movements in the rocks may be well seen in the Sunny Corner mine. A dyke of the elvanite has been split in two and the fissure filled with clay, showing that the fracture took place after the intrusive rock had solidified; then again the sedimentary formation has in places been displaced from its contact with the igneous rock, appearing to have slipped or moved bodily over the igneous rock, causing, where the original line of junction was curving or uneven, the projecting surface of the one formation to abut upon a projecting portion of the other, the intervening concave surfaces forming the irregular cavities now filled with lode-stuff, and, of course, where the line of junction was even or straight, the upper formation has moved upon the other without producing any cavity; consequently where this occurs the so-called lodes pinch out, though a well defined fissure joint continues containing a thin seam of clay fluccan.

In the Great Western mine the two different sites of fissures are very clearly seen. We here see that along the line of fracture the surface of the rock has been grooved or striated by the friction or movement of one rock upon the other, and the fissure filled with fragments of the crushed rock. In this fissure-deposit argentiferous sulphides of lead, copper, iron and zinc, have been formed in patches. The fissure then opened again and became filled with clay, which, in one place is 20 ft. thick, and somewhat resembles a decomposed feldspathic basalt rock. Then shrinkage cracks formed in the clay-lode and were filled with carbonate of lead, probably derived from the decomposition of the galena in the breccia lode.

On account of the irregular manner in which the intrusive rock has been intruded, it is of course impossible to indicate where the hidden line of junction between the formations is uneven; and, therefore, the whereabouts of any cavities filled with lode-stuff can only be ascertained by actual prospecting along the lines of fracture. But we have a general guide in that the sliding movement of the upper formation has taken place towards the north-west; for the ore deposits already discovered occur chiefly upon the north-western slopes of the intrusive formation. This is an important feature, for it affords us assurance that in a north-westerly direction, below the deposits already opened, other similar irregular lodes are likely to be found.

From the nature of the formation of the lodes, it will be apparent that there is no probability of the occurrence of *one main lode* in this district; but only of such as those which are at present known and which are so variable in extent and thickness, notwithstanding that they are true fissure lodes.

The New Nevada lode is somewhat different from the above-mentioned lodes in being more regular in its course, though it has resulted from the same movements which have produced the others. It is a well formed lode, dipping E. to E. 10° S. at from 50° to 73°, and occurs in a fissure formed by a fault in the sedimentary strata. The lode is worked from a tunnel, and where the tunnel has pierced it, is about 30 ft. wide, but split in two by a "horse" 9 ft. wide, which, about 170 ft. to the north, thins out and the lode is 21 ft. wide with slate walls. The lode-stuff is soft and consists of pyrites, galena, and copper pyrites,

pyrites, intermixed with irregular patches and veins of porous crystalline quartz, with masses of hard compact pyrites and galena scattered through the mass, especially within 18 in. from the black slate foot-wall, where the ore is sometimes richer in silver than the rest. A band of hard sulphide is sometimes seen in contact with the hanging wall of the slate "horse" in No. 1 south drive. The whole lode-stuff appears to have crystallized from thermal solutions containing the sulphides which have in places segregated into hard masses. In the south drive at 160 ft. from the tunnel, the lode narrows to a seam of slickenside clay or fluccan 6 inches thick, produced by the movement of the uneven walls. As the movement of the rock on the hanging wall side has, I think, here taken a downward course towards the north-east, the argentiferous sulphide lode-stuff will probably be found to continue gradually to lower levels in a northerly direction. The main tunnel was continued to the east for a further distance of 160 feet, and another lode 10 feet wide struck, which, when followed south for about 50 feet, thinned out into a fissure filled with clay; and 15 feet north from the tunnel it changed into chalcedonic quartz, with cavities containing white silicious clay. If sunk upon, this lode might be found to form into sulphides, as it is near the junction of the altered shales and the intrusive elvanite, veins of which occur in the slates at the end of the tunnel. On the range immediately to the east the intrusive rock comes to the surface for a width of about 5 chains.

An analysis (No. 1) of an average sample of the lode-stuff, taken from the whole width of the lode at the end of the north drive, gave as follows:—

	No. 1.	No. 2.
Oxides of iron and alumina	24·18	26·31
Insoluble silicious matter (gangue)	46·63	51·02
Lead	9·34	6·25
Copper	5·06	4·02
Bismuth.....	·88	trace
Antimony	·43	do.
Arsenic	·90	do.
Sulphur	12·42	9·32
Manganese.....	trace	trace
Chromium.....	.....	do.
Undetermined, loss, &c.....	·16	4·08
	<hr/> 100·00	<hr/> 100·00

No. 1. Fine silver at the rate of 13 oz. 12 dwt. per ton; fine gold, a trace (under 2 dwt. per ton). No. 2. Fine silver at the rate of 2 oz. 14½ dwt. per ton; fine gold, a trace (under 2 dwt. per ton). No. 2 is an analysis of a similar average sample taken from a stope in the south drive, near the 90 feet shaft, where the lode-stuff is more oxidized and contains less sulphides than in the lower level from which sample No. 1 was taken.

These analysis show that the lode-stuff, not being sufficiently rich in silver to be smelted as taken out *en masse*, must first be treated for concentration of the sulphides; for the gangue which could be separated by concentration amounts to over 63 per cent. of the whole lode-stuff, and the remaining sulphides would yield from about 37 oz. to 9 oz. of silver per ton, in addition to about 12 per cent copper, and 2 per cent. of lead. As there is promise of the lode being permanent in depth and chiefly composed of the ore described in No. 1 analysis, with patches of richer ore, this mine, with efficient reduction appliances, should prove a payable one.

The Nevada is the most northerly silver mine on this field, and due south from it, about 1¼ mile, is situated the Sunny Corner mine, which is the oldest and most productive of the silver mines. The lode, consisting of porous siliceous gossan, was worked for gold as far back as 1875, and though at that time the ore was known to contain a good percentage of silver, it was not until the Pacific smelters were introduced upon the field, by Messrs. Lamont and Kahlo, in 1885, through the enterprise of Messrs. Newton and Co., that mining for silver commenced. Since then this mine has produced 1,169,454·164 oz. of gold and silver bullion, of which 562,987 oz. were obtained from 27,231 tons of ore smelted during the year ending 31st October, 1886. The lode varies considerably in thickness, and has been opened at five different levels, by tunnels driven in a southerly direction from the northern slope of the hill. At the top, or No. 5 level, which is about 190 feet above the lowest or No. 1 tunnel, a large excavation open to the surface has been made in the lode, which here attains a thickness of 40 feet of gossan, covered in places with gold-bearing porous quartz, and passing downwards through No. 4 level into undecomposed sulphides, or "base ore," 19 feet thick. From some of the gossan rich specimens of native silver, in beautiful arborescent forms, have been obtained; specimens of it have been presented to the Mining and Geological Museum, Sydney. In No. 3 level 147 feet above No. 1, richer ore has been struck, yielding, it is said, 70 oz. of silver per ton, and averaging from 1 to 2 feet thick; it consists of galena, with iron and copper pyrites. But this ore will be found to vary much in its yield; for one sample gave on assay 12·74 per cent. lead, 0·85 per cent. copper, and 4 oz. 18 dwt. of silver per ton. No. 2 level, 75 feet above No. 1, has been driven along the line of lode, which in one place is from 7 feet to 15 feet thick, then narrowing opens again at the end of the tunnel to 2 feet, consisting of finely crystalline galena and pyrites. An assay of a sample of this ore gave:—Copper, 1·65%; lead, 14·60%; silver, 37 oz. 10½ dwt. per ton; gold, 4 dwt. per ton. The hanging wall dips W. 10° S. at 58°. This ore should be followed down.

In No. 1 tunnel no defined lode has been found, but a block of good sulphide ore, 7 feet thick, was struck, the hanging wall dipping W. 10° S. at 58°, which is almost the same angle of dip as that in No. 2 level. It is probably due to the greater regularity in the walls of the fissure that it has here not formed large cavities, such as those formed in the higher levels, where the containing walls of the fissure are very uneven.

It will thus be seen that larger ore deposits occur in the higher levels than in the lower, which, as above mentioned, appears to be due to the fissure walls being more regular or even in the latter than in the former. As it is unlikely that the regularity has continued for any considerable distance there is every probability that in following the fissure walls, other large and valuable ore deposits will be discovered from time to time. The most favorable places for searching for them are on the north-western and western face of the elvanite rock; that is where the line of junction between the igneous and sedimentary rocks curves round from a southerly course to the west. Such places occur in G. L. 1, below the present workings in the Sunny Corner mine; in the south-eastern half of G. L. 10; in M. L. 56, below

below the present workings in the Tonkin mine; in M. L. 70, below the main lode in the Great Western mine; in the central and northern portions of M. L. 8, of the Victoria mine; on the northern boundary of the elvanite M. L. 53, of the Silver Hill mine; and in places where the altered sedimentary rocks rest on the elvanite in M. L. 52, of the Silver King mine; and in M. L. 58 of the Sunny Corner mine.

At the entrance to No. 3 level there is an elvanite dyke 10 feet wide, with a clay fissure 3 feet thick in the centre. This should be followed, for, about 20 yards to the west, the dip of the strata is reversed from being westerly, to E. 20° N. at 22°, indicating a point of disturbance, where it is probable that a deposit of ore may be formed.

The Silver King mine adjoins the Sunny Corner, and the lode-stuff is of a similar character, viz. auriferous quartz gossan near the hanging wall, of irregular thickness from 1 to 5 feet, with gossan underneath it passing downwards into undecomposed sulphides of iron, lead, and copper. The lode varies considerably in thickness; at the southern tunnel it is over 20 feet, having filled an irregular cavity in the elvanite near its junction with the altered shales overlaying it. In the No. 3 drive to the north the gossan pinches out where the walls of the two formations come together and turns from the usual dip of the hanging wall, W. 12° N. at 42°, to N. E. at 80°. This line of junction should be followed down, and also to the north-west, as it might be found to reopen and the lode to make again. At the end of the main drive, which has been carried east beyond the lode fissure, the elvanite contains small seams and bunches of sulphides of iron, copper, and lead, a sample of which gave on assay, copper 8·10 per cent., lead 8·13 per cent., 4 oz. 18 dwt. of silver per ton, and gold a trace. As these small ore masses are sometimes mixed with soft clay, it is probable that they may be connected with the main lode fissure; this could be ascertained by driving to the north to strike the fissure.

A shaft has been sunk about 60 ft. below the level of the southern drive, and I was informed by the underground manager, Mr. Lemon, that the lode of "black ore," consisting of galena and iron and copper pyrites, has been sunk into and driven upon, and is 14 ft. wide; it pinched out a short distance to the north, but continued well-defined along the drive to the south. The shaft contained water, and so I could not see the lode. According to the assays made by the Company's assayer, Mr. Cossins, as quoted in the report on the Silver King mine, by Messrs. Cox and Seaver, this "black ore" gave (average of nine assays) 5 oz. 10 dwt. 18 gr. of silver, and 3 dwt. 7 gr. of gold per ton, which are poor returns for silver; but it is stated that the drive was taken along the foot-wall of the lode, which has been the poorest part in the gossan, and so a higher yield may be anticipated on an average, when the whole of the lode is taken; and it is worthy of note that some of the ore carries as high as 9 per cent. of copper to assay. In the same report it is stated that the average yield of 2,489 tons of the gossan ore smelted, was 13 oz. 8 dwt. 5 gr. of silver, and 5 dwt. 15 gr. of gold per ton, equivalent to about 19 oz. of silver per ton, allowing that each dwt. of gold is equal to an ounce of silver.

In the Tonkin mine, which adjoins the Sunny Corner mine on the south, a tunnel has been driven E. 10° N. 500 ft., passing through altered shales and sandstone into elvanite. At 40 ft. from the mouth of the tunnel, the elvanite was first met with a little gossan at the line of junction, which is nearly vertical; at 133 ft. in, a pyritous quartz reef was struck, 12 ft. thick and dipping W. 25° S. at 64°; its hanging-wall merges into the elvanite, while the foot-wall is of soft broken slate and clay; and 8 ft. east this changes into a fluccan clay mixed with fragments of slate and elvanite 59 ft. wide, and containing small irregular patches of galena and pyrites, an assay of which gave 8 oz. 3½ dwt. of silver per ton, and gold a trace. The foot-wall is nearly vertical, inclining a little westerly, and shows stains of carbonate of copper. Near this a shaft was sunk 85 ft. deep, and on the foot-wall a lode of sulphurets, said to be 10 ft. thick, was found; an assay of a sample given me by the mining manager, Mr. G. R. Fearby, yielded 16·47 per cent. copper, 6 oz. 10½ dwt. of silver per ton, and 4 dwt. of gold. The very broken ground from this foot-wall westerly to the above-mentioned quartz reef, indicates an irregular fissure lode, which should be further prospected to the north and south, and at greater depths, for it may be found to contain large masses of sulphuret ore. At 225 ft. in the tunnel, a vein of carbonate of copper 6 in. thick was passed through; and at 321 ft. in, a joint fissure was struck dipping W. 5° N. at 73°, containing copper ore on the foot-wall, which is sandstone 6 ft. thick, 2 ft. of which contains patches of copper ore; a sample of this ore gave on assay at the rate of 45·67 per cent. of copper, 22 oz. 1 dwt. of silver, and 3 dwt. of gold per ton. The next 12 ft. consists of a jumbled mass of fragments of crushed elvanite and ferruginous clays with a foot-wall of elvanite. This is a lode which ought to be prospected further, both in depth and laterally. Beyond this, to 480 ft., the elvanite contains the same sulphurets scattered through it, sometimes in lenticular patches a few inches long and 1 in. thick. I do not think it advisable to drive further east into the elvanite, for any large ore deposits are only likely to be found in the fissure lodes just mentioned, about the junction of the elvanite with the sedimentary rocks.

The Great Western Silver-mine adjoins the Sunny Corner mine on the north. The country rocks consist of the same intrusive elvanite and altered sandstones and shales, which have been much broken and fissured. A main tunnel has been driven into the range for a distance of nearly 600 ft. in a direction E. 20° S., and two principal fissure lodes have been cut through, besides several other metalliferous veins. One of these lodes, called the galena lode, is from 7 to 20 ft. wide, dipping E. 12°-15° N. at 15°-45°, and has been followed along its strike towards the south, until it turns easterly and then northerly. At this bend the surface of the hanging wall is striated vertically, and appears as though it had slid down upon, and moved away in a northerly direction from the foot-wall, leaving between the walls the above-mentioned brecciated metalliferous lode-stuff of crushed fragments of rocks, and after a further movement, the clay dyke formed, which is here 20 feet thick. It is in the stopes above the south drive that the native silver and native copper have been found in the joints, in both the elvanite rock and the clay, where the lode has been much oxidized; these metals have, no doubt, been precipitated from solution from the decomposed sulphides in the brecciated portion of the lode. The clay dyke is also traversed by the veins of carbonate of lead previously mentioned. An assay of this carbonate of lead gave metallic lead 65·5 per cent., and neither gold nor silver; and a sample I collected of the undecomposed galena ore which, with zinc blende, occurs in irregular patches up to 12 inches thick in the breccia lode-stuff, yielded 60·08 per cent. of lead and 4 oz. 1½ dwt. of silver per ton. The returns, kindly supplied me by the manager of the Great Western Silver-mining Company, of twenty-six assays, chiefly of galena ore, yielding in the highest 34 oz. 6 dwt. of silver per ton, and 80·9 per cent. of lead, gave an average yield at the rate of 7 oz. 0 dwt. 16 gr. of silver per ton, and 37·19 per cent. of lead.

The galena lode will, I believe, be found to continue from the bend in the south drive to the east and

and north, and connect with the other breccia and fluccan lode, 5 feet thick, passed through in the main tunnel: it would be important to prove whether they be connected. Near this lode is a copper pyrites vein, from 4 to 9 inches thick, dipping E. 5° 8 at 60°, this on its strike to the S.S.W. also probably connects with the galena lode. The hanging-wall rock for 13 feet to near the end of the tunnel, is traversed by irregular veins, up to 2 inches thick, of copper pyrites, of which an assay gave 4.75 per cent. of copper, silver 3 oz. 5 dwt. per ton and gold a trace. About 40 feet in from the tunnel entrance a lode, 3 feet thick, containing galena, was cut through dipping E. 25° N. at 30°. Instead of continuing the tunnel further, I think that the exploratory work should be devoted to these lodes, of which the above-mentioned galena lode is the principal, and evidence of much disturbance in the country rocks having taken place, there is, therefore, a probability of the existence of large ore deposits in it. Besides following it from the south drive to ascertain if it be connected with the 5 feet breccia lode, it should be sunk into near the main tunnel, and also driven along in a northerly direction from the tunnel.

Immediately north of the Great Western mine, the Victoria Company have sunk a shaft 50 feet deep, on a lode said to be 20 feet wide. It dips E. 30° N. and consists of brecciated porous silicious gossan, containing a little sulphide of copper and lead. A tunnel has been driven towards this lode, from the side of the hill, passing through altered sandstone and elvanite, containing crystalline quartz and copper and iron pyrites. The lode did not appear to have been struck yet. About 7 chains west from the shaft, a dyke of elvanite, 10 feet wide, traverses the altered shales in a northerly course, with a small gossan lode at the junction.

The great central mass of the intrusive elvanite occurs in portion 53, the property of the Silver Queen Company, and forms at the flagstaff hill, the highest point in the district, attaining a height of 4,068 feet above sea-level, or 270 feet above the town of Mitchell. A shaft has been sunk on this hill, showing the elvanite to contain small crystals of pyrites scattered through its mass, but not in sufficient quantity to be of value. The main shaft of the Silver Queen Company has been sunk to a depth of 224 feet, upon a breccia lode about 4 feet wide, containing galena with sulphides of zinc, copper, and iron, of which a mixed sample gave on assay, lead 5.12 per cent., silver 16 dwt. per ton, and gold a trace. The lode strikes N. 20° W., and in that direction, about 6 chains from the main shaft, it appears to be of a more promising character, consisting of brecciated gossan and quartz, 15 feet wide, with purple shale on the western wall, and a narrow dyke of elvanite on the east. It has been opened to a depth of 17 feet, and this would, I think, be the most favourable place for testing the lode to a greater depth. To the south of the main shaft the lode becomes more feldspathic, with red and white breccia of elvanite and quartz porphyry, containing a little pyrites, and is well seen in the shaft on the Silver Prince Company's ground; but it does not present favourable metalliferous indications. On the eastern side of the hill a tunnel has been driven west for 380 ft. to strike the lode at about 90 ft. below the surface; the tunnel passed through altered pyritous sandstone, strike about N.N.W., and greenish feldspathic elvan. No work was being done here, but Mr. Robinson, manager of the Silver Queen mine, informed me that, at 310 ft. in, a small patch of sulphide of copper with quartz was struck.

In portion M.L. 18 a shaft has been sunk 60 ft. deep on a quartz vein 2 ft. thick, striking N. 12° W. in altered slate country; it contains much iron and copper pyrites, a fair sample of which gave on assay only 2 oz. 9 dwt. of silver per ton and a trace of gold. In the Great Extended Company's ground, portion 20, a shaft has been sunk 180 ft. and driven west 110 ft. with the hope of finding a lode at the junction of the altered slates and quartz porphyry formations, but the work was not successful.

In portion M.L. 86 a shaft has been sunk upon a gossan lode known as Tasker's lode, which is about 3 ft. thick, dipping E. 20° S. at 40° in sandstones and shales. It can be traced southwards for a considerable distance. Two samples from it yielded on assay neither gold nor silver. Samples from two other lodes, the British Lion and Frieberg Tunnel, in the same locality, gave similar returns on assay; but to prove such gossan lodes, bulk samples should be tested; for assays made of small samples of gossan ore do not always give reliable results.

About $\frac{3}{4}$ mile S.W. from the town of Mitchell is the Monte Christo mine in M.L. 129, where, under the direction of Mr. Marshall, a quartz reef has been opened by a shaft on the underlay to a depth of 115 ft. The reef, which is well defined and has a hanging-wall of indurated pyritous shale or "spotted rock," and the foot-wall of feldspar and quartz porphyry and pyritous jasper rock, dips S. 35° E. at 40° and is from 1 to 4 ft. thick. The quartz contains copper, iron, and arsenical pyrites with sulphides of zinc and silver, of which a sample I collected yielded on assay silver 9 oz. 7 dwt. per ton. When burnt the quartz shows freely particles of metallic silver. A few feet north of the shaft the reef turns a little and narrows to 6 in., then widens again, and can be traced on the outcrop for about 7 chains. It will, I believe, prove a profitable reef. A few yards to the east another similar reef, 6 in. thick, dipping east, crops out at the surface; and about 100 yards to the west are other ferruginous veins traversing porphyry which were to some extent worked for gold, it is said, about twenty years ago.

It will thus be seen that the primary formation of this district consists of siluro-devonian sandstones and shales, which have been upheaved and penetrated by elvanite and quartz porphyry; that, subsequently, movements of the rocks took place, resulting in the production of the fissures in which the metalliferous ores were deposited, chiefly about the line of junction of the sedimentary and igneous rocks; that these movements having affected the rocks to a considerable extent, the fissures will continue to great depths, though, owing to their irregular form, the ore deposits in them will vary much in thickness; that as these lodes are explored in depth, similar large patchy deposits to those already discovered, are likely to be found; that the gossan or oxidized portions of the lodes occurring within about 100 ft. from the surface, must soon be exhausted; that the less easily worked unoxidized or sulphide ores will be the permanent class of ores to mine; and that, as these usually are less rich in silver than the gossan ores, weight of ore considered, special appliances for concentrating the sulphides must be employed, especially as the ores are not rich in silver and will necessitate the most economic methods of treatment, not only for the extraction of the silver, but also of the lead and copper which are sometimes present to a large extent in the ore.

At the Sunny Corner mine, which is under the able direction of Mr. Thos. Eyre, mining manager, smelting operations are very successfully carried on by means of the "water-jacket" furnaces, of which an accurate description by Mr. E. F. Pittman, Chief Mining Surveyor, has already been published in the Annual Report of the Department of Mines, 1884; but the large Probert furnace at first erected has been discarded in favour of the smaller furnaces which are much more conveniently worked. Mr. Woodgate, the smelting manager, has, by judicious fluxing, succeeded in reducing the loss of silver in the

the slag to an average of 1 oz. 17 dwt. per ton for four months run, as against an average loss of 2 oz. 19 dwt. for the previous five months run. He is also successfully smelting in the "water-jacket" furnace the base ores into "matte," and from experiments he is at present conducting further improvement in the reduction of the base ores is anticipated. It is said that ore yielding 16 oz. of silver per ton can be profitably worked by the present process. During the half year ending October 31st, 11,647 tons of ore were smelted at these works, giving an average yield of 23.56 oz. of gold and silver bullion per ton; the bullion is worth on account of the gold contained in it about 5s. per oz. The Sunny Corner Company has recently erected an amalgamation plant for treating the old tailings from the battery, which are said to contain an average of 35 oz. of silver, and about 2 dwt. of gold per ton.

At the "Nevada mine," the large "Probert" furnace has also been discarded, and two smaller German furnaces substituted, which are believed to be more suitable for the reduction of the ores of this mine, and to consume less fuel than the "water-jacket" furnace. The Nevada Company has also a Frue concentrator, a large reverberatory furnace, and the manager, Mr. Edwards, is constructing appliances for the treatment of the wasted cuprififerous ore by lixiviation.

The Silver King Mining Company has two 20-ton "Gafford" water-jacket smelters, which, I was informed, have worked well, especially in the treatment of the mixed gossan and base ores by the "matting" process, introduced by the Company's assayer, Mr. Cossins. It is said that without the use of lead, Mr. Cossins can work his process on 14 oz. of silver per ton.

Mr. J. F. Waller, the general manager in Sydney for the Silver King Company, has been good enough to place at my disposal the following results of a "matting" experiment conducted by Mr. Cossins at the Company's smelting works:—

	tons.	cwt.	qr.	lb.
The ore treated consisted of gossan	13	9	1	4
Black ore	11	3	3	20
	24	13	0	24
	tons	cwt.	qr.	lb.
Coke used	4	10	3	6
Limestone	2	15	1	0
Matte obtained	1	3	1	22
Assaying—				
	oz.	dwt.	gr.	
Silver	307	1	8	per ton
Gold	3	5	8	"
Copper				23 per cent.

Mr. Cossins states that the loss of silver in the slag by this process, would not exceed that shown by the three following assays of the slag made during the trial,—4 oz. 13 dwt. 2 gr., 3 oz. 6 dwt. 23 gr., 2 oz. 13 dwt. 21 gr., which is about equal to the ordinary loss of silver by the old method. The "matte" was sent to Swansea and realized £130 2s. 11d., equal to £5 5s. 6d. per ton of the original mixed gossan and base ores; the total cost of raising, smelting, transit, and other charges amounted to about £2 9s. per ton, thus leaving a net profit of £2 16s. 6d. per ton of ore. The largest item in the cost of production was that of the coke, which amounted to £18 3s. 3d., equal to 14s. 8d. per ton of ore, notwithstanding that the quantity of coke was 6 per cent. less than that used in the old process. In the Sunny Corner and the Nevada smelting works, the quantity of coke in the charge varies from 20 to 50 per cent. of the weight of the ore. The price of the Newcastle coke delivered on the ground is £4 per ton.

The large charge of coke required in the water-jacket smelter is partly due to cooling of the furnace by the circulation of the water round it; this effect is said to be lessened in the German smelter, around which the air blast, instead of water, is made to circulate. Some more efficient method for economizing the fuel is much required. And I would suggest that the lowering of the temperature in the water-jacket furnace might to a considerable extent be prevented by injecting hydrogen gas into the molten charge. The increase of temperature would be great, and a saving, probably, of one-half of the present charge of fuel would be effected. The gas might be simply made by sending a current of steam through a heated retort containing charcoal, whence it might be conducted into the furnace through small pipes laid in the nozzles of the existing tuyeres; so that no alteration in the furnace would be needed, and the appliances for generating the gas from steam would be of small cost. I have seen auriferous pyritous quartz successfully treated in a blast furnace partly heated in this manner by hydrogen gas.

The only other smelting works on this field are those of the Mitchell Company, which include a German air-jacket furnace, constructed by Mr. Icke; this is now out of blast, owing, I understand, to the difficulty of getting suitable firebricks.

The Sunny Corner Company are using the diamond-drill for prospecting; the bore at present in progress is down about 200 feet into the hard elvanite rock. Sulphides of iron, copper, lead, and zinc in small crystalline masses occur disseminated through the elvanite; but as they do not afford any indication of the existence of payable masses of ore, it would be useless to continue this bore. Throughout the field the elvanite is observed to be more or less charged in the same manner with these sulphides; and I am of opinion that it is from thermal water permeating this intrusive rock that the metalliferous deposits in the fissure lodes have been derived. Instead of boring far into the elvanite, the drill might, with prospect of success, be employed in exploring the line of junction of the igneous and sedimentary formations about which, as I have above mentioned, the ore deposits are likely to be found.

The position of these formations, also of the lodes and gold-bearing quartz reefs, have been indicated by Mr. Anderson, Geological Surveyor, and myself, on the accompanying map.

In regard to gold-mining, a quartz reef, called the "Paddy Lackey reef," is now being worked at Dark Corner, about 4 miles north of Mitchell. The shaft is on M.L. 78, and has been sunk vertically to a depth of 170 ft. The general course of the quartz reef is from N. 10° W. to S. 10° E., and from the bottom of the shaft, north and south drives have been driven along the reef, which dips at a high angle to the east. The walls are well defined; the hanging-wall consists of a greenish talcose rock, while the foot-wall is composed of elvanite rock containing blebs of quartz; in some places the elvanite occurs for a short distance on the hanging-wall as well.

The northern drive is 170 ft. in the reef. At its northern end it takes a slight curve to the east. In the course of this drive the reef attains its greatest width, 10 ft., but only for a short distance, when it

it begins to divide into two. The westerly branch has been followed to its pinching out, which takes place within a few yards. The easterly or principal branch continues gradually thinning off, till, at the end of the drive, it is only 2 ft. wide. In the stope here the reef is seen to take a bend over, and now dips slightly to the west at a high angle. A short distance from the bottom of the shaft the reef gave out, but on following the hanging-wall it was found to make again.

The south drive has been driven 150 ft. In this direction the reef is gradually thinning out until, at the end of the drive, it is only a few inches thick. They are stopping upwards on the reef at intervals along both drives.

In the centre of the reef the quartz is very hard and crystalline, and does not show much mineral, but towards the walls it becomes seamed with thin greenish layers containing iron pyrites. Galena also occurs in the quartz, and gold can be seen in fine specks generally surrounding a nucleus of other mineral. The average yield of gold from the crushings of this reef is 15 dwts. to the ton. The quartz is crushed at a battery consisting of five stampers, a few hundred yards to the north of the shaft.

On the mineral lease immediately to the north of 78, there is another party sinking a shaft on the line of the reef, but they have not yet struck the reef. This is called the Advance Mine.

Many years ago the quartz reefs in the neighbourhood of the source of Mitchell's Creek were extensively worked, and a large quantity of gold obtained from them.

The reefs occur on both sides of the creek, to the north on the Big Hill, and to the south on the Little Hill, both of these being riddled with the old workings. They traverse a series of beds of shales, sandstones, and coarse grits, which have a general north and south strike; and which have been much tilted. The reefs, as a rule, lie nearly flat, or with a slight westerly dip, and the only workings at present being carried on are by Messrs. J. Shepherd, M.P., and Johnson, who are driving a tunnel into the western face of the Big Hill. This tunnel has been driven for 240 feet through the sedimentary strata, in the direction of S. 60° E., and they expect to strike the reef after driving 300 feet. This reef was at one time worked from the outcrop, which is a considerable distance higher up the slope than the tunnel. The working of this reef at the tunnel-level will probably lead to the further development of some of the other reefs. There can be no doubt that the alluvial gold which has been got in such abundance in the bed of Mitchell's Creek, has been derived from the denudation of these quartz reefs on the Big and Little Hills.

On the hill between the new town of Mitchell and Bob's Creek, there are a few quartz reefs. This hill and the Sugar Loaf Hill to the east of it, both consist of quartz porphyry. The reefs are, as a rule, very small, with the exception of one near the Catholic church, which is of considerable thickness. None of these reefs have ever been very extensively worked, although it must have been from the denudation of them that the gold was deposited in the alluvial in Bob's Creek, the bed of which has been much turned over, and a good deal of gold obtained from it. No gold was got by washing higher up the creek than the quartz reefs on the Sugar Loaf Hill, where five reefs have been more or less worked; they are from 4 inches to 8 inches thick, dipping E. 10° N. at 45°, in quartz porphyry. No work is at present carried on here, but I think that the reefs deserve further prospecting.

In conclusion, I consider that silver-mining on this field will be a permanent and important industry; but its development, which must necessarily be gradual, must to a large extent depend upon—1st, the concentration of the sulphide ores, for they are generally of low grade; 2nd, more economical methods of smelting the sulphides, which will be the permanent class of ore to operate upon; judicious exploration of the lodes, for as the ore deposits are very irregular in thickness, having originated, as I have already described, in fissure cavities of varying extent, it will be necessary that the prospecting of the lode should be kept well in advance. The gossan, or oxidized portions of the lodes, occurring within 100 feet from the surface, must soon be exhausted, but the depth to which the undecomposed sulphide ores may be found is practically unlimited.

I have, &c.,

C. S. WILKINSON,
Geological Surveyor in Charge.

APPENDIX F.

Progress Report by T. W. E. David, B.A., F.G.S., Geological Surveyor.

Sir,

I have the honor to furnish you with the following progress report of the work done by myself, and the field assistant, Mr. G. A. Stonier, during the year 1886. From the commencement of the year until the end of January, I was employed at the office in Sydney, completing my report on the Vegetable Creek Tin-fields.

On February 1st I proceeded to Heathcote, on the Southern line, to witness the boring through of the upper coal seam, struck in the diamond drill bore, which was being made by the North Cumberland Coal Company.

Owing to a slight accident to the machinery, the bore could not be proceeded with at that time. I was enabled, however, with the help of Mr. J. T. Pearson, the engineer in charge of the drill, to get a complete section, from the cores, of the strata passed through from the surface to the top of the coal.

This section has already been published in the Annual Report for the preceding year.

On February 18th I proceeded to Newcastle, and witnessed the boring through of a coal seam at the No. 12 diamond drill bore, on the Homebush and Waratah Railway, my evidence being required by the Crown Solicitor.

On February 20th I returned to Sydney, and gave evidence as to the nature of the core on February 22nd.

On March 15th, as instructed by you, I went to Gunnedah, to examine and report on a newly discovered seam of coal on Mr. J. Pryor's selection, at Springfield, near Gunnedah. My report on that seam, and also on a seam on Mr. Darcey's property, 1 mile distant, is appended, with some additional notes. (*Appendix H.*)

On April 19th, in accordance with your instructions, I left Sydney for Maitland, with the field-assistant, Mr. G. A. Stonier, to commence a preliminary examination of the great Northern Coal-field.

From that date until May 10th, I was employed in measuring the cliff sections between Newcastle and Redhead.

On May 10th, as instructed by you, accompanied by Mr. Stonier, I left Maitland for Uralla, to report on the Rocky River Gold-field. My report, with plans and sections, is appended. (*Appendix I.*) We returned to Maitland on May 22nd.

From

From that date the Assistant and I were employed in geologically examining the coal-measures between Maitland and Greta, until July 13th, when I proceeded with Mr. Stonier to Upper Muswell Creek, near Muswellbrook, to examine some beds of iron ore and limestone. My report on these is appended. (Appendix F 1.)

On July 15th we returned to my camp at Farley, and resumed our geological exploration of the neighbourhood.

On August 3rd I discovered a seam of coal at Deep Creek, near Bishop's Bridge. The existence of coal near the spot had been known to local residents for many years past, through the occurrence in the bed of the creek of drifted pieces of coal; but, as far as I can ascertain, the seam itself had not previously been discovered. Observing that the coal seam dipped into Crown Lands, I at once communicated the information to you, and on your recommendation a reserve was made for coal-mining, comprising an area of about 100 square miles, in the direction of the dip of the seam.

About 2,000 acres of this reserve has lately been leased, and the coal seam has been proved, by prospecting shafts and bores, to be at least $13\frac{1}{2}$ feet thick, of which I consider $11\frac{1}{2}$ feet to be workable. This seam should yield, after deducting one-third for waste in getting, faults, &c., about 8,700 tons of large coal, and 2,900 tons of small coal, per acre. My report on this coal seam, together with a "Preliminary report on the East Maitland and Stony Creek Coal Seams," is appended. (Appendix G.)

From this date I was occupied with field-work, near Maitland, until October 16th, when I proceeded, according to instructions, to the New Lambton mine, near Newcastle, to examine the Borehole seam, at the point where the Homebush and Waratah railway passes through that property, my evidence as to the nature of the coal being required by the Crown Solicitor.

From that date I was occupied with field-work near Maitland, until November 2nd, when, by your instructions, I proceeded to Fairfield, near Tenterfield, and examined that gold-field. My report thereon is appended. (Appendix J.)

On December 4th my leave of absence commenced, extending for three weeks from that date.

On December 17th I went to Piercefield, near Muswellbrook, by your instructions, to report on an unworked coal seam, exposed in the left bank of the Hunter River.

I returned to Maitland on December 20th. My report on this seam is appended. (Appendix F 2.)

During my leave of absence, and on previous occasions, when not required to accompany me, Mr. Stonier was employed in mapping the alluvial deposits, which cover the coal-measures in the neighbourhood of Maitland. His work will form part of the geological map of the Maitland District, on which I am now engaged.

During the time I have been in camp, Mr. D. Grant, collector and camp labourer, has assisted in collecting specimens of rocks, minerals, and fossils, from the different parts of this coal-field, to which my examination has extended; and he has prepared a number of sections of local rocks for microscopic examination. The former have been forwarded to the Mining and Geological Museum, for exhibition to the public.

I have, &c.,

T. W. EDGEWORTH DAVID, B.A., F.G.S.,
Geological Surveyor.

APPENDIX F 1.

Report on the Iron Ore and Limestone, near Upper Muswell Creek, Muswellbrook.

Sir,

In accordance with your instructions, I proceeded to Muswellbrook, accompanied by Mr. G. A. Stonier, on July 13th, and examined the beds of iron ore and limestone at the heads of Lincoln's and Limestone Creeks, near Upper Muswell Creek. The country in which these minerals occur is rather broken and deeply eroded, though not precipitous; and is well timbered with stringy bark, red and blue gum, and oak. The deposits of iron and limestone are 5 and 6 miles distant, in a north-easterly direction, from the Grass-tree platform on the Great Northern Railway; and occur at levels varying from 850 feet to 1,250 feet above that of the railway at Grass-tree, and between 1,447 and 1,847 feet above sea-level. The geological formations consist of igneous and sedimentary rocks. The former are chiefly felsites, for the most part rendered slightly porphyritic by crystals of pink orthoclase. The latter are sandstone, greenish-brown sandy shale, black carbonaceous shale, conglomerate, oolitic limestone, and two beds of ferriferous sandstone.

The dip ranges from N. 20° E. to E. 20° N., the prevailing dip being north-easterly at 20° , the highest dip observed being 36° , and the lowest 10° .

The occurrence of an abundant fossil fauna, near the N.W. corner of portion 33, in the parish of Herschell, proves the beds to be probably of lower carboniferous age. Among the fossils are a number of spirifers, large specimens of productus, and a few trilobites.

The deposits of iron ore, of which I was shown four outcrops, appear to belong to two distinct beds which are interstratified with the palæozoic rocks. The outcrops 1 and 4 (*see* plan), belong probably to a lower bed, and 2 and 3 to an upper. No. 2 outcrop, $\frac{1}{4}$ mile distant S.E. from the S.E. corner of portion 32, parish of Balmoral, county of Durham, consists of a bed of tuffaceous and slightly calcareous sandstone, of a dark greenish-brown colour, highly impregnated with hæmatite and magnetite. The dip is about E. 33° N. at 20° . The bed, which is here about 2 feet in thickness, can be traced in a north north-westerly direction for 6 or 7 chains. Its further extension in this direction seems then to be interrupted by a mass of felsite; but $\frac{1}{2}$ mile further it reappears near the east boundary line of portion 159, parish of Balmoral. This part of the upper bed (No. 3 outcrop on plan), consists of laminated greenish brown, slightly calcareous sandstone containing iron ore for a thickness of 6 feet, the upper 2 feet being rather poor in ore. The dip is E. 18° N. at 28° . The bed is rich in ore for a distance of 2 chains, and its outcrop can be traced for about 6 chains. The lower ore bed, at the point where the fourth outcrop is marked on the plan, in portion 154 Balmoral, is similar in character to the upper bed, and has a thickness of about 3 feet. Its dip is uncertain.

No. 1 outcrop near the S.W. corner of portion 41, parish of Herschell, is similar to the preceding, but neither the thickness nor dip could be ascertained.

The composition of the ferriferous sandstone is given in the following analysis, to which is subjoined a short report by the Assistant Government Analyst, Mr. William Hamlet, F.C.S.

No. 1 sample from Muswell Creek, near Muswellbrook :—

	In 100 parts.
Gangue.....	30·70
Ferric oxide (Fe ₂ O ₃)	45·61
Ferrous oxide (Fe O)	7·53
Alumina	8·52
Lime.....	1·80
Magnesia.....	3·13
Moisture and undetermined	2·71
	100·00

These samples are poor iron ores of no commercial value. The other two samples were similar in composition. The three samples were assayed and found to contain neither gold nor silver.

This analysis shows that the iron in the ore is present in the proportion of about 24 per cent. of magnetite to 29 per cent. of hæmatite, the total percentage of metallic iron being about 37·77 per cent. The high percentage of silica contained in this ore renders it unfit for smelting.

Limestone.—A mass of limestone, known as the Yellow Rock, occurs in portion 139, parish of Balmoral, county of Durham, at a level of about 1,630 feet above the sea. The rock lies in thin even beds from 3 to 6 inches in thickness, the lines of separation between the beds being marked by soft partings of argillaceous lime from $\frac{1}{4}$ to 1 inch thick. The dip is N. 20° E. at 18°. The total thickness of the limestone seen was about 38 feet. The rock is rather soft, of a bluish-grey colour, composed of lime, sand and clay, has an oolitic structure, and contains numbers of joints of stems of enerinites.

The following is an analysis of the rock, made by the Government Analyst, from a sample selected by myself :—

	In 100 parts.
Hygroscopic moisture	1·10
Combined moisture	1·29
Carbonate of lime	66·55
Carbonate of magnesia	1·66
Alumina and oxide of iron	7·65
Silica	21·75
Phosphoric acid (P ₂ O ₅)	strong trace
	100·00

The analogy between the composition of this limestone, and that of the hydraulic limestones in Europe, at once suggests its suitability for making Portland cement. It may be interesting to quote here, for the sake of comparison, an analysis of a hydraulic limestone belonging to the Lias formation from Holywell, in North Wales.

*Analysis of hydraulic limestone from Holywell, North Wales :—

	In 100 parts.
Carbonate of lime	71·55
Alumina and silica	23·60
Water	0·50
Carbonate of magnesia.....	1·35
Oxide of iron	2·21
Alkalies	0·79
	100·00

* See "Portland Cement, its Manufacture and Uses," by Henry Reid, p. 57.

The important feature to be noticed in connection with the Yellow Rock limestone is the comparative absence of crystalline structure in the lime. The great difficulty to contend with hitherto, as far as I can ascertain, in procuring suitable raw material for Portland cement-making in this Colony, has been to find a limestone, in which the lime was so far free from crystallization as not to necessitate the "double kilning process." This process has to be resorted to in the case of hard crystalline limestones, such as the carboniferous and Devonian limestones of Europe, and would have to be adopted in the case of our crystalline siluro-Devonian limestones, such as occur at Marulan, Wallerawang, Bathurst, Jenolan, Tamworth, Kempsey, &c. As a proof of this I am informed by Mr. Owen Blacket, C.E., that when conducting some experiments in making Portland cement from raw materials procured in this Colony, he and his party used the Marulan limestone, and failed to make good cement by the direct process, owing to the crystalline state of the lime. They then proceeded to burn the limestone, and slaked it with water, so as to destroy the crystals, and then burnt it over again, with a much better result. This was simply adopting the "double kilning process" commonly practised in Europe, in places where only crystalline limestones are available. Obviously the double burning of the lime is a serious increase in the cost of manufacture, so that it is a question of prime importance to secure a limestone in which the lime is in a more or less amorphous condition. The quantity of silica and clay in the stone is of less consequence, as this can easily be brought to the proper proportion by a judicious mixture with other siliceous and argillaceous rocks. The Yellow Rock limestone, near Muswellbrook, is therefore specially adapted for making hydraulic lime and Portland cement; and considering the large quantity of Portland cement annually imported into this Colony, it would be a matter of great importance to test as soon as possible the cement-making properties of this limestone.

My thanks are due to Mr. James Glendenning, of Uralla, for having called my attention in the first instance to the existence of these deposits, and to Messrs. John, Alexander, and Robert Glendenning for kindly accompanying me to the above-mentioned localities.

I am, &c.,

T. W. EDGEWORTH DAVID,
Geological Surveyor.

APPENDIX F 2.

Report on a Coal Seam at Piercefield, near Muswellbrook.

Sir,

In compliance with your instructions, I went to Piercefield, near Muswellbrook, on December 17th, 1886, and have the honor to submit to you the following report:—

The seam outcrops in the left bank of the Hunter River, near Piercefield, distant 9 miles W. 36° S. from Muswellbrook, and is about 90 feet below the level of the railway at Muswellbrook, that is about 385 feet above sea-level. The surveyed railway line from Muswellbrook to Merriwa and Cassilis passes over the point where the coal outcrops.

The geological formations in the neighbourhood consist of yellowish-grey, fine-grained sandstone, cherty in places, and containing numbers of large white branching fossil plants, from $\frac{1}{2}$ -inch to over one foot in diameter, fossilized by white wood-opal; thin-bedded yellowish-grey mudstones; blueish-grey clay shales, crowded with leaves of glossopteris; and dark carbonaceous clay shales. Between Muswellbrook and Grass-tree these strata have been much disturbed by the intrusion of basaltic and other igneous rocks. At 190 yards easterly from the 76-mile mark, Great Northern Railway, and within a distance of less than 200 yards further, I measured no less than 5 *stepped reverse faults*, each throwing down the coal measures in an easterly direction from $1\frac{1}{2}$ to $9\frac{1}{2}$ feet.

At Piercefield, where the Hunter River has laid bare the coal, the seam is faulted, being thrown down to the north to the extent of about 11 feet. As the river bank here runs nearly S.S.E., and the seam dips about W. 25° S. at 10°, a double outcrop of the seam is exposed.

The following is a rough descending section of the coal seam and the overlying strata, as far as I was able to get them by sinking a hole $4\frac{1}{2}$ feet deep on the outcrop close to the river, and calculating the remainder from the exposed section of the seam:—

Feet.	Inches.	Description
0	2	Clayey sandstone, yellowish and blueish grey on thin even beds.
1	0	Clay, shale, slatey-blue.
0	9	Mudstone, yellowish-grey, crowded with impressions of glossopteris leaves
1	1	Clay shale, grey.
1	1	Dark crumbling shale, forming roof of coal.
1	1	Coal, bright, bituminous.
0	$4\frac{1}{2}$	Band of brown and white fireclay.
0	$8\frac{1}{4}$	Coal, laminated, bright, black, and dull layers alternating.
0	$0\frac{1}{4}$	Band of brown clay.
2	5	Coal, finely laminated, bituminous. (In the last foot of coal irregular flattened oval concretions of earthy limonite, about 6 inches long and 1 inch thick.)
0	3	Band, clay shale, ferruginous.
1	0 (about)	Coal, laminated, bituminous.
0	$1\frac{1}{2}$ to 2	Band, grey fireclay.
1	5	Coal, chiefly bright bituminous.
<hr/>	<hr/>	
7	$4\frac{1}{2}$	

Floor of dark shale resting on fine-grained whitey-grey, crumbling sandstone.

The coal in quality appeared to me to resemble the East Maitland seams, especially those worked at Marshall's Thornley Colliery; though that at Piercefield contains less splint coal.

The following is an analysis of the coal made by the Government Analyst, from a sample selected by me:—

	In 100 parts.
Moisture (at 100° C.)	4.26
Volatile hydrocarbons	28.85
Fixed carbon	54.31
Ash	12.58
	<hr/>
	100.00

Coke, 66.89 per cent.; sulphur in coal, .45 per cent.; specific gravity, 1.305; colour of ash, white

It must be stated that these samples are hardly a fair test of the quality of the coal in the seam, as they were slightly damaged by exposure, and it is unsafe to express an opinion as to whether the coal is workable or not, until a shaft or tunnel is made in the coal, so as to give a true section of the solid seam.

I am, &c.,

T. W. EDGEWORTH DAVID,
Geological Surveyor.

APPENDIX G.

Preliminary Report on the East Maitland and Stony Creek Coal Seams, and a newly-discovered Coal Seam at Deep Creek, $8\frac{1}{2}$ miles south-westerly from West Maitland.

Geological Survey Camp, Farley, near West Maitland,
November 2, 1886.

Sir,

In accordance with your instructions, I have the honor to report to you on the above-mentioned coal seams.

The East Maitland and Stony Creek coal seams belong to two distinct series of coal-bearing strata, separated from one another by a mass of rocks of marine origin which are not coal-bearing. The East Maitland series are believed to underlie the Newcastle coal-beds, while they certainly overlie the Stony Creek coal seams. They may therefore be termed Middle Coal Measures.

Underlying these four series is a second group of marine beds not coal-bearing. The five series may therefore be provisionally grouped in descending order as follows:—

5. *Upper Coal Measures*.—Newcastle Series.
4. *Middle Coal Measures*.—East Maitland Series.
3. *Upper Marine Beds*.
2. *Lower Coal Measures*.—Stony Creek Series.
1. *Lower Marine Beds*.

Between Lochinvar railway station and Newcastle the general dip of the strata is easterly or south-easterly, while between the former point and Rix's Creek, near Singleton, the general dip is westerly.

westerly. This change of dip proves the existence of a great anticline or dome between Newcastle and Rix's Creek, the summit of which must have been situated somewhere above the present site of Lochinvar. Previous to the formation of this dome, the coal seams were probably continuous and approximately horizontal from Newcastle to Rix's Creek, the Greta seams being the equivalents of the Stony Creek seams, while the Rix's Creek seams may be the equivalents of the East Maitland or Newcastle seams. The horizontality of the beds was subsequently disturbed by the formation of the great anticline, whereby the beds at Lochinvar were raised many thousands of feet into the air. The subsequent wearing down of this dome by the denuding forces of nature has entirely removed all the seams belonging to the Upper, Middle, and Lower Coal Measures between Farley and Greta.

To the south, however, where the anticline appears to have died out, the seams have consequently suffered less from denudation, and there is some probability, as pointed out by yourself, that the outcrops of all the series may be traced without a break from Newcastle and Maitland to Greta and Rix's Creek. The shape described by the outcrop of the seams would be that of a V, or horseshoe, the thin end of the V being situated at some point considerably south of Lochinvar.

The character and strike of the coal seam recently found in Deep Creek confirms this supposition.

The coal seams at Greta and Rix's Creek on the west side of the V, or anticline, will be described by me in a subsequent report. The present report relates to the seams on the east side of the anticline.

Between Farley and East Maitland the Middle Coal Measures, Upper Marine Beds, and Lower Coal Measures show the following stratigraphical features:—The Stony Creek series, which consists of sandstones, conglomerates, clay shales, and coal seams, has a total thickness at Stony Creek of about 280 feet.

At Stony Creek the strata dip easterly at 16° ; but east of the Homeville Colliery, near Stony Creek, the dip increases gradually towards West Maitland to an angle of 60° . The intermediate rocks are fine, clayey sandstones, conglomerates and boulder beds, belonging to the Upper Marine series, not coal-bearing, their aggregate thickness being not less than 2,000 feet.

Between West and East Maitland the carboniferous rocks are hidden by alluvial deposits, and where they re-appear at East Maitland dip south-easterly at an angle of 8° , showing that they flatten out as they recede from the sharp curve at West Maitland.

In the East Maitland series the strata, chiefly of fresh-water origin, consists of thin-bedded whitish-grey sandstones, and sandy clay shales with seams of clay ironstone 3 inches to 1 foot in thickness. Cherty beds occur at intervals, and are quarried for road metal. The seams principally worked are three, viz., the top and bottom seams worked at the Four-mile Creek, and Marshall's Thornley Colliery, and the Rathluba seam worked at Taylor's Colliery.

The Four-mile seams overlie the Rathluba seam, and are separated from it by about 300 ft. of rock. At the Thornley Colliery, about 1 mile south-westerly from the Four-mile, two seams of coal are worked. The pit, which is about 60 ft. deep, gives the following descending section of the coal-seams and intermediate strata.

	Ft.	in.	
	1	0	Clay shale, crowded with glossopteris leaves; forms roof of seam.
	1	4 $\frac{3}{4}$	Coal, bright, bituminous.
	0	3	Coal, inferior clayey.
	0	0 $\frac{1}{2}$	Band of brown pyritous clay strata.
	0	5 $\frac{1}{2}$	Coal, dull black, splinty.
	1	0	Coal, soft bituminous.
	0	1	Coal, inferior.
	0	1	Band of brown clay shale.
Top seam.—	0	6 $\frac{1}{2}$	Coal, soft, bright, bituminous.
Thick-	0	4	Band of dull black rotten stony coal.
ness of	0	8 $\frac{1}{2}$	Coal, firm bituminous.
coal	0	0 $\frac{1}{2}$	Band of clayey coal.
worked,	0	4	Coal rather inferior.
6 ft. 7 $\frac{1}{2}$	0	8	Coal, bituminous and splint.
in.	0	2	Coal, dull black splint.
	0	1	Coal, inferior.
	0	4	Coal, dull black splint.
	0	6	Coal, soft, bright, bituminous.
	0	1 $\frac{1}{2}$	Coal, dull black splint.
	1	4	Clay shale, with films of bituminous coal.
	0	7	Hard dark grey mudstone.
	0	4	Grey clay shales, with films of bituminous coal.
	1	9	Hard dark grey mudstone.
	1	0	Crumbling clay shales, with films of bituminous coal.
	0	10	Coal, bright, black bituminous, left to form roof.
	0	0 $\frac{1}{2}$	to 1 in. Band, dark clay shale.
	0	1 $\frac{1}{2}$	Coal, dull, splinty.
Bottom seam.—	2	2 $\frac{1}{2}$	Coal, fairly hard, bright bituminous.
Total	0	4 $\frac{3}{4}$	Band of inferior clayey coal.
thick-	0	2	Coal, rather soft, bright bituminous.
ness of	0	5 $\frac{3}{4}$	Coal, dull splint.
coal	0	0 $\frac{1}{2}$	Band, dark brown clay shale.
worked,	0	6 $\frac{1}{2}$	Coal, soft bituminous.
5 ft. 1 in.	0	0 $\frac{3}{4}$	Band, dark brown clay shale, thinning out in places.
	0	4 $\frac{1}{2}$	Coal, splinty.
	0	1 $\frac{1}{2}$	Band of coaly shale.
	0	0 $\frac{3}{4}$	Coal, soft, bright bituminous.
	0	1 $\frac{1}{4}$	Band, coaly shale.
	0	7 $\frac{3}{4}$	Coal, dull splinty.
	0	6	Coal, soft, bright bituminous.
	12	0	Ferruginous mudstone.
	2	9	Coal (not seen by me).
	0	6	Coal, inferior (not seen by me).
	20	0	Rock.
	3	0	Coal (not seen by me.)

This coal is used chiefly for household and blacksmith purposes. The seams dip S. 34° E. at $41\frac{1}{2}^\circ$.

At the above-mentioned thickness of coal worked, the upper seam contains, after allowing for waste in getting rolls, &c., about 5,234 tons of large coal, and 1,744 tons of small per acre, and the lower seam 4,016 tons of large coal, and 1,338 tons of small coal per acre. At

At Four-mile Creek, Mr. Tulip is working out some pillars at the Sunderland Colliery from a seam identical with Marshall's bottom seam. At about 20 ft. below the seam worked here, a seam of coal is said to occur 2 ft. 9 in. thick, identical with the seam of the same thickness at Marshall's.

Rathluba Colliery (Taylor's) is about $\frac{1}{2}$ a mile north-westerly from the Four-mile. The seam, which is chiefly composed of a bright bituminous coal, gave the following section:—

	Ft.	in.	
	0	10	to 1 ft. Coal, bituminous.
	0	1 $\frac{1}{2}$	Band, soft clay shale.
	0	0 $\frac{1}{2}$	to 1 $\frac{1}{2}$ in. Band, grey fire clay.
	0	1	to 1 $\frac{1}{2}$ in. Band, coaly shale, forms roof.
Total thick- ness of coal worked, 4 ft.	{	1	0 $\frac{1}{2}$ Coal, brittle, bright, bituminous.
		0	3 to 4 in. Band of clayey coal.
		1	11 Coal, brittle, bright, bituminous.
		0	1 to 2 in. Band, dark, coaly shale.
		1	0 $\frac{1}{2}$ Coal, brittle, bright, bituminous.

Taking the workable portion of this seam at 4 ft. thick, and after allowing for waste in getting, &c., it would yield about 3,161 tons of large coal, and 1,053 tons of small coal per acre.

A seam of coal, probably identical with the Rathluba, was worked about thirty-five years ago in East Maitland at a spot about 10 chains E.N.E. from the east corner of Newcastle and King Streets. The seam is stated to have been 4 ft. thick.

In No. 4 diamond drill bore at Maitland Gaol a seam of coal was pierced at 124 ft. from the surface, giving the following descending section:—

	Ft.	in.	
	2	6	Coal, with 1 in. band.
	1	7	Pipeclay and blue clay.
	4	2	Coal.

(*Vide* Annual Report of Department of Mines for 1884, p. 179.)

This seam is probably about 200 ft. below the Rathluba.

Stony Creek Seams.—Five seams of coal have been proved in this series. The furthest point north to which these seams have been traced, is about a $\frac{1}{4}$ mile north of the old toll-bar on the main northern road, some 2 miles from West Maitland. Two shafts have been sunk here, and a tunnel driven on the outcrop of one of the bottom seams. The following descending section is to be seen in the tunnel:—

		Ft.	in.	
				Conglomerate.
		0	6	Black, very carbonaceous clay shale.
		1	1	Ferruginous, sandy clay shale.
		0	0-6	Nodules of clay ironstone.
		3	3	Finely laminated grey sandy clay shales.
Total thick- ness of seam, 2 ft. 0 $\frac{1}{2}$ in.	{	0	1 $\frac{1}{2}$	Coal, dull cannel.
		0	11	Coal, hard, bituminous.
		0	0 $\frac{1}{2}$	Coal, clayey.
		0	0 $\frac{3}{8}$	Band, coal and shale.
		0	5	Coal, rather clayey, resembling "jerry."
		0	1	Band, dark clay shale.
		0	3 $\frac{1}{2}$	Band, coal and shale mixed.
	0	1 $\frac{1}{2}$	Coal, inferior.	
				Floor, grey clayey sandstone with streaks of dark clay shales.

This seam is probably an equivalent of the Cannel Seam, though greatly inferior to it in quality and thickness.

One quarter of a mile south of the preceding, five seams of coal have been worked in this series by the late Hon. Bourne Russell, on the Rutherford and Homeville Estates. These old workings, as well as those now in progress at Homeville, show that the seams are very variable in character and thickness. The lowest seam in the Homeville property has an average thickness of about 3 ft. 5 in. in the area north of the railway. Taking the specific gravity of the coal at 1.270, the seam contains, after allowing one-third for waste in getting, rolls, &c., about 2,892 tons of large coal, and 964 tons of smalls per acre. The thickness of this seam varies from 2 ft. 9 in. to 4 ft. 8 in. A band of clay shale from $\frac{1}{2}$ in. to 1 in. in thickness occurs intermittently at about 4 in. below the roof of the seam. The coal is of an excellent quality for steam, gas, and household purposes, and from its very hard nature is well suited for shipment. The following is an analysis of the coal by the Government Analyst:—

ANALYSIS.		In 100 parts.
Hygroscopic moisture.....		2.10
Volatile hydrocarbons.....		40.27
Fixed carbon		51.80
Ash.....		5.83
		100.00

*Coke, 57.63 per cent.
Sulphur, 0.890 per cent. Specific gravity, 1.270.

At about 50 ft. above this lowest seam is a seam of bituminous coal from 1 ft. 4 in. to 3 ft. thick, and at from 2 to 4 ft. above this is a seam known as the Cannel Seam, having an average thickness of 4 ft. Taking the specific gravity of the coal as 1.35, this seam would yield, after allowing for waste in getting, &c., about 373 tons of large coal, and 1,251 tons of small per acre. The following is an analysis of this coal by the Government Analyst:—

ANALYSIS.		In 100 parts.
Hygroscopic moisture.....		2.27
Volatile hydrocarbons.....		35.39
Fixed carbon.....		53.91
Ash.....		8.43
		100.00

Above

Above this cannel seam and separated from it by from 7 ft. to 9 ft. of clay shale and fireclay, is a seam of coal known as the Fireclay Seam. Near the present workings the seam shows the following descending section :—

Ft.	in.	
0	5	Coal, bituminous.
0	7	Clay shale.
2	0	Coal, hard, streaky, bituminous.

The sections given in the Rev. W. B. Clarke's "Sedimentary Formations" show that this seam varies in thickness from 1 ft. to 4 ft., so that it is impossible even to approximate the quantity of coal contained in the seam. The same remark applies to the top seam, which overlies the preceding, being separated from it by from 7 ft. to 10 ft. of clay shale. This seam is 5 ft. 7 in. thick at the northern end of the property, but is only a few inches thick near the present workings. Like most seams which have coarse conglomerate roofs, it has probably suffered in places from contemporaneous erosion. The seams have an average dip of $15\frac{1}{2}^{\circ}$ E. 6° N., or about 1 in $3\frac{1}{2}$. Brickworks have lately been erected on this property to make bricks from the white fireclay which underlies and overlies the fireclay seam.

At Font Hill, about 18 chains southerly from the Homeville boundary, cannel coal has been worked from a seam identical probably with the Homeville cannel seam; the workings, however, being flooded, I was unable to see the seam.

Deep Creek Coal Seam.—At Deep Creek (called Swamp Creek on the parish maps) $8\frac{3}{4}$ miles south-westerly from the West Maitland Railway Station, a seam of coal was discovered by my party on August 3rd last. The following is a section of the seam :—

Ft.	in.	
		Roof, Clay-band.
3	6	Coal, very hard, streaky, bituminous.
0	$0\frac{1}{4}$ to 2	Band of grey fireclay.
1	11	Coal similar to preceding coal.
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5	5	Total thickness of coal.

The following is an analysis of the coal made by the Government Analyst :—

Hygroscopic moisture.....	2.35
Volatile hydrocarbons	40.79
Fixed carbon.....	52.76
Ash	4.10
	<hr/>
	100.00

Specific gravity, 1.243. Coke, 56.86° per cent. Sulphur in coal, .83.

The coal will yield a coke of a good quality, and is a good coal for gas-making.

The seam dips from S. 23° W. to S. 20° E. at from $2\frac{3}{4}$ " to 5", the average dip being about 1 in 20. This seam would yield, after allowing one-third of its contents for waste in getting, &c., about 4,088 tons of large coal and 136.2 tons of small per acre.

Appended is a tracing showing the position of the coal seams described in my report :—

I have, &c.,

T. W. EDGEWORTH DAVID, B.A., F.G.S.,
Geological Surveyor.

Additional notes on the Deep Creek Coal Seam, near Bishop's Bridge.

Sir,

As instructed by you I went to Deep Creek, accompanied by Mr. G. A. Stonier, on February 25th, 1887, to further inspect the seam since the completion of a prospecting shaft sunk on the seam by a syndicate. In my "preliminary report," dated November 2nd, 1886, I stated that the seam (as far as proved in a small shaft sunk by my party in the bed of the creek, on September 2nd and 3rd, 1886) was 5 ft. 5 in. thick. Some months subsequent to this, after the reservation of the land for coal-mining, a syndicate made a bore in a bar of sandstone in the bed of the creek, about 50 yards above where my shaft was put down, and passed through about 7 ft. of coal, but probably discontinued the bore at the top of the thick band in the centre of the seam, taking it for the floor of the seam. At 4 chains east from this last bore-hole a shaft had been sunk on the seam at the time of my visit of February 25th, 1887, to a depth of about 29 ft. The influx of water from the seam was so strong that the men were unable to bale it down to within less than 2 ft. of the bottom of the shaft, so that I was unable to make sure that I measured to the bottom of the seam. The seam was described to me as being $14\frac{1}{2}$ ft. thick, but my measurements make its thickness $13\frac{1}{2}$ ft., though it is possible for the reasons above given that my measurements are a foot short.

The following is the section measured by me :—

Ft.	in.	
5	0	Alluvial sandy soil } from information.
5	0	Soft conglomerate } from information.
4	7	Dark pebbly carbonaceous sandstone.
5	11	Coal, hard bituminous, with pitchy black lustre, rather pyritous.
Details of the 5 ft 11 in. of coal above-mentioned.)		
1	1	Coal, hard, streaky, bituminous, with pitchy lustre.
2	0	Coal, similar to preceding, but rather pyritous, concretions of pyrites $\frac{1}{8}$ to $\frac{1}{4}$ in. thick
0	10	Coal, like top coal, with minute streaks of pyrites.
2	0	Coal, clean, like top coal, with $1\frac{1}{2}$ in. of cannel coal.
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1	8	Coal and bands, not workable; dull, black, stony coal, with clay bands.
2	1	Coal, hard, streaky, bituminous, with pitchy lustre.
0	$0\frac{1}{2}$	Band of brown clay.
1	$8\frac{3}{8}$	Coal, similar to preceding coal.
0	$0\frac{1}{2}$	Band, brown clay.
2	0	Coal, similar to preceding coal.
<hr/>		
13	5	Total thickness of coal seam.

Out

Out of this total thickness of 13 ft. 5 in., I think that about 11 ft. 8 in. might be workable, though, as the coal near the top of the seam is rather pyritous, like the "brassy tops" at Greta, some of it would probably have to be rejected. Taking the thickness of workable coal at 11½ ft., and the specific gravity as 1.243, and allowing that one-third of the coal would be lost in getting, and through faults, &c., and that one-quarter of what remains would be small coal, it should be possible to exploit from this seam about 8,700 tons of large marketable coal, and 2,900 tons of small coal per acre.

The seam dips in a S.S.W. direction at about 1 in 18. This low amount of dip will be a great help towards working the seam economically. The seam is distant 8 miles in a direct line from Farley railway station, on the Great Northern Railway, from which it bears S. 30° W.

From the very hard nature of the coal, it is well adapted for shipment, and it is useful for steam, gas, and household purposes.

I have, &c.,

T. W. EDGEWORTH DAVID, B.A., F.G.S.,
Geological Surveyor.

APPENDIX H.

Report on Coal recently discovered near Gunnedah.

Sir,

Department of Mines, Sydney, 29 March, 1886.

In accordance with your instructions, I proceeded to Gunnedah on March 16th ultimo, and having inspected the coal seam on Mr. J. Pryor's selection, I have the honor to report as follows:—

This seam is situated in portion 53, parish of Black Jack, county of Pottinger, and is distant by road 5½ miles southerly from Gunnedah, and 4 miles 50 chains from the railway at the nearest point, which is 190 miles from Newcastle. The road from Gunnedah to this seam passes over alluvial and volcanic flats, and gently sloping hills of coal-bearing sandstone and shale. The level of the surface of the ground, at the spot where the coal has been discovered, is 350 ft., as measured by aneroid, above that of the railway at Gunnedah, and 1,224 ft. above sea-level. The coal-bearing strata here dip at an angle of from 9° to 12°, in a direction varying from N.W. to S.W., the dip close to Pryor's shaft being W. 10° N.

The workable coal was struck, in sinking a well, at a depth of 72 ft. 3 in., and extended downwards to 78 ft. 7 in., the total thickness of clean coal being 6 ft. 4 in. The following descending section of the seam was measured by me in this shaft:—

	Ft.	in.	
Analysis A.	0	5	Bright black bituminous coal.
	0	2	Soft coal.
	1	2	Firm bituminous coal.
	0	2	Soft coal. (Analysis B.)
Analysis C.	0	8	Firm bituminous coal.
	0	1	Soft coal.
	1	3	Firm bituminous coal.
	0	2	Soft coal.
	0	11	Firm bituminous coal.
	0	1	Soft coal.
Total	6	4	

The bottom of the coal rests on a floor of sandy shale. The top of the workable part of the seam passes first into a black stony coal, and then into hard shale; and is separated by a thickness of about 17 ft. of shale and decomposed sandstone, from basalt 50 ft. thick, which here overlies the coal-bearing strata. The following analyses of the coal have been made by the Government Analyst from samples selected by myself:—

A. Mixed sample representing upper half of seam.

	In 100 parts.
Hygroscopic moisture	3.00
Volatile hydrocarbons	29.50
Fixed carbon	58.80
Ash	8.70

Sulphur in coal, 0.61%. Specific gravity, 1.291.

B. Sample of soft coal:—

Hygroscopic moisture	1.75
Volatile hydrocarbons	14.75
Fixed carbon	76.76
Ash	6.74

Sulphur in coal, 0.64%. Specific gravity of coal, 1.255.
Neither of these samples yielded true coke. Ashes were yellowish grey.

C. Mixed sample representing lower half of seam:—

Hygroscopic moisture	2.80
Volatile hydrocarbons	30.47
Fixed carbon	56.83
Ash	9.90

Sulphur in coal, 0.52%. Specific gravity of coal, 1.278. Coke, 66.73%.

The coke was of a fairly good quality, though the percentage of ash is rather high. The colour of the ash was yellowish-grey.

These analyses show that the layers of soft coal are composed chiefly of carbon, so that as far as relates to their chemical composition they rather add to than detract from the value of the seam. The seam, therefore, consists of free-burning, as well as caking bituminous coal, quick lighting, and suitable for steam, gas, and other purposes.

Coal

Coal has also been found on John Darcey's selection, $\frac{3}{4}$ mile south-easterly from the preceding, in portion 16, in the same parish. Darcey's coal, the level of which is 170 ft. below Pryor's, probably belongs to a lower seam; but this cannot be definitely asserted, as the surrounding strata have been much disturbed by volcanic agency. The general dip here is about W. 20° S. The top of the seam, which has a good sandstone roof, is 93 ft. 9 in. below the surface of the ground. The part of it visible above the water in Darcey's well showed a thickness of 4 ft. 9 in. of firm clean coal, and I am informed that the seam extends 2 ft. deeper (below the water). Its total thickness in this case would be about 7 ft.

The following analysis of the coal has been made by the Government Analyst from a sample selected by myself:—

	In 100 parts of coal.
Hygroscopic moisture	3.10
Volatile hydrocarbons	39.60
Fixed carbon	48.23
Ash	9.07
	100.00

Sulphur in coal, 0.78%. Specific gravity, 1.281. Coke, 57.3%.

The coke was of a fair quality. The colour of the ash was yellowish-grey. The coal is therefore a caking bituminous coal, quick lighting and useful for gas, steam, &c.

Probable yield of coal per acre.—The clean coal at Pryor's shaft being 6 ft. 4 in. in thickness, and the specific gravity of the coal 1.283, the quantity of coal contained in the seam per acre would be about 9,800 tons.

Deducting one-third for waste in getting, and assuming that one-quarter of the remainder would be small coal, it should be possible to exploit from this seam about 4,900 tons of large, and 1,600 tons of small coal per acre.

Assuming Darcey's seam to be 5 ft. thick (the thickness is probably about 7 ft.), the specific gravity being 1.281, the total quantity of coal per acre contained in the seam would be about 7,800 tons; and the same allowance as before being made for waste in getting and for small coal, the seam should yield about 3,900 tons of large, and about 1,300 tons of small coal per acre.

If therefore Darcey's seam is distinct from Pryor's, as seems probable, ground containing the two seams should produce about 8,800 tons of large, and about 2,900 tons of small coal per acre.

I have, &c.,

T. W. E. DAVID, B.A., F.G.S.,
Geological Surveyor.

Additional notes on the Gunnedah Coal-field.

GUNNEDAH being situated between the plain country and the hilly tableland of New England presents a mixture of mountain and plain scenery. Broad flats of red soil, well grassed and sparsely timbered with white box, alternate with rolling pine-clad hills of sandstone, and plateaux of dense black basalt rising over 1,000 feet above the plains. The wide valley flats have been formed by the partial filling up of pre-existing valleys of erosion, partly by lava streams, and partly by extensive deposits of silt. The following sections show the character of these strata, which are probably of tertiary and post-tertiary age:—

No. 1. Section of Pryor's Well, in portion 53, parish of Black Jack, about 1,224 feet above sea-level.

Post-tertiary and tertiary: 20 feet of surface rubble and decomposed basalt. (The latter is intersected in an adjoining creek by a dyke of hard basalt, containing flakes of black mica 1 inch in diameter.)

Tertiary: 33 feet 7 inches. Hard, partly decomposed basalt, requiring blasting.

Tertiary: 8 feet 5 inches, yellow clayey sand; 2 feet 5 inches, pipeclay, nearly white.

Palæozoic, Permian (?): 3 feet, carbonaceous shales passing into; 4 feet 10 inches, black stony coal (inferior); 6 feet 4 inches, coal, workable; 2 feet, blueish-grey clayey sandstone.

No. 2. Section of Darcey's well, in portion 16, parish of Black Jack, about 1,089 feet above sea-level.

Post-tertiary and Tertiary: 60 feet 9 inches, basalt chiefly; perhaps some alluvial at top.

Palæozoic, Permian (?): 28 feet 3 inches, sandstone. (A bed of "concrete"—tufaceous limestone (?) said to occur in this sandstone, about 10 feet above the coal). 7 feet (?), coal (4 feet 9 inches seen).

Fine clayey sandstone and grey clay shale for a considerable depth.

No. 3. Section of a well 180 feet deep, in portion 14, parish of Black Jack, 1,069 feet above sea-level.

Post-tertiary and Tertiary: Red soil; basalt; fine sand and gravel.

Palæozoic, Permian (?): Sandstone, carbonaceous.

No. 4. Well, between portions 19 and 20, parish of Black Jack, about 80 feet deep, 1,109 feet above sea-level.

Tertiary: 60 feet, (about) basalt.

Palæozoic, Permian (?): 20 feet of loose conglomerate, composed of well rolled pebbles of quartz and black Lydian stone, from $\frac{1}{2}$ -inch to $1\frac{1}{2}$ -inch in diameter, bedded in white sandstone.

A tertiary age has been provisionally assigned to the basalts on stratigraphical grounds, though no definite palæontological evidence was obtained. There is, however, abundant proof of their having intruded the coal-bearing rocks, which, as will presently be shown, are probably of the same age as the East Maitland or the Newcastle series. The basalts are therefore probably of later age than the permian. These basalt sheets are very thick, in places, as at Black Jack, about 390 feet thick, though it is possible that this thickness is made up of more than one flow. Specimens taken from $\frac{1}{2}$ a mile west of portion 17, parish of Black Jack, were so crystalline that hand specimen might easily be mistaken for diabase. The points of eruption of these lava sheets may be divided into two classes:—

1. Lava cones.
2. Conical hills, chiefly fragmental.

The

The conical basalt hill adjoining Mount Digby, in the parish of Digby, belongs to the first of these types. The top is about 900 feet above the general level of the valley flat, 700 feet above the surrounding sandstone, and about 2,000 feet above sea-level. The summit is oval, with a slightly convex surface, measuring 2 chains from N. to S., and 35 yards from E. to W. to the E.N.E., where the slope is most gradual, the inclination is 17° ; to the South 31° ; and to the West 37° . Large masses of sandstone occur between 200 and 300 feet below the summit of the cone; but I was unable to determine whether they were portions of the solid underlying sandstone upturned or disrupted fragments of the same.

The points of eruption of the second-class are very remarkable, and form several low dome-shaped hills, near the west boundary lines of portions 36, 37, and 38. The sandstone here has apparently been completely wrecked by the explosions accompanying the eruptions of the basaltic lava. These hills so formed are composed of shattered angular fragments of flaggy sandstone averaging 5 inches in diameter, some of the larger pieces being 2 feet in diameter. These fragments have been bleached or reddened by the heat of the basalt, and many of them are partly coated with it. Masses of laminated sandstone occur at the summit of these hills, interlaced with veins of basalt in such a manner as to render it doubtful whether they have been fractured in position or have been disrupted from the underlying rock. Therefore it is difficult to determine how far the hills are fragmental. Whether they have been formed, as they now stand, by the bursting and shattering of the sandstone by volcanic explosions, or subsequent to the intrusion of the basalt, by the accumulation of debris, resulting from the degradation of the basalt and sandstone round the volcanic pipes, cannot be definitely determined without further investigation.

Specimens of this breccia, formed of broken pieces of sandstone cemented together by vesicular basalt, are to be seen in the Mining and Geological Museum, Sydney.

The coal-bearing rocks, through which the basalt has burst, are chiefly sandstone, yellowish-grey and greenish-grey, diagonal bedded; fine-grained, blueish-grey, clayey sandstone; blueish-grey shale with a few fossil plants; conglomerate and tufaceous limestone. (?)

The dip of the strata, as might have been expected in so disturbed a district, varies considerably. The general dip is westerly, ranging from N.N.W. to W. 30° S. The dip close to Pryor's seam is W. 10° N. at $9\frac{1}{2}^\circ$, the general amount of dip being 10° . In Darcey's well I was unable to ascertain the dip with accuracy, but it lies between W. and W. 30° S. The coal in Darcey's well is about 156 feet below that in Pryor's, and from their relative positions as well as from the observed dips it would appear, unless faults intervene, that Darcey's seam is considerably below Pryor's, probably not less than 200 feet. That the seams struck in the two wells are distinct from one another is also implied by the difference in the quality of the coal, as well as by the difference in the nature of the rock forming the roof of the coal in the two wells.

As regards the age of the coal-bearing rocks, the occurrence of *Glossopteris* in clay shale in a creek 7 chains below Pryor's coal-well, shows that the rocks belong to one of three great coal-bearing series, the Newcastle, East Maitland, or Stony Creek, and Greta series. The absence of marine fossils at Black Jack, taken into consideration with the fact that here the strata are dipping off beds, which at Somerton, about 27 miles to the east, contain marine carboniferous fossils, favours the supposition that the Gunnedah coal belongs to the East Maitland or to the Newcastle series. The quality of the coal, especially the occurrence of thin layers of "Mother of Coal," supports this inference.

T. W. EDGEWORTH DAVID,
Geological Surveyor.

APPENDIX I.

Report on the Rocky River and Uralla Goldfield.

Mr. Geological Surveyor David to the Geological Surveyor-in-charge.

Geological Survey Camp, near West Maitland,

Sir,

17 June, 1886.

In accordance with your instructions received on May 7, I proceeded to Uralla on May 10, accompanied by Mr. G. A. Stonier, Assistant Field Geologist, and inspected the Rocky River and Uralla Goldfield, and have the honor to furnish the following report on the three points to which my attention was specially directed in your instructions:—

1. *General Geological character with special reference to the Metalliferous deposits of value.*

The Rocky River Goldfield, which embraces the town of Uralla, and lies principally to the west of it, has an area of $22\frac{1}{2}$ square miles. The field is situated on the western watershed of the Dividing Range, and at the nearest point is only one mile distant from the main line of water-parting. The Dividing Range is here so flat that it is impossible to tell with the unaided eye in which direction the surface slopes. This evenness of surface is chiefly due to the filling up of pre-existing valleys by extensive flows of basalt. Tabular hills, composed of basalt and laterite, rise in places to a height of 150 feet above the general level of the country. At a distance of from 1 to 3 miles west of the main line of water-parting, the basalt has been denuded by the deeply-croded valleys of the Rocky River and its tributaries, leaving bare the underlying granite and altered Siluro-Devonian claystone.

The local formations may be divided into six classes:—

Quaternary Tertiary: 6. Recent alluvials; 5. Basalt and laterite; 4. Tertiary alluvials; 3. Quartzite; 2. Granite hornblende and intrusive, with associated dykes of quartz-porphyr and eurite. Siluro-Devonian: 1. Claystone and granitoid.

Quaternary: 6. *Recent alluvials*.—These consist chiefly of quartz-sand and quartz-gravel intermixed with greenish micaceous soapy clay, derived from the waste of the granite. The thickness varies from a few feet to 20 feet. Pieces of subangular quartz are occasionally found 6 inches in diameter. The sandgrains in these alluvials are more or less angular or subangular, but contain rounded grains and pebbles, derived from the Tertiary alluvials, of quartz, zircon, spinel, and litaniferous iron. Litaniferous iron (= ilmenite) is abundant at Wallaby Gully, where a pebble of that mineral has been found 2 inches in diameter. The gold associated with these beds is coarser and more angular than that contained in the Tertiary alluvials. This formation is principally developed along the banks of the Rocky River and its tributaries, Kentucky and Uralla Creeks, and Green, Cabbagetree, Wallaby, Post-office, Mount Welsh, and Sawpit Gullies, &c. Volcanic bombs of glassy basalt, called locally "buttonstones," are plentifully distributed through these beds, especially near the junction of the Green Gully with Kentucky Creek.

The bombs are spherical discs, shaped like a doubly convex lens, from the size of a sixpence up to that of a penny. The under surface shows spinal grooves, while the upper is cellular. Many of the bombs have delicate rims curved slightly upwards so as to form tiny saucers, and the edges are translucent.

Tertiary: 5. Basalt and Laterite.—This formation occurs in oval patches at the outliers of Mts. Mutton, Beef, Welsh, Harris, and Monopoly, and at Cherrytree Hill, and in a wedge-shaped mass at Mt. Jones and Sydney Flat, widening to the N.E., where it becomes united at Doherty's Hill to a sheet, $1\frac{1}{2}$ miles in width. Its thickness ranges from 15 to 140 feet. The color varies from dark-green to dark-blue. In some places this rock can be pierced with a pick, while in others it is so hard as to require blasting powder for its removal. Columnar structure is prevalent, especially at the outlier close to Uralla, called Mt. Beef, where a fine section is exposed in a quarry. At the No. 2 Bullion shaft the basalt, which was soft and friable, contained large erupted fragments of granite, some of them being tons in weight. The granite blocks are roughly rounded, and were described as being rudely bedded in the basalt as though tipped from a cart, the beds dipping steeply northwards.

The succession of strata in this shaft is remarkable. The shaft was $147\frac{1}{2}$ feet deep. From the surface to a depth of 100 feet the sinking was through rotten greenish basalt, with occasional beds of erupted granite blocks. At one point a block of granite was met with of such size, that it formed a complete floor to the bottom of the shaft. At a depth of a 100 feet from the surface the basalt became very hard and dense, and no more granite blocks were found. From here to a depth of 137 feet the basalt was full of irregular hollows, $2\frac{1}{2}$ feet long by $\frac{1}{2}$ foot deep, with clear stalactites hanging from the roof, described as being like icicles, and probably of zeolite material. The basalt continued down to the bed rock, where it was much intermixed with pulverized granite and black clay. The granite, forming the bed rock, was traversed in all directions by veins of basalt.

Laterite, composed of red volcanic dust and fragments of decomposed erupted basalt, forms the capping of the Sugarloaf, near Doherty's Hill, of Doherty's Hill and of a hill near Mount Butler, in portion 26, parish of Ellon. The summits of these hills have a cindery scoriaceous appearance, and have certainly been points of eruption.

4. Tertiary Alluvials.—The sands, gravel, and clay of the deep leads. These beds are mostly capped by basalt though not co-extensive with it, as has been proved by several shafts in which the basalt has been found resting directly on the granite. The alluvial beds, as shown on plan No. 2, were found to lie in long hollows in the granite. The width varies from 5 to over 40 chains, and the thickness from a few feet up to 114 feet. The average thickness on the main lead, between Mount Jones and Doherty's Hill, was about 30 feet. The greater part of the beds is composed of a very fine yellowish grey quartz sand, much rounded; and near the bed rock the sand becomes much coarser, passing into a fine gravel, composed of rounded doubly hexagonal quartz crystals, locally called "hailstone gravel." The gravel immediately overlying the wash is cemented in places by brown iron ore, so as to form a hard crust about an inch in thickness. Round lumps of greenish decomposed dolerite (a variety of coarse crystalline basalt) are found in this gravel at Mount Jones, in Mr. French's new tunnel, and at Mount Mutton. These blocks, which are from 3 inches to 2 feet in diameter, are not waterworn, but erupted, and resemble those found in the laterite at Doherty's Hill, and do not therefore imply that the leads in which they occur are younger than those which do not contain such fragments. The gold gravel is usually rich near these blocks, owing probably to eddies having formed round them, in the water by which the gold was drifted.

It is a feature worthy of notice, in connection with the occurrence of these alluvials under outlying patches of basalt, that the bed rock on which they rest has a slight dip on all sides towards the centres of the hills, from which it may be inferred that the preservation of the outliers is due to the fact of their lying in slight hollows, where they would be less exposed to denudations than at higher levels.

The clays are pale greenish grey, yellow, and black. The black and yellow varieties often contain fossil leaves. One of these, given me by Mr. W. Cleghorn, is identical with one of most common occurrence in the deep leads of stream-tin at Rose Valley, near Emmaville. In the long tunnel, a bed of grey clay was noticed by me, over 5 feet in thickness, and with the exception of a few interstratified seams of fine sandy clay, was remarkably pure and free from grit; and being strongly plastic, might form a good pottery clay, though this could not be determined without actual experiment.

Its soapy nature is probably due to the large quantity of decomposed mica present. Gold is found sprinkled through the base of the sand and gravel, chiefly next to the bed rock, and for 3 inches above it. The grains are finer and more waterwoven than those in the recent alluvials.

There is not sufficient evidence afforded, by the Rocky River lead, to determine whether the tertiary alluvials are of marine or of freshwater origin. The shape of the worked lead is suggestive of an old river channel, with tributaries; but the fineness and clean character of the drift, and the smallness of fall in the bed rock, favour the inference that it is a deposit partly of marine origin, though no marine fossils have ever been found in the beds. There is, however, the most conclusive evidence that the alluvials under Doherty's Hill were laid down on a land surface, as is proved by the great quantities of fossil leaves and wood preserved in dark clays, which were found in sinking the Phoenix, Parker, and Edmonds' shafts, &c., north of Doherty's Hill. From the width of the alluvials at the Bullion shafts, and from the great thickness and persistence of the black carbonaceous clay lying next to the bed rock (37 feet thick at No. 4 Bullion, and about 30 feet in No. 5), as well as from the rapidity of the fall into this deep ground from Sydney Flat, it would appear that this part of the deposit is of lacustrine origin.

Probably all the leads in this neighbourhood were brought into their present positions by the agency of fresh water only, though much of the material in them may have been derived from marine beds.

The main lead appears to have been laid down by one or more rivers, or by one river flowing at different levels at different ages, running from Mount Welsh to Mount Jones, and through Sydney Flat to Doherty's Hill, and thence into a small lake, on the west margin of which was worked the "Sons of Temperance" lead. At Mount Welsh, the bottoms of the channel at both ends of the outline are so nearly on a level, that it is difficult to determine the direction of the flow; and Mr. W. French, who worked part of the lead here, is of opinion that the fall is here from east to west, but the general fall of the main lead is in the direction already indicated.

3. Quartzite.—Locally called "White Billy." This term is applied to a rock of frequent occurrence in the district, and of very variable character. The rock is chiefly composed of silica, with a small proportion

portion of clay, and is found in lenticular patches from 1 to 10 acres in extent, and from 1 to 15 feet thick. The greater part of this rock is a true quartzite composed of sand grains cemented together by silica, and is evidently an altered tertiary sand, the consolidation of which into a compact rock has been effected by the infiltration of silica from hot springs, connected with the tertiary volcanic eruptions. In other places the rock has more the appearance of a white jasperoid chert, opaque, excepting on thin edges, and infusible before the blow-pipe. In the last respect it differs from porcelain-jasper and artificial porcelain, its infusibility being due to its highly siliceous nature, and its whiteness and opacity to the presence of a small percentage of Kaolin. The most remarkable variety of this rock was noticed in Wiggin's selection, in portion 241, parish of Arding. A low hill here is capped with a white siliceous breccia, resembling the white chert just described, but enclosing angular fragments of white jasperoid claystone, some as much as 8 inches in diameter. The whole hill appeared to be built up of broken pieces of claystone, and the bed of white breccia at the summit is certainly of volcanic origin, resembling a chrysolite breccia in appearance; but judging from the infusibility of the rock, more closely allied to chert. The relation of this quartzite to the drift is obscure. At Sydney Flat it underlies the basalt, and forms an intensely hard covering, from 1 to 2 feet in thickness over the gold sands. In other places, as in portion 271, parish of Arding, it appears to overlie the basalt. At all events the points where it is chiefly developed are along the margins of the basalt sheets, between them and the edge of the bar rocks. It belongs certainly in many cases to the tertiary sands and represents their outcrop. Expectations, however, of great bodies of drift in its immediate neighbourhood are not always realized.

2. *Granite*.—The granite is of a medium coarseness of grain, composed of quartz, felspar, dark mica, and hornblende. The mica is occasionally aggregated into nests, from $\frac{1}{2}$ to 2 inches in diameter. The granite is jointed in a direction 32° E. of N. and W. of S.; and is intersected by veins of eurite, coursing N. to S., and 15° N. of E. and S. of W., from $\frac{1}{2}$ to 1 foot wide, and by dykes of felspathic and micaceous trap rock. The strike of these dykes is 10° N. of W. and S. of E. The largest dyke observed, in Mount Welsh Gully, is 8 feet wide, and strikes at 20° S. of W. and N. of E., and is highly micaceous. A dyke of trap rock at the S.W. end of Mount Jones contains a little pyrites, but the actual presence of gold in the dyke has not yet been detected. Dykes of quartz-porphry, probably connected with the granite, have cut the claystone and granitoid on the west side of the main deep lead, in portions 238, 241, and water reserve, 338, parish of Arding. The granite is slightly intrusive at its line of junction with the granitoid. Veins of quartz traverse the granite in places, chiefly composed of white milky quartz, barren of any metal excepting iron. A promising looking reef of porous ferruginous quartz, near the junction of Jackson's Gully with the Rocky River, is $2\frac{1}{2}$ feet wide, and strikes 36° E. of N. and W. of S. A sample of stone selected by me, and assayed by the Government Analyst, showed only a trace of gold under 2 dwts. per ton. A large barren quartz reef about 5 feet wide, and having an E. and W. strike, occurs 1 mile W. of Uralla, about the point shown on the plan.

The only reef in the district in which gold is said to have been found is one situated in portion 91, parish of Devon, at the point shown on the map. From the general non-auriferous character of the quartz veins where the alluvials are richly gold-bearing, and from the fact that the bed-rock in places for a radius of more than a mile from the gold-bearing alluvials, is composed of granite as well as from the fine and crystalline nature of the gold itself, it would appear that the gold was originally derived from the granite.

Siluro-Devonian (?): 1. *Claystone and granitoid*.—The Palæozoic sedimentary rocks, which have been slightly intruded by the gold-bearing granite, are dark-blue to brownish claystones passing towards the margin of the granite into a fine-grained greenish-brown crystalline rock, in appearance resembling basalt. This rock is seen at O'Brien Sugarloaf, extending thence to the head of Wallaby Gully, and in the parish of Arding in portion 244 (James Bishop's) near Mrs. Bullen's house in portion 90, &c., striking south-easterly across the main road from Uralla to Armidale. It is a true bed-rock and it is useless to search under it for alluvial gold. A shaft has, however, been sunk to a considerable depth with such an expectation in Wiggin's selection, portion 241, parish of Arding.

Gold.—The character of the Rocky River gold is rather peculiar. Most of the particles are very small, averaging about $\frac{1}{8}$ inch in diameter, and are chiefly shotty, while a few are piliform (= wire-gold), or scaly. Many of the particles show definite faces of crystals, chiefly those of the orthohedron, proving that the fine state of division in which the gold is found is due more to its manner of crystallization in its original matrix than to mechanical disintegration by the agency of water. The coarsest fragments are found in the recent alluvials of Cabbage Tree Gully, where small nuggets are often met with about $\frac{1}{4}$ -inch in diameter. The gold in the recent alluvials is coarser and less water-worn than that in the Tertiary.

The average mint value is £3 18s per oz. The present price given by the branch of the Bank of New South Wales at Uralla is £3 15s. per oz.

II. *Mining operations at present carried on, and the probable prospects of the field.*

Gold-mining as at present carried on in the district is of the desultory kind commonly termed Fossicking. The Long Tunnel Company have temporarily suspended active operations, and have let part of their ground on tribute to a party of six. In 1877 this Company undertook the gigantic enterprise of tunnelling through the granite from the lower end of Sydney Flat near Mount Jones for the distance of three-quarters of a mile to Doherty's Hill, at a sufficiently low level to drain the wet unworked lead which is known to extend for some distance under that hill. The main tunnel has now been pushed forward for a distance of about 1,800 feet, and a considerable amount of work has been done in driving a cross-cut and making jump-ups at intervals through the roof of the tunnel, and tapping the worked gold-sands of Sydney Flat.

It was hoped that the gold obtained from the worked sands of Sydney Flat would be sufficient to pay for the expense of driving the tunnel. These expectations have, however, not yet been realized, as the worked gold-sands at present are stated to produce only from 1 to 8 dwts. per load, 8 dwts. being about the richest yield. The drift here is a fine ferruginous quartz-sand with some clay. The ultimate success of this Company will, of course, depend on how far the unworked portion of the lead under Doherty's Hill is payable, as the Company have conclusively proved that the percentage of gold in the worked deep lead ground under Sydney Flat is, by itself, quite inadequate to pay the expenses of extending the tunnel. A great deal of work has been done at Mount Jones by Mr. W. French, and he is at present engaged

engaged single-handed in the great task of putting a tunnel into Mount Jones at a level of about 70 feet above that of the Sydney Flat gold-wash, to strike what he believes will prove an upper lead of payable auriferous gravel under the basalt of which Mount Jones is formed. Mr. French has already tunnelled into Mount Jones at its N.W. end for a distance of 700 feet, and proved that there exists, between the granite and the basalt a considerable body of fine quartz sand containing a little gold. The sands are composed of clean, well-worn quartz grains, showing current bedding, which, in Mr. French's old tunnel, dip in a direction S. 20° E., as though the currents by which they were deposited flowed from N.N.W. In Mr. French's new tunnel large rounded lumps of dolorite basalt are of frequent occurrence in the sand, and rest immediately on the granite. Similar lumps were observed by me in the gold wash at Mount Mutton, and in the red laterite on the top of Doherty's Hill. They are quite unlike the overlying basalt, though clearly of volcanic origin, and indicate that Mr. French's lead is as old as that at Mount Mutton. Fragments of true basalt tuff are associated with them in the drift in this tunnel. Mr. French is doing a valuable work in testing the payability of these high level auriferous sands. At Fiddler's rush, on Sydney Flat, Mr. John Anderson is working the deep lead sands on the northern edge of the Sydney Flat lead in an open cutting. At Mount Jones, Mr. Klindest is working on the edge of the old Mount Jones lead, his shaft being 46 feet deep, giving the following descending section—35½ feet basalt; ½ foot sandy clay; 5½ feet fine yellow clayey sand; 4½ feet fine current bedded quartz sand, resting on a bottom of rotten granite.

At Mount Welsh, Mr. James Young is working the recent alluvials in Mount Welsh Gully, and at the S.W. end of Mount Welsh Mr. W. Herbert is tunnelling into the hill. The Messrs. Tebbs are working the gold gravel at the N.E. end of Mount Mutton. The tertiary alluvials here consist of fine red sands and grey sandy clay, with intensely worn pebbles of granite quartz ¼-inch in diameter. The payable auriferous part of the drift (wash) lies next to the red rock, having a thickness of 3 inches, and is composed of fine quartz gravel (= "hailstone gravel.") A great deal of mica is mixed with it, making it soapy to the touch. Round lumps of rotten dolorite are found in the wash here as at French's tunnel; and round pebbles of smoky quartz and grains of red and yellow zircon are not uncommon. Above the wash comes reddish brown sand and grey clayey sand; the total thickness of the alluvial beds being about 9 feet, though towards the centre of the hill, as much as 20 feet. The whole is capped by dense columnar basalt, having a thickness of about 45 feet.

The above work is all I saw in progress at the time of my visit; but we were informed that in wet seasons, when the supply of water is good, a great deal of work is done in the recent alluvials. The number of miners employed on the field fluctuates considerably, as in dry seasons many leave for the Tingha or Vegetable Creek tinfields, returning to the Rocky when there is a sufficient supply of water for sluicing. The approximate number is 100 Europeans, and 40 Chinese.

The amount of gold won in 1884 is stated by the Mining Registrar, Mr. J. M. Shehan, to have been 863 oz. 11 dwts. 18 grains—valued at £1,238 9s. 1d.; and in 1885.

To convey any idea of the probable future prospects of the field it will be necessary to recapitulate briefly the work already done.

According to an article which appeared in the *Armidale Express* on May 14th, last, gold was worked in the recent alluvials of the Rocky River some years before its discovery in the Deep Leads, in 1856. The occurrence of gold in the deep lead at Mount Welsh is then stated to have been predicted by the Rev. W. B. Clarke. In his Report on the geological characters, and probable extent of the Hanging Rock Gold Diggings, published in 1852, Mr. Clarke says:—"It may be satisfactory to enumerate in this place such localities as have hitherto proved to be more or less auriferous in addition to those already proclaimed as such. Near Walcha, Newton Boyd, the neighbourhood of Armidale, north and west of Salisbury, the banks of the Buntarre, Rocky River, and some distance down the Namoi, are localities which my prospecting correspondents represent to me as supplying some gold. I have reason to believe that the Rocky River will turn out rich, and that on both sides of the Dividing Range, near Salisbury, gold will be found." But it was not until the beginning of 1856 that the actual discovery was accidentally made by Mr. Jones, who found gold in a natural outcrop of sand at Mount Jones (named after him.) The gold sand was found to extend under the basalt which here caps the hill, and the tracing of it in this direction by the prospectors ultimately led to the development of the rich Mount Jones lead. The lead at first had a width of about 2 chains, and was worked in an easterly direction for the first 35 chains at depths varying from 20 to 60 feet. (See plan No. 2.) The average thickness of the wash was 8 inches, averaging 1 oz. of gold per load, the richest yielding 2 oz. per load. At the last point the lead branched, the main lead trending north-easterly and the branch east. The latter had a width of from 1 to 3 chains, and was followed easterly for ¼ mile. The wash averaged about ½ oz. per load. Returning to the point where the leads diverge, the main lead, which here has a width of about 6 chains, when followed towards Sydney Flat widened to 10 chains, and the sinking deepened to 70 feet. The yield of the wash diminished in proportion as the lead widened; but where the lead again became contracted the wash became correspondingly richer. At the foot of Doherty's Hill, the lead was spread out over a width of 10 chains, and again became somewhat impoverished, though still payable. This is the furthest point to which the lead was systematically worked, the increased depth of sinking (130 to 190 feet) and the quantity of water in the sands much impeding further operations. The total length of the lead worked, inclusive of the branch, is about 1 mile 30 chains; the total area worked being between 40 and 50 acres. The estimated average yield has been about 6 dwts. per load for a thickness of about 18 inches above the bed-rock. Assuming the area worked to be 45 acres, the yield should have been about 30,000 ozs., valued at £117,000 (mint value.) A rich, deep lead has also been worked at Sawpit Gully, ½-mile E.S.E. from Doherty's Hill. This lead was worked for ¼ mile for a width of from 3 to 5 chains.

Another lead has been worked at Digger's Ridge, ½ mile north-west of Doherty's Hill. The level of the bed-rock here is higher than that at Sydney Flat, and the sand is much poorer.

At Mount Brisbane, a spur of the main sheet of basalt, 1½ miles northerly from Doherty's Hill, a number of shafts have been sunk and a tunnel driven into the hill. Gold was found in the sand and was worked on a small scale, but was scarcely payable. The sand is very fine and angular, or sub-angular. No hailstone gravel was found here. The bed-rock is approximately on the same level as that at Sydney Flat, but it is about 60 ft. higher than that in the Bullion ground.

The

The outliers of Mount Welsh and Mt. Mutton have also yielded a large amount of gold, Mount Welsh being the richest locality on the field, and having produced about 10,000 oz. of gold. Both these outliers have, however, been practically worked out.

The most important questions at present connected with the prospects of the field appear to be:—

- (a) Does the main Sydney Flat lead continue to be payable beyond Doherty's Hill?
- (b) If so, in what direction should it be prospected for?
- (c) Is it possible to increase the present water-supply for sluicing purposes?

(a) The main Sydney Flat lead was almost exhausted in a single year by the labour of 3,000 diggers. Since then many attempts have been made to prove the continuation of this lead, the most successful being those conducted by Mr. J. Anderson and others, which led to the discovery of the Sons of Temperance lead. (See plan No. 2.) At the base of Doherty's Hill a bar in the bed-rock split the lead, sending one branch easterly and the other northerly. The northerly branch was proved by the Esperanza tunnel, and was picked up further north and followed for a distance of nearly $\frac{1}{2}$ -mile in the Sons of Temperance lead. The sinking here was through basalt, and about 130 feet deep. The lead was from two to three chains wide and the wash from 2 to 3 in. thick, stated as yielding sometimes over 1 oz. per load. The bed-rock was very flat. At Haythorne's shaft, however (No. 14 on No. 2 plan), a perpendicular fall was found in the bed-rock of at least 5 ft. The lead proved payable and was worked up to the edge of the fall. The miners were unable to get down to the bed-rock beyond, owing to the great quantity of water in the sand. The Phoenix shaft (No. 10 on plan No. 2) was sunk in the hope of striking the right branch of the E side of the bar. The shaft was bottomed on to granite at a depth of 166 ft. and then sunk in the granite to a depth of 182 ft. A drive was then put in in an easterly direction at a level of 179 ft. from the surface, which tapped the drift and proved the bed-rock to be still dipping. A monkey-shaft was then sunk in the bottom of the drive, and a second drive put in at a lower level which cut the drift again at a distance of 20 ft. from the main shaft, proving that the bed-rock dipped 24 ft. in that distance. The workings were choked with running sand and water before the prospectors could get down to the bottom of the channel. Parker and Edmond's shaft (No. 9 on 2 plan) was sunk to a depth of 96 $\frac{1}{2}$ ft., through 86 ft. of basalt, 2 $\frac{1}{2}$ ft. of carbonaceous clay, with fossil leaves, and 8 ft. of compact sand. Water then rose in the shaft so rapidly that the men barely had time to escape, and had to leave their tools behind them. The shaft was subsequently bottomed by Mr R. Roberts with boring rods at a depth of 106 ft.

To the N. and E. of Parker and Edmond's shaft the Bullion and Long Tunnel Companies have sunk several deep prospecting shafts, but without success. The bed-rock at No. 2 Bullion shaft is at a lower level than any hitherto proved on the field, though borings at Nos. 4 and 5 Bullion shafts prove the bed-rock there to be within a few feet of the same level. A little gold was got in the Bullion shafts Nos. 1 and 5, but not in any payable quantity.

Gold has been won in small quantity 2 $\frac{1}{2}$ miles north-easterly of the bullion shafts in a well in Patrick O'Sullivan's portion No. 13, parish of Arding.

The Sydney Flat lead does, therefore, extend beyond the point up to which it was last worked, and the probability of its being payable may be estimated from the following facts:—

- (1.) The lead was payable up to the last point to which it was systematically worked, viz., the base of Doherty's Hill.
- (2.) The bed-rock on which the gold gravel rests has a slight fall towards Doherty's Hill.
- (3.) A payable lead—"The Sons of Temperance"—has been worked for nearly half a mile N. of the unproved ground at Doherty's Hill (on its W. side), and this lead is said to have been the richest on the side next to the deep improved ground.
- (4.) At Mount Brisbane, 1 $\frac{1}{2}$ miles northerly from Doherty's Hill, the deep lead alluvials contain almost sufficient gold to be payable, and this, too, when it would appear from the angular character and fineness of the drift that it belongs to a tributary lead rather than to the main channel.

There is a certainty, therefore, that payable patches must exist in the deep ground under Doherty's Hill.

(b) *To what points should prospecting operations be directed?*

The rule that the deepest ground is also the richest is not always true. High level alluvials are in some cases payable when the low levels are not so, because the former are enriched with the products of a more extensive erosion than that which formed the latter. Also in the case of a river debouching into a lake, the deep ground forming the bottom of the lake, which would probably be covered by wide thick beds of fine silt, would be less likely to contain gold in payable quantity than the higher level river channel, where the lead would be more confined, and the drift, owing to the stronger rush of water, would be composed of coarser material.

In the Rocky River deep lead, as long as it maintains its fluvial character the payable ground follows the deepest hollows in the bed-rock. The absence of payable drift from the deep ground between Nos. 2 and 5 Bullion shafts may be explained on the lacustrine theory of the origin of this part of the tertiary formations, or by the steepness of fall in the bed-rock in this direction from Doherty's Hill. The amount of fall in the bed-rock from Sydney Flat to the Nos. 2, 4, and 5, Bullion shafts are about 60 feet. No sand, however, was got in either of these shafts next to the bed-rock, which was covered by thick sheets of black clay, as already stated.

Considering the clayey nature of this deep ground it appears to me that it would be better to leave the deepest part of it alone for the present, and to prospect across its south-western edge from the last point where the lead was proved. The furthest point north to which the lead was found to be payable was at Haythorne's shaft. The bed-rock there was found to have an abrupt fall of at least 5 feet, in a northerly direction, and payable gold drift was worked up to the edge of this fall. It seems to me, therefore, that the best point for prospecting would be along a line drawn from Haythorne's shaft to a point 10 chains east of the Phoenix Engine shaft. The exact locality of the most promising ground might be ascertained by boring and drilling. The question as to whether or not it is payably auriferous could be proved subsequently by sinking a shaft. Another favourable point for further testing the lead would be along a line running south-east and north-west from a shaft 40 feet deep, not bottomed, shown on the geological sketch map in portion 23, parish of Arding, towards the bed-rock at the nearest point, as shown in the preceding map in portion 244, in the same parish. This line would cross an old prospecting shaft sunk in the south-west corner of portion 102, in the same parish. This shaft is said to be over 100 feet deep,
and

and is not bottomed. The surface here is about 20 feet above the surface at Sydney Flat, so that the bottom of the shaft is already about the level of the bed-rock at the latter place. A considerable area of unproved basaltic country lies to the south-east of Uralla.

"Bourke's Nob" is a basaltic hill forming a spur connected with a large sheet of basalt which extends for at least two (2) miles south-south-east, then turns more easterly towards Gostwyck. At Bourke's Nob there is a small outcrop of worn quartz pebbles, and in a shaft sunk 25 feet deep, gold was found in this drift at the rate of from 6 to 15 dwt. to the load. The hill is worthy of further trial.

Worn sand also occurs in small quantity near the point where the road from Uralla to Gostwyck crosses the Dividing Range, near the south-west corner of portion 454, parish of Uralla. Similar worn quartz pebbles and gem sand were observed along the margin of a patch of basalt, overlying granite at Cherry Tree Hill, $3\frac{1}{2}$ miles southerly from Uralla.

(c) *Is it possible to increase the present supply of water for sluicing?*

The proximity of this gold-field to the Dividing Range, and the consequent absence of perennially flowing creeks and rivers, occasions a scarcity of water.

The rainfall for 1885, according to records kindly placed at my disposal by the Rev. W. G. Hugill, was 33.35 inches.

This rainfall is partly stored in:—

- (1.) Surface lagoons, swamps, and waterholes.
- (2.) Tertiary alluvials capped by basalt.
- (3.) Granite, where it is much decomposed and jointed.

The last is not of much importance as regards mining, as the cost of raising the water from wells in the granite would be too great. It is nevertheless interesting to note that at Uralla, as at Byrock, the granite is so decomposed in places as to become a pervious water-bearing rock. For instance, at Mr. Lonsdale's well, 70 feet deep, near the east corner of portion 16, in the village of Uralla, the water makes at the rate of at least, 12,000 gallons in twelve hours.

(1.) Lagoons are the most important kind of natural storage for water belonging to this class. There are three lagoons of importance near Uralla:—Salisbury Lagoon, Racecourse Lagoon, and Bailey Fields. Salisbury Lagoon, when full, has an area of about 126 acres, and is said to be from 6 feet to 7 feet deep in the centre. In the early days of the field, a race was made by Mr. Roman from this lagoon to the ground above Uralla, $1\frac{1}{2}$ miles in length. For the first seven (7) furlongs, the water is conveyed in a covered race, the bottom of which is on the average about 11 feet below the surface of the ground. The race, of which the sides and top are of wood, is 1 foot 8 inches wide, and $2\frac{1}{2}$ feet deep. For the remainder of the distance the water used to flow in an open race, and for two or three consecutive years the supply is stated to have been equal to from four to five ground sluice leads daily (the measurements of a ground sluice being 12 inches wide, and 1 inch deep, with a fall of 1 inch in 12.)

This race has not been used now for many years, and would need a considerable amount of repair and some alteration before water could again be brought on by its means.

Racecourse Lagoon, about half a mile north-west of Salisbury Lagoon, is a saucer-shaped depression in the granite, more or less filled with water, except in unusually dry seasons. It has an area of about 56 acres, and when quite full is about 11 feet deep. At the time of my visit this lake was dry, for the first time for thirty-five years previous.

The Bailey Fields Lagoon is a shallow pond having a surface area of about 14 acres. Thirty years ago a race known as Francis was cut from this lagoon to bring water on to the gold-field in the neighbourhood of Sawpit Gully, the total length being about 2 miles.

(2.) *Tertiary Alluvials* form a vast subterranean reservoir in which a practically inexhaustible supply of water is stored under the line of water-parting of the Dividing Range. Owing to these beds being hidden under thick sheets of basalt, it is impossible to estimate their exact extent. Some idea of it may be formed from the following already ascertained facts. To the north of Doherty's Hill, these beds are water-bearing for a width of at least half a mile, and vary in thickness from 10 to 70 feet. Their length is to be estimated in miles. Numerous wells have been sunk at intervals through the basalt covering, these alluvials for over 3 miles northerly from Doherty's Hill, and with few exceptions have struck good supplies of water in the underlying alluvials. At the No. 2 Bullion shaft, the water is 69 feet deep; at the No. 4 Bullion shaft, 70 feet; and at Parker and Edmund's shaft, 38 feet. At the No. 2, Bullion shaft, the flow of water was so strong that a plunge and lift pump, throwing 3,000 gallons of water per hour was barely able to lower the water. As future mining operations on this gold-field will be centred on the deep leads, it appears to me that it should always be possible to obtain water in sufficient quantity for mining purposes from the water-bearing beds contained in the leads. When the leads are worked, it will be obviously necessary to constantly pump large quantities of water to the surface, to drain the mines, and the water so raised might, without further expense, be utilised for sluicing, as was done so successfully by the late Mr. T. Flannery on his tribute area to the Wesley Company, at Rose Valley, on Vegetable Creek, and is now being done here on a small scale by the Long Tunnel Company.

III. I have reported elsewhere on the modification of the present boundaries of the Rocky River and Uralla Gold-field Reserve.

Every assistance was rendered by Mr. Stonier and myself, by Mr. James Glendenning, Secretary of the Miners' League, and Mr. W. Cleghorn, J.P., supplied much valuable information. I have also to acknowledge the kind help afforded by the following residents:—Messrs. John Anderson, Dewson, W. French, J. D. Lace, R. Roberts, H. Roman, A. P. Smith, Tebbs Bros., J. Young, and others.

I have, &c.,

T. W. E. DAVID,
Geological Surveyor.

APPENDIX J.

Report on the Fairfield Gold-field.

Sir,

Geological Survey Camp, Farley, 8 December, 1886.

In accordance with your instructions, I have examined the Fairfield gold-field, and have the honor to report thereon as follows:—

Fairfield is 33 miles distant by road from Tenterfield, and is situated on the main road from that town to Grafton.

Gold-mining is being carried on principally at four localities, all lying in a line running N.N.W. and

and S.S.E. (1) Yellow Creek, at the extreme S.S.E.; (2) Fairfield, $1\frac{1}{2}$ mile N.N.W. from Yellow Creek; (3) Mount Carrington, 1 mile N.N.W. from Fairfield; and (4) Red Rock, at the extreme N.N.W., 7 miles from Mount Carrington.

Yellow Creek and Fairfield are within the Timbarra gold-field, while Red Rock is within the Boorook and Lunatic gold-field.

Fairfield is about 7 miles due south from the Lunatic gold reefs, and about 10 miles E.S.E. from the silver and gold reefs at Boorook. For about 24 miles from Tenterfield, the Grafton Road passes chiefly over granite, which is rendered very coarsely porphyritic in places by pink crystals of feldspar. For the remainder of the distance to Tenterfield, the formations are dark green dioritic rocks, diorite, greenish-grey gneiss, chlorite schist, felsite, and felsite breccia. The country is rocky and deeply eroded, well timbered with stringy bark, spotted gum, mahogany, &c., and well watered.

Gold was first discovered at Fairfield about the end of January last, by Mr. John Castor. He communicated the discovery to Mr. George Smith, the owner of the property, and as the gold proved payable, capital was raised to work the ground, and a rush set in on a small scale to Fairfield, which resulted in the additional discoveries of Mount Carrington, Yellow Creek, and Red Rock.

At Yellow Creek (called Violet Creek on the Government maps), bearing about E. 30° S. from Fairfield, $1\frac{1}{2}$ mile distant, three gold and silver veins are being prospected. The surrounding rocks are diorite, a greenish felstone, and banded felsite.

At M'Phee's claim are two veins in felstone. The northern veins strikes N. 35° W. and S. 35° E., dipping W. 35° S. at 85° . Its average thickness is 4 feet 3 inches. The veinstone is bluish and greenish quartz, with sulphides of iron and zinc. A mixed sample taken by me from this reef has been assayed by the Government Analyst, with the following result:—

	oz. dwt.
Fine gold.....	1 $1\frac{1}{2}$ per ton
„ silver.....	32 $7\frac{1}{2}$ „

The southern vein, $1\frac{1}{2}$ feet thick, dips E. 10° S. at 74° . The vein stuff is a bluish cellular or solid quartz, with iron pyrites and galena. The veinstuff is not bounded by defined walls, but merges gradually into the country rock.

At Golland and party's claim, about half a mile from the preceding, a vein of quartz, 6 inches thick, dips W. 10° S. at 85° . The rock casing this vein is a very hard dark green diorite. The veinstone contains galena, blende, and carbonate of copper. The sample taken by me from the vein has been assayed by the Government Analyst, with the following result:—

	oz. dwt.
Silver	19 12 per ton
Gold a trace	(under 0 2 „

Fairfield.—Gold occurs here in numbers of thin veins of quartz, traversing a felsite breccia, and the latter also is auriferous for several feet on either side of the quartz veins. Diorite occurs about a quarter of a mile S.E. from the Prospectors; and in Hynde's shaft, on the south side of the Grafton Road, adjoining the Prospector's, a dyke of quartzose diorite rock was cut in the west drive. The dyke strikes N.W. The felsite breccia is variable in character. At a short distance from the ore deposits it is very hard, and consists of angular fragments of opaque whitish-grey felsite from $\frac{1}{4}$ inch to 1 foot in diameter, set in a quartzose or felsitic base. In other places, as at Harkness and party's claim, a quarter of a mile N.N.E. from the Prospector's, the breccia is more dioritic. In the vicinity of the ore deposit, the breccia is very much decomposed, being comparatively soft to a depth of 35 feet from the surface, and is of a prevailing reddish purple colour.

The principal ore deposit is confined to one oval patch about 12 chains long and from 1 to 2 chains wide, the longest axis of which runs about N. 6° W. and S. 6° E. The whole of the rock within this area is more or less auriferous, but the richest part lies towards the centre of the patch, where an irregular vein of porous ferruginous quartz can be traced striking N. 30° W. and S. 30° E., and dipping W. 30° S. at 65° . The quartz passes gradually into the felsite breccia on either side of it, and the latter is richly auriferous for about $1\frac{1}{2}$ ft. on either side of the main vein. At present the deposit is being worked by stoping out all the stone for a width of 4 ft. in the direction of the strike of the irregular quartz vein, keeping it in the centre of the stope. The ore so obtained is chiefly feldspathic, resembling rather half-burned bricks, and is mixed with porous quartz, the whole being charged with oxides of iron, and containing carbonate of copper, and an earthy black powder, resulting from the decomposition of sulphide of zinc. The deposit is not bounded by true walls, and its lateral extent has not yet been fully proved. The natural "faces" of rock met with in the workings are joints rather than true walls, for the rock on either side of them has been proved to be auriferous for at least 20 ft. to the east and west of the main deposit, at right angles to its strike.

At a point about 6 ft. northerly from the centre of the Prospector's main working shaft a branch vein leaves the main vein, about $2\frac{1}{2}$ ft. wide, striking towards Kelly's claim, and dipping S. 18° W. at about 54° .

At Kelly's, a mass of ore somewhat similar to the Prospector's, but harder, is being stoped out for a width of 9 ft. The stopes follow "faces," or joints in the rock, which dip from 10° to 30° S., and W. at 66° .

At the Prospector's the zone of decomposition extends to a depth of 38 ft. from the surface, while at Kelly's the sulphides of iron and zinc were met with at a depth of about 23 ft. A mixed sample selected by me from the Prospector's, to represent the width of 4 ft. of the ore deposit which is now being worked out for crushing, has been assayed by the Government Analyst with the following result:—Fine gold, 5 oz. $8\frac{1}{2}$ dwt. per ton; fine silver, 1 oz. 18 dwt. per ton.

A sample from the east cross-cut, at a distance of 20 ft. from the eastern margin of the main ore body, assayed as follows:—Fine gold, 4 dwt. per ton; silver, a trace.

A sample of quartzose veinstone, containing iron and copper pyrites and sulphide of zinc, taken by me from Kelly's claim, assayed as follows:—Fine gold, 4 dwt. per ton; silver, a trace.

There is therefore a large body of gold-bearing stone at the Prospector's, and at Kelly's. At the Prospector's the ground has been proved chiefly at the north and south end of the property, altogether for a horizontal distance of about 80 ft. If the intermediate 600 ft. prove equally auriferous, there can be no doubt that the mine will pay very well as long as the ore treated is the oxidised veinstone above the water-level. When the sulphides are reached at a depth of about 38 ft., the difficulty of treating the ore will of course be greatly increased, as, although some of the gold is free, the greater part of it is held by the sulphides of iron, copper, and zinc. The specific gravity also of the sulphide-bearing veinstone will be considerably higher than that of the oxidised portion, so that although the yield of gold per cubic yard

yard may be approximately the same, the yield per ton in the sulphide ore will be proportionately reduced. This has been proved already by the assays made by the Government Analyst of samples of ores from different parts of the field, the oxidized ores, as a rule, giving slighter returns than the sulphides.

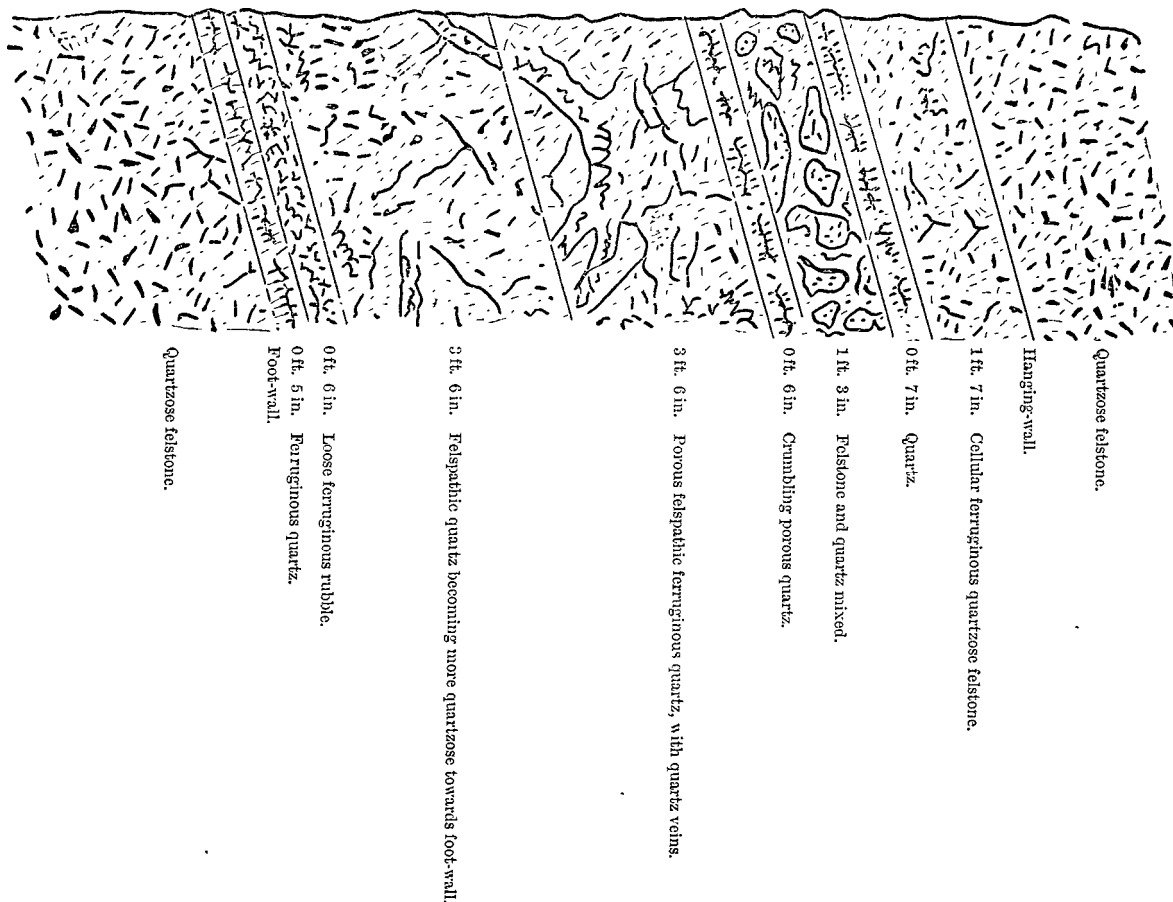
At Mount Carrington, one mile north-westerly from Fairfield, upwards of 40 chains are held on lease, making a total area of over 180 acres. Mount Carrington is a rocky ridge rising to a height of about 600 ft. above Fairfield, and trending N.W. for about $\frac{1}{4}$ mile, then northerly for another $\frac{1}{4}$ mile. The sides are steep and the summit is only from 2 to 3 chains wide. Five different varieties of rock occur here, (1) felsite breccia, of a greenish grey or reddish purple tinge; (2) greenish felsite; (3) banded white felsite; (4) bluish-grey argillite (?); (5) dark green dioritic rock, probably an altered sedimentary rock. At the north end of Dillon's claim, portion 9, the felsite dips S.E. at about 70° .

The argillite (?) which occurs principally at Real and Pinkerton's claims has a slaty cleavage and dips about N. 10° W. at 55° . The veins occur chiefly in the felsite breccia and felsite, but some traverse the diorite rock. There are about 15 distinct veins of importance varying in thickness from a few inches to 11 ft. The strike and dip of the veins is also very variable; but of 37 veins examined at Mount Carrington, the prevailing strike was found to be N. 30° E. and S 30° W. Three-fifths of these dipped westerly, and two-fifths easterly, the amount of dip varying from 30° to 90° . The mean thickness of the fifteen veins was found to be 2 ft. Nine of these were 3 ft. or upwards in width, the widest being 11 ft. 4 in. In three cases a "clay-dig," or "flucan" was observed, viz.: at the Gladstone, Strauss, and Real and Pinkerton's claims.

Most of the veins have no true walls, but adhere firmly to the country rock, and pass into it gradually.

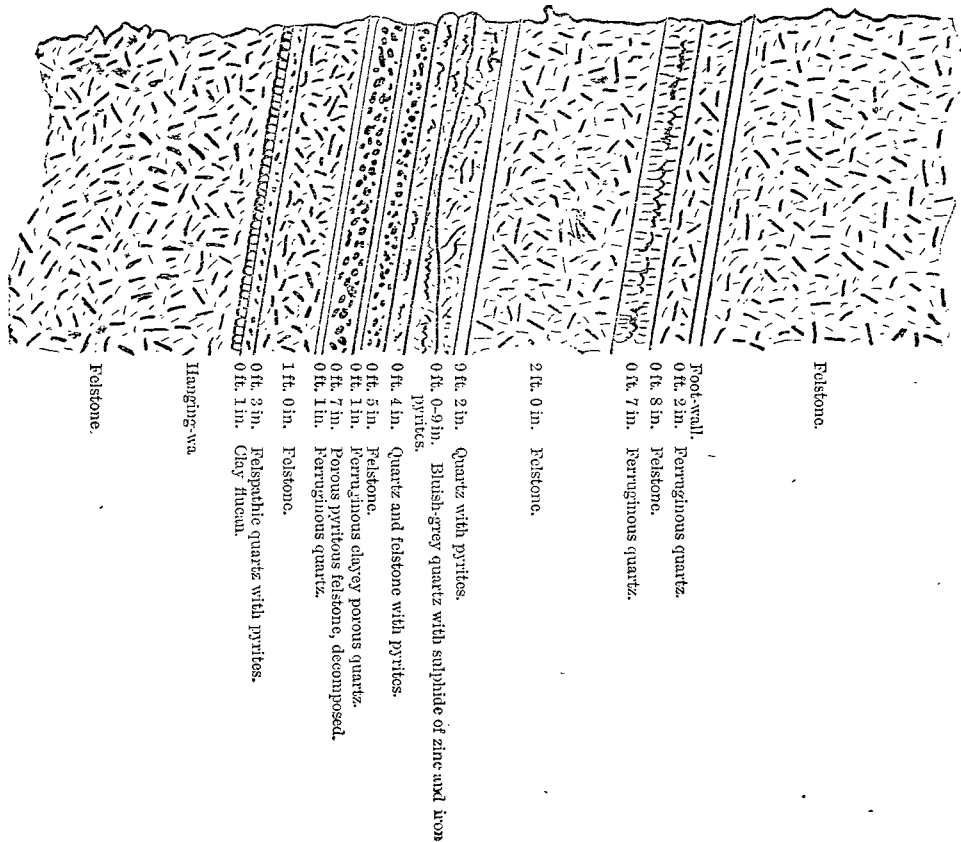
The water-level and zone of decomposition is reached at a depth of about 40 ft. near the summit of Mount Carrington, and on its sides and base at depths of from 10 to 20 ft. From the surface to the water-level the ores consist of porous ferruginous quartz with cubical cavities resulting from the removal of dissolved iron pyrites; and in some cases they show minute specks of gold. Carbonate of copper and decomposed sulphides of zinc are also present in the oxidized ores. Below the water-level the veinstone becomes hard, and contains iron and copper pyrites and sulphide of zinc. Some fine specimens of the last mineral, enclosing coarse pieces of gold, have been obtained at Strauss' claim.

The thick veins are not auriferous throughout their whole width, as they enclose slices of the country rock, which have been so thoroughly silicified as to make it difficult to distinguish them from the quartz veins. These silicified portions of the country rock enclosed between contiguous parallel quartz veins have been included by me in the total width of the veins, when estimating their thickness. As a rule, however, they contain but very little gold. The following section of Sageman's vein may be taken as typical:—



A mixed sample from this vein has been assayed by the Government Analyst, with the following result:—Fine gold, 3 dwt. per ton; silver, a trace.

Straus's vein, described as being 7 ft. wide, consists of nine quartz veins with intermediate silicified portions of the country rock, the aggregate thickness of the quartz veins being $2\frac{1}{2}$ ft., as shown on the following section:—



A sample from this reef consisting chiefly of sulphide of zinc and carbonate of copper has been assayed by the Government Analyst, with the following result:—Fine gold, 4 dwt. per ton; fine silver, 1 oz. $12\frac{1}{2}$ dwt. per ton.

Fogwell's ore, also composed of sulphide of zinc and carbonate of copper, assayed as follows:—Fine gold, 3 dwt. per ton; fine silver, a trace. As a rule the veins are richer in the felsite breccia than in the solid felsite.

The felsite breccia is most extensively developed at the top of Mount Carrington. Bourke's big reef, the most important vein here, consists of porous ferruginous quartz, 4 ft. wide, passing gradually at its sides into ferruginous quartzose felsite. Gold shows freely in this stone, and the sample taken by me and assayed by the Government Analyst yielded:—Fine gold, 15 dwt. per ton; fine silver, 8 dwt. per ton. Amongst other samples which gave good returns were—(a) Sample of ferruginous quartz from vein 4 in. thick, Shannon's claim, yielding:—Fine gold, 1 oz. 18 dwt. per ton; fine silver, a trace; (b) Sample from yellowish-white friable quartz, vein 5 in. thick, Dillon's claim:—Fine gold, 11 dwt. per ton; fine silver, 2 oz. $14\frac{1}{2}$ dwt. per ton.

There are a number of promising veins here, in addition to those already described, as Carmichael's, Horton's, Scott's, Williams's, Jones's, the Gladstone, &c. At Mount Carrington the veins have been proved to be auriferous at levels which differ from one another by 300 ft.

As before mentioned, the upper or oxidized portions of the veins are the richer, while the assays made of the undecomposed sulphides from lower levels have given returns of about 4 dwt. of gold per ton, but the yield of this ore would be considerably increased if the sulphides were to be concentrated.

Red Rock.—The auriferous area at Red Rock is situated at the junction of the Crooked Creek with the Cataract River, on the left bank of Crooked Creek, 7 miles north-westerly from Mount Carrington, and bears E.N.E. from the Boorook silver-mines, $3\frac{1}{2}$ miles distant. The country is rocky and very steep, especially along the frontage to the Cataract River, where there is an almost precipitous fall of 750 ft. from the Red Rock to the bed of the Cataract River.

About 70 acres were held under lease at the time of my visit, and upwards of thirty men were employed upon them.

The geological formations consist of—(1) Felsite breccia and quartzose felsite similar to that at Mount Carrington. The latter is white in places, resembling quartzite, but is more often stained by iron oxides and carbonate of copper; as at the Red Rock; (2) Dark green chlorite schist, and a rock composed of quartz and chlorite without schistose structure, the quartz being present in the rock in the form of grey cellular patches. The latter group of rocks are seen in the bed of the Cataract River. There are about ten veins here belonging to two sets, which intersect one another at a high angle. The prevailing strike of the principal set is N. 27° E., which approximates to that of the Boorook silver veins, of which

the prevailing strike is stated to be N. 22° E. Five of the veins dip easterly, and four westerly, at from 30° to 90°. The prevailing strike of the other set is N.W. and S.E., the dip being easterly at 70'. The mean width of the veins is 2 feet 9 inches, four being 3 feet or upwards in thickness; and the thickest 6 feet; the prospectors, Farrell and party. The veinstone is chiefly porous ferruginous quartz, containing in places, as at Hyndes's claim, carbonate of copper. The sulphides have not yet been reached at most of the claims. A few small specks of gold were seen by me in the veinstone at Pollard's claim, and I also saw a prospect washed from a sample selected by myself, from the prospectors' claim, which should have yielded gold at the rate of from 2 to 3 dwt. per ton. Of the four samples selected by me from the Red Rock reefs, assayed by the Government Analyst, one showed traces of gold and silver, another traces of gold, but no silver, and two contained neither gold nor silver. A few assays such as these do not afford conclusive evidence as to the non-payable nature of the stone, but they show at any rate that the veins here are not auriferous throughout. The veins being of considerable extent, and of a very promising appearance, deserve to be thoroughly tested; but if the surface stone does not prove payable, the hard nature of the country rock at the low levels, as seen in the natural sections, does not offer any encouragement to the supposition that the reefs will improve at a depth.

Workings.—The ore deposits are being prospected by means of shafts, tunnels, and open cuttings.

The steep falls in the ground at Red Rock and Mount Carrington offer great facilities for tunnelling, and a great body of vein-stuff can be obtained cheaply in this way. The deepest shafts do not much exceed 60 feet. The aggregate amount of feet sunk is about as follows:—At Mount Carrington, 700 ft.; at Fairfield, 350 ft.; at Red Rock, 150 ft.; at Yellow Rock, 130 ft.

As the gold in the stone is generally invisible, even when the ore is examined under a lens, miners are obliged to test their ores by first crushing them up very fine with a pestle and mortar, and then washing the powder in a dish in the usual manner. The mortars in use at most of the claims are wrought-iron mercury bottles with the necks cut off. These empty bottles are obtained from the crushing batteries, where, of course, a considerable quantity of mercury is constantly being used. A good pestle and mortar are indispensable articles to a prospector's outfit in this district, for as the gold is "free" in the gossan ores a quantity of the ore crushed and washed will always give very reliable results, in many cases of more practical value than those obtained from assays.

Machinery.—Two crushing batteries have been erected—one by the Fairfield prospectors, and the other by Carmichael and party. The former is within 5 chains of the northern end of the prospectors' ore deposit, and about 8 chains distant from Plumbago Creek. The plant comprises 15 stamps, 5 of 6 cwt. each and 10 of 5½ cwt.; copper-plate tables; 7 amalgamating pans; 22 settling boxes, &c.; and a horizontal engine of from 25-to 30-horse-power, which drives the battery and pans, and pumps water from Plumbago Creek. This battery should be able to crush the soft ores at present being mined at the rate of 200 tons a week. Carmichael's battery is situated on the left bank of Plumbago Creek, about 50 chains south-easterly from the south-east end of Mount Carrington, this being the nearest point to the mountain, where a good supply of water can be obtained. The plants consist of 5 stamps of 5 cwt. each, with fittings for five more; electric copper-plate tables, and a portable engine of 10-horse power, which drives the stamps, and pumps water from the creek. This battery should crush from 40 to 50 tons of the Mount Carrington ores per week.

The evidence already adduced shows that the veins are very irregular in strike and dip; and the manner in which the veinstone in most cases passes gradually into the country rock without the intervention of defined walls precludes them from being classed with those fissure veins, in which there is evidence of considerable vertical displacement. They rather resemble shrinkage cracks which have been filled with auriferous metallic sulphides and quartz. The veins at the top of Mount Carrington will prove auriferous to a depth of at least 300 feet, as is proved by the natural sections. At this depth the veins will be better defined, but probably more contracted, and the country will become harder. As already stated, there are two kinds of ore to be treated—(1) the oxides and (2) the sulphides. The latter are by far the most important, as the former, on the average, do not extend for more than 30 feet below the surface. The oxidised ores in such a vein as Bourke's will certainly pay well for working down to the water-level.

As regards the main question as to whether the ores can be worked to advantage below the water-level, the yield of the sulphides from the veins lying near the base of Mount Carrington is so small (4 dwt., according to assay) that it will not leave sufficient margin to pay for the extraction of the gold from the sulphides of iron, zinc, and copper, unless, as pointed out, the sulphides in the ores be concentrated by machinery. At the higher levels, near the top of Mount Carrington, the veins, as a rule, are wider, and there is a great body of stone which the returns by assay have shown to yield from 4 dwt. up to 2 oz. Experience alone will prove whether a large body of easily won stone with this yield can be worked profitably when it contains ores so difficult of treatment as sulphides of zinc and copper and iron pyrites.

At the Prospectors', Fairfield, the stone is so rich as to admit of its being profitably worked when the sulphides are reached. Here there is every prospect of a permanent paying mine.

At Yellow Creek the gold and silver in M'Phee's vein are in payable quantity, but it has not yet been proved whether this vein is of any considerable horizontal extent.

At Red Rock there is an immense body of easily worked auriferous veinstone, but up to the present there is not sufficient evidence to show that it is payable, but from the favourable nature of the formation it deserves to be well tested.

Speaking generally of the field it may be said that on account of the variable character of the veins, and the unevenness of the distribution of metals in them, there is sure to be a great fluctuation in their yield. Some deposits will widen, and others become contracted, when followed horizontally or vertically; and it does not follow that a property will contain any auriferous deposits simply because it is on the line of strike of and not far distant from some known deposit. This is an important point for the consideration of mining companies, for it shows the necessity for extensive prospecting, and testing of the ores before laying out much capital in erecting machinery.

Though colours of gold may be found near the surface in many places no payable alluvial gold has yet been found on the field. On the whole, though the yields of the veins will fluctuate considerably, as above mentioned, I am of opinion that this will become an important gold-mining field.

I have, &c.,

T. W. EDGEWORTH DAVID. B.A., F.G.S.,

Geological Surveyor.

APPENDIX K.

APPENDIX K.

Mr. Geological Surveyor Anderson to The Geological Surveyor-in-charge.

Report on the Yarrangobilly Caves.

Sir,

Department of Mines, Sydney, 3 January, 1887.

In accordance with your instructions, I proceeded to the Yarrangobilly Caves on December 6th, and I have now the honor to submit a report on these caves.

The caves are situated on the Yarrangobilly Creek, a tributary of the Tumut River, in the county of Buccleuch, and lie about 40 miles to the south of Tumut, and 12 miles to the north of Kiandra.

There are two principal routes to the caves—one by Gundagai and Tumut, and the other by Queanbeyan, Cooma, and Kiandra.

By the former route a coach runs as far as Tumut, and from this point to the foot of Mount Talbingo, a distance of about 20 miles, there is a fairly good buggy-road, although some parts of it are a little rough. It is extremely difficult to take a buggy up Mount Talbingo, the ascent being 2,080 ft. within a distance of 3 miles, and the present track being very bad; but this difficulty having been surmounted, there is a passable bush-track on to Mr. Gibbs' station, within 8 miles of the caves. These last 8 miles can only be performed on horseback or on foot, and in wet weather many of the sidlings are very dangerous. This route from Tumut passes through a very mountainous and picturesque country, and some of the views obtained from points of vantage, such as the top of Mount Talbingo, are very fine, while on striking the Yarrangobilly Creek a splendid view is obtained of the limestone cliffs and the great arch which forms the entrance to the two principal caves.

The second route is by Queanbeyan, Cooma, and Kiandra, all of which are connected by coach. For 8 miles from Kiandra there is a buggy-road across the Kiandra Plain, but from here a bridle-track has to be followed which goes to a selection within half a mile of the caves. At various points on this route glimpses can be obtained of the Snowy Mountains, which, even within a fortnight of midsummer were dotted over with patches of snow. By the former route visitors could drive to the foot of Mount Talbingo, within 20 miles of the caves, while by the latter route they could drive to within 4 or 5 miles of them.

The Yarrangobilly Creek has a general course from N. to S. The rocks of the district consist of nearly vertical beds of the older palæozoic shales, sandstone, and limestone, whose outcrop is also in a N. and S. direction. The limestone in which the caves occur is a very thick bed forming the eastern slope of the valley of the Yarrangobilly Creek, and all along its course it forms high cliffs, in which openings may be seen, some of which no doubt lead into chambers in the limestone hitherto unvisited. This limestone contains the remains of fossil corals in considerable abundance.

The two principal and best-known caves go under the name of the Glory Hole Caves, while the cave higher up the creek is called the Yarrangobilly or Copper-mine Cave.

The Glory Hole Caves have a common entrance by the great arch. Immediately on getting inside the arch a large opening is seen passing away to the left; this is the Left-hand Cave. Going still further into the arch the roof is seen to have an immense egg-shaped hole in it, the fallen material from which has formed a small hill on the floor of the archway. On gaining the summit of this rising ground the archway is seen gradually to diminish in size to form the entrance to the Right-hand Cave.

The Left-hand Cave.—The entrance to this cave is very lofty and of considerable width. It is here that visitors usually camp who remain over-night at the caves. From the roof hang pink and green-tinged stalactites, exhibiting very irregular forms, and in the inequalities of which nestle tufts of maiden-hair ferns, which produce a very pretty effect. For about 40 yards in from the mouth of the cave the passage is nearly 40 ft. high by 30 ft. wide. At this point it widens out into a large chamber, the sides of which are thickly coated with layers of carbonate of lime, which assumes great variety of forms, while from the roof hang numberless yellow-tinged stalactites. On the floor are three large masses which have no doubt fallen from the roof, and become coated over with stalagmitic growth from the water dripping upon them. At the far end of this chamber there are the remains of a mass of stalactites, which must at one time have had the appearance of a frozen waterfall. It can be seen coming from a hole in the roof, and its lower end must have hung free, probably in a series of points; but now it has partly been destroyed by being broken across, and the lower part of it carried away. This chamber is about 60 yards in length where it begins to narrow, and afterwards it forms a gradually contracting gallery, in the centre of which stands an isolated pillar of stalagmite, about 8 ft. in height, which, however, is much disfigured by the pencilling of names on its surface. To the right of this pillar stands a large group of stalagmites, which at the floor form a single mass. As they rise each one gradually tapers off out of the mass, until only the single central stalagmite reaches the roof. The sides of the chamber are thickly coated with stalactites, which in many places form pillars which stand out a little distance from the wall. The roof is a dense mass of large and long stalactites. Passing to the end of this chamber there is nothing seen but a forest of pillars formed by the union of stalactites and stalagmites with a few dark holes between them. On getting into one of these holes a passage is entered which is flanked on either side by rows of pillars, between the bases of which are stalagmitic basins full of water. This avenue of pillars extends for about 25 yards, when the cave again widens out into a large and beautiful chamber called the "Queen's Chamber," which is about 50 yards long by 35 yards wide. From every part of the roof hang a perfect forest of stalactites, many of which are over 4 ft. in diameter at the base, while between these larger forms hang the smaller and more delicate stalactites. The floor has a number of large stalagmites standing up from it, and among these lie many stalactites which have fallen from the roof. It is also in many places strewn with well-rounded and water-worn boulders and pebbles, the presence of which show that at one time a stream of water had flowed through the cavern. This chamber narrows slightly, and then widens out again into another large chamber somewhat similar in general aspect to the Queen's Chamber, the roof being covered with large pendant stalactites, forming pillars towards the sides of the chamber, while the floor is covered with stalagmites, which in some places form large groups. A little further on in this direction the cave comes to an end, by being blocked by a sloping talus of debris, consisting mostly of large blocks of limestone. Near the end of the Queen's Chamber a passage goes off to the left, which winds in a very tortuous manner for a considerable distance, its course being mostly between walls of limestone, there being little or no deposit of carbonate of lime on them. By a little climbing the end of this passage is found to open out into a very large cavern, the roof of which is very high. In one corner is a beautiful mass of stalactites, which much resemble a frozen waterfall, but this is the only deposit of stalactites there is in the cavern. A great fall of rock from the roof of this chamber precludes further progress.

The

The Right-hand Cave.—The great archway may be taken as the entrance chamber of this cave. Viewed from the opposite side of Yarrangobilly Creek it is seen to be nearly a perfect arch. The large hole in the roof is somewhat egg-shaped, and stretches nearly the whole breadth of the arch. Some distance in from this it narrows down to a passage about 20 ft. in height, in which stand numerous isolated stalagmites which are very massive. This passage opens out into a large chamber, which is one of the finest in the caves. When seen from the entrance it presents a mass of stalagmites, some standing alone, and others in large groups, the whole bringing to the mind the spires and turrets of some great cathedral. Several large stalactites have recently fallen in this part of the cave, though the fractures are hardly fresh enough to have been caused by the shock of the recent earthquake. By a little climbing visitors can move about among these groups and pillars of stalagmite for considerable distances, but in many places there occur stalagmitic basins on the floor, some of them containing water to the depth of a few feet. There are many passages through between the stalagmites of this chamber to the entrances into the next chamber. The chief of these entrances is the Blow Hole, which is a small crooked hole through which it is a little difficult to squeeze. There is always a very strong draught blowing through it, so that the light is generally blown out. On passing through this blowhole the largest chamber yet discovered in these caves is entered. This is an enormous cavern. Its floor is covered with immense boulders, most of which have now a coating of stalagmite over them. The surface of this stalagmitic covering very much resembles the rough and jagged surface of a coral reef. Some of these blocks are so large that it is almost impossible to get over them. This enormous cavity goes in for a long distance, and near its furthest end it must attain its greatest height, for there is a point where far overhead a small dim spot of light can be seen. This seems to show that this great cavity has a small opening somewhere high-up on the hill side. It is very probable that there are other chambers in connection with this one whose entrances are not yet known. At the far end of this large chamber are one or two small cavities with very pretty stalactitic growths in them. The termination of this great cavern is a talus-heap of limestone blocks, which slopes upwards to the roof.

About 4 miles higher up the creek there is another cave, called the Copper Mine or Yarrangobilly Cave. In the neighbourhood of this there is a quartz reef containing copper ore, and hence the name of the cave. A stream of water flows out of the mouth of the cave, but it is possible to get into the cave when the water is low by stepping on the ridges of stalagmites which rise above the water. It extends for a considerable distance at one spot as a somewhat narrow passage, and at another widening out into a large chamber. So far as I saw the stalactitic growths were not of particular beauty or interest, though I did not get into every part of this cave. The bridle-path, up the side of the creek, between these caves, has a few sidlings which are somewhat dangerous looking, but the views obtained on the way of the limestone cliffs and the Yarrangobilly Valley are very fine.

The deposition of carbonate of lime in the form of stalactites and stalagmites in these caves has been more rapid than in the case of the Jenolan Caves. Here the stalactites are larger and more massive, and in many parts of the caves both these and the stalagmites are coated over with a thick layer of soft pulverulent deposit which easily rubs off. In many cases they assume the most fantastic shapes, forming crooked and irregular masses. The prevailing colour tint is yellow, although pure white and green are not uncommon. The fine and delicate forms of stalactite are not so common, but they do occur in clusters between the larger stalactites as small delicate white or yellow tubes. Although very many of the stalactites have been broken and otherwise disfigured by former visitors to the caves, there still remain some beautiful specimens of stalactitic growth, particularly in the Left-hand Cave and the middle chamber of the Right-hand Cave. The other features of this latter cave is its inmost chamber, which is well worth seeing, because of its vast size, and the enormous blocks of limestone which strew the floor.

In some of the smaller and drier cavities in these caves the floor is found to be covered with the bones of small animals. No bones have as yet been found cemented in the stalagmite of the floors of any of the caves, although it is quite probable that if search were made some such remains might be found. In Britain and some parts of the Continent of Europe there occur limestone caves which have yielded the remains of extinct animals, which have proved of the greatest scientific value; while, in a few instances, traces of prehistoric man have been discovered in these caves, such as layers of charcoal, which are the remains of his fires and the occurrence of his weapons and implements, under the stalagmitic floors. We have, in the Jenolan Caves, deposits of stalagmite containing fossil bones, which, however, have not yet been examined; and doubtless bone breccias occur in other caves in the Colony, which, if worked out, might give results of peculiar scientific interest, for it is very probable that some of our caves at least may have been open to the external air for ages. But apart from the scientific interest of these caves, as preservers of the remains of some of our ancient fauna, they have also a public interest in that they would well repay the visitor, both by their own natural beauty and by the magnificent mountain scenery which is to be seen by either route.

In both caves there has already been much damage done by former visitors breaking off the stalactites, and disfiguring those that are left by pencilling their names on them. To prevent any further damage of this kind from taking place it would be necessary either to put an iron gate across the mouth of the Great Arch, or else a gate across the entrance of each cave; but I think the former would be preferable, and also to have a guide and keeper, who would show visitors through the caves and see that no damage was done.

Inside the caves the improvements necessary for the safety of visitors would not require to be very extensive. In the Left-hand Cave there is a good path in as far as the beginning of the Avenue of Pillars mentioned above. At this point three steps would be a convenience, while the whole length of the avenue, about 25 yards, would need to be levelled by filling up the hollows. At the further end of it a couple of steps, with a short levelling, and then three more steps, would make progress easier. Through the Queen's Chamber and the one adjoining it a path can easily be cleared by the removal of a few broken stalagmites and the fallen stalactites which strew the floor. At the commencement of the passage which goes off from the Queen's Chamber to the left a number of steps would need to be cut, while at the end of the passage a ladder would be necessary in order to allow of visitors seeing the chamber at the end of it. In the Right-hand Cave steps would have to be cut or a ladder placed for a considerable distance among the groups of stalagmites, to get easily from the Middle Chamber to the Blow Hole. The Blow Hole itself, or some other of the openings, would require to be enlarged to enable visitors to pass into the Great Cavern. To make a path through this cavern it would be necessary to cut the tops of the boulders flat, which

which came in the way, and fill up the hollows between them with cement. If this were done, it is probable that in some parts of its course the path would require to be fenced in with iron-wire rope and netting. The course which this path would take through the Great Cavern would have to be fixed only after an examination of the whole area of the floor, as the boulders are so large and lie in such confusion. With regard to the site for an accommodation house and a horse-paddock, there can be no difficulty about these. Little over a $\frac{1}{4}$ of a mile down the Yarrangobilly Creek, where it takes a bend to the east, there is a piece of good land which would be very suitable both for the site of an accommodation house and a paddock of almost any size. This land is bounded on the west and south by the Yarrangobilly Creek, and on the east by what is called the Warm Spring, which at this point is a strong flowing creek, the waters of which are tepid. A path could easily be made up the side of the creek from the accommodation house here to the caves. The only spot nearer the caves than this where there is sufficient level ground for a house is within a few hundred yards to the south of the caves, but here there would be no water except what was carried up from the creek, 300 ft. below.

With reference to the appointment of a keeper to the caves, I have to state that while I was at the caves I met Mr. James Murray, of Kiandra, who knows the caves well, and seems otherwise well fitted to fill the post of caretaker and guide to the Yarrangobilly Caves.

I have, &c.,

WILLIAM ANDERSON,

Geological Surveyor.

APPENDIX L.

Mr. Geological Surveyor Anderson to The Geological Surveyor-in-Charge.

Report on the Kiandra Gold-field.

Department of Mines, Sydney, 11 January, 1887.

Sir,

In accordance with your instructions, I have inspected the auriferous Pliocene and Pleistocene deposits which are being hydraulic sluiced and otherwise worked for gold in the neighbourhood of Kiandra, and have the honor to submit the following report thereon:—

The late Mr. Lamont Young, in his report on the Kiandra Gold-field, published in the Annual Report of the Department of Mines for 1880, has given such a good account of the general features of the district, both physical and geological, that it will not be necessary for me to go into details regarding them.

At the present time the only hydraulic sluicing being carried on is by the Kiandra Sluicing Company, at the New Chum Hill claim, about $\frac{1}{4}$ of a mile to the N.W. of the township. The New Chum Hill is situated in the angle of junction between the Eucumbene River and Bullock's Head Creek. It is a "made" hill, and its summit is a heterogeneous mass of loose basalt blocks. At no point on this hill did I see the bed of basalt *in situ*. The workings are on the S.E. side of the hill. The most westerly of the two open cuttings has been formerly worked but is now stopped. The other large cutting to the east is the one which the Kiandra Sluicing Company are at present engaged on. The exposed face in this cutting ranges in height from 105 to 120 ft. The beds which form this section are as follows:—1st, wash-dirt; 2nd, clay; 3rd, carbonaceous clay; 4th, pipeclay; 5th, lignite; 6th, clay; 7th, basalt. The bed-rock consists of nearly vertically bedded Silurian rocks which have a meridional strike. Some of them contain a large amount of iron pyrites. Their colour varies much, and many of them are much decomposed, some into a pink and others into a yellowish clay. The surface of these slates on which the wash-dirt rests is very irregular. In some places there are from 1 to 2 in. of cement or iron ore between the slate and the wash-dirt, and some patches of this cement have proved very rich in gold, which is in the form of small water-worn pieces. Wherever the bed-rock is blue coloured there is no cement, but the wash-dirt has a blue tinge. The wash-dirt itself has an average thickness all round the exposed face of 10 ft. In some places it is quite loose, but in others it is somewhat cemented together. Lenticular patches of lignite, sand, and clay occur throughout it. The boulders and pebbles in the wash consist mostly of Silurian slates. Quartz pebbles do not occur in any great abundance, but some large boulders of quartz have been obtained which showed large patches of gold on them. In some places the cement occurs on the top as well as below the wash, but in this position it never contains payable gold.

The beds of clay and pipeclay are mostly of a white colour, but some parts of them are brown, pink, and yellow. As a rule they are fine-grained, except the upper beds, which are very gritty, being largely made up of small fragments of quartz. These clays show evidences of false bedding.

There are two beds of the so-called lignite. The lower of these is a chocolate-coloured carbonaceous clay, which contains the remains of much vegetable matter, in the form of stumps, branches, and leaves of trees, mostly in a good state of preservation. The bed is finely laminated, and easily splits up into fine layers, disclosing the fossil leaves in great profusion. This leaf-bed is of considerable thickness, and at one spot shows a beautiful example of contemporaneous erosion and deposition, where it has been entirely eroded through by a streamlet, and the old channel is now filled up with white clay, similar to the bed above it. In another part of the section occurs a second example of this, where the clay-bed below is eroded, and the leaf-bed rests immediately on the wash-dirt.

The upper bed of lignite is a hard black coaly-looking bed, almost entirely composed of vegetable matter, in the form of branches, twigs, and leaves of trees, all lying more or less horizontally, and as a rule well preserved.

With an average rainfall sluicing operations can be carried on at this claim almost all the year round. A constant supply of water is obtained from a dam which the Company have made in the Three-mile Creek. The water is conveyed by a race for a distance of 3 miles to the workings. The race comes in on the top of the face, and the water is conveyed from it, first in 22-inch pipes, and then in 15-inch pipes, to the bottom of the cutting, where the pipes are reduced to 13-inch, and this size of pipe carries the water to the nozzle, whose diameter at the point is $5\frac{1}{2}$ in. The pressure of the water at the nozzle point is 120 lb. to the square-inch. It can throw a stream of water a distance of 150 ft.; but to do work the distance must be from 100 to 120 ft. There are two sets of pipes from the race to the bottom of the workings, and two nozzles are at work placed at some distance from each other. The nozzles are movable in all directions, so that they can play on the bed-rock from a few feet in front of them to the face of the cliff, and on the cliff itself for a considerable distance on either side. The method of working is as follows:—The stream of water from the nozzles is applied to the wash-dirt at the base of the section, and as this is washed out the cliff is undermined, and as a result great masses of it fall. They sometimes effect

effect this by driving a tunnel in through the wash, and firing a large shot at the end of it. The nozzle is allowed to play upon these masses brought down from the cliff face, and all the loose material is washed away, leaving the larger lumps of clay and lignite. These are blown into small pieces by means of blasting, so that most of these clays and lignites are washed away along with the gold-bearing gravel. For the collection of the gold there are from 15 to 1,600 ft. of wooden boxes, which carry the muddy water from the workings to the Eucumbene River. The material which falls from the cliff along with the finer wash-dirt and gold is carried by the stream of water from the bottom of the cutting into the boxes, which are paved with stones. When the gold is to be collected from the boxes this false bottom of stones is taken out, and the amalgam of mercury and gold is removed and retorted. In 1885 the amount of gold obtained was 1,100 oz.

Township Hill lies to the west of Kiandra, and is separated from the New Chum Hill by the Bullock Head Creek, which proved very rich in gold for nearly a mile above its junction with the Eucumbene River. This gold had been washed out of the lead, which was cut across at this point by the creek in the formation of the valley. The hill itself has a capping of basalt, and the exposed sections and old shafts show that the clay-beds and lignite occur beneath it. Only one party are at present at work here, driving a tunnel into the hill to strike the wash. The tunnel is situated a little to the N.W. of the town, and at a slightly higher level. It has been driven 433 ft. through the slate rock. At the entrance the rock was somewhat soft, probably due to decomposition; but it gradually got harder until now at the end of the tunnel it is very hard and compact, and full of small veins of quartz. The direction of the tunnel is westerly, and they have every prospect of shortly striking the wash-dirt, which in all likelihood will be very rich.

The deep lead will no doubt be found under the basalt tableland which stretches from the Township Hill on to the Four-mile Creek, which is the next point southward where it has been worked. At North Broomfield, on the west side of this creek, the section in the cutting is composed of the same succession of beds as are found in the New Chum Hill workings. On the opposite side of the valley is another open cutting, and still further to the south are the South Broomfield workings. Sluicing operations are now stopped at all of these places. The only work being done is by a party who are engaged working the redistributed deep-lead gravels in the valley of the Four-mile Creek.

Nine-mile Diggings.—There are still one or two parties working in the redistributed gravels in the Nine-mile Creek.

The deep lead itself has been worked here as the Empress mine, and sluicing operations have been carried on until lately. The beds seen in the face are similar to the New Chum Hill beds, except in their thickness, which varies much in the different localities where they have been exposed. The wash here is thicker than at the New Chum Hill, and the gravel is not so coarse, while patches of sand, impregnated with iron, are more numerous. The upper bed of carbonaceous clay or lignite is not shown in the section exposed in the face. The pebbles in the wash are mostly quartz, and they are much smaller than in New Chum Hill.

Fifteen-mile Diggings.—They lie in a southerly direction from Kiandra, to the south of the Tumut River. Sluicing has been at a standstill here for some time. The section is essentially the same as in the other cuttings, except that here the carbonaceous clay is more shaly and harder than in the other localities, and in some parts the wash is in the form of a hard conglomerate. Some of the plant-remains in the hardened shaly clay are particularly well preserved.

Three miles further south there is some work being done in a small gully, with fairly good results. Between this point and the Fifteen-mile Diggings the basalt can be traced all the way.

Six-mile Diggings.—These are situated about 6 miles out from Kiandra on the north side of the Kiandra Plains. The wash-dirt here is much cut up by layers of sand. For a considerable distance further into the hill than has been worked there is very little thickness of clay above the wash-dirt, although higher up the hill the other clay and lignite beds come into the section, so that the gravel could be easily worked here for some distance. In all the workings the bed-rock is Silurian slate, having a N. and S. strike, with a high dip to the east, so that in this part of its course the old river had flowed approximately parallel to the strike of the slates.

This deep lead can be traced at intervals for over 20 miles in the neighbourhood of Kiandra, the basalt forming flat tablelands along the tops of the ridges. In some places the bed of basalt itself is seen, with its upper surface weathering out into rudely columnar blocks, while in others the soil is full of the basalt boulders.

The clay-beds in all the localities are remarkably uniform, both as to their succession and texture, and consequently they could not have been laid down by a strong flowing stream such as deposited the gold-bearing gravels below them. But I think that after the gravels had been deposited by the old stream, it is probable that during the deposition of these clay-beds lacustrine conditions must have prevailed. The occurrence of false bedding would show that there had been currents present, while the evidences of contemporaneous erosion and deposition in the lower carbonaceous clay-bed point to the fact that either its upper surface must have been, for a time at least, a land surface, probably a marshy one, or that it had been covered by only a small depth of water, which, gradually increasing in depth, allowed of the deposition of the clay-beds above it. There can be no doubt, I think, that the upper bed of carbonaceous clay or lignite was formed under conditions somewhat analogous to those which obtain in the formation of peat. After this there must have been a considerable depth of water in which the overlying beds of clay were deposited. In none of the sections did I see the bed of basalt resting on the bed below it, but it must have flowed down the valley as a stream of lava, covering up the deposits which had been forming there, and by its presence preserving the gold-bearing gravels and beds below it from being washed away by the denuding agents which have swept away the hills which formed the boundaries of the old river valley, leaving now as hills the deposits which were laid down in the bottom of the valley.

The great drawback to the working of this deep lead in the neighbourhood of Kiandra is the want of a sufficient supply of water for sluicing operations, although the work at the New Chum Hill can be carried on for most of the year. There is no doubt that from the number of places at which this deep lead has been proved to be payable the other parts of it will be equally so, and I believe that this lead will yet prove a very rich source of gold.

I have, &c.,

WILLIAM ANDERSON,

Geological Surveyor.

APPENDIX M.

APPENDIX M.

The Curator of the Mining and Geological Museum to The Under Secretary for Mines.
Report of the Curator of the Mining and Geological Museum.

Sir, Mining and Geological Museum, Department of Mines, 7 January, 1887.

I have the honor to submit the following report upon the examination, assays, and analyses of specimens submitted to the Department of Mines during 1886; returns of donations and other additions to the Mining and Geological Museum and Library; collections prepared for institutions and individuals; and progress made in the arrangement of the collection for display.

EXAMINATION, ASSAYS, AND ANALYSES OF SPECIMENS.

The increasing number of specimens submitted for examination each year affords practical evidence of the value to the public of the work being done in this way.

In addition to the samples assayed or analysed—of which particulars are given—numerous others have been personally submitted and verbally reported on after blow-pipe or other tests.

At the beginning of the year, upon your instructions, I undertook the correspondence in connection with results of assays, &c., as well as the bulk of the preliminary examinations, a course which I am pleased to report has resulted in the dispatch of the results to the senders either upon the day received from the Government analyst or the one following, in the majority of cases on the former, thus doing away with the unavoidable delay caused in submitting them in the usual way.

I desire to bear testimony to the promptness with which the Government Analyst and his officers have performed the great amount of work submitted to them. The following record reflects great credit upon the capability and energy of Mr. Mingaye, the officer who, under the Government Analyst's supervision, has performed the great bulk of the work.

2,211 samples were received in the ordinary way for examination. Of these 404 were deemed sufficiently tested by blow-pipe or other simple tests, and the senders informed.

1,807 were, after preliminary examination, submitted to the Government Analyst for treatment; of these 1,799 were completed by the end of the year, necessitating 3,647 separate tests and 51 complete analyses.

GOLD.

1,657 tests were made for gold, and resulted as follows:—

274 samples yielded from 2 dwt. to 884 oz. of gold per ton.

330 samples yielded from a trace to 1 dwt. 23 gr. of gold per ton.

1,053 samples yielded no gold.

LOCALITIES.

Localities and description of ores from which the best results were obtained,—

Locality.	Description.
Albury	Pyritous quartz.
Abercrombie Ranges	Gem sand.
Armidale	Quartz and breccia, associated with sulphide of antimony.
Bongongolong	Quartzite and pyrites.
Bundanoon	Gossan and compact iron ore.
Boro	Ferruginous carbonate and sulphide of copper.
Bombala	Quartz and massive pyrites.
Bellubula	Black sand associated with gem stones.
Bingera	Ferruginous quartz.
Bungonia	Ferruginous porous quartz and a little pyrites.
"	Quartz and iron ore showing free gold.
Bermagui	Quartz with free gold.
Carangera	Tailings.
Clear Creek	Blanketings.
Cudal	Ferruginous gossan.
Coolongolook	Quartz with pyrites and free gold.
Cowra	Ferruginous gossan.
Captain's Flat	Quartz with pyrites and specular iron.
Capertee	Ferruginous quartz.
Dromedary Mountain	Brown iron ore.
Fairfield	Ferruginous porous quartz with free gold.
"	Copper and iron pyrites with a thin film of black oxide of copper.
"	Ferruginous claystone.
"	Ferruginous, brecciated, felspathic vein-stuff.
Gundagai	Quartz and mispickel.
Goulburn	Pyritous quartz showing free gold.
Green Swamp	Quartz with iron pyrites.
Gulgong	Quartz showing free gold.
Glen Innes	Quartz with iron pyrites.
Hanging Rock	Ferruginous quartz and free gold.
Howlong	Quartz containing iron and arsenical pyrites.
Jerrara Creek	Porous silicious iron ore.
Lewis Ponds Creek	Ferruginous quartz, with a little carbonate of lead and clay fluccan.
"	Porous, friable, brown iron ore.
Lucknow	Iron pyrites (concentrated.)
Marulan	Brown iron ore.
"	Sulphide and oxide of antimony, with lead and quartz.
"	Quartz containing carbonate and sulphide of lead, a trace of antimony, and arsenical pyrites
Muttama	Concentrated pyrites.
"	Quartz, iron pyrites, and galena.
Mudgee	Ferruginous quartz and mispickel, showing free gold.
Mitchell	Quartz, with a little pyrites and galena.
Major's Creek	Quartz, with copper and iron pyrites and galena.
Nana Creek	Quartz.
Orange	Porous ferruginous quartz and iron pyrites.
Paling Yard Creek	Ferruginous gossan.
Sebastopol	Quartz, with iron pyrites and galena.
Turon River	Ferruginous quartz.
Tuena	Ferruginous carbonate of lead.
"	Massive iron pyrites, with black oxide of copper in lode-stuff.
Trunkey	Black sand, principally magnetic iron ore.
Urana	Ferruginous quartz.
Wagonga	Ferruginous quartz.
"	Ferruginous quartz with pyrites.

SILVER.

SILVER.

1,659 tests were made for silver, with the following results:—161 samples yielded from 10 oz. to 7,872 oz. 13 dwt. of silver per ton; 589 samples yielded from a trace to 9 oz. 19 dwt. per ton; 909 samples yielded no silver.

Localities.

Localities and character of ore from which the most favourable returns were obtained were:—

Armidale	In ferruginous carbonate of lead galena.
Barrier Range	Ferruginous quartz with galena and carbonate of lead.
Braidwood	Crushed sample.
Back Creek	Ferruginous schist and quartz veins.
Bingera	Ferruginous quartz.
Cooma	Galena.
Deepwater	Carbonate and sulphide of lead.
Ennerville	Ferruginous claystone and oxide of iron.
"	Fahlerz, galena, and pyrites, and a little quartz.
Emu Swamp	Porous, silicious, brown iron ore.
Fairfield	Porous ferruginous quartz.
Goulburn	Arsenical pyrites, and a little black oxide of copper.
Grafton	Crushed ferruginous sample, with galena.
Lewis Ponds Creek	Earthy carbonate of lead.
Marulan	Sulphide and oxide of antimony, with lead and quartz
"	Porous gossan and arsenical pyrites.
Mt. Grosvenor	Galena and quartz.
Mitchell	Galena.
Newbridge	Crushed sample.
Ophir	Porous ferruginous quartz.
Pye's Creek	Sulphide of antimony and lead occurring in nodular pieces.
"	Claystone and quartz, with fahlerz.
"	Galena and carbonate of lead.
Peelwood	Porous silicious gossan, with carbonate of lead.
"	Ironstone and quartz.
Tuena	Ferruginous carbonate of lead.
"	Porous iron ore.
"	Galena, carbonate of lead, and brown iron ore.
Tenterfield	Carbonate and sulphide of lead.
"	Galena.
Wiseman's Creek	Earthy veinstone, chiefly quartz.

COAL.

Twenty-one analyses were made of samples of coal. The best samples were from James Pye's 6-ft. seam, at a depth of 72 ft., in portion 53, parish of Black Jack, county Pottinger. A good sample was also obtained from Darcy's Well, in portion 16 of the same parish.

From the diamond drill bore at Heathcote, from a seam 4 feet 8 inches, at a depth of 1,513 feet.

From block 16, parish Wallarab, county of Northumberland.

From Lake Macquarie, from an unworked seam, and from Deep Creek, Bishop's Bridge, West Maitland.

SHALE.

Four analyses were made of samples of kerosene shale from the Mudgee Railway Line beyond Capertee, Rylstone, and Port Stephens, but in each case the amount of ash was excessive.

TIN.

Eighty-nine tests were made for tin; eighteen of the samples yielded from 1.25 to 70.3 per cent.; seventy-one from nil to a trace of tin per cent.

Localities.

Localities and character of ore from which the best returns were obtained were:—

Ashford	In greisen.
Bendemeer	Stream-tin ore.
Bundarra	"
Gilgai	Lode-tin ore.
Inverell	Stream
Gumble	A fine sample, obtained by crushing and washing lode-stuff, at Gumble Tin and Copper Mine—felspathic lode-stuff, with tinstone and carbonate of copper.
Moree, 40 mls. NE. of	Stream-tin ore.
Stannifer	Lode-tin ore.
Tenterfield	"

COPPER.

Seventy-three tests were made for copper, eighteen yielded from 20.5 per cent. to 72.05 per cent.; fifty-five from nil to 20 per cent. of metallic copper.

Localities.

Localities and character of ore from which the best results were obtained were:—

Bombala	Ferruginous grey and yellow sulphide of copper.
Barrier Range	Grey sulphide and traces of green carbonate of copper.
Bermagui Biver	Copper pyrites and traces of green carbonate of copper in quartz.
Cobar, 3 miles from ...	Blue and green carbonate of copper.
"	Green carbonate, from 70 miles west of Cobar
Fairfield	Crushed sample of iron and copper pyrites, coated with a thin film of black oxide of copper.
"	Ferruginous grey sulphide of copper.
Gulgong	Ferruginous carbonate and sulphide of copper.
Gundagai	Red oxide of copper and a little quartz.
Molong	Yellowish earthy felspathic lode-stuff with carbonates of copper.
Mitchell	Carbonates of copper from Tonkin's silver mine.
New England	Green carbonate and grey sulphide of copper, from Lottery Creek.
Razorback, 6 mls. from	Ferruginous copper gossan.
Shoalhaven River	Grey sulphide of copper in quartz.

ANTIMONY.

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ANTIMONY.

Twenty-three tests were made for antimony; sixteen yielded from 10 per cent. to 70·4 per cent., and seven from nil to 10 per cent. of metallic antimony.

Localities.

Localities and character of ore from which the best returns were obtained were:—

Bellinger River.....	Sulphide of antimony.
Coolongolook.....	Sulphide of antimony in quartz.
Carangula.....	Sulphide of antimony and a little quartz; sulphide and oxide of antimony.
Crudine.....	Breccia with sulphide of antimony.
Gulgong.....	Oxide of antimony, from Ford's Creek.
Macdonald River.....	Sulphide of antimony and a little quartz.
Razorback.....	Oxide and sulphide of antimony and a little quartz.
Sofala.....	Sulphide of antimony and quartz.
Shoalhaven.....	do do
Talbragar.....	Oxide of antimony.
Temora.....	Sulphide of antimony in quartz.

LEAD.

Eighty-three tests were made for lead; forty-eight of them yielded from 20 per cent. to 76·5 per cent.; and thirty-five from nil to 20 per cent. of metallic lead.

Localities.

Localities and character of ore from which the most favourable returns were obtained, were:—

Binalong.....	Sulphide of lead and a little quartz.
Bombala.....	Ferruginous sulphide of lead, quartz, and calcite, with sulphide of lead, copper pyrites, and a little green carbonate of ditto; ferruginous galena and carbonate of lead.
Burrowa.....	Crushed sample.
Barrier Range.....	Ferruginous carbonate of lead; ferruginous carbonate of lead and quartz.
Bathurst.....	Galena and pyritous quartz.
Braidwood.....	Schist rock with carbonate of lead.
Cooma.....	Galena (sulphide of lead).
Emmaville.....	Ferruginous felspathic gossan with galena; galena and carbonate of lead; galena and a little quartz and decomposed felspathic rock.
Fairfield.....	Ferruginous carbonate of lead galena.
Lewis Ponds Creek.....	Earthy carbonate of lead.
Mitchell.....	Ferruginous carbonate of lead galena.
Severn River.....	Galena carbonate and sulphate of lead.
Tenterfield.....	Carbonate and sulphate of lead.
Tuena.....	Ferruginous carbonate of lead.
Yass.....	Galena.

BISMUTH.

Eleven tests were made for bismuth, yielding from nil to 11·76 per cent., the latter being from the Gumble Mine, near Molong.

IRON.

Five analysis of iron ores were made—one from Port Stephens, yielding 48·14 per cent. of metallic iron; the others were of inferior character.

MANGANESE.

Twelve tests were made of manganese ores, yielding from 23·67 to 91 per cent. of manganese dioxide. The samples submitted were all various qualities of the ordinary black oxide of manganese, the best results were obtained from ores from the following localities:—

Localities.

Bendemeer, Bowning, Newbridge, Newcastle District, Pentecost Island, Sutton Forest, Walcha.

COBALT.

Eighteen tests were made for cobalt; fourteen yielded from 0·5 per cent. to 5·8 per cent. of sesquioxide of cobalt.

Localities and character of ore from which best results were obtained, were:—

Bungonia.....	Concretionary manganese oxide grit, cemented with oxide.
Bombala.....	Concretionary manganese oxide.
Glen Morrison.....	Porous do
Lake George.....	Concretionary do
Lismore.....	Decomposed felsite with joints, coated with slickensides of black oxide of manganese.
Port Macquarie.....	Earthy manganese oxide.
Sutton Forest.....	do do
Trial Bay.....	do do

NICKEL.

Five tests were made for nickel, but little more than a trace was found in them, and associated with cobalt in manganese oxide.

ZINC.

Four tests were made for zinc, yielding from 18·17 to 69·98 per cent. of metallic zinc—from the following localities:—

Localities.

Bredbo.....	Carbonate of zinc (the first discovery, as far as I am aware, of this ore in the Colony.)
Fairfield.....	Sulphide of zinc.
Pye's Creek.....	do with copper pyrites.

CHROMIUM.

Four tests were made for chromium, yielding from 28·44 per cent. to 47·70 per cent. of sesquioxide of chromium; the samples were chromite, and came from the Grafton District.

TUNGSTEN.

Two assays and one analysis were made of wolfram ores, yielding from 47·9 per cent. to 74·41 per cent. of tungstic trioxide, from the following localities:—

Localities.

Armidale.....	Scheelite (tungstate of lime.)
Peelwood.....	do do
Severn River.....	Wolfram (tungstate of iron and manganese).

PLATINUM.

Two tests were made for the presence of this rare metal, but without result.

LIMESTONE.

Four analyses were made of samples of limestone from the following localities, and yielding the accompanying percentages of carbonate of lime :—

Bungonia	86.70	per cent.	
Ben Bullen.....	95.32	"	
Myall River	52.52	"	} An argillaceous limestone, likely to be of use in the manufacture of hydraulic cement.
Muswellbrook	66.55	"		} Of an oolitic character.

GYPSUM.

An analysis of a sample of gypsum from Lake Tank, 20 miles north of Bourke, yielded :—

Sulphate of lime	75.66	per cent.
Water of crystallization and Hygroscopic moisture	20.20	"
Sulphate of magnesia .....	.61	"
Oxide of iron and alumina .....	.60	"
Silica	2.90	"
	<hr/>	
	99.97	per cent.

This mineral is reported to occur in considerable quantity.

WATER.

Four analyses were made of water for the purpose, in two instances, of ascertaining the cause of reported poisonous effects of water from Patrick's Station, near Denison Town, upon stock; in another the deleterious effects upon the human bladder, of water from Pike's well, near Curlewis Station, G. N. Railway line; and in the last, to ascertain whether a sample of water from Holy Box well, near Mossgiel, was becoming more potable.

MISCELLANEOUS.

Fifteen analyses were made of miscellaneous samples from various parts, and for various purposes.

MINING AND GEOLOGICAL MUSEUM.

108 donations were received during the year for the Mining and Geological Museum; the most important being a collection of Permian and Cretaceous fossils from the Royal Mineralogical and Geological Museum of Dresden, presented through the director, Dr. Genitz. Fossil fish, portion of ribs, jaw, and teeth of labyrinthodont, lamellibranchs, and plant remains from the Wianamatta shales at Bowral, by Mr. B. Dunstan; three specimens of diamonds in tertiary drift, and samples of diamondiferous wash from the Crown Jewel Mine, Inverell, by Mr. W. Brown; antimony ores from Mr. Cochran's property at Carangula, by Mr. W. H. Buckley; blue and white topaz and rock crystal from Cooyal, by Mr. S. Blackman; silver and copper ores from Wiseman's Creek Silver and Copper Mine, by Mr. T. A. DeWolf; tertiary fossil leaves and fruits from Mount Pleasant, Nundle, by Mr. J. Henderson; tin and copper ores from Gumble Tin and Copper Mine, by Mr. J. E. Kelly; the original fossil fish *Cleithrolepis granulatus* Eg. described by Sir Phillip Egerton, Bart., M.P., F.R.S., V.P.G.S., &c., in the Quarterly Journal of the Geological Society of London, 1864, Vol. XX, presented by the Reverend Canon King; chessylite from new Mount Hope, by Dr. M'Queen; metallic antimony in calcite, auriferous mispickel, &c., from New Reform Gold-mine, Lucknow, by Mr. H. W. Newman; chloride of silver from Northern Queensland, by Dr. Robertson; volcanic ash, stones, and scoriæ from the recent eruptions at Mount Tarawera, in New Zealand, by Mr. T. S. J. Rigg; diamond crystal from the Sydney Diamond Mining Company's property at Inverell, by Mr. T. Walters, manager.

In addition to the above, the collection has been augmented by specimens collected by yourself, Mr. Geological Surveyor David, and the Collector Mr. Charles Cullen, of which particulars are appended.

Mr. Cullen has been fortunate in discovering at Cockatoo Island, a portion of the first labyrinthodont found in Australia. It was identified by Professor W. J. Stephens, M.A., as being closely related to *Mastodonsaurus robustus* of the Trias of Stuttgart. The discovery of this interesting fossil, so closely resembling that from Stuttgart, even to the mineralogical character of the strata in which it is embedded, should, if the two formations yielding similar fossils can be classed together as homotaxial—though probably not geologically contemporaneous—set at rest the hitherto undecided question of the exact chronological age of the Hawkesbury series.

Following this discovery an almost perfect specimen of a smaller species of the same family was obtained from the same geological horizon at Gosford, and secured for this Museum. From the overlying Wianamatta shales at Bowral, portion of a jaw and teeth, and of a vertebra and ribs of a similar animal were discovered by Mr. B. Dunstan, and generously presented to the Museum.

The Museum has been further enriched by the addition of a large collection of fossil fish secured by Mr. Cullen, at Gosford. Many of the fossils are in a splendid state of preservation, and embrace—in addition to several known species—others that appear new to science. They were obtained in quarrying sandstone ballast for the railway line in course of construction at Gosford.

This discovery is particularly interesting and valuable, as hitherto, but few remains of fishes have been discovered in the Colony; and, with the exception of those found at Bowral, almost isolated specimens only. The majority of these were in the collection of the late Rev. W. B. Clarke, destroyed with the Garden Palace.

It is interesting to note that the only shell—a univalve, belonging to the Bellerophonidæ—as yet discovered in the Hawkesbury formation, should afford yet another example of the prolongation of the existence of an ancient type at the Antipodes. It was obtained in excavating the Government Dock at Cockatoo Island, and Mr. Robert Etheridge, jun., who has recently described and named it *Tremanotus Maideni*, states that it has affinities with a similar type in the Upper Silurian, and with a single (?) specimen discovered in the Cretaceous, of Europe (?); but is more closely related to the former. Its occurrence, therefore, in the Hawkesbury sandstone affords no evidence of the age of the beds.

The number of specimens registered amounted to 2,706, making the total to date 19,417.

From this total must deducted 1,056 specimens used for collections, leaving a balance of 18,361 in hand.

LIBRARY.

LIBRARY.

Sixty-one donations were received for the Library; amongst them being valuable reports of the geological surveys of the United States, India, Canada, and New Zealand; progress reports from the Secretary for Mines and Water Supply, Victoria, and reports of the proceedings of various scientific institutions abroad.

Nineteen collections, numbering 1,261 specimens, were prepared upon your instructions for the different institutions and individuals given in Appendix.

During the first quarter of the year a considerable amount of time was taken up in the arrangement and dispatch of the balance of the mineral exhibits for the Indian and Colonial Exhibition in London, which has just now closed.

From the reports published, the Mineral Court at the Exhibition fully sustained the reputation of New South Wales, being one of the most favoured of British possessions in the variety and extent of its mineral resources.

I am glad to be able to report that the Mining and Geological Museum is now sufficiently arranged to allow of the admittance of the public.

Owing to the limited space, specimens from other Colonies and countries have necessarily been curtailed, chief prominence being given to the minerals and fossils of the Colony.

No systematic arrangement has been aimed at other than the grouping of the various minerals and ores, and the stratigraphical arrangement of the fossils, owing to want of room, and to allow of additions and alterations from time to time as specimens are obtained.

In view of a more commodious building being obtained in the future, it is extremely advisable to obtain for the Museum a complete collection of minerals and fossils from Europe, as many breaks occur in our collection, the value of such would be unquestionable.

As I venture to think that a detailed description of the specimens in the Museum comes more within the scope of a pamphlet for distribution, I refrain from entering into it here, and briefly state that advantage has been taken of all the best specimens in hand, so far as space would allow, and that in the present year just begun, as show cases can be procured, the passages will be still further encroached upon, and other and more appropriate labels substituted, as the work can be performed at the Government Printing Office.

In concluding my report, I have to acknowledge the ready and willing assistance I have always received from my assistant, C. Hildebrandt, junior, since his appointment.

I have, &c.,
JOSEPH E. CARNE,
Curator.

Specimens obtained by Officers of the Department of Mines during 1886:—

Donor.	Donation.	Locality.
C. S. Wilkinson, F.G.S., F.L.S., Government Geologist.	Collections of minerals and fossils	From Gulgong, Coogal, Mudgee, Razorback, and Mitchell.
T. W. E. David, B.A., F.G.S., Geological Sur- veyor.	Collections of Carboniferous and Permo-car- boniferous fossils.	From Read Head, Singleton, West Maitland, Harper's Hill, Ravensfield, and Muswell- brook.
Do	Collections of minerals and gold-bearing ores...	Fairfield.
Do	Coal	Hunter River District.
Charles Cullen, collector...	Labyrinthodont and plant remains	Cockatoo Island.
Do	Collection of fossil fish.....	From the Hawkesbury series at Gosford.

Donations to the Library of the Mining and Geological Museum during 1887.

Donation.	Donor.
Third Annual Report of the United States Geological Survey, 1881-82.....	J. W. Powell, Director.
Fourth do do do do 1882-83.....	do
Older Mesozoic Flora of Virginia—Fontaine—Geological Survey, United States.....	do
Silver Lead Deposits of Eureka—Curtis— do do	do
Monographs of the Geological Survey of the United States. Vol. VIII.....	do
Mineral Resources of the United States. A. Williams, jun. 1883-84.....	do
Annual Report of the Comptroller of the Currency, United States. 1885.....	do
Bulletin of the United States Geological Survey. Parts VII, VIII, IX, X, XI, XII, XIII	do
Do do do Notes on the Mesozoic and Cenozoic	do
Palæontology of California. Part XV.	
Bulletin of the United States Geological Survey. On the higher Devonian Faunas of the Ontario County. New York. Part XVI.	do
Bulletin of the United States Geological Survey. On the development of crystalli- zation in the igneous rocks of Washoe, Nevada, with notes on the Geology of the district. Part XVII.	do
Bulletin of the United States Geological Survey. On Marine Eocene, Freshwater Miocene and other fossils mollusea of Western North America. Part XVIII.	do
Bulletin of the United States Geological Survey. Notes on the Stratigraphy of Cali- fornia. Part XIX.	do
Bulletin of the United States Geological Survey. Contributions to the Mineralogy of the Rocky Mountains. Part XX.	do
Bulletin of the United States Geological Survey. The Lignites of the great Sioux Reser- vation, a report on the region between the Grand and Moreau Rivers, Dakota. Part XXI.	do
Bulletin of the United States Geological Survey. On the new Cretaceous Fossils from California. Part XXII.	do
Bulletin of the United States Geological Survey. Observations on the Junction between the Eastern Sandstone and the Keweenaw Series on Keweenaw Point, Lake Superior. Part XXIII.	do

Donations, &c.—*continued.*

Donations.	Donor.
Preliminary Paper on the investigation of the Archæan Formations of the North-western States of America. (Extract from the Annual Report of the United Geological Survey. 1883-84. By Roland D. Irving.	J. W. Powell, Director.
Mineral Statistics of Victoria for 1884.....	Secretary for Mines and Water Supply, Victoria.
Do do 1885.....	do
Annual Report of the Acting Secretary for Mines and Water Supply, on the working of the statutes relating to the Regulations and Inspection of Mines and Mining Machinery during 1884.	do
Annual Report of the Secretary for Mines and Water Supply, Victoria. 1885.....	do
Reports of the Mining Registrars, for the quarter ending 31st March, 1885.....	do
Do do do do 30th September, 1885.....	do
Do do do do 31st December, 1885.....	do
Reports of the Mining Registrars for the quarter, 31st March, 1886.....	do
Do do do 30th June, 1886.....	do
First Progress Report of the Victorian Royal Commission on Water Supply, 1885.....	Secretary.
Further do do do do do with appendices thereto; extracts from Minutes of Committee, together with Minutes of Evidence, &c., 1885	do
Reports of the Inspectors of Mines to Her Majesty's Secretary of State for 1884.....	
Mining and Mineral Statistics of the United Kingdom of Great Britain and Ireland, 1884	
Records of the Geological Survey of India, Vol. XIX. Part 1, 1886.....	H. B. Medlicott, M.A., F.R.S., Superintendent.
Records of the Geological Survey of India, Vol. XIX. Part 3, 1886.....	do
Memoirs of the Geological Survey of India. Palæontologia Indica. Series XIII, Vol. I. Part 5.	do
Do do do do Series X, Vol. III.	do
Parts 7 and 8.	do
Do do do do Series XIV, Vol. 1-3. Fasciculus VI.	do
Handbook of New Zealand, with maps and plates.....	Dr. J. Hector, C.M.G., F.R.S., &c.
Detailed Guide and Catalogue to the Geological Exhibits in the New Zealand Court at the Indian and Colonial Exhibition, 1886.	do
Smithsonian report for 1883.....	Secretary.
Annales de la Société Géologique de Belgique. Tome douzième, 1884-85.....	do
Proceedings of the American Academy of Arts and Sciences. New Series, Vol. XII, from May, 1884, to May, 1885.	do
Do do do do Vol XIII. Part I	do
VIII Jahresbericht des Vereins für Erdkunde zu Metz, für, 1885.....	do
Report of the School of Mines, Ballarat, 1885.....	do
Transactions of the American Institute of Mining Engineers. Vol XIV. June, 1885, to May, 1886.	do
Bullettino della Societa Africana D'Italia Anno V. Fasc I. Gennais, 1886.....	do
Do do do do Fasc II. Febbrais, 1886.....	do
Bulletin of the Minnesota Academy of Natural Sciences, Minneapolis.....	do
Bergens Museum, Bidrag, til Myzostomernes anatomi, og Histologi af Fredtjof Nansen.	
Bulletin of the American Geographical Society. No. 1. 1886.....	do
Proceedings of the Canadian Institute, Toronto, June, 1886. Vol. XXI.....	do
Minutes of proceedings taken at the adjourned inquest on the bodies of forty-two men and boys, killed by the explosion at Unsworth Colliery on the 2nd March, 1885.	
Descriptive Catalogue of a collection of Economic Minerals of Canada at the Indian and Colonial Exhibition, London, 1886.	A. R. C. Selwyn, C.M.G., L.L.D., F.R.S., &c.

Donations to the Mining and Geological Museum during 1887.

Donor.	Donation.	Locality.
Mr. P. F. Adams (Surveyor-General).	Sulphur and scoræ.....	From the recent eruptions at Mount Tarawera, New Zealand.
Mr. H. J. Adams.....	Coal from Homeville Colliery.....	West Maitland.
Mr. S. Alexander.....	Carboniferous marine fossils.....	Wollongong.
Mr. Allen.....	Tine ore.....	Mount Schoolbridge Tin Mines, Port Darwin.
Mr. W. E. Abbott.....	Permo-carboniferous fossils.....	From Mount Wingen.
Mr. W. Brown.....	3 specimens of diamonds in Tertiary Drift, and samples of diamondiferous-wash.	From the Crown Jewel Mine, Inverell.
Mr. E. W. Bathurst.....	Silurian fossils.....	From near Marulan.
Mr. J. W. Boulton.....	Aboriginals' stone hatchet.....	From Yancannia, 120 miles north-east of Wilcannia
Mr. J. B. Beauregard.....	Auriferous and argentiferous lodestuff.....	From Lewis Ponds Creek, near Orange.
Mr. W. H. Buckley.....	Sulphide and oxide of antimony.....	From Cochran's property, near Carangula.
Mr. S. Blackman.....	Blue topaz and rock crystal.....	From Cooyal.
Mr. G. S. Buzacott.....	Galena (argentiferous).....	Ravenswood, Queensland.
Mr. J. Barling, L.S.....	Aremcolites and Aboriginals' stone hatchets.....	From near Gunnedah and Goonery Well.
Mr. Brown.....	Conularia and palæaster.....	Ravensfield.
Mr. Clarke.....	Gold in calcite.....	From Ti-tree, Oaky.
Do.....	Reef, 2 ft. thick, at a depth of 50 ft.....	Manilla Creek.
Mr. C. W. Chapman.....	Chloride of silver.....	From Silverton.
Mr. S. H. Cox.....	Alunite.....	From Bulladelah.
Dr. J. Cox.....	Recent shell conglomerate.....	From Mountain, Manly.
Mr. Cotter.....	Aboriginals' stone hatchets.....	Caiwarra Station, Queensland.
Mr. D. Dunstan.....	Fossil fish-shell, &c.....	From the Wianamatta series, Bowral.
Mr. P. Davies.....	Stolzite.....	From near Peelwood.
Do.....	Talc.....	From 12 miles south of Newbridge.
Do.....	Native silver.....	From Mexico.
Mr. T. A. De Wolf.....	Silver and copper ores.....	Wiseman's Creek silver Mine.
Messrs. Dyson & Porter.....	Manganese oxide.....	Moonbi.
Mr. S. Dawson.....	Silver ore.....	Eveleen Silver Mine, 140 miles from Palmerton, Northern Territory.

Donations, &c.—*continued.*

Donor	Donation	Locality
Mr G. Day, M P. Mr J M Dalyell Mr M. Davidson Engineer to New South Wales Water Commis- sion.	Auriferous ore Gold in calcite Carboniferous marine fossils Tertiary fossil leaves from under basalt	From a new reef, near Albury. From Mount Holly, near Rockhampton. Capelee Valley. Hanging Rock, near Nundle.
Mr J R Fealy Dr. Geinitz (Director)	Aboriginal's stone hatchet Collection of permian and cretaceous fossils	Emmaville. Royal Mineralogical and Geological Museum, Dresder.
Captain Garth Mr. Charles Hodson Mr J Henderson Mr Travers Jones, M.P. Mr. J. E. Kelly Do Mr C Knoblanche Rev. Archdeacon King Mr. H. Larkin Mr N Lockyer Do Mr. W. Litchfield Mr H. Leshe Mr Lowe Mr. W. G. M'Arthur Mr. R. Mullington Do Dr Morris Mr A Milne Mr J. M'Kay Manager Mr Macdonald Mr. D. Munio Mr J Mitchell Dr. M'Queen Mr. J H Maiden (Secre- tary, Technological Mu- seum). Do Do Mr. C S. M Glue Mr. J C Neild, M P. Mr H. W. Newman Do Mr Nancarrow Mr A Oppenheimer Mr M. Orlovick Mr H. W. Onslow Mr. D. A. Porter Do Mr V. Parkes, M P. Mr. W. Partington Mr. J. Reilly Mr. J. Rossiter Dr Robertson Mr. T. S. J. Rigg Do Do Mr J Ramsay Mr J Russell Mr. Ross Mr P. Speare Mr F. Smith Mr. H. L. Steel Mr C Solomon Mr G Spring, M P. Mr T. Suttou Mr S Somper Mr. Seaver Mr A H Taylor Mr. J Usher Mr. J. Veitch (Manager) Mr W. T. Weston Mr. T. Waters (Manager) Messrs. Wilson & Ritchie	Jasper Star antimony Tertiary fossil leaves Common opal Rich tin ore Pliocene fossil fruits Fluorspar Fossil fish Limestone Chlorobromide of silver Gold in quartz Tinstone nuggets Secondary pyrites investing fossil wood Silurian and carboniferous fossils Auriferous quartz Lode tin Orthoclase and quartz crystals Encrinurites in ironstone Cervantite Calamine Gold in cement Jet in kerosene shale Tripolite Collection of rocks Chessylite Cast of cobaltite crystal Cast of platinum nugget Gold nugget Fossil fruits Anglesite Metallic antimony in calcite Serpentine, containing auriferous mispickel Red hematite and goethite Stibnite Glossopetris Dendrites in sandstone Zeolites Topaz Fossil ferns Block of manganese oxide Collection of fossils Fossil wood, with iron pyrites Chloride of silver Volcanic ash Tikitapu stones Scoriae Miocene fossils Sulphate of barite Granite, conglomerate, basalt Scheelite Portion of a meteorite Granulated quartz Auriferous ores and associated rocks Chromite Pyritous quartz and galena Tin ore Lower carboniferous fossils Fossil fern (<i>Gleichenites</i>) Auriferous ores Collection of auriferous copper ores Gold in ferruginous clay slate Diamond crystal Gold in quartzite	From Lord Howe Island. From Armidale antimony ores. Mount Pleasant, near Nundle. From Gundagai. Gumble, near Molong. Forest Reefs. Woolgooli, near Yass From Cockatoo Island. From Ben Bullen. Broken Hill. Mundi Mundi, Silverton. From Pine Ridges, near Inverell. Near Mudgee. Yam Creek, Northern Territory. From Elsmore. do Mudgee. From Ford's Creek, near Gulgong. From 3½ miles from Collington, Bredbo Road. New Chum Hill, Kiandra Sluicing Company. Haitley. Lismore. Barren Jack Range, Murrumbidgee River. From New Mount Hope. Sweden. Russia California. From the Ophi Deep Lead, Beaconsfield, Tas- mania. From Campbell's Reef, Severn River. Lucknow. do Dubbo District From between Razorback and Cradine. Near Demson Town. Waterfalls. Glen Innes do From Liverpool and Gianville. Near Rockley. From near Gowrie. Forest Reefs. Northern Queensland. Bush Road, Tarawera, New Zealand. From foot of Mount Tarawera, New Zealand. Rotorua, New Zealand From the Murray Cliffs. Caloola. Bathurst. From Gara Falls From Thundah Station, Queensland. From near the Victorian Border, and about 20 miles N W of Gabo Bond & Co's mines, Haigraves. Near Young From Mount Grosvenor. Northern Territory. From top of mountain, 8,900 ft above sea level, between Bullahelah and Cooloolook. Narabeen. Lucknow. Gordon Mines, Buckinbar. Near Mount Hope, Lachlan District. From the Sydney Diamond mining Co.'s pro- perty, Inverell. From the Challenger Gold mine, Adelong.

COLLECTION sent from the Mining and Geological Museum.

No.	Date.	Description.	To whom sent.
40	22-3-86	Small collection of minerals of New South Wales	Mr. D. Munro, Lismore.
21	22-3-86	,, specimens ,, ,, ,, ..	Mr. H. H. Cooke, Parkes.
43	13-5-86	,, collection ,, ,, ,, ..	Mr. J. Davies, M.P., C.M.G.
49	13-5-86	,, ,, ,, ,, ,, ..	Mr. L. F. Heydon, M.P.
183		,, ,, ,, and fossils of New South Wales..	Hon. W. B. Dalley, P.C.
30	9 6-86	,, samples of ,, of New South Wales	Major Parrot, C.E.
20		Rock specimens (exchange)	Australian Museum
110	2-9-86	Collection of minerals and fossils	Newcastle School of Arts.
42	7-9-86	Small collection of minerals of New South Wales (exchange)..	J. Mackenzie, South Africa
32	7-9-86	,, ,, silver ores	Sandhurst School of Mines.
100	9-9-86	,, ,, minerals of New South Wales	Plattsburg Mechanics' Institute
100	11-9-86	,, ,, ,, ,,	Penguin Mining Institute and Museum, Tasmania.
22	15-9-86	Specimens of New South Wales iron ores and coal	Mr. W. H. Vivian, for a European smelting firm.
100	16-9-86	Collection of minerals for reference	Mr. J. M'Lean, editor of the Shoal- haven <i>Express</i> , Nowra.
70	24-9-86	Small collection of minerals	Mr. J. P. Abbott, M.P.
132	Sept.	,, ,, ,, of New South Wales	Imperial Government of Russia.
7	.. ..	Samples of silver and tin ores and asbestos	Mr. Cameron, for the Halifax Museum, Nova Scotia.
60	10-12-86	Collection of minerals of New South Wales	Lieut. J. C. Williams, H.M.S. "Myrmi- don."
1,161			

APPENDIX N.

Remarks on a Univalve Shell from the Hawkesbury Sandstone. By R. Etheridge, Junr., Palæontologist to the Geological Survey, New South Wales.

THE Hawkesbury Series, so largely developed around Sydney, has up to the present time proved quite barren of any traces of an invertebrate fauna. The discovery, therefore, of a univalve shell in the Hawkesbury Sandstone, near Sydney, by Mr. J. H. Maiden, Curator of the Technological Museum, is a fact of much importance, the organic remains hitherto consisting only of fish and plants.

The shell in question may belong to either one of two genera—*Bucania*, Hall, or *Tremanotus*, Hall—precisely as certain points in its structure are interpreted. Both these genera are members of the extinct family Bellerophontidæ, and nearly allied to *Bellerophon* itself. The family became extinct at the close of the Palæozoic Period, with the exception of one genus, *Bellerophina*, which appeared and died out in the Cretaceous Epoch. If the present shell is determined to be a *Bucania*, we have here simply a survival from the underlying Carboniferous rocks, at the termination of which period the genus ceased to exist. On the other hand, should the controversial point of structure, shortly to be touched upon, be maintained in favour of *Tremanotus*, we cannot help regarding the Hawkesbury fossil as a very interesting reappearance of a peculiar Upper Silurian type of Gasteropoda. *Tremanotus* occurs in the Niagara Group of North America, and in the equivalent horizon in Europe, the Wenlock Series; and although *Bucania* is not known in Australian Carboniferous rocks, notwithstanding its otherwise wide geographical range, representatives of the family Bellerophontidæ are found in the Upper Marine series of New South Wales.

The view of Dr. O. Feistmantel as to the Triassic age of the Hawkesbury series appears to be now generally accepted, based on the nature of its flora, and has been adopted by Mr. C. S. Wilkinson.* Accepting this view as probably the correct one, so far as our knowledge of the Hawkesbury flora at present exists; and, looking to the firmly established position of the group of beds above the Carboniferous series, we are constrained to regard the occurrence of *Tremanotus* in the Hawkesbury Sandstone as a reappearance of a member of the Bellerophontidæ, similar to that of the little *Bellerophina* in the Cretaceous period. I do not otherwise perceive how it is to be accounted for, when we remember that the Carboniferous fauna, of which the Bellerophontidæ form an important factor, died out at the close of the Upper Marine Series, almost completely, and that between this horizon and that of the Hawkesbury rocks we have the whole of the Upper Coal-measures without an invertebrate fauna. With the view of arriving at a more accurate conclusion, let us examine the characters of the two genera more minutely. *Bucania* was established † by Professor James Hall, of Albany, "to include several species of shells of a peculiar form, usually referred to *Bellerophon*, but from which they differ in having all the volutions visible, and gradually increasing in size. The *Bellerophon cornuarietes*, of Sowerby (Min. Conch., Tab. 469., f. 2) will fall under this genus." The name is derived from βυκωνη, a trumpet, which exceedingly well exemplifies the form of the shell, the whorls enlarging rapidly, with an expanded aperture, the last one being carinate along the median line of the back. *Tremanotus* is described thus ‡ by the same author: "Volutions apparently in the same plane; umbilicus on both sides; aperture expanded; the dorsal line pierced by several oblong perforations." On the species *Tremanotus alpheus* he remarks: "The specimen is a cast of the interior of the shell, and along the periphery presents a range of elongated oval prominences which have apparently been perforations in the shell, arranged at equal distances from each other." Now, a comparison between the characters of the two genera and those of the Hawkesbury fossil will indicate its resemblance to *Tremanotus*, rather than to *Bucania*. In all three the volutions are in the same plane, there is an umbilicus on both sides, and a much expanded trumpet-shaped aperture; but in *Bucania* the back of the body whorl is simply carinate, whereas both in *Tremanotus* and the Hawkesbury shell the carina bears traces of a series of oval apertures extending along its course—a very important structural difference. An inspection of the accompanying sketches will at once illustrate these distinctive features. The opinion has been advanced by Mr. S. A. Miller § that the "supposed openings on the cast represent the spines upon the back of the anterior part of the last whorl of the shell, and the fossil is a true *Bucania*." On

* Official Record, Sydney International Exhibition, 1879 (1881) p.p. 56 and 64 N. S. Wales Official Catalogue, Colonial and Indian Exhibition, 1886, p. 166. † Pal. New York, 1847, l. p. 32. ‡ 20th Annual Report, Regent's Univ. State New York, Cabinet Nat. Hist., 1867, p. 347. § Cat. American Pal. Foss 2nd Edit., 1885, p. 304.

On the other hand, the late Mr. F. B. Meek, in an able article, "Note on the affinities of the Bellerophonidae,"* used the row of isolated oval openings in *Tremanotus* as an argument for placing the family amongst the Prosobranchiate Gasteropoda. He says: "Now, as we have no examples, so far as known to the writer, either amongst the Heteropoda or Cephalopoda, living or extinct, of a shell with isolated siphonal openings, while we have many such examples amongst the Prosobranchiate Gasteropoda—such for instance as in the Haliotidae, Fissurellidae, and Pleurotomariidae—the bearing this feature in the newly discovered type has on the question respecting the affinities of the Bellerophonidae, will be readily understood. In other words, it indicates for the family a position near the Fissurellidae and Haliotidae, and between those groups and the Pleurotomariidae." Again he adds: "It will be seen that the shell under consideration (i.e., *Tremanotus*) presents exactly the form of *Bucantu*, from which it only differs in the peculiar and interesting character of having along the middle of the dorsal side a row of isolated oval siphonal openings."

It is manifest from these remarks that Mr. Meek did not for a moment regard the markings on Professor Hall's *Tremanotus* as "casts representing the spines on the back of the outer part of the last whorl," as suggested by Miller; but rather as genuine siphonal openings. If any further proof is wanting, it can be obtained by an inspection of the beautiful figures of *Tremanotus longitudinalis*, from the Wenlock beds of Gotland, given by Dr. G. Lindström,† in which the shelly matter of the mollusc has been retained, and the siphonal openings preserved in great perfection. Even a little more attention on Mr. Miller's part to American palæontological literature would probably have convinced him that these markings were not spines. In the "Geology of Canada," the late Mr. Billings figured‡ an example of *Bellerophon angustata*, Hall, in which the siphonal openings are even better shown than in Professor Hall's original delineation of *Tremanotus*, extending along the whole of the middle line of the back of the last whorl. Mr. Miller refers *Tremanotus alpheus*, Hall, to *Bucania Chicagoensis*, M'Chesney; but although Professor M'Chesney included his figures§ of the former, under the name of the latter, he was careful in his revised paper § to point out that they really represented *Tremanotus alpheus*, and the casts of the apertures are distinctly visible. Siphonal openings occupying this position are not alone confined to *Tremanotus* in the Bellerophonidae. For instance, in the genus *Salpingostoma*, F. Roemer||, from the Lower Silurian Boulder Drift of East Prussia, a single long slit-like aperture occurs on the median line of the back in a similar manner to the oval and more numerous one of *Tremanotus*. Lastly, in the genus *Tubina*, Barrande ¶, from the Upper Silurian Series of Bohemia, the periphery is ornamented with a row of apertures and an additional row on each side flanking the median series, all extended into curved hollow spines.

Accepting, therefore, the united opinions of Messrs. Meek and Lindström in favour of retaining *Bucania* and *Tremanotus* as separate genera, it necessarily follows that the Hawkesbury fossil has a greater affinity with the latter than the former. Furthermore, it must also be admitted that we have here a most interesting reappearance of a genus supposed to have closed its existence during the Upper Silurian.

As the shell found by Mr. Maiden is clearly distinct from any hitherto described species, I shall take much pleasure in describing it in his honour as,—

Tremanotus Maideni, sp. nov.

Sp. Char.—Shell discoidal, strongly trumpet-shaped, thin; whorls, five or more, visible on both sides, elliptical in section, the last one sub-angular at the sides, but the inner whorls with the flanks much more rounded; apertural expansion much prolonged upwards, but not greatly expanded laterally; the anterior or outer lip reflected backwards, and the slit, if present, not visible from imperfection of preservation; inner lip apparently not much reflected; siphonal openings numerous, close together, oval, and situated on rather raised, oblong prominences, which give to the periphery a rather broken-keeled appearance; surface of shell ornamented with spiral fluctuating lines, parallel to the dorsal keel, and which on the expanded outer lip become coarser and more plait-like. Length 4 in., breadth 2 in.

Obs.—This unique shell is quite distinct from either of the Gotland species, but is nearer to *T. alpheus*, Hall, or *T. angustata*, Hall, as figured by Billings, agreeing with the former especially in the broad plait-like ribbing on the back of the outer lip, and the apparent absence of much lateral expansion of the same.

I am not in possession of any information regarding the discovery of this interesting shell beyond the locality, but the suggestion may be thrown out that it perhaps came from one of the ironstone bands, which are described by the Rev. J. E. T. Woods** as forming "a characteristic feature in the Hawkesbury sandstone"; this is, however, a question which Mr. Maiden can satisfactorily settle. The fossil is decidedly surrounded by a matrix of Limonite, such as arises from the decay of organic matter. Mr. C. S. Wilkinson has mentioned †† the occurrence of boulders in the Hawkesbury series, but had he not described them as undoubtedly derived from the associated shale beds, I should suggest the possibility of the present fossil having been derived from a travelled boulder of some older formation. At any rate I should not be inclined to base any discussion as to the age of the Hawkesbury series on the occurrence of *Tremanotus Maideni*.

Locality and Horizon.—New Government Docks, Biloela, Sydney; Hawkesbury Sandstone, at a depth of 25 feet from surface. (*J. H. Maiden, Esq.*)

The following list of species of *Tremanotus* known to me may perhaps be of interest to those who care to pursue this subject further:—

Tremanotus alpheus, Hall, Twentieth Regent's Report State Cab. Nat. Hist., N. York, 1867, p. 347, t. 15 (6), f. 23 and 24.

Tremanotus angustata (Hall), Billings, Geol. Canada, 1863, p. 344, f. 352.

Tremanotus compressus, Lindström, Kongl. Svenska Vet.-Akad Handlingar, 1884, Bd. XIX., heft 2, no. 6, p. 87, t. 4, f. 8-12.

Tremanotus longitudinalis, Lindström, loc. cit., p. 86., t. 3, f. 39 and 40, t. 4, f. 1-7.

The following species may belong to the genus—

Tremanotus? (*Bellerophon dilatatus*), J. de C. Sby., Murchison's Sil. System, 1839, p. 627, t. 12, f. 23 and 24.

Tremanotus (Bucania) trigonostoma, Hall and Whitfield, Report Geol. Survey Ohio, 1875, vol. II., pt. 2, p. 146, t. 8, f. 5.

Explanation

* Proc. Acad. Sci., Chicago, 1886, I, p. 11. † Kongl. Svenska Vet.-Akad. Handlingar, 1884. Bd. XIX., heft 2, No. 6, p. 86, t. 4, f. 1-7.
 ‡ Geol. Canada, 1863, p. 344, f. 352. § Illustrations of New Palæozoic Fossils, 1865, t. 8, f. 4 a-b. || Lethæa Geognostica, Theil I, Atlas, 1876, t. 5, f. 12a and b. ¶ Owen's Palæontology, 1860, p. 71, f. 17 (8). ** Journ. R. Soc., New South Wales for 1882 (1883) vol. xvi. p. 70. †† Journ. R. Soc., New South Wales for 1879 (1880), vol. xiii., p. 106.

Explanation of the Figures

Fig. 1. *Tremanotus Maidenii*, Etheridge, Jun., showing the apertural expansion, with broad radiating faint plaits, and siphonal openings along the periphery. Hawkesbury Sandstone, Sydney—nat. size.

Fig. 2. The same viewed from the opposite side.

Fig. 3. The back of the body whorl showing the broken keel, and siphonal openings—nat. size.

Fig. 4 and 5. *Tremanotus alpheus*, Hall—after Hall—nat. size.

Fig. 6 and 7. *Bucania cornuarietes*, Sby., after J. de C. Sowerby, an internal cast with the shell removed—nat. size.

R. ETHERIDGE, JUNR.

 APPENDIX O.

Report on the Discovery of Fossils at Gosford and Bowral.

Soon after the discovery of remains of the gigantic Labyrinthodon, *Mastodonsaurus*, in the Hawkesbury sandstone formation at Cockatoo Island, the Mining and Geological Museum has received other specimens of one of these ancient Amphibians from Mr. B. Dunstan, an energetic geological student, who collected them from the Wianamatta Shales, near Bowral. Since then Mr. Joseph Thompson, solicitor, of Pitt-street, on being shown some fossil fishes found in a railway cutting near Gosford, by his clerk, Mr. A. Lambert, who is also an enthusiastic geological collector, advised him to submit them to me. I at once recognized amongst them the remains of another of these remarkable "frog-lizards."

Professor Stephens kindly undertook to examine this fossil, and in his elaborate paper on it, recently read before the Linnean Society, has described it under the new generic name *Platyceps*. I sent Mr. Cullen, the collector, to explore the excavation at Gosford, and he succeeded in obtaining not only more labyrinthodon remains, but also a magnificent collection, numbering over 400 specimens, of fossil fishes, ganoids and placoids, several of which are of remarkable forms, and appear to be new to science. Splendid impressions both of fishes and labyrinthodons are to be seen on the same piece of rock, and it is interesting to find thus associated the remains of these ancient types of fishes with those of the amphibian class, the next higher in the scale of the animal kingdom. This valuable collection is now in the Museum. Mr. Blunt, railway contractor, also obtained from the same quarry, at Gosford, a large slab of stone showing no less than eighteen fish impressions. This fine specimen Mr. Blunt has lent to the Department.

C. S. WILKINSON.

SUPERINTENDENT OF DRILLS' REPORT.

Superintendent of Drills to the Under Secretary for Mines, reporting on the workings of the Diamond-drills and Water-augers for the year 1886.

Sir, Department of Mines, Diamond-drill Branch, Sydney.

In submitting my annual report on the workings of the Diamond-drills and Water-augers for the year 1886, I do myself the honor to attach to said report the following Appendices:—

Diamond-drills.

Appendix A.—Return showing the locality, strata, depth bored, percentage of core extracted, value of diamonds used during the year, and rate per foot, exclusive of office salaries, store wages, and rent, also Superintendent of Drills' travelling expenses.

Appendix B.—Summary of diamond-drills, showing the number of feet bored, total working cost to the Department, average cost per foot, and amounts receivable for the year 1886.

Appendix C, Nos. 1 to 10.—Sections of boring during the year 1886.

Water-augers.

Appendix D.—Return showing the locality, depth bored, and rate per foot, exclusive of office salaries, store wages, and rent, also Superintendent of Drills' travelling expenses.

Appendix E.—Summary of water-augers, showing the number of feet bored, total working cost to Department, average cost per foot, and amounts receivable for the year 1886.

Appendix F, Nos. 1 to 12.—Sections of boring during the year 1886.

Appendix G.—Map of Colony of New South Wales, showing positions of wells and bores, as published last year, with additions.

Appendix H.—Index to wells and bores.

Appendix I.—Balance-sheet for diamond-drills.

Appendix J.—Balance-sheet for water-augers.

The diamond-drill work has not progressed so favourably as I anticipated it would do when I took charge of this work during the latter part of 1885. This, however, is owing to causes over which I had no control. In April last it was decided by the Honorable the Minister for Mines that in future all boring for coal must be done by private enterprise; after which all the applications for Government diamond-drills to bore for coal were refused, and those drills in the field were removed into the Diamond-drill Stores, Sydney, on completion of contract.

In June last application was made by the Sunny Corner Silver-mining Company, Mitchell, for the use of a diamond-drill to bore for a silver lode. This request was granted, on condition that the Company pay £10 per week for the use of drill, including diamonds and wear and tear of machinery, also to pay direct for all carriage in connection with the drill, and pay fortnightly the wages to the engineer and men, which terms the Company accepted, and a drill was forwarded accordingly. The terms accepted by the Sunny Corner Silver-mining Company were also open to the general public, but seem not to be appreciated by the latter, as no other applicants have accepted such terms, but they prefer to pay by results (at per foot).

Through the above-stated action only five drills were at work at the end of the year, viz.:—No. 3 drill, Bundanoon, in charge of Engineer Fryer; No. 7 drill, at Clarence Siding, in charge of Engineer Goodare; No. 10 drill, at Ballimore, near Dubbo, in charge of Engineer Richards; No. 11 drill, at Holt-Sutherland, in charge of Engineer Pearson; and No. 13 drill, at Sunny Corner, in charge of Engineer Roy.

No. A drill, which had bored to a depth of 1,020 feet at Clarence Siding, has been replaced by No. 7 drill; the former however, is still at Clarence Siding. Nos. 2, 4, 5, 6, 8, and 9 drills are in store.

The most important bore put down during the year is that at Holt-Sutherland, about 16 miles from Sydney.—2,242 feet 4 inches; still boring.*

This bore is the largest in diameter (being 3 in.) and deepest bore in the southern hemisphere, viz., 2,307 ft. In the year 1883 this bore was commenced and put down to the depth of 1,003 ft., and abandoned at that depth; but in April last No. 11 drill was forwarded by me and erected on the old bore, and active boring operations commenced, which, with the exception of an occasional breaking of a rod, progressed steadily. At the latter part of the boring operations the weight of the rods hanging down the bore was about 10 tons, and at times these rods would break and tear asunder by their own weight. Taper taps, which were always at hand, were then lowered into the broken rods, and the latter were quickly recovered. Coal was struck on the 21st December, and pierced through on the 24th December, the delay occurring in substituting a complex for an ordinary bore-barrel and the silting of the bore, as it frequently took eighteen hours to lower the rods, and six hours to hoist them to the surface; and, although there was a continual pressure of water from 125 to 150 lb. to the inch forced down the rods, it took fully two hours before the silt or coal dust would rise from the bottom of the bore to the surface. The first seam of coal proved to be 4 ft. 2 in. in thickness, at a depth of 2,228 ft. from surface. Boring operations were again proceeded with, and the second seam of coal was tapped 65 ft. below the first seam, which proved to be 5 ft. 3 in. in thickness.

Analysis of coal from the top seam struck in the Holt-Sutherland Estate by Government diamond-drill, at the depth of 2,228 ft.; thickness of seam, 4 ft. 2 in.:—

Moisture	0·67
Volatile hydrocarbon	13·06
Fixed carbon	70·70
Ash	15·16
Sulphur	0·41
	100·00

Specific gravity, 1·48; coke, 85·86.

Analysis

*Depth bored to 31st December, 1886, 2,242 feet 4 inches. Bore completed, 1st February, 1887, 2,307 feet 8 inches.

Analysis of coal dust brought up by drill water from same seam :—

Moisture	1·43
Volatile hydrocarbon	14·61
Fixed carbon	77·36
Ash	6·08
Sulphur	0·52
	<hr/>
	100·00

Specific gravity, 1·32 ; coke, 83·44.

53.—No. 1. Sample of coal from second seam struck in diamond-drill bore at Holt-Sutherland Estate, about 16 miles southerly from Sydney :—

Moisture	0·36
Volatile hydrocarbon	13·52
Fixed carbon	70·96
Ash	14·72
Sulphur	0·44
	<hr/>
	100·00

Specific gravity, 1·44.

54.—No. 2.

Moisture	0·24
Volatile hydrocarbon	14·03
Fixed carbon	73·96
Ash	11·16
Sulphur	0·61
	<hr/>
	100·00

Specific gravity, 1·34.

55.—No. 3.

Moisture	0·68
Volatile hydrocarbon	12·21
Fixed carbon	69·92
Ash	16·80
Sulphur	0·39
	<hr/>
	100·00

Specific gravity, 1·36.

NOTE.—The coke of No. 53 (85·68 per cent.) was black, not swollen, and rather soft. The coke of No. 54 (85·12 per cent.), No. 55 (86·72 per cent.), and 56 (86·56 per cent.) were all swollen slightly, firm, but dark coloured.

The ashes in all were dark grey. These coals are all short-flamed steam coals; the average ash is 13·8 per cent., which is $\frac{1}{2}$ per cent. more than Bulli coal. They are all, however, noticeable for the small amount of volatile hydrocarbon and the high percentage of fixed carbon, and should therefore give good results under boilers built to consume Welsh coal.

W. A. DIXON, F.I.C., F.G.S.

I stated in my last annual report that the Government diamond drills ought to be made self-supporting, and this, I am glad to be able to state, has been the case during this year, notwithstanding the obstacles and difficulties I had to contend against, such as the withdrawal of the majority of the drills from the field into the store, the enforced idleness of the drills at Clarence Siding and Dempsey Island, and other causes.

Taking all these circumstances into consideration, I have still cause to be thankful for the results obtained and credit gained to the Department of Mines, viz., that the Diamond-drill Branch is self-supporting.

It may, however, be thought or said that since the Diamond-drill Branch has been put on a footing of self-support the general public have had to pay more for the use of Government diamond-drills than formerly, but such is not the case, as the rates of boring per foot have been fixed lower on new applications during this year than formerly. In fact, while the public have obtained better terms, the expenditure has been reduced, and the earnings of the drills increased.

When I took charge of the Diamond-drill Branch, on the 14th September, 1885, in connection with my duties as Inspector of Mines, there were seven (7) clerks in the branch, viz. :—Messrs. Barden, Dalrymple, McNeil, McCulloch, Tuck, Spalding, and Mr. Draftsman W. S. Leigh. At the end of this year Messrs. McNeil, Dalrymple, and McCulloch are the only three clerks remaining, and I have no doubt with them the clerical work of the branch will be satisfactorily carried on. To specify one from the other would in my opinion be wrong, as they have all three assisted me very considerably by taking special interest in their official duties; and helped me to make the office work more simple and effective, which enabled me to bring the diamond-drill work to a successful issue. The loss sustained by this branch through the transfer of Mr. Draftsman W. S. Leigh to the Stock Branch will no doubt prove beneficial to the latter, he being an energetic and efficient officer.

I also thank Mr. J. S. Leigh (the storeman) for his unremitting attention to his work in connection with the diamond-drill store.

Three engineers were discharged by me during the year, namely :—Archibald, Hampshire, and Gretten; and Engineer Alexander Roy, who was very trustworthy and capable to do his work, had, to my sorrow, to leave the service on account of serious illness, and has since died.

The best and quickest work done with diamond-drills during the year was done by Engineer Pearson (assisted by Engineer Spargo), with No. 11 drill, at Holt-Sutherland Estate, and by Engineer Fryer, of No. 8 drill, at Red Head, Newcastle District.

Engineer Goodare, of No. A, and No. 7 drills, has been very unfortunate during the year, but I trust he will be able to show better results in future. The same may be said of Engineer Richards.

The

The total depth bored by diamond-drills during the year is 6,539 ft. 7½ in., or 4,785 ft. 8¼ in. less than during the year 1885. This is due to causes (as stated above) over which I had no control.

The average cost per foot of boring, exclusive of office salaries, store wages, and rent, also of Superintendent of Drills' travelling expenses, is 14s. 11½d., or 2s. 0½d. per foot less than during the year 1885.

Total working or field cost, exclusive of all office salaries, store wages, and rent, also Superintendent of Drills' travelling expenses, amounts to £4,899 12s. 5d., and the total earnings during the year amount to £6,264 12s. 5d.; but the total cost, inclusive of all expenditure in connection with the Diamond-drill Branch, amounts to £5,796 7s. 2d., or at the rate of 17s. 8½d. per foot for this year, which is 1s. 4½d. less per foot than for the year 1885.

In my last annual report I stated that the loss and wear of diamonds in the borehole, and the cost of diamonds at per foot bored, which had been very great at the commencement of the diamond-drill work, was likely to decrease, owing to the engineers in charge of diamond-drills gaining more knowledge in setting the diamonds in a working bit, to the knowledge gained in supervision as to which are the best diamonds adapted for the work, and to a thorough knowledge of the work generally, which experience alone can teach. My opinion formed last year has proved correct, as the following will show:—

Loss of diamonds and cost at per foot:—

	s.	d.
For 1883	3	8
„ 1884	2	0½
„ 1885	1	5¾
„ 1886	0	8½

Percentage of core saved, 80·07, which is 1·06 more than saved during last year.

Had it not been that the Government possesses the most powerful diamond-drill at present in New South Wales, capable to bore at least 2,500 ft. with a 3 in. diameter, the exact depth and thickness of the seams of coal within 16 miles of Sydney might not have been correctly ascertained for many years to come.

The boring for coal at Ballimore, about 23 miles from Dubbo, is also of great importance. At the depth of 540 ft. the drill passed through a seam of coal 5 ft. 2 in. in thickness, and while boring for a second seam of coal 10 ft. below the first seam artesian mineral water commenced to flow to the surface, and is now flowing at the rate of 1,000 gallons per hour, and will flow through tubing 30 ft. above the surface, and higher if required. The water when coming up out of the borehole contains a great deal of gas, and has a taste very similar to the German seltzer water. I believe this is the first artesian mineral water discovered at such a depth in New South Wales; it is therefore of great importance, and may become very valuable to the Colony. I brought two quart bottles full of water with me to Sydney for a rough analysis, but owing to the cork coming out the gas escaped, and the analysis is not as satisfactory as it would have been had I been able to obtain Winchester quart bottles on the place. Nevertheless the rough analysis obtained proves it to be a valuable mineral water, as the following certificate of analysis will show:—

Sir,

Department of Mines, Assay Branch, Sydney.

I have the honor to report as follows respecting the sample of water received from you, and numbered.

Total fixed residue, 226·66 grains per gallon, consisting of—

	Grains per gallon.
Carbonate of lime.....	14·00
Chloride of magnesium.....	12·05
Oxide of iron.....	1·02
Alumina.....	trace.
Silica.....	·21
Alkaline carbonates.....	199·38
	—————
	226·66

NOTE.—The quantity of water received was too small for a thorough analysis; if such a one is required it will be necessary to supply 2 gallons of the water in clear stoppered Winchester quart bottles, also two samples in sodawater bottles securely corked for the estimation of the free carbonic acid. The water has all the properties of a mineral water, and is highly charged with carbonic acid.

I have, &c.,

JOHN C. H. MINGAYE.

The above-stated facts prove beyond doubt that the use of the Government diamond-drills, although no burden on the revenue of the country, confer an immense benefit to the general public by materially assisting in the development of the mineral resources of New South Wales.

Water-augers.

In the beginning of the year there were eleven water-augers at work, nine in search of water and two prospecting for gold, viz., two on road Wilcannia to Silverton, three on road Bourke to Wanaaring, two on Moongulla Reserve, Collarindabri, one at Barringun, one at Hay, one prospecting for gold at Bingara, and one prospecting for gold at Forbes. The two augers on road Wilcannia to Silverton and the one at Barringun have been withdrawn and brought into store, as it was thought that any large or beneficial water supply would not likely be struck in the geological formation near the Wilcannia to Silverton road. At Barringun an artesian supply of water was not likely to be obtained at a lesser depth than from 1,000 to 1,200 ft., and the auger was not capable of boring to anything like that depth.

The water-augers at Moongulla Reserve have not been a success, and I intend to recommend their withdrawal at an early date. Total number of feet bored during the year was 2,185 ft. 3 in., or 1,661 ft. 4 in. less than during the year 1885, which is due to the withdrawal of three water-augers, as stated above. The total cost of boring per foot, exclusive of cost of carriage and office expenditure, was £1 7s. 8d., and inclusive of carriage is £1 12s. 8½d.; but inclusive of all office expenditure the total cost of boring per foot is £2 1s. 0½d.

When glancing over the mere figures the rate per foot of boring seems high, but when all circumstances are taken into consideration the rate of boring at per foot compares favourably with former years.

At Moongulla Reserve, near Collarindabri, the cost of boring appears very considerable. This is owing to great delays and other causes, viz., ministerial consideration whether the augers should be discontinued through great delay caused to articles forwarded from Sydney taking such length of time to reach bore site. Articles have often been on the road from four to six months. A shell auger which left Sydney four months ago has not yet arrived at the boring site. Swelling clays were also very troublesome, the borehole continually closing in.

The

The delays on the augers, Wilcannia to Silverton road, occurred through no funds being available for some time for the removal of augers and payment of men.

At Barrigun only 6 ft. were bored, after which the auger was removed, delays occurring through inability to obtain carriers and other causes.

The cost of the bore at Gunbar Road, 13 miles from Hay, also appears high, but as it includes the forcing down of tubing through 212 ft. and the sinking of two shafts 70 ft. and 78 ft. respectively, the latter shaft has been made use of as a permanent well, and has an ample water supply for domestic and stock purposes.

At Bingara the auger passed through nothing but hard boulders of felspar and other stones, which was the cause of slow boring; nevertheless it has proved the depth of the strata, and if gold-bearing. The boring was done in a large alluvial valley which miners had tried but could not bottom with their ordinary appliances.

In my last annual report I stated that I expected great results from the boring operations at the 75-mile, Bourke to Wanaaring road, also from the boring operations on the Gunbar Road, 13 miles from Hay. At the latter place the well has been completed for the use of the public on the site of the first bore, and a second bore has been started, which, by last report, was down 311 ft. Since the 14th August, when the services of the late foreman Ford were dispensed with, the work has been satisfactorily carried on by foreman William Morgan, but who has so far not had any fair opportunity to prove his real worth, but from whom I expect far greater results next year than have been obtained since the commencement of these boring operations.

The boring operations at the 75-mile, Bourke to Wanaaring road, closed with the depth of 844 ft. 2 in., but no water, although I was of opinion, as stated in my last report, that artesian water would be tapped at a depth between 700 to 800 ft. I am, however, pleased to state that although I was wrong as to the exact depth a large flow of artesian water was obtained at the 75-mile a few weeks after the closing of the year 1886, and the result being far beyond my most sanguine expectation. At the depth of 942 feet the water flowed to the surface at about 4,000 gallons per diem, and at the depth of 960 feet 33,000 gallons of water fit for domestic and stock purposes was flowing to the surface in twenty-four hours, and by latest report the supply was increasing. The water flowed through tubes fully 30 feet above the surface, and would flow or force up far higher if required.

This water supply has been tapped in the cretaceous formation in one of the most arid parts of New South Wales, and is therefore of immense value to the Colony at large. This tapping of large supplies of artesian water on the track from Bourke to Wanaaring to Mount Browne must by force of necessity and force of circumstances cause stock to travel during droughty seasons from Cooper's Creek, Thorgomindah Lake, and the Mount Browne and Poole districts towards the Bourke Railway Station and Sydney, instead of as formerly towards Adelaide. Great credit is due to foreman D. C. Carmichael for assisting me in every possible way to keep down the expenditure and bring the boring operations to a successful issue.

Foreman D. C. Carmichael had to undergo many hardships and privations, but his energy, perseverance, and practical knowledge overcame them all.

W. H. J. SLEE,
Superintendent of Drills.

APPENDIX A.

DIAMOND-DRILL work, showing average cost per foot, exclusive of office salaries, store wages, and rent, also Superintendent of Drills' travelling expenses, to the Department.

No of machine.	No. of bores.	Locality.	Strata.	Depths bored.		Days occupied.						Rate bored per hour.	Percentage of core extracted.	Cost.		Remarks.	
				Depth of each bore.	Total depth bored in each locality.	Moving.	Erecting.	Boring.	Repairing.	Idle.	Holidays.			Total.	Amounts.		Per foot.
A	1	Clarence Siding	Hawkesbury series and coal-measures	ft. in. 682 0	ft. in. 682 0	10	125	114	55	9	313	inches. 8-20	50-04	£ s. d. 698 13 7	£ s. d. 1 0 5½	From April 5th to June 1st, boring operations were stopped through non-payment of account (<i>vide</i> Ministerial decision). From November 22nd to December 31st, erecting stronger drill, the Company having decided to bore deeper than at first anticipated. These delays cost £111 6s. 8d., but for which, the cost would not have exceeded 17s 2½d. per foot.	
3	1	North Shore	Hawkesbury sandstone	57 7	57 7	6	45	17	2	70	14-40	86-40	145 8 11	2 10 6-3½	From February 6th to May 8th, drill detained idle at Dempsey Island, by Ministerial decision, to afford parties an opportunity to arrange a second bore. This delay cost £84 8s., but for which the cost would not have exceeded 17s. 6½d. per foot.
4	1	Wallsend	Upper coal-measures	470 5	470 5	6	27	82	4	1	3	123	8-60	81-09	315 2 4	0 13 4½	
5	1	Bundanoon	Hawkesbury series and coal-measures	720 3	720 3	7	22	72	93	90	6	290	15-00	68-56	658 2 3	0 18 3½	
7	1	Dempsey Island	Upper coal-measures	35 0	35 0	..	..	6	21	80	3	110	8-75	90-71	114 14 10	3 5 6½
8	1	Redhead	do do	637 4	.....	..	..	82	8	6	5	101	11-65	94-79	.....	.....
8	Trial bore	Do	do do	34 10	.....	4	9	11	1	1	1	27	4-75	.....	.....	November 8th to December 18th, drill detained at site (Red Head) owing to no money being available to remove it to Sydney. This delay cost £38 1s. 4d., but for which the cost would not have exceeded 20s. 3d. per foot.
8	2	Do	do do	935 7	1,607 9	4	2	114	13	41	..	174	12-30	89-49	661 4 5	1 0 8½	January 18th to March 10th, men detained at Lucknow owing to non-payment of wages. This delay cost £55 10s., but for which the cost would not have exceeded 16s. 3½d. per foot.
10	1	Lucknow	Altered Silurian and serpentine	64 6	64 6	12	..	10	1	35	1	59	9-70	55-42	108 1 8	1 13 6½	
10	1	Ballimore	Coal-measures	561 6	561 6	12	12	65	134	27	4	254	12-90	50-35	471 18 5	0 16 9½	
11	1	Heathcote	Hawkesbury series and coal-measures	153 8	153 8	..	..	25	53	51	2	136	9-22	83-94	208 6 8	1 7 1½
11	1	Sutherland	do do do	1,239 1	1,239 1	12	24	332	85	27	10	490	5-60	98-08	873 14 5	0 14 1½	
12	1	Pelican Flat	Upper coal-measures	£61 4s. 10d. expenses incurred at Pelican Flat after completion of bore, owing to indcision of Railway authorities whether or not to remove the drill to Adamstown. April 5th to May 29th, drill detained, being idle, owing to arbitration case. This delay cost £55 12s., but for which the cost would not have exceeded 16s. 4½d. per foot.
1	1	Adamstown	do do	243 1	243 1	8	5	15	3	74	..	105	24-30	73-09	254 4 9	1 0 11	
1	1	Werris Creek	Devonian	24 11	24 11	1	..	3	10	12	3	29	12-46	89-96	56 12 5	2 5 5½	
1	1	Waratah	Upper coal-measures	383 10½	383 10½	3	18	38	10	18	2	89	15-15	88-15	214 10 11	0 11 2½	
3	1	Mitchell	Siluro-Devonian altered and intrusive elvanite.	296 0	296 0	7	18	81	22	10	3	141	5-50	88-17	118 16 10	0 8 0½	
				6,539 7½	76 147	1,067	622	545	54	2,511	9-19	80-07	4,899 12 5	0 14 11½	The total delays amount to £344 18s., but for which the total cost would not have exceeded 13s. 10½d. per foot.		

J. S. McNEIL.
D. McCULLOCH.

W. H. J. SLEE,
Superintendent of Drills.

APPENDIX B.

SUMMARY of Diamond-drills, showing number of feet bored, total working cost to Department, average cost per foot, and amounts receivable for 1886.

No. of Drill.	Locality.	Feet bored.	Wages.	Carriage.		Travelling Expenses.	Repairs.	Diamonds used.	Stores issued.	Fuelwater and sundries.	Proportion of balance of general account.	Proportion of balance of general stores issued.	Office Salaries.	Store Wages.	Rent.	Superin- tendent of Drills' Travelling Expenses.	Total.	Cost per foot.	Amounts receivable inclusive of Ministerial concessions.	Amount conceded by the Minister.	Total amounts receivable, exclusive of Ministerial concessions.	Amount receivable per foot.																
				Railway.	Other.																																	
A	Clarence Siding....	682 0	£ s. d. 433 2 8	£ s. d. 15 5 7	£ s. d. 17 2 6	£ s. d. 8 7 8	£ s. d. 5 1 6	£ s. d. 65 4 9	£ s. d. 31 12 7	£ s. d. 28 4 5	£ s. d. 93 11 7	£ s. d. 1 0 4	£ s. d. 87 1 10	£ s. d. 28 19 1	£ s. d. 15 3 1	£ s. d. 5 0 3	£ s. d. 834 17 10	£ s. d.	£ s. d. 705 8 6	£ s. d.	£ s. d. 705 8 6	£ s. d.																
3	North Shore	57 7	87 17 4	.....	1 3 8	1 4 6	4 10 6	4 12 1	8 18 9	13 9 2	23 7 10	0 5 1	21 15 7	7 4 9	3 15 9	1 5 1	179 10 1	.....	113 13 0	.....	113 13 0	.....															
4	Wallsend.....	470 5	266 9 4	.....	1 14 1	2 11 0	1 17 0	.....	1 8 2	1 14 6	38 19 9	0 8 6	36 5 9	12 1 4	6 6 3	2 1 9	371 17 5	.....	399 17 1	.....	399 17 1	.....															
5	Bundanoon.....	720 3	406 18 0	7 14 4	3 4 10	2 7 4	6 12 6	51 14 0	40 18 9	51 18 0	85 15 10	0 18 8	79 16 8	26 10 10	13 17 9	4 11 11	782 19 5	.....	746 14 4	.....	746 14 4	.....															
7	Dempsey Island....	35 0	82 18 8	.....	0 15 6	0 10 0	11 1 5	.....	5 11 7	6 0 0	7 15 11	0 1 9	7 5 2	2 8 3	1 5 3	0 8 5	126 1 11	.....	35 0 0	.....	35 0 0	.....															
8	Redhead.....	1,607 9	478 4 0	.....	14 17 9	1 7 0	3 17 4	41 15 2	33 9 0	0 19 8	85 15 10	0 18 8	79 16 8	26 10 10	13 17 9	4 11 11	786 1 7	.....	846 16 2	.....	846 16 2	.....															
10	Lucknow.....	64 6	77 6 0	1 17 3	0 13 6	4 11 6	0 3 0	.....	7 5 0	0 10 0	15 12 0	0 3 5	14 10 4	4 16 6	2 10 6	0 16 9	130 15 9	.....	34 17 6	.....	34 17 6	.....															
10	Baltimore.....	561 6	344 0 0	7 0 6	4 19 9	8 1 0	6 1 0	6 4 6	14 18 3	1 16 10	77 19 7	0 17 0	72 11 6	24 2 6	12 12 6	4 3 6	585 8 5	.....	432 11 9	.....	432 11 9	.....															
11	Heathcote.....	153 8	179 1 4	0 0 3	0 5 5	3 16 8	.....	.....	8 17 7	0 10 0	15 12 0	0 3 5	14 10 4	4 16 6	2 10 6	0 16 9	231 0 9	.....	273 3 8	.....	273 3 8	.....															
11	Sutherland.....	1,239 1	670 6 4	3 0 3	8 8 6	7 3 5	12 18 6	26 18 5	60 2 6	6 0 0	77 19 6	0 17 0	72 11 6	24 2 6	12 12 6	4 3 6	987 4 5	.....	1,931 12 0	.....	1,931 12 0	.....															
12	Adamstown.....	243 1	186 18 0	.....	27 12 8	1 2 0	.....	.....	5 17 6	16 19 2	15 12 0	0 3 5	14 10 4	4 16 6	2 10 6	0 16 9	276 18 10	.....	238 17 7	.....	238 17 7	.....															
13	Werris Creek.....	24 11	35 19 4	1 1 4	0 18 9	.....	.....	.....	3 4 2	7 11 3	7 15 11	0 1 8	14 10 4	4 16 6	2 8 3	0 8 5	67 19 6	.....	48 14 10	.....	48 14 10	.....															
13	Waratah.....	383 10 1/4	119 10 0	36 4 0	6 0 8	3 13 6	5 4 9	2 3 11	6 16 3	3 7 3	31 3 10	0 6 9	29 0 8	9 13 1	5 1 2	1 13 5	259 19 3	.....	351 5 8	.....	351 5 8	.....															
13	Mitchell.....	296 0	.....	8 13 9	0 10 0	3 2 5	2 11 6	38 2 3	26 2 0	0 6 8	38 19 9	0 8 6	36 5 9	12 1 4	6 6 3	2 1 10	175 12 0	.....	141 0 4	.....	141 0 4	.....															
		6,539 7 1/2	3,368 11 0	80 17 3	88 7 7	47 18 0	59 19 0	236 15 1	255 2 1	139 6 11	616 1 4	6 14 2	573 7 3	190 12 3	99 15 0	33 0 3	5,796 7 2	0 17 8 1/2	6,299 12 5	35 0 0	6,264 12 5	0 19 1 1/2																
EXTRA EXPENDITURE.																																						
12	Pelican Flat.....	This cost incurred after completion of boring in 1885															61 4 10																					


COMPARATIVE STATEMENT OF COST PER FOOT OF DIAMONDS USED, 1883-6.

1883.....	s. d. 3 8	per foot.
1884.....	2 0 1/2	"
1885.....	1 5 1/2	"
1886.....	0 8 1/2	"

J. S. McNEIL.
D. McCULLOCH.

W. H. J. SLEE,
Superintendent of Drills.

Section of Bore (in course of Progress)
 No. A. Diamond Drill
 at Clarence Siding

Borehole 2" diameter	Nature of Strata	Thickness of Strata		Depth from Surface	
		ft.	in.	ft.	in.
	Bored in 1885, (See Annual Report for 1885)			338	0
	Sandstone and Conglomerate	25	0		
	Sandstone, Chert and Conglomerate	68	0		
	Coarse Conglomerate and Ironstone bands	27	0		
	Sandstone and Conglomerate	27	0		
	Soft chert and shale	11	0		
	Chert and Sandstone	34	0		
	Conglomerate and Ironstone bands	3	0		
	Sandstone and Conglomerate	18	0		
	Shale and Coal	1	0	552	0
	COAL	2	6		
	Coal and Shale		6		
	Chert and Sandstone	36	0		
	Shale and Coal bands	1	0		
	Shale and Coal bands	4	0		
	Chert	2	0		
	COAL	1	0		
	Shale	1	0		
	Chert	1	0		
	Shale and Coal bands	5	0		
	Cherty shale	2	0		
	Chert and Sandstone	22	0		
	Shale and Sandstone	6	0		
	Shale	8	0		
	Shale and Coal bands	4	0		
	Black shale	7	0		
	Coarse Sandstone	10	0		
	Shale and Coal bands	1	0		
Chert	1	0			
Shale and Coal bands	10	10			
Chert		6			
Blue Shale, Sandstone, Chert and Sandstone	92	3			
Shale and Sandstone	141	5			
Fine Conglomerate	22	0			
Blue Shale	3	0			
Shale and Sandstone	76	6			
Coal bands		2			
Shale and Sandstone	3	4			
To 31 st December 1885				1020	0

Section of Bore
No 4 Diamond Drill
at Young Wallsend

Borehole 4" Diameter	Nature of Strata	Thickness of Strata		Depth from Surface		Enlarged Sections																																																																																																																																																																																																									
		ft.	in.	ft.	in.																																																																																																																																																																																																										
	Shaft	37	0			<p>Coal Seam A. at 38 ft. 6 in.</p> <table border="1"> <tr><td>COAL with Clay bands</td><td>3</td><td>6</td></tr> <tr><td>COAL</td><td>3</td><td>6</td></tr> <tr><td>Clay</td><td>1</td><td>3</td></tr> <tr><td>COAL</td><td>1</td><td>6</td></tr> <tr><td>Clay</td><td>1</td><td>0</td></tr> <tr><td>Coal & bands</td><td>3</td><td>9</td></tr> <tr><td>Dirty coal with clay bands</td><td>9</td><td>0</td></tr> <tr><td>Slate shale</td><td>1</td><td>0</td></tr> <tr><td>Shale</td><td>1</td><td>6</td></tr> <tr><td>COAL</td><td>1</td><td>3</td></tr> <tr><td>Fireclay</td><td>1</td><td>2</td></tr> <tr><td>Coal & bands</td><td>7</td><td>1</td></tr> <tr><td>dirty COAL</td><td>3</td><td>3</td></tr> <tr><td>Thickness</td><td>37</td><td>9</td></tr> </table> <p>Coal Seam B. at 95 ft. 6 in.</p> <table border="1"> <tr><td>COAL</td><td>1</td><td>0</td></tr> <tr><td>Clay</td><td>1</td><td>0</td></tr> <tr><td>COAL</td><td>1</td><td>0</td></tr> <tr><td>Clay</td><td>1</td><td>0</td></tr> <tr><td>COAL</td><td>1</td><td>0</td></tr> <tr><td>Clay</td><td>1</td><td>0</td></tr> <tr><td>COAL</td><td>1</td><td>0</td></tr> <tr><td>Clay</td><td>1</td><td>0</td></tr> <tr><td>COAL</td><td>1</td><td>0</td></tr> <tr><td>Thickness</td><td>4</td><td>9</td></tr> </table> <p>Coal Seam C. at 128 ft. 9 in.</p> <table border="1"> <tr><td>COAL</td><td>9</td><td>9</td></tr> <tr><td>band</td><td>1</td><td>8</td></tr> <tr><td>COAL</td><td>1</td><td>8</td></tr> <tr><td>band</td><td>1</td><td>8</td></tr> <tr><td>Clay</td><td>1</td><td>5</td></tr> <tr><td>COAL</td><td>1</td><td>5</td></tr> <tr><td>Clay and sand</td><td>2</td><td>8</td></tr> <tr><td>COAL & bands</td><td>1</td><td>6</td></tr> <tr><td>COAL</td><td>1</td><td>9</td></tr> <tr><td>Clay</td><td>2</td><td>0</td></tr> <tr><td>COAL</td><td>2</td><td>0</td></tr> <tr><td>Clay</td><td>2</td><td>0</td></tr> <tr><td>COAL</td><td>1</td><td>1</td></tr> <tr><td>Clay</td><td>1</td><td>1</td></tr> <tr><td>Stone</td><td>1</td><td>1</td></tr> <tr><td>Clay</td><td>1</td><td>1</td></tr> <tr><td>COAL</td><td>1</td><td>1</td></tr> <tr><td>Clay</td><td>1</td><td>1</td></tr> <tr><td>COAL</td><td>1</td><td>1</td></tr> <tr><td>Thickness</td><td>13</td><td>9</td></tr> </table> <p>Coal Seam D. at 391 ft. 10 in.</p> <table border="1"> <tr><td>COAL</td><td>2</td><td>2</td></tr> <tr><td>band</td><td>2</td><td>2</td></tr> <tr><td>COAL</td><td>2</td><td>0</td></tr> <tr><td>band</td><td>2</td><td>0</td></tr> <tr><td>COAL</td><td>3</td><td>11</td></tr> <tr><td>Fireclay</td><td>6</td><td>6</td></tr> <tr><td>COAL</td><td>1</td><td>8</td></tr> <tr><td>band</td><td>1</td><td>8</td></tr> <tr><td>COAL & bands</td><td>7</td><td>2</td></tr> <tr><td>Grey shale</td><td>7</td><td>1</td></tr> <tr><td>Coal & bands</td><td>1</td><td>0</td></tr> <tr><td>COAL</td><td>1</td><td>6</td></tr> <tr><td>Black shale</td><td>1</td><td>6</td></tr> <tr><td>COAL</td><td>1</td><td>0</td></tr> <tr><td>Thickness</td><td>22</td><td>2</td></tr> </table> <p>Coal Seam E. at 461 ft. 3 in.</p> <table border="1"> <tr><td>COAL</td><td>1</td><td>3</td></tr> <tr><td>band</td><td>1</td><td>1</td></tr> <tr><td>COAL</td><td>1</td><td>4</td></tr> <tr><td>Stone</td><td>1</td><td>2</td></tr> <tr><td>COAL</td><td>1</td><td>4</td></tr> <tr><td>band</td><td>1</td><td>4</td></tr> <tr><td>COAL</td><td>1</td><td>8</td></tr> <tr><td>Thickness</td><td>6</td><td>2</td></tr> </table>	COAL with Clay bands	3	6	COAL	3	6	Clay	1	3	COAL	1	6	Clay	1	0	Coal & bands	3	9	Dirty coal with clay bands	9	0	Slate shale	1	0	Shale	1	6	COAL	1	3	Fireclay	1	2	Coal & bands	7	1	dirty COAL	3	3	Thickness	37	9	COAL	1	0	Clay	1	0	COAL	1	0	Clay	1	0	COAL	1	0	Clay	1	0	COAL	1	0	Clay	1	0	COAL	1	0	Thickness	4	9	COAL	9	9	band	1	8	COAL	1	8	band	1	8	Clay	1	5	COAL	1	5	Clay and sand	2	8	COAL & bands	1	6	COAL	1	9	Clay	2	0	COAL	2	0	Clay	2	0	COAL	1	1	Clay	1	1	Stone	1	1	Clay	1	1	COAL	1	1	Clay	1	1	COAL	1	1	Thickness	13	9	COAL	2	2	band	2	2	COAL	2	0	band	2	0	COAL	3	11	Fireclay	6	6	COAL	1	8	band	1	8	COAL & bands	7	2	Grey shale	7	1	Coal & bands	1	0	COAL	1	6	Black shale	1	6	COAL	1	0	Thickness	22	2	COAL	1	3	band	1	1	COAL	1	4	Stone	1	2	COAL	1	4	band	1	4	COAL	1	8	Thickness	6	2
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COAL	3	11																																																																																																																																																																																																													
Fireclay	6	6																																																																																																																																																																																																													
COAL	1	8																																																																																																																																																																																																													
band	1	8																																																																																																																																																																																																													
COAL & bands	7	2																																																																																																																																																																																																													
Grey shale	7	1																																																																																																																																																																																																													
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COAL	1	0																																																																																																																																																																																																													
Thickness	22	2																																																																																																																																																																																																													
COAL	1	3																																																																																																																																																																																																													
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COAL	1	4																																																																																																																																																																																																													
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COAL	1	8																																																																																																																																																																																																													
Thickness	6	2																																																																																																																																																																																																													
Grey Shale	1	6	38	6																																																																																																																																																																																																											
COAL SEAM A. (see enlarged section)	37	9																																																																																																																																																																																																													
Chert	15	3																																																																																																																																																																																																													
Grey Shale	3	3	95	6																																																																																																																																																																																																											
COAL SEAM B. (see enlarged section)	4	9																																																																																																																																																																																																													
Grey shale	28	0																																																																																																																																																																																																													
Clay	6	128	9																																																																																																																																																																																																												
COAL SEAM C.	13	9																																																																																																																																																																																																													
Stone and clay	1	0																																																																																																																																																																																																													
Hard grey shale	22	0																																																																																																																																																																																																													
Fine sand	1	0																																																																																																																																																																																																													
Conglomerate	38	6																																																																																																																																																																																																													
COAL	1	0																																																																																																																																																																																																													
Grey shale and coal pipes	5	0																																																																																																																																																																																																													
Grey shale	4	6																																																																																																																																																																																																													
Conglomerate, shale & sand	86	0																																																																																																																																																																																																													
Grey shale	1	0																																																																																																																																																																																																													
Fireclay	1	6																																																																																																																																																																																																													
Black shale	2	3																																																																																																																																																																																																													
Fireclay	1	6																																																																																																																																																																																																													
Coal and clay	2	0																																																																																																																																																																																																													
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Fireclay	1	3																																																																																																																																																																																																													
COAL	1	3																																																																																																																																																																																																													
Hard grey shale	18	0																																																																																																																																																																																																													
Grey shale with coal pipes	8	0																																																																																																																																																																																																													
Shale with coal & clay bands	3	0																																																																																																																																																																																																													
Grey shale	27	3																																																																																																																																																																																																													
Sandstone	3	9																																																																																																																																																																																																													
Grey shale	3	9																																																																																																																																																																																																													
COAL	3	6																																																																																																																																																																																																													
Grey shale	11	0																																																																																																																																																																																																													
Chert	4	1	391	10																																																																																																																																																																																																											
COAL SEAM D. (see enlarged section)	22	2																																																																																																																																																																																																													
Grey shale	45	6																																																																																																																																																																																																													
Black shale	1	9	461	3																																																																																																																																																																																																											
COAL SEAM E.	6	2																																																																																																																																																																																																													
Sandstone	3	0																																																																																																																																																																																																													
Total Depth			470	5																																																																																																																																																																																																											


Section of Bore No 1
No 5 Diamond Drill
at Bundanoon

Forehole 2 1/2" Diameter	Nature of Strata	Thickness of Strata		Depth from Surface	
		ft.	in	ft.	in.
	Standpipe -----	8	7		
	Sandstone and Ironstone bands	109	11		
	Sandstone -----	28	7		
	COAL -----	1	2		
	Sandstone and shale -----	11	6		
	Sandstone with Ironstone bands	11	0		
	Sandstone -----	38	0		
	Conglomerate -----	2	0		
	Ironstone band -----		2		
	Sandstone -----	213	5		
	Sandstone and Conglomerate	18	9		
	Sandstone -----	153	11		
	Sandstone and Conglomerate	21	0		
	Sandstone -----	54	5		
	Sandstone and Conglomerate	13	9		
	Sandstone -----	2	10		
Sandstone and Conglomerate	11	0			
Sandstone -----	5	7			
Sandstone and Conglomerate	14	8			
Total Depth -----				720	3

Section of Bore No 1
No 8 Diamond Drill
at Redhead


Borehole 2 1/2" Diameter	Nature of Strata	Thickness of Strata		Depth from Surface		Enlarged Sections
		ft.	in.	ft.	in.	
	Bored in 1885 (See Annual Report for 1885)			160	6	
	Blue Shale with Ironstone bands	37	2			 COAL Seam A. at 211 ft. 7 in.
	Chert	6	11			
	Blue Shale	7	0	211	7	
	COAL SEAM A. (See enlarged section)	13	3			
	Sandstone, Shale and Sandstone	45	6			
	Chert	11	10			
	COAL	3	5			
	Grey and black Shale	1	3			
	Chert and Shale	1	3			
	Sandstone	8	9			
	Shale	4	2	298	3	
	Ironstone	4	2			 Coal Seam B. at 298 ft. 3 in.
	COAL SEAM B. (See enlarged section)	26	7 1/2			
	Clay and Shale	8	1/2			
	Shale, Sandstone and Conglomerate	83	0			
	Shale and Coal bands	2	8			
	Ironstone	2	8			
	Black shale with COAL bands	1	6			
	Chert	1	3			
	Sandstone	3	9			
	Black shale, Sandstone and Blue shale	45	5			
	Black shale with clay bands	5	8	465	10	
	COAL SEAM C. (See enlarged section)	10	1			
	Sandstone and Shale	108	4			 Coal Seam C. at 465 ft. 10 in.
	Chert, Shale & Sandstone	55	8			
	COAL with bands	3	6			
	Shale and Sandstone	3	10			
	Shale with COAL pipe	1	9			
	COAL with shaly bands	1	8			
	COAL	9	2			
	Chert	4	6			
	Sandstone with COAL pipes	8	0			
Shale and Sandstone	4	0				
Blue shale	4	0				
Shale with coal bands	8	6				
Sandstone and shale	8	4				
COAL and bands	1	12				
Shale	13	4				
Chert	6	4				
Shale, Sandstone & Chert	6	4				
COAL	11	1/2				
Shale and Ironstone	6	10				
Shale, Sandstone & Blue shale	6	10				
COAL partings	7	5				
Sandstone and Shale	7	8				
COAL	4	6				
Shale with Sandstone	4	3				
COAL and bands	7	10				
Shale	7	4				
Chert	8	5				
Shale, Sandstone and Chert	8	5				
Shale with COAL partings	1	1				
Shale with Clay bands	1	0				
Stately Sandstone	23	1				
COAL with bands	1	4				
Chert	2	8				
COAL	7	8				
Stately Sandstone	4	8				
Blue shale	9	8				
Sandstone	4	9				
Conglomerate	4	5				
Sandstone						
Total Depth			797	10		

Section of Bore (in Course of Progress)
 No 10 Diamond Drill
 at Ballimore.

Borehole 2" Diameter	Nature of Strata	Thickness of Strata		Depth from Surface	
		ft.	in.	ft.	in.
	Soil	17	10		
	COAL	1	4		
	Sandstone		3		
	Shale	12	8		
	COAL		10		
	Shale	7	0		
	COAL	1	2		
	Shale	1	3		
	Sandstone	3	7		
	Shale	2	10		
	Sandstone	2	10		
	COAL		10		
	Sandstone	1	9		
	COAL		9		
	Shale	8	0		
	COAL		10		
	Shale	5	0		
	COAL		6		
	Shale	8	0		
	COAL		2		
	Shale	4	2		
	COAL		7		
	Shale	2	3		
	COAL		3		
	Sandstone and shale	93	7		
	COAL		4		
	Shale	11	3		
	Sandstone	9	9		
	Conglomerate	5	3		
	Sandstone and shale	51	6		
	Soft shale with sandstone partings and brown shale	194	6		
	Shale	15	0		
	Black shale	7	1		
	Dark soft shale with soft sandstone bands	28	8		
	Shaly sandstone	8	3		
	Soft sandstone	18	2		
	Coaly shale		10	526	7
	COAL	5	3		
	COAL	4	1		
	COAL	5	6		
soft fireclay	16	1			
soft coaly shale					
soft sandstone					
Drifty sand	4	0			
To 31 st December 1886				561	6

Note - Artesian Water (Mineral) was tapped at a depth of 550 feet and rose 50 feet over surface at a rate of 1000 Gallons per hour. Strata and sediment from bottom of bore was thrown over the surface by the force of water.

Section of Bore
No 11 Diamond Drill
at Holt-Sutherland Estate

Borehole 3" Diameter	Nature of Strata	Thickness of Strata		Depth from surface	
		ft.	in.	ft.	in.
	Bored during 1883 See Annual Report for 1883			1003	3
	Greyish white sandstone with layers of mudstone and grey shale	53	0		
	Mudstone dark grey 12-6; Sandstone grey 15-8	28	2		
	Sandy clay shale & mudstone 8-10; Whitish grey sandstone 52-0	69	10		
	Sandstone fine grained whitish grey and dark clay shale	87	0		
	Clay shale crumbling on exposure	5	6		
	Sandstone fine grained whitish grey with layers of clay shale	123	10		
	Sandy clay shale grey with valves of Estheria species	1	3		
	Sandstone whitish & greenish grey with layers of clay shale	58	5		
	Sandy clay shales 3-0; Clay shale 1-3; Sandstone 1-0	5	3		
	Clay shale chocolate 3-6; Sandstone fine grained grey & greenish grey 3-0	26	6		
	Sandstone greenish grey glauconitic with layers of mudstone & clay shale	38	11		
	Conglomerate 0-6; Sandstone greenish grey, glauconitic, pebbly 45-10	46	4		
	Sandstone glauconitic, pebbly and fine grained	30	2		
	Sandstone glauconitic 20-4; Sandstone greenish grey glauconitic 33-10	54	2		
	Sandstone and clay shale alternating	2	6		
	Sandy clay shale dark with valves of Estheria species	2	1		
	Sandstone glauconitic with layers of dark shale and garnister	11	6		
	Sandstone pebbly glauconitic 12-8; Siliceous clay shale 0-6	13	3		
	Pebbly sandstone glauconitic with layers of siliceous clay shale & garnister	23	10		
	Sandstone glauconitic pebbly in places	31	8		
	Sandstone glauconitic with layers of clay shale	5	6		
	Pebbly sandstone glauconitic 12-0; Clay shale light grey 4-0	16	0		
	Clay shale & mudstone dark greenish grey and reddish purple	35	10 1/2		
	Clay shale reddish purple with thin flakes of native copper	1	4		
	Clay shale reddish purple	1	4		
	Clay shale with thin flakes of native copper	2 1/2	1		
	Siliceous clay shale 10-0; Sandy clay shale with native copper 1-0	11	0		
	Siliceous clay shales 7-4; Clay shales with flakes of native copper 0-5	7	9		
	Siliceous clay shales greenish black	1	2		
	Clay shale dark greenish black copper bearing	1	3		
	Siliceous clay shale 2-7; Clay shale copper bearing 0-6	3	1		
	Clay shale, crumbling on exposure	10	3		
	Sandstone dark grey carbonaceous and glauconitic	13	7		
	Conglomerate 9-7; Sandstone glauconitic 4-0	13	7		
	Clay shale and garnister 11-1; Clayey sandstone 5-0	16	11		
	Clay shale siliceous greenish grey	7	0		
	Clayey sandstone glauconitic	12	3		
	Conglomerate fine with bands of glauconitic sandstone	12	2		
	Clay shale greenish grey 5-0; Sandstone glauconitic 6-0	11	0		
	Conglomerate sandstone & fine conglomerate with a little clay shale	9	6		
	Garnister greenish grey 0-6; Clayey sandstone greenish grey 3-0	3	6		
	Siliceous clay shales greenish grey	6	6		
	Coarse pebbly sandstone with bands fine conglomerate	27	9		
	Siliceous clay shales and glauconitic sandstone	39	0		
	Carbonaceous sandstone with coal pipes	25	6		
	Conglomeratic sandstone greenish brown	4	10		
	Clay shale grey, crumbling on exposure	10	3		
	Siliceous clay shale containing fragments carbonized plants	9	0		
	Sandstone and clayey sandstone	2	0		
Garnister and siliceous clay shale with bands clay shale	25	0			
Sandstone greenish grey 2-6; Clay shale 6-0	8	6			
Clayey sandstone compact, dark grey	5	0			
Fireclay & garnister, root of plant converted into coal occurs in this fireclay	5	0			
Sandstone greenish grey 16-6; Conglomerate 3-0	19	6			
Sandy clay shale dark grey	98	4			
Sandy clay shale with carbonized roots	1	0			
Sandstone, clayey in places, greenish brown	8	2			
Siliceous clay shale dark grey with thin ferruginous bands	12	0			
Sandstone fine grained 7-4; Sandy clay shale 0-6	7	10			
Carbonaceous sandstone compact	14	0			
Conglomerate carbonaceous with small pebbles greenish quartzite	5	8	2228	0	
COAL					
Clay shale dark 1-2; Carbonaceous sandstone 10-9	4	2			
Sandstone, dark carbonaceous with coal pipes	11	11			
Conglomerate, loosely cemented	26	9			
Pebbly sandstone, glauconitic & carbonaceous with coal pipes	7	4			
Carbonaceous mudstone, dark laminated sandstone	2	2			
Sandstone compact greenish grey & conglomeratic	6	10			
Griddy sandstone 0-6; Clay ironstone brown 0-5	11	11			
Sandstone dark with coal pipes	11	11			
Conglomerate with thin bands of sandstone	1	11 1/2			
Sandstone soft greenish grey with a few pebbles	5	0 1/2	2296	6	
COAL SEAM					
Carbonaceous sandy shale black	5	3			
Carbonaceous clayey sandstone, dark fine grained	3	3 1/2			
Coaly clay shale black	8 1/2	8 1/2			
Coaly shale with films of coal	0 1/2	0 1/2			
are left at bottom of borehole	1	9 1/2			
Total Depth			2307	8	

Note. - Depth bored to 31st December 1886, 2242 ft. 4 in. Bore completed 3rd February 1887, Total Depth 2307 ft. 8 in.

Section of Bore
 No 12 Diamond Drill
 at New Lambton, Adamstown

Borehole 3" Diameter	Nature of Strata	Thickness of Strata		Depth from Surface	
		ft.	in.	ft.	in.
	Standpipe -----	10	0		
	Soft sandstone and clay -----	44	0		
	COAL and bands -----	1	6		
	Shale and Sandstone -----	66	6		
	COAL and bands -----	1	11		
	Shale and Sandstone -----	20	2		
	Black coal shales & coal pipes -----	4	2		
	Shale -----	4	4		
	Sandstone -----	4	6		
	Conglomerate and Sandstone -----	3	6		
	Conglomerate -----	42	4		
	Conglomerate shale & Sandstone -----	15	9		
	Shale and Sandstone -----	1	6		
	Coaly shale and coal pipes -----	1	0		
	post -----	6	0		
Shale and Sandstone -----	15	11			
Total Depth -----			243	1	

Section of Bore
No 13 Diamond Drill
at Folly Coal fields, Waratah.

Borehole 3" Diameter	Nature of strata	Thickness of strata		Depth from Surface		Enlarged Sections																														
		ft.	in.	ft.	in.																															
	Stand pipe	25	7			<p>COAL SEAM A. at 96 ft. 8 in.</p> <table border="1"> <tr><td>COAL</td><td>10</td></tr> <tr><td>Sand</td><td>4 1/2</td></tr> <tr><td>COAL</td><td>3</td></tr> <tr><td>fireclay</td><td>3</td></tr> <tr><td>Sand</td><td>1 1/2</td></tr> <tr><td>COAL</td><td>8</td></tr> <tr><td>COAL</td><td>4 1/2</td></tr> <tr><td>Sand</td><td>2</td></tr> <tr><td>COAL</td><td>2 1/2</td></tr> <tr><td>Sand</td><td>1</td></tr> <tr><td>COAL</td><td>5</td></tr> <tr><td>Sand</td><td>1</td></tr> <tr><td>COAL</td><td>1 1/4</td></tr> <tr><td>Black sand</td><td></td></tr> <tr><td>Thickness</td><td>6 5</td></tr> </table>	COAL	10	Sand	4 1/2	COAL	3	fireclay	3	Sand	1 1/2	COAL	8	COAL	4 1/2	Sand	2	COAL	2 1/2	Sand	1	COAL	5	Sand	1	COAL	1 1/4	Black sand		Thickness	6 5
	COAL	10																																		
	Sand	4 1/2																																		
	COAL	3																																		
	fireclay	3																																		
	Sand	1 1/2																																		
	COAL	8																																		
	COAL	4 1/2																																		
	Sand	2																																		
	COAL	2 1/2																																		
	Sand	1																																		
	COAL	5																																		
	Sand	1																																		
	COAL	1 1/4																																		
	Black sand																																			
	Thickness	6 5																																		
	Blue shale	22	7																																	
	Blue shale & sandstone	8	0																																	
	Shale and sandstone	40	6	96	8																															
	} COAL SEAM A. (See enlarged section)	6	5			<p>COAL SEAM B. at 143 ft. 9 in.</p> <table border="1"> <tr><td>COAL</td><td>9 1/2</td></tr> <tr><td>fireclay</td><td>8</td></tr> <tr><td>COAL</td><td>1 4</td></tr> <tr><td>Shale</td><td>8</td></tr> <tr><td>COAL</td><td>7</td></tr> <tr><td>Sand</td><td>5</td></tr> <tr><td>Thickness</td><td>4 5 1/2</td></tr> </table>	COAL	9 1/2	fireclay	8	COAL	1 4	Shale	8	COAL	7	Sand	5	Thickness	4 5 1/2																
COAL		9 1/2																																		
fireclay	8																																			
COAL	1 4																																			
Shale	8																																			
COAL	7																																			
Sand	5																																			
Thickness	4 5 1/2																																			
Chert	14	1 1/2																																		
Hard shale	6	0 1/2																																		
Shale & fine conglomerate	15	10																																		
Shale & sandstone	4	8	143	9																																
} COAL SEAM B. (See enlarged section)	4	5 1/2																																		
	Shale and sandstone	10	3 1/2																																	
COAL Sand with coal pipes	2	5																																		
fireclay		3																																		
COAL		4																																		
Shale & sandstone	14	10 1/2																																		
Blue shale	6	2																																		
Black shale	10	8																																		
Blue shale	12	4																																		
Shale and sandstone	12	4																																		
Blue shale	43	4																																		
Blue shale & chert	11	0																																		
Chert	4	0																																		
Blue shale	6	6																																		
Broken shale & chert	7	0																																		
Broken shale	71	2																																		
Blue shale	22	4																																		
Total Depth				383	10 1/2																															

Section of Bore (in course of progress)
 No 13 Diamond Drill
 at Sunny Corner

Borehole 3" Diameter	Nature of Strata	Thickness of Strata		Depth from Surface	
		ft.	in.	ft.	in.
	Standpipe -----	5	0		
	Grey slate shale -----	3	0		
	Gravel and clay -----	3	0		
	Grey shale -----	13	0		
	Grey slate shale -----	4	6		
	Grey and blue shale -----	7	10		
	Pipeclay and shale -----	1	8		
	Grey and blue shale -----	20	6		
	Blue shale -----	24	9		
	Grey and blue shale -----	7	4		
	Hard blue shale with mundic -----	2	11		
	Hard grey quartz with mundic -----	1	10		
	Grey rock with quartz -----	19	6		
	Grey and blue rock -----	36	2		
	Grey rock with quartz -----	58	0		
Hard grey shale -----	57	0			
To 31 st December 1886 -----			296	0	

APPENDIX D.

REPORT of Water-auger Work for the year 1886, exclusive of office salaries, store wages, and rent, also for Superintendent of Drills' travelling expenses.

No of Machine	No of Bores put down	Locality	Days occupied							Depths			Rate bored per day	Cost of Carriage	Working Cost exclusive of Carriage	Working Cost inclusive of Carriage	Cost per foot		Remarks																	
			Moving	Erecting	Boring	Baling	Repairing	Delays	Holidays	Tank sinking	Total	Each bore					Total	ft		in	ft	in	ft	in	£	s	d	£	s	d	£	s	d	£	s	d
1, 2, & 3	1	Bourke	2	166		92	51	2			313	ft	in	ft	in	ft	in	£	s	d	£	s	d	£	s	d	£	s	d	(a) At Moongulla Reserve the loss of time was very considerable owing to several causes over which I had no control. First, Ministerial, considering whether the auger should be discontinued, second, swelling clay continually closing the bore, and articles forwarded to Moongulla often took from four to six months to reach there from Sydney. A shell auger has now been on the road for four months and not yet arrived. (b) Wilcanma to Silvertown, delays occurred through no funds being available for removal of augers and payment of wages. (c) At Barrington only 6 feet 7 inches were bored, the expenses were incurred through non payment of wages and inability to obtain carriers to remove auger. (d) The cost of the Hay bore at first sight appears very high, but as it includes the forcing of tubes through sand drift, and the sinking and timbering of two wells of a permanent nature 70 and 75 feet respectively, the cost would (were such taken as boring) be less than Bourke, viz, £1 7s 5s per foot. The forcing of tubes was begun by the late foreman, Ford, in the month of May last, who then reported that he would have the tubes down in a fortnight, but which was not completed on the 14th of August, when his services were dispensed with. Foreman Morgan, now in charge, succeeded him, and continued the work to the end of the year. He also sunk and timbered the aforementioned shafts. No 2 bore is now in progress, and Mr Morgan reports being already down 311 feet.						
4 & 6	1	Moongulla (a)	12	66	7	47	180	1			313	192	0	192	0	2	11	112	12	0	725	6	7	837	18	7	1	5	1		1	8	11			
5	1	Wilcanma to Silvertown (b)	1	1			73	1			77	18	0			18	0				506	3	4	561	5	6	2	12	8		2	18	5			
8	1	" "	1	2	47	8	34		4		96	229	2			4	10 $\frac{1}{2}$																			
	2	" "	7				79	1			87	7	4			1	0 $\frac{1}{2}$																			
10	1	" "	6	5	42	2	17	14			86	250	5			5	11 $\frac{1}{2}$																			
	2	" "	2				36	2	1		41	1	9			0	10 $\frac{1}{2}$																			
	3	" "	4								4	52	0			13	0																			
7	1	Barrington (c)	3	21		8					11	73	0	631	8	24	4	88	18	11	762	6	3	851	5	2	1	4	1 $\frac{1}{2}$		1	6	11 $\frac{1}{2}$			
11	1	Hay (d)	64	51	189	7	2				313	193	1	193	1	3	0 $\frac{1}{2}$	25	7	3	608	16	6	637	3	9	3	3	0 $\frac{1}{2}$		3	6	0			
Gold prospecting bores —			11	22	423	60	402	468	8	4	1,398	1,601	6	1,601	6	3	9 $\frac{3}{4}$	287	15	11	2,694	7	4	2,982	3	3	1	13	7 $\frac{1}{4}$		1	17	2 $\frac{1}{2}$			
9	{ Gaol well }	Bingera										13	3																							
9	{ Shaft }	" "										7	6																							
10	1	Bingera (e)	28	12	55		21	22	3		141	36	6																							
	2	" "										63	6	120	9	2	2 $\frac{1}{4}$	74	3	9	211	18	11	256	2	8	1	15	1 $\frac{1}{4}$	2	7	4 $\frac{1}{2}$				
	3	Forbes										169	0																							
	4	" "										104	0																							
	5	" "										74	6																							
		" "	12	13	54		13	28	2		122	57	6																							
		" "	51	47	532	60	436	518	13	4	1,661	2,185	3	2,185	3	4	1 $\frac{1}{2}$	549	17	2	3,023	18	1	3,573	15	3	1	7	8	1	12	8 $\frac{1}{2}$				

J. S. McNEIL
D. McCulloch.

W. H. J. SLEE,
Superintendent of Drills.

APPENDIX E.

SUMMARY of Water-augers, showing number of feet bored, total working cost to Department, and average cost per foot for 1886.

No. of Auger.	Locality.	Feet bored.	Wages.	Carriage.		Travelling expenses.	Repairs.	Stores issued.	Sundries.	Proportion of balance of general account.	Proportion of balance of general stores issued.	Office salaries.	Store wages.	Rent.	Superintendent of Drills' travelling expenses.	Total.	Cost per foot.
				Railway.	Other.												
1, 2, & 3	Bourke	578 2	588 1 4	19 17 0	42 14 5	28 2 3	5 6 0	19 18 9	47 10 3	83 14 3	2 14 4	232 4 11	77 4 3	40 8 1	12 7 4	1,200 3 2	.. .. .
4 & 6	Moongulla	192 0	401 12 8		21 15 2	25 17 9	6 17 0	14 8 2	30 3 0	55 15 6	1 16 3	154 16 8	51 9 6	26 18 9	9 18 4	804 8 9	.... ..
5, 8, & 10	Wilcanna to Silverton. ,	631 8	655 6 0		66 14 3	23 14 0	11 8 0	31 9 1	24 6 0	37 3 8	1 4 2	103 4 5	34 6 3	17 19 2	5 18 10	1,012 13 10	.... ..
7	Barrungun	6 7	66 2 0		.. ..	9 10 0	5 10 2		8 12 0	4 13 1	0 3 0	12 18 1	4 5 9	2 4 11	0 14 11	114 13 11	. . . .
11	Hay	193 1	449 3 0	10 3 9	1 10 0	6 5 3	8 9 0	34 8 3	98 8 7	27 17 9	0 18 2	77 8 4	25 14 9	13 9 4	4 9 2	758 5 4	.... ..
		1,601 6	2,160 5 0	30 9 0	132 13 10	96 9 3	37 10 2	100 4 3	208 19 10	209 4 3	6 15 11	580 12 5	193 0 6	101 0 3	33 8 7	3,890 5 0	2 8 6½
	Gold prospecting bores:—																
9	Bingera	120 9	143 19 0	....	74 3 9	6 9 6	11 6 0	11 18 7	38 5 10	.. .. .				.. ..		286 2 8	.....
10	Forbes	463 0	97 9 4	79 9 9	108 7 9	1 17 6		17 7 0	0 18 0	.. .. .				.. ..		305 9 4	.....
		2,185 3	2,401 13 4	109 10 6	315 5 4	104 16 3	48 16 2	129 9 10	248 3 8	209 4 3	6 15 11	580 12 5	193 0 6	101 0 3	33 8 7	4,481 17 0	2 1 0½

J. S. McNBILL.
D. McCULLOCH.

W. H. J. SLEE,
Superintendent of Drills.

SECTION OF BORE NO. E.
 NO. 2 WATER AUGER
 AT 75 FEET POST
 ROAD BOURKE TO WARRAWING

Thickness of Strata	Feet	in	Nature of Strata	Bore Hole	Height Water rose from point of tapping	Quality	Depth Water Tapped
260	0	0	Bored in 1885 - (See Appendix Report)		<p>Rose over surface at the rate of 4000 Gallons per day.</p> <p>Rose 20 feet over surface at the rate of 33000 Gallons per day.</p>	<p>Fresh</p>	<p>0</p>
9	0	Blue & grey sandstone					
15	6	Fine blue clay shale					
5	0	20. 20. with green speckling					
14	6	Sandy clay shales					
10	0	Blue & black shale					
48	4	Blue shale with thin seams of sandstone					
39	6	Black & blue clayey shale					
38	4	Black clay shale					
30	10	Blue clayey sandy shale					
23	10	Black clay shale					
33	0	Blue and black shale with thin layers sand					
34	2	Sandstone and white rock of bowlers					
25	6	Hard blue clay with sandstone of bowlers					
11	0	Grey & dark sandstone					
22	6	Rock and shale					
16	6	Blue rock & sandstone					
25	10	Bluish grey sandstone with clay & shales					
13	8	Blue rock & grey stone					
16	0	Grey sandstone & black clay shade with small fossil wood					
26	3	Grey & black sandstone & clay					
20	0	Grey & black sand & black shaly clay					
16	0	Black & grey shaly rock with water worn pebbles & 1/2 inch seams of pyrites					
22	4	Light grey sand & sandstone & black shaly clay in layers					
21	0	Black & shaly brown clay shale of sandstone of sand with small shells					
24	9	Grey sandy of black clay					
14	10	Light grey rock and black shaly clay					
28	3	Dark clay & sand					
16	3	Dark grey & brownish sand					
26	8	Light grey sand and brown clay					
2	8	Grey clay with decaying rock					
12	9	Grey clay & grey pebbles					
14	7	Grey clay & grey pebbles					
3	0	Light grey sandy limestone with small shells					
960	0	Total Depth					

REMARKS

Fresh Artesian Water Tapped at 942 ft. rose over surface at a rate of 4000 Gal. per day

" " " 958 ft. rose 20 ft. over surface at a rate of 33000 Gal. per day.

The fresh Artesian Water Tapped at 942 feet continued to flow at an increasing rate until at 958 feet after cutting through a light layer into the water channel, the water burst up and rising 20 feet over surface continued to flow at the rate of 33000 Gallons per day. By test accounts the supply is increasing. Strata from 24. Water channel at 958 feet was driven up over the surface by the force of water.

Note - 115 ft. 10 in. of 2 1/2 in bore put down in 1887.

(SG 337-2e)

Section of Bore No. 1 (in course of progress)
 Nos 4 & 6 Water Augers
 at Moonulla Reserve

Thickness of strata		Nature of strata	Borehole	Height Water rose from point of tapping	Quality	Depth Water Tapped		
ft.	in.					ft.	in.	
Surface								
134	0	Bored in 1885.... (See Annual Report for 1885)						
18	0	Clay				Salt	139	0
8	6	Pipeclay						
14	6	Conglomerate and wash dirt.						
33	6	Limestone with drift sand.				Salt	200	0
7	6	Limestone & yellow clay						
8	0	Pipeclay						
19	0	Red & white clay & pebbles						
16	0	Soft white clay						
35	0	Yellow clay				Salt	269	0
2	0	Blue clay						
2	0	Pipeclay						
1	0	Cemented sand						
8	0	Yellow clay						
8	6	Pipeclay						
10	6	Blue clay						
326	0	To 31 st December 1886						

Remarks

Salt water tapped at 139 feet, rose to within 33 ft. of surface.
 " " " " 200 " " " " " "
 " " " " 269 "
 Rate of supply not given.

Section of Bore No. B.H.
 No. 5 Water Auger
 Near Glen Lyon Station
 Road Wilcannna to Silverton

Thickness of strata		Nature of strata	Bore hole	Height water rose from point of tapping	Quality	Depth water tapped		
ft	in					ft	in	
			Surface					
6	0	Red loam						
24	0	Clay, cemented sand and gravels						
9	6	Stony clay						
12	9	Cemented gravels and boulders						
15	0	Stiff red clay with gypsum						
10	0	Cemented sand and gravels						
9	9	Stiff stony clay						
14	0	Mottled clay						
6	0	Stiff red clay						
15	0	Black clay						
11	0	White pipeclay and ironstone pebbles						
10	7	Pipeclay with limestone						
9	5	Reddish clay with ironstone boulders						
7	0	Stony clay & boulders						
10	0	Ironstone boulders and clay						
7	7	Yellow sandy clay & ironstone pebbles						
14	0	Dark cemented sand						
10	9	Violet sandy clay						
10	10	Pipeclay						
16	0	Stiff sandy cement						
229	2	Total depth						

Remarks

No water tapped in this bore.

A trial bore depth 18 feet was put down by this Auger on the Eastern boundary of C.R. 607, near Glen Lyon station.

Section of Bore No. C.C.
No. 8 Water Auger
at Catter's Well
Road Wilcannia to Silverton

Thickness of strata		Nature of strata	Borehole	Height of Water rose from point of tapping	Quantity	Depth Water tapped		
ft.	in.					ft.	in.	
		Surface						
8	0	Red loam						
10	0	Stony clay and dry gravel wash						
4	0	Hard cemented gravel						
10	0	Red & grey clays						
32	0	Red & mottled clays						
11	0	Stiff grey clays						
35	0	Pipe clay						
30	0	Brown clay shale						
58	0	Hard brown shale						
						5 1/2	190	0
10	3	Hard grey clay slate						
9	5	Hard blue slate						
2	0	Hard blue rock						
250	5	Total Depth						

Remarks

5 1/2 water tapped at 190 feet, rose 48 ft. in bore, supply 290 Gall. per day

Note. - 7 ft. 4 in. bored by this Auger during 1886 at bore D. Cooks Paddy, thus making total depth of bore D. 112 ft. 7 in.

Section of Bore No 1
 No 9 Water Auger
 at Jones' Fluitt Bingera
 (Gold prospecting Bore)

Thickness of Strata		Nature of Strata	Borehole	Height water rose to in point of tapping	Quality	Depth Water Tapped		
ft.	in.					ft.	in.	
			surface					
1	0	Mudlock						
2	0	Conglomerate gravel						
1	0	Mudlock						
2	0	Cement						
20	0	Gravel & boulders				Fresh	20	0
5	0	Conglomerate gravel						
5	6	Boulders & gravel						
		Serpentine rock						
36	6	Total depth						

Remarks

Fresh Water tapped at 20 feet, stood at 20 ft. rate 700 Gals per hour
 The Foreman states, - that by the use of proper appliances
 the water in this bore could be tested up to a rate of 1000
 Gallons per hour.

A shaft 7 ft. 6 in. deep was sunk at this site.

Boring by No 9 Auger at the Gool Well Bingera

Original depth of Well ----- 33 ft. 9 in.
 Bored through Clay, gravel & boulders ----- 13. 3 "
Total depth ----- 47. 0.

The water stood at its original depth 32 feet
 from surface, no fresh supply, tested up to
 400 Gallons per hour.

Section of Bore No 3
72° 9 Water Auger
at Cemetery Flat Bragera
(Gold prospecting bore)

Thickness of strata		Nature of strata	Borehole	Height of water rose from point of tapping	Quality of Water	Depth of Water Tapped		
ft.	in.					ft.	in.	
			Surface					
1	0	Clay						
1	0	Cement						
9	8	Clay & pebbles						
13	8	Cement & gravel						
4	8	Gravel & boulders						
1	3	Boulders						
7	10	Gravel & boulders						
3	10	Boulders						
2	8	Cemented gravel						
3	10	Gravel & boulders						
1	6	Gravel						
1	7	Boulders						
1	6	Clay & pebbles						
6	0	Slaty stone and boulders						
4	6	Slate						
63	6	Total depth						
					Fresh	48	0	

Remarks

Fresh water tapped at 48 feet, rose 6 feet, rate 100 Gals per hour

Section of Bore No 1
 No 10 Water Auger
 at Forbes
 (Gold prospecting bore)

Thickness of strata		Nature of strata	Borehole	Height Water rose from point of tapping	Quality	Depth water tapped		
ft	in					ft	in	
Surface								
22	0	Yellow clay						
10	0	Yellow sand						
10	0	White drift sand				Fresh	34	0
6	0	White clay						
4	0	Mud & sand						
12	0	Coarse drift				Fresh	52	0
9	6	Hard red clay						
4	0	Red clay with stones						
4	0	White clay						
4	0	Red clay with stones						
4	0	Blue clay						
16	0	Red clay with stones						
31	0	Stiff red clay						
10	0	Yellow clay						
11	0	Stiff red clay						
9	0	Stiff blue clay						
8	0	Stiff red clay and gravel						
169	0	Total Depth						

Remarks

Good supplies of Fresh Water tapped at from 34 ft. to 52 ft. from surface. Water stood at 55 ft. from surface at finish of bore.

Section of Bore No. 2
 No. 10 Water Auger
 at Forbes
 Gold prospecting bore

Thickness of strata		Nature of strata	Borehole	Height water rose from point of tapping	Quality	Depth Water tapped		
ft.	in.					ft.	in.	
			Surface					
36	6	Red & yellow clay with sand						
	4	Fine drift with stones				Fresh 31 0		
	15	Coarse drift						
	4	Coarse drift with stones				Fresh 60 0		
	13	Red clay & stones						
	14	Stiff red clay						
	8	Blue clay						
	4	Red clay				Brackish 99 0		
	3	Rotten slate						
104	0	Total depth						

Remarks

Fresh water soaking at 31 ft. 9 in., rising 30 ft. at 60 ft. from surface.
 Brackish water tapped at 99 ft.

Section of Bore No 3
 No 10 Water Auger
 at Florbes
 (Gold prospecting bore)

Thickness of strata		Nature of strata	Borehole	Height water rose from point of tapping	Quality	Depth Water Tapped	
ft.	in.					ft.	in.
			Surface				
2	0	Red clay					
10	0	Chocolate clay					
12	0	Yellow clay					
6	6	Yellow sand					
8	0	White sand with clay					
10	0	Fine drift sand with stones				Fresh	43 0
1	6	White clay					
7	6	Coarse drift					
10	6	Red & white clay					
3	6	Red clay with rotten slate					
3	0	Rotten slate					
74	6	Total depth.					

Remarks

Good supply of fresh water tapped at 43 ft. from surface, rising 16 ft. in tubes.
 (Sig 337-2F)

Section of Bore No. 4
 No. 10 Water Auger
 at Forbes
 (Gold prospecting bore)

Thickness of strata		Nature of strata	Borehole	Height Water rose from point of tapping	Quality	Depth Water Tapped	
ft.	in.					ft.	in.
			Surface				
1	6	Black soil					
20	9	Yellow clay					
1	3	Conglomerate					
18	0	Yellow sand & clay					
7	0	Coarse drift					
1	6	White clay					
6	0	Coarse drift					
1	6	Rotten slate					
57	6	Total depth					
						41	0

Remarks

Good supply of fresh water tapped at 41 ft. from surface, rising 18 ft. in tubes.

Section of Bore No. 5
No. 10 Water Auger
at Forbes
(Gold prospecting bore)

Thickness of strata		Nature of strata	Borehole	Height & Water rose from point of tapping	Quality	Depth Water Tapped		
ft.	in.					ft.	in.	
			Surface					
1	0	Black soil						
12	6	yellow clay						
2	6	Red clay						
5	6	Blue clay						
7	0	Red & White sand						
5	6	yellow clay						
3	0	Red & White sand						
3	0	Red & White clay						
12	0	Coarse drift						
1	0	Blue clay						
3	6	Coarse drift						
1	6	Red clay						
11	0	Red & white clay						
25	0	Red clay with stones						
8	0	yellow clay						
3	0	Rotten slate						
105	0	Total depth						
						44	0	

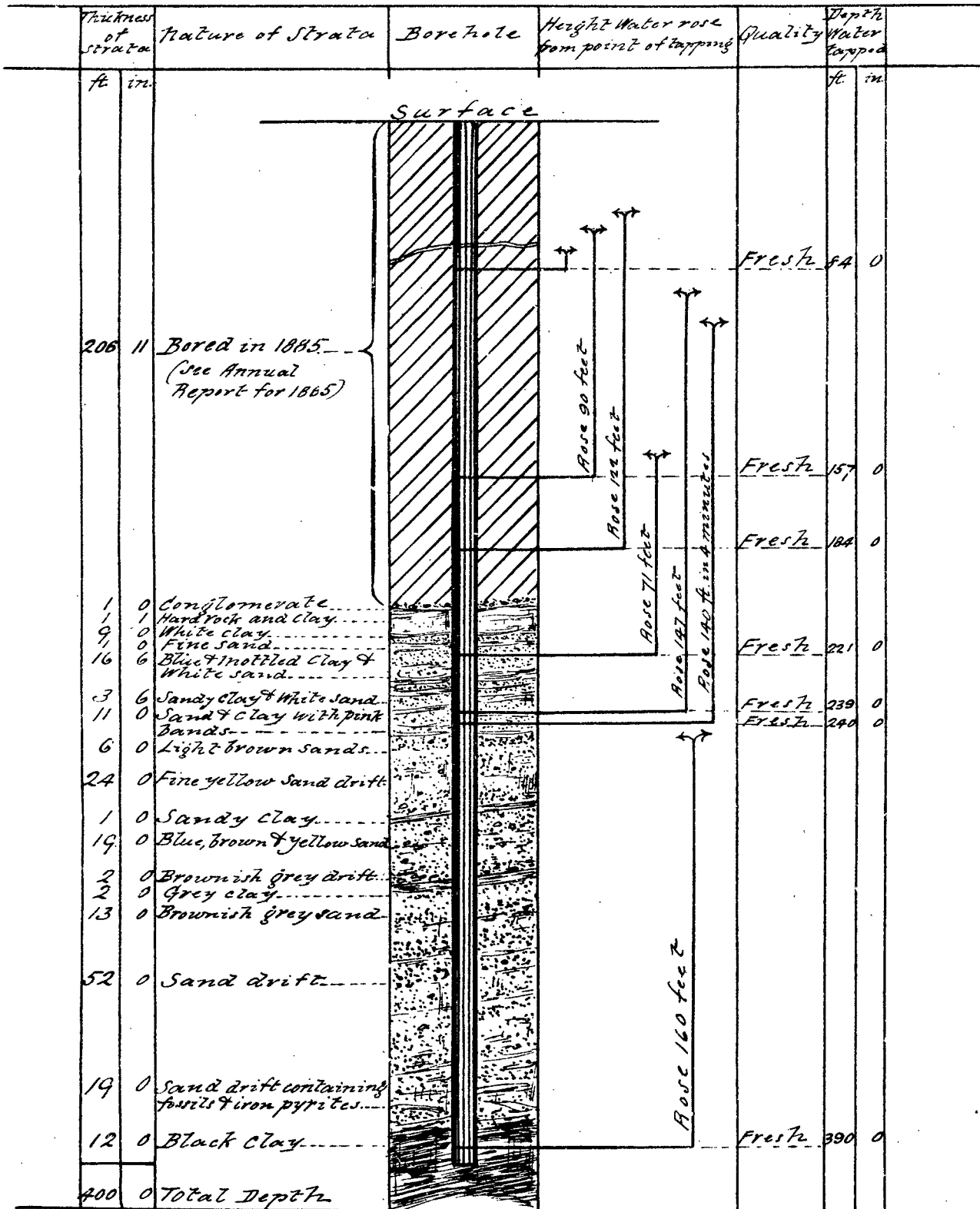
Remarks

Good supply of fresh water tapped at 44 ft. from surface, rising 18 ft. in tubes.

Note. - 47 feet of this bore put down in 1887.

Note. - This Auger (No. 10) bored 1 ft 9 in. at Bore H., road Wilcannia to Silverton, also two tube retrieving bores depths 52 feet and 73 ft. at the same site during 1886.

Section of Bore No 1
 No 11 Water Auger
 at Gunbar Road, Hay



Remarks

Fresh Water at 84 ft. rose 9 ft., rate 3600 Galls. per day

" " " 157 ft. " 90 ft.

" " " 184 ft. " 122 ft. " 2,640 " " "

" " " 221 ft. " 71 ft.

" " " 239 ft. " 147 ft. in 15 minutes, rate 6720 Galls. per day

" " " 240 ft. " 140 ft. " 4 " " 25200 " " "

" " " 390 ft. " 160 ft. " a few minutes.

The Water Tapped at 240 feet rushed in with great force and propelled 20 feet of clay before it up the tubes a distance of over 100 feet. Supply 25,000 Galls. day.

At 266 feet, water was within 84 ft. of surface, at 308 ft. it rose to 90 ft. of surface, rate 21,600 " "

From 200 to 400 ft. drift sand in great quantities forced its way up the tubes.

Note. - No 1 shaft 78 feet deep was sunk at this bore during 1886.

No 2 " " " 149 Total
 Tubes redriver 122 ft. 10 in, being equal to a fresh bore.



EXPLANATION OF COLORS

- Shows Fresh Water
- Shows Salt Water
- Shows Brackish Water
- ★ Shows Fresh Artesian Water
- Shows where no quality of water is given
- Shows Mineral Artesian Water

**NEW SOUTH WALES
HYDROGRAPHICAL MAP
SHEWING POSITION OF WELLS**

SCALE
MILES 20 10 0 10 20 30 40 50 60 70 80 90 100 MILES

Compiled from information furnished by the Government Geologist, the Chief Inspector of Public Watering Places, and the Superintendent of Diamond Drills.

Appendix to Annual Report of W.H.J. Slee
Superintendent of Drills. 1885.

APPENDIX H—*continued.*INDEX to Wells and Bores—*continued*

No	Locality	District	Strata	Remarks
200	Youngarrina Springs	Albert		Well 6 ft deep, estimated 800 to 1,000 gals. good water per diem.
201	M'Crae's Well, Brongum yarra	"		Well 27 ft deep: 8 or 9 ft in rock; good supply for stock; too brackish for domestic purposes.
202	Buckley's Well, Yantabulla	"	Bottom on sandy drift	Well 40 ft deep, water fairly good, but slightly impregnated with soda; daily yield about 150 gallons.
203	Rudder's Well, Warroo Station.	"		Well 20 ft. deep, water rose 10 ft.; very salt.
204	Tyngame Spring	"		Well 40 " excellent water; estimated at about 10,000 gallons per diem.
205	Brindingabba, Moolort Block	"		Well 94 ft. deep; watered 12,000 sheep through drought; excellent quality.
206	Kilfera, on Kilfera Block	"		Well 120 ft. deep; water excellent; rose 90 ft. in shaft.
207	Kilfera Block	"		Well 150 " supply 100 gals. per diem; good water.
208	Kenmare Block	"		Well 38 " bore 197 ft.; water salt.
209	Kilfera Block	"		Well 35 " water very salt; very bitter; no supply.
210	Polygonam Hut	Darling		Well 100 " said to contain powerful mineral poison.
211	Barrangan Well	Albert		On road Boohgal to Wilcannia
212	Wanganilla	Murrumbidgee		On the "Border Run"
213	Pretty Pine			On South Wanganella Block
214	Beefwood Well, on "The Wells" Block	County Yungnulgra, Albert District.		Lower Demihquin Run
215	New Well, on Block Byjerk South, Paroo River.	County Landsborough, Albert District.		
216	Well	County Yungnulgra, Albert District.	Coolawundy	Well 157 ft. deep; good water
217	Well, Block Germono East	County Yungnulgra	Coparto	Well 50 " water rises to 20 ft.
218	Junction Well, Germano East	Albert		Well 80 " good water rises to 50 of surface.
219	Danbery Well, Danbery North Block	"		Good stock-water.
220	Minamthoo Well, Dilkoorba North Block.			300 ft. deep; good water rose to 65 ft. from surface.
221	Parkungi Block	Albert		298 " good water rose to 80 ft. from surface.
222	Well		Poolamacca	236 " good water
223	Thackaringa Well	Albert		236 " "
224	Wanga Well	"		270 " "
225	North Ita Well	"		240 " "
226	Melang West Well	"		20 " "
227	Moredevil Station	Liverpool Plains		Artesian fresh water
228	Myalmundi	Narromine		194 ft. deep; good water
229	Gap Well (45 miles west of Cobar).	South Warrego		Salt.
230	Top Well, Newcombe	Muggare Back B Block		70 ft. deep; good water
231	Dungle Well (5 miles north of previous well).			70 ft, good for stock; at 75 ft, salt.
232	Walgett Wells	Town of Walgett		40 to 50 ft.; good water in black-soil flats.
233	Triangi Well	Narromine		350 ft.; good water; equal to 5,000 to 6,000 gals. per day.
234	Chapman's Well	"		350 ft.; water brackish.
235	Randwick Asylum	Randwick		Fresh water.
236	Bingagong Well	Yanko Creek		120 ft. deep; fresh water rose 52 ft. in shaft.
237	Goree Well	"		172 " good water rose 105 ft.
238	Packsaddle	Albert	Blue clay on drift	102 " 14,000 gals. in twenty-four hours, brackish.
238A	"	"		Supply unlimited; 250 ft. deep.
239	Tarella	"	Shaly clay and slate	250 ft. deep; water obtained by driving 10,000 gals. in twenty-four hours.
240	"	"	Conglomerate cement	Untested fresh; rose 60 ft. in shaft
241	Packsaddle	"	"	Trial shaft 40 ft., salt, large supply.
242	Cobbham	"	"	Supply large; fresh water.

W. H. J. SLEE,
Superintendent of Drills.

APPENDIX I.

BALANCE-SHEET—DIAMOND DRILLS.—1886.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.			
To value of stock in store at 1st January	1,015	16	11				By amount receivable for boring during the year	6,264	12	5						
„ value of diamonds on hand at 1st January ...	1,755	7	5	2,771	4	4	„ inspection fees	16	16	0						
„ working expenses (exclusive of office salaries, store wages, rent, Superintendent of Drills, travelling expenses, and extra expenditure)...	4,899	12	5				„ diamonds sold, &c.....	335	10	11						
							„ tubing sold	11	5	3						
	£	s.	d.				<i>Work done prior to 1886.</i>									
„ office salaries	580	12	5				„ Pelican Flat	39	6	8						
Less (included in extra expenditure)	7	5	2	573	7	3	„ Dempsey Island	35	0	0						
							„ sundries	0	6	0	74	12	8			
„ store wages	193	0	6										6,702	17	3	
Less (included in extra expenditure)	2	8	3	190	12	3	<i>Stock on hand at 31st Dec.</i>									
„ rent	101	0	3				„ plant issued and not used...	173	0	6						
Less (included in extra expenditure)	1	5	3	99	15	0	„ tubing „ „ „	63	16	6						
„ Superintendent of Drills' travelling expenses	33	8	8				„ value of diamonds at drills „ „ „ on hand	205	15	11						
Less (included in extra expenditure)	0	8	5	33	0	3	„ „ „ stock in store.....	771	1	1			2,535	6	2	
				896	14	9										
„ extra expenditure																
„ plant purchased	71	2	3	5,796	7	2										
„ stores purchased.....	206	4	4	61	4	10										
„ diamonds purchased																
„ amount receivable in excess of expenditure ...																
				£	9,238	3	5						£	9,238	3	5

J. S. McNEIL.
D. McCulloch.

W. H. J. SLEE,
Superintendent of Drills.

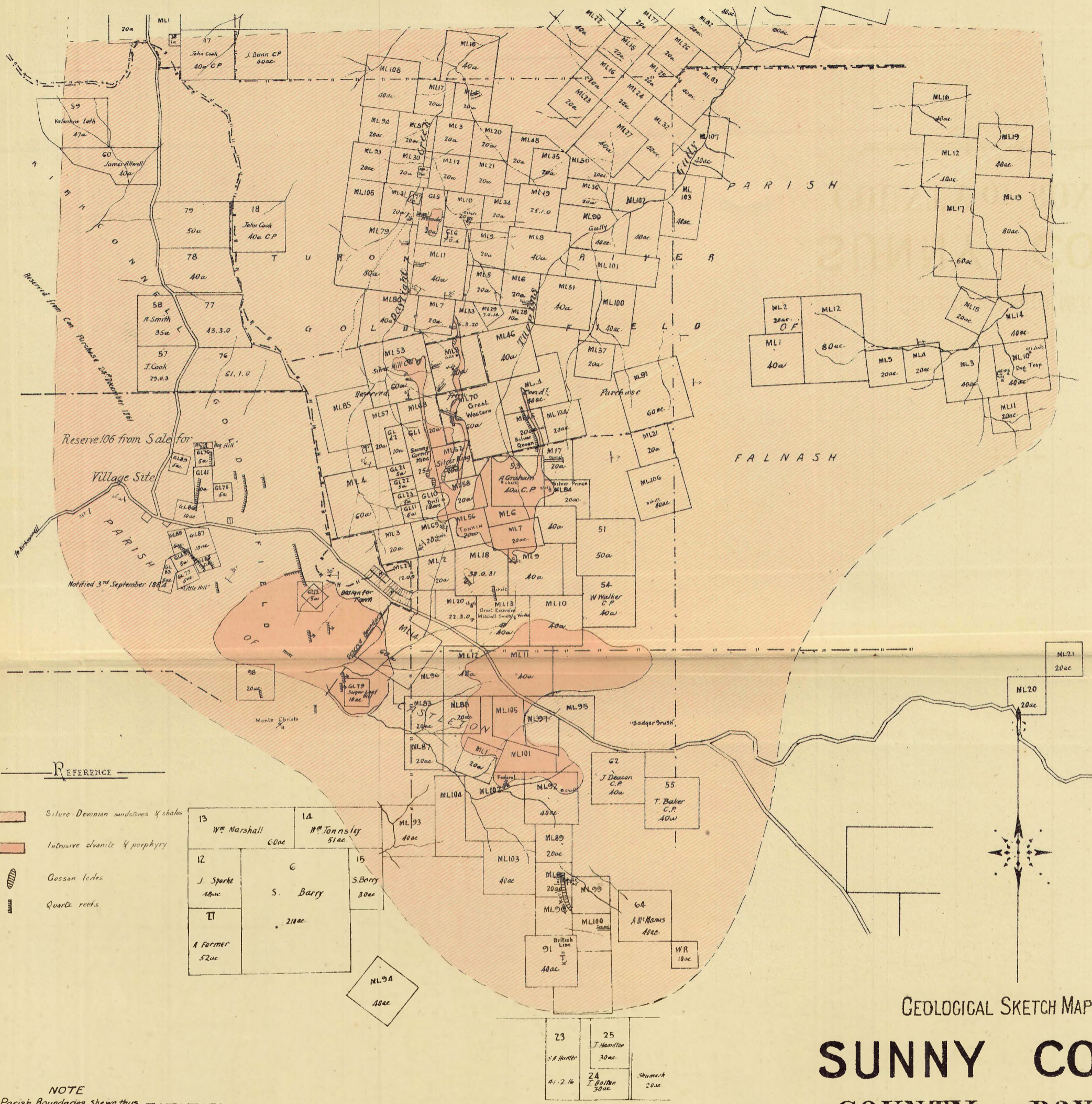
APPENDIX J.

BALANCE-SHEET—WATER-AUGERS.—1886.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.			
To value of stock in store at 1st January				1,643	13	3	By amount receivable other than tubing	30	9	0						
„ working expenses (exclusive of office salaries, store wages, rent, and Superintendent of Drills, travelling expenses)	2,982	3	3				„ tubing	5	6	7						
							„ „ sold	8	0	7			43	16	2	
	£	s.	d.				<i>Stock on hand at 31st December.</i>									
„ office salaries	580	12	5				By plant issued and not used	17	8	0						
„ store wages	193	0	6				„ tubing „ „ „	176	19	10						
„ rent	101	0	3				„ value of stock in store	1,543	19	5			1,738	7	3	
„ Superintendent of Drills' travelling expenses	33	8	7				„ cost of work performed in search of water						3,975	0	7	
	908	1	9	3,890	5	0										
„ plant purchased	13	7	0													
„ tubing „	151	0	10													
„ stores „	58	17	11	223	5	9										
				£	5,757	4	0						£	5,757	4	0

J. S. McNEIL.
D. McCulloch.

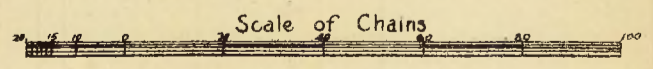
W. H. J. SLEE,
Superintendent of Drills.



GEOLOGICAL SKETCH MAP

SUNNY CORNER

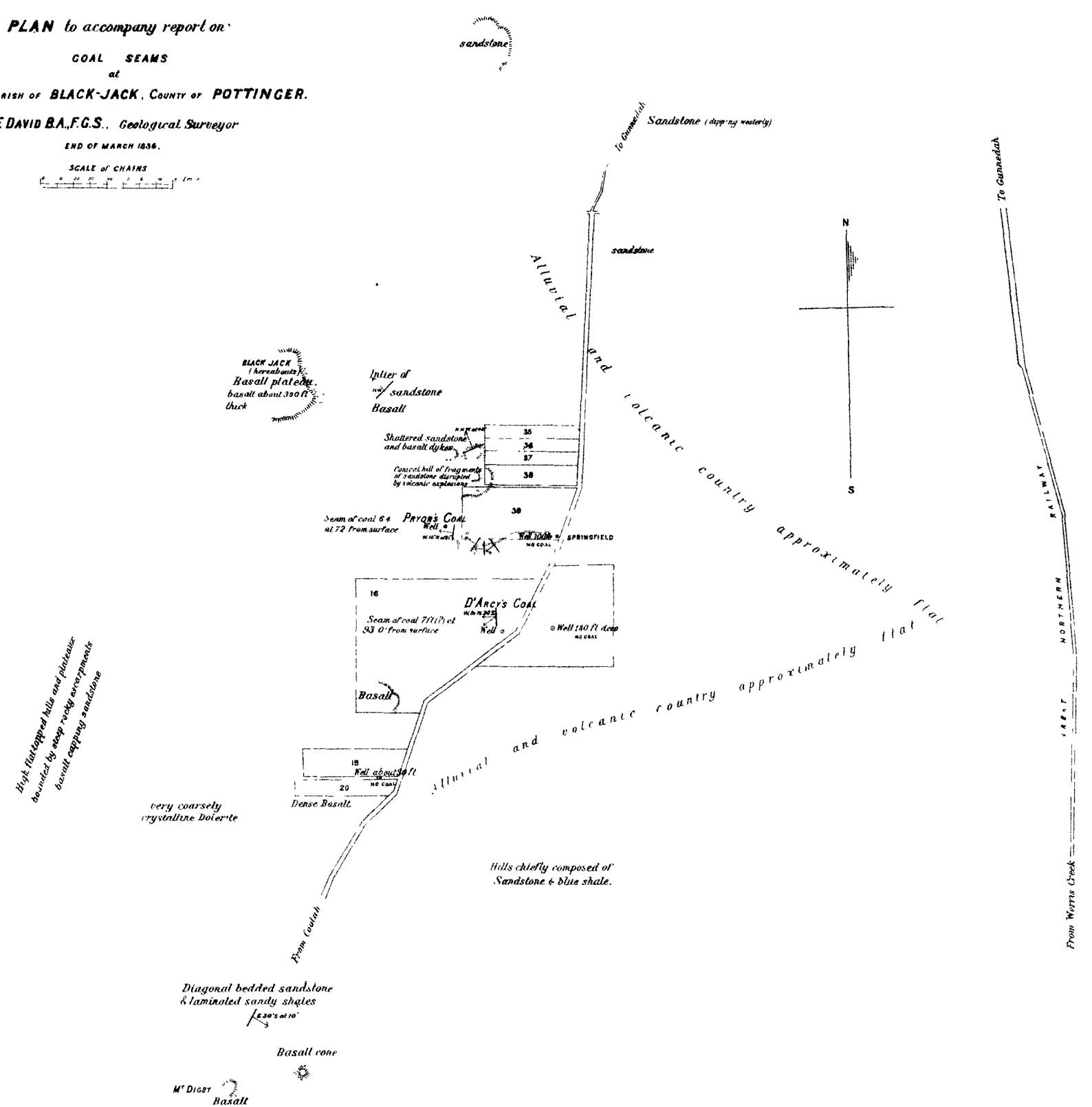
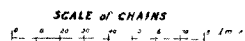
COUNTY OF ROXBURGH



To accompany Report on Mitchell Silver Lodes by
 C.S. Wilkinson, Geological Surveyor in Charge,

(SIG 337-)

PLAN to accompany report on
COAL SEAMS
 at
GUNNEDAH, PARISH OF BLACK-JACK, COUNTY OF POTTINGER.
 By **TWE DAVID BA., F.G.S., Geological Surveyor**
 END OF MARCH 1836.



Plan of
DEEP LEAD WORKINGS
ROCKY RIVER GOLD FIELD

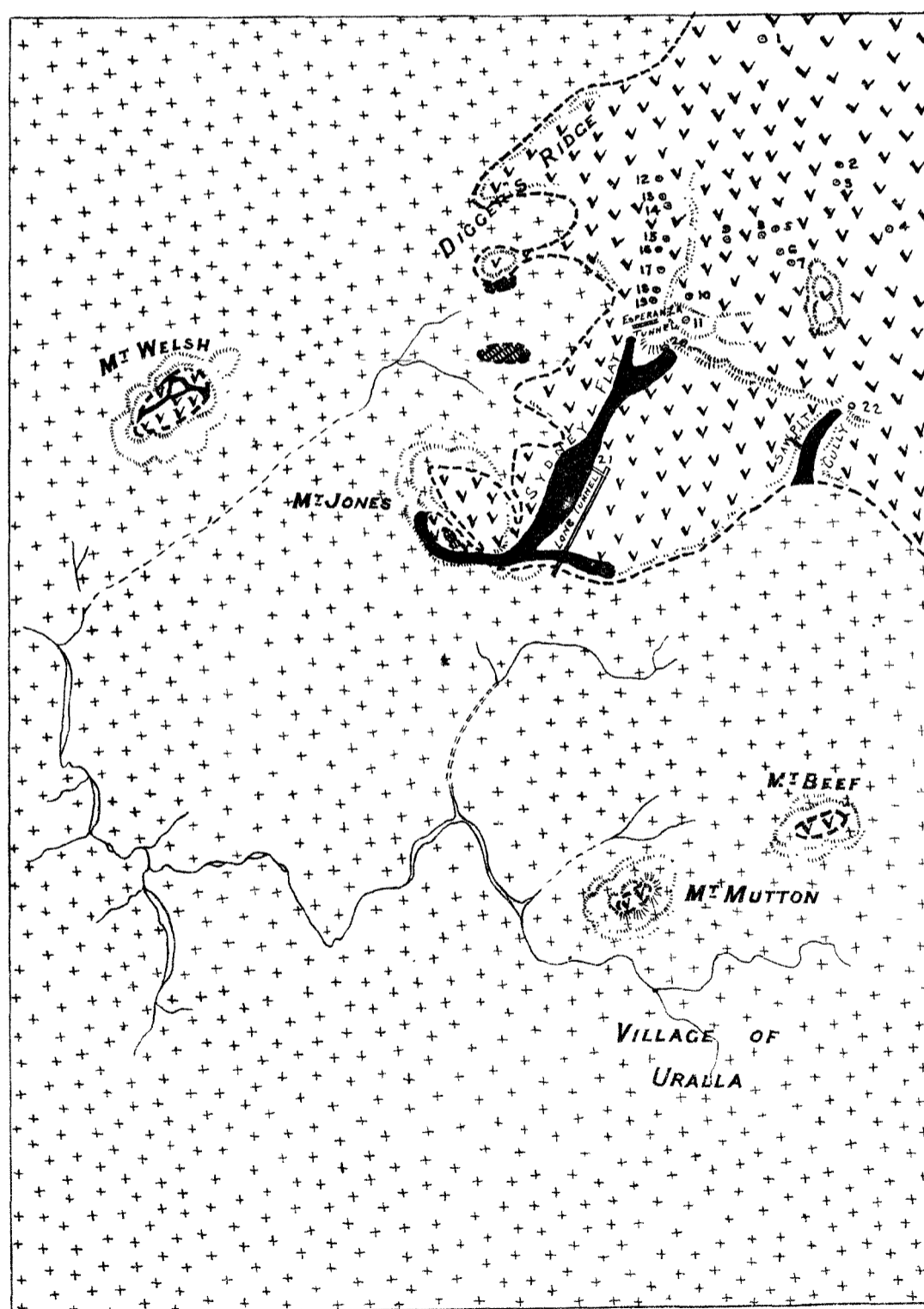
To accompany report by Geological Surveyor T.W.E. DAVID, B.A.

JUNE 1886.

SCALE.

10 5 0 10 20 30 40 50 60 70 80 90 Chs

Reference



- 1 N^o 1 Bullion - 60 ft - water
- 2 N^o 2 " - 147½ ft - water level 58 ft
- 3 N^o 3 " - water at 61 ft
- 4 Shaft 70 ft - dry
- 5 N^o 4 Bullion - 154 ft - w.l. 84 ft
- 6 N^o 5 " - 188 ft - w.l. 128 ft
- 7 N^o 6 " - 126½ ft
- 8 Long Tunnel shaft 98 ft.
- 9 Parker & Edmunds' shaft - 106 ft - w.l. 68 ft
- 10 Phoenix engine shaft - 166 ft to granite
190 ft to bottom of dip
- 11 Ingle's shaft - 186 ft.
- 12 Shaft 82 ft.
- 13 Whip shaft 95 ft - dry
- 14 Haythorne's - 96 ft to water
- 15 N^o 5 Temperance shaft 132 ft.
- 16 " 4 " " " "
- 17 " 3 " " " "
- 18 " 2 " " " "
- 19 " 1 " " " "
- 20 Shaft 130 ft.
- 21 " 74 ft
- 22 " about 130 ft

- | | |
|--|------------------|
| | Basalt |
| | Granite |
| | Quartzite |
| | Worked deep lead |

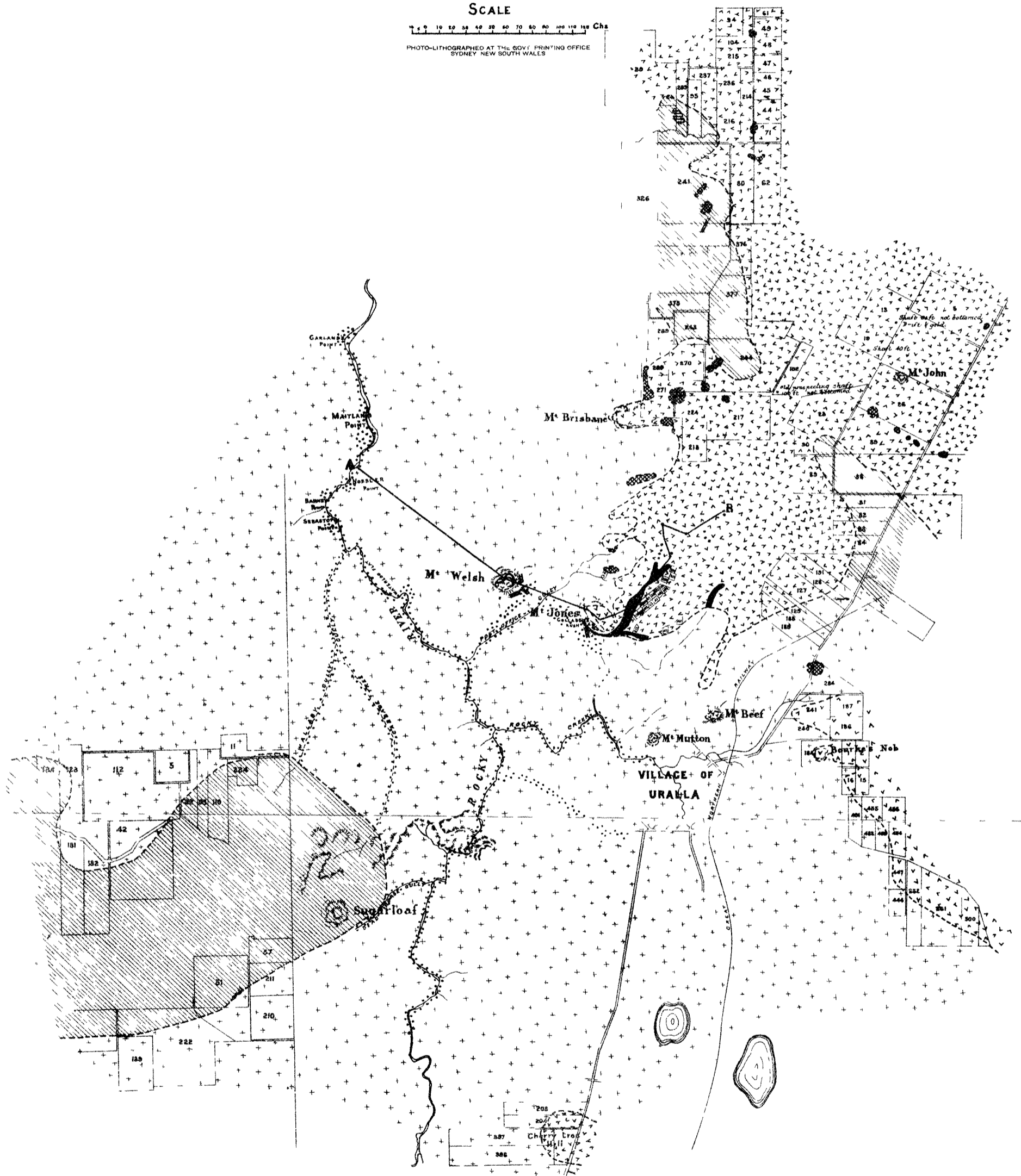
Drawn by G.A. Stoner, Geological Survey Branch

GEOLOGICAL SKETCH MAP OF THE ROCKY RIVER GOLD FIELD

To accompany report by Geological Surveyor T W E David B.A. FGS

June 1886

SCALE
0 10 20 30 40 50 60 70 80 90 100 110 120 Chs
PHOTO-LITHOGRAPHED AT THE GOV. PRINTING OFFICE
SYDNEY NEW SOUTH WALES



REFERENCE

- | | | | |
|---|--|---|---|
| <p>SILURIAN ?
Claystone <i>passing into Granitoid near junction with intrusive granite</i></p> | <p>Quartzite <i>(in part overlying & in part underlying basalt)</i></p> | <p>TERTIARY
Basalt <i>in part capping gold bearing alluvials</i></p> | <p>Granite <i>Intrusive gold-bearing</i></p> |
| <p>(Sig 337—)</p> | <p> Basalt dyke</p> | <p> Eurite dyke</p> | <p> Deep lead</p> |
| | | | <p> Alluvial gold</p> |

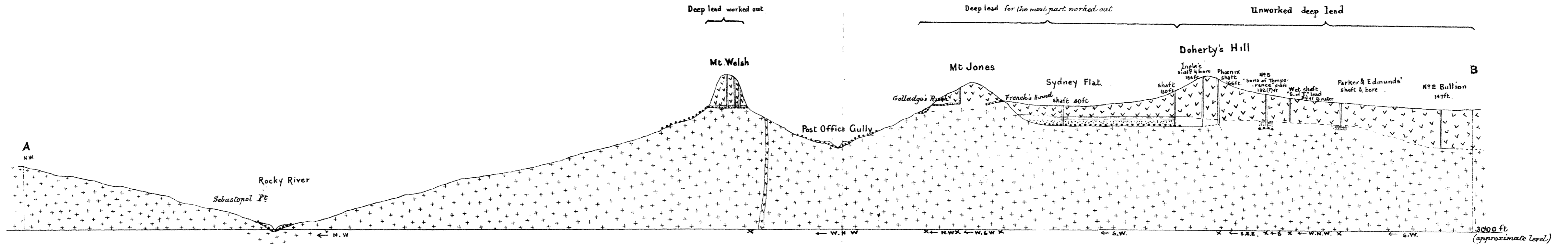
SECTION ACROSS ROCKY RIVER GOLD FIELD





APPENDIX I.

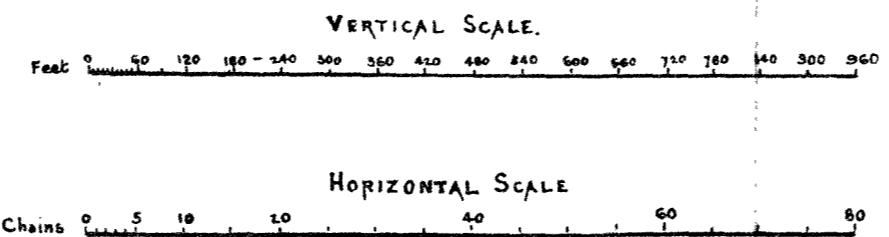
showing relative position of "shallow" and "deep lead" auriferous alluvials

see line A-B Geological Sketch Map

To accompany report by Geological Surveyor T.W.E. DAVID, B.A.F.C.S.

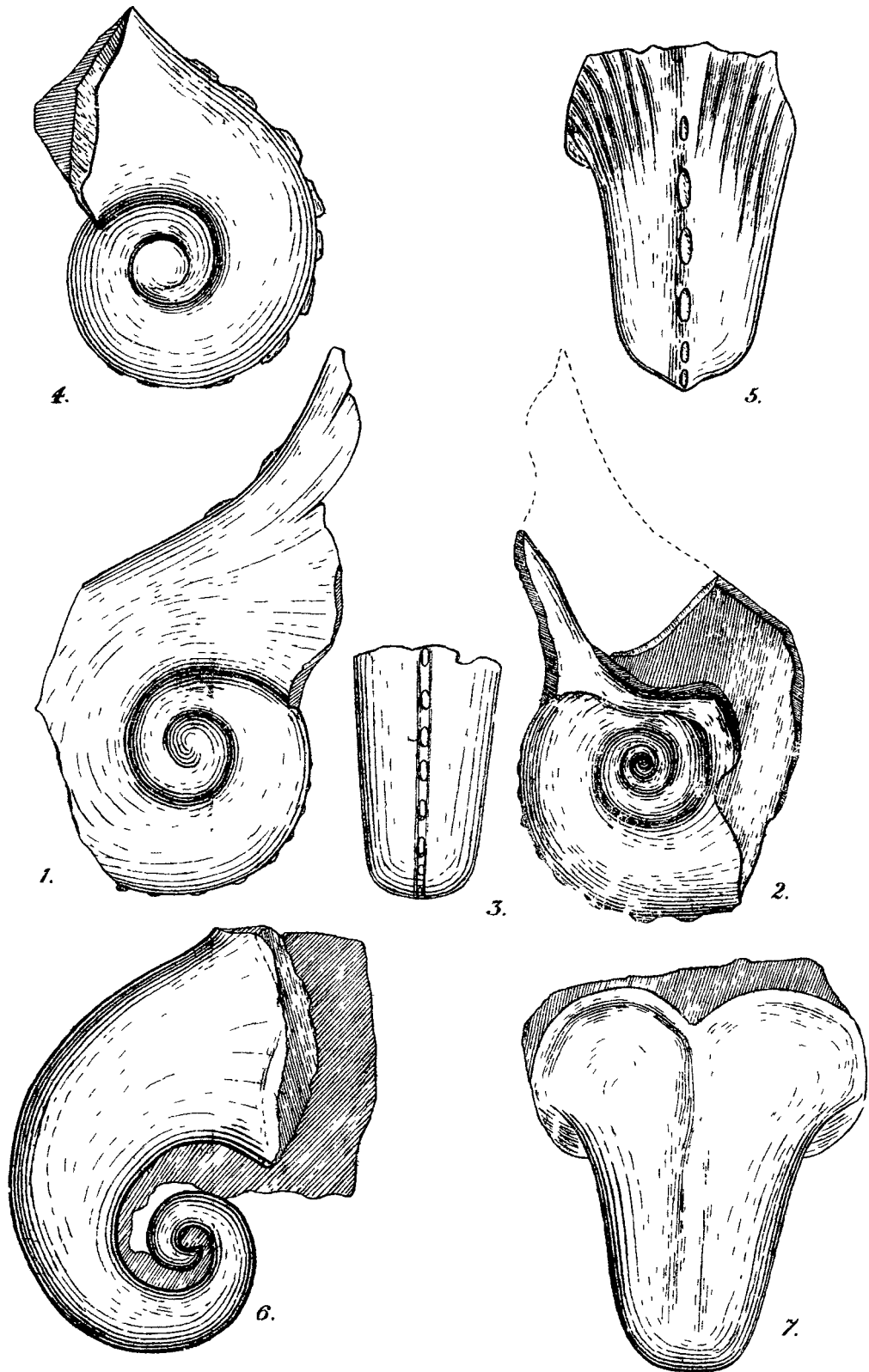


-  Recent auriferous alluvials.
-  Tertiary basalt capping tertiary gold gravel.
-  Tertiary auriferous alluvials consisting of quartz sand and quartz gravel with beds of white and grey pipeclay & black clay with fossil leaves.
-  Intrusive granite probably the matrix of the alluvial gold.



NOTE The total quantity of gold raised in this district from 1858 to 1885 has been about 120,025 ozs valued at £455,719. A payable branch lead has been worked between the 130 ft shaft at the base of Doherty's Hill and the No 5 "Sons of Temperance" shaft.

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.



1 & 3 *Tremanotus Maideni* (Eth j^{nr}) from the Hawkesbury Sandstone, Biloela, Sydney.
 4 & 5 *Tremanotus alpheus* (Hall) from the Niagara Group (Upper Silurian) North America, (After Hall)
 6 & 7 *Bucania Cornuarietes* (J. de C. Sby.) from the Carboniferous Limestone, England (After Sowerby)

Drawn by A. H. Taylor Geological Survey Eck

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

ASSISTANT INSPECTOR OF COLLIERIES.

(APPOINTMENT OF MR. T. L. BATES—CORRESPONDENCE, &c.)

Ordered by the Legislative Assembly to be printed, 31 March, 1887.

[*Papers relative to Mr. Thomas L. Bates's application for and appointment to the position of Assistant Inspector of Collieries.*]

Mr. Thos. L. Bates to The Minister for Mines.

6, Brougham Terrace, Victoria-street, Darlinghurst,
Sydney, 4 November, 1886.

Sir,

I understand that an Assistant Inspector is about to be appointed under the Coal Mines Regulation Act, and I beg respectfully to make application for the same.

I am 31 years of age, and have had very considerable experience in the management of coal mines in the South Yorkshire District, in England.

In 1878 I obtained, by examination, a Government certificate of competency as mine manager.

I passed a Cambridge examination in geology, and passed in the first class with "special distinction," and am also a Fellow of the Geological Society of England.

Previous to leaving England I was on the Home Secretary's list as candidate for Inspector of Mines. I feel sure, sir, that should you see fit to appoint me that I could give you every satisfaction, and would be most diligent in the discharge of my duties.

I enclose copies of three testimonials, which I hope will be satisfactory. Trusting that you will favourably consider this application,—

I am, &c.,
THOS. L. BATES.

[*Enclosures.*]

Mr. James Ormiston to Mr. J. S. Keep, Birmingham.

Dear Sir,

Mount Vernon, Glasgow, 18 January, 1884.

I have received this morning from Mr. T. L. Bates a letter, in which he says he is applying through you for a situation as Mining Engineer to the Komo Colliery Company, New Zealand, and he asked me for a testimonial as to his qualifications.

I shall put all I have to say, and all that I think will be necessary, in this letter to yourself. For the two years—1876 and 1877—during which I held the post of Certificated Manager of the extensive Rothvale Collieries, Mr. T. L. Bates was my assistant in charge. During that time he was constantly employed, both above and below, helping me in every detail of the practical management of the collieries. In both the mining and the working of coal he had acquired at the time I left these collieries a wide and varied knowledge, as proved by his shortly afterwards passing successfully his examination, and obtaining a Government certificate of competency as a mine manager.

I need not go into any detail regarding the extent of his mining knowledge.

The searching nature of the examination he passed successfully through is the best voucher on this point. For the rest, I may say that I always found him faithful and diligent in the discharge of his duties, one who could be thoroughly trusted to abuse no confidence which might be placed in him, and one also who by firmness of character could command the respect of all with whom he came in contact.

I am, &c.,
JAMES ORMISTON.

Mr. F. J. Jones to The Komo Colliery, Auckland.

Gentlemen,

Rothervale Collieries, Limited, Rotherham, 19 January, 1884.

During the past three years Mr. T. L. Bates has acted as my assistant here. He has had during this time, and for years before, most exceptional opportunities of acquiring a thorough knowledge of every detail connected with the sinking, fitting-up, and working of collieries.

I have very great pleasure in recommending him for the vacancy of Mining Engineer you have, and believe the training he has received especially fits him for the appointment.

He is most trustworthy and faithful in the discharge of his duties, and will in no way abuse any confidence placed in him. His character is unimpeachable.

I am, &c.,
F. J. JONES.

Mr. T. Carrington to The Komo Colliery Company, Auckland.

Dear Sirs,

Kiveton Park Collieries, Sheffield, 22 January, 1884.

I have pleasure in stating that I have known Mr. T. L. Bates for several years, and that he is a gentleman of considerable experience and ability as a mining engineer. He has had charge as assistant manager at important collieries at Rothervale, in this neighbourhood, and I believe him to be well qualified for the post he seeks as the mining engineer of your collieries. Five years ago he passed with credit his examination for a certificate as Manager of Mines before the Yorkshire Board of Examiners.

I believe Mr. Bates to be a gentleman of the highest character.

Yours, &c.,

THOMAS CARRINGTON.

Mr. T. L. Bates to The Minister for Mines.

Dear Sir,

6, Brougham Terrace, Victoria-street, Darlinghurst,
Sydney, 19 November, 1886.

Since forwarding my application to you for an appointment as Assistant Inspector of Mines, I have received an additional testimonial, of which I beg to enclose a copy.

I trust that this and the ones previously sent will be satisfactory to you as regards my character and ability, and that you may see your way to grant me the appointment, as I feel sure I could discharge the duties to your entire satisfaction. I hope you will not think me importunate, but I am anxious to get to work and make myself useful.

Yours, &c.,

THOMAS L. BATES.

[Enclosure.]

Princes-street, Auckland, N.Z., November, 1886.

I HAVE great pleasure in stating that I have known Mr. T. L. Bates for more than a year, and can certify that I believe him to be of the strictest integrity, and in every way trustworthy. Mr. Bates came out from England with very high credentials, and his conduct fully endorsed the same. I believe Mr. Bates has a practical and theoretical knowledge of mining.

JOHN CHAMBERS.

Mr. T. L. Bates to The Minister for Mines.

Sir,

6, Brougham Terrace, Victoria-street, Darlinghurst, 31 December, 1886.

I have been advised by Mr. Fletcher to see you with regard to a matter under consideration at the time of his resignation.

I am a mining engineer, and was introduced to him by Mr. Goodchap. He informed me that it was contemplated to appoint an additional Inspector of Coal Mines, and advised me to apply to him for the same. I did so. He informed me that I had an excellent chance of the appointment, and advised me not to be away in the event of his requiring me. He sent me to Mr. Mackenzie, the Examiner of Coal-fields, who inspected my testimonials, and reported me fully qualified for the post. This was a day or two before Mr. Fletcher resigned, and consequently nothing has been done.

Having received such encouragement from Mr. Fletcher, I have stayed here about eight weeks, in the hope of obtaining the situation, for which I am in every way qualified, and my finances are getting very low, so that I am under the absolute necessity of doing something immediately.

May I ask you therefore to give my case your early consideration, and shall be glad to wait upon you whenever you may desire.

I sent in my application, together with copies of testimonials, as desired. I hold a Government certificate of competency as a mine manager, obtained by examination in 1878, and am a Fellow of the Geological Society of England.

I have had charge of collieries in England, and for a short time in New Zealand previous to coming here. My age is 31.

Trusting that you may be disposed to consider this application favourably,—

I am, &c.,

THOS. L. BATES.

Place with papers, Additional Inspector.—H.W., 3/1/87.

Re appointment of Inspector of Collieries.

REFERRING to your blank-cover communication of the 8th instant, asking me to examine the qualifications of the several applicants for the appointment of an Inspector of Collieries, and report the most suitable for the position, I have the honor to submit and recommend Mr. T. L. Bates, who is 31 years of age, possesses an English Government certificate of competency as a colliery manager, can make surface and underground surveys, and, as his testimonials show, has had considerable experience in the mining, working, and ventilation of coal-mines in Great Britain. Many of the other applicants are suitable in many respects, but, upon the whole, Mr. Bates appears to be the most competent.

J. M., 10/1/87.

The Under Secretary for Mines, B.C., 10/1/87. In view of this report, it would appear advisable to appoint Mr. T. L. Bates to the position of Assistant Inspector of Collieries.—H.W., 10/1/87. Submitted. Approved. Mr. T. L. Bates may be appointed.—C.K.M., 11/1/87. Ex. Co. Minutes, 9 Feb., 1887.

Minute

Minute for Executive Council.

Recommending the appointment of Mr. T. L. Bates as an Assistant Inspector of Collieries.

Department of Mines, Sydney, 17 January, 1887.

I RECOMMEND to His Excellency the Governor and the Executive Council that Mr. T. L. Bates be appointed Assistant Inspector of Collieries, with a salary of £250 per annum, such appointment to take effect from the 11th instant.

His Excellency the Governor and the Executive Council.

C. K. MACKELLAR.

Minute for Executive Council.

Recommending the appointment of Mr. T. L. Bates as an Assistant Inspector of Collieries.

Department of Mines, Sydney, 9 February, 1887.

I RECOMMEND to His Excellency the Governor and the Executive Council that Mr. T. L. Bates be appointed Assistant Inspector of Collieries, with a salary of £250 per annum, such appointment to take effect from the 11th instant.

His Excellency the Governor and Executive Council.

FRANCIS ABIGAIL.

The Executive Council advise that the appointment herein recommended be approved.—ALEX. C. BUDGE, Clerk of the Council, Min. 87/18, 7/3/87. Confirmed, 15/3/87. Approved.—CARRINGTON, 7/3/87.

c

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

VENTILATION OF COAL MINES.

(CORRESPONDENCE AND REPORTS.)

Ordered by the Legislative Assembly to be printed, 1 April, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 5th February, 1886, that there be laid upon the Table of this House,—

- “(1.) A copy of all correspondence that has taken place between Mr. Curley, Miners’ General Secretary, and Mr. Mackenzie, Examiner of Coal-fields.
- “(2.) Copies of all reports from Mr. Mackenzie relative to the non-provision of ventilation as required by the Coal-fields Act.
- “(3.) A return showing the collieries in which such neglect existed; the time which elapsed from Mr. Mackenzie complaining to such colliery managers and the removal of cause of complaint; and the means taken to improve ventilation, and how carried out.”

(*Mr. Melville.*)

Newcastle-Wallsend Colliery.

SCHEDULE.

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No. 1.

Mr. James Curley, Miners' General Secretary, to The Examiner of Coal-fields.

Sir,

Hamilton, 8 January, 1883.

I have the honor, by direction of the representatives of the Miners' Association, to invite your attention to the number of men working in one split or current of fresh air in the Lambton headings, at the Wallsend mine. This question originated at a monthly meeting of the Wallsend miners some time ago, concerning which there was much discussion and dissatisfaction expressed. The dissatisfaction referred to was founded not only upon the check inspectors' report, but the practical daily experience of the workmen. The subject was therefore referred to the Delegate Board.

And while admitting that temporary advantages are occasionally secured by calling your attention to apparent defects and want of compliance with the Coal Mines Regulation Act, the miners regret, through their representatives, that there is not more permanent and satisfactory ventilation throughout the mines.

I am, &c.,

JAS. CURLEY,
Miners' General Secretary.

No. 2.

The Examiner of Coal-fields to The Miners' General Secretary.

Sir,

Coal-fields Office, Newcastle, 16 January, 1883.

I beg to acknowledge the receipt of your letter of the 8th inst., written by direction of the Representatives of the Miners' Association, and inviting my attention to the number of men working in one split or current of fresh air in the Lambton headings at the Wallsend mine, a question which you inform me originated at a monthly meeting of the Wallsend miners some time ago, concerning which there was some discussion and dissatisfaction expressed.

In reply, I beg to state that I forwarded your letter to Mr. Inspector Dixon for his report, which I received yesterday, and from which it appears to me that the 4th General Rule, section 12 of the Coal Mines Regulation Act, 1876, is complied with in the Lambton headings in the Wallsend mine.

2. Mr. Dixon's report is as follows:—"I entered the front heading from the main tunnel, Bossfield's side of the mine. Here I measured the air, and found it entering the heading at the rate of 7,680 cubic feet per minute. This current of air supplies 66 men, 5 boys, and 3 horses: total, 74—that is, when the men are all in together; but as some of the front shift men had gone home, I found only 50 men, 5 boys, and 3 horses; total, 58. I measured the current of air again at the far end of the front heading, and found it to be 7,000 cubic feet per minute. This current of air now leaves the front heading and passes through a stenton, where it is met in the middle heading by a current of fresh air, about 8,000 cubic feet per minute, coming along the middle heading from the main engine bank. The two currents—that is, the 7,000 cubic feet of air from the front heading, and the 8,000 cubic feet in the middle heading—now mingle together and form one current of about 15,000 cubic feet of air per minute. This current of air passes through another stenton into the back heading workings, where it serves about 45 men, boys, and horses, after which it passes to the furnace."

3. With respect to the concluding portion of your letter, in which you call my attention to apparent defects and want of compliance with the Coal Mines Regulation Act, and say that the miners regret, through their representatives, that there is not more permanent and satisfactory ventilation throughout the mines, I have to request that you will as early as possible be so good as to specifically mention the collieries in this district which you refer to.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

No. 3.

Mr. James Curley, Miners' General Secretary, to The Secretary for Mines.

Sir,

Hamilton, 31 January, 1883.

I have the honor to respectfully submit the enclosed correspondence for your consideration. In conjunction with the Chairman and Treasurer of the Coal-miners' Association, I may state that this course is adopted owing to the expressed opinion of the Government Examiner of Coal-fields regarding alleged deficient ventilation at the Wallsend Colliery, and more men working in a district or split of air than

than what is provided for by the Coal Mines Regulation Act of 1876. In connection with the correspondence, it will be observed that Mr. Inspector Dixon's report is given, and in reference to which the Government Examiner of Coal-fields states:—"It appears to me that the 4th general rule, section 12, of the Coal Mines Regulation Act, 1876, is complied with in the Lambton heading in the Wallsend mine." It may be presumed that this opinion is based upon Mr. Inspector Dixon's report, and if so, we respectfully submit that such an opinion is contradictory to the report, and is also at variance with the 4th general rule, section 12, of the Coal Mines Regulation Act, 1876, to which reference is made. A brief quotation will at once make this apparent: "Every mine shall be divided into districts or splits of not more than seventy men, and each district shall be supplied with a separate current of fresh air." It will be observed that the Inspector's report makes reference to two separate currents of air, but unfortunately the "7,680 cubic feet" referred to, and that supplies 66 men, 5 boys, and 3 horses; total, 74. After it has done its work, instead of being carried by an overcast into the return, continues onward and "now mingles" with the second current, "8,000 cubic feet," and the two combined, "15,000 cubic feet," passes into another district and serves forty-five men, boys, and horses, after which it passes to the furnace. Here then it is quite evident that the 8,000 cubic feet of air, or second separate current, is allowed to be polluted with 7,000 cubic feet of air that serves another district, and which the Inspector in his report states "now mingles together"—that is, the 7,000 and 8,000—"and form one current of about 15,000 cubic feet of air per minute." This being so, very naturally, there is a bulky, polluted, and most unwholesome atmosphere for these forty-five men, boys, and horses to work in. The 8,000 cubic feet of itself, if a separate current at all, is of itself amply sufficient to supply forty-five men, boys, and horses. This cannot have escaped the notice of either the Inspector or the Examiner of Coal-fields. The cost of an overcast to the Company to carry off the 7,000 cubic feet appears to be the sequel. And why this was not directed to be done, instead of the apparent erroneous conclusion arrived at by the Examiner of Coal-fields, we leave the Honorable Minister to judge.

Mr. Inspector Dixon, in the former part of his report, alludes to the total in one instance as seventy-four, and then again as fifty-eight, through some of the front-shift men having gone home. This we contend may possibly give rise to complications, and should, if possible, be avoided. The Inspector might have said it was owing to the time his inspection was made that it is certainly better to confine himself to the number of men working in a district, without the qualification of either front or back shift. This can be obviated if the inspections are made when both shifts are in, for it must be well known to the Inspector that the most of the miners are in the mines during the major part of the day.

In conclusion, having brought these matters under the notice of the Honorable Minister, we are confident that he will deem them of sufficient importance as to require immediate attention, and by giving an early reply will greatly oblige,—

Yours, &c.,

JAMES CURLEY,
Miners' General Secretary.

No. 4.

Minute of the Under Secretary for Mines.

Complaint *re* Ventilation at the Wallsend Colliery.

THE complaint made by the Miners' General Secretary appears to be not that a sufficient quantity of fresh air is not brought into the mine, but that one of the currents, sufficient in itself both as to quantity and quality, is allowed to be polluted by mingling with contaminated air before it reaches the men for whom it is intended, and that consequently these men, contrary to the provisions of the Coal Mines Regulation Act, are not supplied with fresh air. The papers may be forwarded to the Examiner of Coal-fields for report; and the Miners' General Secretary may be informed that the complaint will receive due consideration.

H.W., 2/2/83.

Submitted. Approved.—J. P. ABBOTT, 3/2/83. The Examiner of Coal-fields.—H.W., B.C., 6/2/83.

No. 5.

The Examiner of Coal-fields on Minute dated 2 February, 1883.

To enable the Minister to more clearly understand this case, I forward a tracing* showing where the men were at work, and a statement of the number and names of the front and back shift men in the Lambton headings on the 10th ultimo, the day Mr. Dixon inspected it, from which it will be perceived that the number of men getting coal was fifty-seven in the front shift and fifty-seven in the back shift; and each set of fifty-seven men were supplied with two currents of air of 7,000 and 8,000 cubic feet per minute, both of which were fresh intake air currents when they entered the Lambton heading district; and that the 7,000 cubic feet of air per minute current was of itself more than was required by the provisions of the Act for the fifty-seven men.

* See Appendix
A.
See enclosure.

The hour at which the front and back shift men enter and leave the mine, and the time they are in together, is as follows:—About 2 a.m. sometimes a few of the front-shift men enter the mine; at about 4 a.m. more than half of the front-shift men are in their working places, and at about 6 a.m. the whole of them. At 8 to 9 a.m. the back-shift men go in to relieve the front shift, and they work together for about two and a half hours. The front-shift men are supposed to be all out by noon, and the back shift remain in until about 5 p.m. Thus we find that for about ten and a half hours out of thirteen (say from 4 a.m. to 5 p.m.), on the 10th ultimo, only fifty-seven men were in the Lambton heading district, and for two and a half hours out of thirteen there were 114 men. I do not consider, therefore, that the spirit of the Act has been infringed in this instance; but if its enforcement to the letter is thought necessary, the men appear to have a remedy in their own hands when changing shifts, by the "front-shift men" leaving off work when the "back-shift men" enter.

J.M., 16/2/83.

NAMES

NAMES and numbers of miners working Lambton heading on Mr. Inspector Dixon's last visit:—

201 Lenn and Smith	220 Hughes and Christo	239 Davison and Graves
202 Muthee and Merehan	221 Broadhead and Buxton	240 Shaw and Sims
203 Two Robinsons	222 Hay and Storie	241 Thornton and Davis
204 Fisher and Wallace	223 Boyle and Adamson	242 Firth and Davis
205 Two Eringtons	224 Palmer and Oustom	243 George and Morgan
206 Maclaughlan and Mate	225 Lonsdale	244 Jones and Edwards
207 Two Youngs	226 Ougtram and Ougton	245 Two Hornbes
208 Screen and Hopkins	227 Jones and Howel	246 Bray and Wilson
209 Dunstan and Goodwin	228 Lewis and Thomas	247 Two Nelsons
210 Oswald and Holland	229 Two Conns	248 Conney and Dawson
211 Two Metcalfs	230 Two Oswalds	249 Hindmarsh and Taylor
212 Metcalf and Ziplady	231 Two Peels	250 Jones and Williams
213 Two Horsefields	232 Evans and Mechant	251 Two Gibsons
214 Frederic and Evans	233 Two Morgans	252 Tilley and Drummond
215 Two Keegans	234 Sherlock and Dunlop	253 Two Masons
216 Two Keegans	235 Two Kings	254 Two Hopkins
217 Two Jarretts	236 King and Taylor	255 Two Simpsons
218 Reece and Davis	237 Two Hamiltons	256 Simpson and Gibbons
219 Britt and Joyce	238 Two Walkers	257 Two Websters.

Under Secretary for Mines, B.C., 16/2/83. Submitted. The remedy might inflict loss.—H.W., 19/2/83.

No. 6.

The Examiner of Coal-fields to Mr. J. Y. Neilson.

Sir,

Coal-fields Office, Newcastle, 8 March, 1883.

In pursuance of the provisions contained in the 31st section of the Coal Mines Regulation Act, 1876, I hereby give you notice that on the 13th January last, the 4th sub-section of the 12th section of the said Act was not carried out in the Lambton heading districts at the Newcastle-Wallsend Colliery.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

No. 7.

Mr. J. Y. Neilson to The Examiner of Coal-fields.

Sir,

Newcastle-Wallsend Coal Co., Wallsend, 15 March, 1883.

Your favour of the 8th instant only came to hand yesterday. In reply to which I may state that although I entirely differ with you in your interpretation of the Coal-fields Regulation Act, I will at once proceed to make the necessary alterations to comply with your request.

I have, &c.,

J. Y. NEILSON.

No. 8.

The Examiner of Coal-fields to Mr. J. Y. Neilson.

Sir,

Coal-fields Office, Newcastle, 20 March, 1883.

I beg to acknowledge the receipt of your letter of the 13th instant, informing me that you will at once proceed to make the necessary alterations to comply with the request contained in my letter of the 8th idem.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

No. 9.

Minute of the Honorable the Secretary for Mines.

Ventilation of Wallsend Colliery.

I HAVE read the correspondence in reference to the complaint of the Miners' General Secretary, and I am forced to the conclusion that the 4th sub-section of the 12th section of the Coal Mines Regulation Act of 1876 is not carried out in this mine.

The 3rd sub-section of this clause of the Act states that "an adequate amount of ventilation shall mean not less (as a minimum) than 100 cubic feet of pure air per minute for each man, boy, and horse, which shall sweep undiminished along the airway past each working place."

The 4th sub-section provides that "each district or split shall have not more than seventy men, and each district shall be supplied with a separate current of fresh air." I am satisfied that there being for two and a half hours 114 men in the mine, and during those two and a half hours there being an insufficient supply of fresh air in the terms of the Act, that there was not a compliance with the Act even in spirit. The remedy for this state of things is not in the hands of the men, but of the management, which is bound to supply the fresh air under the Act, as quoted. Where air which has served a district is then allowed to mingle with fresh air and serve another district, however great that supply may be, it is clearly not a compliance with the Act, which speaks of "pure air." This can only mean such air as is sent in fresh without having been used by the men. A copy of this minute may be sent to Mr. Curley, and the Examiner may be informed of it.

J. P. ABBOTT.

26/2/83.

Copy

Copy to Mr. Curley, 27 February, 1883. The Examiner of Coal-fields.—H.W., B.C., 27/2/83. I forward for the Minister's information a copy of notice I have served on Mr. Neilson, and shall be obliged by your informing me what further action he may desire I should take in the matter.—J.M., 8/3/83. The Under Secretary for Mines, B.C., 8/3/83. Submitted.—H.W., 13/3/83.

The Examiner of Coal-fields may be asked to report if any further breaches of the law in the same respect happen, and then steps must be taken to prevent them in the future.—J. P. ABBOTT, 17/3/83. Copy of letter received from Mr. Neilson (the Manager) and my reply thereto forwarded herewith for the Minister's information. Will instruct Mr. Inspector Dixon to visit and report on the Lambton heading district.—J.M., 20/3/83. The Under Secretary for Mines, B.C., 20/3/83. Submitted.—H.W., 28/3/83. Seen.—J. P. ABBOTT, 31/3/83.

Co-operative Colliery.

SCHEDULE.

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No. 1.

Mr. John Dixon, Inspector of Collieries, to Mr. James Fletcher, junr., Manager, Co-operative Colliery.

Sir,

Glebeland, 5 November, 1885.

I hereby notify you of the very defective state of the ventilation in certain districts in the Co-operative Colliery, as found by me on my inspection of said colliery yesterday (Wednesday), 4th instant, as follows:—

1. In the first split, brattice heading, the total current of air was only about 6,000 cubic feet per minute, for about 62 men, 3 boys, and 3 horses—total, 68.

2. In the third split, brattice heading, the total intake current of air was only 7,560 cubic feet per minute, for 76 men, 6 boys, and 6 horses—total, 88. There are too many men on this split, and the current of air is not well sustained, as in one working heading I only got a result of about 4,200 cubic feet per minute, and in the return from this split, 12,580 cubic feet per minute.

In No. 1 district the only available current of air for 53 men, 10 boys, and 7 horses was about 4,080 cubic feet per minute.

2. I have therefore to urge that you would give immediate attention to the above matters, with a view of having them remedied as soon as possible; and in my opinion the only way to effect a proper remedy would be to sink a shaft, and erect a furnace inside of the fault, which furnace would avail for many years to come.

I have, &c.,

JOHN DIXON,
Inspector of Collieries.

No. 2.

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Co-operative Colliery Inspection.

Sir,

Glebeland, 5 November, 1885.

I have the honor to report inspection of the above colliery yesterday, Wednesday, 4th instant, as follows:—

In the 1st split, brattice heading, the current of air was only about 6,000 cubic feet of air per minute, for about 62 men, 3 boys, and 3 horses—total, 68.

In the 2nd split the intake current of air was about 7,980 cubic feet per minute, for about 52 men, 5 boys, and 4 horses—total, 61.

In the 3rd split the total intake current of air was only about 7,560 cubic feet per minute, for about 76 men, 6 boys, and 6 horses—total, 88. There are too many men on this split, and the overman (Mr. Davidson) informed me that this was caused by recent alterations made to relieve the 2nd split, where

where the ventilation had been defective. The current of air in this 3rd split was not well sustained in the working headings, for in one heading it was only about 4,200 cubic feet per minute, and in the return from this split the total current of air was about 12,580 cubic feet per minute.

In No. 4 split, at the top end of No. 3, the total current of intake air was about 7,800 cubic feet per minute for about 26 men, 2 boys, and 2 horses.

In the No. 1 district the total available current of intake air in the working headings was only about 4,080 cubic feet per minute, for about 56 men, 10 boys, and 7 horses, and at the same time the return current of air at the furnace for this district alone was about 20,000 cubic feet per minute.

The overman (Mr. R. Davidson) was with me the whole of the time, and I drew his attention to the above matters in every instance. In addition to this, I have notified the manager, Mr. J. Fletcher, junior, by registered notification, a copy of which I beg to forward along with this report.

Seeing the state of the ventilation in the brattice heading section of workings in the Co-operative Colliery on my inspection yesterday, I am more than ever convinced that the opinion I expressed in my report on 9th May last was a correct one, viz., that the brattice heading sections would never be properly ventilated, unless by having an up-cast shaft and furnace inside the fault; and on two occasions during this year I have urged on the manager the necessity of having this done before the summer months came, but as far as I know nothing has yet been done in the matter.

The main roads and wheeling roads were in good order, and a good supply of timber at the various stations ready for use.

I have, &c.,
JOHN DIXON,
Inspector of Collieries.

No. 3.

The Examiner of Coal-fields to Mr. James Fletcher, junior., Manager, Co-operative Colliery.

Sir,

Department of Mines, Sydney, 24 November, 1885.
In view of a recent report of Mr. Inspector Dixon on the ventilation of the Co-operative Colliery, and in pursuance of the provisions contained in the 31st section of the Coal Mines Regulation Act, 1876, I hereby give you notice that you have failed to comply with sub-sections 2 and 3, section 12 of the said Act.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

No. 4.

The Examiner of Coal-fields to The Under Secretary for Mines.

Sir,

Mines Department, Sydney, 24 November, 1885.

I beg to forward reports, received from Mr. Inspector Dixon, respecting a deficiency of ventilation at the Co-operative Colliery, and copy of a notice I have served upon Mr. James Fletcher, junr., and shall feel obliged by your informing me what further action the Minister desires me to take in the matter.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

The Examiner may take the necessary steps to enforce the penalty provided in this case, unless the owners comply with the law before such proceedings have been commenced.—H.W., 30/11/85.

Submitted. Approved.—G.T., 1/12/85. The Examiner of Coal-fields.—H.W., U.S., B.C., 2 Dec., 1885. Mr. Inspector Dixon for report as to whether the law is now complied with.—J.M., 22/12/85. Further report forwarded.—J.D., 23/12/85.

Mr. Inspector Dixon's report, forwarded herewith, from which it will be seen that the matters complained of have been remedied, and that there is only a slight deficiency of the required current of air in No. 6 split, which, in all probability, will be rectified in the course of a week, as the overman informed him it was the intention of the manager to have the furnace repaired during the week end, so as to get a better result throughout the split. Also that there are several shiftmen constantly employed in this colliery at present in connection with the ventilation, and tenders have been called for the sinking of another shaft for the fault section of workings.—J.M., 24/12/85.

Under Secretary for Mines.—B.C., 24/12/85. In view of this report further proceedings do not appear to be necessary.—H.W., 4/1/86. Submitted. Approved.—R.M.V., 9/1/86.

[Enclosure to No. 4.]

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.
Co-operative Colliery Inspection.

Sir,

Glebeland, 23 December, 1885.

I have the honor to report inspection of the above colliery to-day, Wednesday, as follows:—

1st split.—In this split the current of air was about 10,000 cubic feet per minute, for about 62 men, 5 boys, and 3 horses; total 70. The current of air was well sustained throughout the split.

No. 2 split.—The current of air in this split was about 9,200 cubic feet per minute, for about 57 men, 8 boys, and 4 horses. The main current of air in this split was fairly well sustained, being about 8,610 cubic feet per minute at 36 bord, 6,000 cubic feet per minute at 44 bord, 6,975 cubic feet per minute at 63 bord, 8,400 cubic feet per minute at 68 bord.

No. 3 split.—In this split the current of air at the narrow bord was about 6,930 cubic feet per minute, for about 42 men, 4 boys, and 2 horses; total 48. The current of air at 50 bord was about 4,630 cubic feet per minute, at the stenton 5,850 cubic feet per minute, and at the last bord about 5,590 cubic feet per minute.

No. 4 split.—The current of air in this split was about 9,000 cubic feet per minute, for about 52 men, 6 boys, and 3 horses; total 61.

No. 5 split.—In the intake near shaft the current of air was about 5,040 cubic feet per minute, for about 38 men, 4 boys, and 2 horses; total about 44. The above current of air was well sustained past the first few working places, and I saw shiftmen at work building stoppings in order to conduct the current of air throughout the working headings.

No. 6

No. 6 split.—The intake current of air in this split was about 7,300 cubic feet per minute for about 64 men, 6 boys, and 4 horses; total 74. The above result shows a slight deficiency in the total current, but I beg to state that in all probability the current of air for this split will be very much increased in the course of a week, as the overman, Mr. Davidson, informed me that it was the intention of the management to have the furnace repaired during the week end, so as to get a better result throughout the split.

There are several shiftmen constantly employed in this colliery at present in connection with the ventilation, and tenders have been called for the sinking of another shaft for the fault section of workings.

I have, &c.,
JOHN DIXON,
Inspector of Collieries.

[Enclosure to No. 4.]

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Glebeland, 21 November, 1885.

For your information, I beg to state that on Thursday evening last, 19th instant, I received a telegram from Mr. H. Winchester, of the Coal-fields Office, informing me that Mr. A. Cook, secretary to the Co-operative miners, had wired concerning alleged deficient ventilation in that colliery, and that the miners had ceased work in consequence. I may here state that no particular part of the workings was specified as being defective in ventilation, and I did not see the Check Inspectors' last report, as I am not aware that it was entered in the book kept at the colliery office for that purpose when I was at said colliery yesterday.

However, acting on the message from Mr. Winchester, I went to the Co-operative Colliery yesterday (Friday), and judging that the splits complained of would be in the part of the workings known as "over the fault," I made an inspection of those splits, and beg to report as follows:—

No. 1 split: The total intake current of air for this split was about 6,620 cubic feet per minute. This current of air is coursed along the front heading, and at the far stenton between the two headings. I found it to be about 6,290 cubic feet per minute, and at No. 24 bord, in the back heading, the current of air was about the same as in the stenton. This split, when at work, contains about 67 men, 4 boys, and 2 horses; total, about 73,—thus showing a deficiency in the intake current of air for the above number of men, &c. (on the minimum quantity of air required by the Act), of about 700 cubic feet per minute. This is one of the splits complained of by me in my report of 5th instant, and of which I notified the manager, Mr. J. Fletcher, on the same day.

In No. 2 split the current of air was about 8,640 cubic feet per minute at the intake, and in the cut-through between Jarvie's bord and the Gannon bord it was about 6,600 cubic feet per minute. I saw men at work in this split erecting screen, &c., and when completed the ventilation will be sustained in the working headings throughout the split. When at work there are about 65 men, 7 boys, and 5 horses; total, 77 in this split.

No. 3 split: In this split the total intake current of air was about 8,100 cubic feet per minute, but at 53 bord the current of air was reduced to about 4,320 cubic feet per minute. About 42 men, 4 boys, and 4 horses—total, 50 men, &c.—belong to this split.

In No. 4 split the total intake current of air was about 8,250 cubic feet per minute, and at No. 86 bord it was about 8,000 cubic feet per minute, and well sustained throughout the split. There are about 52 men, 4 boys, and 3 horses—total, 59 men, &c.—in this split when the mine is working.

I here beg to state that the last-mentioned split has been formed since my inspection on 4th instant and notification of 5th instant, in order to relieve the third split, which was then overcrowded.

Concerning the quality of the air supplied in the above splits, I can only say that I have no instrument wherewith to test it, and may add that each of the above-mentioned splits is supplied with air direct from the surface—in two of them from air shafts, in one from a little tunnel, and in another from the main tunnel.

On my inspection yesterday I noticed several men at work in various places erecting stoppings, putting up screens, &c., and at one place a gang of men were at work making an overcast. All this work was being done to further benefit the above-mentioned splits.

In conclusion, I beg to state that I have notified the manager (Mr. J. Fletcher, junr.) concerning the deficiency in No. 1 split, and also of the loss of air in the third split.

I have, &c.,
JOHN DIXON,
Inspector of Collieries.

No. 5.

Check Inspectors' Reports.

Plattsburg, 27 November, 1885.

THE last three inspections on the state of the ventilation in the Co-operative Colliery are as follows:—

26 JUNE, 1885.

Thermometer on top 60°.

Intake in tunnel, 17,094 cubic feet. Thermometer 58°.

No. 1 (timber shaft) intake.—No record, shaft in disuse.

No. 1 Split.

Intake at shaft, 7,920 cubic feet. Thermometer 64°.

At No. 4 bord the current was 3,276 cubic feet. Thermometer 64°.

At No. 10 bord the current was 2,600 cubic feet. Thermometer 65°.

At No. 18 bord the current was 2,600 cubic feet. Thermometer 68°.

Return from No. 1 split, 8,015 cubic feet. Thermometer 70°.

Return from No. 2 split (in the cross-cut), 4,560 cubic feet. Thermometer 70°.

There are 49 men, 3 horses, and 5 boys working on this split of air.

No. 2 Split.

Back heading intake, 2,600 cubic feet. Thermometer 72°.

At Stenton, 2,050 cubic feet.

At No. 3 bord the current was 3,465 cubic feet. Thermometer 72°.

There are 50 men, 8 boys, and 10 horses working on this split of air.

No. 3 Split.

At No. 45 bord the current was 3,125 cubic feet. Thermometer 73°.

At Forester's narrow bord the current was 7,800 cubic feet. Thermometer 73°.

At No. 55 bord (in the back heading) the current was 4,242 cubic feet. Thermometer 73°.

At Stenton the current was 6,240 cubic feet. Thermometer 74°.

Intake from narrow bord, 3,042 cubic feet. Thermometer 72°.

There are 66 men, 9 boys, and 5 horses working on this split of air. The return at the furnace was 12,168 cubic feet.

No. 4 Split.

Intake from shaft, 10,000 cubic feet. Thermometer 69°.

Intake from No. 3 shaft, 8,244 cubic feet. Thermometer 70°.

At the return the current was 11,700 cubic feet. Thermometer 72°.

There are 34 men, 6 boys, and 4 horses working on this split.

No.

No. 5 Split.

At No. 92 bord the current was 5,720 cubic feet. Thermometer 72°.
 From No. 92 to No. 98 bord the anemometer would not work.
 At No. 101 bord the current was 4,500 cubic feet. Thermometer 75°.
 Stoppings badly required in this split.
 There are 30 men, 10 boys, and 8 horses working on this split.
 Return at the big furnace was 44,330 cubic feet. Thermometer 76°.
 Furnace in good working order.

27 JUNE, 1885 (Second Day).

Henderson's Tunnel.—Intake, 11,655 cubic feet. Thermometer 61°.

No. 6 Split.

Intake from fall in, 6,360 cubic feet. Thermometer 60°. Intake from shaft, 6,480 cubic feet.
 A door is badly required at the first cut-through.
 At No. 112 bord the current was 5,656 cubic feet.
 At the cut-through from narrow bord the current was 5,376 cubic feet.
 At No. 131 bord the current was 5,616 cubic feet.
 At No. 136 bord the current was 8,008 cubic feet.
 Return from little furnace 27,630 cubic feet.
 There are 58 men, 12 boys, and 8 horses working on this split.
 Furnace in good working order, and there seemed to be a good supply of timber on the various flats.

GEORGE COOPER, } Inspectors.
 JOHN HOUSTON, }

24 JULY, 1855.

Thermometer on top 58°.

The tunnel intake, 13,650 cubic feet. Thermometer 59°.

No. 1 Split.

At No. 4 bord the current was 2,840 cubic feet. Thermometer 62°.
 At No. 21 bord the current was 2,400 cubic feet. Thermometer 68°.
 There are 44 men, 5 boys, and 3 horses working on this split.
 Return from No. 1 split 8,000 cubic feet. Thermometer 69°.
 Cross-cut return, 9,750 cubic feet. Thermometer 72°.
 At No. 23 bord the current was 7,800 cubic feet. Thermometer 72°.
 At No. 29 bord the current was 3,200 cubic feet. Thermometer 73°.
 At Wonder's cross-cut the current was 7,280 cubic feet. Thermometer 73°.
 At No. 34 bord the current was 7,386 cubic feet. Thermometer 73°.
 At No. 42 bord the current was 3,930 cubic feet. Thermometer 73°.
 At No. 49 bord the current was 6,006 cubic feet. Thermometer 72°.
 At No. 56 bord the current was 2,808 cubic feet. Thermometer 72°.
 There are 84 men, 8 boys, and 10 horses working on this split.
 Intake, 6,760 cubic feet. Thermometer 70°.
 No. 3 split (over the fault) 4,788 cubic feet. Thermometer 72°.
 At No. 65 bord the current was 2,520 cubic feet. Thermometer 74°.
 Cruickshank's narrow bord intake 9,360 cubic feet. Thermometer 73°.
 At No. 74 bord the current was 3,900 cubic feet. Thermometer 74°.
 At No. 77 bord the current was 2,080 cubic feet. Thermometer 74°.
 At Stenton to back heading the current was 7,200 cubic feet. Thermometer 74°.
 The anemometer would not work in the cut-through at Thomas' bord. Very hot and smoky.
 At No. 89 bord the current was 3,120 cubic feet. Thermometer 74°.
 At No. 93 bord the current was 5,200 cubic feet. Thermometer 74°.
 There are 70 men, 7 boys, and 4 horses working on this split.
 Return for big furnace was 50,765 cubic feet. Thermometer 74°. The furnace was in good working order.

25 JULY (Second Day).

Intake from fall in, 3,824 cubic feet. Thermometer 58°.
 Intake from air shaft, 4,680 cubic feet. Thermometer 58°.
 At No. 136 bord the current was 5,440 cubic feet. Thermometer 68°.
 Over the fault, 2,940 cubic feet. Thermometer 71°.
 At No. 142 bord the current was 6,656 cubic feet. Thermometer 71°.
 At No. 148 bord the current was 5,766 cubic feet. Thermometer 71°.
 There are 44 men, 10 boys, and 7 horses working on this split.
 Little furnace, 25,875 cubic feet. Thermometer 70°.
 Intake at Henderson's tunnel, 9,688 cubic feet. Thermometer 64°.

Over the Fault.

At No. 96 bord the current was 4,075 cubic feet. Thermometer 65°.
 At No. 100 bord the current was 5,025 cubic feet. Thermometer 65°.
 At No. 113 bord the current was 3,960 cubic feet. Thermometer 69°.
 At No. 117 bord the current was 3,150 cubic feet. Thermometer 70°.
 There are 42 men, 7 boys, and 5 horses working on this split.
 Return for furnace, 8,970 cubic feet. Thermometer 72°.
 Return for No. 3 split, 11,700 cubic feet. Thermometer 72°.

No.

No. 5 Split.

At No. 118 bord the current was 3,936 cubic feet. Thermometer 72°.

At Nos. 122 and 123 and on to the door the anemometer would not work.

There are 26 men, 8 boys, and 6 horses working on this split.

GEORGE COOPER, } Inspectors.
JOHN HOUSTON, }

26 OCTOBER, 1885.

No. 1 Split.

This split is aired from No. 1 timber shaft and main tunnel.

At the time of our inspection there was not sufficient air coming down the main shaft or passing by the first thirteen (13) bords to work the anemometer, but the working places were cool, fresh, and clear. Thermometer ranging from 68° to 69°.

At No. 14 bord (over the fault) there was a current of 2,805 cubic feet. Thermometer 69°.

At the stenton (near the face of the heading) the current of air was 5,742 cubic feet. Thermometer 69°.

At No. 24 bord the current was 4,510 cubic feet. Thermometer 70°.

At the return for this split at No. 23 bord the current was 5,760 cubic feet. Thermometer 72°.

The air passing the last six or seven bords in this split was thick and sluggish.

There are 64 men, 4 boys, and 3 horses working on this split.

No. 2 Split.

This split is aired from the main tunnel. The intake current at No. 2. Jenny Flat was 7,260 cubic feet. Thermometer 70°.

The current at No. 68 bord was 4,000 cubic feet. Thermometer 72°.

At No. 57 bord the current was 5,900 cubic feet. Thermometer 73°.

At No. 53 bord (in the back heading) the current was 5,376 cubic feet. Thermometer 73°.

The current at No. 47 bord was 4,025 cubic feet. Thermometer 73°.

At No. 39 bord the current was 2,310 cubic feet; thermometer 74°. The air at this place was very irregular; we had to wait for some time before we could get the anemometer to work.

The current of air in the return for this split (in the back cross-cut) was 8,712 cubic feet. Thermometer 72°. The air from No. 47 bord back to the return needs improving very much. At the time of our inspection it was very hot and smoky; also from No. 63 to 68 bords the air needs improving. We were shown two doors that had just been fixed for the purpose of splitting the air at No. 47 bord. The fixing of these two doors should improve the air in this split.

There are 78 men, 9 boys, and 4 horses working on this split.

The return at the furnace for Nos. 1 and 2 splits was 33,900 cubic feet; thermometer 74°.

No. 3 Split.

This split is aired from the main tunnel and Morgan's narrow bord; the current of air at the intake was 7,486 cubic feet. Thermometer 73°.

From No. 80 to No. 88 bords the anemometer would not work, as the current was so slight.

At No. 88 bord the current was 6,860 cubic feet. Thermometer 74°.

At No. 93 bord, after waiting for a considerable time, we recorded a current of 4,255 cubic feet. Thermometer 74°.

At No. 96 bord there was a current of 5,550 cubic feet. Thermometer 74°.

At No. 101 bord the current was 5,445 cubic feet.

At No. 105 bord (next to the return for this split) there was a current of 8,897 cubic feet. Thermometer 74°.

The air all through this split was hot and smoky. The doors in this split require to be well attended. There are 54 men, 12 boys, and 6 horses working on this split.

No. 4 Split.

This split is aired from No. 2 timber shaft. Current of air at the intake was 5,280 cubic feet. Thermometer, 67°.

The current of air at No. 110 bord was 3,240 cubic feet. Thermometer 67°.

The air in the remaining portion of this split was not confined for us to measure it; but the working places were cool and clear, the thermometer ranging from 67° to 70°.

There are 40 men, 2 boys, and 2 horses working on this split.

The current of air at the return of the furnace was 7,920 cubic feet. Thermometer 71°. This furnace also draws the air from No. 3 split, the return from which near the furnace was 10,300 cubic feet.

No. 5 Split.

This split is aired from No. 3 timber shaft, Henderson's tunnel, and the fall-ins. The air not being confined we could not measure it near the working places till we came to—

No. 133 bord, where the current was 2,587 cubic feet. Thermometer 70°.

At No. 140 bord the current was 2,100 cubic feet. Thermometer 70°.

The current of air passing by the working places in the remaining part of this split was so slight that it could not turn the anemometer. Thermometer ranging from 70° to 72°.

The current of air at the furnace was 19,135 cubic feet. Thermometer 70°. There are 64 men, 6 boys, and 3 horses working on this split.

It is necessary that the air in this split should be confined and conducted by the working places as the men in the remaining portion of this split are badly off for air. There appeared to be a good supply of timber at the various flats. The travelling roads would be all the better for a cleaning, as there are some places nearly impassable for water and sludge.

The total currents of air at the three (3) furnaces were 71,255 cubic feet per minute.

JOSEPH MIDDLEBY, } Inspectors.
AMRAM LEWIS, }

No. 6.

The Miners' General Secretary to The Honorable the Secretary for Mines.

Sir,

Hamilton, 25 January, 1886.

I have the honor to respectfully refer you to the interview which took place on the 15th instant, by the Executive of the Miners' Association, and the subjects then brought officially under your notice by communication.

In furtherance of the object of the deputation, I am instructed by the Executive of the Mining Association to forward copies of check inspectors' reports made at several collieries for your perusal; and am requested to add that since the interview took place certain of the Co-operative miners have had to come out of the mine, not being able to work in consequence of alleged defective ventilation. This occurred on Tuesday, 19th instant.

Trusting that the subjects brought under notice on the 15th instant will receive immediate attention,—

I have, &c.,

JAMES CURLEY,
Miners' General Secretary.

[Enclosure to No. 6.]

Lambton Colliery, 28 and 29 July, 1885.

WE, the undersigned, having examined the workings and travelling roads of the above colliery, report as follows:—

New Tunnel—Farish Flat.

There are 62 men, 6 boys, 6 horses at this flat. Intake of air is 10,920 feet per minute; air passing the ends of 5 bords, from No. 1 to No. 5, is 6,840 feet per minute; air passing the ends of 7 bords, from No. 5 to No. 12, is 2,520 feet per minute, thermometer 68°; air passing the ends of 9 bords, from No. 12 to No. 21, is 3,240 feet per minute, thermometer 67°; air passing the ends of 5 bords, from No. 21 to No. 26, is 6,000 feet per minute, thermometer 67°; air passing the ends of 5 bords, from No. 26 to No. 31, is 4,290 feet per minute, thermometer 68°.

We also wish to call your attention to the cut-through that the men travel in, which is full of water, and requires something doing to it.

Far Flat No. 1.

There are 46 men, 6 boys, 5 horses at this flat. Intake of air, 7,560 feet per minute; air passing the ends of bords from No. 18 to No. 10 so slack that we were unable to test the quantity, thermometer 75°; air passing the ends of 7 and 8 bords, 2,840 feet per minute; there, 5 pillars with 20 men in them, we found the air to be very much heated, and were unable to test the quantity, thermometer 75°.

Far Flat No. 2.

There are 42 men, 4 boys, 4 horses at this flat. Intake of air is 5,280 feet per minute; air passing the ends of 10 places on right-hand side of bank so slack that we were unable to test the quantity, thermometer 70°; air passing the ends of 10 bords on left-hand side of flat, 2,640 feet per minute, thermometer 69°.

Straight-down Flat.

There are 60 men, 7 boys, 6 horses at this flat. Intake of air, 7,160 feet per minute; air passing the ends of 5 bords on right-hand side of flat is 2,400 feet per minute, thermometer 69°; air passing the ends of 4 bords on right-hand side of narrow bords is 2,400 feet per minute, thermometer 70°; air passing the ends of 5 bords on right-hand side of narrow bord cut-through higher up, 2,310 feet per minute, thermometer 71°; air passing the ends of 11 bords in Dent's heading, 3,465 feet per minute, thermometer 74°; air passing the ends of 5 bords on left-hand side of narrow bord, 2,800 feet per minute, thermometer 74°.

South Pit Flat.

There are 34 men, 3 boys, 3 horses at this flat; air passing the ends of Nos. 1 and 2 bords, 1,960 feet per minute; air passing the ends of 5 bords, from No. 2 to No. 7, so slack that we were unable to test the quantity; intake of air on right-hand side of bank, 2,640 feet per minute; air passing the ends of 10 bords here, 3,300 feet per minute, thermometer 70°.

Middle Pit Flat.

There are 54 men, 7 boys, 7 horses at this flat. No. 1 intake of air at New Chum, 8,320 feet per minute; air passing the ends of 4 bords, from No. 2 to No. 5, is 4,320 feet per minute, thermometer 65°; air passing the ends of 9 bords, from No. 6 to No. 14, is 4,512 feet per minute; air passing the ends of 4 bords, from No. 14 to No. 18, 2,871 feet per minute, thermometer 70°.

Intakes.	Returns at Furnace.
10,920	42,120
7,560	32,340
5,280	42,840
7,160	23,100
2,640	
8,320	
	Total..... 140,400

Total..... 41,880

Travelling roads and furnaces in good order, with the exception of No. 1 return at furnace, which is partly blocked up.

WALTER KERR, }
E. CHARLTON, } Check Inspectors.

[Enclosure to No. 6.]

Lambton Colliery, 24 and 25 August, 1885.

WE, the undersigned, having examined the workings and travelling roads of the above colliery, report as follows:—

New Tunnel—Farish Flat.

There are 62 men, 6 boys, 6 horses at this flat. Intake of air, 7,140 feet per minute.

Air passing the ends of 5 bords, from No. 1 to No. 5, is 3,300 feet per minute; thermometer 61°.

Air passing the ends of 10 bords, from No. 5 to No. 15 was so slack that we were unable to test the quantity; thermometer 64°.

Air passing the ends of 6 bords, from No. 16 to No. 21, is 1,470 feet per minute; thermometer 69°.

Air passing the ends of 10 bords, from No. 21 to No. 31, is 5,320 feet per minute; thermometer 70°.

Far Flat No. 1.

There are 46 men, 6 boys, 5 horses at this flat. Intake of air, 5,005 feet per minute.

Air passing the ends of 5 bords, from No. 18 to No. 14, so slack that we were unable to test the quantity; thermometer 71°.

Air passing the ends of 7 bords, from No. 14 to No. 7, is 4,800 feet per minute; thermometer 72°. We found the air to be more improved at the Pillars than last time.

Far

11.

Far Flat No. 2.

There are 44 men, 4 boys, 4 horses at this flat.

Air passing the ends of all the bords on right-hand side of flat was so slack that we were unable to test the quantity ; thermometer 70°. Intake of air on the bank, 3,960 feet per minute.

Air passing the ends of 10 bords on left-hand side of flat, 1,800 feet per minute ; thermometer 67°.

Straight-down Flat.

There are 60 men, 7 boys, 6 horses at this flat. Intake of air on the bank, 3,960 feet per minute.

Air passing the ends of 5 bords on right-hand side of bank was so slack that we were unable to test the quantity ; thermometer 72°.

Air passing the ends of 5 bords on right-hand side of narrow bord, 1,800 feet per minute ; thermometer 72°.

Air passing the ends of 5 bords in top cut-through, 2,210 feet per minute ; thermometer 72°.

Air passing the ends of 11 bords in Dent's heading, 4,050 feet per minute ; thermometer 74°.

Air passing the ends of 5 bords on left-hand side of narrow bord, 3,300 feet per minute ; thermometer 75°.

South Pit Flat.

There are 35 men, 4 boys, 4 horses at this flat. Intake of air on right hand side of flat, 3,630 feet per minute.

Air passing the ends of all the bords on right-hand side of flat, 3,630 feet per minute ; thermometer 69°.

Air passing the ends of all the bords on left-hand side of flat so slack that we were unable to test the quantity ; thermometer 74°.

We also wish to draw your attention to the want of timber at the South Pit, and also to the want of manholes in that portion of the bank from the old flat to the new one.

Middle Pit Flat.

There are 60 men, 6 boys, 6 horses at this flat. No. 1 intake of air, 6,490 feet per minute ; No. 2 intake of air, 5,720 feet per minute.

Air passing the ends of 7 bords, from No. 1 to No. 7, is 3,360 feet per minute ; thermometer 68°.

Air passing the ends of 12 bords, from No. 7 to No. 19, is 3,300 feet per minute ; thermometer 69°.

Intakes.

7,140
5,005
3,960
3,960
3,630
6,490
5,720

Returns at Furnace.

41,760
35,770
33,390
24,360

Total.....135,280

Total.....35,905

Travelling roads and furnace in good order.

WALTER KERR, }
E. CHARLTON, } Check Inspectors.

[Enclosure to No. 6.]

Lambton Colliery, 23 and 24 September, 1885.

WE, the undersigned, having examined the workings and travelling roads of the above colliery, report as follows :—

New Tunnel, Farish Flat.

There are 62 men, 6 boys, 6 horses at this flat. Intake of air for same, 5,460 feet per minute.

Air passing the ends of 5 bords, from No. 1 to No. 5, is 2,340 feet per minute.

Air passing the ends of 8 bords, from No. 6 to No. 13, is 2,730 feet per minute ; thermometer 69°.

Air passing the ends of 8 bords, from No. 13 to No. 21, is so slack that we were unable to test the quantity ; thermometer 70°.

Air passing the ends of 10 bords, from No. 21 to No. 31, is 2,400 feet per minute ; thermometer 69°.

Far Flat No. 1.

There are 50 men, 3 boys, 3 horses at this flat. Intake of air for same, 4,680 per minute. We inspected all the pillars and found the air to be workable ; thermometer 74°.

Far Flat No. 2.

There are 54 men, 6 boys, 6 horses at this flat. Intake of air for same, 4,800 feet per minute.

Air passing all the bords on right-hand side of flat so slack that we were unable to test the quantity ; thermometer 71°.

Air passing the ends of 10 bords on left-hand side of flat, 1,650 feet per minute ; thermometer 69°.

Air passing the ends of 5 bords on right-hand side of Straight-down Flat, which is attached to Far Flat, was so slack that we were unable to test the quantity ; thermometer 70°.

South Pit Flat.

There are 40 men, 6 boys, 6 horses at this flat. Intake of air for same, 4,650 feet per minute.

Air passing the ends of 5 bords, from No. 11 to No. 7, is 4,650 feet per minute ; thermometer 72°.

Air passing the ends of 6 bords, from No. 7 to No. 1, so slack that we were unable to test the quantity ; thermometer 72°.

Intake of air on left-hand side of bank, 2,790 feet per minute.

Air passing the ends of 8 bords, from No. 19 to No. 10, is 2,790 feet per minute ; thermometer 72°.

Middle Pit Flat.

There are 56 men, 6 boys, 6 horses at this flat. No. 1 intake of air, 4,680 feet per minute ; No. 2 intake of air, 5,985 feet per minute.

Air passing the ends of 7 bords, from No. 1 to No. 7, 2,695 feet per minute ; thermometer 67°.

Air passing the ends of 12 bords, from No. 7 to No. 19, 2,475 feet per minute ; thermometer 69°.

We once more wish to draw your attention to the want of manholes on the South Pit Bank from the old flat to the present flat. We further want to draw your attention to the different parts of the roof which want attending to, as we think they are not safe.

Intakes.

5,460
4,680
4,800
4,650
2,790
4,680
5,985

Returns at Furnace.

45,360
38,220
34,965
25,200

Total.....143,745

Total 33,045

Travelling roads and furnace in good order, with the exception of the air-course in front of the furnace, which is very much blocked up with coal and requires clearing away, and that portion of the South Pit Bank which we drew your attention to.

WALTER KERR, }
ED. CHARLTON, } Check Inspectors.

No. 7.

The Under Secretary for Mines to The Examiner of Coal-fields.

Sir, Department of Mines, Sydney, 30 January, 1886.
I am directed by the Secretary for Mines to inform you that a letter has been received from Mr. James Curley, Secretary of the Miners Association, to the effect that the miners at the Co-operative Colliery had to come out of the mine on the 19th instant, not being able to work in consequence of defective ventilation, and I am to request that you will report on the matter without delay.

I have, &c.,
HARRIE WOOD,
Under Secretary.

No. 8.

The Under Secretary for Mines to The Manager, Co-operative Colliery, Wallsend.

Sir, Department of Mines, Sydney, 30 January, 1886.
I am directed by the Secretary for Mines to call your attention to a statement made by James Curley, Secretary of the Miners' Association, in a letter to this Department of the 25th instant, to the effect that the miners at the Co-operative Colliery, Wallsend, had to come out of the mine on the 19th instant, not being able to work in consequence of defective ventilation.

I have, &c.,
HARRIE WOOD,
Under Secretary.

No. 9.

Mr. James Fletcher, jun., Manager, Co-operative Colliery, to The Honorable the Secretary for Mines.

Sir, Wallsend, 1 February, 1886.
Your letter of 30th ultimo, informing me that Mr. Curley, Miners' General Secretary, had written to you on the 25th ultimo, that the miners employed at the Co-operative Colliery, Wallsend, had to come out of the mine on the 19th instant, not being able to work in consequence of defective ventilation, is duly to hand, and contents noted.

I do not say that Mr. Curley wrote intentionally to mislead you, but I venture to affirm that the wording of his letter could have no other effect than to convey the idea that the whole of the miners employed at this colliery had to leave the pit in consequence of defective ventilation. I am so much accustomed to hear of late of misleading statements being made that they would have to be extravagant indeed to surprise me. Mr. Curley, in his official capacity, could not, of his own knowledge, know anything but what was communicated by some or other of the miners here employed, and it is but another proof that men holding important positions should act with the greatest of caution on *ex parte* statements before making such serious charges against this or any other colliery.

It is true that some fourteen or fifteen men left their work in consequence of the air being slack in that particular part of the pit where they were working. The cause of the deficiency of air was discovered by the underground manager by 7 o'clock a.m., the time the drawing of coal commences, and was remedied in less time than it takes to write this. Briefly stated the cause was the leaving of an air-door open which allowed the air to go direct to the furnace without passing over the men in this particular district, or any part of the pit, as the air passed through the doorway in question and went direct to the ventilation shaft. I may mention that this door was placed there as a convenience for the men, so that they might travel to and from their work in a shorter distance than by keeping the main road. It also served for the colliery officials to pass through when examining the airways.

Every practical coal-miner knows that air-doors are erected to check currents, and that the leaving of them open disarranges the whole of the ventilation in their locality; but notwithstanding this fact being universally understood, the miners in passing through this door, instead of closing it behind them, left it open, which I believe was done wilfully and designedly, with the view of creating a misunderstanding between us and the men.

When the defective state of the ventilation was detected by the underground manager and other colliery officials, they immediately examined the airways and ventilating furnace, and finding everything right with both they were at a loss to account for the slackness of air, never for one moment dreaming that the door in the travelling road for the men's convenience had been left open, and it was only by following up the return column of air that the cause was detected. This was at once explained to the men, who were about to go home, and they were assured that the air would shortly be all right, and within half-an-hour of their leaving, and the door being closed, the air was as good as it was before, and is since.

It was no secret amongst the men that the door being left open caused the defective ventilation, and I have no hesitation in saying that Mr. Curley's informant knew it as well as we did.

At every air-door on the main roads of our mine a boy is kept specially to open and shut it each time a person or horse passes through, but the door in question only being there for the convenience of the men, and not on a main road, no boy was kept to attend it. Whoever left it open committed a gross abuse of a privilege established for their convenience; and to prevent a like occurrence it has since been nailed up.

We have several miles of airway in our mine, and no matter how careful we are, falls from the roof and similar accidents may occur which temporarily interfere with the ventilation, and to provide for this the airways are examined every day, either by the regular officials, or persons told off for that particular duty. If, however, the miners themselves, who are equally interested with the management in keeping up a proper supply of air, will either negligently or designedly leave air-doors open it is a difficulty of far greater magnitude than keeping the airways in proper order, notwithstanding their great length.

We

We have 340 to 350 miners employed in this colliery, and as only fourteen or fifteen of that number left their work on the day referred to by Mr. Curley, it is, I think, substantial proof that the deficient ventilation was confined to the district I refer to, and not the whole of the mine, as must be inferred by Mr. Curley's letter.

Where the Coal-fields Regulation Act is not carried out faithfully, I do not, for one, complain at the miners seeking the Minister's assistance to insist on its being done, but I do complain of statements being made to the Minister calculated to mislead, when the miners themselves knew exactly the cause; and further, that the cause was not brought about by any act or neglect of the management, but by the negligence or design of members of their own body.

I trust the explanation here given will put the matter brought under your notice by Mr. Curley in its proper light; and to still further prove the statements here made, I shall feel extremely obliged if you will instruct Messrs. Mackenzie and Dixon to visit the colliery and ascertain for themselves by actual experiment whether leaving open the air-door referred to will not bring about the result of which Mr. Curley complains.

I am, &c.,

JAMES FLETCHER, JUNIOR,
Manager.

No. 10.

The Examiner of Coal-fields to The Under Secretary for Mines.

Examiner of Coal-fields' Report on a complaint made to the Honorable the Secretary for Mines by the Miners' General Secretary, respecting alleged defective ventilation at the Co-operative Colliery, on 19th January, 1886.

Sir,

Coal-fields Office, Newcastle, 3 February, 1886.

In compliance with the instructions of the Honorable the Secretary for Mines, conveyed to me in your letter of the 30th ultimo, with respect to a letter he has received from Mr. Curley, Secretary of the Miners' Association, to the effect that the miners at the Co-operative Colliery had to come out of the mine on the 19th ultimo, not being able to work in consequence of defective ventilation, and asking me to report on the matter without delay,—I have the honor to state that I went to the Colliery, accompanied by Mr. Inspector Dixon, yesterday, and report as follows:—

1. On arriving at the colliery, I went in the mine with Mr. Inspector Dixon, Robert Davidson (overman), and John Houston (deputy), where I was met by the "Miners' Inspectors," who happened to be there for the purpose of making their monthly inspection, and who came and asked if I had any objection to their accompanying me, or would I let them check their anemometer with the Government one.

I replied I was only there that day inquiring into and ascertaining the cause of a deficiency of ventilation on the 19th ultimo, which Mr. Curley had complained of at the request of the Executive of the Miners' Association. But after this was done, having before entering the mine seen the latest report made by them in the "book" kept at the colliery office for that purpose, I and Mr. Dixon accompanied by them would measure the quantity of air at the same places where they had measured it and reported a deficiency of ventilation.

Inquiry and Report.

1. John Houston (deputy), of the Co-operative Colliery, said as follows:—On the morning in question I was in No. 1 split at about 7 a.m., when some of the men then coming into that split said, "Houston, what is the matter in the cross-cuts; there are some of the men going away home on account of the air." I replied that is the first I have heard of anything the matter with the air this morning, but will make my way there immediately. On going, with a view to making my way to the furnace, thinking there might be a fall in the return, I entered into it from No. 1 split, and when coming up the return and arriving at the door that enters into the cross-cut return, I immediately saw what was the matter, as the door was standing about three-parts open with a stone against it, keeping it open. That the door must have been opened by some of the men coming in to work in No. 2 or 3 splits. Could not say whether the door had been propped open purposely, or a stone had fallen against it as some one had passed through it.

2. Robert Davidson (overman), of the Co-operative Colliery, stated:—When going to the mine from my breakfast, I met Daniel Rees, John Rees, Samuel Rees, Daniel Rees (junior), William Gilpin, Alfred Upton, Thomas Lewis, Henry Forrester, Ezekiel Williams, and Alfred Patterson at the tunnel mouth and asked them what was the matter. They replied "the air was bad." I told them I would go down immediately and see what was the matter, and that I could not understand how the air could be bad unless a door had been left open. They said they did not know. I then went to the bord where they had been at work and found the air as good as usual and nothing possible to complain of. Then I sent for the deputy (John Houston), who came and told me it was all right, and that he had found out where the fault was, "by a door being propped open by a stone," and that he believed it had been propped open on purpose. I then went to other miners who did not leave off working, and were still at work, in the same split, who said "their air was all right."

The "back shift" (second daily set of miners) never came to work that day, although the air was as good as ever in half an hour after the "front shift" had left the mine.

3. I got Houston to show me and Mr. Dixon how he found the door, and after taking the stone away which he put against the door to illustrate it I passed through it to see if it was possible that a stone could fall down and rest against the door in such a manner, whilst the door, which was a self-acting one, closed of its own accord. My opinion, and Mr. Dixon's, is that from the way the stone was placed, as shown us by Houston, it was most probably put there intentionally. (*Appendix B.*)

4. I annex a tracing showing the method adopted for the ventilation of the portion of the mine complained of, also the bords (lettered A) where the men left off work and those in which the men remained at work (lettered B) in the same split of air; and where the door (D in red) was found open in the

the stenton between the intake and return air-ways. The arrows shown in blue denote how the intake air enters the split outside of the said door and circulates through the northern side of the split crossing the heading almost opposite the door, near the top of which heading a temporary screen is fixed, from which it will be seen that when the door referred to (D) was open the current (→) would sweep through the screen down the heading and through the open door into the main return airway instead of circulating into the heading and bords where the men left off work, and that when the door is open the air would travel through it to the furnace, as it would be the shortest route.

5. In conclusion, I have only to state that the overman says the door was put where it is for the men's convenience in travelling in and out of this part of the mine, and that each person passing in and out was supposed to see it was closed, and that if it had been shut on the day in question the alleged defective ventilation would not have occurred. Also that the defect was rectified within half an hour of certain miners leaving the mine—they and others having been made acquainted with it immediately afterwards. Notwithstanding this, the complaint was made to the Minister after a lapse of five days, during which time the same miners had been at work in the places where they left off work. One of the miners who left off work with his three sons on the morning in question was Mr. Daniel Rees, of the Miners' Executive Committee, and District Chairman of the Hunter River Miners' Association.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

From this report it appears there was no ground for the complaint of defective ventilation on the 19th January.—H.W., 8/1/86. Submitted. Approved.—R.N.V., 19/2/86. Mr. Curley informed 25 February, 1886.

No. 11.

Report of a joint Inspection of Nos. 2 and 3 splits in the Co-operative Colliery made by the Examiner of Coal-fields, Inspector of Collieries, and Mr. Middleby and Mr. Lewis (Miners' Inspectors), on Tuesday, 2nd February, 1886.

Sir,

Coal-fields Office, Newcastle, 3 February, 1886.

The following are the results of measurements taken at the request of the Miners' Inspectors for the purpose of ascertaining what quantity of air was circulating in the Nos. 2 and 3 splits in which they had reported, in the book kept at the colliery office for that purpose, a deficiency of ventilation on the 6th and 7th of January last.

The measurements were taken at the same time, and the anemometers placed side by side.

No. 2 SPLIT.

At No. 80 bord the result was about 7,716 cubic feet of air per minute, the reading of both instruments in this instance being nearly the same.

At No. 71 bord the result was about 5,082 cubic feet of air per minute, and by the Miners' Inspectors' instrument about 3,880.

At No. 41 bord the result was 7,049 cubic feet by the Government instrument, and 6,829 by the Miners'; and at 38 bord 6,600 by the Government anemometer, and 5,500 cubic feet per minute by the Miners'.

The largest current of air measured in this No. 2 split was about 7,716 cubic feet per minute for about 56 miners, 2 wheelers, 2 drivers, 3 tappers, and 2 horses—total 65, giving about 118 cubic feet of air per minute for each man, boy, and horse.

The Miners' Inspectors at Co-operative Colliery, however, have lately adopted the plan of measuring the current of air in several places in each split, then adding the measurements together and striking an average for the result, and even by this method the result would be a little over 101 cubic feet of air per minute for each man, boy, and horse in the split.

No. 3 SPLIT.

The greatest current of air was got at the No. 65 bord end, being about 6,840 cubic feet per minute. The two anemometers registered about the same on this occasion, and in the far stenton in this split the current of air was about 5,800 cubic feet per minute, the instruments again giving nearly the same reading. At 52 bord, however, the current of air was about 6,435 cubic feet per minute by the Government anemometer, and about 6,184 by the Miners'.

The largest current of air in this split was about 6,840 cubic feet per minute for about 48 men, 5 boys, and 3 horses—total 56 men, &c., giving about 122 cubic feet of air per minute for each man, boy, and horse in this No. 3 split, and by the Co-operative Miners' Inspectors' method of average would give about 113 cubic feet of air per minute for each man, boy, and horse in the split.

It will thus be seen that the provisions of the Coal Mines Regulation Act are here complied with.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

The result of the investigation appears to be satisfactory, and may be communicated to the Miners' Secretary.—H.W., 8/2/86. Submitted. Approved.—R.M.V., 19/2/86.

No. 12.

The Under Secretary for Mines to The Miners' General Secretary, Hamilton.

Sir, Department of Mines, Sydney, 25 February, 1886.

Referring to the complaint made by you respecting alleged defective ventilation at the Co-operative Colliery on the 19th ultimo, I am directed by the Secretary for Mines to inform you that, from the report of the Examiner of Coal-fields, there appears no ground for complaint as to the ventilation of the colliery on the day named.

I have, &c.,
HARRIE WOOD,
Under Secretary.

No. 13.

The Under Secretary for Mines to The Examiner of Coal-fields.

Sir, Department of Mines, Sydney, 25 February, 1886.

Referring to the reports sent in by you—the one on a complaint by the Miners' General Secretary respecting alleged defective ventilation at the Co-operative Colliery, and the other as to the quantity of air circulating in Nos. 2 and 3 splits in the same colliery,—I have the honor to inform you that it has been intimated to Mr. Curley, the Miners' General Secretary, that both reports furnished by you as to the ventilation of the abovenamed colliery are considered satisfactory.

I have, &c.,
HARRIE WOOD,
Under Secretary.

Maryville Colliery.

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No. 1.

Mr. John Wright to Mr. J. Dixon, Inspector of Collieries.

Sir, Wickham, 9 November, 1885.

I am instructed by the Committee of our body to write to you calling your attention to the air in the Maryville Colliery, as there have been a great many complaints.

I have, &c.,
JOHN WRIGHT,
Secretary.

No. 2.

Mr. John Dixon, Inspector of Collieries, to Mr. H. Harper, Colliery Manager, Newcastle.

Sir, Glebeland, 25 January, 1886.

I hereby have to notify you of the very defective state of the ventilation in the Maryville Colliery, as found by me on my inspection of said colliery to-day (Monday), inasmuch as the total current of air in the main return airway near pit-bottom was only about 1,885 cubic feet per minute, being over 3,000 cubic feet of air per minute short of the quantity required by sub-section 3, section 12, of the Coal Mines Regulation Act, 1876, for the number of men, &c., at work in the Maryville Colliery at the time of my inspection.

2. On my inspection this morning I noticed that the top coal had been cut up and, to some extent, worked in three bords. Therefore, in pursuance of the provisions contained in the 25th section of the Coal Mines Regulation Act, 1876, I hereby notify you that, in my opinion, owing to the soft nature of the

the strata above the seam at the Maryville Colliery, it is a dangerous practice to work the top coal at the present time, more especially as there is only one shaft, and consequently only one way of escape for the persons employed below in the event of a sudden inrush of water, sand, and gravel, which, in my opinion, may be liable to take place at any time after the removal of the top coal.

3. I have, therefore, to urge that the above matter may have your serious attention at once, with a view to the well-being and safety of all persons employed in the Maryville Colliery.

I have, &c.,

JOHN DIXON,

Inspector of Collieries.

No. 3.

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Maryville Colliery Inspection.

Sir,

Glebeland, 1 February, 1886.

I have the honor to report inspection of the above colliery on Monday (25th January ultimo), as follows:—

At the time of my inspection there were about 37 miners, 1 small coal filler, 1 deputy, 5 wheelers, 2 water-balers, 1 onsetter, and 2 horses; total, about 49 men, &c., employed below.

The total current of air for the above number of men, &c., was only about 1,885 cubic feet per minute. This result was got in the main return air-way near the shaft bottom immediately after descending the shaft on the day of inspection. After going through the workings (where I could not get a result with the anemometer), I came back to the bottom of the shaft again, and got exactly the same result as before. Although none of the workings are a very great distance from the pit bottom, yet, owing to the very limited quantity of air descending the shaft, the ventilation throughout the working headings was sadly defective, as the total quantity of air was over 3,000 cubic feet per minute below the requirements of the Coal Mines Regulation Act for the number of men, &c., employed below.

At the time of my inspection there was a good fire in the furnace at the surface, but it seemed to have little or no power over the up-cast column of air behind the brattice in the shaft. I here beg to remark that on the 12th December last the manager (Mr. Harper) promised me that he would raise the up-cast portion of the shaft above the level of the landing stage. This promise he (Mr. Harper) fulfilled by raising the furnace stack some 16 feet higher, but without any apparent beneficial results to the ventilation of the mine.

2. On my inspection of the Maryville Colliery on Monday last I also noticed that three bords had been cut up, and part of the top coal worked in each of the three. In the No. 2 heading there were two men cutting a bord up; they had reached the roof at about 5 feet, but had not got the bord cut all across when I saw it; this bord was about 6 yards wide. In No. 3 heading I saw two men working top coal in a bord about 7 yards wide; the tops in this bord were also about 5 feet in thickness, and had been worked for about 10 yards in length down the bord. In the adjoining bord, being No. 6 bord, No. 3 heading, I also saw two men at work in the tops; this bord was about 7½ yards wide, and the tops had been worked for a distance of about 11 yards. The roof in this bord was wet, as water was coming through in several places.

3. Seeing that as yet there is only one shaft in connection with the Maryville Colliery, and that the strata overlying the seam of coal is of an extremely soft nature throughout, I am of opinion that it is a highly dangerous practice to work the top portion of the seam in the Maryville Colliery until the dip-coal is worked, and a second shaft sunk to afford another means of escape for the persons employed below.

4. In conclusion, I beg to state that on Monday last, the day of inspection, I notified the manager (Mr. Harper), by registered notification, concerning the defective ventilation, and the top coal workings in the Maryville Colliery, a copy of which notification I herewith beg to forward.

I have, &c.,

JOHN DIXON,

Inspector of Collieries.

No. 4.

The Examiner of Coal-fields to The Under Secretary for Mines.

Deficiency of Ventilation, &c., at the Maryville Colliery.

Sir,

Coal-fields Office, Newcastle, 5 February, 1886.

I have the honor to forward for the information of the Honorable the Secretary for Mines a report I have received from Mr. Inspector Dixon, dated the 1st instant, with respect to a deficiency of ventilation at the Maryville Colliery, the ventilation of which had been previously complained of by the Inspector to the manager on 12th December last, when the latter promised to raise the up-cast portion of the shaft above the level of the landing-stage. This promise was fulfilled by raising the furnace stack 16 feet higher, but without any beneficial results to the ventilation of the mine, there being a deficiency on 25th ultimo of over 3,000 cubic feet of air per minute for the number of men, &c., employed underground.

2. Mr. Dixon also reports that three 6-yard bords had been cut up and part of the top coal worked in each of them. In No. 3 heading two men working top coal in a bord about 7 yards wide, and in another 7½-yard bord, the top coal had been worked for a length of about 11 yards where the roof was wet, and water was coming through it in several places; and that, seeing there is only one shaft in connection with the colliery, and that the strata overlying the coal seam is of an extremely soft nature throughout, he is of opinion that it is a highly dangerous practice to work the top portion of the seam in the Maryville Colliery until the dip coal is worked, and a second shaft sunk to afford another means of escape for the persons employed below, in which I fully agree, and forward for the Minister's information a letter I wrote to Mr. Dixon on the subject, on the 21st October last, and a copy of a letter to Mr. Dixon, dated 28th October, from the manager, saying he was putting down a borehole, in view of ascertaining the most suitable position for putting down a shaft. The bore was completed a short time afterwards

and

and nothing further has been done with a commencement of the second shaft, which Mr. Dixon and myself have told him we considered absolutely necessary, taking into consideration the extremely soft nature of the strata overlying the coal-seam, and the probability of a much larger influx of water flowing into the mine than has occurred on three previous occasions. I also enclose copy of notice Mr. Dixon has served on the manager.

3. I shall be obliged by your informing me, as early as practicable, what further steps the Minister desires me to take in the matter.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

Unless the defects be at once remedied the Examiner may take proceedings to enforce the observance of the provisions of the Act.—H.W., 11/2/86. Submitted. Approved.—R.M.V., 12/2/86. The Examiner of Coal-fields.—G.E.H., B.C., 13/2/86.

In regard to the matter of the second opening referred to in the within report, the Examiner should instruct the Inspector to serve notice, in terms of section 25 of the Coal Mines Act, upon the owners of the Maryville Colliery.—H.W., 4/3/86.

Submitted. The Inspector served notice upon the manager on 25th January last.—J.M., 8/3/86. The Under Secretary for Mines, B.C., 8/3/86.

From the fact that the owner has not complied with the notice it may be inferred that he objects, in which case the matter will have to be referred to arbitration; but the Minister might perhaps desire that the owner's attention be called to the notice before taking further proceedings.—H.W., 8/3/86.

Submitted. Approved.—J.F., 10/3/86.

[Enclosures to No. 4.]

The Examiner of Coal-fields to Mr. John Dixon, Inspector of Collieries.

Sir,

Coal-fields Office, Newcastle, 21 October, 1885.

Since my inspection and examination with you of the heading and bord which caved in a short time since, where two men were at work at the Maryville Colliery, the caving in having taken place immediately after the heading and bord, being driven by the two men, reached a face of sand and gravel, when a tremendous rush of water and sand ran therefrom into the workings, which wash-out, consisting of sand and gravel, is now barred back by a barrier reaching to the roof of the coal-seam.

2. In consequence of the disturbed nature of the country at this Colliery and others in the neighbourhood, and the liability at any time of similar washes of sand and gravel, I have thought seriously as to the necessity of the owners of the Maryville, Wickham, and Bullock Island, and Stockton Coal Companies being compelled to keep boreholes at least 10 feet ahead in all exploring headings driven north, east, south, or west of their working shaft.

3. Do you not think it is a dangerous practice, knowing the disturbed nature of the country in which the Maryville and Stockton Collieries are, for them to be worked as they now are by one shaft, and consequently only one means of escape for the men, boys, &c., working therein, and that a second shaft should be commenced at once; if so, you had better serve the colliery managers with registered notices to that effect under section 25 of the Coal Mines Regulation Act 1876?

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

Mr. John Dixon, Inspector of Collieries, to Mr. H. Harper, Colliery Manager, Newcastle.

Sir,

Glebeland, 24 October, 1885.

Knowing the disturbed nature of the ground in connection with the Maryville Colliery, I have, in pursuance of the provisions contained in the 25th section of the Coal Mines Regulation Act 1876, to notify you that I consider the practice of only having one shaft (and consequently only one means of escape) to be dangerous; and therefore have to urge that a second shaft in connection with the Maryville Colliery be commenced at once, and carried on without delay, so that a second opening from the surface to the present workings may be completed as soon as possible.

2. Seeing that in the Maryville Colliery there exists a danger of tapping, at any time, loose ground liable to contain a heavy feeder of water, I am directed to draw your attention to the necessity of keeping a borehole at least 10 feet ahead of the working face in every exploring place or heading driven north, south, east, or west.

3. I have therefore to urge that you would give your serious attention to the above matters at once, with a view of having them carried out without delay.

I have, &c.,

JOHN DIXON,
Inspector of Collieries.

Mr. Henry Harper to Mr. John Dixon, Inspector of Collieries.

Sir,

Maryville Colliery, 28 October, 1885.

Your favour of the 24th instant came duly to hand, and your request I have carefully thought over. With regard to the second shaft, I have already put down one bore to the westward of our pit, with a view of ascertaining the most suitable position for putting down a shaft. I am also putting in a bore ahead of some of my headings, wherever I think there is the slightest necessity of doing so. As far as we can ascertain there are other collieries adjacent who are worse off in this respect than we are; but we will endeavour to comply with the various suggestions as far as practicable.

I have, &c.,

HENRY HARPER.

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Glebeland, 29 October, 1885.

I have the honor to acknowledge receipt of your communication of 21st instant, concerning the disturbed state of the country in connection with the Maryville, Stockton, and Bullock Island Collieries, and the necessity for the second shaft at Maryville and Stockton, &c.

In reply, I beg to state that I most fully endorse your views respecting the above-named collieries, and, according to your instructions, have notified the managers, under the 25th section of the Coal Mines Regulation Act, 1876, to commence at once the second shaft at Maryville and Stockton, and to keep a borehole at least 10 feet ahead of the face in every bord or heading driven north, east, south, or west, in the Maryville, Stockton, and Bullock Island Collieries, copies of which notifications I herewith beg to forward.

I have, &c.,

JOHN DIXON,
Inspector of Collieries.

No. 5.

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.
Special inspection of the Maryville Colliery to see if the ventilation had been improved since my inspection of that colliery on 25th January last month.

Sir,

Glebeland, 26 February, 1885.

I have the honor to report inspection of the above-named colliery on Wednesday last, 24th instant, as follows:—

Since my inspection on 25th ultimo, the manager (Mr. Harper) had caused a "fire-lamp" to be erected in the return air-way at the shaft bottom, in order to improve the ventilation of the mine; and although a slight increase in the main current of air had been effected by the fire-lamp, yet I regret to say that on the 24th instant the ventilation in the Maryville Colliery was not by any means up to the requirements of the Coal Mines Regulation Act, 1876, as the following results will show. At the time of my inspection there were about fifty men and boys and two horses at work in the mine. The first measurement of the air current was taken in the main return air-way, near the shaft bottom, at about 9:20 a.m., the total result being about 2,940 cubic feet of air per minute. After going through a portion of the workings, I again returned to the shaft bottom and measured the current of air at the same place as before. This was about 10:30 a.m., and the result was an improvement on the first measurement, being about 3,360 cubic feet of air per minute. The first and second measurements, as given above, were taken when the pump was working and exhausting into the upcast behind the brattice in the shaft. The third measurement was taken about 11:30 a.m., when the pump was stopped, and the result was about 2,870 cubic feet of air per minute. For the fifty-two men, &c., employed in this colliery, on the day of inspection, the minimum quantity of air to comply with the Act ought to have been 5,200 cubic feet per minute. The first measurement, however, as taken by me shows a deficiency of about 2,260 cubic feet per minute; the second a deficiency of 1,840 cubic feet per minute; and the third a deficiency of about 2,330 cubic feet per minute.

In my previous report on this colliery I mentioned that top coal was being taken out in various places. I here beg to state that the same work is still being carried on; and since my inspection of 25th last month a top coal bord has given way, and the fall has extended to the surface. This is the bord I mentioned as having a wet roof.

On coming out of the mine on Wednesday last I saw Mr. Harper, and told him about the state of the ventilation in the Maryville Colliery, and he informed me that he was having a bore put down to test the ground with a view of commencing the second shaft as soon as possible.

I have, &c.,

JOHN DIXON,

Inspector of Collieries.

No. 6.

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Glebeland, 27 February, 1886.

For your information I beg to forward a letter which I received from Mr. Harper, manager, Maryville Colliery, this (Saturday) morning, by which is inferred that the ventilation at said colliery has been made considerably better since my inspection on Wednesday last.

I shall be obliged for instructions on this matter, as to whether I am to make another inspection of the Maryville Colliery prior to taking action in Court.

I have, &c.,

JOHN DIXON,

Inspector of Collieries.

Submitted for further instructions.—J.M., 4/3/86. The Under Secretary for Mines, B.C., 4/3/86.

A further inspection should be made, and if the ventilation is not in accordance with the provisions of the Act the Inspector should at once take the necessary proceedings. Authority to take proceedings, under the Coal Mines Regulation Act, may be issued to Mr. Inspector Dixon.—H.W., 4/3/86.

Submitted. Approved.—J.F., 4/3/86. The Examiner of Coal-fields.—H.W., 4/3/86. Mr. Dixon instructed.—J.M., 4/3/86. Under Secretary for Mines, B.C., 4/3/86. Proceedings taken on 6th April, 1886, and a verdict obtained.—J.D., 16/4/86. The Crown Solicitor may be asked to prepare a form of authority to enforce the provisions of the Coal Mines Regulation Act, and to recover any penalties under the said Act.—H.W., 4/3/86. Submitted. Approved.—J.F., 10/3/86.

No. 7.

The Under Secretary for Mines to The Crown Solicitor.

Sir,

Department of Mines, Sydney, 6 March, 1886.

I have the honor, by direction of the Secretary for Mines, to request that you will be so good as to prepare a form of authority to enforce the provisions of the Coal Mines Regulation Act, and to recover any penalties under the said Act.

I have, &c.,

HARRIE WOOD,

Under Secretary.

No. 8.

Authority to prosecute for the recovery of penalties under the Coal Mines Regulation Act, 1876.

To all to whom these Presents shall come,—

GREETING:

Whereas by the Coal Mines Regulation Act 1876 it is provided that all penalties imposed by the said Act may be recovered summarily before two or more Justices of the Peace at the suit of the Examiner Inspector or other officer authorized in that behalf by the Minister Now know ye that I the Honorable the Secretary for Mines for the Colony of New South Wales do by this

this writing under my hand in pursuance of the power and authority given to me in this behalf by the said Act authorize and empower _____ of _____ in the said Colony to sue for and recover all every and any penalties and penalty imposed by the said Act And for that purpose to make and exhibit before any two or more Justices of the Peace for the said Colony all and every such informations or information charging any person or persons with a breach or breaches of the provisions of the said Act in respect of which breach or breaches a penalty or penalties is or are imposed by the said Act as the said _____ may think fit And to proceed to judgment upon such information or informations or the same to withdraw and discontinue And for the purpose of suing for such penalties to employ any counsel solicitor or attorney And to take all proceedings necessary to recover and obtain payment of the said penalties And I declare that this authority shall continue in force until a revocation hereof in writing under the hand of the Minister for Mines for the said Colony for the time being shall be received by the said _____ And that same shall not be deemed or taken to be revoked by the appointment of another person or other persons to prosecute for the recovery of penalties under the said Act.

In witness whereof I have hereunto set my hand at Sydney in the said Colony this _____ day of _____ in the year of Our Lord one thousand eight hundred and eighty-

No. 9.

Telegram from The Examiner of Coal-fields to Mr. John Dixon, Inspector of Collieries.

Sydney Club, Sydney, 6 March, 1886.

WHEN you were down Maryville Colliery yesterday were they working the top coal, or have they discontinued working it since you served notice on manager on 25th January?

JOHN MACKENZIE,
Examiner of Coal-fields.

No. 10.

Telegram from Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Hamilton, 8 March, 1886.

WERE working top coal in Maryville Colliery on my inspection in February. Pit not at work on Friday last; have forwarded last two reports on this colliery to Coal-fields Office, Newcastle.

JOHN DIXON,
Inspector of Collieries.

No. 11.

The Under Secretary for Mines to The Manager of the Maryville Colliery.

Sir,

Department of Mines, Sydney, 13 March, 1886.

I have the honor, by direction of the Secretary for Mines, to invite your attention to the notice which was served on you in terms of section 25 of the Coal Mines Act, in respect to the ventilation of the Maryville Colliery.

I have, &c.,
HARRIE WOOD,
Under Secretary.

No. 12.

The Manager, Maryville Colliery Company (Limited) to The Secretary for Mines.

Sir,

Newcastle, 19 March, 1886.

Referring to yours of the 13th instant, I am doing all that possibly can be done to carry out the provisions of the Coal-fields Act in the face of the most trying circumstances, to which, if it becomes necessary, I can refer you in detail.

So far I have had no complaint from the men under my charge.

I am glad to notice through the Press that you contemplate ordering a first-class anemometer from England, as such an instrument will enable the Inspectors to do justice to the masters as well as the men.

I have, &c.,
HENRY HARPER.

Submitted.—H.W., 20/3/86. The report of the officers must be acted upon.—J.F., 20/3/86.
The Examiner of Coal-fields, Newcastle.—G.E.H., *pro* U.S., B.C., 22/3/86.

No. 13.

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Glebeland, 16 April, 1886.

I do myself the honor to herewith return the papers in connection with the Maryville and Bullock Island Colliery cases, and at the same time to report that said cases came on for hearing at the Newcastle Court, before Mr. Mair, P.M., on Tuesday, 6th instant, and occupied the Bench nearly the whole of the day.

Messrs. Wallace and Sparke appeared for the prosecution, and Messrs. Thompson and Windeyer for the defence.

Much of the time during the day was taken up by Mr. Thompson's objections to the way in which the information had been laid; also to my authority to prosecute. On these points the arguments on both sides appeared most forcible, and, in my opinion, Mr. Wallace is deserving of great praise for the able manner

manner in which he conducted both cases. For of one thing I am pretty certain, namely, had not Mr. Wallace been well posted up in the many objections which he no doubt anticipated could be taken to certain clauses in the Coal Mines Regulation Act, 1876, both cases would have fallen through. In the Maryville case I gave evidence as to the state of the ventilation in that colliery on 24th February and 5th March last, and was cross-examined by Mr. Thompson at some length with a view of testing my knowledge of ventilation and the use of the anemometer, &c. The manager (Mr. Harper) was called for the defence, but failed to make a case, the consequence being that he (Mr. Harper) was fined the sum of £5 with costs of Court, and £2 2s., professional costs.

In the Wickham and Bullock Island case the information was laid against the owners, some of whom were present to answer the charge of neglecting to observe the provisions of sub-section 1, section 12, of the Coal Mines Regulation Act, 1876, which sub-section provides for the completion of at least two distinct openings to the day or surface intercommunicating with each other, by means of either of which openings all persons employed in the colliery might at all times pass in or out, &c.

On the reading of the information, Mr. Thompson raised a primary objection that action had not been taken within the eighteen months prescribed by the Act, and that the incorporation of the Company had not been proved. His Worship said he would reserve his decision on these points till after the hearing of the evidence. I was then called upon to give evidence as to the time when bords were first turned away in the Wickham workings, &c., after which the manager, Mr. Gardiner, was called for the defence. This defence was that there were the usual means of getting in and out of the colliery—an engine and wire ropes. In cross-examination, however, the manager admitted that the slides were being taken out of the pit, and that the steam was not kept up at the Wickham shaft, and that it would take three or four hours to get steam up, &c.

This evidence closed the case, and the Magistrate in summing up remarked that there were some difficult points to decide, but on the whole he felt justified in finding defendant guilty. He thought, however, that a moderate fine would meet the case, and returned a verdict against defendants for £10 Court costs, and £2 2s. professional costs.

I have, &c.,

JOHN DIXON,

Inspector of Collieries.

Forwarded for the information of the Honorable the Secretary for Mines.—J.M., 6/5/86. The Under Secretary for Mines.—B.C., 6/5/86. Submitted.—H.W., 10/5/86. Seen.—J.F., 14/5/86.

Wickham and Bullock Island Colliery.

SCHEDULE.

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No. 1.

The Examiner of Coal-fields to The Under Secretary for Mines.

Sir,

Mining Department, Sydney, 9 March, 1886.

I have the honor to forward a report received from Mr. Inspector Dixon with respect to sub-section 1, section 12, of the Coal Mines Regulation Act, 1876, not being complied with at the Wickham and Bullock Island Colliery; also copy of a notice served on the manager, and shall be obliged by your informing me what further action the Minister desires me to take.

I have, &c.,

JOHN MACKENZIE,

Examiner of Coal-fields.

Has the working of bords, stalls, or longwall workings been commenced more than one year and six months since?—H.W., 9/3/86. Yes.—J.M., 9/3/86. Unless within one week steps are taken to remedy the defect, proceedings may be taken to enforce the fine.—H.W., 9/3/86. Submitted. Approved.—J.F., 9/3/86. The Examiner of Coal-fields.—H.W., B.C., 9/3/86. Mr. Inspector Dixon to take the necessary proceedings if matter complained of is not remedied within one week.—J.M., 10/3/86. Proceedings taken 6th April, 1886, and verdict obtained.—J.D., 16/4/86.

[Enclosure to No. 1.]

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Wickham and Bullock Island Colliery Inspection.

Sir,

Glebeland, 6 March, 1886.

I have the honor to report inspection of the above-named colliery yesterday, 5th instant, as follows:—

The number of men, &c., employed below on the day shift is about eighty-two, being about sixty miners, eight wheelers, four horses, ten shiftsmen, and water-balers. The total quantity of intake air from the Wickham shaft at the time of inspection was about an average current of 8,500 cubic feet per minute. The majority of the working places were well ventilated, but in Dunn's heading, where there were six men at work, the air was very slack. I noticed, however, that cuts-through were being driven from bord to bord, and, when holed, the matter of complaint would be remedied.

A good road has now been made between the two shafts, and an incline plane is being formed, in order to run the coal down from the workings on the Wickham side of the colliery. I went to the bottom of the Wickham shaft and looked up, and from the appearance of the shaft I arrived at the conclusion that a considerable amount of work would have to be done in it before it could be rendered safe for men to pass in or out, according to the requirements of the Coal Mines Regulation Act, 1876.

Seeing that sub-section 1 section 12 of said Act was not complied with at the Wickham and Bullock Island Colliery, I notified the manager (Mr. Gardiner) to that effect yesterday, a copy of which notification I beg herewith to forward, and shall be obliged for further instructions on this matter.

Throughout the workings there seemed to be a good supply of timber on hand ready for use.

I have, &c.,

JOHN DIXON,

Inspector of Collieries.

[Enclosure

[Enclosure to No 1.]

Mr. John Dixon, Inspector of Collieries, to Mr. A. Gardiner, Colliery Manager, Wickham.

Sir,

Glebeland, 5 March, 1886.
During my inspection of the Wickham and Bullock Island Colliery this day (Friday) I noticed that although there were two separate and distinct openings to the day or surface from such mine, intercommunicating with each other, yet there was only one opening available for the persons employed in the colliery to pass in or out. I therefore hereby notify you that sub-section 1 section 12 of the Coal Mines Regulation Act, 1876, is not complied with at the Wickham and Bullock Island Colliery, inasmuch as said sub-section provides for two separate and distinct openings to the day or surface, "by means of either of which openings all persons employed in the colliery may at all times whatsoever pass in or out."

2. I have therefore to urge that you would attend to the above matter at once, with a view to having it remedied as soon as possible.

I have, &c.,

JOHN DIXON,
Inspector of Collieries.

Burwood Colliery.

SCHEDULE.

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No. 1.

The Examiner of Coal-fields to The Under Secretary for Mines.

Sir,

Coal-fields Office, Newcastle, 14 January, 1886.

I have the honor to forward reports I have received from Mr. Inspector Dixon respecting a deficiency of ventilation at the Burwood Colliery, and copy of a notice I have served upon Mr. Samuel Birrell, and shall be obliged by your informing me what further action the Minister desires me to take in the matter.

2. Mr. Dixon informs me to-day that Mr. Birrell has made a commencement with building up the top of the furnace shaft.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

Proceedings should be taken to enforce the provisions of the Act, unless the defects be remedied before such proceedings can be taken.—H.W., 21/1/86. Submitted. Approved.—R.M.V., 25/1/86. The Examiner of Coal-fields.—H.W., U.S., B.C., 30 January, 1886. Mr. Inspector Dixon for report as to whether the defects are remedied.—J.M., 1/2/86.

I inspected the Burwood new tunnel to-day, Monday. The stalk on the furnace shaft has not yet been made higher, the bricks and mortar are on the ground, but the manager, Mr. Birrell, informed me that he could not get a bricklayer, although offering a great price for the work. However, the current of air to-day was about 5,580 cubic feet per minute for forty-two men, six boys, and three horses; total, fifty-one men, &c. The current of air in the new pit was about 7,200 cubic feet per minute for a total of sixty-two men, &c.—J.D., 1/2/86.

The Act is now complied with.—J.M., 2/2/86. The Under Secretary for Mines, B.C., 2/2/86. Under the circumstances now reported no proceedings need be taken.—H.W., 17/2/86. Submitted. Approved.—R.M.V., 18/2/86. Inform Examiner.—H.W., U.S., 18/2/86.

[Enclosure to No. 1.]

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Burwood New Pit Inspection.

Sir,

Glebeland, 10 December, 1885.

I have the honor to report inspection of the abovenamed pit workings to-day (Thursday) as follows:—

On the day shift in the New Pit workings there are about forty men, six wheelers, and two horses employed. About twenty of the miners are employed in ordinary 8-yard bords, and the others engaged in narrow work. When I inspected this place on the 28th of October last, there were only about fourteen men employed below, and the ventilation was good; but on my inspection to-day, I regret to say that I found the ventilation very defective throughout the workings, as the total current of air was only about 2,750 cubic feet per minute for a total of about forty-eight men, &c., being a deficiency of over 2,000 cubic feet of air per minute.

The shaft is bratticed from the surface to the bottom, and from the upcast side of the shaft at the surface there is a wooden box 16 inches by 10 inches, by which a portion of the return air is conducted to the boiler stalk.

In addition to the above there is a small exhaust fan employed at the surface, and connected to the upcast by a box 10 inches square.

The manager (Mr. Birrell) was with me throughout the whole of the workings. I drew his attention to the defective ventilation, and he (Mr. Birrell) stated that he intended putting the exhaust steam from the pump into the upcast part of the shaft, and if that did not produce the required quantity of air he would connect the whole of the upcast with a spare boiler and stalk, and promised me that he would do his very best to remedy the matter as soon as possible.

I regret to state that slight signs of inflammable gas have been found in one of the headings in this pit, and two men were slightly burned by it early on Monday morning last. The manager (Mr. Birrell) reported the matter to the Coal-fields Office, and after investigating it to-day I found that neither of the men had been laid off work by the accident, and that it was not at all serious. The underground overman (Mr. Horsfield) was one of the men, and from him I gathered the following particulars concerning the explosion:—It appears that a shift of men commenced work at about 12 p.m. on Sunday night last, and about half-an-hour after one of the men, named Townsend, came to bank and reported to the overman that his heading

heading had fallen in near the face and for some distance back. The overman went down the pit with the miner, and both went into the heading. The overman (Mr. Horsfield) gave orders for the removal of the fallen stuff, and was about to leave the heading when a slight explosion of gas took place, which burnt Horsfield a little on the forehead and Townsend very slightly on the hands.

I am informed that this is the first time that gas has been found in this pit workings; and I tried the same place to-day with a safety lamp, and could not detect the slightest trace of gas anywhere.

I cautioned the manager (Mr. Birrell) to strictly adhere to the 14th special rule, which provides for the deputy making an examination of the working places before the miners are allowed to start work. This he (Mr. Birrell) promised to have carried out in future, and gave orders in my presence to that effect. In my opinion a more vigorous ventilation is required to ensure safety.

I have, &c.,

JOHN DIXON,
Inspector of Collieries.

Make another inspection early next month, and report whether The matters complained of have been remedied.

J.M., 12/11/85.

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Burwood Colliery Inspection.

Sir,

Glebeland, 9 January, 1886.

I have the honor to report inspection of the above colliery on Thursday last, 7th instant, as follows:—

In the New Tunnel the total current of air was about 5,600 cubic feet per minute for about sixty-six men, six boys, and three ponies; total, 75. The above result shows a deficiency of about 1,900 cubic feet of air per minute on the minimum quantity required by the Coal-fields Regulation Act, 1876. I drew the attention of the manager (Mr. Birrell) to this matter, and in reply he stated that he had been compelled to stop the "old tunnel" for a short time, and, not wishing to throw any of the men out of work, had to put six pairs, or twelve of the "old tunnel" miners into the new tunnel. He (Mr. Birrell) further stated that he was prepared to do anything to benefit the ventilation, and as I advised him to have the top of the furnace shaft built about 20 feet higher than at present he promised to have it done as soon as possible, which will be about three weeks or so.

New Pit.

In relation to this place, I am pleased to be able to state that since my inspection of 10th December (last month) I found a marked improvement in the ventilation. The total number of men, &c., employed in the New Pit is about 163. There are three shifts, and the greatest number employed on one shift is about sixty-four men, &c. This was about the number at work on the day of inspection, and the total current of air circulating in the mine was about 6,510 cubic feet per minute.

In both tunnel and pit I found the working places well timbered, and a good supply of timber on hand ready for use

I have, &c.

JOHN DIXON,
Inspector of Collieries.

The current of air in this new pit (lately sunk) has been increased from 2,750 cubic feet per minute, on 10th December, to 6,510 cubic feet on 9th January, 1886; *vide* Mr. Inspector Dixon's reports of 10th December, 1885, and 9th January, 1886.—J.M., 16/1/86.

The Under Secretary for Mines, B.C., 16/1/86.

The Examiner of Coal-fields to Mr. Samuel Birrell, Manager, Burwood Colliery.

Sir,

Coal-fields Office, Newcastle, 14 January, 1886.

In view of a recent report received from Mr. Inspector Dixon on the ventilation of the Burwood Coal Company's "New Tunnel" workings, and in pursuance of the provisions contained in the 31st section of the Coal Mines Regulation Act, 1876, I hereby give you notice that you have failed to comply with sub-sections 2 and 3, section 12, of the said Act.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

No. 2.

Mr. Samuel Birrell, Manager, Burwood Colliery, to The Examiner of Coal-fields.

Sir,

Burwood Colliery, 19 January, 1886.

I have reduced the number of men so as to comply with the Coal Mines Act of Parliament.

I have, &c.,

SAMUEL BIRRELL,
Colliery Manager.

Mr. Dixon for report as to whether the provisions of the Act are now complied with.—J.M., 20/1/86. The provisions of the Act are now complied with.—J.D., 1/2/86.

No. 3.

The Under Secretary for Mines to The Examiner of Coal-fields.

Sir,

Department of Mines, Sydney, 25 February, 1886.

Referring to your communication of the 2nd instant, to the effect that the provisions of the Act were being complied with in respect of ventilation at the Burwood Colliery, I am therefore directed by the Secretary for Mines to inform you that, under the circumstances now reported, no proceedings need be taken.

I have, &c.,

HARRIE WOOD,
Under Secretary.

Newcastle

Newcastle Coal-mining Company's Colliery.

SCHEDULE.

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No. 1.

Check Inspectors' Report.

Newcastle Coal-mining Company's Colliery, 11 January, 1886.

WE, the undersigned, having examined the workings and part of the travelling roads, &c., of the above-named colliery, report as follows :—

No. 8 Intake.

Amount of air passing in is 6,192 cubic feet per minute ; thermometer 68°.

No. 8 Heading.

14 men, 2 boys, 1 horse. Air passing 7 bords is 4,896 cubic feet per minute, or 287 cubic feet per minute for each man, boy, and horse ; thermometer 75°.

No. 7 Heading.

24 men, 2 boys, 2 horses. Air passing 12 bords is 4,400 cubic feet per minute, or 157 cubic feet for each man, boy, and horse ; thermometer 74°.

Nos. 6 and 5 Headings.

57 men, 8 boys, 5 horses. Amount of air passing through these headings is 7,200 cubic feet per minute, or 102 cubic feet per minute for each man, boy, and horse ; thermometer 75°.

No. 1 Heading.

46 men, 6 boys, 3 horses. Air passing 23 bords is 4,320 cubic feet per minute, or 78 cubic feet per minute for each man, boy, and horse ; thermometer 75°.

No. 1 Return at Cut-through.

Amount of air passing through is 5,145 cubic feet per minute ; thermometer 75°.

No. 2 Heading.

28 men, 3 boys, 3 horses. Air passing 14 bords is 3,241 cubic feet per minute, or 95 cubic feet per minute for each man, boy, and horse ; thermometer 74°.

No. 1 Overcast.

Amount of air passing over from Nos. 5 and 6 headings is 9,635 cubic feet per minute ; thermometer 73°.

No. 10 Fault.

Amount of air passing in is 15,680 cubic feet per minute ; thermometer 70°.

No. 10 Front Heading.

18 men, 1 boy, 1 horse. Air passing 9 bords is 3,045 cubic feet per minute, or 152 cubic feet per minute for each man, boy, and horse ; thermometer 75°.

No. 10 Middle Heading.

26 men, 1 boy, 1 horse. Air passing 13 bords is 2,592 cubic feet per minute, or 92 cubic feet per minute for each man, boy, and horse ; thermometer 76°.

No. 10 Back and No. 11 Headings.

28 men, 2 boys, and 2 horses. Air passing 14 bords is 5,768 cubic feet per minute, or 180 cubic feet per minute for each man, boy, and horse ; thermometer 76°.

No. 12 Heading.

20 men, 2 boys, 2 horses. Air passing 10 bords is 5,400 cubic feet per minute, or 225 cubic feet per minute for each man, boy, and horse ; thermometer 73°.

At Furnace Shaft.

Total amount of air passing up the shaft is 63,080 cubic feet per minute ; thermometer 77°.

Remarks.

We found the air very slack in the first three or four bords in No. 8 front heading ; but the Deputy was busy putting up a canvas door on the mouth of the back heading which will drive a greater current of air to the men there. Complaints were being made to us in several flats with regard to the miners being unable to get timber brought into them when required. Also, complaints were made about the door being left open the greater part of the day by the wheelers and drivers, thereby causing the air to be slack with some of the men. We would especially draw the manager's attention to these matters, and also to many—but through being left open between the two narrow bords in No. 6 flat, also between Nos. 10 and 11 headings, as some of the canvas doors were torn to pieces ; found a good supply of timber on each flat.

Burwood, 12 January, 1886.

EDWARD BUXTON,
WILLIAM R. HARRISON, } Check Inspectors.

Mount.

Mount Kembla Colliery.

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No. 1.

The Examiner of Coal-fields to The Under Secretary for Mines.

Sir,

Coal-fields Office, Newcastle, 19 January, 1886.

I have the honor to forward reports I have received from Mr. Inspector Rowan, showing a deficiency of ventilation in the Nos. 1, 2, and 4 divisions, and the Nos. 2 and 3 west headings at the Mount Kembla Colliery, near Wollongong.

2. It appears that Mr. Green, the colliery manager, is driving a heading to improve the ventilation, which he expected would be completed in ten days from the 8th instant; but the inspector says he is of opinion it will be of little or no benefit, and that upon his offering suggestions to the colliery manager he was told that he could only act through Dr. Robertson, the directing manager. Such should not be the case in a matter of this nature.

3. I have wired Mr. Rowan to make another inspection to-morrow (*vide* copy of telegram herewith), and shall be obliged by your informing me what further action the Minister desires me to take in the matter, besides causing the notice to be served on the manager (copy enclosed).

I have, &c.,

JOHN MACKENZIE,

Examiner of Coal-fields.

Proceedings must be taken unless the owners remedy the defects before such proceedings can be commenced.—H.W., 21/1/86. Submitted. Approved.—R.M.V., 22/1/86. The Examiner of Coal-fields.—H.W., U.S., B.C., 23/1/86. Mr. Inspector Rowan to take proceedings at once, as he wires me on the 29th that defects are not remedied.—J.M., 30/1/86. Proceedings were taken on 11th February by Mr. Inspector Rowan, and the manager fined £5 and professional costs. Report herewith.—J.M., 15/2/86. Under Secretary for Mines, B.C., 15/2/86.

[Enclosures to No. 1.]

Mr. James Rowan, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Wollongong, 11 January, 1886.

For your information, I have the honor to inform you that on the 8th instant I inspected Mount Kembla Colliery. About 124 men and horses are employed underground, and supplied with about 9,000 cubic feet of air per minute, in 4 separate currents. No. 1 east division of workings, 36 men and horses are employed, and supplied with 2,500 cubic feet of air per minute. No. 2 east division, 18 men and horses are employed, and supplied with 1,500 cubic feet of air per minute. No. 4 division, 40 men and horses are employed, and supplied with 3,000 cubic feet of air per minute. In the No. 1 east division of workings the air was very weak as it approached the working faces; also, in No. 4 the ventilating current was very weak. In the centre and extreme end of the workings a slight current was going, but insufficient to put the air meter in motion; the bords were also warm and uncomfortable. In the Nos. 2 and 3 west headings, 34 men are employed, and supplied with 2,000 cubic feet of air per minute, by means of two regulating doors from the main current, besides, a rush of air aids the ventilation, by the doors being opened to allow the full and empty sets to pass in and out.

I drew the manager's (Mr. Green's) attention to section 12, sub-section 3, of the Coal Mines Regulation Act. Mr. Green pointed out a heading, which he was driving with three shifts of men, to improve the ventilation of the colliery, and which he expected would be finished in about 10 days from the date of my inspection. This air-course referred to will come on the mountain side about 300 yards east of the tunnel.

I may state I am of opinion that little or no benefit will result from this new air-course, except a furnace be built in connection with it—that is to say, a furnace built at the mountain side where the heading will be driven through, and to bring all the ventilating current down the main tunnel.

This new furnace, with the present one, would have the combined power of ventilating the east and west sides of the colliery; or otherwise to sink an air-shaft in the interior of the workings, as it is quite evident either of these or some other motive power is required to assist the present system of ventilation. On putting these suggestions before Mr. Green he stated he could only act through Dr. Robertson, the directing manager.

I have, &c.,

JAMES ROWAN,

Inspector of Collieries.

Telegram from The Examiner of Coal-fields to Mr. James Rowan, Inspector of Collieries.

Newcastle, 13 January, 1886.

THINKING that little or no benefit will result from Kembla new air-course, why don't you serve Mr. Green with registered notice for non-compliance with Act, sending me copy of same?

JOHN MACKENZIE,

Examiner of Coal-fields.

Mr.

Mr. James Rowan, Inspector of Collieries, to Mr. W. B. Green, Manager, Mount Kembla Colliery.

Sir,

Wollongong, 13 January, 1886.

In reference to my inspection, made on the 8th instant, at Mount Kembla Colliery, I beg to inform you that I found the ventilation to be in a defective condition in No. 1 east and No. 4 division of workings. In the centre and extreme end of these workings I failed to get a register with the air-meter.

2. In accordance with the provisions contained in the 25th section of the Coal Mines Regulation Act, 1876, I hereby give you notice that you have failed to comply with section 12, sub-section 3, of the Coal Mines Regulation Act. I have therefore to request you to remedy this matter forthwith.

I have, &c.,

JAMES ROWAN,
Inspector of Collieries.

Telegram from The Examiner of Coal-fields to Mr. James Rowan, Inspector of Collieries.

Newcastle, 19 January, 1886.

Your Kembla report says Mr. Green expected heading being driven to improve ventilation would be finished in about ten days, which would be 18th instant. Make another inspection to-morrow, and wire me if it is finished, and if sub-sections 2 and 3 of Act are now complied with.

JOHN MACKENZIE,
Examiner of Coal-fields.

No. 2.

The Examiner of Coal-fields to The Under Secretary for Mines.

Re Kembla Colliery deficient ventilation.

Sir,

Coal-fields Office, Newcastle, 21 January, 1886.

I herewith beg to forward a telegram and letter received from Mr. Inspector Rowan this day, from which it will be seen that there was no improvement in the ventilation yesterday.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

[Enclosures.]

Mr. W. B. Green, Manager, Mount Kembla Colliery, to Mr. James Rowan, Inspector of Collieries.

Sir,

Mount Kembla Colliery, 16 January, 1886.

I herewith beg to inform you that we have now got the drive holed outside on the north side of our "main tunnel," and that we have also shifted our return airway to escape the water that you spoke to me about when you last visited the colliery. And I may state that all will be done that can be done on my part to improve the ventilation of the colliery in those places you complain of in your letter to me, date the 13th January.

I have, &c.,

W. B. GREEN.

Telegram from Mr. James Rowan, Inspector of Collieries, to The Examiner of Coal-fields.

Wollongong, 20 January, 1886.

Re Kembla Colliery.—The new air-course driven through to the mountain side; no improvement in ventilation. Section 12, sub-section 3, of the Act not complied with in the No. 1 and two last, also No. 4 division of workings.

JAMES ROWAN.

No. 3.

Telegram from Mr. James Rowan, Inspector of Collieries, to The Examiner of Coal-fields.

Wollongong, 29 January, 1886.

MOUNT Kembla Colliery reinspected; defective ventilation not remedied. Shall legal proceedings be taken at once? Do you advise any solicitor in particular?

JAMES ROWAN,

Inspector of Collieries.

No. 4.

Telegram from The Examiner of Coal-fields to Mr. James Rowan, Inspector of Collieries.

Newcastle, 30 January, 1886.

INSTITUTE proceedings against Mr. Green for Kembla deficient ventilation at once, and employ whichever solicitor you think best. Great care is required in the way the information is drawn out.

JOHN MACKENZIE,

Examiner of Coal-fields.

No. 5.

Telegram from The Examiner of Coal-fields to The Under Secretary for Mines.

Newcastle, 30 January, 1886.

INSPECTOR Rowan wired yesterday that defective Kembla ventilation not yet remedied, shall he take proceedings at once, and what solicitor do I advise. Have replied that he must take proceedings at once, and the solicitor he thinks best.

J. MACKENZIE,

Examiner of Coal-fields.

The Examiner's action may be approved.—G.E.H. (for the U.S.), 30/1/86. Submitted.
Approved.—R.M.V., 1/2/86.

No.

No. 6.

Mr. James Rowan, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Wollongong, 12 February, 1886.

In accordance with your instructions of the 30th ultimo, I have the honor to inform you that legal proceedings have been instituted against W. B. Green, Manager of the Mount Kembla Colliery, for neglecting to have an adequate amount of ventilation sent into the mine.

The case was tried at Wollongong Petty Sessions on the 11th instant, before A. A. Turner, P.M., and a Justice of the Peace; C. Russell, solicitor, for the defence, and F. Woodward for the prosecution. W. B. Green, Manager of the Mount Kembla Colliery, was charged, under section 31 of the Coal Mines Act, for a breach of section 12, sub-sections 2 and 3. W. B. Green in answer to the charge pleaded "guilty in part."

In leading the prosecution I produced a sketch of the Mount Kembla Colliery showing the various districts where the ventilation was defective, giving dates and the result of each day's inspection, viz., the 8th, 20th, and 29th ultimo; also showed the air-meter by which the air currents were tested. Also three miners gave evidence as to the defective state of the ventilation, and that no improvement had taken place up to the 10th instant.

Defendant's counsel urged much upon my assent to the bad ventilation being caused by the condition of weather outside, also the blasting had increased through the workings of late on account of extra hard coal, &c., &c.

These arguments being reviewed before His Worship for the prosecution, showed the more need of a strict adherence to sections 2 and 3 of the Act.

The defendant's counsel, in summing up for his client, pleaded guilty to the whole charge, and strongly begged for a mitigation of the penalty on account that the manager had made strenuous efforts to improve the ventilation by the new air-course, although it had failed to produce the desired effect. Also produced a letter from Dr. Robertson, the Directing Manager for the Company, that a furnace would be built at the mountain side of the new air-course, and a fan also erected if necessary; and W. B. Green pledged himself to have the colliery as well ventilated in a few weeks as any other colliery in the district.

After a patient hearing of the case His Worship imposed a fine of £5 with all professional costs.

I have, &c.,

JAMES ROWAN,

Inspector of Collieries.

Forwarded for the information of the Hon. the Secretary for Mines.—J.M., 15/2/86. The Under Secretary for Mines.—B.C., 15/2/86. Submitted for the information of the Minister.—H.W., 17/2/86. Seen.—R.M.V., 18/2/86.

Australian Agricultural Company's Colliery.

SCHEDULE.

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No. 1.

Twenty-fourth Check Inspectors' Report of the A.A. Co.'s Collieries, at Newcastle, N.S.W.

COMMENCED this Inspection of the above collieries on Monday, 1st December, 1884, starting at the Hamilton pit.

Measured the air passing into Cope's heading, and found by the anemometer 7,980 cubic feet per minute passing. The most of this air returns on to the main column by way of the church heading.

Measured the air passing along the engine plane, with the result of 26,970 cubic feet per minute, which, added to the quantity passing into Cope's heading, makes a total of 34,950 cubic feet per minute passing into the workings of this pit.

We also measured the air passing into Bullerwell's heading at the bottom end of intake, and got for result 1,700 cubic feet per minute. There are 20 men, 2 wheelers, and 2 horses in this heading: 70 cubic feet per minute for each man, horse, and wheeler. Between the top end and bottom of this intake a deal of air escapes through the stoppings. Visited Gardiner's heading, and measured intake with result 5,544 cubic feet per minute. Cut-throughs want stopping in Collins's bord and also in No. 1 bord: 23 men, 1 boy, and 1 horse.

Stark's heading, 15 men, 1 boy, and 1 horse. The air coming into Gardiner's heading supplies it and also Stark's, thus giving to each man, horse, and boy, 132 cubic feet per minute.

Grant's heading, 4 men; Taylor's heading 12 men, 1 boy, and 1 horse; Donnison's heading, 22 men, 2 boys, and 2 horses; Sindle's heading, 6 men; Robinson's heading, on No. 1 bord the sheet is badly broken, and also the third bord wants a canvas hung: 12 men, 1 boy, 1 horse. In Tracey's heading there are 24 men, 2 boys, and 2 horses. The air in the five last-mentioned headings is very good. Men about the flats and pit bottom, 11.

Total quantity of air passing into this pit, 34,950. Total number of men, wheelers, and horses, 156, 11, and 11 respectively, thus giving to each 196 cubic feet per minute.

The

The several flats were well supplied with timber and travelling roads in good condition. Having completed our inspection of this pit we returned by way of the Old Galley horse-road to No. 2 pit bottom. Thermometer ranged from 79° to 71° Fahrenheit.

No. 2 Pit.

Measured the air at measuring place on engine plane, and found 37,170 cubic feet per minute passing. Air passing into No. 1 district from the above column, 24,500 cubic feet per minute. Visited the whole of the workings in this district. In the elbow there are 6 men, 1 boy, and 1 horse. In the second left-hand there are 40 men, 5 boys, and 5 horses. Sheet wanted on Wilson's bord; also on Riley's bord. Sheet wants repairing on Pascoe's bord. In the third left-hand there are 17 men, 2 boys, and 2 horses. There were complaints in this heading for want of timber. In fourth left-hand there are 28 men, 3 boys, and 3 horses. Sheet and stopping want attending to. In fifth left-hand, 12 men, 1 boy, and 1 horse. In sixth left-hand, 8 men; and in cross-cut and horse-road, 10 men, 1 boy, and 1 horse. In the sixth right-hand, 2 men. In fifth right-hand, 17 men, 1 boy, and 1 horse; and in fourth right-hand, 28 men, 2 boys, and 2 horses. The air in this heading is very dull. Sheet on Griffiths' bord wants attending to. We tried to measure the air in this heading in an area of 28 square feet, but got no result. In third right-hand there are 16 men, 2 boys, and 2 horses; in second right-hand, 9 men, 2 boys, and 2 horses; and in first right-hand, 2 men, 1 boy, and 1 horse.

The number of men, boys, and horses in this district is 195, 21, and 21 respectively.

Quantity of air, 104 cubic feet per minute.

We directed the overman's and other officials' attention to the several deficiencies, which they promised to rectify as speedily as possible.

No. 5 District.—Measured the air coming from Hamilton pit, by way of Griffith's narrow bord, with a result of 12,948 cubic feet per minute.

Quantity of air passing into No. 5 District, 18,972 cubic feet per minute.

In the first left-hand back horse-road there are 16 men, 3 boys, and 3 horses; second left-hand, 8 men, 1 boy, and 1 horse; first right-hand, 13 men, 2 boys, and 2 horses; back cross-cut, 6 men, 1 boy, and 1 horse; front cross-cut, 6 men. In the fourth right-hand, 14 men, 2 boys, and 2 horses; and in third right-hand, 21 men, 2 boys, and 2 horses. The air, at the time of our visit, was in a very bad state in the two last-mentioned headings, which we drew the attention of the deputy to. He promised to try and better it at once. In second right-hand there are 16 men, 2 boys, and 2 horses; in first right-hand, 20 men, 2 boys, and 2 horses. Canvas wants attending to. Men about the flats, 12.

Grand total in this district, 132 men, 15 boys, and 15 horses. Total quantity of air, 18,972, which gives to each 125 cubic feet per minute.

Visited No. 6 district. Measured the air passing, with result of 6,118 cubic feet per minute. There are 7 men, 1 boy, and 1 horse.

Visited fan shaft, the travelling road to which we found in very good condition.

Various flats throughout the pit we found well supplied with timber. Travelling roads in very good condition.

9th December, 1884.

GEO. JONES,
JAMES THOMPSON, } Check Inspectors.

No. 2.

Twenty-fifth Check Inspectors' Report of the A.A. Co.'s Collieries at Newcastle, New South Wales.

This inspection was commenced on 20th April, 1885.

Hamilton Pit.

Air passing into Cope's heading, 7,059 cubic feet per minute. Measured the air passing along engine plane with following result, viz., 34,944 cubic feet per minute, which, supplemented by the air passing into Cope's heading, makes a grand total of 42,000 cubic feet per minute passing into the workings of this pit.

Air passing into Bullerwell's heading, 11,000 cubic feet per minute; 22 men, 2 boys, and 2 horses in this heading. Canvas required on Christensen's bord, and also the canvas on Collins's bord wants repairing. We also visited Turnbull's heading, in which there are 14 men. In Gardiner's heading there are 30 men, 2 boys and 2 horses. Canvas and stopping want attending to in Firth's bord. In M'Auliffe's and Stark's headings there are 6 men, 1 boy, and 1 horse collectively.

Visited the workings on the right-hand side of the horse-road, and found in Donnison's heading 16 men, 1 boy, and 1 horse; in Harding's heading, 14 men, 1 boy, and 1 horse; and in Murphy's heading 6 men; in Robson's heading there are 23 men, 1 boy, and 1 horse; in Tracey's heading, 32 men, 2 boys, and 2 horses; and in Thomas's heading, 2 men.

The powder smoke in most of these headings hangs very bad, but at the time of our visit a number of men were employed making an overcast which when finished will divide these workings into two splits.

Total number of men, boys, and horses in this pit, 190, 12, and 12 respectively. Total quantity of air, 196 cubic feet each.

There were no complaints, for timber and travelling roads were in good condition.

No. 2 Pit.

Commenced an inspection of this pit on Tuesday, 21st April, 1885.

Measured the air passing below engine bank, and got for result 43,360 cubic feet per minute.

No. 1 District.—Air passing in, 31,920 cubic feet per minute. We tried to get a measurement at the intake to No. 3 flat, but the area being so large the instrument would not revolve. In this flat there are 44 men, 7 boys, and 7 horses. In the fourth left-hand heading there are 20 men, 2 boys, and 2 horses. At the top end of the heading the air was very slack. The canvas on Walker's and Dawes' bords wants repairing, as in their present state they allow a large quantity of air to escape that should go round the heading. In the split heading there are 12 men, 1 boy, and 1 horse; in the fifth left-hand there are 14 men, 1 boy, and 1 horse. The air returning from the two latter headings mixes with the air coming into

No.

No. 3 Flat, but the overman informed us that he intended having an overcast put in across the No. 3 road, so that the air returning from the fourth and fifth left-hands will pass into the main return without interfering with any other. In the sixth left-hand 11 men, 1 boy, and 1 horse; in cross-cut, 6 men; and in seventh right-hand, 6 men, 1 boy, and 1 horse. The air was very dull at the time of our visit in this latter heading. In the sixth right-hand, 10 men, 1 boy, and 1 horse; failed to get a measurement in the return from this heading. In the fifth right-hand, 16 men, 1 boy, and 1 horse; could get no result in this heading. In the fourth right-hand, 34 men, 2 boys, and 2 horses; this heading is supplied with air from its entrance, and also by the fifth right-hand. We tried to measure the air passing down this heading, but got no result.

Taking into consideration measurements taken in similar areas to those obtainable in this heading, and the number of men, we are of the opinion that there is a great deficiency of air. A narrow bord has been driven down from the third right-hand a distance of about 114 yards, for the purpose of easing the friction on the air, but the heading is not down far enough to meet it. We would respectfully urge on the management to push on this heading with all possible despatch, as the men complain bitterly of the bad air.

In the third right-hand there are 14 men, 2 boys, and 2 horses. In the second right-hand, 5 men; and first right-hand, 2 men. These three headings are aired from No. 5 district.

Total number of men, boys, and horses in this district is 193 men, 18 boys, and 18 horses. Total quantity of air, 31,920, equal to 140 cubic feet each.

No. 5 District.—Measured the air coming from Hamilton pit by way of Griffith's narrow bord, with the following result—13,552 cubic feet per minute. Measured the air passing into this district, and found 18,650 cubic feet per minute.

Back Horse-road.—First left-hand, 4 men; second left-hand, 8 men, 1 boy, and 1 horse; third left-hand, 4 men; third right-hand, 2 men, 1 boy, and 1 horse. In first right-hand, 16 men, 2 boys, and 2 horses; and in second right-hand, 2 men, 1 boy, and 1 horse. The air in most of these headings was very dull.

Back Cross-cut.—First left-hand, 6 men; and 10 men, 1 boy, and 1 horse in cross-cuts. In the fifth right-hand there are 14 men, 2 boys, and 2 horses; in fourth right-hand, 20 men, 2 boys, and 2 horses. This heading is one of the main intakes for the No. 5 district, but the current being so slow we failed to get a measurement. In the third right-hand there are 24 men, 2 boys, and 2 horses. This heading with the fourth are the only two splits in this district, but we failed to get a measurement in either of them. Failing to get a result at the intakes, we tried the return from the third right-hand in a 19-foot area, and got for a result 2,508 cubic feet per minute. In the second right-hand there are 16 men, 2 boys, and 2 horses; and in the first right-hand, 14 men, 1 boy, and 1 horse. These headings are aired from the third right-hand, consequently the air is very bad. There were no complaints for want of timber, and the travelling roads were in very good order. Number of men, boys, and horses aired from this district, 171, 19, and 19, respectively; quantity of air for each, 89 cubic feet per minute.

No. 6 District.—10 men, 1 boy, and 1 horse; quantity of air passing in, 6,000 cubic feet per minute; grand total quantity of air passing into workings of this pit, inclusive of air coming from Hamilton pit, 56,912 cubic feet per minute. Total men, boys, and horses, 448, 32, and 32, respectively; quantity of air for each, 127 cubic feet per minute.

We would most respectfully request men to refrain from committing nuisances in the airways, as it has a great tendency to render the air impure.

We, the undersigned, hereby certify that the foregoing is correct.

24th April, 1885. GEO. JONES, }
JAS. THOMSON, } Check Inspectors.

No. 3.

Twenty-sixth Report of the ventilation of the A.A. Co.'s Collieries at Newcastle, New South Wales.

WE commenced an inspection of Hamilton pit on 30th July, 1885.

Measured the air passing into Cope's heading with following result, 8,190 cubic feet per minute; most of this air returns again on to the main column by way of church heading. Measured the air passing along engine plane, at measuring place below engine bank, and found 29,148 cubic feet per minute passing.

Bullerwell's heading.—Quantity of air passing, 8,400 cubic feet per minute. There are 20 men, 1 boy, and 1 horse in this heading; in Turnbull's heading, 12 men; in Sneddon's heading, 4 men, 1 boy, 1 horse; visited Gardiner's heading; there are 30 men, 4 boys, and 4 horses; in Stark's and M'Auliffe's there are 4 men, 1 boy, and 1 horse, collectively; in Harding's heading, there are 6 men; in Donnison's, 12 men, 2 boys, and 2 horses; in Johnson's, 12 men, 1 boy, and 1 horse; in cross-cut, 14 men, 1 boy, and 1 horse; and in Murphy's heading, 10 men, 1 boy, and 1 horse; canvas wants replacing on Dixon's bord; the air at the time of our visit in the latter heading and the cross-cut was very bad; visited Robson's heading, where there were 20 men, 1 boy, and 1 horse; also Tracey's heading, where there were 36 men, 2 boys, and 2 horses; these two headings are aired from one intake; we measured the air passing along Tracey's heading and found 11,000 cubic feet per minute.

There are 15 men about the roads and flats; total quantity of air passing in this pit, 37,330 cubic feet per minute, which, divided amongst 190 men, 19 boys, and 19 horses, gives a result of 164 cubic feet per minute.

Travelling roads in very good order and no complaints for timber.

We saw very little to complain of in the ventilation of this pit, with the exception of those places mentioned.

No. 2 Pit.

Quantity of air passing at measuring place, 47,250 cubic feet per minute; air passing into No. 1 district, 25,000 cubic feet per minute; visited the various headings in No. 3 district; we tried to measure the air passing into this district, but could get no result; there are 59 men, 7 boys, and 7 horses in this split; although getting no result in this split, still we are of the opinion that there is a great deficiency, in

in fact less than one-half of the minimum quantity required; in the higher portions of this split the heat was intense, the thermometer ranging from 79° to 84° Fahrenheit; in the 4th left-hand there are 30 men, 3 boys, and 3 horses; canvas wants repairing on the 1st bord; in the 5th left-hand, 16 men, 2 boys, and 2 horses; canvas wants hanging on Oswald's bord; measured the air coming in this heading and found 2,312 cubic feet per minute, which, divided between these two headings, falls far short of the required quantity; in the sixth left-hand there are 16 men, 2 boys, and 2 horses; thermometer 81° Fahrenheit at face of the heading; in cross-cut, including horse-road, 10 men, 1 boy, and 1 horse. This side being concluded, we visited the several headings on the right-hand side, where, in the 7th heading, there were 6 men; in the 6th, 16 men, 1 boy, and 1 horse; canvas was required on Reid's bord; in the 5th right-hand there were 22 men, 1 boy, 1 horse; and in the 4th right-hand, 32 men, 2 boys, and 2 horses; canvas wants attending to on John Duke's bord; we found little improvement in this heading to that we reported on our last visit, and our opinion is that it will never be any better so long as skips are allowed to block up the entrance. Our reason for affirming this is from experiments made on the main road opposite. We tested the instrument at 5 feet from the floor, and the air passing there was not sufficient to work the fan, but on testing it at 1 foot from the floor the air passing there caused it to revolve very rapidly.

In the 1st, 2nd, and 3rd right-hand headings there are 18 men, 2 boys, and 2 horses, collectively; these headings are ventilated from No. 5 district; there are 221 men, 20 wheelers, and 20 horses, inclusive of those about the roads, flats, &c.; total quantity of air, 25,000 cubic feet per minute, which, divided amongst the above, gives 95 cubic feet each; travelling roads in very good order, and no complaints for timber.

No. 5 District.—Measured the air at intake, with following result:—20,100 cubic feet per minute, but upon again measuring it in the drift we only got 14,500 cubic feet per minute, so that the difference must be allowed to leak between the two places into the returns. We visited the first split in this district, which comprises the first, second, and third right-hand headings. The air is the first right-hand was very bad, but in the other headings mentioned it was very fair, especially in the third. We failed to get a result in this split, but that was owing to the area being so large. There are 58 men, 5 boys, and 5 horses in this split. In the fourth right-hand the canvasses on the first and second bords want replacing with stoppings. There are 20 men, 2 boys, and 2 horses in this heading. The air at the far end was very bad. In the fifth right-hand there are 18 men, 3 boys, and 3 horses; and in the sixth right-hand, 10 men, 1 boy, and 1 horse.

Front cross-cut, 4 men; third left-hand, 4 men, 1 boy, and 1 horse; second left-hand, 10 men, 1 boy, and 1 horse. Canvas required on Davis's bord.

Back Horse-road.—Third right-hand, 8 men, 1 boy, and 1 horse. Canvas wanted on the heading. Second left-hand, 10 men, 1 boy, and 1 horse. Second bord wants canvas hung. Second right-hand, 4 men; first left-hand, 6 men; and in first right-hand, 10 men, 1 boy, and 1 horse. Total number of men, inclusive of those about the roads and flats, 177; boys, 19; and horses, 19. Total quantity of air passing in being 20,100, gives to each 93 cubic feet per minute.

Visited No. 6 district, where there are 9 men, 1 boy, and 1 horse; quantity of air passing in, 4,000 cubic feet per minute. On the whole, we found a marked improvement, but we saw room for still greater improvement, especially in the first and fourth right-hand headings.

Total quantity of air passing into the workings of this pit, 58,000 cubic feet per minute, which, divided amongst 412 men, 40 boys, and 40 horses, gives to each 118 cubic feet per minute.

We found the travelling roads in good order, except one place in Griffiths' narrow bord, to which we would direct the overman's attention. The place in question was in the roof, a short distance from the entrance to No. 5.

We, the undersigned, hereby certify that the foregoing is a true report.

8th August, 1885.

GEO. JONES,
JAS. THOMSON, } Check Inspectors.

No. 4.

Twenty-seventh Check Inspectors' Report of the Australian Agricultural Collieries, at Newcastle, N.S.W.

We commenced this inspection on Monday, January 4th, 1886, starting at the Hamilton pit. Measured the air passing into Cope's heading, and got for result 10,760 cubic feet per minute. Measured the air passing along the engine plane, below engine bank, and got for result 31,500 cubic feet per minute.

Measured the air passing into Bullerwell's heading, with result of 10,475 cubic feet per minute. There are 4 men in this heading, 4 men Wilson's heading, and 2 men working in the cross-cut. There are 12 men, 1 boy, and 1 horse in Sneddon's heading, and 18 men, 1 boy, and 1 horse in Turnbull's heading. The air in this latter heading was very slack. In Gardiner's heading there are 22 men, 4 boys, and 4 horses. Visited Harding's heading, where there are 18 men, 2 boys, and 2 horses. In Bishop's heading, 4 men, and in the cross-cut, 18 men, 2 boys, and 2 horses. The canvas on the first bord was so badly torn that we found by the air-meter that about 1,000 cubic feet per minute was escaping that should travel around the face of the cross-cut. In Johnson's heading there are 6 men. The air in this heading was very bad at the time of our visit. With reference to the torn canvas in the cross-cut, we directed the deputy's attention to it, and he promised us he would attend to it as early as possible. In Murphy's heading there are 14 men, 1 boy, and 1 horse. Visited Robson's heading, in which there are 26 men, 2 boys, and 2 horses; and also Tracey's heading, where there are 30 men, 2 boys, and 2 horses—making a total of 56 men, 4 boys, and 4 horses. The air in this split was very good. We were pleased to notice in travelling along the engine plane in this pit that the greater part of the old stoppings had been replaced by brick stoppings.

The total number of men, boys, and horses in this pit is 192, 26, and 26 respectively. Total quantity of air, inclusive of air passing into Cope's heading, which returns on to the main column, is 42,260 cubic feet per minute.

There were no complaints for timber, and the travelling roads were in very good condition.

No. 2

No. 2 Pit.

Measured the air coming down this pit, and got for result 40,000 cubic-feet per minute. Quantity of air passing into No. 1 district from this column is 31,000 feet per minute. Visited various headings in No. 3 flat of this district. Measured the air coming in and found by the air-meter 7,500 cubic feet per minute. In this flat there are 82 men, 14 boys, and 14 horses. The quantity of air is only 68 cubic feet per minute each. In the fourth and fifth left-hand headings in this district there are 20 men, 2 boys, and 2 horses. Quantity of air, 2,200 cubic feet per minute. In the sixth left-hand, 10 men, 1 boy, and 1 horse. In the sixth right-hand there are 16 men, 1 boy, and 1 horse. The air in this heading was very slack. Quantity of air, 1,400 cubic feet, thus giving to each 78 cubic feet per minute. In the horse-road, eighth right-hand, and seventh there are 34 men, 3 boys, and 3 horses. Quantity of air, 4,300 cubic feet per minute, which gives to each man, horse, and boy 107 cubic feet per minute. In the fifth right-hand, 20 men, 1 boy, and 1 horse. The air was very dull in this heading. In the fourth right-hand 18 men, 3 boys, and 3 horses; and in the second right-hand, 2 men; about the roads, 10; making a total of 212 men, 25 boys, and 25 horses. Quantity of air, 31,000 cubic feet; giving to each of the above 118 cubic feet per minute.

No. 5 District.—Quantity of air passing into this district, 23,780 cubic feet per minute.

Back Horse-road.—First left-hand, 18 men, 1 boy, and 1 horse. There are 22 men, 1 boy, and 1 horse in the fourth right-hand heading of No. 1 district which are aired from this district. In the horse-roads there are 4 men, and 2 men lifting bottoms; and in the first right-hand there are 6 men, 1 boy, and 1 horse.

Back Cross-cut.—First left-hand, 10 men, 1 boy, and 1 horse. Second left-hand, 6 men; cut-through wants cleaning out. In third left-hand 4 men, and 6 men in the cross-cuts. In the seventh right-hand there are 6 men, 1 boy, and 1 horse. The air is very dull in this heading. In the sixth right-hand there are 14 men, 1 boy, and 1 horse. In the fifth right-hand there were two of the canvasses badly torn, which we called the attention of the deputy to. There are 22 men, 1 boy, and 1 horse in this heading. In the fourth right-hand there are 20 men, 1 boy, and 1 horse. These three headings comprise one split. Measured the air returning from these headings, over overcast, 8,250 cubic feet per minute. Several of the canvasses in these headings were allowing a considerable quantity of air to escape which should travel around the top end of the heading; but the system now being pursued by the management will prevent a recurrence of this, as they are substituting stoppings for the canvas, which is the only effectual remedy. In the first, second, and third right-hand headings there are 62 men, 6 boys, and 6 horses. The air in the upper parts of this split was very hot.

Total number of men, boys, and horses, inclusive of those about the roads and flats, is 215, 15, and 15 respectively. Total quantity of air, 23,780 cubic feet per minute, which gives to each 97 cubic feet per minute. In No. 6 district there are 12 men, 1 boy, and 1 horse.

We travelled the returns from No. 5, which we found in splendid condition, the management having of late expended a considerable sum in improving them. Total number of men, boys, and horses in the whole of this pit is 453, 41, and 41 respectively. Total quantity of air, inclusive of 14,700 cubic feet per minute coming from Hamilton pit by way of Griffiths' narrow bord, is 54,700 cubic feet per minute, giving to each man, horse, and boy 102 cubic feet per minute.

There were no complaints for timber, and the travelling roads were in very good condition.

Before concluding this report we wish to thank the officials for their courtesy, and also their readiness in supplying any information that we required during this inspection.

12th January, 1886.

GEO. JONES,
WM. AITCHESON, } Check Inspectors.

Ferndale Colliery.

SCHEDULE.

No.	PAGE.
1. Copies of Check Inspectors' Reports on Ventilation of Ferndale Colliery. 1 December, 1885.	30

No. 1.

Copies of the three last Check Inspectors' Reports.

Ferndale Lodge, 1 December, 1885.

No. 1 REPORT.

10 April, 1885.

We, the undersigned, having examined the several workings and airways, &c., of the Ferndale Colliery, report as follows:—

Intake of air on engine bank, 9,250 cubic feet per minute; thermometer, 68°. Intake from the old furnace shaft, 1,800 cubic feet per minute; thermometer, 68°. Air passing from old furnace shaft to No. 1 heading, 1,800 cubic feet. Air passing from engine bank to No. 1 heading 4,600 cubic feet. The top part of No. 1 heading the anemometer gave 2,550 cubic feet of air per minute for 19 men, 4 boys, and 2 horses, being 102 cubic feet per minute for each man, boy, and horse; thermometer, 71°. Middle part of No. 1 heading: Air passing from narrow bord at cut-through, 4,138 cubic feet per minute for 29 men, 4 boys, and 2 horses, being a fraction over 118 cubic feet per minute for each man, boy, and horse; thermometer, 71°. Lower part No. 1 heading, at cut-through from narrow bord, the anemometer gave 2,844 cubic feet of air per minute; thermometer registering 74°. After passing seven bords, anemometer gave 4,260 cubic feet of air per minute. There are 22 men, 5 boys, and 2 horses employed here. There is a vast improvement in this part since our last inspection. We never visited No. 3 heading, but at the cut-through from No. 8 narrow bord the area was so large that there was not sufficient air to move the anemometer. The cut-throughs have been cleared, and there were no complaints about the air; there were

were 8 men, 2 boys, and 1 horse working there; thermometer, 74°. No. 4 heading: 2 men, with a fair supply of air. No. 5 heading: Intake from engine brow, 575 cubic feet of air per minute. There were 6 men, 2 boys, and 1 horse employed here, giving each 64 cubic feet of air per minute; thermometer, 72°. Returns from No. 4 heading gave 3,032 cubic feet per minute. Returns from main flat, 5,402 cubic feet per minute, but all the returns cannot be taken here. Each was well supplied with timber.

JOSEPH BOWDITCH, }
WILLIAM LLOYD, } Check Inspectors.

No. 2 REPORT.

Ferndale Colliery, 2 July, 1885.

We, the undersigned, having examined the several workings, airways, &c., report as follows:—
Intake of air on the engine bank, 14,450 cubic feet per minute; thermometer, 61°. Intake from old furnace shaft, 1,800 cubic feet per minute; thermometer, 61°. Air passing from engine bank into No. 1 heading, 6,346 cubic feet per minute; thermometer, 68°. At the top part of No. 1 heading the anemometer registered 4,070 cubic feet per minute; thermometer, 72°. This gives 185 cubic feet of air per minute to each man, boy, and horse,—15 men, 5 boys, and 2 horses. At the cut-throughs from No. 27 narrow bord, the anemometer registered 5,730 cubic feet per minute; thermometer, 71°. At the two cut-throughs from No. 13 narrow bord, the current of air had increased to 6,320 cubic feet per minute. This current of air has to supply 59 men, 13 boys, and 6 horses, giving a fraction over 83 cubic feet per minute for each. There were 29 men, 8 boys, and 4 horses, from No. 27 to No. 13 bords inclusive, and 23 men, 5 boys, and 2 horses, from No. 12 to No. 1 bords, both inclusive, and 4 men in two bords in No. 3 and No. 4 headings, and 1 man pumping, making in all 57 men, 13 boys, and 6 horses supplied from the above current. In Nos. 1 and 2 bords the air was very slack; the thermometer registered 78°. The bord in No. 3 heading is in before the air nearly 60 yards without a cut-through; thermometer registered 76°. Our attention was called to the road in No. 19 bord being dangerous for the boys wheeling there, but a cut-through being nearly holed through will remedy that in a day or two. At No. 5 heading the air passing through cut-through showed 744 cubic feet per minute. We were told that the other cut-through was closed, but on passing next morning I found a large current of air passing through; 9 men, 1 boy, and 1 horse are employed here. Returns from No. 4 heading, 3,485 cubic feet per minute; returns from furnace shaft, 10,030 cubic feet per minute; total returns, 13,515 cubic feet per minute, but in consequence of the manner it splits up here we were unable to get all the returns correctly. There was a plentiful supply of timber in the headings.

JOSEPH BOWDITCH, }
CHARLES WILLIAMS, } Check Inspectors.

No. 3 REPORT.

Ferndale Colliery, 28 October, 1885.

WE, the undersigned, having examined the several workings, airways, &c., of the above colliery, report as follows:—

Intake at engine bank, 12,960 cubic feet per minute; thermometer, 68°. Intake from old furnace shaft, 2,812 cubic feet per minute. From engine bank to No. 1 heading, 5,964 cubic feet per minute. Top part of No. 1 heading, anemometer registered 4,890 cubic feet per minute for 27 men, 6 boys, and 4 horses, being a fraction over 132 cubic feet per minute for each man, boy, and horse; thermometer, 72°. At the cut-through at the top, Ganon bord, the anemometer registered 4,050 cubic feet per minute for 18 men, 4 boys, and 2 horses, being 168½ cubic feet for each man, boy, and horse; thermometer, 75°. At the cut-through in No. 17 bord the anemometer registered 2,450 cubic feet per minute for 15 men, 4 boys, and 2 horses, being 116½ cubic feet per minute for each man, boy, and horse; thermometer, 78°. At the cut-through at the lower Ganon bord the anemometer registered 3,870 cubic feet per minute for 22 men, 6 boys, and 3 horses, a fraction over 124½ cubic feet per minute for each man, boy, and horse; thermometer, 75°. There were 2 men working off the right-hand of No. 8 heading, but the area being so large there was not sufficient air to move the anemometer. No. 5 heading, intake from engine bank, 1,633 cubic feet per minute for 8 men, 2 boys, and 1 horse, giving a fraction over 148½ cubic feet per minute for each man, boy, and horse; thermometer, 72°. Return from No. 4 heading, 2,940 cubic feet per minute. At the main flat, 8,525 cubic feet per minute, but all the returns cannot be taken here. Each place was well supplied with timber.

WILLIAM LLOYD, }
DAVID HOPKINS, } Check Inspectors.

Lambton Colliery.

NO.	SCHEDULE.	PAGE.
1.	The Examiner of Coal-fields to the Under Secretary for Mines, enclosing Report from Mr. Inspector Dixon, and copy of notice served upon the Manager of Lambton Colliery, with minutes. 6 October, 1885	32
2.	Mr. T. Croudace, Manager, Lambton Colliery, to the Examiner of Coal-fields, admitting Mr. Inspector Dixon's complaint as justifiable, and promising improvements as to ventilation, with minutes. 7 October, 1885	32
3.	Mr. Inspector Dixon to the Examiner of Coal-fields, enclosing letter from Mr. Croudace, <i>re</i> ventilation in Lambton Colliery. 8 October, 1885	33
4.	The Examiner of Coal-fields to Mr. Croudace, in reply to No. 2. 8 October, 1885	33
5.	Mr. Melville, M.P., to the Honorable the Secretary for Mines, asking questions <i>re</i> Lambton Colliery, with Minister's replies thereto. 4 February, 1886	33

No. 1.

The Examiner of Coal-fields to The Under Secretary for Mines.

Sir,

Coal-fields Office, Newcastle, 6 October, 1885.

I have the honor to forward for the information of the Honorable the Secretary for Mines a report from Mr. Inspector Dixon and copy of a notice I have served upon Mr. Croudace, the Manager of the Lambton Colliery, for failing to comply with sub-sections 2, and 3, section 12, of the Coal Mines Regulation Act, 1876.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

Unless

Unless within fourteen days from the date of the notice sent to the manager some effective steps are taken to remedy the matter complained of steps may be taken to recover the penalty.—H.W., 9/10/85. Submitted. Approved.—F.A.W., 12/10/85. The Examiner of Coal-fields.—G.E.H. (for the U.S.) B.C., 14/10/85. Mr. Dixon for a further report to be made, 24th October, as to whether the matters complained of are remedied.—J.M., 16/10/85. The Lambton miners being now on strike further inspection is useless until work is resumed.—J.D., 23/10/85. The men are still out on strike, therefore nothing further has been done in the matter.—J.M., 30/1/86. The Under Secretary for Mines, B.C., 30/1/86. The Examiner of Coal-fields.—G.E.H. (for the U.S.), B.C., 8/2/86.

[Enclosure to No. 1.]

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Sir, Glebeland, 5 October, 1885.
I have the honor to draw your attention to the defective ventilation in that portion of the workings in the Lambton Colliery known as the right-hand side of the No. 2 far flat main tunnel. In this part of the mine there are eight working bords, two men in each, and two working headings with three men in each, making a total of twenty-two men, besides two wheelers and two horses.

When on the 15th August last I reported this same place there were about twenty men employed in it. At that time I found the ventilation defective, and drew Mr. Croudace's attention to the matter, and he (Mr. Croudace) at once promised to have it remedied. However, on the 28th ultimo (Monday last) I again made an inspection of the place complained of, and regret to report that I found matters in a similar position to that reported by me on 15th August. But as the ventilation in the whole of the far flat section was a little deranged on Monday last, owing to a very large fall of roof in the pillar workings in No. 1 far flat, I thought it best to go back again at the end of the week, when the No. 1 part of the workings would be properly settled. Consequently, on Saturday last, 3rd instant, I made another inspection, and found that the No. 1 far flat was in no way interfering with the intake at No. 2 far flat, but the same state of affairs prevailed in the split complained of, and I could not detect the slightest difference from what I found on the Monday. The only time when I could find trace of an intake current of air was when the empty train was running into the flat; then, on the loaded train going out, the current of air would rush back—then, to all appearances, come to a standstill. In every working place the powder smoke was hanging thick, owing to there being no current of air to carry it away. I may here remark that a new overcast was being built, which, when completed, would connect the part complained of with another return, and may possibly be of benefit. I notified the Manager (Mr. Croudace) by registered letter on Saturday last, a copy of which I herewith beg to forward, and desire to be instructed as to further proceedings in relation to the matter complained of.

I have, &c.,
JOHN DIXON,
Inspector of Collieries.

Mr. John Dixon, Inspector of Collieries, to Mr. Thomas Croudace, Colliery Manager, Lambton.

Sir, Glebeland, 3 October, 1885.
Referring to our several conversations concerning the deficient ventilation in the workings at the right-hand side of No. 2 far flat in the Lambton Colliery, and your repeated promises to have the matter remedied, and notwithstanding the fact that sufficient time has elapsed to have had the matter put right since you were first notified, I regret to state that on Monday last, 28th ultimo, and to day (Saturday), I found the abovenamed split in a deplorable state.

In this split there are eight working bords, besides the two headings, two wheelers and two horses, making a total of twenty-six men, &c. For this number (at the time of my inspection) there was no perceptible steady current of air, and as a consequence the powder smoke was hanging in dense clouds in every working place. The only time that there appeared to be any air entering the split was when the empty train was running into the flat; but the loaded train going out overcame this to such an extent that the current of air would return with the same velocity as it entered the split.

2. I have therefore to request that you would give attention to this matter at once, with a view of having it remedied as speedily as possible.

I have, &c.,
JOHN DIXON,
Inspector of Collieries.

The Examiner of Coal-fields to Mr. T. Croudace, Manager, Lambton Colliery.

Sir, Coal-fields Office, Newcastle, 6 October, 1885.
In view of a recent report of Inspector Dixon's on the ventilation of the Lambton Colliery (No. 2 far flat), and in pursuance of the provisions contained in the 31st section of the Coal Mines Regulation Act, 1876, I hereby give you notice that you have failed to comply with sub-sections 2 and 3, section 12, of the said Act.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

No. 2.

Mr. T. Croudace, Manager, Lambton Colliery, to The Examiner of Coal-fields.

Sir, Lambton Colliery, Lambton, 7 October, 1885.
In reply to yours of yesterday, I can only say that Mr. Dixon's complaint is quite justifiable, and that he has complained two or three times about the same place.

I am making alterations to-day, which I will not be able to complete for a fortnight, but I hope even by Friday to have it materially improved.

I have, &c.,
THOMAS CROUDACE.

The above communication, *re* Lambton Colliery deficient ventilation, has been received by me to-day, and I enclose you copy of my reply for the information of the Honorable the Secretary for Mines.—J.M., 8/10/85. The Under Secretary for Mines, B.C., 8/10/85.

Under the circumstances proceedings may be stayed till the expiration of the fortnight.—H.W., 22/10/85. Submitted. Approved.—J. P. ABBOTT, 31/10/85. The Examiner of Coal-fields—H.W., B.C., 3/11/85. Seen, and noted.—J.M., 3/11/85.

33

No. 3.

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Glebeland, 8 October, 1885.

For your information, I beg to forward enclosed letter, received this morning from Mr. Croudace, *re* No. 2 far flat, &c.

I also beg to state that I have been notified to-day concerning the accident to John Hinds in Minmi on Monday last, also an accident to a boy in Brown's Colliery yesterday, and in consequence of such notification I intend going to Minmi to-morrow (Friday).

I have, &c.,
JOHN DIXON,
Inspector of Collieries.

[Enclosure to No. 3.]

Mr. Thomas Croudace, Manager, Lambton Colliery, to Mr. John Dixon, Inspector of Collieries.

Sir,

Lambton Colliery, Lambton, 7 October, 1885.

I have to acknowledge receipt of yours of 3rd, complaining of deficient ventilation at No. 2 far flat. In justice to you, and not wishing in the least to shield myself, I must admit that this is neither the first nor the second time that you have complained, and that I have promised to have it put right; but, as you know, there have been many other matters to attend to. I inspected the district complained of yesterday, and found it very bad—worse than I have ever seen it; but, upon closer inspection, I found two or three important in-by stoppings completely blown down by the recent heavy fall from the pillars, which occurred when you were there one day last week. I am now pushing ahead such alterations as I hope will improve it by Friday, and very materially improve it in about a fortnight, when we get a long wall holed over into back cross-cut.

I am so confident of having it improved by Friday that I would ask you to come up and inspect it.

I have to thank you for the tolerant manner in which you have dealt with this complaint, and trust you will not consider my neglect in any way intentional.

I have, &c.,
THOMAS CROUDACE.

No. 4.

The Examiner of Coal-fields to Mr. T. Croudace, Manager, Lambton Colliery.

Sir,

Coal-fields Office, Newcastle, 8 October, 1885.

I beg to acknowledge the receipt of yours of the 7th instant, informing me that Mr. Inspector ^{See No. 2.} Dixon's complaint is quite justifiable, &c., and that you are making alterations, which will not be completed for a fortnight, but hope by Friday next to have matters materially improved.

Trusting such will be the case,—

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

No. 5.

Mr. Melville, M.P., to The Secretary for Mines.

Department of Mines. Legislative Assembly.

Question for this day. Proof, No. 19. Thursday, 4 February, 1886.

QUESTION NO. 4:—

MR. MELVILLE *to ask* THE SECRETARY FOR MINES,—

- (1.) Has Mr. Mackenzie at any time made any complaints concerning the ventilation of the Lambton mine, of which Mr. Croudace is manager?
- (2.) Were such complaints, if any, made during Mr. Croudace's management?
- (3.) If such complaints were made, what steps were taken to remedy them, and what time elapsed between the making of complaints and the remedying of them?
- (4.) Has Mr. Mackenzie at any time called the Minister's attention to the extensive falling in of the surface of the Newcastle Pasturage Reserve, under which the Lambton Company, of which Mr. Croudace is manager, are mining for coal?
- (5.) When and on what dates did Mr. Mackenzie report that the main Northern Road, near Tighe's Hill, was being undermined?
- (6.) How long afterwards was such undermining stopped?
- (7.) Who was the owner of the coal so taken?
- (8.) Was any sum of money placed upon the Estimates for the repair of such coal by the Minister for Mines, and what amount?

ANSWERS:—

- (1.) Yes.
- (2.) Yes.
- (3.) Immediate steps.
- (4.) No.
- (5.) The information asked for was fully dealt with in Mr. Mackenzie's report to Mr. Secretary Abbott, dated 12th June, 1884.
- (6.) No coal was got after June, 1884.
- (7.) The Crown.
- (8.) No.

Wallsend Colliery.

SCHEDULE.

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2. The Under Secretary for Mines to the Miners' General Secretary, in reply to No. 1. 11 December, 1883	34
3. Mr. James Curley to the Honorable the Secretary for Mines inviting attention to different subjects in connection with Wallsend Colliery, with minutes and enclosures. 22 November, 1883	34
4. The Examiner of Coal-fields to the Under Secretary for Mines, enclosing Mr. Inspector Dixon's report <i>re</i> Wallsend Colliery, with minutes. 15 January, 1884	35
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No. 1.

Mr. James Curley, Miners' General Secretary, to The Secretary for Mines.

Sir,

Hamilton, 1 December, 1883.

I have the honor, by direction of the Executive Committee of the Miners' Association, to invite your attention to copy of Check Inspectors' report, made at Wallsend Colliery, on November 5th, 6th, and 7th respectively, and which was forwarded to you on the 27th November. This report, in connection with previous ones, goes to show that the provisions of the Act are not complied with in matters of detail. The proper conducting of the air and its necessary distribution will at once appear evident to the most casual observation; for instance, in some parts of the mine there is over double the quantity of air required by the Act, and in other districts no record can be obtained, as there is not sufficient air to work the anemometer, while in others 50 or 60 cubic feet per minute is all that is passing. This is most unsatisfactory, and it is to be regretted that a remedy is not urged by either the Inspector for Collieries or the Examiner for Coal-fields. And it is further to be regretted that more uniformity is not obtained in establishing a systematic method of ventilation in the several mines throughout the district. The health of miners is far too often impaired and seriously injured owing to such a cause, all because there is a manifest indifference regarding the carrying out of some simple detail, such as the erection of stoppings at old bord ends, the erection of a door, or it may be that an engine-rope works through a wood stopping, and it is splintered for want of a small pipe to confine the action of the rope, and thousands of feet of air lost to the miners, and otherwise by not erecting an air-crossing where required.

Having again brought this subject under the Honorable Minister's attention, the miners trust he will urge a more uniform compliance with the provisions of the Coal-mines Regulation Act, 1876, not only at the Wallsend Colliery, but the Newcastle Company's Colliery as well, where recent complaints have been made.

I have, &c.,

JAMES CURLEY,
Miners' General Secretary.

May be referred to the Examiner for report.—H.W., 6/12/83. Submitted. Approved. Acknowledge.—J. P. ABBOTT, 7/12/83. The Examiner of Coal-fields.—H.W., B.C., 11/12/83. Mr. Inspector Dixon for report.—J.M., 21/12/83. Returned. The Examiner of Coal-fields.—J.D., 27/12/83.

No. 2.

The Under Secretary for Mines to Mr. James Curley, Miners' General Secretary.

Sir,

Department of Mines, Sydney, 11 December, 1883.

See No. 1.

I am directed by the Secretary for Mines to acknowledge receipt of your letter of the 1st instant, on the matter of enforcing a more uniform compliance with the provisions of the Coal Mines Regulation Act, 1876, and to inform you that a report will be obtained upon the subject without delay.

I have, &c.,

HARRIE WOOD,
Under Secretary.

No. 3.

Mr. James Curley, Miners' General Secretary, to The Secretary for Mines.

Sir,

Hamilton, 22 November, 1883.

I have the honor, in conjunction with the Chairman and Treasurer of the Miners' Union, to invite your attention to the undermentioned subjects, which are deemed of sufficient importance for interview, and which has been asked for in a letter to Messrs. N. Melville and A. A. P. Tighe, Ms.P. :—

1st. Recent Check Inspectors' report at Wallsend Colliery, showing very defective ventilation.

2nd. Correspondence from Examiner of Coal-fields, dated October 18th, 1883.

3rd. A means of egress from mines other than the furnace shaft in case of accident to the main down-cast shaft.

I have, &c.,

JAMES CURLEY,
Miners' General Secretary.

This probably refers to the deputation recently received by the Minister.—Noted to await further communication.—H.W., 1/12/83.

[Enclosures

[Enclosures to No. 3.]

Special Inspection—Check Inspectors' Report.

Mr. T. Bonsfield's District.

Wallsend Colliery, 5 and 6 November, 1883.

Engine Bank, intake air-current	...	...	...	...	31,490	cubic feet per minute.
Swamp Oak	...	...	...	...	11,500	,, ,,
Chinaman's Shaft, Chinaman's Split intake air-current	...	...	...	...	5,520	,, ,,
,, Magpie and Donnolly's intake air-current	...	...	...	...	9,690	,, ,,
B Pit, intake air-current	...	...	...	...	9,500	,, ,,
					67,700	

B Pit, Chinaman's Flat, Nos. 111 to 116.—The air is very slack, and with 9,500 cubic feet registered at the intake we could only find 585 cubic feet per minute near the faces for the supply of 8 men, 1 boy, and 1 horse, giving each 53 cubic feet per minute; thermometer, 78°.

Chinaman's Flat, from No. 117 to 130.—Air-current, 5,520 cubic feet per minute for 22 men, 1 boy, 1 horse, giving each 230 cubic feet per minute; thermometer, 68°.

Magpie and Donnolly's Flats, from Nos. 130 to 176.—The air-current is 9,690 cubic feet per minute for 62 men, 5 boys, 4 horses at Magpie, and 24 men, 2 boys, 1 horse at Donnolly's, giving each a fraction over 98 cubic feet per minute, the last numbers at Donnolly's ranging from 70° to 76°.

Lambton back and part of front headings, from Nos. 177 to 215.—Air-current, 11,040 cubic feet per minute. This split includes Nos. 265 and 266, making 80 men, 10 boys, 5 horses, the air-current giving each a fraction over 116 cubic feet per minute; thermometer, 76°. The air from No. 178 to 189 would not register, as the anemometer would not work on the heading.

Lambton front heading, from No. 216 to 255.—Air-current, 6,000 cubic feet per minute for 78 men, 8 boys, 4 horses, giving each 66½ cubic feet per minute; thermometer, 72°.

Up-casts, Main Furnace	...	...	...	...	48,384	cubic feet per minute.
,, No. 1 Split	...	...	...	...	16,020	,, ,,
,, No. 2	...	...	...	...	19,080	,, ,,
Total Up-cast	...	...	...	...	83,484	,, ,,

Mr. W. Willis's District.

7 November, 1883.

No. 2 Tunnel, from No. 1 to 34.—The air-current is too unsteady to work the anemometer; thermometer, 72°. There were some complaints about short supply of timber.

Front heading intake.—Air-current, 15,750 cubic feet per minute for Nos. 59 to 85, making 54 men, 8 boys, 6 horses, giving each a fraction over 231 cubic feet. From 75 to 85 the air is very slack, but the management is busy sinking a shaft, which will give the required ventilation; thermometer, 74° to 76°.

Cemetery Flat, from No. 86 to 104.—The air-current is 2,975 cubic feet per minute for 38 men, 4 boys, 2 horses, giving each 67½ cubic feet per minute; thermometer, 73°. We suggest a stopping be put in the stenton opposite No. 104 bord end.

Old water pit, Nos. 105, 106, and 107.—There was no regular air-current, and old water pit Nos. 108, 109, and 110 there was no regular air-current.

Travelling road intake.—The air-current is 8,280 cubic feet per minute for Nos. 35 to 38, making 48 men, 4 boys, 2 horses, giving to each 153½ cubic feet per minute.

Upcast tunnel furnace, 33,620 cubic feet per minute. A good supply of timber on all stations excepting Little tunnel, previously referred to, and the travelling road is very dangerous between the door and the main horse-road in Mr. Willis's district.

J. SUMMERS, }
J. LEVER, } Check Inspectors.

The Examiner of Coal-fields to Mr. James Curley, Miners' General Secretary.

Sir,

Coal-fields Office, Newcastle, 18 October, 1883.

In reply to your telegram of this morning, asking if I consider Duckenfield Colliery ventilation is now in compliance with the Coal Mines Regulation Act, I beg to inform you, from a report I have received from Mr. Inspector Dixon, dated 16th instant, and a telegram from Mr. Croft, in reply to one from me, asking how many men, boys, and horses were at work in the mine to-day, that I am of opinion there must be more than an adequate amount of ventilation for the men, boys, and horses now at work there.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

No. 4.

The Examiner of Coal-fields to The Under Secretary for Mines.

I FORWARD for the Minister's information a report I have received from Mr. Inspector Dixon, with reference to the Miners' Executive and Mr. Curley's complaint, that the provisions of the Coal Mines Regulation Act are not complied with *in matters of detail* at the Wallsend Colliery, Newcastle Co., and others, where recent complaints have been made, I beg to state that nothing more can be done than has been by myself and Mr. Dixon, and that it should not be expected that extensive mines like the Wallsend Colliery and others can *daily comply in detail* with the provisions of the Act, which require the erection of stoppings, doors, &c., to ensure an adequate amount of ventilation.

2. With regard to the charges made, of Mr. Inspector Dixon's neglect of duty in not urging remedies when he sees that the provisions of the Act are not complied with, I beg to say that I believe they cannot be substantiated, that the statement made is incorrect, and very great improvements have been made in the ventilation of the northern collieries since he received the appointment of Inspector of Collieries.

J.M., 15/1/84.

The Under Secretary for Mines.—B.C., 15/1/84.

[Enclosure to No. 4.]

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Glebeland, 24 December, 1883.

I beg to acknowledge receipt of correspondence forwarded by the Miners' General Secretary to the Honorable the Secretary for Mines, re the ventilation in the Wallsend and Newcastle Co.'s collieries, &c.

In reply thereto, in reference to Wallsend Colliery, I have the honor to state that I made an inspection of that colliery during last month, and, with the exception of a few matters of detail, I found the ventilation good. A few days after the inspection I saw Mr. Neilson, manager, and drew his attention to those matters. I also notified him (Mr. Neilson) by letter, and

and in reply he wrote me expressing surprise that I should deem such matters worthy of official complaint, and desires that at an early date an inspection of the whole of Wallsend Colliery be made by the Examiner, Inspector, Check Inspectors, and Manager, so that the exact state of the mine may be ascertained for the information of the Honorable the Secretary for Mines and the miners of Wallsend Colliery. I beg to state that I quite agree with the suggestion as being the only means to thoroughly sift the matter, and put an end to the complaints concerning the ventilation at that colliery. It is clear to anyone in the least degree acquainted with the working of a colliery, that in an extensive mine like Wallsend, with such an extraordinary output, and with such a length of airways, there will occasionally be a derangement of the ventilation, caused by circumstances over which there is no control; for instance, a heavy fall of roof, such as I saw in one part of the Wallsend workings on my last inspection; but as soon as I called the attention of the Manager to the matter, he caused a small shaft to be sunk, which at once effected a remedy. Seeing that such things do occur, it is highly necessary to inquire into the cause and extent of any defective ventilation before sweeping assertions are made concerning any colliery.

2. Newcastle Co.'s Colliery.—The place complained of in this colliery is, I suppose, the No. 6 district, where the ventilation was completely deranged by a heavy crush which took place a considerable time since. This No. 6 heading has had to be forewon in order to reach the No. 5 narrow bord. Lately there have been about 38 men, 2 boys, and 2 horses in this split.

It has been a most difficult place to ventilate, as a door had to be hung on the No. 1 main road, and one on the main road in No. 6, so that all possible pressure might be brought to bear on this split to ensure a sufficient quantity of air. On my several inspections of this district I have found a variation in the current, as the following results will show:—1st, 4,720 cubic feet per minute; 2nd, 4,130 cubic feet per minute; 3rd, 3,960 cubic feet per minute; and the last result obtained was during last month, 4,060 cubic feet per minute. But I observe by the report of the Check Inspectors for this month that they got a result of 5,670 cubic feet of air per minute, or 134 cubic feet per minute for every man, boy, and horse in the split.

It is expected that the No. 6 heading will be holed through into No. 5 narrow bord during this week; then the ventilation will be even better than it is at present.

Taking the Newcastle Co.'s mine throughout, I am of opinion that the ventilation is first-class.

Regret is expressed by the Executive Committee that a remedy is not urged by me in cases of non-compliance with the Act.

In reply, I fearlessly state that during the time I have had the honor to hold the position of Inspector of Collieries, whenever I have seen anything wrong in any mine I have drawn immediate attention to the matter with a view to having it remedied at once, and have never passed by anything, even down to the smallest detail, in a mine which I thought likely to militate against the health or safety of anyone employed in the mine.

Standing as I do, with employers on one hand and the employed on the other, my study hitherto has been to steer a steady course in my official capacity, knowing neither master nor man, but honestly and conscientiously giving a report of each mine as I have found it on my several inspections.

In conclusion, I desire to say that notwithstanding the enormous output of coal from the collieries in this district, and the continual changes which are taking place owing to the large output, in my opinion, the present state of said collieries will bear favourable comparison with any part of their past history, both regarding the quantity of air circulating and its distribution in the various parts of the workings.

I have, &c.,

JOHN DIXON,

Inspector of Collieries.

Submitted.—H.W., 18/1/84. If it is the practice to do so, a copy of this report may be sent to Mr. Curley.—J. P. ABBOTT, 19/1/84. In view of the precedent on 82-7,586, the copy may be supplied.—H.W., 22/1/84.

No. 5.

The Under Secretary for Mines to Mr. James Curley, Miners' General Secretary.

Sir,

Department of Mines, Sydney, 28 January, 1884.

See No. 4.

I have the honor, by direction of the Secretary for Mines, to forward a copy of the report furnished by Mr. John Dixon, one of the Inspectors of Collieries, upon the ventilation at the Wallsend and Newcastle Company's Collieries.

I have, &c.,

HARRIE WOOD,

Under Secretary.

Duckenfield Colliery.

NO.

SCHEDULE.

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Report of the Duckenfield Tunnel, taken on 20 October, 1885.

WE, the undersigned, have examined the airways and workings of the Duckenfield Colliery, and certify our report as follows:—

Intake of air taken in the engine brow below first flat, 12,210 cubic feet of air per minute; intake of air from Fault heading shaft, 6,565 cubic feet of air per minute; 7 men in the Fault heading. West heading, No. 7 cut-through, 3,520 cubic feet of air per minute; 6 men in this cut-through. No. 2 cut-through, 4,480 cubic feet of air per minute; 4 men in this cut-through. No. 3 cut-through, 4,620 cubic feet of air per minute; 3 men in this cut-through. There are 4 wheelers, 2 horses, and 20 men in the West heading cut-throughs and Fault heading. Average heat in the bords in West heading district—Thermometer registered 71°. Return air from Fault heading and West heading to Furnace shaft, 23,760 cubic feet of air per minute. Dip Workings.—Split of air from shaft at the foot of the engine brow to the B and D heading district: Result taken in B heading, 7,315 cubic feet of air per minute; 10 men in this heading. D heading, 5,940 cubic feet of air per minute; 10 men in this heading. D heading, No. 1 cut-through, 4,437 cubic feet of air per minute; 10 men in this cut-through. No. 2 cut-through, 3,812 cubic feet of air per minute; 7 men in this cut-through. No. 3 cut-through, 3,948 cubic feet of air per minute; 8 men in this cut-through. No. 4 cut-through, 4,770 cubic feet of air per minute; 4 men in this cut-through. No. 5 cut-through, 4,617 cubic feet of air per minute; 10 men in this cut-through. No. 6 cut-through, not sufficient air to take any result with anemometer (P.S.—The overseer informed

informed us that he would put a door on No. 5 cut-through to remedy the air in this cut-through); 10 men in this cut-through. There are 69 miners, 12 wheelers, and 6 horses in the B and D heading district. Return air from this district, 15,105 cubic feet of air per minute.

Intake of air from engine brow shaft to the E heading district, 4,235 cubic feet of air per minute. No. 7 cut-through, not sufficient air to take any result with anemometer (P.S.—The overseer said in a few days he would put a door on No. 6 cut-through to remedy the air); 15 men in this cut-through. No. 6 cut-through, 3,780 cubic feet of air per minute; 17 men in this cut-through. No. 5 cut-through, 4,307 cubic feet of air per minute; 8 men in this cut-through. No. 4 cut-through—2 men in this cut-through. Return air from E heading, 8,325 cubic feet of air per minute. There are 42 miners, 6 wheelers, and 3 horses in this heading.

M heading is supplied with the return air from E heading—2,827 cubic feet of air per minute; 12 miners, 1 wheeler, and 1 horse for this heading. Return air from dip workings to West heading furnace, 19,125 cubic feet of air per minute. Return from West heading district and dip workings at furnace, 53,560 cubic feet of air per minute.

We also find that there is a good supply of timber on the flats for the various sections.

JAMES SNEDDEN, } Check
GEORGE NIX, } Inspectors.

Report of the Back Creek Tunnel on 21 October, 1885.

WE, the undersigned, have examined the airways and workings of the Back Creek Colliery, as certify our report, as follows:—

Cross-cut pillars.—We find a sufficient supply of air travelling in this district. There are 10 miners, 2 wheelers, and 1 horse. Thermometer registered 68°. Intake of air in engine brow below turn for the No. 10 heading district, 21,890 cubic feet of air per minute.

First section in No. 10 heading.—Intake for No. 11 cut-through, 6,037 cubic feet of air per minute; 14 miners, 2 wheelers, and 1 horse in this cut-through. No. 8 cut-through, 5,759 cubic feet of air per minute; 20 miners, 2 wheelers, and 1 horse. No. 7 cut-through, 7,684 cubic feet of air per minute; 12 miners, 2 wheelers, and 1 horse. Return air from first section in No. 10 heading, 16,632 cubic feet of air per minute.

Second section in No. 10 heading.—No. 4 cut-through, 6,578 cubic feet of air per minute; 30 miners, 4 wheelers, and 2 horses in this cut-through. No. 3 cut-through, 12,358 cubic feet of air per minute; 20 miners, 2 wheelers, and 1 horse in this cut-through. Return air from No. 10 heading sections, result taken at furnace, 30,485 cubic feet of air per minute.

Intake.—First split of air from No. 12 shaft to A heading, 5,445 cubic feet of air per minute; 22 miners, 3 wheelers, and 1 horse in this district. Return air from A heading, 4,162 cubic feet of air per minute.

Engine brow, 3,465 cubic feet of air per minute; 3 miners, 1 wheeler, and 1 horse.

Second split of air from No. 12 shaft to No. 12 heading district.—Result taken in No. 4 cut-through, 4,312 cubic feet of air per minute; 32 miners, 5 wheelers, and 2 horses for this current of air. Return air from No. 12 heading district, 6,138 cubic feet of air per minute. Return air from engine brow, A heading, and No. 12 heading, result taken at No. 4 furnace, 19,720 cubic feet of air per minute.

We also find a good supply of timber on the flats for the various sections.

JAS. SNEDDEN, } Check
GEORGE NIX, } Inspectors.

Australian Agricultural Company's Colliery.

SCHEDULE.

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No. 1.

Minute of The Secretary for Mines.

Re Deputation of Miners at Newcastle.

A DEPUTATION of miners introduced by Messrs. Melville and Tighe, Ms.P., waited on me at Newcastle on Saturday, the 24th February, 1883, in reference to the matters mentioned in the annexed letter, and I desire that Messrs. Tighe and Melville should be informed of my decision in the several matters therein mentioned.

- 1st. Send them copy of my minute on the Wallsend Colliery.
- 2nd. The number of men allowed in a district to my mind is very clearly defined as being not more than seventy men.
- 3rd. The Examiner of Coal-fields will at once be asked to report upon the charge of the air being bad in the Lambton Commonage Coal Tunnel.
- 4th. The same as to scarcity of timber at the A.A. Company's mine.
- 5th. The Examiner has also been asked to report as to two shafts at the Newcastle Coal-mining Company's mine.

J. P. ABBOTT,
26/2/83.

[Enclosure

[Enclosure to No. 1.]

Mr. J. Curley and others to The Secretary for Mines.

THE undersigned deputation desire respectfully, on behalf of the Coal Miners' Association, to bring under your notice for consideration the following subjects:—

- 1st. The apparent erroneous opinion of the Examiner of Coal-fields regarding the Act of 1876, and a recent inspection at the Wallsend Colliery.
- 2nd. The advisability of a definition as to the computed number of men in a district.
- 3rd. Report of Lambton miners' meeting which appeared in last Saturday's *Herald* and *Advocate*.
- 4th. Scarcity of timber at the A. A. Company's mine and timber of proper lengths.
- 5th. Last year's Annual Mining Report disclosing great indifference both on the part of colliery management and Inspector.
- 6th. The question of two shafts at the Newcastle Coal-mining Company's mine.

DAVID MITCHELL.
JOHN McFADYEN.
JAMES CURLEY.

No. 2.

Minute of The Secretary for Mines.

The Deputation of Coal-miners at Newcastle.

THE Examiner of Coal-fields will cause an inquiry to be made whether there is at all times a sufficient supply of timber kept at the A. A. Company's mine, and of proper lengths.—J. P. ABBOTT, 26/2/83.

The Examiner of Coal-fields.—G.E.H. (for the U.S.), B.C., 28/2/83. Mr. Inspector Dixon for report.—J.M., 1/3/83.

The deficiency of timber in the A. A. Company's mine was only in one district, viz.:—No. 1 in No. 2 pit, where very long props are required. Owing to the heavy rains up the river, this particular class of timber was rather scarce for about three weeks. However, there is now a good supply, for I was in No. 1 district on Tuesday last, and saw a good supply on the engine flat ready for the miners' use. I cannot hear of any complaint concerning the timber from any other part of the A. A. Company's mine.—J.D., 2/3/83.

Examiner of Coal-fields.—B.C., 2/3/83. The Under Secretary for Mines.—J.M., B.C., 3/3/83. Submitted—H.W., 5/3/83. Approved. Inform Messrs. Melville and Tighe, Ms.P.—J. P. ABBOTT, 10/3/83.

No. 3.

The Under Secretary for Mines to Messrs. N. Melville and A. A. P. Tighe, Ms.P.

Gentlemen,

Department of Mines, Sydney, 1 March, 1883.

Referring to the several matters brought forward by the deputation introduced by you to the Secretary for Mines, on the 24th ultimo, I am directed to forward a copy of Mr. Abbott's decision in the matter of the ventilation of the Wallsend Colliery.

2. I am directed to state that in Mr. Abbott's opinion the number of men allowed in a district is very clearly defined as being not more than seventy (70) men.

3. The Examiner has been asked to report upon the charge of the air being bad in the Lambton commonage tunnel; also,

4. As to the scarcity of timber at the Australasian Agricultural Company's Mine; and

5. As to two (2) shafts at the Newcastle Coal Company's Mine.

I have, &c.,

HARRIE WOOD,

Under Secretary.

No. 4.

The Under Secretary for Mines to Messrs. N. Melville and A. A. P. Tighe, Ms.P.

Gentlemen,

Department of Mines, Sydney, 12 March, 1883.

Referring to my letter of the 1st instant, I have the honor to inform you that it appears, from the report forwarded by the Examiner of Coal-fields, that the deficiency of timber in the Australian Agricultural Company's Mine occurred in No. 1 district, pit No. 2, where very long props are required, but that there is now a good supply, and there was no complaint as to the deficiency of timber from any other part of the mine when the Inspector visited it.

I have, &c.,

HARRIE WOOD.

Under Secretary.

Messrs.

Messrs. Browns' Colliery, Minmi.

SCHEDULE.

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No. 1.

The Miners' General Secretary to The Secretary for Mines.

Sir,

Hamilton, 19 October, 1881.

I have the honor to bring under your notice the enclosed letter, which was delivered to the Government Examiner of Coal-fields on the 1st October, 1881, regarding the defective working of the Coal Mines Regulation Act of 1876, and referring to a number of accidents caused by explosions of gas at the Messrs. Browns' Colliery, Minmi. That there are just grounds for complaint will be admitted when I state that since the delivery of the letter herein mentioned another accident of a similar character has occurred at the same place, and in this instance has been officially reported, which, for some unexplained reason, has not been done in other cases equally serious.

There is, I may add, general complaint regarding defective ventilation at the principal mines in the district, not of the ventilation as a whole, but that in certain portions of the mines the ventilation is exceedingly bad, and believing it to be within the province of the Inspector for Collieries to effect some remedy in this direction, I would respectfully invite you to draw his attention to this very important subject, also the Examiner of Coal-fields.

Should you desire to have further information respecting this matter by deputation I shall be most happy to wait upon the Honorable Minister.

I have, &c.,

JAMES CURLEY,
Miners' General Secretary.

The Examiner of Coal-fields for explanation.—H. W., B.C., 22/10/81. The Under Secretary for Mines,—The correspondence with reference to this case was forwarded for the information of the Honorable the Secretary for Mines with my communication of the 22nd inst.—J.M., B.C., 24/10/81.

[Enclosure to No. 1.]

Messrs. J. Curley and others to The Examiner of Coal-fields.

Sir,

Hamilton, 30 September, 1881.

I beg respectfully to bring under your notice the defective working of the Coal Mines Regulation Act of 1876, and the apparent indifference of your Department in endeavouring to see that the provisions of the Bill are carried out. That the subject has assumed an important aspect you may infer when I state the miners of the district have placed myself and colleagues in a position to take all necessary steps towards a remedy. A series of questions have therefore been drafted to be placed in the hands of the Members for the county, upon which subject also the co-operation of the city Members will be invited, and an inquiry the most searching will thus be opened up, and will tend to show that on the part of the Inspector of Collieries there is a great indifference.

I have before me the Mines Report of 1880, wherein the admission is made that I have made previous complaints, with the assertion that they have been immediately remedied. What is the answer to this? Three miners have been burnt in the Minmi mine recently by explosions of gas. Two of these accidents were only three weeks or one month apart from each other, and at a time when no night furnacemen were employed. If atmospheric pressure has any influence (which you will admit) in generating gas and its accumulation in mines, surely, in a climate like ours of sudden atmospheric change, it is a first condition in ventilation that the apparatus be kept in motion. Minmi is not the only place where false economy requires your immediate attention, and, what is more, constant attention.

I will put the question thus with your permission:—"It is better that accidents should be prevented by inspection, than that it should be said accidents, in the cases cited, are the inspectors."

The report of Inspector for Collieries requires attention, and, to those unacquainted with the Act, is very misleading. For instance, it is said of such a mine there are "280 men and horses, &c., in the mine, for whom 55,000 cubic feet of air per minute is introduced, which is in excess of the minimum quantity required by the Act."

The inspector does not state whether the main current is divided into the requisite number of splits, and fresh air supplied to every section of seventy men, and it is certainly impossible to be so where the anemometer will not turn, which is recorded by the local inspectors in several recent examinations, some of which are in my possession.

In conclusion, we, the undersigned, request your immediate attention towards remedying the cause of complaint—defective ventilation—in some parts of the collieries in the district.

DAVID MITCHELL, Chairman.
J. MFADYEN, Treasurer.
JAMES CURLEY, Secretary.

No. 2.

No. 2.

The Examiner of Coal-fields to The Under Secretary for Mines.

Sir, Coal-fields Office, Newcastle, 22 October, 1881.

I beg to forward herewith, for the information of the Honorable the Secretary for Mines, a letter received from the Chairman, Treasurer, and Secretary of the Hunter River District Coal-miners' Association, bringing under notice an alleged defective working of the Coal Mines Regulation Act, 1876, and the apparent indifference of this Department in endeavouring to see that the provisions of the bill are carried out, with the Inspector's report thereon and a copy of my reply.

See Enclosures.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

The Miners' General Secretary may be informed that the Examiner of Coal-fields having replied to the only specific charge made, and having asked for further information respecting the charges made in general terms, there does not appear to be any action for this Department to take until such information has been supplied.—H.W., 25/10/81. Submitted.—To be informed accordingly.—A.R., 26/10/81.

[Enclosures to No. 2.]

Messrs. Curley and others to The Examiner of Coal-fields.

Sir, Hamilton, 30 September, 1881.

I beg respectfully to bring under your notice the defective working of the Coal Mines Regulation Act of 1876, and the apparent indifference of your Department in endeavouring to see that the provisions of the Bill are carried out. That the subject has assumed an important aspect you may infer when I state the miners of the district have placed myself and colleagues in a position to take all necessary steps towards a remedy. A series of questions have therefore been drafted to be placed in the hands of the Members for the county, upon which subject also the co-operation of the city Members will be invited, and an inquiry the most searching will thus be opened up, and will tend to show that on the part of the Inspector for Collieries there is great indifference.

I have before me the Mines Report of 1880, wherein the admission is made that I have made previous "complaints," with the assertion that they have been immediately remedied. What is the answer to this? Three miners have been burnt in the Minmi Mine recently by explosions of gas. Two of these accidents were only three weeks or one month apart from each other, and at a time when no night furnaceman was employed. If atmospheric pressure has any influence (which you will admit) in generating gas and its accumulation in mines, surely in a climate like ours, of sudden atmospheric change, it is a first condition in ventilation that the apparatus be kept in motion. Minmi is not the only place where false economy requires your immediate attention, and, what is more, constant attention. I will put the question thus, with your permission:—"It is better that accidents should be prevented by inspection, than that it should be said accidents in the cases cited are the inspector." The report of the Inspector for Collieries requires attention, and to those unacquainted with the Act is very misleading. For instance, it is said of such a mine, there are "280 men and horses, &c., in the mine, for whom 35,000 cubic feet of air per minute is introduced, which is in excess of the minimum quantity required by the Act." The Inspector does not state whether the main current is divided into the requisite number of splits, and fresh air supplied to every section of seventy men; and it is certainly impossible to be so where the anemometer will not turn, which is recorded by the local Inspectors in several recent examinations, some of which are in my possession. In conclusion, we, the undersigned, request your immediate attention towards remedying the cause of complaint—defective ventilation—in some parts of the collieries in the district.

DAVID MITCHELL, Chairman.
JOHN M'FADYEN, Treasurer.
JAMES CURLEY, Secretary.

Urgent. The Inspector of Collieries for report. To be returned.—J.M., 4/10/81.

Being unable to understand the exact meaning of the statement in the letter, "The Inspector is indifferent, &c.," I can scarcely be expected to furnish a reply to it. As to the statement "That the Inspector's report does not state whether the main current is divided into the requisite number of splits, &c.," I reply that, although not so stated in the report, nevertheless such currents are divided into district currents; and the omission shall be made good in future.—T.L., 5/10/81.

The Examiner of Coal-fields to Mr. James Curley and others.

Gentlemen, Coal-fields Office, Newcastle, 22 October, 1881.

I have the honor to acknowledge the receipt of your letter of the 30th ultimo, bringing under notice an alleged defective working of the Coal Mines Regulation Act of 1876, and the apparent indifference of this Department in endeavouring to see that the provisions of the Bill are carried out.

2. In reply, I beg to inform you that as the only specific complaint brought forward in your letter had reference to the Minmi mine, I recently made it my business to make a thorough examination of Brown's colliery, by inspecting all the places where the men were at work, measuring the quantity of air circulating through the different districts or splits and the men's working places, as well as the quantity of intake and return air travelling through the mine, and found that the main current was divided into the required number of splits, and not only was there a far larger quantity of air passing through the mine than the Coal Mines Regulation Act requires, but it was properly circulated, and the mine well ventilated.

I asked each miner at work, amongst other questions, whether he considered the air he was working in was good or bad, and if he had been working in any badly ventilated places during the year, and they said they had no reason to complain of the air they were then or previously working in; that they had worked where the air was slack and deficient, when their bords, &c., had been driven past where a "cut-through" was about being "put through."

I also inspected the bords and headings where Hunter, Gilder, Hull, Davies, Bothwell, Duggan, and Andrews were burnt by explosive gas, and made inquiries as to their injuries. Hunter, Gilder, Davies, and Bothwell being only slightly burnt it was not considered necessary by the manager to report their accidents, and the men themselves did not consider they received "serious personal injury," or that it was necessary for the manager to have reported their injuries.

The manager informed the Inspector that Duggan and Andrews had been burnt by explosive gas, and that officer reports to me that upon visiting Duggan he found he was apparently only very slightly burnt, and did not consider he had received serious personal injury.

On the 6th instant I went to the Newcastle Hospital to see Duggan, and found that his back, arms, face, and one hand had been severely scorched; and although the Inspector, when visiting him, formed the impression that no serious personal injury had been received, the case has, in my opinion, proved to be one of that character.

Dr. Harris says, whilst the case has, in my opinion, proved to be one of that character, and Duggan says for over two weeks he was in such pain that he could not lie on his back to sleep; but, from his own account of the occurrence, I conclude that had he exercised ordinary caution the accident would not have happened.

4. In the No. 10 heading, where the seam of coal generates the most gas, and there were 42 men, boys, and horses at work (in the two shafts), I found there were 10,080 cubic feet of air per minute circulating through the working-places, and was informed that there was seldom a less quantity travelling through this part of the mine. I saw Davies, who was slightly scorched by an explosion of gas about eighteen months since, and he told me he did not consider his was a case which it was necessary to report; that he was working in a 6-foot heading at the time, and about 30 yards before the current of air. In No. 12 heading, where Andrews was burnt, there were 4,950 cubic feet of air per minute circulating through it, and only two men working in it. Mr. Brown has since my first visit appointed a fireman, whose special duty it will be to go round all the places known to contain explosive gas, before the men go to work. Previously

Previously it was John Morgan's (the deputy's) duty to go round the dip workings, wherever fire-damp was likely to exist. And as the quantity of gas generated by the seam of coal is at present small in quantity, and there is a good current of air circulating, it appears to be unnecessary for the Manager to do more than he has promised for the prevention of accident from such a source—a view supported by the miners themselves, of whom inquiry was made on the spot.

5. In conclusion, I may observe, that if you will be so good as to mention specifically the other collieries in this district to which you refer, as not carrying out the provisions of the Act, I shall take effective steps for ascertaining whether the law is complied with in each case, for the reports received from the Inspector of Collieries for some time have led me to suppose that there were no causes for complaint.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

No. 3.

The Under Secretary for Mines to Mr. James Curley, Miners' General Secretary.

Sir,

Department of Mines, Sydney, 28 October, 1881.

Referring to your letter of the 19th instant, in which you bring under notice a communication made to the Examiner of Coal-fields, touching the alleged defective working of the Coal Mines Regulation Act 1876, and the accidents caused by explosions of gas at Messrs. Browns' Minmi Colliery, I have the honor, by direction of the Secretary for Mines, to inform you, that as the Examiner has replied to the only specific charge made and has asked for further information respecting such charges as have been made in general terms, there does not appear to be any action for this Department to take until such information has been supplied.

I have, &c.,

HARRIE WOOD,
Under Secretary.

No. 4.

Mr. James Curley, Miners' General Secretary, to The Examiner of Coal-fields.

Sir,

Hamilton, 7 November, 1881.

I have the honor to acknowledge the receipt of your communication dated 22nd October, and referring to the second clause therein, as to the answers given by the miners respecting the ventilation being of a generally satisfactory character; this was, as I am given to understand, when you were accompanied by Messrs. J. Brown, J. Croft, and G. Durie, all representing the management, while the miners were unrepresented by any of their number, exception being taken to Mr. J. Patrick, an experienced practical miner, now in the employ of the men as check-weigher, going down the mine in company with you, so that it is nothing unreasonable to conclude the inquiry and examination partook of a partial, one-sided, and unsatisfactory character, inasmuch that a sense of intimidation would under such circumstances be at once produced. This view of the case is supported by the fact that the delegate's two sons had been some days previous to this peremptorily discharged from their work in the fitting shops adjacent to and in connection with the colliery. Mr. W. M. Williams, the delegate, I know to be a man of exemplary character, while his sons had by their industry, won the respect and esteem of the overseers in their department.

This is most inconsistent with the courtesy uniformly observed by the gentleman representing the firm, whom I have met on several occasions at meetings between masters and men.

Admitting, however, the answers to have been given as stated, the evidence, judging from the number of accidents by explosions of gas and the time at which they occurred, it is quite evident that there has been grave indifference on the part of the management, and still more on the part of the Inspector for Collieries.

In clause 3 of your communication you state, "Hunter, Gilder, Hull, Davies, Bothwell, Duggan, and Andrews were burnt by explosive gas,"—"Hunter, Gilder, Davies, and Bothwell being only slightly burnt, it was not considered necessary by the manager to report their accidents, and the men themselves did not consider they received serious personal injury or that it was necessary for the manager to have reported their injuries." The opinion of both manager and men in reference to a report is perverse in the extreme, and probably was quite different on the dates when the accidents took place, and confirms what has been said regarding indifference. If the Inspector committed a mistake in the case of Duggan's accident, which you admit, neither the management nor men are more judicious (but the latter are not requested to report, and why you include them with the management I fail to understand). What is serious personal injury? When miners are knocked down and severely burnt by gas-explosions, and incapacitated from following their employment for two and three weeks together. It must be serious personal injury when these accidents are concurrent and take place at intervals of a few weeks together. It is not the slight trifling matter represented. And more especially when you consider the time at which the accidents took place, when the men had been some hours at work, the air would then be in motion, however defective, and forced about by the skips in motion, and yet gas collected in sufficient quantity to explode, which explains two important facts—

1. That there was very defective ventilation at the time of these gas explosions, or
2. That there was that amount of gas collecting in the mine requiring vigilant attention, and, in case of an accident, rendering a report imperatively necessary.

The Colliery Inspector in Duggan's case showed not only indifference and a want of judgement but is culpably negligent for not making an examination on the spot; and in reference to such examinations it would be more satisfactory if the miners were represented, and the press admitted. This would constitute something like an impartial Board of Inquiry. I cannot refrain from dissent regarding Duggan's want of caution as expressed by you. Did anyone warn him against going into his working-place on the morning of the explosion? No; and as he advanced into it the gas exploded about 15 yards from the working face. This was shortly after Hunter's accident. Duggan not only suffered serious personal injury, but, as you state, Doctor Harris considered his life was endangered; and yet the Colliery Inspector deemed this most serious case of such trifling importance that neither an enquiry was held nor an examination made. Is this in conformity with the Act? In attributing the accident to a want of ordinary caution there appears to be something strangely inconsistent, especially when you consider Hunter's, Gilder's, and other accidents in connection with it. Why not attribute it to careless management and indifferent inspection? The evidence in favour of this latter conclusion is overwhelming.

Both Duggan's and Andrew's accidents were occasioned by gas explosions as they were advancing to the working face in the morning, which goes to show that no fireman had been in these places on the morning of the accidents, or he would have noticed the gas, and warned the miners against entering them, and thus have prevented all approach to danger.

Whatever may have been the state of the ventilation when the examination was made, or the quantity of air passing in the mine,—at the time of the whole of these seven accidents by gas-explosions, the whole of which were more or less serious, there was not that quantity of air passing in the mine stipulated by the Act, wherein it is stated—(2) “An adequate amount of ventilation shall be constantly produced in every mine, to dilute and render harmless noxious gases to such an extent that the working places of the shafts, levels, stables, and workings of such mine and the travelling roads to and from such places shall be in a fit state for working and passing therein.”

I enclose you a copy of statement which I have taken from William Hunter, in the presence of Mr. Patrick, which confirms what I have stated relative to the whole question:—

1. Indifference on the part of the management regarding the ventilation of the mine.
2. Negligence in not using more precaution to prevent accidents by gas explosions, and when such accidents did occur, in not reporting the same to the Examiner for Coal-fields.
3. Indifference on the part of the Colliery Inspector, who must have seen from the local press, that miners were burnt by gas explosions at Messrs. Browns' Colliery, Minmi, and when informed of the same by report from the management to apparently treat the matter with contempt, as in Duggan's case.
4. The incorrectness of the Inspector's reports, in the face of the facts brought under notice.
5. That there is room for improvement regarding the way in which the inquiries and examinations are made.

With regard to clause 5 of your communication, before I refer to it, I would draw your attention to a mine abandoned, but inundated by water, in close proximity to the Messrs. Brown's Collieries now in work, and would ask you respectfully, whether the Inspector has reported this matter to you, and whether any steps are taken as a safeguard in the event of the old tunnel workings piercing the abandoned workings of the inundated mine, and if there are efficient appliances in case of escape on account of any unexpected accident arising from such a source of danger.

In conclusion, respecting clause 5, and the specific naming of the other collieries in this district, I would mention, Wallsend, Borehole, and Lambton, and for any reference to the state of ventilation being defective in these mines in any particular portions thereof, would refer you to the recent local Inspectors as entered in the book at the respective Colliery Offices named.

I am, &c.,
JAMES CURLEY,
Miners' General Secretary.

We the undersigned concur in the above statement.

DAVID MITCHELL, Chairman.
J. M'FADYEN, Treasurer.

[Enclosure to No. 4.]

William Hunter states as follows:—On the morning when I was burnt by an explosion of gas, I was working in No. 14 front heading. The heading was about 27 yards in past the cut-through; my mate was working in the back heading, which was about 6 yards past the cut-through; we had been working in these places about three weeks. Before commencing to work in them, we heard from report by the men there was fire-damp in these places; my mate, Alfred Conway, went to Mr. Thomas, the manager, and told him that we knew nothing about fire, and what the men had told us concerning these places. This was on the Monday morning before commencing to work them. Thomas, in reply, said there was no fire in the place, and if there was Durie would tell them. Durie at no time warned us about fire-damp. He said if we brushed the place with our shirts we would take no hurt. On the morning on which the accident occurred I brushed the place as usual, and had been working about two hours and a half—from half-past six to nine o'clock. I had been back from the face of the heading about 25 yards, for breakfast, only a few minutes, and on returning to the face I was brushing the place, and, when about 5 yards from the face, an explosion of gas took place. I was struck on the breast, and knocked down by the force of the explosion, and fell on my breast.

I thought it was a serious matter at the time, and was unable to follow my work for two weeks after.

I think the accident should either have been reported or steps taken to clear the gas from the places.

Mr. Durie came to see me and offered me a place to work elsewhere in the mine, and said I would go back there no more. Neither Mr. Lewis, the Colliery Inspector, nor Mr. Mackenzie visited me at the time I was off work. When I answered Mr. Mackenzie's questions Mr. J. Brown, J. Croft, and G. Durie were present, and I felt somewhat intimidated by their presence, and did not care to say anything reflecting on the management, for fear I should be dismissed.

I am a practical miner, having worked in mines for eight years. The day on which Mr. Mackenzie visited us in one of the No. 6 headings and said the air was good enough, there were very few men in that part of the mine, as the pit was filling slack and nearly all the men were cleared out.

WILLIAM HUNTER.
JOHN PATRICK.
JAMES CURLEY, Miner's General Secretary.

“Burley's Hotel,” Minmi, 31 October, 1881.

The Inspector of Collieries for explanation. Copy of my letter referred to in this communication forwarded herewith.—
J.M., B.C., 14/11/81.

In this statement I am blamed for indifference, but not knowing the meaning of the same as used herein, I am therefore unable to reply.

2. For the incorrectness of my report, to which I think that the result of the examination by the Examiner of Coal-fields is a sufficient answer.

3. For neglecting the accidents by explosions of fire-damp, to which I answer that I investigated each case brought under my notice.—T.L., 15/11/81.

No. 5.

The Miners' General Secretary to The Secretary for Mines.

Sir,

Hamilton, 8 November, 1881.

I have the honor to state that a further communication on the defective working of the Coal Mines Regulation Act, 1876, and recent accidents by explosions of gas at the Messrs. Browns' Colliery, Minmi, has been forwarded to the Examiner of Coal-fields.

A statement which I have taken from one of the miners burnt by explosive gas has also been forwarded, which confirms the allegations made respecting this important subject.

I have, &c.,
JAMES CURLEY,
Miners' General Secretary.

Ask the Examiner what has been done in this matter.—H.W., 2/12/81.

No. 6.

No. 6.

Mr. James Curley, Miners' General Secretary, to The Examiner of Coal-fields.

Sir,

Hamilton, 28 November, 1881.

I have the honor to respectfully call your attention to the defective state of ventilation in connection with the drive at Raspberry Gully, South Waratah. The drive is in 500 yards, more or less. Air is conveyed to the workmen by means of troughs laid on the floor of the drive, and when a change of shifts takes place water sometimes accumulates in certain places of the drive, so as to almost overflow the pipes and air current within. Gas is occasionally visible, so that the danger to the life of the workmen must be very great at times. At the time when the Inspector visited the drive recently, the workmen had been withdrawn a half shift the day previous.

I have, &c.,

JAMES CURLEY,

Miners' General Secretary.

No. 7.

The Examiner of Coal-fields to Mr. James Curley, Miners' General Secretary.

Sir,

Coal-fields Office, Newcastle, 1 December, 1881.

With reference to your letter of the 28th ultimo, calling my attention to the defective state of ventilation in connection with the drive at Raspberry Gully, South Waratah Colliery, I beg to inform you that, upon going to the Colliery on the 29th ultimo, I found that Mr. Green (the Colliery Manager) was connecting the trough with the Charles pit down-cast shaft, for the purpose of ascertaining whether the furnace would ventilate the drive better than the fan has lately done, and, as the men had not been at work the previous day, I arranged to go on the 30th idem, and see how the new method answered. Upon arriving there on the 30th ultimo, I found that the shaft which the men had to go down was full of smoke from the furnace. I then discussed with Mr. Green the advisability of remedying this, either by making Charles pit the up-cast or putting a landing at the 6-foot seam, in the present up-cast or furnace shaft, so that the men could go to their work down Charles pit and from thence to the bottom of the furnace shaft free of smoke, &c. This Mr. Green will do immediately, and, when completed, inform me of, and whether the ventilation is improved. See No. 6.

2. With respect to the gas, Mr. Green informs me that the overman is instructed, whenever the men leave the face of the drive, to examine the tunnel and see that it is free from gas, and safe to work in, before the men resume their work; and that whenever gas has been seen it has accumulated during the stopping of the "fan," from 2 o'clock on Saturday night to 6 o'clock on Sunday morning.

I have, &c.,

JOHN MACKENZIE,

Examiner of Coal-fields.

No. 8.

The Under Secretary for Mines to The Examiner of Coal-fields.

Sir,

Department of Mines, Sydney, 8 December, 1881.

I have the honor to inform you that a letter has been received from Mr. James Curley, the Miners' General Secretary, to the effect that a further communication has been made to you respecting the alleged defective working of the Coal Mines Regulation Act of 1876, and the recent accidents by explosions of gas at the Messrs. Browns' Colliery, Minmi, and I accordingly request that you will be so good as to state what has been done in the matter.

I have, &c.,

HARRIE WOOD,

Under Secretary.

Copy of Mr. Curley's letter, &c., forwarded herewith. Have visited the collieries complained of, and shall reply to his letter early next week. I also forward copies of letters respecting the Raspberry Gully drive.—J.M., 10/12/81. The Under Secretary for Mines.—B.C., 10/12/81.

No. 9.

The Examiner of Coal-fields to The Under Secretary for Mines.

Sir,

Coal-fields Office, Newcastle, 14 December, 1881.

Adverting to your letter of the 8th instant, with reference to a letter received from Mr. James Curley, the Miners' General Secretary, and my blank cover communication of the 10th idem, I have the honor to forward you, for the information of the Honorable the Secretary for Mines, a copy of my reply to Mr. Curley and others' letter. See No. 8.

I have, &c.,

JOHN MACKENZIE,

Examiner of Coal-fields.

It does not seem necessary for the department to take any further steps in this matter, unless further moved by the Miners' General Secretary, who is in possession of Mr. Mackenzie's report, copy of which is herewith.—H.W., U.S., 19/12/81. Await further communication.—A.R., 20/12/81.

[Enclosure to No. 9.]

The Examiner of Coal-fields to Mr. J. Curley and others.

Sir,

Coal-fields Office, Newcastle, 13 December, 1881.

In acknowledging the receipt of your letter of the 7th ultimo, referring to the second paragraph of my communication of the 22nd October last, with regard to the answers given to me by the miners at the Minmi Colliery, respecting the ventilation, and complaining that the enquiry and examination held on the occasion was of a partial, one-sided, and unsatisfactory character, owing to the men having been unrepresented, I beg to inform you that Mr. John Brown, the Colliery Manager, having objected to allow Mr. J. Patrick (who, I was informed, was the only person paid by the men at that colliery) to accompany

accompany me during my visit, I had no alternative but to make the examination without him, although I may state that the Colliery Manager was entitled, if he thought fit, to prevent Mr. Patrick from entering the mine. As stated in my letter of 22nd October last, the mine was, at the different days I examined it, well ventilated, whatever it may have been previously; and, as I also informed you, the reports from the Inspector of Collieries had for some time led me to suppose there were no causes of complaint.

2. With respect to your remarks about persons injured by explosive gas at the same colliery, I am of opinion that it would be better and more satisfactory if all such injuries, whether serious or not, were reported to the Examiner of Coal-fields by the owner or manager of the mine, although the Act does not make it imperative that such should be done.

I am also inclined to think that the presence of explosive gas, and the injuries received therefrom, were treated too lightly by the manager previous to my visiting the colliery on 4th October last, since which time a "fireman" has been appointed, whose special duty is to go around all the places known to contain explosive gas before the men go to work. Duggan told me he was about 30 yards in his bord, past the district air current, and about 5 yards from the face, not 15 yards, when the gas fired, and where I was shown his lamp was found was about the distance stated by him to me.

3. Upon making enquiries at the mine, and examining Messrs. Brown's colliery plans, I find that the nearest drives going towards the Minmi old abandoned workings inundated with water, are 35 chains, at least, distant from them, and consequently cannot be in close proximity thereto.

4. The proposal in the fourth paragraph of your letter, that the miners should be represented and the Press admitted at official examinations of collieries, is not provided for in the Act, and cannot, therefore, be complied with.

5. Adverting to the reference made in the concluding paragraph of your letter to the Wallsend, Borehole, and Lambton Collieries, I beg to inform you that I have recently made it my business to make a thorough examination of the Newcastle Wallsend Colliery, by inspecting nearly all the places where the men were at work, measuring the quantity of air circulating through the different districts (or splits) and the men's working places, as well as the quantity of intake and return air travelling through the mine.

6. On the first day, I was accompanied by William Willis (overseer), and John Naismith and David Beveridge (the men's Check Inspectors), whom the Colliery Manager permitted to accompany me through Mr. Willis' district.

In the engine bank road there were 21,600 cubic feet per minute of intake air travelling down it, and 13,860 cubic feet per minute of intake air circulating along the travelling road.

In the No. 1 district (or split) where the air enters it, near the travelling road heading, there were 5,910 cubic feet per minute of intake air for the supply of 70 men, boys, and horses at work; between Nos. 15 and 16 bords it measured 6,000, and between 18 and 19 bords 4,940 cubic feet per minute, thus showing the irregularity of the current of air circulating through this split, and that there is not the quantity of air circulating through it which the Coal Mines Regulation Act provides for, but Mr. Neilson expects that when the water shaft, now in course of being connected with the workings in this district is completed, the ventilation will be improved and exceed the requirements of the Act.

In the No. 2 district (split) there were only 11,040 cubic feet of intake air per minute coming down the "air shaft," for 133 men, boys, and horses at work there, and only 5,670 cubic feet per minute travelling along the air-way past the last working place in the split, which is far less than the Act requires. Mr. Neilson (the Manager) informed me that there was and had been for some time cause for complaint with respect to a deficiency of air in this split, but anticipated that when the new "water shaft" in course of sinking is in a few days completed, it will add to the quantity of air at present supplied to men in this part of the mine. On the second day I was accompanied by Mr. Neilson (the manager), Thos. Boasfield (overseer), and John Naismith and David Beveridge (the men's Check Inspectors), who Mr. Neilson again permitted to accompany me through Mr. Boasfield's district, where I found there was the requisite quantity of air circulating through the different "splits," and the provisions of the Act complied with. The Lambton heading (or No. 1 district) having 6,031, 1,377, and 9,800, equal to 17,208 cubic feet of air per minute (by three intakes) for 141 men, boys, and horses working therein, and with respect to a complaint the men's Check Inspectors drew my attention to, which I examined, where six miners were working in bords where the air was supposed to have passed over "stagnant water," I am of opinion that as the manager is daily drawing large quantities of water away from it, and it is continually receiving fresh supplies, that the 4th general rule in section 12 of the Act, does not apply to it, and I would further add that I could not perceive any bad smells coming from it or the air passing over it. The quantity of return air passing through the furnace shaft was—

No. 1 Split	30,564	cubic feet per minute.
No. 2 Split	12,960	" "
No. 3 Split	34,280	" "
Total]	77,804	

7. On my visit to the Borehole Colliery, where I met by appointment the colliery manager (Mr. Turnbull), and William Lee, and Samuel Selby (the men's check inspectors), and looked over their last reports. I found that the only places they had to complain of were in the south-east side of the south-east headings, and that since the Report dated 27th June last, W. H. Britton and Henry Turner had been appointed Check Inspectors in the place of Lee and Selby. The day previous to my visit Britton and Turner had come out of the mine and asked the Manager if he would go down the pit and see if something could not be done to improve the ventilation where men were working in the south-east side of the south-east headings, as the air was heavily charged with "black-damp," so much so that in many places the men could not keep their lights burning. Mr. Turnbull immediately accompanied Britton and Turner to the places complained of, and after discussing the matter, he made such alterations, as not only gave the men a larger quantity of air, but also that of a better quality. Owing to the large quantity of "black-damp" which is given off and accumulates in this part of the A.A. Company's workings, when a hot north or north-west wind is blowing it makes it very difficult for the Manager to always keep the ventilation in this district up to the requirements of the Act. When I examined this district with Mr. Turnbull and the Check Inspectors (Lee and Selby) the day after the alteration had been made, I found that the men were quite satisfied, and the places well ventilated.

8. I have been to the Lambton Colliery, and Mr. Croudace has marked for my guidance, &c., on the coal-fields record tracings, the different splits, doors, &c., and the way the air travels through and ventilates the mine, and also informed me that he was then busy making alterations and improvements in the ventilation. The Check Inspectors reports were lent me for my perusal, and to take copies of them if I wished to do so, and Mr. Croudace told me that he should have no objection to allow the Check Inspectors to accompany me in my examination.

Upon seeing Mr. Jackson, on Saturday last, I find that the Lambton Colliery is not likely to be working this week, and I must therefore leave my examinations of it until my return from the western and southern districts, and completion of my 1881 yearly report.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

No. 10.

Mr. H. Winchester to Mr. J. Y. Neilson, Manager, Wallsend Collieries.

Sir,

Coal-fields Office, Newcastle, 20 December, 1881.

With reference to your communication of the 19th instant, I beg to inform you that the Examiner of Coal-fields, who is now absent from Newcastle, anticipating your request, instructed me to furnish you with a copy of his report, if applied for, and accordingly have the honor to enclose the same herewith.

I will forward your letter to Mr. Mackenzie without delay.

I have, &c.,
HERBERT WINCHESTER.

No. 11.

No. 11.

Messrs. J. and A. Brown to Mr. James Curley, Secretary, Miners' Association.

Sir,

Newcastle, 23 December, 1881.

We are much astonished to find that you have written to the Examiner of Coal-fields in the following terms:—"I would draw your attention to a mine abandoned but inundated by water in close proximity to the Messrs. Brown's Collieries now in work, and would ask you respectfully whether the inspector has reported this matter to you, and whether any steps are taken as a safeguard in the event of the old tunnel workings piercing the abandoned workings of the inundated mine, and if there are appliances in case of escape on account of any unexpected accident arising from such a source of danger."

As the above statement is both malicious and untrue we would ask you to immediately furnish us with an explanation with respect to the same, and a withdrawal of the statement to the Examiner of Coal-fields.

In the event of this not being done we shall deal with the matter in whatever summary manner we may be advised.

We have, &c.,

J. & A. BROWN.

No. 12.

Mr. James Curley, Miners' General Secretary, to N. Melville, Esq., M.P.

Hamilton, 28 December, 1881.

CAN Minister Mines meet deputation Miners' Association on Friday. Arrange same and meet in Mines Office; reply paid.

JAMES CURLEY.

PRESENTED by Mr. Melville, M.P. In the absence of the Secretary for Mines I informed Mr. Melville that the deputation would be received on Friday at 11:30 a.m.—G.E.H. (for the U.S.), 29/12/81.

Submitted.—G.E.H. (for the U.S.), 31/12/81.

No. 13.

Minute of the Hon. the Secretary for Mines.

Re Deputation from Miners' Association, Hamilton and Newcastle.

INFORM the Examiner of Coal-fields that it is reported that a letter having been forwarded to him by the Secretary of the Miners' Association, he forwarded an extract from the letter to the proprietors of the coal mine (Messrs. Brown), regarding which the complaint was made. Inform further that in consequence of this action on the part of the Examiner the proprietors have threatened to take summary action against the Secretary of the Miners Association.

The Minister requires a report from the Examiner on the subject.

A.R., 4/1/82.

The Examiner of Coal-fields.—B.C., 4/1/82., H.W.

No. 14.

The Examiner of Coal-fields to The Under Secretary for Mines.

MESSRS. J. and A. Brown's letter to me and my reply forwarded herewith, also letter from J. Y. Neilson and my answer thereto.—J.M., 11/1/82. The Under Secretary for Mines.—B.C., 11/1/82. Submitted.—H.W., 16/1/82. Read.—A.R., 16/1/82.

[Enclosure to No. 14.]

Messrs. J. and A. Brown to The Examiner of Coal-fields.

Sir,

Newcastle, 29 November, 1881.

Referring to your semi official conversation with our Mr. Alexander Brown, relative to the near approach of our present workings at Brown's Colliery to some of the old Minmi pit workings, and the probable consequences which might arise owing to any careless working, and of which careless working you had been informed by some person in authority, we should be very glad to know the name of your informant, as Mr. Brown when at the mines, made it his special business to inquire into the truthfulness or otherwise of the assertion, and we are glad to say, found it as uncalled for as it was untrue.

We have, &c.,

J. & A. BROWN.

The Examiner of Coal-fields to Messrs J. and A. Brown.

Gentlemen,

Coal-fields Office, Newcastle, 7 December, 1881.

Referring to your letter of the 29th ultimo, asking me if I would tell you who it was informed me of the near approach of Brown's Colliery workings to some abandoned workings full of water in that neighbourhood, I beg to say that, in a communication received from Mr. Curley, the Miners' General Secretary, he states as follows:—"I would draw your attention to a mine abandoned but inundated by water in close proximity to the Messrs. Brown's Collieries now in work, and would ask you respectfully whether the Inspector has reported this matter to you, and whether any steps are taken as a safeguard in the event of the old tunnel workings piercing the abandoned workings of the inundated mine, and if there are efficient appliances in case of escape on account of any unexpected accidents arising from such a source of danger."

I have, &c.,

JOHN MACKENZIE,

Examiner of Coal-fields.

Mr. J. Y. Neilson, Manager, Wallsend Collieries, to the Examiner of Coal-fields.

Sir,

Wallsend, 19 December, 1881.

I notice in to-day's issue of the *Newcastle Chronicle* a report of a Wallsend miners' meeting, wherein it is reported as follows:—

"Mr. Curley stated he had received a very lengthy report from Mr. Mackenzie, Examiner of Coal-fields, respecting the ventilation and stagnant water in the Wallsend workings, and on many things, &c.; and he, Mr. Curley, concludes by stating, if the meeting desired it, he would bring the report, and read it to the Committee." In

In reference to the above, I think you will have a perfect recollection of the Wallsend Check Inspectors asking to make a special report, you stating that it was a special report, and you could only report to your superior officer or head of your department; and they, the Check Inspectors, had only been allowed to accompany you round the works by the courtesy of the manager, who wished to give you (the Examiner) every information. You then asked me if I was going to make any special report. I at once replied, "Not until I see your official report."

Assuming the report in paper is correct, I do think that you have not acted in strict good faith, inasmuch as you have favoured the accuser with a report, and left the accused in ignorance of your conclusions; and to say the least, it is a most unfair and inequitable arrangement, and a position which you have taken without mature thought; and I shall be glad if you will give me the same copy of your report as you have given Mr. Curley, as I must now report this matter in full to my Directors on the 21st inst., when I have no doubt but that they will be as much surprised as I have been, to find that their Miners' Secretary has been furnished with information that has been withheld from the masters, the latter being equally interested and more responsible.

I am, &c.,
J. Y. NEILSON,
Colliery Manager.

The Examiner of Coal-fields to Mr. J. Y. Neilson, Manager Wallsend Collieries.

Sir,

I am very much surprised at your letter forwarded to me here, and in reply thereto, beg to state that I did exactly what I told you I should do, viz., reply to Mr. Curley's letter, and send you a copy of it (if you wrote for one), which I left instructions with Mr. Winchester to do in my absence; also, send a copy to the Honorable the Secretary for Mines.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

Stockton Colliery.

SCHEDULE.

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The Examiner of Coal-fields to The Under Secretary for Mines.

Sir,

Coal-fields Office, Newcastle, 11 September, 1885.

I have the honor to forward for the information of the Honorable the Secretary for Mines, a letter received from the Miners' General Secretary, and a report from Mr. Inspector Dixon, with respect to defective ventilation in the workings of the Stockton Colliery, also copy of a notice I served upon the Colliery Manager, after having made an examination of the mine with Mr. Dixon, on the 9th instant.

2. I shall be obliged by you informing me what further action the Minister desires me to take in the matter. Whilst I was at the Colliery on the 9th instant, a man came to make a commencement at putting a brattice down side of shaft, for the purpose of improving the ventilation, and complying with the requirements of the Coal Mines Regulation Act, 1876.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

Unless effective measures be adopted for improving the ventilation before he has time to initiate proceedings, he should proceed in terms of the Act to enforce compliance with its provisions.—H.W., 22/9/85. Submitted. Approved.—J. P. ABBOTT, 25/9/85. The Examiner of Coal-fields.—G.E.H. (for the U.S.), B.C., 28/9/85. The brattice down the side of shaft is now completed, and sub-section 3, section 12, of the Coal Mines Regulation Act, 1876, is now complied with.—J.M., 30/9/85. The Under Secretary for Mines.—B.C., 30/9/85. No further action appears to be necessary.—H.W., 3/10/85.

[Enclosures.]

Mr. James Curley, Miners' General Secretary, to The Examiner of Coal-fields.

Sir,

I am instructed by the miners working at the Stockton Colliery, to respectfully draw your attention to the state of the ventilation, with a view that some improvement be effected.

I may add that the miners refused to enter the mine to day, owing to alleged defective ventilation.

I have, &c.,
JAMES CURLEY,
Miners' General Secretary.

Mr. Inspector Dixon for report as early as possible.—J.M., 8/9/85. Seen and reported on.—J.D., 8/9/85.

Mr. John Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Glebeland, 8 September, 1885.

According to your instructions sent by telegram, and also your verbal instructions when I saw you this afternoon, I went to the Stockton Colliery and made an inspection of the workings, and beg to report as follows:—

2. I got down into the workings a little before 4 o'clock p.m., and just at the time the miners were knocking off. There had been several shots fired prior to the men leaving their working places, and as a consequence I found the various headings almost filled with powder, smoke, and seemingly no current of air to clear the workings of said powder smoke. I went through the various headings and bords and also into the return airway which has been holed into the shaft, but could nowhere find the current of air according to the Act, even for the twenty men employed below.

3. The cause of the above state of things is to be found in the fact that a tangye pump has been placed in the lower seam to force the water up the pit. It was found that owing to the steam having to be brought from the surface, the power was almost lost before reaching the pump, consequently the pump was not doing the work required, and the compressed air which had been used to ventilate the workings had to be used to work the pumps. When the Manager took the compressed air

air from the workings and connected it to the pump, he endeavoured to make a provision for a supply of fresh air into the workings by connecting the back return airway with an 8-inch column of pipes into the shaft, and also connecting the pipes at the surface with the boiler stack. This arrangement, however, does not seem to act, and in my opinion is due partly to the contracted area of the pipes and partly to a portion of the surface connection being formed of canvas.

4. I saw the Manager (Mr. Hardy), and urged on him the necessity of at once putting a quarter brattice in the shaft, which, in my opinion, would result in proper ventilation for the limited number of men employed. He (Mr. Hardy) informed me that it was his intention to put a brattice in, and that the timber for that purpose had been ordered several days since, but had not yet come to hand, and further added that to-morrow (Wednesday) morning, he would send a man on purpose and get the timber across if possible.

5. In conclusion, I beg to state, that it is about a week since the compressed air was put on the pump, but for the most part of last week the men were employed on the surface and there was very little work done below. The present arrangement to return the air was completed during yesterday (Monday) morning. I further beg to state that it is my intention to visit Stockton Colliery again to-morrow (Wednesday) morning, and I should very much like if you could make it convenient to accompany me and see the workings for yourself.

I have, &c.,
JOHN DIXON,
Inspector of Collieries.

The Examiner of Coal-fields to Mr. Joseph Hardy, Colliery Manager, Stockton Colliery.

Sir, Coal-fields Office, Newcastle, 10 September, 1885.
Referring to the inspection made by Mr. Inspector Dixon, on the 8th instant, and that made by Mr. Dixon and myself on the 9th instant, I hereby give you notice that you have neglected to comply with sub-section 3, section 12, of the Coal Mines Regulation Act, 1876.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

Great Western Zigzag Colliery.

SCHEDULE.

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2. The same to the same forwarding Mr. Inspector Rowan's report, and other enclosures on above Colliery. 7 May, 1884.	48

No. 1.

The Examiner of Coal-fields to The Under Secretary for Mines.

Sir, Coal-fields Office, Newcastle, 8 April, 1884.

I beg to forward for the information of the Honorable the Secretary for Mines, correspondence, &c., and copy of a notice I have served on Mr. Wilson, of the Great Western Zigzag Colliery, Esk Bank, for non-compliance with sub-sections 2 and 4, section 12, of the Coal Mines Regulation Act, 1876.

2. Mr. Wilson I have found to be an excellent promiser but a very bad performer in remedying any matters complained of when he was Manager at the Vale of Clwydd Colliery, and I shall be obliged by your informing me what further action the Minister desires me to take in the matter.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

[Enclosures to No. 1.]

Mr. James Rowan, Inspector of Collieries to the Examiner of Coal-fields.

Sir, Esk Bank, 9 February, 1884.

I have the honor to report for your information that I have inspected the Zigzag Colliery, and regret to state I found the ventilation not in a satisfactory condition.

I tested the ventilation in several parts of the mine, but did not get a register with the anemometer; there were slight currents of air passing at intervals caused by the action of the ascending and descending cages, but no proper method of ensuring a constant current of air through the workings. I called the Manager's (Mr. Wilson's) attention to the upcast side of the shaft, where a small pumping engine and water tank are placed, not giving sufficient space for the ventilation to pass. I requested Mr. Wilson to remove the abovenamed tank and engine to the bottom of the shaft, or otherwise place them so as to allow a sufficient space for the ventilation to pass. This he promised to do.

I may state the above is a new colliery, commenced about two months ago, so the levels, and headings, &c., are not a great distance from the bottom of the shaft. Mr. Wilson desires a little time granted to enable him to make the necessary improvements in connection with the ventilation. He said in four weeks from date of inspection he would have the tank and engine removed from the upcast side of the shaft, and the ventilation made all right.

In conclusion, I beg to state, if the tank and engine referred to be removed, and a furnace or steam jet be placed at the bottom of the upcast, it will produce a plentiful supply of ventilation. About 30 men employed underground; distance from the bottom of the shaft to working faces, about 90 yards.

I received no complaints from workmen.

I have, &c.,
JAMES ROWAN,
Inspector of Collieries.

Seen, and Mr. Wilson written to, 14 February, 1884.—J.M., 14/2/84.

The Examiner of Coal-fields to Mr. W. Wilson.

Sir, Coal-fields Office, Newcastle, 14 February, 1884.

I beg to acknowledge the receipt of yours of the 12th instant, and forward you three copies of special rules.

2. In reply to paragraph 2, I have to request that you will have the matters complained of remedied in four weeks from the time of Mr. Inspector Rowan's inspection, in accordance with the promise you made him.

3. Have you removed the tank and engine to the bottom of the shaft or placed them so as to allow a sufficient space for ventilation to pass according to promise.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.
Mr.

Mr. W. Wilson to The Examiner of Coal-fields.

Sir, Zigzag Colliery, 12 February, 1884.
I expected you to send me according to promise the colliery rules; kindly forward as soon as possible, as I am now in fairly working order; got about thirty miners employed.

I have not got the air return quite up to the Act, as all the places are close to the shaft, but will have everything completed one month from date.

I have, &c.,
WM. WILSON.

Mr. James Rowan, Inspector of Collieries, to The Examiner of Coal-fields.

Sir, Esk Bank, 3 April, 1884.
According to instructions received I have inspected the Zigzag Colliery, and regret to state I found the ventilation not satisfactory.

The small engine and water tank referred to in my last report are removed a small distance back in the shaft where they were stationery, making a space about 9 square feet for the upcast ventilation to pass; also a small furnace has been built at the bottom of the shaft. I tested the air current in four different places in the main airway, but there was not a sufficient current going to work the anemometer; the only place I got a register was in the return airway immediately before the air current passed through the furnace, I got a register of 5,400 cubic feet of air per minute.

I showed Mr. Wilson (Manager), that nearly all the current was passing round the bottom of the shaft without going into the workings. On examining the working faces I found a large percentage of furnace smoke diffused through the workings caused by the midwall on the furnace side of the shaft being defective. I also examined the air stoppings, which consist of a mass of loose rubbish not sufficient to guide the ventilation into the working faces.

In conclusion, I beg to state, the midwall on the furnace side of the shaft is defective, and ought to be thoroughly repaired to prevent the furnace smoke from mixing with the downcast current of air, also that proper stoppings should be put in and the air current brought forward to the working faces. I am further of opinion that 9 square feet is not a sufficient space for the ventilation of the Colliery to pass through. Nevertheless if the midwall and stoppings are thoroughly repaired, this space may do in the meantime, seeing a new shaft has to be sunk to meet the requirements of section 12, sub-section 1, of the Coal Mines Regulation Act.

I have, &c.,
JAMES ROWAN,
Inspector of Collieries.

The Examiner of Coal-fields to Mr. W. Wilson, Great Western Zigzag Colliery, Esk Bank.

Sir, Coal-fields Office, Newcastle, 8 April, 1884.
In view of a recent report I have received from Mr. Inspector Rowan, on the Great Western Zigzag Colliery, and in accordance with the provisions contained in the 31st section of the Coal Mines Regulation Act, 1876, I hereby give you notice that you have failed to comply with sub-sections 2 and 4, section 12, of the said Act.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

[Minutes on above.]

THE Examiner should give the Manager notice that he will, on a certain day to be fixed in the notice, visit the Colliery, and if he find that the rules have not been complied with, he will at once proceed to enforce the penalty.—H.W., 16/4/84.

Submitted. Approved.—J. P. ABBOTT, 17/4/84. The Examiner of Coal-fields.—T.C.B. (for U.S.), B.C., 18/4/84.

No. 2.

The Examiner of Coal-fields to The Under Secretary for Mines.

Sir, Coal-fields Office, Newcastle, 7 May, 1884.
In compliance with the instructions of the Honorable the Secretary for Mines on my letter of 8th ultimo, conveyed to me under your blank cover of the 18th idem, I beg to enclose copy of a letter I wrote Mr. Wilson on 27th April last, and to state, that Mr. Inspector Rowan having to visit the Colliery *re* hanging up of special rules, I instructed him to make a further report on the state of the ventilation.

2. I beg to forward Mr. Inspector Rowan's report, from which it appears that the provisions of the Coal Mines Regulation Act, 1876, are now complied with at that Colliery.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

Seen.—H.W., 12/5/84.

[Enclosures to No. 2.]

The Examiner of Coal-fields to Mr. W. Wilson, Great Western Zigzag Colliery, Eskbank.

Sir, Coal-fields Office, Newcastle, 27 April, 1884.
I hereby give you notice, that on or about the 10th proximo, I shall visit the Zigzag Colliery, and if I find that the provisions of the Coal Mines Regulation Act, 1876, referred to in my letter of the 8th instant, are not then complied with at that Colliery, I shall at once proceed to enforce the penalty.

2. I have also instructed Mr. Inspector Rowan, who is now in the West, to make another early inspection, and report thereon.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

P.S.—Have received no reply from you to my letter of 9th April, *re* hanging up of special rules.

Mr. W. Wilson to The Examiner of Coal-fields.

Sir, Zigzag Colliery, 30 April, 1884.
Yours of 28th to hand, and contents noted. I have had copy of special rules hung up at the Colliery, and the miners' attention drawn thereto. The rules have been hung up over three weeks.

Hope to see you next month.

I have, &c.,
W. WILSON.

Mr. James Rowan, Inspector of Collieries, to The Examiner of Coal-fields.

Sir, Eskbank, 2 May, 1884.
For your information, I have the honor to inform you that I have this day inspected the Zigzag Colliery, *re* defective ventilation.

2. Since my last inspection, on April 2nd, an improvement has been made in the ventilation, viz., several air stoppings are put in, the mid-wall overhauled, and the air current brought forward to the working faces.

3. I tested the air-current and got a register with the anemometer of 2,310 cubic feet of air per minute in one current. About eighteen men employed underground.

4. I may also state, a copy of the special rules are hung up in a conspicuous place at the mine, and the attention of the miners called thereto.

5. In conclusion, I beg to state, the spirit of the Coal-mines Regulation Act in the abovenamed colliery has been complied with.

I have, &c.,

JAMES ROWAN,

Inspector of Collieries.

Telegram from Mr. James Rowan, Inspector of Collieries, to The Examiner of Coal-fields.

Wollongong, 7 May, 1884.

ZIGZAG Colliery. The provisions of the Coal-mines Regulation Act complied with.

JAMES ROWAN.

Katoomba Colliery.

SCHEDULE.

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Mr. G. Clark to The Secretary for Mines.

Sir,

Katoomba, 6 December, 1883.

Would you kindly inform the Chief Inspector of Mines to pay a visit to the mine of Katoomba, in regard to the air, as the place is in that sort of state that there is no air in it.

I have, &c.,

GEORGE CLARK.

P.S.—I hope you will not let it be known as to who was the informer.—G.C.

The Chief Inspector for the Western District. Mr. Inspector Rowan's report hereon forwarded for the Minister's information.—J.M., 11/1/84. The Under Secretary for Mines, B.C., 11/1/84.

From the Inspector's report it appears the proper quantity of air is sent into the mine, and that steps were being taken to perfect the distribution. The Examiner should see that the work is carried on with proper expedition.—H.W., 17/1/84.

Submitted. Approved.—J. P. ABBOTT, 18/1/84. The Examiner of Coal-fields, B.C., 19/1/84.—H.W.

The work has been completed, and the defective ventilation remedied. *Vide* Mr. Inspector Rowan's report herewith.—J.M., 4/2/84. The Under Secretary for Mines, B.C., 4/2/84. Seen.—H.W., 6/2/84.

No. 2.

Telegram from The Examiner of Coal-fields to Mr. J. Rowan, Inspector of Collieries.

HAVING got telegram at "Imperial," dated 7th instant, from Mines, saying that complaint has reached that office that supply of air in Katoomba Colliery is insufficient, come and see me "Hayles' Hotel," Blackheath, six train to-morrow morning. Bring anemometer and your last report, so that you may inspect it that day, and see me Saturday after inspection.

JOHN MACKENZIE.

No. 3.

Telegram from the Examiner of Coal-fields to The Under Secretary for Mines.

Blackheath, 14 December, 1883.

YOUR letters, dated 6th, *re* Usher's appointment, and telegram of 7th, *re* Katoomba ventilation, only received by me when happening to be at Mount Victoria yesterday. Please forward me copy of Katoomba complaint and Mr. Usher's address, so that I may write him and appoint some day next week.

J. MACKENZIE.

Forward information asked for.—H. W., 14/12/83.

No. 4.

Mr. J. Rowan, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Esk Bank, Lithgow, 15 December, 1883.

By your instruction, I have carefully inspected Katoomba Colliery. I tested the air-current. Got a register of 3,000 cubic feet of air per minute in one current. This 3,000 cubic feet of air was well maintained through the workings, with the exception of two bords in the main cross-cut. Ventilation not very good.

Mr. Hepburn, Manager, showed me an air-passage he was driving and would be completed in about three days from date of inspection. This connection will bring the air-current up to the two bords above referred to. I went round every working face and inquired of every miner if he had any complaint to make about the ventilation. I received no complaint. About thirty men are employed in this colliery.

I have, &c.,

JAMES ROWAN,
Inspector of Collieries.

No. 5.

Mr. J. Rowan, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Katoomba, 1 February, 1884.

By your instruction I have re-examined Katoomba Colliery.

I may state, the Manager has carried into effect the improvements promised on my last inspection, namely, the main cross-cut and heading are connected, and the air-current brought up to the two bords that were defective in ventilation.

I have, &c.,

JAMES ROWAN,
Inspector of Collieries.

Lambton Commonage Coal-mine.

SCHEDULE.

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No. 1.

Minute by The Secretary for Mines.

Re Deputation of Coal-miners at Newcastle.

26th February, 1883.

THE Examiner of Coal-fields should be asked to report whether the ventilation in the Lambton Commonage Coal-mine is sufficient, and whether men have to come out of the mine owing to the impure air.

J. P. ABBOTT.

The Examiner of Coal-fields, B.C., 28/2/83.—G.E.H. (for the U.S.) The Inspector of Collieries is requested to ascertain whether the ventilation in the Lambton Commonage Coal-mine is now sufficient, and say if men have had to come out of the mine owing to impure air. Also whether the defects complained of in his report to me of 24th January last, and which I wrote to the Manager about on the 20th ultimo, have been remedied.—J.M., 1/3/83. The Inspector of Collieries.—B.C., 1/3/83.

On the 21st ultimo fourteen miners came out of straight heading, Lambton Commonage Tunnel, on account of the air being impure in that heading. On the same day an air-shaft was started and is now down about 50 feet. Men have been employed at it day and night. The ground gone through has been hard—nearly the whole of it has had to be blasted. It is expected that the shaft will be through into the workings to-morrow (Saturday), when the defect will be remedied. The ventilation was much improved to-day, owing to a good breeze on the surface blowing directly into the mouth of main tunnel.—J.D., 2/3/83. The Examiner of Coal-fields, B.C., 2/3/83.

The Under-Secretary for Mines.—J.M., B.C., 3/3/83. Submitted.—H.W., 5/3/83. Approved.—J. P. ABBOTT, 10/3/83.

No. 2.

The Under Secretary for Mines to Messrs. N. Melville and A. A. P. Tighe, Ms.P.

Gentlemen,

Department of Mines, Sydney, 1 March, 1883.

Referring to the several matters brought forward by the deputation introduced by you to the Secretary for Mines on the 24th ultimo, I am directed to forward a copy of Mr. Abbott's decision in the matter of the ventilation of the Wallsend Colliery.

I am also directed to state that in Mr. Abbott's opinion the number of men allowed in a district is very clearly defined as being not more than seventy (70) men.

The Examiner has been asked to report upon the charge of the air being bad in the Lambton Commonage Tunnel.

I have, &c.,

HARRIE WOOD,
Under Secretary.

No. 3.

No. 3.

The Under Secretary for Mines to Messrs. N. Melville and A. A. P. Tighe, Ms.P.

Gentlemen,

Department of Mines, Sydney, 12 March, 1883.

Referring to my letter of the 1st instant, I have the honor to inform you that it appears, from the report forwarded by the Examiner of Coal-fields, that as regards the Lambton Commonage Tunnel some of the miners did, on the 21st ultimo, come out of the straight heading on account of the impure air in that heading.

That, on the same day, an air-shaft was commenced, which it was expected would reach the workings on Saturday last.

I have, &c.,

HARRIE WOOD,

Under Secretary.

Wallsend Colliery.

SCHEDULE.

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No. 1.

Mr. J. Curley, Miners' General Secretary, to The Secretary for Mines.

Sir,

Hamilton, 25 January, 1884.

I have the honor, by direction of the Executive Committee of the Miners' Association, and at the special request of the Wallsend miners, to again respectfully invite your attention to the defective state of the ventilation at Wallsend Colliery. This subject was brought under notice by deputation on November 27th of last year, and again by letter on December 1st. Upon the 11th December a report was promised on the subject, but up to the present date no further allusion has been made to the question, other than a reference to the Glebe Colliery.

The Honorable Minister's attention is again drawn to the enclosed Check Inspector's reports, numbered 1 and 2 respectively, and which are forwarded at the request of the miners concerned, who have expressed themselves with much surprise that no apparent action has been taken with a view to improve the ventilation of the mine. Trusting immediate attention will be given to the subject matter of complaint.

I have, &c.,

JAMES CURLEY,

Miners' General Secretary.

I wish to know what has been done.—J. P. ABBOTT, 28/1/84. Acknowledge and inform Mr. Curley.—J. P. ABBOTT, 31/1/84.

[Enclosure No. 1.]

Check Inspector's Reports.

Wallsend Colliery, 5 December, 1883,

Mr. T. Bamsfield's District.

Intake	Engine-bank	Cubic feet per min.
	.....	26,790
„	Magpie and Donnolly's	8,360
„	B Pit Travelling Road	12,880
„	Swamp Oak	9,500
	Total	57,530

NOTE.—The figures following represent the velocity of air in cubic feet per minute, unless specified differently.

B Pit, Chinaman's Flat, Nos. 111 to 117.—With six men extra, the air-current registered 540 in the same place where we got 585 last month, but we found a current, two cut-throughs from this, registering 1,984, making a total of 2,524 for 14 men, 1 boy, 1 horse, giving each 157½. Thermometer, 76°.

Chinaman's Shaft, from Nos. 117 to 130.—The air-current is very unsteady, and the anemometer would not work on account of improvements at present going on at the bottom of the shaft, and a door is required to convey the air to first numbers on this split, and this will account for about 5,000 cubic feet per man, regularly registered, not appearing among the intakes. There are 24 men, 1 boy, and 1 horse on this split. Thermometer, 71°.

Magpie

Magpie and Donnolly's Flat, from Nos. 130 to 176.—The air-current is 8,360 for 70 men, 5 boys, 4 horses at Magpie, and 22 men, 1 boy, 1 horse at Donnolly's, giving each $81\frac{1}{3}$; but the men at Donnolly's receive only a small quantity of this air, as there are too many men on this split. Thermometer, 71° to 75° .

Lambton back and part of front headings, Nos. 179 to 215.—With 4 men extra, the air-current is 10,560 for 80 men, 7 boys, 4 horses, giving each $116\frac{2}{3}$. Thermometer, 76° .

NOTE.—There are too many men on this split, and we suggest a door be placed at the bottom of first heading, as the air is very bad from Nos. 180 to 190, and we think a general system of stoppering is necessary.

Lambton front heading, Nos. 216 to 256.—The air-current at main intake, off bank, is 6,240, which is supplemented with 520 at 246 cut-through, making 6,760 for 78 men, 7 boys, 4 horses, giving each $76\frac{2}{3}$. Thermometer, 74° to 78° .

NOTE.—There are too many men on this split.

	Cubic feet.
Upcast Main Furnace	34,560
" Left-hand split	14,400
" Right-hand split	19,080
Total	68,040

Mr. W. Willis's District.

Wallsend Colliery, 6 December, 1883.

Little Tunnel, Nos. 1 to 35.—The air is very unsteady, and the air-meter would not work. There are complaints about the air supplying Nos. 1 to 16. Other parts of this station there was a fairly good current. Thermometer, 74° to 76° .

No. 1 Tunnel, Nos. 59 to 76.—The intake registers 11,340 for 38 men, 3 boys, 3 horses, giving each $257\frac{2}{3}$. Thermometer, 74° .

Brookstown Shaft, intake Nos. 77 to 90.—The air-current registered 12,250 for 30 men, 4 boys, 2 horses, giving each a fraction over 340. Thermometer, 76° .

Cemetery Shaft, Nos. 91 to 104.—The air-current is very unsteady, and after various tests we found 2,040 for 29 men, 3 boys, 2 horses, giving each 60 cubic feet per minute. Thermometer, 75° .

Old water pit, Nos. 105 to 110.—Anemometer would not work. Thermometer, 76° .

Furnace upcast, 33,210 cubic feet per minute. Travelling road intake, 5,220 for Nos. 35 to 59, making 48 men, 4 boys, 3 horses, and giving each nearly 95 cubic feet per minute. This is supplemented with two small shafts, which will no doubt give the requisite quantity. Thermometer, 70° to 74° .

The travelling road is in fair order, and a stopping has been put in the stenton opposite No. 104 bord end, and there are no complaints about the timber supply.

JOHN SUMMERS, }
JAMES LEVER, } Check Inspectors.

Mr. W. Willis's District.

Wallsend Colliery, 9 January, 1884.

Little Tunnel, Nos. 1 to 24.—The air-current would not work the anemometer in any part of this branch of the works, and in the faces of Nos. 17 to 22 inclusive, the air is very light. Thermometer, 72° to 76° .

No. 1 Tunnel, Nos. 42 to 62.—The intake registered 10,880 cubic feet per minute for 40 men, 3 boys, 3 horses, giving each $236\frac{1}{3}$. Thermometer, 72° to 76° . And we would urge upon the miners to in no case interfere with the stoppings, as there is one between Nos. 48 and 49 broken through, simply to save a little travelling, at the expense of health; and we suggest any miner seeing another commit such acts to immediately report offender to Manager.

Brookstown Shaft, supplying Nos. 63 to 71.—The air-current is 9,500 cubic feet per minute for 22 men, 3 boys, 3 horses, giving each $351\frac{1}{2}$ cubic feet per minute. Thermometer, 73° .

Sneddon's Dog and Rat intake for Cemetery Flat, Nos. 72 to 90 inclusive.—The air-current is 3,740 cubic feet per minute for 36 men, 2 boys, 2 horses, giving each $93\frac{1}{3}$. Thermometer, 75° .

A trapper is needed at the far indoor, as the men in Nos. 83 to 90 inclusive, complain, with reason, about the air.

Old water pit, Nos. 91 and 92.—There is no air travelling near the men. Thermometer, 76° .

Travelling road intake for Nos. 25 to 42.—The air-current registered 9,000 cubic feet per minute for 32 men, 3 boys, 3 horses, giving each over 236 cubic feet per minute. Thermometer, 75° .

Furnace up-cast, 36,900 cubic feet per minute. Total intakes, 33,120 cubic feet per minute.

Mr. T. Bonsfield's District.

11 January, 1884.

Engine-bank intake.—25,380 cubic feet per minute.

Lambton front heading, Nos. 195 to 238 included.—The air-current is 6,120 cubic feet per minute, and at No. 227 bore end this is supplemented with 1,160 cubic feet per minute for 88 men, 7 boys, 5 horses, giving each 72 cubic feet per minute. Thermometer, 73° to 77° .

NOTE.—We again refer to too many men being on this split.

Lambton back and part of front headings, Nos. 157 to 194.—The air-current registered 10,560 cubic feet per minute, for 74 men, 6 boys, 4 horses, giving each a fraction over 125 cubic feet per minute. Thermometer, 76° to 77° .

Swamp Oak intake, 9,250 cubic feet per minute.

Furnace Upcasts—	Cubic feet per minute.
Main Furnace	38,880
Left-hand Furnace	18,000
Right-hand "	19,800
Total	76,680

Magpie and Donnolly's, Nos. 114 to 150 at Magpie, and Nos. 151 to 156 at Donnolly's.—The intake was 13,680 cubic feet per minute, giving each $138\frac{1}{3}$ cubic feet per minute for 84 men, 9 boys, 6 horses. Thermometer, 74° to 75° .

NOTE.—There are still too many men on this split.

Chinaman's Flat, Nos. 99 to 112.—The air registered 3,780 cubic feet per minute for 28 men, 2 boys, 1 horse, giving each 123 cubic feet per minute. Thermometer, 72° to 74° .

Chinaman's B Pit Flat, Nos. 95, 96, 97, and 98.—The air meter would not work, and after many attempts to find air supply, we could not get anemometer to work, and the air at present is very bad, and requires immediate improvement. Thermometer, 77° .

B Pit, travelling road intake.—7,840 cubic feet per minute.

JOHN SUMMERS, }
JAMES LEVER, } Check Inspectors.

No. 2.

The Under Secretary for Mines to Mr. J. Curley.

Sir,

Department of Mines, Sydney, 5 February, 1884.

I have the honor, by direction of the Secretary for Mines, to acknowledge receipt of your letter of the 25th ultimo, in which attention is again invited to the alleged defects in the ventilation of the Wallsend Colliery, and in reply thereto to invite your attention to my letter of the 28th ultimo, covering a report by Mr. Inspector Dixon on the matter.

I have, &c,
HARRIE WOOD,
Under Secretary.

No. 3.

See No. 1.

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No. 3.

Telegram from The Examiner of Coal-fields to The Under Secretary for Mines.

Newcastle, 11 February, 1884.

PLEASE forward me to-night all the correspondence with respect to Miners' Secretary complaint, *re* Wallsend ventilation, with Inspector Dixon's report thereon.JOHN MACKENZIE,
Examiner of Coal-fields.

The Examiner of Coal-fields.—G.E.H. (for the U.S.), B.C., 11/2/84. Correspondence received to-day, and returned herewith.—J.M., 11/2/84. The Under Secretary for Mines, B.C., 12/2/84.

No. 4.

Mr. J. Curley, Miners' General Secretary, to The Secretary for Mines.

Sir,

Hamilton, 13 February, 1884.

I have the honor to acknowledge receipt of letter, dated 5th February, referring to ventilation See No. 2. of Wallsend Colliery, and drawing attention to a report from Mr. Inspector Dixon on the subject. The Executive Committee cannot regard the report of the Inspector as being anything like satisfactory. It is alleged that the ventilation was good in November, with the exception of a few matters of detail. The Inspector has not specified what he refers to as details; and if too many men and deficient quantity of air in various splits are to be considered as such, the Committee are of opinion the official interference of the Mines Department is required in a different manner to the present report.

The Inspector places great stress upon the large out-put, length of airways, falls, &c., but these are surely no reason why the management are justified in being behind the requirements of the Act. They are only so many proofs why uniformity should be maintained. If the Wallsend Colliery out-put is enormous, the Company have ample means at command. There are also natural facilities in connection with the mine that make it comparatively easy to remedy defects caused by falls. The shaft specially mentioned by the Inspector in his report would probably be sunk in three days by two men. The Committee drew attention to the Check Inspectors' report, and what it revealed concerning the ventilation of Wallsend Colliery. Subsequent to this report by the Inspector, other reports have been referred to by the Committee, all supporting, in the most substantial manner, the allegations made by them in the presence of the Minister. The Committee are not open to the charge of making "sweeping assertions" without inquiry, and as no reference is made by the Inspector in his report to the Wallsend Check Inspectors' report it must be evident it stands without any attempt having been made on his part to impugn it. The Check Inspector's reports do not deal with "occasional derangements of the ventilation," but the permanent standing violation of the Act. The Committee desire to state that it is their wish to see the suggestion of the Wallsend Manager, "with which Mr. Inspector Dixon quite agrees," carried into effect as early as possible, regarding a joint inspection of the Wallsend Colliery, to consist of the Examiner of Coal-fields, Inspector, Manager of Wallsend Colliery, and Check Inspectors of Wallsend, and of which they will expect notification.

It must, however, appear to the Minister that arranged inspections of this character are not likely to give satisfaction, and cannot take the place of ordinary inspections.

Wallsend miners, quite recently, have come out of the mine because there was not sufficient air for them to work in.

Reference is made to the Newcastle Company's Colliery, and the ventilation is described as being "first-class." A partial report of this mine was made by the Check Inspector on 30th January, 1884. This report has been forwarded to the Committee for consideration, and they observe that in No. 7 heading the anemometer would not register, although tried in three or four different places.

In a part of No. 6 district the air-meter would not work, owing to insufficiency of air. This district the Inspector speaks of as being difficult to ventilate, and if difficult to ventilate, and is not properly ventilated, yet it must also be very difficult for miners to follow their employment, and the sooner some permanent remedy is effected the better.

Mr. Inspector Dixon alludes to the past and present history of the mines in this district, and states "their present state will bear favourable comparison with any part of their past history, both regarding the quantity of air circulating and its distribution in the various parts of the workings." The Committee can only state that judging of the present state from reports which have been brought under their notice, they cannot do other than express their disappointment and dissatisfaction that the provisions of the Coal-mines Regulation Act, 1876, are not more faithfully enforced.

Trusting the Honorable Minister will deem this subject worthy of consideration,—

I have, &c.,

JAMES CURLEY,
Miners' General Secretary.

The Examiner of Coal-fields.—H.W., B.C., 3/3/84. Mr. Inspector Dixon for further report.—J.M., 8/3/84.

No. 5.

Mr. J. Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Glebeland, 12 March, 1884.

I have the honor to acknowledge receipt of papers *re* the ventilation in the Wallsend and Newcastle Companies' Collieries.

In reply thereto, I beg to state that the matters complained of in the Wallsend Check Inspector's reports of November 5th and 6th, 1883, on Willis' side of the workings have since been remedied. In looking over the same report, on Bonsfield's side, I notice they (the Check Inspectors) give a result of 6,000 cubic feet of air per minute, for a total of 90 men, boys, and horses. On the 28th November, same month, I got a result of 9,240 cubic feet of air per minute for a total of 89 men, &c.

In

In the Check Inspection for 30th January, the result for the same split is given at 7,020 cubic feet per minute for a total of 102 men, &c., and in the second split in Lambton headings, 8,640 cubic feet per minute for 115 men, &c.

On the 1st February, I got a result of 9,600 cubic feet of air per minute in the first split for a total of 100 men, &c., or about 96 cubic feet of air per minute for each man, boy, and horse. On the same day, in the second split, Lambton headings, the result was about 11,550 cubic feet of air per minute for a total of about 115 men, &c.

On the 18th February, I again inspected the abovementioned splits, and in the first split the result was about 10,800 cubic feet of air per minute for a total of 77 men, &c., and in the second split about 10,850 cubic feet of air per minute for about 110 men, &c., being over 98 cubic feet per minute for each man, boy, and horse.

On the 4th December last, I wrote to Mr. Neilson about the extra men in the Lambton heading splits, and urging him to have another split made at once. This work was completed and another split made on the 20th of last month, and, also at my request, preparations are being made to form another split in the Magpie district, which, at the present time, has more men in one split than the Act allows; at the same time I beg to state that the last two results got by me in the Magpie and Donnolly's split showed the quantity of air to be more than the Act requires for every man, boy, and horse.

Regarding the statement made by Mr. Curley that "Wallsend miners quite recently have come out of the mine because there was not sufficient air for them to work in," I know nothing about this matter, as no complaint has been made to me officially or otherwise concerning it.

2. *Newcastle Company's Colliery*.—This colliery has again been referred to, and I again repeat my statement that according to the showing of the Check Inspectors in December last, the ventilation was first-class. I also made an inspection of the same colliery on the 22nd January last, and found the ventilation according to the Act in every working heading in the pit. I am therefore at a loss to account for the statements given by the Check Inspectors to Mr. Curley, as I believe the said inspection was made only about one week after mine.

3. In conclusion, I beg to state that in my opinion this method of doing business is not the correct one. What I mean is simply this, if the miners at any of the collieries have complaints to make concerning anything with which I have to do, I think it would be only common justice to me if they would communicate with me at once, either through the Lodge Secretary, General Secretary, or Executive Committee, which is composed of the three district officers. Then, if I failed to attend to the matter, the Honorable the Minister for Mines could be appealed to. I feel strongly on this point, and fail to see why I should not have the same fair play as an English Inspector, who, in every instance, is first appealed to in any matter concerning the health and safety of the miners, and, from my knowledge of the miners in this district, I believe they would endorse my views on this subject by a large majority.

I have, &c.,

JOHN DIXON,

Inspector of Collieries.

As I only lately returned from Wollongong to attend to matters requiring immediate attention including my annual report, I shall not be able to visit the Wallsend Mine at present. I therefore send the Inspectors' further report in reply to Mr. Curley's letter of the 13th ultimo, and I cannot help observing that if these complaints were made in the first instance to the Inspector, as suggested by Mr. Dixon, a great deal of time and trouble would be saved to all parties.—J.M., 13/3/84. The Under Secretary for Mines, B.C., 13/3/84.

The attention of the Miners' General Secretary may be invited to the suggestion that all complaints on the part of the miners be made in the first instance to the Inspector, and if not attended to by him they should then be forwarded to the Minister.—H.W., 17/3/84. Submitted. Approved.—J. P. ABBOTT, 18/3/84.

No. 6.

The Under Secretary for Mines to Mr. J. Curley, Miners' General Secretary.

Sir,

Department of Mines, Sydney, 20 March, 1884.

With reference to complaints as to alleged failure on the part of colliery owners in the Newcastle district to comply with any of the requirements of the Coal-mines Regulation Act, 1876, I have the honor to inform you that the Secretary for Mines is of opinion, that in all such cases any complaints on the part of miners should, in the first instance, be made to the Inspector of Collieries, and that if such complaints be not attended to by that officer they should then be forwarded direct to this office.

I have, &c.,

HARRIE WOOD,

Under Secretary.

No. 7.

The Examiner of Coal-fields to The Under-Secretary for Mines.

Sir,

Coal-fields Office, Newcastle, 18 April, 1884.

I beg to forward, for the information of the Honorable the Secretary for Mines, a recent report of Mr. Inspector Dixon's on the Newcastle Wallsend Colliery, and copy of a registered notice I have served on Mr. J. Y. Neilson, the Colliery Manager, for non-compliance with sub-sections 3 and 4, section 12, of the Coal Mines Regulation Act, 1876, and shall be obliged by your informing me what further action the Minister desires me to take in matter.

I have, &c.,

JOHN MACKENZIE,

Examiner of Coal-fields.

At the end of fourteen days from date of his letter to the Manager, the Examiner should make another inspection, and if the defects have not been remedied he should take the necessary proceedings.—H.W., 22/4/84. Approved.—J. P. ABBOTT, 24/4/84.

[Enclosures

[Enclosures to No. 7.]

Mr. J. Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Sir,

Glebeland, 15 April, 1884.

I have the honor to report inspection of the Wallsend Colliery, as follows:—

1. *Willis's District, 9th instant.*

In the little tunnel I found the air good; there are about 32 men employed in this place. Front heading, from 19 to 24, there are 10 men, supplied with a current of air of about 3,500 cubic feet per minute from a small shaft.

From 24 bord to 32 the current of air was about 5,600 cubic feet per minute for 26 men, 2 boys, and 2 horses—total, 30. In the Brookstown shaft split there are about 28 men, 2 boys, and 2 horses—total, 32. For this number I got a result of about 3,150 cubic feet of air per minute, but at the same time found the current to be fluctuating, as there were times when the instrument would not work. There is, as a rule, a good result from this shaft, but at the time of my inspection the current of air seemed to be baffled. Please note.

Cemetery Split.

In this split there are about 62 men. At the far end of the split a new shaft has been sunk, which is known as the Foundry Shaft. At the time of my inspection the current of air from this shaft was almost nil. Hence the major portion of the split was being ventilated from Sneddon's tunnel, at the rate of about 7,800 cubic feet per minute. It will be seen by the above that the current entering this split is more than the minimum quantity for the 62 men, yet I am strongly of opinion that it has too much to do in this split after serving upwards of 20 men, &c., in Sneddon's workings, and certainly think it would be better to shut the air off from Sneddon's and get a current from the Foundry Shaft for the whole of the Cemetery Split. Please note.

Bonsfield's District, April 10th.—Lambton Front Heading, First Split.

In this split there are about 72 men, 4 boys, and 4 horses—total, 80, supplied with a current of air of about 10,000 cubic feet per minute.

Lambton Headings, Second Split.

In this split there are about 34 men, 2 boys, and 2 horses—total, 38; supplied with a current of about 4,000 cubic feet of air per minute. This air was not well conducted into the top heading, as a screen on one of the headings had been knocked down by a train of skips on the previous evening, and had only been put up temporarily, but the overman promised to have it put right at once.

Third Split, Lambton Headings.

The current of air in this split was about 10,710 cubic feet per minute for about 80 men, 4 boys, and 4 horses—total, 88. It will be seen that the current of air in this split is above the minimum quantity required by the Act, yet I would especially draw your attention to the fact that, although the men on this split were reduced to about 66 after the second or middle split was formed, yet I find that the manager has put more men in and brought the number up to 80. I certainly fail to understand this sort of work, in the face of all the vexation we have lately had in connection with the overcrowding of the splits in the Wallsend Colliery. Please note.

Maggie Split.

In this split there are about 42 men, but the current of air was only about 3,000 cubic feet per minute. Please note.

Donnolly's Split.

In this split there are about 70 men, supplied with a current of air of about 6,300 cubic feet per minute. Please note.

No. 1 Split, Chinaman's District.

In this district there are about 32 men, supplied with a current of air of about 16,800 cubic feet per minute. The three splits, as given above, are all ventilated from what is known as the Chinaman's Shaft, and, as a rule, there is a plentiful supply for every man, &c., employed in that part of the mine.

Yet it will be seen that there is not an equal distribution of the air got from said shaft, as I found both Maggie and Donnolly's short, while a current of about 16,800 cubic feet per minute was going into Chinaman's, for 32 men. The overman was with me when I got the above results, and I requested him (Mr. Maddison) to see Mr. Neilson that evening, if possible, and draw his attention to the state of things as I found them.

In the second split, Chinaman's or Cockroach, there are 8 men, 1 boy, and 1 horse. The current of air in this split is about 1,760 cubic feet per minute, which, in my opinion, is not an adequate amount to keep the working places sweet, as the current has a great distance to travel before it reaches the working places, and for part of the distance travels over water. Please note

The travelling roads are in good order, and a good supply of timber at the various stations ready for use.

In concluding this report, I desire to state that I did not see Mr. Neilson concerning the above matters, neither have I written to him, but leave the matter entirely with you to act on this report as you may think best. At the same time, I am of opinion that a letter from you to the Manager would cause matters to be rectified at once, for most of the things complained of by me in the above report can be remedied in a few days.

I have, &c.,

JOHN DIXON,
Inspector of Collieries.

The Examiner of Coal-fields to Mr. J. Y. Neilson.

Sir,

Coal-fields Office, Newcastle, 18 April, 1884.

In view of a recent report I have received from Mr. Inspector Dixon on the Newcastle Wallsend Colliery, and in accordance with the provisions contained in the 31st section of the Coal-mines Regulation Act, 1876, I hereby give you notice that you have failed to comply with sub-sections 3 and 4, section 12 of the said Act, in the third split, Lambton headings, and in Maggie and Donnolly's splits.

Mr. Dixon's report on them being as follows:—

"*Third split, Lambton headings.*—The current of air in this split was about 10,710 cubic feet per minute for about 80 men, 4 boys, and 4 horses—total, 88. It will be seen that the current of air in this split is above the minimum quantity required by the Act; yet I would especially draw your attention to the fact that, although the men on this split were reduced to about 66 after the second or middle split was formed, yet I find that the Manager has put more men in, and brought the number up to 80. I certainly fail to understand this sort of work, in the face of all the vexation we have lately had in connection with the overcrowding of the splits in the Wallsend Colliery.

Maggie split.—In this split there are about 42 men, but the current of air was only about 3,000 cubic feet per minute.
Donnolly's split.—In this split there are about 70 men, and supplied with a current of air of about 6,300 cubic feet per minute."

2. Mr. Dixon also informs me that he got unsatisfactory results in the ventilation in the Brookstown Shaft split, in which, as a rule, he had previously got good results.

3. That in the Cemetery split there are about 62 men. At the far end of the split a new shaft has been sunk, which is known as the Foundry Shaft, and that, at the time of his inspection, the current of air from the shaft was nil: hence the major portion of the split was being ventilated from Sneddon's tunnel, at the rate of about 7,800 cubic feet per minute. That it will be seen by the above that the current entering the split is more than the minimum quantity for the 62 men, but he was strongly of opinion that it has too much to do in this split, after serving upwards of 20 men, &c., in Sneddon's workings, and thinks it would be better to shut the air off from Sneddon's, and get a current from the Foundry shaft for the whole of the Cemetery split.

4. That on the second split (Chinaman's, or Cockroach) there are 8 men, 1 boy, and 1 horse. The current of air in the split being about 1,760 cubic feet per minute, which, in his opinion, is not an adequate amount to keep the workings sweet, as the current has a great distance to travel before it reaches the working places, and for part of the distance travels over water.

I have, &c.,

JOHN MACKENZIE,
Examiner of Coal-fields.

No. 8.

No. 8.

The Examiner of Coal-fields to The Under Secretary for Mines.

Sec No. 7.

Sir, Coal-fields Office, Newcastle, 22 April, 1884.
I beg to forward, for the information of the Honorable the Secretary for Mines, a letter and telegram I have this day received from J. Y. Neilson, Esq., with respect to the notice I served upon him on the 18th instant, referred to in my letter to you of the 18th idem, with respect to his non-compliance with sub-sections 3 and 4, section 12, of the Coal-mines Regulation Act, 1876, at the Newcastle-Wallsend Colliery, and asking to be informed what further action the Minister desired me to take in the matter.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

[Enclosures to No. 8.]

Mr. J. Y. Neilson to The Examiner of Coal-fields.

Sir, Wallsend, 21 April, 1884.

Your favour of the 18th instant to hand, and contents duly noted.

In reference to your several queries, I shall reply at length in a few days, as your letter is so very strong, and your interpretation of the Act requires some consideration; and as I have a strong opinion of the justice of my position, and as the matter is likely to receive the serious consideration of other parties concerned, I will give you a detailed reply in a few days.

If you refer to the last Check Inspectors' Report on the mine you will find all things satisfactory, even to the miners.

I have, &c.,
J. Y. NEILSON.

Telegram from Mr. J. Y. Neilson to The Examiner of Coal-fields.

Wallsend, 22 April, 1884.

This morning I have made a thorough examination of Lambton headings, and find that my orders have been entirely disregarded in respect to No. 3 split. I promise you the matter will be all put right in seven days. I leave for Sydney to-night, and will be at the "Great Northern Hotel" at 10 p.m., and would like to see you.

J. Y. NEILSON.

Telegram from The Examiner of Coal-fields to Mr. J. Y. Neilson.

Newcastle, 22 April, 1884.

Your telegram received respecting No. 3 split, and promise to have it put right in seven days. Regret that I am unable to comply with your desire to see you at "Great Northern" 10 to-night.

J. MACKENZIE,
Examiner of Coal-fields.

No. 9.

The Under Secretary for Mines to The Examiner of Coal-fields.

Sir, Department of Mines, Sydney, 26 April, 1884.

Referring to your letter of the 18th instant, forwarding Mr. Inspector Dixon's report on the Wallsend Colliery, and copy of your letter to Mr. Neilson, the Manager of that Colliery, pointing out the defects in the 3rd split, Lambton headings, and in Magpie and Donnolly's splits, and I am directed to request you to be good enough, at the expiration of fourteen (14) days from the date of your letter to Mr. Neilson, to cause another inspection of the Colliery to be made, and if the defects referred to have not been remedied, you should take the necessary proceedings.

I have, &c.,
HARRIE WOOD,
Under Secretary.

No. 10.

The Examiner of Coal-fields to The Under Secretary for Mines.

Sec No. 9.

Sir, Coal-fields Office, Newcastle, 8 May, 1884.

Referring to your letter of the 26th ultimo, informing me that you were directed to request me, at the expiration of fourteen days from the date of my letter of the 18th ultimo, to cause another inspection to be made of the Newcastle Wallsend Collieries, I have now the honor to forward, for the Minister's information, a further report from Mr. Inspector Dixon, dated the 5th instant, from which it will be seen that Mr. Neilson has remedied the defects complained of, and that the provisions of the Coal-mines Regulation Act are now complied with.

I have, &c.,
JOHN MACKENZIE,
Examiner of Coal-fields.

[Enclosure to No. 10.]

Mr. J. Dixon, Inspector of Collieries, to The Examiner of Coal-fields.

Sir, Glebeland, 5 May, 1884.

According to instructions from you, I proceeded to Wallsend Colliery on Saturday last, 3rd instant, and made another inspection of the places complained of by me in my report dated 15th April last, and am pleased to be able to report that, for the most part, the matters complained of have been remedied, as the following will show:—

Willis's District.

1. In the Brookstown shaft split a steady current of air, of above the minimum quantity, is now supplied for the 32 men, &c., from a new shaft lately sunk to ventilate this split.

Cemetery Split.

2. The top end of this split is now ventilated from the Brookstown Shaft instead of from Sneddon's Tunnel. There are now only about 24 men on this split, part of which is ventilated from Sneddon's and part from the Foundry Shaft. I may here state that preparations are being made to shut the whole of Sneddon's air off and ventilate the whole of this split from the Foundry Shaft, as suggested by me, and I expect the arrangements to be completed this week. However, as it is, the matter complained of by me has been remedied, inasmuch as the air from Sneddon's tunnel is only supplying about 24 men in Cemetery split, instead of about 62, as before.

Bonsfield's

Bonsfield's District.

3. Lambton heading, 3rd split.—The number of men on this split have now been reduced to 68 instead of 80 men as reported by me on 15th April last.

4. Magpie back heading.—In this split the current of air was about 6,000 cubic feet per minute for about 42 men, being about 3,000 cubic feet more than I got on my previous inspection.

5. Magpie front heading and Donnolly's cross-cut.—As there has been some alteration made at the entrance to this split since my previous inspection, I could not get the whole of the intake air in one volume. But, judging from the result which I got on the front heading (about 5,000 cubic feet of air per minute), and from the amount of sealing through the framework of one of the bearing-up doors, I am of opinion that the total quantity of air going into this split was over 7,000 cubic feet per minute, for about 68 men. The air sealing through the door would go on to 12 men. I expect that the framework of this door will be plastered to-day, and the whole of the current sent down the front heading, then away through the whole of the split.

Cockroach District.

6. I found the current of air in this split to be about 1,920 cubic feet per minute for a total of 10 men, &c., being about 160 cubic feet per minute more than the quantity given in my previous report. Regarding this place, Mr. Neilson has decided to take the air from Chinaman's split to ventilate it, and shut the air off from the Ballarat Shaft which air has hitherto been supplying the Cockroach split.

This decision is heartily approved of by the men working in the above split, and Mr. Neilson gave me his promise that this should be done in a week, or less, if possible.

I have, &c.,

JOHN DIXON,
Inspector of Collieries.

The Under Secretary for Mines to The Examiner of Coal-fields.

Sir,

Department of Mines, Sydney, 26 April, 1884.

Referring to your letter of the 18th instant, forwarding Mr. Inspector Dixon's report on the Wallsend Colliery, and copy of your letter to Mr. Neilson, the Manager of that Colliery, pointing out the defects in the third split, Lambton headings, and in Magpie and Donnolly's splits, I am directed to request you to be good enough, at the expiration of fourteen days from the date of your letter to Mr. Neilson, to cause another inspection of the Colliery to be made, and if the defects referred to have not been remedied, you should take the necessary proceedings.

I have, &c.,

HARRIE WOOD,
Under Secretary.

Mr. Inspector Dixon to make another inspection on May 3rd, and report whether the defects complained of have been remedied.—J.M., 28/4/84. Seen.—J.D., 29/4/84.

Will make another inspection on May 3rd, and report whether the defects complained of have been remedied.—J.D., 29/4/84. The Examiner of Coal-fields, 29/4/84.

No. 11.

The Under Secretary for Mines to Mr. J. Curley, Miners' General Secretary.

Sir,

Department of Mines, Sydney, 15 May, 1884.

With reference to your letter of the 13th February last, respecting the defective ventilation in the Newcastle-Wallsend Colliery, I have the honor to inform you that the Examiner of Coal-fields has reported that the defects complained of have been remedied, and the provisions of the Coal Mines Regulation Act are now being complied with.

I have, &c.,

HARRIE WOOD,
Under Secretary.

No. 12.

The Under Secretary for Mines to The Examiner of Coal-fields.

Sir,

Department of Mines, Sydney, 5 August, 1884.

Referring to your letter of the 8th May last, covering a report from Mr. Dixon, an Inspector of Collieries, to the effect that the defects complained of in the case of the Newcastle-Wallsend Colliery have been remedied, I have the honor to inform you that the Secretary for Mines has approved of that report.

I have, &c.,

HARRIE WOOD,
Under Secretary.

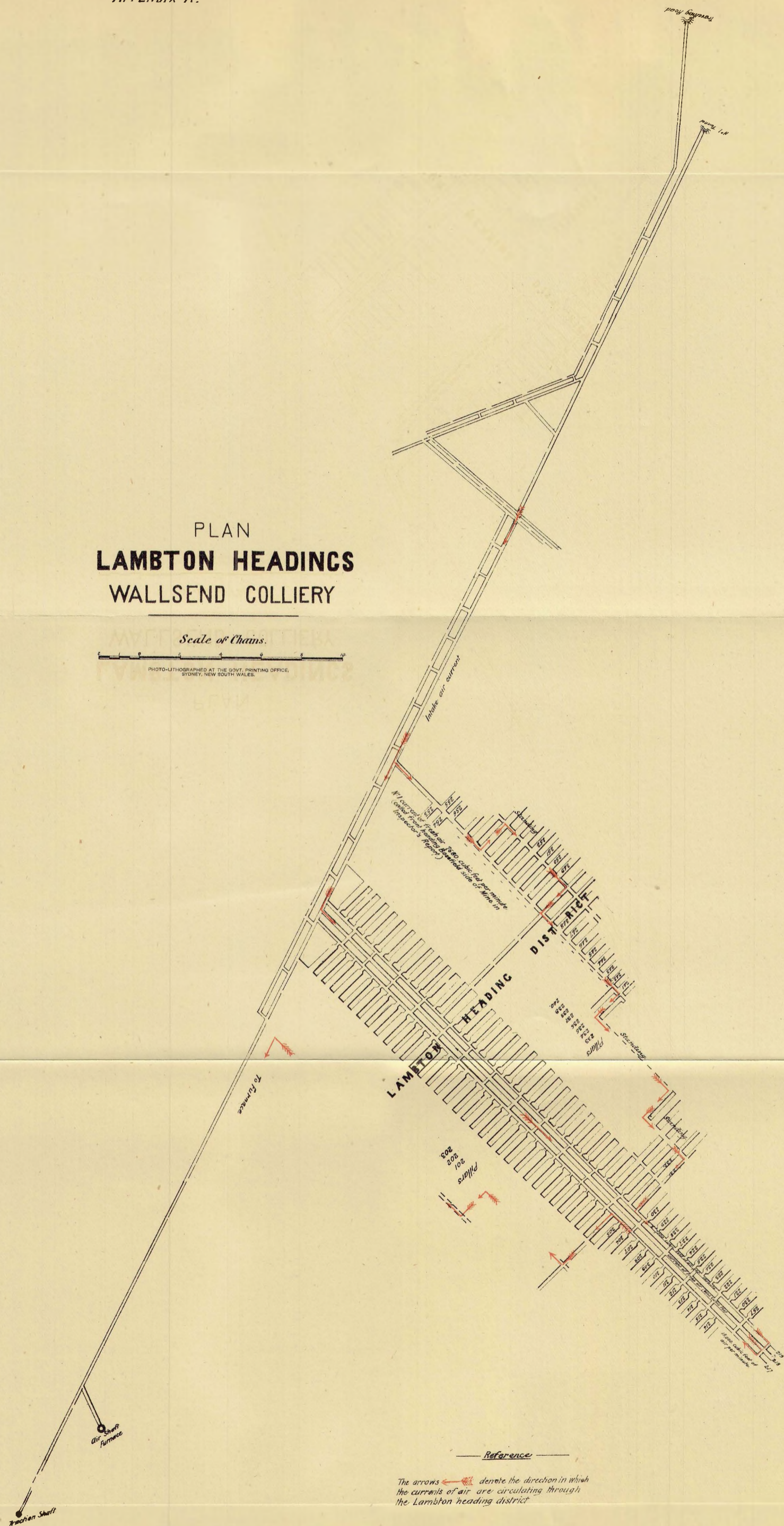
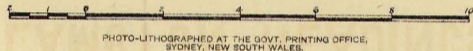
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
Sydney: Charles Potter, Government Printer.—1887.

PLAN LAMBTON HEADINGS WALLSEND COLLIERY

Scale of Chains.



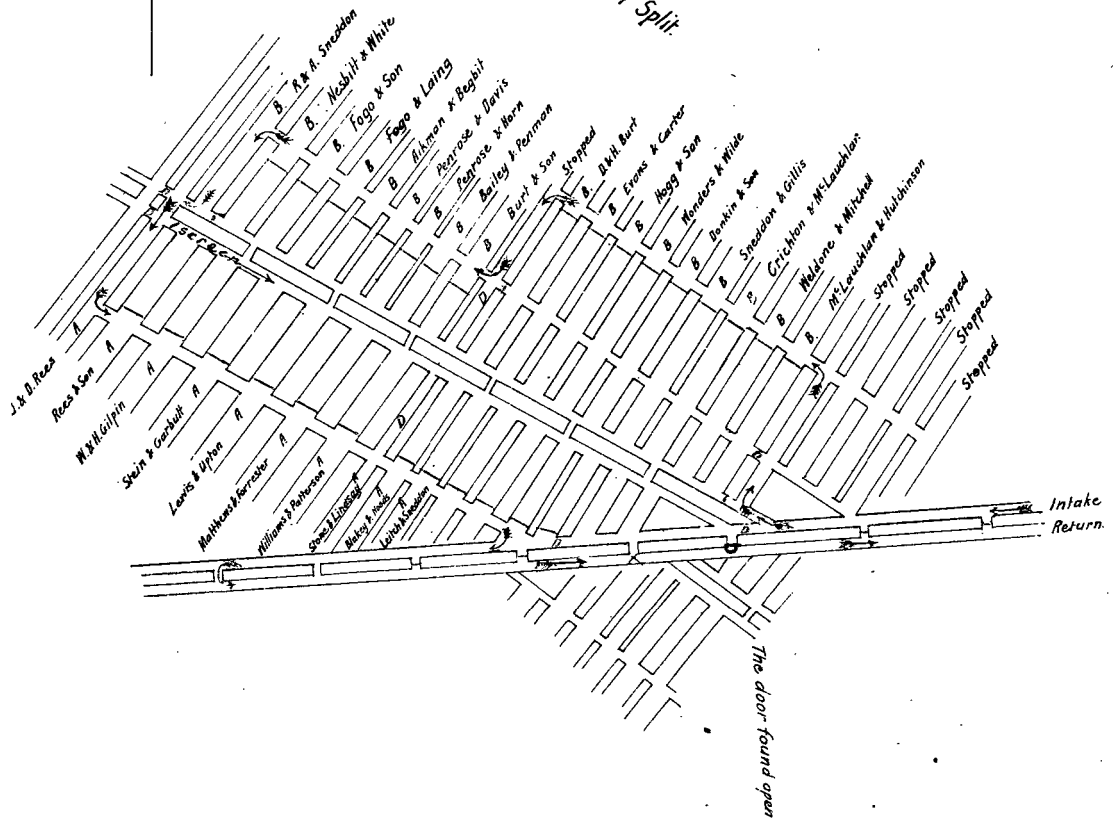
Reference

The arrows  denote the direction in which the currents of air are circulating through the Lambton heading district

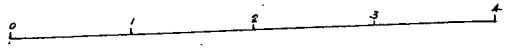
APPENDIX B.

Tracing referred to in Examiner
of Coal Fields' report dated 3rd
February 1886.

Northern side of Split.



Scale of Chains.



1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY,
NEW SOUTH WALES.



BULLI COLLIERY ACCIDENT.

REPORT

OF

ROYAL COMMISSION;

TOGETHER WITH THE

MINUTES OF EVIDENCE

AND

APPENDICES.

ORDERED BY THE LEGISLATIVE ASSEMBLY TO BE PRINTED,
12 July, 1887.

SYDNEY: CHARLES POTTER, GOVERNMENT PRINTER.

1887.

DOCUMENTS REFERRED TO.

 SCHEDULE.

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BULLI COLLIERY ACCIDENT.

REPORT OF ROYAL COMMISSION.

To His Excellency the Right Honorable CHARLES ROBERT BARON CARRINGTON,
 Knight Grand Cross of the Most Distinguished Order of Saint Michael and
 Saint George, Governor and Commander-in-Chief of the Colony of New South
 Wales and its Dependencies.

MAY IT PLEASE YOUR EXCELLENCY,—

The Commission appointed to make a diligent and full inquiry into the cause of the explosion that recently occurred at Bulli Colliery, in the district of Illawarra, in this Colony, whereby many valuable lives were sacrificed, and also to investigate all the surrounding circumstances, in order to ascertain whether blame attaches to any person or persons, and if so, to report the person or persons to whom in our opinion the blame attaches; and, further, to make any recommendation affecting the general management, especially the ventilation of collieries, and to offer any suggestions which we may deem advisable for the amendment of the law relating to the working of coal-mines, especially with the view of preventing the accumulation of dangerous gases,—have concluded their inquiry into the cause of the said explosion, and, with the aid of voluminous evidence transcribed from the shorthand-writer's notes, have unanimously agreed upon the following description of the mine, the extent and nature of the explosion, particulars relative to the ventilation and conduct of the operations, the findings or conclusions, and the recommendations that they propose in order to ensure safety and proper discipline, also a *résumé* of the work accomplished and the evidence taken during the sittings. These, together with the documents and plans detailed on the margin hereof, the Commission have the honor to present to your Excellency.

A general meeting, at which all the then members of the Commission attended, was held in Sydney on the 5th day of May, when, considering the urgency of the inquiry, it was agreed to proceed to the scene of the explosion, and at once commence their investigations. Accordingly, they left for Wollongong by the evening steamer.

Early the following morning (the 6th) the Commission considered the question of the most suitable locale for holding their inquiries, when it was unanimously considered expedient to examine witnesses in Wollongong. Accordingly, having left one of their number to make suitable arrangements towards this end, the remaining members of the Commission at once proceeded to the scene of the explosion, and having by pre-arrangement met Mr. Inspector Rowan, they at once proceeded into the mine, and conducted by Messrs. Rowan, Ross, and White, narrowly inspected the mine and the damage to plant, with the object of arriving at an independent opinion as to the cause of the explosion, and the remedies to be applied.

For the purpose of ascertaining beyond all doubt the exact condition of the mine, and the position of the bodies as seen by the first search parties, the Commission considered it prudent to summon some of the volunteers who could best inform them on these subjects. Accompanied by Messrs. Jones, MacCabe, Evans, M'Kenna, and N. Hobbs, the Commission revisited the mine on the 7th, and again on the 9th, and minutely inspected the whole of the mine affected by the explosion, and were thereby enabled to form precise and independent opinions as to the cause of this unprecedented and deplorable accident.

Convenient premises having been secured, and most satisfactory arrangements made for taking evidence, the taking of evidence was commenced in public on the 10th, and was continued till the evening of Tuesday, the 17th May, when the Commission, having exhausted the evidence obtainable in the district, adjourned *sine die*.

Having by public advertisement inserted in the local papers, and by posters distributed throughout the district, invited the attendance of anyone desirous of giving evidence touching the inquiry, the Commission again assembled at Sydney, on the 6th day of June, and proceeded to Wollongong for the purpose of examining those who were prevented from giving evidence during the first sittings, and who desired to do so. In response to their invitation only five witnesses presented themselves.

On the 8th June the Commission, desirous of ascertaining by personal inspection whether any additional evidence was obtainable in support of an hypothesis put forward by the Examiner of Coal-fields as to the primary cause of the disaster, again visited the colliery, and having narrowly examined the main tunnel, and satisfied themselves upon this point, proceeded to Sydney and adjourned.

After the arduous and tedious work of transcribing the voluminous notes of the shorthand-writers had been completed, and having been requested to examine a man who emerged from or had left the mine a short time before the occurrence of the explosion, the Commission again assembled at Sydney, on Monday, the 27th day of June, and having examined Edward Kerrison, at once proceeded to consider the multifarious points referred to in the course of the inquiry, and during the inspection of the mine, and after serious and mature consideration of every point or circumstance of importance, they unanimously agreed upon the "findings" or conclusions given in the sequel.

In the work of inspecting the colliery, collecting and preparing information, taking evidence, and deliberating upon and considering this Report, the Commission sat during eighteen days, each sitting averaging five and a half hours, irrespective of the arduous and necessary work of preparing work in advance, and in this way expediting the work of the Commission. This occupied several hours daily, and could only be undertaken after the exhausting work of the day had been concluded.

The portion of the picturesque mountain range of Illawarra that surrounds a small bay about 8 miles north of the seaport town of Wollongong, and about 35 miles south of Sydney, and known as Bulli, has for the past quarter of a century been the designation of an important colliery and adjoining village.

The sandstone cliffs that are laved by the waters of the Pacific begin to recede at Coalcliff, and to the south of that exposed promontory the ocean beats against escarpments of the Lower Coal-measures, or on sand-covered beaches representing the ruins of solid strata, disintegrated by the operation of natural and ceaseless forces through untold time.

At

At Bulli a fringe of level land, about 1 mile in width, intervenes between the coast range and the beach, and this distance gradually increases towards the south. At Mount Keira, near Wollongong, the range has receded about 2 miles from the sea, and here it suddenly swerves to the west for a distance of 4 miles to Mount Kembla, when it again breaks to the west for 3 miles, from which point it curves to the south, and approaches the sea in the neighbourhood of Kiama and Jervis Bay.

In Illawarra the mountains rise to an average elevation of 1,000 feet, the prominent eminences of Keira and Kembla rising respectively to the height of 1,568 and 1,760 feet. The eastern declivities of this mountain range possess all the features of the Blue Mountains—sloping sides, covered with a luxuriant vegetation of semi-tropical flora, capped by perpendicular cliffs, fissured with numerous indentations, gullies, and ravines.

The cliffs that form a background, and give special character to the district, consist for the most part of the lower portion of a unique deposit, probably of Tertiary age, known as the “Hawkesbury Sandstones,” composed of inclined and horizontal beds of coarse, gritty, ferruginous sand and pebbles, of irregular and lenticular aluminous beds, enclosing boulders of transported rocks, the whole cemented by convoluted and segregated bands of hydrated iron ore, with embedded fragments of quartz. Some of these beds lie uncomformable on the older rocks.

These sandstones are intersected by regular joints or fissures, and they rest on peculiar reddish aluminous beds (that vary in thickness from 1 to 2 feet in the western to 10 to 15 feet in the southern or Illawarra Coal-field), that may be considered to mark the upper limits of the coal formation of New South Wales. Under this red aluminous bed is a considerable thickness of coarse sandstone, that towards the bottom becomes laminated and intermixed with bands of shale or bind, that overlie the upper coal-bed. This is succeeded by the other coal-beds of the series in regular sequence. These coal-seams, being separated by strata less resisting than the overlying sandstones, have yielded to the eroding action of climate and time, and crumbling, have formed the steep slopes that hide from view the outcrops of coal-seams and dividing strata.

The coast ranges under review are intersected by several lines or dykes of intrusive rocks. These seem to emanate from several centres of eruption. A cursory examination of the physical geology of the district is sufficient to convince the contemplative mind that in recent geological time it has been the theatre of one, if not two, eruptions of volcanic rocks. These, in a state of fusion, have been forced, in the lines of least resistance, through pre-existing rocks, as dykes; and over certain areas have (aided no doubt by conditions as yet obscure) been injected between the laminations of the strata, or into or below coal-seams. In other instances these igneous rocks have filled pre-existing crevices or rents, cutting through all the strata in the form of a wall or dyke. These intrusive rocks have apparently in some instances issued from crevices and flowed over wide belts of country, transmuting and crystallizing the older strata, or, from orifices, have poured in molten streams over certain areas. The rich alluvial bands of Illawarra have been formed by the decomposition of these eruptive rocks; and to this also may be referred the picturesque ravines and sombre crevices—even the very configuration of the scenery of the district is in large measure due.

The

The coal-seams of the Southern District are identical, although they have not been correlated, with the corresponding beds in the Western and Northern Districts. Taking Sydney as the centre of a vast mineral basin, the various beds gradually rise towards the north, and at Newcastle (65 miles north of Sydney) the lowest known workable coal-seam of the series approaches the horizon. In the Western District a coal-seam in the same stratigraphical position is extensively worked at Lithgow and Bowenfels. South from Sydney the beds also approach the horizon, and on the coast cliffs are seen to rise to the south-east. At Bulga, near Stanwell Park, about 26 miles south of Sydney, the strata are somewhat confused and disturbed by volcanic agencies; and at Clifton, about 35 miles from Sydney, the upper coal is seen on the cliffs, about 15 feet above the sea. Assisted by several faults south of Clifton, the coal-seams underlying the upper coal successively appear above the sea, and gradually recede into the coast ranges, still preserving their rise to the south-east. At Bulli the upper coal-seam is exposed on the cliffs, about 450 feet above the sea; at Mount Keira the altitude of the outcrop is about 550 feet; and at Kembla it is nearly 800 feet. A geological section showing the succession of the coal-beds in the Southern District is given in the Appendix, and marked No. 1.

Of the five workable seams in the Illawarra series only three have been operated upon. Of these the upper is by far the most valuable and important, and to it, practically, all the Southern Collieries have, since the first discovery of coal at Wollongong, ninety years ago, been confined. The coal-seam known as the 4ft. seam, and separated from the more important upper coal by about 30 feet of strata, has been worked to a limited extent at the Mount Pleasant and Bulli Collieries; while the bed of kerosene shale, representing the unique and valuable deposit of Hartley Vale and Joadja, in the Western Coal-field, has been found, and a small area worked about ten years ago, on the base of Mount Kembla.

The upper coal, to which operations have practically been confined, is one of the most important coal-seams yet discovered in the Colony, and has been extensively worked at the old-established collieries of Mount Keira, Mount Pleasant, and Bulli, and in later years at Clifton, North Illawarra, and Mount Kembla Collieries. In addition to these, operations have been resumed at Bellambi Colliery, while at Broker's Nose a new winning has been opened—in all eight collieries. The positions of these are marked on Plan No. 2, Appendix.

The upper coal-seam worked at the Southern Collieries, and known as the Illawarra or southern coal, is semi-bituminous, and is excellently adapted for steam purposes.

The following analysis of the coal as worked at Bulli Colliery will convey some idea of its value as a heat-producing agent:—

Analysis of Bulli coal, by Dr. Pery, London.

Carbon	...	...	...	...	...	75.57
Hydrogen	...	...	...	...	...	4.70
Oxygen and Nitrogen	...	...	...	...	...	4.90
Sulphur	...	...	...	...	...	0.54
Ash	...	...	...	...	...	13.17
Water	...	...	...	...	...	1.03
						<hr/>
						100.00
						<hr/>

For

							For Gas.
Coke	...	...	...	...	...	...	74.78
Volatile gaseous matter	...	...	...	...	...	...	24.19
Water	...	...	...	...	...	...	1.03
							100.00

It has a somewhat singed appearance, is dull and non-lustrous, and, being friable, produces dust by attrition or handling.

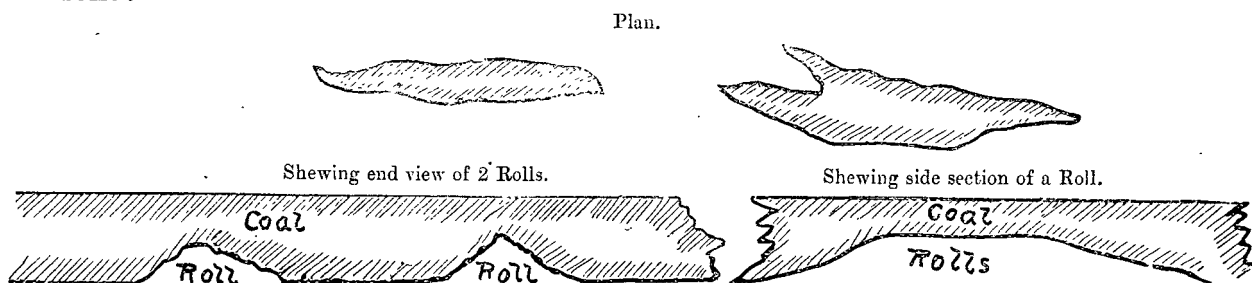
The Illawarra Mountains may therefore be considered as a grand escarpment of carboniferous and other superimposed rocks, exposing in their mural sides the whole of the coal-beds and dividing strata of the series.

These coal-beds have a general dip or pitch to the north-west of about 1–25, and do not in the course of working give off much water. This, in part, may be due to the natural drainage affected by many miles of exposed beds, to the low rainfall, and to the comparative infrequency of faults, slides, or disturbances that penetrate the strata.

The upper coal-bed, as worked in the older collieries of the Middle Division (Mount Keira, Mount Pleasant, Bellambi, and Bulli), possesses some peculiar features deserving of notice.

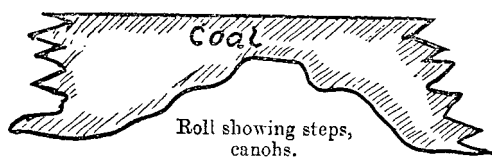
In those collieries this bed measures from 8 feet to 10 feet in thickness of pure coal; while the roof is regular, the floor is subject to irregular waves, corrugations, or crumplings, known as “rolls,” or “houses.” Individually these “rolls” are localized; they begin, grow, and terminate within a short distance. Very rarely can the same “roll” be traced for any considerable length, but where one ends another may begin; nor do these maintain a uniform course—they are subject to infinite variations.

The following imaginary sketches represent a plan and section of two of these rolls:—



and may convey some idea of how these irregularities in the floor occur, and impede the working and winning of the seam.

These rolls are perplexingly irregular. As a rule the sides form steps, or “canohs,” as follows:—



As a rule the long diameter of these follows in a rough way the natural “reed” of the coal, but in actual working the bords or working-places are so directed that they shall run in the same course as the “rolls.” So frequently do these occur that in some parts a “roll” divides or separates every bord. (*Vide* plan and section, No. 2 headings.) These seriously interfere with the laying out and winning of a colliery.

colliery. Where nature has interposed so many obstacles it is next to impossible to conduct with regularity the operations for abstraction of the mineral. As a general rule the irregularities referred to do not cut off the whole thickness of the coal-seam; a few feet of coal are, as a rule, left above the apex of the ridge, and this facilitates the work of passing over and removing the irregularity.

Strange to say, these disturbances are solely confined to the horizon of the upper coal-seam. In the "4-foot" seam underlying the upper bed no such irregularities have been found, even under positions where the upper coal was particularly affected by these distracting occurrences. It is somewhat difficult to assign a cause for these curious irregularities of the floor. Suffice it to say that they manifestly point to violent eddies or currents that occurred prior to the deposition of the coal-seam. They are composed of aluminous schist and siliceous materials, evidently deposited by water.

The presence of so many rolls limit the scope by paralysing the scheme of the manager, and prevents a colliery being economically won by pursuing some of the regular and approved systems for recovery of the mineral that have found most favour in the principal colliery districts of the old world. Under such conditions no system can really be laid down and implicitly followed. Circumstances that cannot be anticipated must guide the manager from time to time in maintaining an output. The distance between bords, their width and direction, or the size of pillars, cannot possibly be predetermined. The "cut-throughs" that connect two bords—and which, according to the 4th sub-section of the 12th clause of the Coal Mines Regulation Act, 1876, must not exceed 35 yards from each other—cannot, on account of the uncertain occurrence of these rolls, be spaced with the mathematical precision possible in districts where the continuity of the coal-seams is unaffected, or as contemplated by the framers of the Act. It often occurs that to avoid driving these "cut-throughs" in stone at great cost the manager is obliged to place them at irregular intervals, and in positions where they can be driven in the greatest thickness of coal. The somewhat irregular and unique character of the workings in the Southern Collieries is principally due to the causes described.

Bulli Colliery was commenced about twenty-five years ago, by a Company incorporated and trading under the name of the Bulli Coal-mining Company (Limited). An adit was put into the coal-seam at the most suitable point of its outcrop, and driven towards the dip of the strata. The "bords" or "stalls" (working-faces) were broken off headings branching off the main tunnel at convenient intervals. The course of this tunnel is N. 75° W. The tunnel mouth is about 450 feet above the sea, and the coal, after being screened from the skips into larger waggons, is sent down a steep self-acting incline to the base of the mountain, whence it is conveyed in trains by a locomotive to a private jetty on the sea-coast, where it is shipped into the Company's steamers and conveyed to market. The colliery has for the long period of twenty-three years been under the management of Mr. Alexander Ross, who, from his earliest years (*vide* evidence), has followed the profession of mining in the large collieries in the north of England and in this Colony. Among his compeers he is considered a careful, cautious, even-tempered man, and a successful manager.

The colliery has maintained a large and steady output since its inauguration, and, from that period, the upper coal has been worked from under about 580 acres. (See plan, Appendix No. 4.) A very considerable proportion of this area is, however, represented by "rolls." The main tunnels have penetrated a distance of 93 chains = $1\frac{1}{6}$ miles from the adit mouth. The bords off the main tunnel to the north are
worked

worked up to a dyke of diabase that entirely cuts off the coal-seam, singed and charred for some distance to the south. This dyke appears to maintain a course almost parallel to the main tunnel, and about 100 yards to the north of that roadway.

The presence of this diabase has had a most disastrous effect upon this part of the coal-field owned by the Bulli Coal-mining Company.

To the north of No. 1 and the diabase dyke referred to, a new tunnel, No. 2, or B, has been driven from the outcrop (where for a few chains only the coal was of excellent quality) for a distance of about a mile under the mountain range, the coal-seam being charred in places to a natural coke; in other places partially burnt and useless. Behind the range a large outburst of igneous rock occurs, that supplies metal for the Government roads. The coal in this division of the field has evidently been burnt by the permeation of heated gases through the rough sandstone contiguous to the coal.

Two varieties of igneous or intrusive rock seem to intersect the southern coal-field—dolerite and diabase.* Of these the dolerite appears to be the oldest, and it is curious to observe the change that is effected on and by this intrusive rock when in contact with carboniferous strata. In presence of coal-measures it assumes a cream colour, and rapidly decomposes, the coal being burnt to a cinder in the neighbourhood of the point of contact, and the shales altered to hornstones. The diabase dykes, on the other hand, do not exhibit these phenomena; and in an adjoining colliery the older dolerite is pierced by a dyke of recent diabase. Both of these, when compared with the coal-measures, are of recent age.

The colliery of Woonona, to the south of Bulli, and that of Bellambi, 3 miles distant, both contain areas of burnt or cindered coal; so that the old Bulli Tunnel (No. 1 or A) has been working a wedge of good coal between areas of country under which the upper coal-seam has been more or less destroyed.

The intrusive dyke to the north of the old tunnel under review threw down protuberances or arms, some of which approached, and at least two of these crossed, the line of the tunnel. (*Vide Appendix 4.*) Through these the main road has been carried at great expense.

On account of the old western sections of the workings becoming exhausted it became necessary, about three years ago, to obtain additional land. In consequence a lease was obtained from the Government of coal in the Hill End District.

To work this coal the main tunnel was advanced through a wide branch of the diabase dyke that stretched down from the north; at the same time a branch bifurcating from the main tunnel, at a point about 1,300 yards from the entrance, was pushed on to open up the new coal-field at a point further south than the main tunnel.

The projections of intrusive rock encountered in the main tunnel terminated before reaching the Western Road, but the coal in advance of the position of this intrusive rock in the Western District is much reduced in thickness, and is somewhat cindered or singed. In this section no marsh or light carburetted hydrogen gas is or ever has been given off.

About two years ago the mine or roadway that was being carried through the diabase fault in the line of the main tunnel touched the coal. A considerable quantity of gas (probably "fire-damp," or light carburetted hydrogen or marsh gas)

issued

* Dolerite is a basaltic rock, composed of Labradorite spar and of augite, and is a typical trap-rock. Diabase is a recent rock, a basalt, and is composed of silica, alumina, sesquioxide of iron, and a little lime.

issued from the face, and forced the workmen to retire.* The gas was removed by means of bratticing† carried into the face of the mine; and this was continued until a separate return way had been obtained (*vide* Appendix No. 45) through the intrusive dyke.

The issue of gas from coal contiguous to or from a fault is no uncommon occurrence in mining; and special emphasis is laid on this circumstance because of the almost perfect immunity that Colonial collieries have hitherto enjoyed from the presence of marsh or light carburetted hydrogen gas. It is extremely difficult to discover how much gas really did issue from this roadway at this time. Considering that the ventilating current was at that period weak, the Commission are inclined to think that the quantity of gas was even then insignificant in amount.

As gas was still given off, safety-lamps (Davy) were issued to the whole of the workmen, and were used until the beginning of the current year, when, on account of a material improvement in the ventilation of the colliery, a change was made, to be hereafter referred to. In consequence of the presence of gas and the use of safety-lamps this part of the mine was known as the "gassy section."

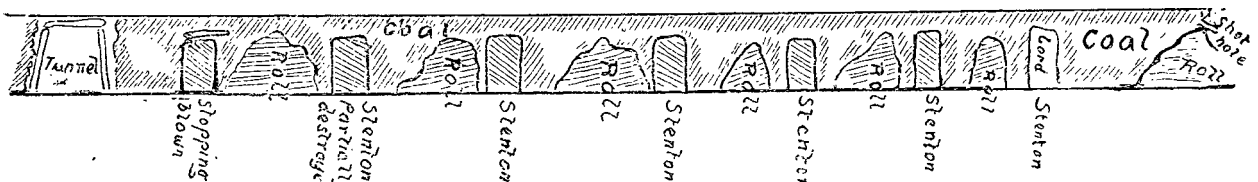
So far as the Commission can discover, the provisions of the 7th sub-section of rule 12, Coal Mines Regulation Act, referring to safety-lamps, was adhered to up to the cessation of work, about August of last year, when, from a disagreement with the workmen, the mine was closed for some months.

The main tunnel was continued into the coal inside the intrusive dyke, and after a return was obtained a double road was pushed rapidly into what was virtually a new coal-field, to attack the coal leased from Government at a point 374 yards to the north of western heading.

With the object of keeping up the output, a pair of headings, Nos. 1 and 2 (*vide* Appendix 4), were broken off about 20 yards inside the dyke and driven in a north-westerly direction. These headings are straight, and are separated by a pillar of coal 7 yards thick, and have been driven 232 yards from the main tunnel. Both of these "headings" from the first gave off gas; both were broken off the main tunnel or intake; and to maintain a circulation of air a single trap-door was placed on the main tunnel between them. This door being closed intercepted the air current and directed it up No. 1 heading, thence it passed through the last cut-through or "stenton" to No. 2, and circulated or coursed down to the main tunnel.

These headings crossed over numerous "rolls" (*vide* plan, Appendix No. 5), their general trend being N.E., and by referring to the plan (Appendix No. 5) it will be seen that one of these almost intervenes between every bord. A horizontal section of No. 2 heading is shown by the following sketch:—

Ideal section of No. 2 Heading from Tunnel to Face.



The

* It may be pardonable for the Commission to state that "light carburetted hydrogen gas," or, as it is sometimes called, "olefiant gas," or ethylene—the "fire-damp" of miners—is composed of two atoms of carbon and four of hydrogen, and is represented by the chemical symbols C_2H_4 or CH_2 ; while methylic hydrogen—"marsh gas"—a much quicker and more sensitive gas, is represented by the symbols H_4C , being composed of four atoms of hydrogen and one of carbon.

Both of these natural gases require the admixture of air in proportion to their chemical composition before an explosion, by the application of a naked light, is possible. In the case of ordinary "fire-damp" it has been found that nine parts of air to one of gas forms the most explosive mixture.

† Bratticing is an artificial division of an airway or underground road. This may be effected by means of planking, canvas, or corrugated iron.

The stentons (openings for air) between the headings have, so far as possible, been driven in the spaces between the rolls, where coal existed; but in some instances the two headings have been connected on the top of rolls. These appear to "Stentons," have been closed by packed walls of stone, backed by rubbish, and were, so far as the Commission could discover, secure and tight.

Bords have been broken off both headings, and are shown on the plans Appendix Nos. 4 and 5. annexed.

Prior to the strike the workmen employed in the bords, as well as in the headings, used nothing but safety-lamps, and these appear to have been carefully locked, in accordance with the provisions of the 7th sub-section of clause 12, Coal Mines Regulation Act. The Commission believe that no considerable amount of marsh gas was given off from these bords. The testimony of Mr. Inspector Rowan was most decided upon this point (*vide* Questions Nos. 5,070–5,089); and his accurate observations have infinitely more weight with your Commissioners than the statements of witnesses of less experience and intelligence, some of whom, when under examination, did not create a favourable impression. Before extending the rope haulage into this district it became necessary to straighten, heighten, and widen the original road.

About 80 yards from the adit mouth the road to the old Western or "slacky" section branches off to the left. The main tunnel may be said to commence at this point. It has been driven through the old pillars and rolls, and across the bords which have been built up. Heavy sets of strong timber were placed at short intervals to secure this passage. About 4 feet of aluminous sandstone bands overlie the coal-seam, and intervene between it and a thick conglomerate post. These sandstone bands are liable to "make" or separate from the conglomerate on exposure to damp air, and had before the explosion, over a considerable distance of this roadway, so separated and sagged down upon the timber sets referred to. From the bifurcation of the Slacky Road the new main tunnel began to rise towards the W.N.W., and continued so to rise for a distance of 1,170 yards, at an average pitch of 1 in 20. This part of the road was worked by a self-acting incline.

The coal was brought from the Western, or from the Straight-in, or Hill End, or gassy section, by means of tail-ropes worked by an engine placed at the mouth of the adit, to the out-bye side of the Western Junction, where a long "flat" or siding was arranged. From this point the trains were sent down the incline to the foot, at the junction of the Slacky Road, where, being disconnected from the main rope, the skips ran by gravity to the screens; a horse, attended by a boy, being required to drag the empty skips to the Slacky Road, for attachment to the incline rope.

The amount of gas given off prior to the strike (September, 1886) seems to have been insignificant, and did not, on the occasions when a thorough examination was made by the Inspector, call for any special mention by that painstaking official. Thus, Mr. Rowan, on 2nd September, 1886 (Appendix 6), reports as follows:—"Hill End District.—Thirty-six men and horses are employed, and supplied with 3,600 feet of air per minute. The miners in this division are working with safety-lamps, as the coal gives off a small portion of fire-damp, &c." * * * "I carefully examined every bord with a safety-lamp, but in no case did the fire (meaning gas) explode in the lamp. I also asked the miners if every care was taken. They said they believed so, and that the deputy made several inspections during the day."

The last paragraph, repeated in Mr. Rowan's evidence, is in strange contrast to the statements of several of the witnesses (*vide* Questions ———), yet who admitted that they never did complain to the Inspector or to any official. On the 22nd December, Mr. Rowan, in his report, remarks, "this is the division that used to generate fire-damp, and where the men, when working, had locked safety-lamps."

For some time it had become apparent to the management that the motive column produced by a furnace at the surface was insufficient to ventilate extensive workings, and overcome the drag occasioned by the great length of rubbing surface over which the ventilating current was obliged to pass. In short, the ventilating power had reached its maximum—it could do no more—and this was insufficient for the requirements of new and distant sections of the colliery, from which gas was or had been given off. No more than 12,500 ft. of air could be circulated in all the districts up to the cessation of operations about September, 1886.

For these reasons an air-shaft had been commenced on a convenient part of the mountain slopes over a point of the Slacky Road workings (return way) about 43 chains from the adit mouth. (*Vide* plan, Appendix No. 4.) This shaft is over 300 ft. deep. A large and excellently constructed furnace—fired from the end and both sides—was built, and this work was reported by the Inspector (Mr. Rowan) as being finished in his report dated 22nd December, 1886. (See Appendix No. 6.) The effect of this new furnace upon the ventilation of the colliery was—by increasing the grate surface, and *caeteris paribus*, the motive column—to cause a circulation of 34,000 ft. in the districts where not more than 12,500 ft. could be passed before; and in the Hill End section from 12,000 to 13,000 ft. circulated, where, prior to the new furnace being started, only 3,600 ft. passed. (*Vide* Report, Appendix No. 6.)

This furnace is surrounded by a large area of high and wide bords, and at the date of the accident three main returns passed into it.

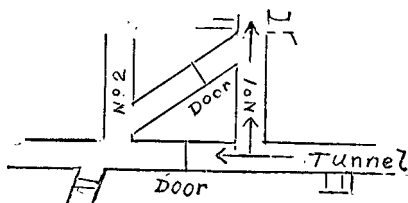
The returns coursed among the old bords, and considerable quantities of air scaled through and ventilated the abandoned workings.

The adequacy of these returns to circulate a large quantity of air is shown by the results of a minute record of the ventilation taken by Messrs. Rowan, Dixon, and Evans, at 9:30 a.m. on the morning after the accident, and which was as follows:—The Western return was passing 44,290 cubic ft.; the Hill End return was passing 37,410,—making a total of 81,700 cubic ft. And again, on the Monday following the accident (the 27th), the following quantities were found passing:—Western return, 59,740; Hillend, 23,635,—equal to a total of 83,375 cubic feet per minute.

The course of the ventilating current is shown by arrows on the plan, Appendix No. 4, and is as follows:—The current entering the adit mouth divides at the bifurcation of the Slacky Road; the main portion passes along the tunnel, and up the self-acting incline; the divided portion passes along the Slacky Road for 23 chains=506 yds., where a door (*vide* plan No. 4) was placed to prevent the current passing straight to the new furnace. This door directed the current to the right, and it passed up a cross-cut road known as the "Horse Road," and joined the main current passing up the incline, about 25 chains from the entrance. Stoppings (or walls) built of stone from the rolls, backed by small coal, confined the current of air to the main road. At the bank-head, or top of the incline, the road divides; the
left-hand

left-hand road is the main hauling road to the Western section, which is directed so as to avoid the edge of one of the basalt dykes already referred to ; while the straight road, or Main Tunnel, is the hauling road to the Hill End section. A single door, with a regulator, or sliding shutter (*vide* plan No. 4), was fixed on the Western Road, a few yards inside the Junction. This door is kept shut, but the regulating shutter permits the quantity of air required for the Western section to pass through it and along that road.

The remaining portion of the air-current passed along the main tunnel until it was arrested by a single door placed between Nos. 1 and 2 headings. (*Vide* plan, Appendix No. 4 and 5.) Another door was fixed in a diagonal road that connected Nos. 1 and 2 headings near to the bottom, as per sketch and plan, No. 5 Appendix.



The object of this door was to direct the whole of the air-current up No. 1 heading, scaling into the bords broken off that road, and arriving at the furthest up stenton, it passed through that opening to No. 2 heading.

These stentons, or openings between two parallel roads, are necessary to permit the ventilating current to circulate ; and, by the 4th sub-section of the 12th clause of the Coal Mines Regulation Act, these must be spaced not more than 35 yards apart. To prevent any leakage of air, and consequent diminution of the current, where it is required at the face, each stenton, as the succeeding one is finished, is stored up with rubbish and the face built with stone, and, if necessary, plastered, to make it impervious to the passage of air.

Having passed through the last stenton, the air descended No. 2 heading, a portion scaling into the working-bords that have been broken off that road, and passing through the cut-throughs or openings between the bords the two currents join and enter the main tunnel. Inside the door (marked on plan, Appendix No. 5); and, passing towards the face, the current was again arrested by a door (marked on plan) fixed between Nos. 3 and 4 headings. This door, in like manner, directs the current up to the face of No. 3, which has been driven about 60 yards from the tunnel, and passing through the stenton courses down No. 4 heading and into the main tunnel face. It then ventilated No. 5, or the face of the main tunnel, and passed down to No. 6—a new heading just broken off to the dip,—and from thence, having performed its circuit, it coursed along the return, marked with a black arrow. It then circulated through the headings marked (B) on plan No. 5, and passing through the intrusive dyke it followed the course indicated by arrows. This part of the return is capacious and in good travelling condition. Before coming to the Western Road a door was fixed. This door permits the passage of the wastemen or officials, but directs the effete or fouled air to the left, where it passed up an incline road, and over an “air-crossing,” or a bridge constructed of thick planks of timber, it was conducted above the pure intake air passing along the Western Road, and entering the old workings was drawn into the new furnace referred to.

It may be mentioned that from the air-crossing described, although there was ample space for the free passage of an abundant ventilating current, yet from the tender state of the bands of stone under the strong conglomerate roof, many falls had

had occurred in the abandoned bords, and it was travellable with difficulty. Scaling, as the return air did, through several old bords, ample space for the passage of almost any quantity of air was afforded, although the occurrence of falls would render the passage of men a work of some difficulty. This condition of the returns did not, it would appear, escape the notice of the Inspector, who, in his report dated 22nd December, 1886 (see Appendix 6), refers to his inability to pass through the return airway, when Mr. Ross, the manager, promised to put it in order when the strike was settled. On the 2nd of March, 1887, Mr. Rowan reports as follows:—"On examining the return airway I found that heavy falls of roof had taken place. The falls were so heavy I could not make a passage through. I drew the manager's attention to this matter. He stated that he had three shifts of men working making a new aircourse, and the same would be kept working until a proper recognized airway was made from the working-faces to the ventilating furnace. As I formerly reported, a number of these falls took place during the recent strike."

The Manager had not attempted to resile from this promise, and at the time of the accident the overman White, with one Cavill, was visiting this road in the hope of calling through to the men working from the western side. The position of White is shown on plan No. 4, and is marked by (c). The falls through which the overman was attempting to "call" or "knock" saved the life of him and his companions, while the men on the other or western side were lost. This return was at the date of our inquiry so far cleared as to permit men to travel (*vide* Ross's letter, 1887).

The doors (described) that were fixed in the main road were single, and, while trains of skips were not passing, directed the ventilating current. During the passing of trains these doors remained open, and at that time partially disorganized the air-current. To prevent delay in closing or damage to the doors, attendants (trappers) were provided. These doors are fixed on main roads. It is not uncommon to arrange double doors so that one is at all times closed, and in this way the regularity of the ventilating current is maintained. Where long trains of skips are hauled by machinery it is often very difficult to duplicate the doors. In the case of Bulli the length of trains would have necessitated their being placed 160 feet apart. This, under the circumstances, would have been impossible, and the practice is not pursued in any Australian colliery.

From calculations hurriedly made during the examination of some of the witnesses (*vide* Mr. MacCabe, Question 3871) it was apparent that the doors did not require to remain open more than about twelve minutes during each day, or more than half a minute on each occasion of the passing of a train. Some days before the accident the overman found the door between Nos. 1 and 2 headings propped open, and for certain reasons accused a witness (James Crawford), who was then a deputy, of having done so. With this exception, the Commission have no reason to think otherwise than that these doors were carefully attended to, and that the opening of them did not seriously interfere with the ventilation.

It will be seen from the foregoing description that the system of ventilation employed at Bulli was a "sweeping" one, consisting of one undivided current for each section. The enormous capacity of the bords, compared with that of portions of the tunnel, precluded the possibility of any marked current at the working-faces. The current entering No. 1 heading was permitted to scale into the bords, but was
not

not directed thither by any screens or other devices. The current was not directed into the face of the heading in advance of the air by means of fanners, air-pipes, or by brattice, *i.e.*, a temporary division in the roadway permitting the air-current to pass up one side and to return on the other.

It will be observed by referring to plan No. 5 (Appendix) that the first two bords off No. 1 heading had been worked back to the dyke, and that one of these bords had been built up or stowed full of rubbish. These are marked on the plan (a). None of the other bords had been worked more than 36 yards from the heading, and only Nos. 3, 4, 5, and 6 bords had been connected by a cut-through. In No. 2 heading the same remark applies. The bords had only been driven sufficiently to permit of the four lowest (nearest to the tunnel) being connected by cut-throughs. In Nos. 3 and 4 headings only two bords had been broken off.

The Hill End section was thus to all intents a perfectly new coal-field, separated from the older portion of the colliery by the dyke described and shown upon the plan. This natural barrier prevented the older workings from draining off the gas that is probably given off more or less by every colliery, especially those tapping untouched or virgin coal-fields. The numerous "rolls," likewise, had a tendency to imprison the natural gases, and to cause them to exude when these natural barriers were exposed. There was no extent of workings opened up. The men were working close to the heading. No room existed for the dissipation of force in event of an explosion; and to the limited area of ground opened up the Commission ascribe the great loss of life that occurred.

The Commission have some doubt as to whether any gas exuded from the coal in the working-bords off Nos. 1 and 2 headings. They are convinced that if any was given off it was in minute quantities, and soon after the section was opened up. They are, however, satisfied that Nos. 1 and 2 headings, going, as they did, in advance of the bords, crossing the rolls, and opening up new ground, always did give off more or less gas. Being the highest point of the whole underground workings they were the most likely spots for gas to accumulate, because of its low specific gravity when compared with that of air.

The evidence of the witnesses examined is most conflicting upon the quantity of gas given off in this section. Excepting Nos. 1 and 2 headings, the Commission are inclined to accept the testimony of the only trustworthy authority that submitted themselves for examination—Mr. Inspector Rowan—who, although his visits were frequent, yet found no amount of gas in this section, and the minute examination of the colliery by the Commission confirms this. No gas whatever was detected by them in any of the bords off Nos. 1 and 2 headings, and only in the face of these headings. The evidence of the Manager, Mr. Ross, who did not often inspect the workings, and of his overman, Richard White, points to the presence of small quantities of gas only. Several of the witnesses, some of whom have not worked in the mine since the strike, and who evinced a considerable amount of feeling, described the gas as issuing from "blowers" or "hummers" with a noise that could be heard a considerable distance off; that they were supplied with lamps that had no gauze. This startling statement emanated from men who had no extensive knowledge of mining, or any previous experience of fire-damp. The statement so confidently sworn to as to the condition of the safety-lamps by Wm. Becton and Noah Hobbs was indignantly denied by the old deputy, James Crawford (Question 3575.)

In

In other respects the statements of these witnesses were not borne out by those of calmer, more intelligent, and truthful men. The Commission have evidence of a small blower in No. 1 heading from whence gas issued for some weeks into which a pipe was fixed. It, however, appears to have issued with no great force.

The evidence referred to portrayed the alleged condition of affairs prior to the cessation of work in September, 1886.

Before the new furnace started the whole of the men employed in the Hill End section worked with safety-lamps. These were locked, the lock, as is the case with the majority of Davy's lamps, consisting of a screw. The overman alone kept a key wherewith, at an appointed station, he could open and relight a lamp that had been extinguished. This is a precaution that has no great value, seeing that such lamps can be unlocked by a nail, a strong pin, a knife, or other instrument that the most strict disciplinarian could not object to being introduced into a mine. Under such circumstances the security afforded by a "locked Davy lamp" is to some extent illusory.

This section of the workings was, in accordance with the provisions of the Special Rules, No. 4 (but this rule does not refer to the presence of "fire-damp"), inspected by a competent person before the men commenced their daily operations.

Before the new furnace was started, and while no more than 3,500 feet of air circulated, safety-lamps were used in every working-face in the section.

When the furnace was completed, and the quantity of air increased to 12,500 feet, and no gas was given off in the bords, the use of safety-lamps where gas was given off, at least in small quantities, was confined to the winning off or "fast" headings Nos. 1 and 2, 3 and 4, 5 and 6. In the ordinary working-faces open lights were used by the workmen.

It will thus be observed that the use of safety-lamps was, since February of this year, confined to the leading winning off or "fast" headings going in advance of the ordinary bords.

It would appear that the provisions of the Act with reference to the use of safety-lamps (7th sub-section, clause 12, Coal Mines Regulation Act, and No. 16 of the Special Rules) were not, since February 7, 1887, complied with, although this circumstance may have been unknown to the Manager. The provisions of the 4th Special Rule dealing with danger-boards were, however, complied with. We find that "danger-boards" were fixed at the last "stenton" in a conspicuous position. Beyond this no naked lights were permitted. It was clearly proved that wheelers (the lads whose duty it was to remove the loaded skips and return empties to the face), who worked with naked lights, were in the habit of leaving their lamps on the ground or hanging to the post supporting the danger-board; and after the explosion one of the search parties actually did find an ordinary lamp hanging on the prop supporting the danger-board in No. 1 heading, the solder being fused into beads or globules.

The result of ventilating by the system described was as follows:—The pure intake air sweeping up No. 1 heading, and diffusing through the bords, would of course take up and absorb any gas that existed in this part in quantities too minute to give any indication on a safety-lamp. At the face of No. 1 heading it would remove whatever gas existed within its sweep, or that had rolled down towards the
stenton

stenton. The quantity of gas so liberated and removed would be variable, and probably in comparison with the large current of air was insignificant. Partially fouled the current passed from No. 1 to No. 2, where the amount of gas given off probably exceeded the quantity given off from No. 1. Fouled by the gas from these headings, instead of being sent direct into the return, it was circulated, and supplied the bords off No. 2, which were really in the return way. The workmen in these bords, however, worked with naked lights. From this the same current supplied Nos. 3 and 4 and 5 and 6 headings.

The Commission are convinced that, although practically no gas was given off *in these bords*, the practice of working with naked lights after the intake air was more or less fouled by the gas exuding from Nos. 1 and 2 was, in the absence of bratticing, or some means of sweeping off the gas as it escaped from the coal, reprehensible. In the absence of bratticing, the space between the face of these headings and the last stenton in advance of the ventilation must have been a magazine, so to speak, for the stowage of gas. At all events, under the circumstances of this section, it would have been better practice to have passed the ventilating current over the main tunnel direct into the returns without requiring it to do duty in the ventilation of the other headings. Some such practice would have obviated the necessity for doors on the main roads, and reduced the risk of danger to a minimum. The Commission are aware that the absence of this latter precaution did not (in all probability) cause or contribute to this accident; but it betrayed an absence of forethought, or of erudition and skill in dealing with gas, that ought not to have been displayed by a manager or overman of the long experience of either Mr. Ross or Mr. White.

The arrangement for firing shots in this section was unusual and unsatisfactory. The Manager appears to have given orders which, if carried out, would have insured a measure of safety; but he appears to have so seldom visited this district with a critical eye to see whether his orders were in practice carried out that his very apathy may have induced carelessness and foolhardiness on the part of his officials and workmen. No better proof of this could be afforded than the manner in which shots were fired. The orders were for all shots to be fired by the deputy; and the Commission believe that, while safety-lamps were used by the ordinary miners in the bords, this custom was practically adhered to. It would also appear that Mr. Ross had given instructions to fire no shot in the actual presence of gas. So far this was as it ought to have been, but to remove the gas the ancient and perfunctory method of beating it out with a garment into the air-current was resorted to. While the management gave orders to remove the gas they provided no effectual means, such as bratticing, for doing so. No surprise need be excited if the operation was imperfectly performed or neglected. The headings were "special places," and driven by contract at an increased cost, by specially selected, and competent, and picked men. These headings were carried on night and day continuously. During the night-shift, when the specially selected men were alone at work, no deputy was provided, but the day deputy locked the lamps, or was supposed to do so, and the contract men fired their own shots. This is not unusual, and with competent men—as capable as any deputy perhaps—no special danger was incurred, but it would have been wise to have constituted one of these men a deputy to fire shots.

The mode of preparing shots was also unsatisfactory, and appears to have been as follows:—The men charged the shot and tamped it without any supervision or instruction. The tamping material was left to the choice of the
workmen.

workmen. While some careful men may have used pounded stone, damped with tea or water, the majority seemed to have used small coal or dust, and were not too particular as to the damping of it. As a rule, ordinary Beckford's fuse was employed to ignite the explosive (which was ordinary loose or compressed powder cartridges), and about 6 in. of this was left outside the hole. To ignite the fuse the safety-lamp was tilted on its side, and by so doing the flame impinged against and spread along the side of the gauze. As a rule, touch-paper (composed of ordinary brown paper soaked in saltpetre) was applied to the gauze; the flame in the inside was thus communicated to the touch-paper on the outside, and thus the fuse was ignited. So callous and careless had the men become that one man, Wood, working in the special heading No. 2, actually admitted that to avoid the trouble of lighting a shot by the means described he had lit the fuse by striking an ordinary lucifer match. With such men no orders probably would have ensured any safety to the other workmen. Illustrating the danger of the practice of tamping shot-holes pursued, the Commission were informed by ——— that about five days before the accident a shot so tamped (probably overcharged) had actually ignited the gas in No. 2 heading. No more reprehensible or dangerous practice could have been resorted to, and the Commission are surprised at the absence of strict orders dealing with the whole *modus operandi* of preparing and firing of shots that would have ensured safety. In the event of an overcharged shot the effect of tamping with small coal would probably be little better than tamping with powder; while inches of burning fuse in the presence of gas was to all intents courting an explosion.

Contrary to all discipline and common-sense, the workmen were permitted to take into this district matches and tobacco-pipes, and to smoke. In the case of the workmen in Nos. 1 and 2 headings, smoking was permitted anywhere under or outside the danger-board. Two days before the accident (*vide* Scott, Hope, and Morgan, Questions 358, 615, 2,943) the gas in No. 1 heading was lit by the wheeler's lamp hanging on the prop supporting the danger-board. While the Commission regret the absence of orders calculated to maintain constant and rigid discipline, and careful solicitude for the safety of the workmen, they cannot everlook the carelessness and the total disregard of the most ordinary precautions on the part of the men, many of whom, knowing the danger incurred, took no steps themselves to ensure the general safety.

This colliery has been from its commencement a peculiarly dry one. No water was given off in the mine. The coal was friable, and, falling on the roads, became pulverised into impalpable powder. Towards the conclusion of a busy day the air became loaded with clouds of dust, that rose in obedience to the slightest disturbance. To remedy this to some extent the Manager had for some time been in the habit of watering the main road, but this practice did not extend to the headings or working-faces. An atmosphere laden with impalpable dust has of late years been proved to be a source of no small danger on the application of an open light.

In collieries the part played by dust in the case of an explosion has long been suspected. In recent years special attention has been given to this recondite subject, and elaborate experiments have been made with the object of ascertaining the behaviour of dusts of various grades and qualities under the usual conditions existing in a coal-mine.

While some authorities are of opinion that coal-dust in a certain minute state of division or fineness may of itself explode and produce all the direful effects of an ordinary explosion, and that, in point of fact, some of the more recent explosions in
Britain

Britain have been attributable to dust alone, it has, without any doubt, been proved that the presence in the atmosphere of a mine of quantities of finely divided coal-dust, with gas, intensifies the effects that would otherwise follow from an explosion of gas alone. The presence of a dust-laden atmosphere increases the intensity and effects of an explosion. By its aid the length and intensity of flame is increased. The flame of an explosion that otherwise would be confined to a limited area may, by the presence of dust in the atmosphere, be prolonged, or projected, or carried to distant localities, and ignite accumulations of gas in those localities. The enormous surface presented by coal in a minute state of division (dust) to the action of flame induces instantaneous combustion, and the production of gases inimical to animal life. By distillation gas itself may be produced which, on the recoil of the first explosion, may be ignited, and so increase the effects originally produced. An explosion of gas in a dusty mine is generally productive of results more disastrous than an explosion of gas in a mine where no dust exists. The terrific effects of some explosions where a very small quantity of gas could have existed is thus explained.

We are of opinion that the explosion at Bulli Colliery is one of the most notable instances of this on record.

Accident.—At 2:30 p.m. on Wednesday, the 23rd day of March, a loud rushing noise was heard by the surface workers issuing from the main adit. The foreman, Alexander Lang, believed this noise indicated that a train of skips had broken away and were rushing down the incline. He was horrified to see a quantity of smoke, dust, and chips ejected from the tunnel with considerable force. In a few seconds another but slighter puff of smoke and dust was discharged, and all was quiet. He and his fellow-workers at once concluded that an explosion had occurred, and with admirable coolness and presence of mind a man was despatched to the village to telegraph the accident to Mr. Ross, who had gone to a flower-show in the neighbouring town of Wollongong. The engine-man blew the whistle to apprise the villagers that an accident had occurred, while Lang and ——— prepared safety-lamps.

Before they entered the mine, a boy, who attended the horse that drew the empty skips to the foot of the incline, came running out of the tunnel, holding his head, and in a state of fright, stating that he had been knocked down by the rush of air. In a short time the horse walked out of the adit. It does not appear that any particular notice was taken of this horse at the time, but in the course of a day or so attention was directed to very slight indications of singeing of the hair on certain parts of this animal, the inference being that the horse was singed by the flame from the explosion. In disposing of this matter, to which much importance has been attached, the Commission draw attention to the circumstance that this horse and its attendant were within 80 yards of the adit mouth when the effects of the explosion passed them. No flames appeared at the tunnel mouth; no indication of direct flame was seen by the boy, or can be detected on the level road for fully half a mile. The boy's hair or skin was uninjured by flame. He saw none. Only localized patches of the horse were slightly affected; strange to say, a small portion near the root of the tail, and the long hair under its lower jaw.

The Commission, in the absence of direct proof of flame having issued from the tunnel, attach no importance to this circumstance. If flame had passed the horse the whole hair on the animal would have been affected; the boy could not have escaped. The marks on the horse may have been caused by contiguity to the

open lamp attached to the cap of its attendant when he released the tail-chain (or draw-chain), or when standing near the animal's head. Trivial and localized singeing, such as that described, is irreconcilable with a flame-charged atmosphere.

On entering the tunnel Lang and his comrade observed that the air-crossing near the entrance—and that conveyed the return air to the old furnace—was deranged. The thick planking had been forced upwards. They proceeded to the foot of the incline. The atmosphere was charged with dust, and the ventilating current had become deranged. While in this position they were joined by Scott and Hope, who, at the moment of the accident, were proceeding to their work in the night-shift in No. 1 heading. A man was dispatched to the Company's jetty for canvas. Finding the tunnel fallen, the men proceeded along the Slacky Road in order to regain the tunnel at B by the cross-cut A referred to. (See plan No. 4.) While proceeding along this road they met the overman White and the man Cavill hurrying outwards. These men had been at the moment of the explosion at point © by pre-arrangement, endeavouring to communicate with the men who, from the western side, were making the new travelling-way, and had thus escaped. (*Vide* evidence of R. White.)

The news of the explosion having spread, managers and men from adjoining collieries, eager to render assistance, gradually assembled at the mine. When the first volunteers reached the tunnel by way of the cross-cut, within an hour after the accident, they found the ventilation in that road much deranged. The atmosphere was charged with smoke and dust and "after-damp." The temperature was somewhat high, but no steam was visible. The tunnel had fallen badly at this point. Passing over falls, they discovered two stoppings partially blown out or damaged. These were speedily repaired, when the ventilation steadily began to improve, and to take, though feebly, its natural course. On the arrival of Mr. Ross, he proceeded as far as the western junction (see plans), when, overcome by the after-damp, he was removed from the mine. Early in the evening, Lang, Richard White, the overman, and others, had, from the same causes, to be removed. A number of the men were also affected. No very concerted work appears to have been taken until 10 p.m., when a number of the managers of adjoining mines, seeing the desirability of concerted action, held a hurried consultation, arranged themselves as leaders of relays, and choosing search parties, the thorough work of penetrating the mine commenced.

Those who had first entered the mine came upon six (6) dead bodies lying on the flat close to the western junction. These they did not in any way touch; but discovering the western door blown away, and a very large fall completely blocking the tunnel, they tightened the stoppings, and closing the western door with canvas, commenced clearing off the top of the fall. This speedily improved the ventilation, and early on the following (Thursday) morning the search parties were enabled to cross this fall, and proceed along the tunnel to the Hill End section.

With the exception of a few falls, no serious damage was done to the tunnel beyond the falls near the Western Junction.

About 100 yards before arriving at the foot of Nos. 1 and 2 headings the bodies of two boys who had been engaged cleaning the road were found, and bore evidence of being blown about, and other marks of external violence.

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The witnesses examined by the Commission, and who had seen the bodies of the six men at the Western Junction, had either not examined these at all, or had done so in a perfunctory manner. They were totally unskilled, and unable to diagnose burns. Some of these witnesses were evidently led astray by the shortness of the hair upon, and the caked dust adhering to, the bodies. The surgeon, Dr. Llewellyn, who had carefully examined these bodies on removal from the mine, and who had had some experience of explosions, had removed from the Colony, but his evidence as given before the Coroner is clear and emphatic, and is reproduced in No. 7 Appendix. After an explosion the steam and heated vapour licks up the impalpable dust, and deposits this in cakes upon anything with which it comes in contact. The fibres of a bunch of token strings, picked up from a prop within a few yards of where the six bodies were found on the flat, although coated with soot, are perfectly untouched by flame; pieces or fibres of bark—extremely sensitive to fire—exhibit no traces of flame; woollen garments, picked up in that spot by the Commission, also show no traces of fire. The statement by Dr. Llewellyn, that the shreds of cuticle on the hands of one of these bodies had preserved its elasticity, shows that the body had been forced along the rough floor, but that the skin had been untouched by flame. The same remarks apply to the two bodies found on the main road referred to.

The positions where the bodies were found are marked by crosses and dots upon plan No. 5.

So little damage was done to the stoppings and doors that these being temporarily repaired with canvas the ventilation was restored, and enabled the whole of the bodies, with the exception of two, to be recovered within thirty-six hours after the explosion.

Attention is directed to the circumstance that, with two exceptions in the Hill End District—one in No. 7 bord, off No. 1 heading, and one in No. 8 bord, off No. 2—the whole of the bodies were found on the main roads. The majority were found with their heads lying towards the exit, and conveyed the impression that, alarmed by the explosion, they had been attempting to effect a hurried retreat, when they were overtaken by the deadly “after-damp,” and fell as they ran, and died as they fell. The appearance of the body in No. 7 bord corroborated this view; when found one of his arms was inserted into the sleeve of his shirt, and the bulk of the garment over his head. The poor man had been choked by the after-damp while in the act of putting on his shirt, before following his neighbours. The awful suddenness of the death may be imagined from another body being found (at the opening to No. 2 bord, No. 1 heading) in the act of drinking out of a flask. No marks of burning were found on any of the bodies, with the exception probably of Westwood, who was found in the last stenton, between Nos. 1 and 2 headings, and probably one or two men in No. 2. The whole of the deaths were due, not to the direct effects of the flame of the explosion, but from the effects of after-damp (the result of the explosion), or the force or impact of the blast.

“After-damp” expresses the name given to the poisonous gases resulting from the explosion, *i.e.*, rapid decomposition of an (explosive) atmosphere consisting of certain proportions of air and fire-damp in some of its forms. It consists of varying proportions of carbonic acid gas (stytho-choke-damp), free nitrogen and watery vapour, in the form of steam, and, if coal-dust is distilled, probably a quantity of carbonic oxide gas (white-damp).

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In the case of marsh gas, the "after-damp" will, in all probability, contain a quantity of carbonic oxide, as a direct result of the explosion, in addition to free nitrogen.

As nothing had been disturbed in the mine (save covering the dead horses with quick-lime) from the date of the explosion till after the Commission had finished their various inspections, the appearances presented by the workings during the inspections of the Commission were essentially similar to those that were observed by the first search parties. These were as follows:—

1st, Main Tunnel.—This had fallen at intervals for a length of about 350 yards, beginning 170 yards from foot of the incline. Over this portion the bands under the conglomerate had sagged, or separated from the main roof, and were resting upon the heavy sets of timber that protected the main road. The outward rush of air probably displaced one or more of the main sets; and in its or their fall others were displaced, and the heavy blocks of stone that had rested on the displaced sets fell upon the hauling ropes. These ropes resisted the weight, and tearing off some of the hanging pulleys, a heavy diagonal pressure was thus suddenly brought to bear upon the adjoining timber. Unable to resist this weight, they would collapse from the centre towards each side. A minute examination of this large fall shows that the major portion of it must have come down subsequent to the blast. Portions of dust carefully removed from the pulleys at the bend (1), and from props towards the bank-head, show that it was uninjured by flame.

The Commission on various occasions examined this fall, and could observe nothing singular in its appearance, or differing from any other similar occurrence that is every day noticed in colliery workings, and nothing to arouse or excite suspicion. A close scrutiny of the surroundings at once reveals the cause.

Bank-head.—A set or train of fifteen empty skips have been somewhat broken and pitched off the rails. On this flat the bodies of six men were found, all of whom exhibited proofs of being blown about and subjected to much violence, their bones being fractured and their clothes torn. Some of the witnesses affirm these bodies were sadly scorched, while the evidence of Dr. Llewellyn proves the contrary. The Commission, after a close examination, could discover no traces of flame upon the back of the props, or pieces of woollen garments evidently torn off the men, while the strings of tokens hanging on a prop have not been affected by flame.

The Western Door.—The western door had been torn from its strong iron hinges and broken into pieces, the fragments being blown inwards. The force that did this damage manifestly came from the outside, and travelled inwards towards the Western District.

Large Fall.—The large fall inside the Western Junction on the main tunnel occurred, in the opinion of the Commission, immediately after the explosion, and was probably caused by the swift rush of compressed air removing a defective set of timber under a weak and broken part of the roof.

On the date of our inspections, 7th and 8th May, 17,000 and 20,790 cubic feet of air were passing over this fall.

The Trap-door between Nos. 1 and 2 headings was demolished, and shows that the direction of the force came from *in-by* towards the mouth of the tunnel.

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The Trap-door in the diagonal road between Nos. 1 and 2 has been forced from No. 1 towards No. 2, and in the opposite direction to the other.

The Trap-door between 3 and 4 has been destroyed and blown inwards by a force proceeding from the mouth of the tunnel.

The Main Flat between Nos. 2 and 3 headings contained a full and empty train of skips. These skips have been acted upon by a sudden though not a great force; they have been bodily blown in-by, and several have been lifted off the rails. Meeting with an obstacle at the end of this flat the empty skips became piled upon each other, and some old worn-out skips are smashed, and portions of the framework have been carried across the flat. Under the full skips the body of a boy was found entangled and very much mutilated, while close to No. 3 heading a man was found terribly smashed, with his clothes torn to shreds, probably from the force with which he was projected by the blast.

Almost opposite No. 2 heading a stopping with a door existed. This stopping was bodily blown in and levelled. Thirty yards down the return, and indicated upon the plan, a horse was found, and beyond it the bodies of four men. These had evidently been caught by the full force of the blast, and carried from the main tunnel through the stopping to the place indicated. The stoppings between the tunnel and the return were from this point inwards partially destroyed.

In the face of the Main Tunnel a skip which was being filled was slightly displaced, the front wheels only being carried over the rails.

Nos. 1 and 2 Headings.—At the moment of the accident a horse was evidently conveying a few skips through the door in this road. Overtaken by the blast, the horse was blown down to the tunnel, where it lay at our inspection, and the skips, slightly broken, were piled up partly in the diagonal road and partly in No. 2 heading. The stoppings opposite the two first bords off No. 1 are slightly displaced towards No. 1, the greatest force evidently coming from No. 2 heading. The three stoppings above this are partially displaced from No. 2 to No. 1.

Charring of Props.—The props in No. 3 bord and in No. 5 bord, No. 1 heading, are charred; portions of woollen clothing picked up in No. 5 were singed, and bore direct evidences of contact with flame. Quantities of coked dust were deposited as a cake on the props. Portions of this were fused into globules. The danger-board in No. 1 heading and its supports are partially charred. The horse that lay inside this signal was also singed, while a coil of fuse hanging a few yards from the face of No. 1 was unburnt, and a quantity of loose powder nearer to the face had not exploded. A safety-lamp, intact, but unlocked, was also found in this heading. An open lamp was found hanging on a support of the danger-board with the solder fused into globules; and beside Jer. Westwood a large copper lamp similar to that used by a deputy was found on the slack coal in the stenton. Evidently at the moment of the catastrophe no gas had existed contiguous to the face of this heading, hence no flame.

No. 2 Heading.—The danger-board was blown down at the stenton, and lies a few feet down the road. At the face a large *roll* was being crossed. About 3 feet of coal exists on the top of the roll. Gas issued from it. A few lumps of coal lay on the top, and a shot-hole could be felt in the face. The coal had evidently not been properly nicked or under-cut. A little gas was heard to issue from the vicinity,
if

if not from the shot-hole itself. The workmen engaged in fixing bratticing in this heading after operations were resumed found an open lamp on this roll, and sent it to the Commission on the —— of May. The oil on the outside of this lamp had not been touched by flame.

During the inspection by the Commission 13 yards of gas, tapering to 2 feet at the face, existed in No. 1 heading. In No. 2 heading 20 yards of gas existed. At the face this gas reached a depth of 3 feet 6 inches. The gas was remarkably sharp, instantly filling the lamp with flame even when the greatest care was observed. It reminded some of the Commission of silver gas (CH_4) met with in some fiery mines in Britain.

At the date of our inspection the ventilation was of course perfectly disorganised, and the following quantities of air circulated on the 8th of May:—

In the main tunnel, inside Western Junction, through last stenton, between Nos. 1 and 2 H, 2,160 cubic feet. Notwithstanding the deranged state of the ventilation, *no gas whatever* was detected in *any* of the bords off Nos. 1 and 2, *none* in the bords off 3 and 4, a trace only in No. 3 heading face, none in Nos. 5 and 6, and none in the western workings.

The bodies found in No. 2 heading were, so far as the Commission could discover, unscorched.

The props for three or four bords down this heading showed evidences of scorching contiguous to the roof. Between Nos. 5 and 4 bords no evidences of flame are visible in the main road, nor were some loose props disturbed. Cut-throughs connected Nos. 1 and 3 and 5 and 4 bords. Actual flame had travelled through these cut-throughs, charring the props. In No. 1 bord, opposite the cut-through connecting that bord with No. 2, a fierce fiery blast, probably due to accumulations of coal-dust, had kept charring the props, displacing some empty skips that were in the road, and depositing a thick layer of fused dust on the skips and props.

Western Section.

The return airways passed down the headings in (B) workings and across the dyke, and following the arrows passed over the Western Road.

The trap-door that separates this road from the return has been tilted up and jambed against the roof. *The planks of the air-crossing* have been broken down, destroying the crossings. A large fall of stone rests on the top of a train of skips contiguous to it.

The door-frame towards the face of the western tunnel is tilted inwards, while the door, smashed, lies —— yards on the out-bye side. No other damage was done to the workings in this section. The bodies of the victims were found on the main road, as if in the very act of effecting their escape.

Findings.

Your Commissioners, after repeated and minute examination of the district affected by the explosion, and having given due consideration to the evidence of witnesses of experience, skill, and erudition, have unanimously come to the following findings:—

Firstly.—That, in their opinion, the accident was caused by an explosion of marsh or of light carburetted hydrogen gas that had accumulated at the face (or between the face and the last stenton) of No. 2 heading in the Hill End district. The explosion was confined to this district, and there is no direct or indirect evidence of any other explosion having occurred elsewhere. *Secondly.*

Secondly.—That the immediate or exciting cause of the explosion was, in all probability, the flame from an overcharged shot that had apparently been fired by the man Westwood, or his mate, in the coal on the top of the “roll,” in the face of No. 2 heading.

Thirdly.—That the explosion was intensified and the force increased and transmitted to distant parts of the district by the presence in the atmosphere of the mine of coal-dust in a minute state of division.

Fourthly.—That the person or persons to whom blame is attachable for this disastrous accident is the man Westwood, or his mate (both deceased), who at the moment were working at the face of No. 2 heading, and who prepared and fired the shot, which, in the opinion of the Commission, *was the immediate or primary cause of the explosion.* The Commission are, however, of opinion that the deputy, Robert Millward (deceased), Richard White, overman, and to a less extent (except in the matter of providing bratticing, for which he was alone responsible), Alexander Ross, manager, were guilty of contributory negligence.

The Commission are firmly convinced that the carelessness, want of skill, and the loose and perfunctory manner in which the principal operations in this mine were performed by the majority of the men, and countenanced by at least the overman and deputies, were intimately connected with, and led up to, the occurrence of the final catastrophe, whereby by the direct negligence of probably one man eighty other men lost their lives.

The circumstance that a shot had apparently just been fired in the face of No. 2 heading, where gas was issuing, and that this shot had not done the full amount of its duty (the coal had not been blown down to the bottom of the hole—the bottom portion of the drill could be felt)—that Westwood, the man who at the time worked in that heading, was found dead in the stenton, where he must have taken refuge,—is pretty conclusive proof that the shot had partially blown out or been overcharged, and that Westwood fired it.

In connection with these findings the Commission desire to make the following observations:—

The examinations of the mine convinced the Commissioners that the opinion as to the seat and course of the explosion expressed by some of the mine managers and others, such as Mr. Inspector Rowan and Mr. Inspector Dixon, Messrs. Jones, MacCabe, Evans, Green, and Williams (*vide evidence*) was a correct one.

In the course of the evidence opinions were expressed by several of the witnesses (none of whom had any direct experience of previous explosions) that distinct and separate magazines of gas had exploded in the old bord at A and B on plan No. 5, and that these increased the effects of the original explosion in No. 2 heading. These witnesses had evidently been puzzled to account for the different effects produced in various parts of the mine—of damage in the main flat and in the western workings, and almost no appearance of a blast in parts of No. 1 and No. 2 headings or in the Hill End return,—and had, without special investigation or careful examination, endeavoured to discover a cause by enunciating the above hypothesis. The untenable nature of these opinions was at once apparent to those who had intelligently examined the condition of the mine and the effects of the explosion. In the first place, the abandoned bords at A are off No. 1 heading, in which a very strong current of pure uncontaminated air circulated—one of the bords was stowed up (*i.e.*, filled full
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of rubbish); the other was patent, but contained no gas. (See evidence of R. White, Question —). None of the bords off No. 1 appear to have given off gas. Had this been the scene of a separate explosion from transmitted flame the stoppings opposite this bord (marked on plan) would have been demolished and blown into No. 2. On the contrary, they have been disturbed by a force in No. 2, which partially forced them into No. 1. There is no evidence of an explosion having taken place here—no charring of props—no deposition of charred dust or coke—while two delicate plumb-lines hanging from props in the main tunnel (adjacent) do not show the slightest sign of actual contact with flame. The same remarks apply to the bords at B. At no time did an explosive atmosphere pass these bords. They are ventilated by the return air, and being lower than the headings Nos. 1 and 2 they are unlikely places for gas to accumulate or lurk. These bords are partly stowed with rubbish. The stoppings in front of them are intact; there is nothing in the surroundings to lead to the suspicion of a separate explosion, or to warrant such an hypothesis. Considered in any aspect it is untenable, and the Commission are convinced that separate explosions, though possible under certain circumstances, did not occur here. On the other hand, however, the evidence that the explosion originated in the face of No. 2 heading is conclusive. Gas constantly issued from Nos. 1 and 2, and on two occasions immediately before the accident it was elicited in evidence that the quantity had increased. The Commission perceive a reason for this in the occurrence of the disturbances of the floor referred to (from which gas issued freely), and the distance that the face of the headings was before the current of air (28 yards) only five days before the catastrophe. Morgan, a wheeler, was requested by Scott, a miner of some experience, to raise his open lamp and hang it on the inside of the “danger-board” on No. 1 (this being a distinct violation of Mr. White’s orders), for the purpose of giving more light to fill a skip that he was then loading from a bord he had commenced. The result was that a sheet of gas lurking near the roof lit and flamed backwards, but was soon extinguished. It does not appear, however, that this circumstance was reported to Mr. White.

The Commissioners are convinced from the evidence that the greatest recklessness, amounting to culpable negligence, was the characteristic feature of the system of working practised in this mine. The use of open lamps in bords off No. 2 heading, which were supplied by air fouled by gas from 1 and 2 headings, was undoubtedly an error of judgment.

The *orders* of Mr. Ross in respect to shot-firing were to some extent in accordance with the practice pursued in fiery mines, viz., that such firing should be done by deputy only. The circumstance that no deputy was appointed during the night-shift clearly shows that Mr. Ross must have been aware that this rule could not have been closely observed, nor does it appear that in the absence of a night deputy he engaged, or instructed, or paid, the special men then engaged driving these headings how or when to do so. So far as the Commissioners could ascertain, the shots were fired at any time during the shift; but it would have been a salutary precaution if, before shots were fired, the men had been withdrawn from the mine, and that no iron or steel tools had been used for charging the shots.

In this the Commission consider the management, especially that of Mr. White, censurable. The method of preparing shots in this colliery deserves the strongest condemnation. This has been proved by the deplorable sequel to long-

continued

continued indifference. We feel that it would be wise for the common safety to impose severe penalties on all engaged in underground operations in respect to this part of their duties.

The Commission were somewhat surprised to find that only in some cases, and this by the more thoughtful and skilful miners, was the coal thoroughly undercut and "nicked" preparatory to using explosives. This they consider should be made obligatory. They feel convinced that no experienced miners would attempt to work coal in the unworkmanlike manner that some of the men seem to have pursued.

An unfortunate practice has almost become general among miners in the Colony, viz., of blasting coal out of the solid instead of pursuing the more skilful method of thoroughly undercutting, nicking the sides, and perhaps of wedging down the mineral. The practice is known by the name of "Cousin Jack," and with advantage could be eradicated. In the present condition of Colonial coal-mining it would perhaps be impossible for an individual manager to prohibit the practice, but where gas exists it is clearly the bounden duty of any manager to risk a strike rather than permit such a pernicious and unworkmanlike custom to be pursued. As a consequence of failing to undercut and nick, the coal is likely to bear the strain of the powder longer than the stemming or tamping, the result being a "blown-out" or a partially blown-out shot. In this event a tongue of flame is ejected from the hole, which would be prolonged by the ignition of the small coal tamping. In event of gas being present in air where dust in minute divisions floated, a very serious explosion might by this means be the result. Indeed, in some of the most disastrous of recent explosions in Great Britain it is doubtful whether the most active agent was not coal dust alone.

Most disastrous effects have been observed where gas was not discovered before or after an explosion, and evidently due to a dust-laden atmosphere in a favourable condition for ignition.

The exact part that coal dust plays in an explosion has not as yet been clearly defined, but the following points have been ascertained:—

- (a) The effects are in direct proportion to the state of division in which it occurs, and to its chemical composition.
- (b) The effects are proportioned to its condition, and the condition as to dryness and temperature of the mine.
- (c) In the presence of even an insignificant quantity of gas it very materially augments or increases the force and after-effects of an explosion. It increases the intensity and length of the flame, and may transmit flame and explode accumulations of gas in distant situations, although no gas existed between.

The scorching of organic substances and the production of coke and carbonic oxide and gases inimical to life after an explosion is very largely due to the presence of coal dust.

The Commission therefore feel that to the absence of proper precautions as to thoroughly nicking, undercutting, and preparing shots, and probably to an error in judgment in gauging the amount of the explosive, the loss of life at Bulli Colliery is to be attributed.

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It is difficult to believe that the general practice pursued of tamping shots with small coal, and of using patent fuse for conducting the fire to the explosive, could be unknown to at least the overman, Richard White. The equally dangerous and reprehensible practice of lighting touch-paper by tilting the flame of the safety-lamp against the protecting gauze must have been observed and known by that official, who, from his long experience in looking after the safety of men under his charge, ought at once to have caused the discontinuance of these practices. In this Mr. White is to blame, while the conduct of the men, some of whom were well aware of the extreme danger incurred, is viewed by the Commission as being extremely reprehensible.

It must also have been known to at least a section of the men that on more than one occasion the fuse attached to shots was lit by the flame of a lucifer match. For neglecting to report this reckless and dangerous circumstance some of the workmen have displayed a callous indifference for consequences that would seem to demand severe censure.

The coal dust found in Bulli Mine existed in the condition favourable for an explosion. The mine was dry and warm, and the dust abundant. (For analysis of this dust, *vide* Appendix 10.)

The Commission can excuse the officials and those engaged in the mine of knowing little of the danger arising from coal dust in the atmosphere of the mine, seeing that the subject has only of late years engaged the attention of the scientific bodies in Great Britain and Europe—indeed they would desire to commend the manager in his endeavour to rectify the evils of dust by watering the main roads. Had this practice been extended to the face and thoroughly done the probabilities are that the Colony would not have had to mourn the occurrence of a disaster unparalleled in the history of Colonial mining. They cannot, however, excuse either officials or the men for the perfunctory and dangerous practices narrated.

The Commission must on another subject express their opinion in words of rebuke. These headings had given off gas for over eighteen months, but no attempt was made to sweep the gas from the face by special means, such as are generally adopted in mines where gas is generated. The management, even when the ventilation was weak, did not direct the current to the face, but relied solely upon the stereotyped number of cut-throughs provided for in the Act. The consequence was that the air in the headings in advance of these passages was stagnant, and served as a permanent reservoir for gas. This was manifestly wrong, and betrayed great indifference or callousness for the safety of the workmen and the mine. The Commission believe that Mr. Ross had a sincere regard for safety, but that both he and Mr. White were lulled by the strong and ample ventilating current obtainable since the new furnace was started, and depended solely—and perhaps too much for security—on the strength of that current. But this is no reason or excuse for neglecting to use bratticing from the last stenton, and so remove the gas as it issued. Had this been done, the difficulty of placing cut-throughs on the top of “Rolls” would have been obviated, and no gas would, in all probability, ever have been seen.

The Commission are further of opinion that Mr. Ross issued instructions to his overman and deputies to lock all lamps; but that for some cause, and unknown to Mr. Ross, this order had not been strictly carried out for some weeks preceding the explosion. At the same time the Commission are fully aware how very difficult

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it is to get subordinates to carry out orders in their integrity. Some ill-feeling appears to have existed between a section of the men and the deputy, Millward, appointed after the resumption of work in February, 1887. The witnesses ——— explained that on their resuming work, the deputy, in obedience (no doubt) to orders, locked their lamps, and on being asked where they were to get them relit, in event of their going out during their shift, Millward is *alleged* to have replied that he would leave the key at a certain point, as apparently had been the custom prior to the strike, and with the old deputy; but struck, evidently, with the absurd insecurity of the practice, Millward, remarking that they might as well have unlocked lamps as the means of unlocking them so near at hand, is alleged to have at once unlocked them. This, it may be remarked, applied to the special men working in the headings. The Commission have some hesitation in accepting these allegations in their entirety. The deputy referred to was lost in the explosion, and they feel that he alone could explain or meet these charges, yet they can see nothing in the circumstances of the practice pursued subsequent to the strike that differ from that prior to that occurrence. It was manifestly easier for the men to retire outside a danger-board, a few yards off, and there relight a lamp, than to retire to the main road, as was the practice before the new furnace was lit. Reducing their labour and inconvenience was surely no cause for complaint.

With respect to the locks on these lamps. The safety-lamps used were the old fashioned "Davy." The bottom or lamp screws into a brass ring supporting the gauze, and the *lock* is merely a small pinching pin or screw on the side that jams into the thread of the screw attaching the gauze. This, however, affords no real security, as the end of a knife, a flattened nail, or almost any instrument is sufficient to undo the lock. Unless unscrewed (and no sane man would do so in the presence of gas) an unlocked is just as safe as a locked lamp, and if a man is determined to infringe the regulations the locking of this type of Davy lamp by officials offers no impediment. There is no evidence that immediately prior to the accident any safety-lamps had been unscrewed, and that this condition of the lamps in any way contributed to the accident. The unlocked condition of the lamps, however, constituted one of a long series of loose and unsatisfactory arrangements and conditions that, as has been remarked, led up to the loss of many valuable lives.

Two witnesses, Beckton and N. Hobbs, stated positively that a lamp issued to them wanted the top part of the gauze, that in short it was not a safety-lamp, and that they showed this to Deputy Crawford, who replied that he could not procure gauze. The Commission minutely investigated this serious charge. Deputy Crawford positively denied the statement, and neither Mr. Ross nor Mr. White ever heard of the circumstance. The witnesses (N. Hobbs and Wm. Beckton) did not favourably impress the Commission, who are inclined to place no importance on the statements of these men. This they believe *did not* occur. If, however, this had occurred, the men would have been guilty of infringing the 16th special rule by taking, or working with, such a lamp, and their having done so (endangering the lives of their fellow-workmen) should have been met with severe punishment.

The practice of permitting workmen to carry lucifer matches, and to use tobacco in a district where gas was given off and safety-lamps were used, is unusual, and is another link in an already long chain of lax discipline and loose and reprehensible practices. Such offences the Commission feel can only be put down by a
stringent

stringent provision sanctioned by Parliament. The lives of all in such a mine are dependent upon individual actions, and it is outrageous to suppose that all men are alike careful, unless compelled by stern discipline and the certainty of summary punishment.

The Commission are surprised that in a mine where so little regard was paid to safety, and where men were permitted and did smoke, in the immediate vicinity and aware of the danger, that a serious accident did not occur from causes other than an overcharged shot.

Mr. Inspector Rowan appears to have visited the mine with regularity, and to have performed his examination in a thorough manner. His statements as to the quantity of gas seen during these inspections is most explicit, while his truthfulness cannot be impugned. His evidence certainly differs materially from that of the majority of the witnesses, but it perfectly corresponds to the statements in his reports. (See Appendix 6.) It seems to have been Mr. Rowan's custom in going through the mines under his charge to ask the men whether they desired to make any complaint. This is perhaps not a usual custom, or one to be commended in Inspectors, but it is certainly one that ought to bring under the Inspector's notice any condition of the mine which, in the opinion of the men, ought to be remedied. He asked the men in Bulli Colliery *whether they had any complaints to make. They had none.* In his various inspections he only observed *traces* of gas in these headings. It may be that during these visits the face of the headings were clear of "rolls," or they were not far in advance of the stentons, and if so, naturally the minimum amount of gas would be given off. It was clear to the Commission that Mr. Rowan had thorough reliance on the large amount of ventilation that was available, and that he disregarded the insignificant quantity of gas in the headings. He did not consider the effect of dust in event of an explosion, and for this he may be excused and exonerated. Mr. Rowan hearing no complaints from men (naturally ready to complain) was seemingly unaware of the reckless manner in which their various duties were performed. He does not appear to have suggested the use of brattice, probably because he did not suspect danger. Had such a suspicion occurred to him, the Commission feel that he would not have hesitated to have brought the necessity of bratticing before the Manager.

The evidence of several of the men—McKenna, Nicholson, Hobbs, and Beckton—went to show that for some time they were aware of danger, but that they believed that rule No. 6 of the Company's terms of engagement precluded them from reporting anything to the Manager. The Miners' Secretary, J. B. Nicholson, who had not been re-employed since the resumption of work in February last, made a remarkable statement, viz., "That he was informed of extreme danger existing for a fortnight before the accident, but had taken no action."

This person aims at being a leader and adviser of the men. One of his duties is to bring complaints before the management, and the Commission believe that in this he seldom failed in performing it. Not being employed by the Company, he certainly was not bound by rule 6; he, at all events, was free to complain. He knew of the dangerous state of the mine, and he believed it would end in disaster, and he did not even warn his fellow-labourers whose avocations led them daily into the mine, but permitted them to carry on their labours in blissful ignorance of their
danger

danger. Rule 6 reads as follows :—“Any employee interfering in any way with the orders issued by the colliery manager or his overman for regulating the work of the mine shall be liable to dismissal without notice.”

The rule is in exact consonance and in perfect harmony with the 18th special rule. By these the men were bound to report—they did not do so, neither did they report to the Inspector. It seems incredible that men could work, or permit others to work, under obvious conditions of danger and not take advantage of their privilege to report that danger. Rule 6, in plain English, repeats the words of the special rules, and, when read in connection with No. 5 rule, was evidently only intended to maintain strict discipline and the authority of the management. The Company declare by this rule that they would not permit any of their employees to interfere with the orders of their Manager. Nicholson informed the Commission that the men objected to this rule to the Company's secretary. On being pressed he admitted that the objection referred to the whole of these engagement rules. The Commission can readily understand how the secretary of a Union that wielded so much influence over men would object to rules that were intended to emancipate the Manager from the control of outside organisations or influences. They are unable to comprehend how intelligent men could permit themselves to be persuaded to display so much pusillanimity, and to pervert or torture the words “That any interference with the orders of the Manager” into meaning that they must not report danger, especially as they admitted that no orders had been issued by the Manager to the effect that men were *not* to report danger, and that they did not ask the Manager whether rule 6 would bear the interpretation given it by Nicholson and others.

In view of the circumstances that the rule was in accordance with the special rules, and that no Company's regulation could or did attempt to override the provisions of these rules, that no complaints were made to Mr. Rowan when he requested the men to do so, the Commission are of opinion that the men or Mr. Nicholson did not misinterpret rule 6, or were under any dubity as to its real meaning. Mr. Nicholson's conduct (who did not come under the operation of the rule), if he really did know of danger and took no steps to communicate with the Inspector, the Minister for Mines, or his late fellow-workmen, betrays an obliquity of character that they sincerely trust is uncommon in the Colony, and will meet with censure that it so deservedly merits.

The course taken by the explosion has been as follows :—

The gas exploded in No 2 heading inside the stenton, expanded, and with lightning speed passed downwards. Had it been pure gas, the probability is that the major portion would have shot through the stenton into No. 1 against the air, but the explosion being in all probability due partly to gas and partly to coal dust it split at the stenton—one portion passed into No. 1, licking up what gas lurked there, and rushed down the heading, shooting into each bord where expansion was possible. At No. 3 bord a portion left the heading, and passing into that bord ran against the current of air coming through the “cut-throughs,” and again entered the heading. The portion that passed through the diagonal road wrecked the skips that at the moment were passing through, and destroyed the door. The portion that passed down No. 2 heading partly swept into No. 3 bord and through the cut-throughs to No. 1 bord, where its track is visible by the singed and charred props and deposits of coked dust on the skips and timber. Directed into No. 2, it joined the current from No. 1, and its intensity and vigour being increased thereby, it carried the horse
attached

attached to the skips at the diagonal road down into the main flat, where it lay at the date of our inspection, and with redoubled energy forced four men and a horse at the time standing on the flat through a stopping and 30 yards into the main returns. The slight impediment offered by this frail stopping was sufficient to divide the current. A portion passed inwards, did some damage to the skips on the main flat, and killed a man and a boy, and expended itself at the face. The other portion rebounding back the main tunnel, forced some of the stoppings and knocked out the weaker sets of timber, permitting the superincumbent weight of rock that rested on them to fall on the strong hauling ropes, thus bringing great pressure to bear diagonally on the adjoining sets, which yielded to the weight and were drawn down in quick succession. On passing under the old air-crossing the compressed air forced the planking upwards, and produced the blast seen at the mouth of the adit.

The first belch of soot and rubbish from the tunnel probably indicated the effects of the explosion; the second and less forcible blast was most likely caused by the outside half of the fall in the main tunnel, while the fall of the inner half would have the effect of restoring the course of the ventilating current, and to send a blast of air back into the workings.

The Examiner of Coal-fields visited this mine on the 16th of March, but, although in the vicinity, did not inspect the Hill End district. He was informed by Mr. Rowan that he would probably observe no gas there, and this is quite in accordance with Mr. Rowan's statements and his official reports. The object of the Examiner's visit was not to inspect but to report upon a section of coal in the Western District leased by the Company from the Government. It is somewhat unfortunate that he did not thoroughly perform his mission by visiting the face of the main tunnel and Nos. 3 and 4 headings, which in some of the plans are shown within Government lands.

Mr. Mackenzie, at the last hour of the inquest, after he had thoroughly inspected the mine, gave his evidence, and enunciated an hypothesis as to the cause of the explosion.

Before giving his evidence to the Commission, Mr. Mackenzie again inspected the mine. This visit confirmed the views expressed by him at the inquest, and he endorsed that to the Commission. His views are given in his reports to the Department, dated 30th April, 1887, and his supplementary remarks to the Commission, and will be found in Appendix No. 8.

Briefly, Mr. Mackenzie contends that there were two explosions: The first originated about the bend of the main tunnel, which blew down the roof and caused the long fall on that roadway; and the second, and in consequence of the first, occurred at the face of No. 2 heading.

The Examiner bases his hypothesis upon the circumstance that from the central point, indicated E on plan, the props are lying in two directions, one section being inclined to the outside, and the other to the inside, and that the western door is driven 30 yards in-by, and smashed from a force coming from the outside and that, in his opinion, the cause of that fall was an explosion of powder or dynamite.

The Commission, taking a comprehensive view of the accident, and the condition and state of the plant and the mine, fail to perceive the slightest grounds for this opinion of the Examiner.

Explosives,

Explosives, if successfully fired on a main road, might cause the destruction of one or two sets of timber, and so bring about the damage narrated, there being nothing to bind the sets of timber together; but the fracture or displacement of one or two sets by the passage of intensely compressed air would cause the same damage. The suggestion of explosives, infers malice of no ordinary kind; it also means that they were placed there and fired in a busy road during the busiest period of the day. No one came out of the mine for at least one and a half hours before the accident, so that the culprit who intended to entomb scores of his fellow-workmen must have perished by his own act. There is nothing remarkable in the conditions of this fall; it differs in no way from other falls that may be seen every day in mines. There is no proof that it occurred anterior to the explosion, *because* the planks of the air-crossing were tilted up by the compression of air, that a violent force from within could alone cause.

The damage to the *western door* may have been caused by the fall; it is much more likely, however, to have been occasioned by the instantaneous expansion of the blast when rushing past this junction, or by the *recoil* that occurred, and that always occurs after an explosion.

Mr. Mackenzie considers that it is necessary for his hypothesis that the large fall inside the Western Junction should have occurred prior to the fall in the tunnel, and that this increased the pressure on the western door. He, however, does not state what caused this fall. An examination of it shows that it occurred after the explosion and the passage of the soot.

How the accident to the tunnel could cause the explosion in No. 2 heading is somewhat obscure.

A force travelling inwards with rapidity would impinge against the door in the main tunnel between Nos. 1 and 2 headings and force it inwards. The contrary is the case. It would then pass into the tunnel face with undiminished force. This, however, it did not do.

The Commission fail to discover cogent reasons to support this remarkable proposition of Mr. Mackenzie, or any circumstance that can justify the enunciation of such views.

The damage done to the plant in the mine is insignificant; greater damage is frequently occasioned by one of the ordinary accidents incidental to mining. It certainly bears no comparison to the great destruction of life. This, considered in connection with the position in which the bodies were found, clearly indicates that the direct effects of the explosion killed very few (if any), and that warning was given to the men who, with a common impulse, ran to the main road, and were there met by the poisonous gas resulting from the explosion and the distillation of dust, which instantly suffocated them while in the act of effecting their escape. The total annihilation of life was entirely due to the small area opened up and the contiguity of the men to the course of the blast. No wastes existed wherein the force of the explosion could expend itself, it being confined to the narrow strip of working where the men were actually engaged.

RECOMMENDATIONS.

RECOMMENDATIONS.

1. The Commission consider that in all mines where gas exists the course of the air should be directed to sweep along the working-faces; in mines worked by Pillar and Stall, bratticing must be resorted to to carry the gas from the face as it issues, and so prevent any accumulation of explosive gases or of gases inimical to life. In cases where gas exists it would be better that no bords should be broken off the back or return heading or supplied with air fouled by dangerous gases. The panel system of working by confining and localising districts, or some modification thereof, might be pursued with advantage.

Of all known systems of mining, Longwall, by supplying a strong sweeping ventilation along the face of the workings, offers the best security to the miner. A modification of the Pillar and Stall (say the "wicket system") may, under certain circumstances and conditions, secure perfect ventilation of the face without the use of brattice (which is liable to injury), but it is very doubtful how far such modification could be permitted under the provisions of the present Coal Mines Regulation Act. This Act evidently only anticipated *one* system of mining.

2. Where safety-lamps are necessary—gas being present for (say) one month after being found in dangerous quantity—they should be securely locked by a man duly appointed, and tampering with them must be punishable by a simple and inexpensive process of law.

3. Where gas exists, and no provisions are made for its constant removal, no shots should be fired, and, where permitted in a gassy mine, shots should be fired only by a man specially appointed, and at such hours when the miners are not within the mine. All shots should be tamped by stone well damped, and only copper or wooden tools should be employed. As far as possible the use of explosives should be discouraged, and skilful mining encouraged. Danger-boards should be placed further from the faces from whence gas issues (say), where practicable, 50 yards.

4. Where safety-lamps are used, and the obligation is laid upon the men to cleanse the same, all examinations, tests, and repairs to these should be done by the owners.

5. Where safety-lamps are used the lock should be of such a character as to prevent any workman opening it. If the "Protector" type of lamp be employed the necessity for a lock is the less necessary, as the unscrewing of this type of lamp extinguishes the light.

6. The Commission would not insist upon a barometer being provided at each mine. Experience has proved that this is a tardy index to atmospheric conditions. Serious changes in the atmospheric pressure occur, and are felt before they are indicated by a barometer.

7. A measure of safety may be found in the use of high explosives combined with wet tamping, or, still better, water cartridges, instead of powder under any of its modifications. Encouragement ought also to be given to the use of patent multiple wedges and appliances of a like nature, for supplanting the use of explosives. Under all circumstances and conditions some provision should be adopted for compelling workmen to thoroughly undercut, shear, or nick, and generally to work the coal as directed by the Manager.

8. Where dust exists in quantity, and under conditions favourable for ignition, it should be periodically and sufficiently damped by water.

9. In gassy mines the Manager should be specially competent, and one possessing a thorough knowledge of the principles and practice of mining, the properties of gases, and systems of ventilation; and, above all, he must be prudent and cautious, yet resolute, possessing sound judgment. He must have absolute and supreme control over the whole operations, and of the men within the mine, to maintain rigid discipline, and be perfectly free and untrammelled by any outside influences. The competency of a manager should be certified by an examination before a specially-appointed Board. The Commission consider that better results may be obtained if such examinations be oral, and probably assume a more practical form than those hitherto conducted in Great Britain for the same object.

10. The Commission do not approve of removing any responsibility from the management by increasing the power or number of the Inspectors. The visits of these officials should, so far as possible, be visits of surprise.

11. The Commission feel that the 4th clause in the present Act, relating to the spacing of cut-throughs, should be amended—to admit of any convenient or safe system of mining being pursued. This is a matter of detail that would be better out of the Act. The Commission would advise that the word should not occur at all, and that, if bratticing be used, or the air by some other satisfactory device be conveyed to the face, scope would be given to Managers to introduce systems of mining adapted to the circumstances of each particular coal-seam, with advantage to all concerned.

12. Complete sets of daily-report books should be provided, and kept in the mine or office, to be overlooked by the Inspector during his periodical visits.

13. Infringement of the regulations by either party should be followed by a summary form of justice, instituted before two Magistrates.

In conclusion, the Commission are well aware that no matter how stringent the regulations, or perfect the discipline, in a mine, or however strictly the industry may be fenced in by Acts of Parliament, accidents will happen.

Where gas exists the safety of the whole workmen is dependent upon the care and attention with which every individual deports himself. The lives of all hang on the actions of an individual, and the momentary carelessness of one may imperil the lives of those observing the regulations. It is impossible to suppose that men will not attempt to deviate from rules obviously necessary for the safe conduct of a mine. In such cases accidents must and will happen, which no Act of Parliament, skilful management, or human foresight can avert; but it is none the less necessary to frame regulations for the preservation of human life, and to maintain the observance of these, while strict and close discipline will certainly decrease the risk or number of accidents; and for this reason they should be rigidly enforced. Harmony and a community of feeling on the part of and between employers and employed would materially contribute towards this end.

The investigation of the accident at Bulli Colliery, with the object of ascertaining the cause of the deplorable loss of life that occurred, has convinced the Commissioners that the accident was due to lax discipline and reckless indifference on the part of the men and colliery officials that they were not prepared to discover

in a mine so long known and so high in popular estimation. They have endeavoured to expose the salient features of the points that require remedy, and that undoubtedly led up to the accident. This duty they have performed with much regret, and have expressed it fairly and dispassionately, yet fearlessly. They hope that the deplorable accident that necessitated this Inquiry, and the unworkmanlike and unsatisfactory practices that it has been their painful duty to expose in this report, will show the necessity to all engaged in mining pursuits and prove an incentive to mine managers to introduce at once precise and workmanlike systems of mining and of thoughtful regulations calculated to protect life and property, and to maintain these by strict and inflexible discipline. The Commission feel assured that, by closely observing good discipline and by pursuing correct and precise systems of mining, especially if backed up and aided by the hearty co-operation of the more thoughtful employees, disasters similar to that just investigated will, under the favourable conditions existing in this Colony, be rare, if not altogether averted.

JAMES R. M. ROBERTSON.
J. Y. NEILSON.
JOSEPH HILTON.
THOMAS CROUDACE, M.E.
JOHN OWENS.
JOHN JONES.
GEORGE O'MALLEY CLARKE.

Witness—AUGUSTUS VIALOUX.

Sydney, 12th July, 1887.

BULLI COLLIERY COMMISSION.

MINUTES OF EVIDENCE.

TUESDAY, 10 MAY, 1887.

Present:—

DR. ROBERTSON, M.D., F.G.S., C.E., PRESIDENT.

MR. G. O'MALLEY CLARKE, S.M.,
MR. NEILSON,
MR. J. OWENS,MR. CROUDACE,
MR. J. JONES,
MR. J. HILTON.

Alexander Lang sworn and examined:—

1. *President.*] What is your occupation? I was weighman and screen overseer at the Bulli Colliery. Mr. A. Lang.
2. How long have you been employed at the Bulli Colliery? About seven or eight years I think. 10 May, 1887.
3. Have you been employed during that time in the same capacity? Yes, I think I have been since they commenced to earn the coal.
4. Are you conversant with the internal workings of the mine? No, I cannot say I am.
5. Your duties have not called you into the mine? No; that is, very seldom.
6. Where were you at the date of the accident? I was outside then.
7. Do you recollect the day on which it occurred, and the time? It was about half-past 2 o'clock on Wednesday, the 23rd of March.
8. Where were you at the time? I expect I would be about 7 or 8 yards from the tunnel mouth.
9. How were you apprised of the accident? By the quantity of stuff coming out of the tunnel—a rush of vapour, carrying dust and chips, as if there had been a fall which caused a sudden rush of air.
10. Did it come out with some force? Yes.
11. How far did it drive the chips and dust you speak of? About 7 or 8 yards I think.
12. Did that recur? Yes, there were two of them, the second coming with less force.
13. What interval was there between the two? It was a matter of seconds; I think, perhaps fifteen or sixteen seconds.
14. Then after the first burst or discharge of rubbish, did you remark any return of the air or recoil? No, sir.
15. There were simply two discharges? Yes.
16. Did it make any noise? Yes.
17. In what way? The way I would describe it would be that a set of skips had come away from Hill End. That was my impression at the time.
18. Then the report was loud and distinct? Yes.
19. What occurred to you when you observed that? Well, after I saw it I got out of the way for fear a set of skips should come out.
20. Did you apprehend any danger? Not unless the tubs ran out.
21. When you saw the chips and rubbish forced out of the tunnel mouth as by a blast, did it not occur to you that an accident of a serious nature had happened? No, not until I had found that no tubs were coming out after it.
22. What proceeding did you take then—what did you do? I went to the tunnel mouth with my mate and saw a lad coming out. It was Herbert Cope, and he was calling for his mother.
23. What were his duties in the mine? He was a driver from the bottom of the Hill End incline.
24. Then what did you do after that—did this lad apprise you of the accident? No, I do not know what he was saying; he was in a very excited state. When we got him away two or three men got ready to go inside the mine.
25. Did you observe whether he was injured in any way? I believe he was injured; he could hardly walk and was staggering about.
26. Was that from fright or personal injury? From personal injury I should say.
27. Did you question him on the subject? No; but when I took him into the office he seemed to get worse, and blood came from his mouth; I thought he would not live.
28. He had been knocked down apparently? Yes.
29. What men came to your assistance? M'Dowell came first and helped me to carry the lad in. Then Hope and Scott and other miners came; also Mr. John Chalmers, the engineer.
30. Then yourself, Mr. Chalmers, Hope, and Scott proceeded into the mine, I suppose? Yes; Hope and Scott went first, and, as soon as we got the lamps, we went in with them.
31. Was it you who apprised them of the accident? No; I do not know who it was. They were going to work at the time and found that there was something wrong.
32. Very well; give us your own story as to what you did after you entered the mine? After we entered the mine the first thing I came across was some slabs of the overcast near the mouth of the tunnel, and when we got within some distance from the bottom of the Hill End incline we could not get any further on account of the bad air.
33. Did you notice any falls? No, we did not come to any serious falls then.
34. How far did you go in? We went in over 300 yards at first, and found some stoppings blown out. We put those stoppings up and then got to a fall which prevented us from proceeding further. It appears now that the distance to the fall is 375 yards. Then we came back again and went up the slacky road.
- [Witness here describes the road on the plan. The slacky road is a road that diverges to the bottom of the incline towards the left.]
35. Then you made your way from this road up to the incline again? Yes.
36. And when you got to the incline, what did you observe? On the Hill End incline the road was all fallen; and having got a short distance, we had to return again, as the air was bad, and the stone was coming down freely.

- Mr. A. Lang. 37. What was the condition of the ventilation at that point? There was very little ventilation up there at that time.
- 10 May, 1887. 38. Then you came back to the slacky road? Yes; and we met two lads coming out with a horse.
39. Where were they coming from? They were coming from the grip section.
40. The grip section is a district to the left? Yes; up that road past the furnace.
41. Did you have any conversation with those lads? Very little. They wanted to know what had happened. We did not know, but told them to put out their lights and go out. We went a little further and met Mr. White, the overman, and a man named Cavill. That was before we came to the road that joins the slacky road to the tunnel.
42. Had White any conception of what had happened? Well, he knew that something had happened.
43. Did you tell him what had happened at Hill End? No. He was carrying a naked light at the time, and we thought it would be better to put the light out. We were carrying a Davy lamp. The air was taking its course along the slacky road. White said there was no danger there; but the men were not satisfied to go further with the naked light, and he went out. Hope, Scott, Mr. Chalmers, and myself went across to the Hill End road.
44. On reaching the main tunnel, or Hill End incline, had the ventilation improved? No. There was not much ventilation there; in fact there was very little after we got into the Hill End. It was owing to this that we made such slow progress. After going a short distance we could scarcely breathe at all. I had not gone much further when some other men came in; and as I did not feel well they advised me to go out, which I did.
45. When did you again enter the mine? Not until it was all over. I felt ill after I got out, and was not able to re-enter the pit.
46. Did you know of the existence of gas in the mine before the accident—I refer to what is known as fire-damp? Yes, I believed there was gas there.
47. How long had you been aware of the existence of gas in the mine? It was not till after the strike that I knew it of my own personal knowledge.
48. How did you become aware of it then? I saw it when I went in with Mr. White on one occasion.
49. In what part was this? In the gassy section—that is the Hill End.
50. The Hill End is known as the gassy section? Yes.
51. In what part of the Hill End did you see the gas? It was either in No. 1 or No. 2 heading, but I believe it was in No. 2.
52. I suppose you are aware that Davy lamps have been used for some time by a section of the men at Bulli? Yes.
53. Do you know how long they have been in use? I cannot say how long, but I know that they have been used in the gassy section since it was opened out.
54. That was some time before the strike? Yes.
55. Who used to clean and light the lamps? A man named Metcalf did before the strike.
56. To whom was that duty delegated after the strike? I do not know that there was anyone.
57. Was no one appointed to that duty after the strike? Not to my knowledge.
58. Then is that all you know about the accident? That is all.
59. Mr. Neilson.] Can you give us any idea as to the proportion of the second explosion as compared with the first? The second one you say was not so strong. Was it one-half the strength or one-fourth? I do not think it would be one-fourth as strong.
60. Then the first was much the stronger? Yes; a great deal.
61. Did you notice any smoke coming out of the tunnel? No; there was no appearance of smoke, only dust and chips.
62. Did you notice whether the air was hot at the tunnel mouth as you entered? It did not seem very hot there; but was very sharp after we got some distance from the tunnel mouth.
63. Did you not notice any peculiar smell after these discharges from the tunnel mouth? No.
64. Mr. Clarke.] Can you say what interval elapsed between these two falls or explosions? I should say fifteen or sixteen seconds.
65. When you went in after the strike with White, was it by his invitation? Yes. It was a few days after the commencement of the strike—a matter of seven or eight days after the men had gone out.
66. Mr. Neilson.] That was before the new furnace was going? Yes.
67. Mr. Clarke.] Mr. White looked for the gas, to test it? Yes.
68. Did you see much or little there? I could not say what quantity.
69. Mr. Owens.] Do I understand that you saw nothing but dust and chips when the explosion took place—no flames? No.
70. When you examined the mine with Mr. White was he aware of the presence of gas? Yes.
71. He tried for it himself? Yes.
72. Mr. Jones.] In what particular bords did you find gas? Only in No. 1 heading. I think it was a very slight quantity, and a little in No. 2 heading. But I would not be certain about the headings.
73. Mr. Owens.] But you found the gas only in the two headings? Yes; and very little in one of them.
74. Mr. Hilton.] Previous to this occasion when you went in with Mr. White, how long was it since you visited the mine? I cannot tell you.
75. Approximately? Well, it might be six or seven months. I was up there once with Mr. Ross, when he was surveying. I was employed outside the pit. I did not go inside unless some accident happened on the road.
76. Had Mr. White any particular desire for you to accompany him on that occasion? No; I do not remember how the matter came up. He asked me to go in with him. I do not think I would have gone in unless he spoke to me about it.
77. Did you see any brattice fixed in the headings to carry the ventilation to the working places? No.
78. Mr. Croudace.] You say that when you went into the mine immediately after the explosion you came across a fall? Yes.
79. And that you went round the slacky road to the other end of the platform? Yes.
80. Have you been into the mine since and seen the same fall? Yes.
81. So that what is now known as the large fall is the same as that which you saw upon first entering the mine? Yes.

82. Did you hear any rumour about a man having been blown some distance on a coal heap? Yes. Mr. A. Lang.
83. Did you believe that? No.
84. Is there any coal heap immediately opposite the tunnel that he could be thrown on? There is a dirt heap there, below the level of the tunnel. There was a man in front of the tunnel—about 7 or 8 yards away, when this stuff came out. It was on the 4-foot road. He was carrying sleepers to the tunnel to send them in to the men. He was facing the blast, and it got into his eyes, but did not hurt him. 10 May, 1887.
85. What is the man's name? Henry Bokey.
86. Is he employed at the mine now? No.
87. Can you tell us where he is? No.
88. Have you any idea of his whereabouts? No. I think he went back to Sydney.
89. You are positive as to the want of force? Yes.
90. Did you ask him to go inside the mine with you? No.
91. Why not? Well, his eyes were bad I thought, and I did not ask him. Besides, we had not lamps sufficient, as far as I could see.
92. Was that the only reason—what was the reason you did not ask him to go into the mine with you? I had no reason. Those that went in were volunteers.
93. Do you know why he did not go in? No, except that he was complaining of his eyes.
94. Have you any knowledge whatever of the conduct of a mine? I have some knowledge of getting coal. I have been fourteen or fifteen years at it.
95. Did a horse come out about the same time that the boy came out of the tunnel? No. The horse was brought out by the horse-keeper afterwards.
96. How long after? About two hours and a half.
97. Did you see the horse? Yes, I saw him that night.
98. Was there any sign of burning on him? Yes, there were signs of singeing on the tail and mane.
99. Was it on the hair of the mane and tail only, or on the rump? There seemed to be slight singeing on the tail and rump, and the mane was slightly singed.
100. *President.*] Can you account for the horse only being singed on those two isolated spots? No, I did not examine him very closely.
101. What occurred to you as to the cause when you saw the marks of singeing on the tail and mane? Well, I saw that there had been a considerable deal of heat there if nothing else.
102. Heat being present, did you consider as to whether you would have expected other parts of the horse to be singed? No, I did not think much about it.
103. Supposing that the horse was surrounded by heated atmosphere, would you consider it likely that the heat would be centralised in two spots, or be distributed over the whole body of the horse? I did not examine it particularly, nor did I think much about it at all.
104. Was the horse severely singed? Not very severely. The hair was curled, as it were.
105. Was it burned and charred over a large space? As I have already said, I did not examine the horse closely for any burning. I just noticed what I have told you.
106. Then the horse was not otherwise injured? No.
107. *Mr. Jones.*] Was not the horse standing on the road leading to the grip at the time of the explosion? I do not know.
108. Where ought the horse to stand? It should stand on the grip road.
109. Would not that partially account for the burning being confined to particular spots, with a full blast coming out of the main tunnel? Yes, it might.
110. Having a knowledge that gas existed in the mine, were you much surprised when you saw the first blast—did you readily perceive what had happened? Well, not at first. My second impression was that something had happened.
111. You say that in going round to get above the fall you met White, the overman? Yes.
112. And one of you advised him to put out his light? Yes, one of the four of us.
113. Did he put out his light? I do not think he did. He went directly out.
114. *Mr. Clarke.*] Who was in charge of the horse you refer to? The lad Herbert Cope.
115. Did he show any symptoms of burning? No, none.
116. How far in the tunnel was he when you came across him? Not in the tunnel at all, he was outside.
117. Do you know how long afterwards it was when the horse was brought out? I should say about an hour or so.
118. *President.*] You say you saw no flame issue from the tunnel? No.
119. *Mr. Jones.*] Are you quite sure that the singeing upon the horse was the result of flame? No; I am not.
120. What do you suppose caused it? I do not suppose anything about it. I am quite sure as to the singeing, but there was no burning of the flesh.
121. *Mr. Clarke.*] Was the singeing confined to the tail, or did it extend further? It was singed from the buttock up to the mane.
122. *Mr. Jones.*] On which side of the horse did you observe the singeing? I believe it was on the near side, but I did not see the horse till he was outside.
123. *Mr. Hilton.*] Can you say whether you went as far as the western junction when you went into the mine? I did not go as far. I think I went about half way up the incline. [*The witness withdrew.*]

John Chalmers sworn and examined:—

124. *President.*] What are you by profession, Mr. Chalmers? I am engineer for the Bulli Coal-mining Company. Mr.
J. Chalmers.
125. Would your duties lead you into the mine? Yes, occasionally.
126. Are you conversant with the workings of the colliery? Only so far as the main roads are concerned. I have been in the other places occasionally, but very seldom. 10 May, 1887.
127. What took you off the main roads to examine those places? Curiosity, I suppose.
128. Then it was not your duty? No.
129. When were you apprized of this accident at the colliery? Shortly after it happened.
130. About what time would that be? About twenty-five minutes to 3 o'clock. 131.

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J. Chalmers.
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131. Where were you at the time? I was on the road between the pit and the township. The first I knew of it was when the engine-driver blew the whistle, when I turned back and met some men coming down who told me that the pit had blown up.
132. Who was it told you? Thomas Bissell.
133. How was he employed about the mine? He was a spare engine-driver.
134. And he had been up in the mine at the time? Yes.
135. He told you that the mine had blown up, and you then returned. What did you do when you reached the mine? I went to the tunnel mouth, and several men there told me they supposed the mine had blown up.
136. Did they state to you what they had seen? Yes.
137. And what was the story they narrated to you? They told me that there had been a great rush of wind, and a boy had come out of the tunnel mouth.
138. Did you see the boy? Yes; I saw him through the window of the cabin to which he had been taken.
139. Did he appear to be injured? Yes.
140. Did you notice in what way? No.
141. Then what did you do, Mr. Chalmers? I told one of the men to get some safety-lamps and canvas, and I then went inside with Lang, and found that Hope and Scott, who had preceded us, had penetrated 50 yards or so into the mine. We found that the overcast was blown up, and a man was put on to fix that whilst we proceeded further in. We found a stopping blown out on the right-hand side further up going in. We fixed that up as far as we could with stone and rubbish, and a few yards further in we were stopped by a fall. That was about 300 yards up. We turned back, and having seen that the overcast was put right, we went up the slacky road, by which means we reached the main tunnel.
142. What was the condition of the main tunnel at the time? There was a lot of timber lying about, and the air was very bad.
143. Did you hear many falls? No, we did not hear many falls; but it was working in many places.
144. Then there was considerable damage done in several places? Yes.
145. What did you do next? We went up, following the air as far as we could, and found another stopping out, about 800 yards from the tunnel mouth.
146. Was Lang still with you? No; he had turned back not long before that. There were three of us, and some others were coming up.
147. What were their names? There were M'Kenna, Richards, and some others, whose names I do not know.
148. Having reached a point about 200 yards from the tunnel mouth you found a stopping blown out, did you put that stopping right? Yes. That was a stopping on the left-hand side. I went for some canvas for it, but in the meantime some other men came in and put up the stopping. We afterwards came in and put a stopping in the mouth of the western.
149. How long after the accident was that? About two hours and a half, I should say.
150. By the time you reached the western did you find the ventilation restored? Yes; it kept getting better all the time.
151. Was it very hot in the main tunnel? Not very hot.
152. Did you notice any steam? No; I cannot say that I did.
153. Was the air bad? Yes; it was very bad. We could hardly see anything at first.

[NOTE.—The witness here refers to the plan and indicates the road that the party took to reach the main tunnel; and also points to the stopping that was blown down on the left-hand side.]

154. Then you got to the western junction about two or three hours after the accident? Yes; I believe we did.
155. Before reaching that point did you see any bodies? Yes; I saw about three or four.
156. Where were they lying? They were lying between the western and the flat.
157. Did you particularly examine the bodies? No; I did not examine them at all.
158. What did you do, then? We went outside again.
159. And when did you return to the mine? On the Saturday.
160. Did you see, or observe, the horse that the boy Cope had? No; I did not see the horse at all.
161. After you came out did you see the horse? Yes; I saw it in the stable that night.
162. Why did you visit the stable—were you in the habit of doing so? No; I was given to understand that there was a horse in the stable singed.
163. Well, in what condition did you find the horse? Its tail appeared to be singed.
164. Was it singed to a great extent or only slightly? It was slightly singed, just on the top of the tail.
165. Was the singeing circumscribed or diffused—was it confined to a small area of the horse's body? It would cover about 6 or 8 inches. Only the hair was singed.
166. Was it completely or only partially charred? I did not examine it that closely.
167. Did you notice the horse's mane? No.
168. You saw it was not injured to any great extent? Yes; I did not think it was injured much.
169. Did you account to your own satisfaction for the singeing? I did not try to account for it.
170. You state that your duties led you frequently into the mine? Yes.
171. And that your duties terminated at the main road? Yes.
172. But, that out of curiosity, you had visited the workings on several occasions. Do you recollect any particular districts that you visited out of curiosity? Yes, I was in the first bord, off No. 3 heading, before the explosion.
173. Had you ever been up No. 1 or No. 2 headings? I do not think I had been up them; I have been up No. 1 heading, but not far.
174. Did the men work with safety-lamps? I understood that safety-lamps were used.
175. Were you aware of the existence of gas in that district? By report, yes.
176. Not from personal observation? No.
177. Do you know whether the lamps were regularly locked? I do not know anything about the lamps; I never used one of them.

178. *Mr. Neilson.*] Have you extended the engine plan latterly? Yes; we started the engine to run 300 yards per minute before the explosion.

[NOTE.—Witness describes on the plan the manner in which certain roads were diverted.]

179. The alterations made did not interfere with any doors or stoppings? No; we only put a tail rope through the door alongside the wall. That is all we did so far as the ventilation was concerned.

180. *Mr. Hilton.*] You know the door at the western junction? Yes; it is a door with two regulating slides to it.

181. Was that door subject to frequent openings? Only when anyone passed through, or when an engine set was running?

182. *Mr. Owens.*] You know that big fall on the right-hand side about 300 yards from the tunnel mouth? Yes.

183. Was that there when you first entered the tunnel mouth after the explosion? Yes.

184. You have been there since? Yes; there is some of it cleared away now.

185. *Mr. Jones.*] Did you carefully examine that horse? No.

186. You cannot say that there were no other burns upon it than those you have spoken of? No.

187. *Mr. Clarke.*] Did you come in contact with the men working in the gassy section at any time? I used to see the wheelers; at times I would come in contact with them.

188. Did you ever hear any rumours as to the presence of gas in dangerous quantities in that section? No; and if I had thought it was so, I would not have been there.

189. Did you ever hear any statement to that effect, or any complaint or expression of fear, with regard to gas in the mine? No.

190. Then you never heard any rumour of imminent danger? No. [*The witness withdrew.*]

Mr. J.
Chalmers.

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Herbert Cope sworn and examined:—

191. *President.*] What is your occupation? I am a wheeler engaged at the Bulli Colliery.

192. You were engaged driving a horse there? Yes. I used to drive a horse from the bottom of the incline to the tunnel mouth.

193. Were you on Wednesday—the day of the accident—at the Bulli Colliery? I was inside the mine.

194. At what point were you? I was just about half way in between the tunnel and the end of the flat.

195. The end of the flat terminates at the overcast, does it not? Yes. I was not so far in as that.

196. You would go from the tunnel to the overcast? Yes.

197. What were you doing at the time of the accident? I was following a full set of skips out.

198. Well, what did you experience—what did you feel? I did not feel anything, I heard the ropes shake first.

199. Yes, and what occurred after that? I do not remember anything else, except being knocked down.

200. Where were you knocked down? I was pushed up against a prop.

201. Were you considerably hurt? No, I was not very much hurt.

202. And you do not recollect what occurred after you were knocked down? No.

203. Did you see any flame? I saw what was similar to flame.

204. What was that? Well I cannot say whether it was flame or not.

205. Or whether it was the violence with which you were dashed against the prop? Yes. I cannot say.

206. Did you see any smoke? Yes, I saw it in front of me.

207. And a rush of dust and rubbish? Yes.

208. Then you picked yourself up and came out? Yes, and I passed the horse, which was standing in the grip road.

209. You were between the junction of the grip road and the overcast? Yes.

210. Did you notice whether the horse was injured when you passed him? I did not see the horse when I passed him. The horse was standing in the grip road in order to let the full trucks pass.

211. Then you simply picked yourself up and ran out to daylight? Yes.

212. Have you worked inside the mine? Yes.

213. In what part? In the western.

214. How long ago was that? A few months before the strike.

215. Did you wheel into the face of No. 1 or No. 2 headings, or No. 3 or No. 4 headings, or where? No; I used to be acting as trapper.

216. Were you ever in the workings of the Hill End district? No.

217. Were you aware of the presence of gas in that district? No; but I have heard of it.

218. Do you recollect the condition of the air in the tunnel when you were making your way out? No.

219. That is, further than what you have described as to the smoke and dust? Yes; that is all I noticed.

220. Do you recollect a rush of wind coming before you were knocked down? No.

221. Then you do not know what force knocked you down? No.

222. *Mr. Neilson.*] Did you notice whether the smoke felt hot? Yes, it did.

223. *Mr. Hilton.*] Did you hear any noises at all? No; I just heard the rope shake.

224. *Mr. Owens.*] Were you affected by any excessive heat? No.

225. And you would not be sure whether you saw any fire or blaze? No.

226. *Mr. Jones.*] Did you see the horse after you recovered? Yes.

227. To what extent was it burnt? Its head was a little singed round the mouth.

228. Was any other part burnt? The tail was a little singed also.

229. Was it on the side near the main tunnel? Yes.

230. And the horse was facing the mouth of the tunnel? Yes.

231. *President.*] Can you account for the horse only being singed on the head and tail? No.

232. Did you use an ordinary miner's lamp? I used a flaming lamp.

233. Are you sure the horse did not receive those singes from the flame of your lamp? Yes, I am.

234. Did you ever take off the tail chain of the horse? Yes.

235. Could not an accident in connection with that proceeding account for the singeing under the chin and the tail? No; I think not.

Mr. H. Cope.

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- Mr. H. Cope. 236. *Mr. Jones.*] You would be naturally confused at the time of the accident? Yes.
 237. And you saw no fire you say? No.
 10 May, 1887. 238. *Mr. Croudace.*] Did you notice whether the horse was burnt prior to the accident? No.
 239. And you could not say whether it was burnt before or not? No.
 240. You are quite sure the horse was standing with its head to the tunnel mouth? Yes; at least that is the way I left it.
 241. Was there any singeing upon the horse other than you have described? I noticed some on the tail and some on the mane. That was all. [*The witness withdrew.*]

Wm. Scott sworn and examined:—

- Mr. Wm. Scott. 242. *President.*] What is your occupation? I am a miner, engaged at Bulli.
 10 May, 1887. 243. How long have you been a miner? About 18 years.
 244. Where have you been principally engaged? In the north of England.
 245. In what part of the north of England? In the county of Durham, near Newcastle.
 246. Have you ever worked in mines where there was fire-damp? A little; not much.
 247. Did you ever work with Davy lamps in Durham? Yes.
 248. You are conversant with the rules and regulations applying to fiery collieries? I was not very much in fiery mines.
 249. How long were you engaged at the Bulli Colliery? I was engaged there five weeks before the strike.
 250. And since the strike how long? I worked there about a fortnight after the strike.
 251. Were you employed at the colliery at the time of the accident? Yes.
 252. Where were you employed—in what part of the colliery? In No. 1 heading.
 253. That was in the Hill End district? Yes.
 254. Were you on the day shift or the night shift? I was on the night shift.
 255. What time did you commence work on the night shift? Generally about 4 o'clock.
 256. We understand that you were proceeding to the mine when the accident occurred? I was just putting my clothes on at the time.
 257. Who told you of the accident? We heard the report of it.
 258. What was the nature of the noise you heard? I thought it was a tree falling at first. My mates said they thought it was that. We asked some men who were passing, and we then heard of the explosion.
 259. What did you do then? We got lamps and went into the tunnel mouth.
 260. What condition was the tunnel mouth in—was it full of dust and smoke? Well, it was taking the air when we got there—it was going back again, you know.
 261. Was Hope with you? Yes.
 262. You got safety-lamps before proceeding into the tunnel. How far did you go? Well, I cannot say exactly the distance. We went just over the siding points.
 263. These siding points do you mean, down to the grip? No, beyond that, on the main tunnel, at the foot of the incline.
 264. Before you come there, is there an overcast? Yes.
 265. Did you observe anything peculiar about that? No. We could see very little at that time when we went in with the Davy lamps.
 266. Was the air hot? Yes, rather hot.
 267. Was after-damp present—could you detect it? No; I could not say so.
 268. Did you think the peculiar atmosphere could be accounted for by the state of the ventilation at the time? It was very like after-damp.
 269. Could you smell it? Yes.
 270. Then, having got as far as the foot of the incline, what occurred then? Well, we stood looking round for a time. There was some timber knocked about there; and presently we saw two lights coming along. It was Chalmers and Lang. We then went up further till we came to a fall, which we could not get over. We filled up a stopping just there which had been blown out on the right-hand side as you go in.
 271. Was that fall of sufficient size to account for the interruption to the ventilation? It would doubtless stop the air a good deal.
 272. On reaching this fall and finding that you could not get over it, what did you do? I think I asked Chalmers if there was no other road up. He said there was, referring to the slacky road, and we returned and went up that road.
 273. That is the road leading down to what is known as the grip section? Yes.
 274. Then you proceeded along that heading, turned off to the right, and along the horse road? Yes; and got to the tunnel further in.
 275. Were there any falls there—at that point? Yes, there were falls there.
 276. Were they sufficient to bar your progress? No; we got over them.
 277. How far did you proceed? I should say about half-way between the top of the incline and where the skips meet.
 278. What did you observe at that point? I noticed a stopping blown out on the left-hand side.
 279. Did you repair the stopping? No; we returned for the purpose of getting the material to repair it.
 280. Did you pay any attention to the state of the ventilation at this time—was it getting better? Yes, it was getting better as we proceeded inwards as I have said; but after reaching this point we could not get any further.
 281. Then you returned to the outside? Yes.
 282. Did you again go into the workings? Yes.
 283. When did you enter the workings again? It was not long after we came out, I could not say exactly how long.
 284. Did you repair the stopping? No. The stopping was repaired in the interval by some others. We then entered the western.

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285. What condition was the ventilation in when you got there? There seemed to be more air going to the western than to the Hill End district.
286. The ventilation was restored along the tunnel? Yes.
287. And arriving at the western what did you do? Finding a door blown down at the mouth of that heading we put up a stopping to send the air down to Hill End.
288. Did you go any further than the western? No.
289. Was the atmosphere hot there? Well, it was rather hot; but cooling down greatly.
290. Before arriving at the western junction did you observe the condition of the props on the road? No.
291. Did you not notice whether they had changed in appearance? The sheaves and rollers were blown up.
292. Did you not observe whether the props were charred or coated with dust? No.
293. Did you observe any of the bodies of the miners? Yes, I saw one on the flat, and five others about the western road end.
294. Could you identify them? The only one I could recognise was Melville. I did not know any of the others.
295. Did any of your mates identify the others? A man named Wm. Joel, I believe, identified one of them. He was an engine man outside.
296. Did you closely observe the condition of those bodies? No, not particularly.
297. You did not look as to whether they were singed, or whether they died from after-damp; or as to their general condition, whether they had been tossed about in any way? No, I never examined any of them except Melville. He was a big man; and I knew him by his neck.
298. At the top of the incline did you notice anything peculiar about the skips there? No.
299. Did you notice whether they were knocked about? No, I did not take much notice, for I was not in very good fettle when I went in the second time.
300. Did you go in further than the western junction? No.
301. In what part of the tunnel or district were you employed? In No. 1 heading.
302. Do you mean in the heading itself? Yes, we were working a contract.
303. You were driving the heading? Yes.
304. As a rescuer did you enter No. 1 and No. 2 headings? On Thursday, the next morning, I did, in company with Mr. McCabe, Mr. Green, Noah Hobbs, J. Charlton, and John Wynne.
305. In going up the headings, did you examine the bords? I never was in one of the bords. Messrs. McCabe and Green were there.
306. Did you notice any of the bodies lying along the headings? Yes, I noticed sixteen or seventeen bodies.
307. Did any of your party identify the bodies? Two of them were identified—Millwood and John Westwood.
308. Where were they found—on the heading or in the bords? On the main heading.
309. In what positions were they found as near as you can recollect? Millwood was found sitting between the first and second bord by the rib side.
310. Against the coal? Yes.
311. And what positions did the other bodies occupy? Westwood was sitting by a pillar—the last that was standing between No. 1 and No. 2.
312. And between Millwood and Westwood several bodies were got? Yes.
313. Did you examine those bodies and satisfy yourself as to whether the men died from the immediate and direct effect of the blast of an explosion, or from after-damp? I did not examine them for that.
314. Millwood was in a sitting posture you say? Yes.
315. And Westwood, in what position was he? He was half sitting and half lying.
316. Where did Westwood work? In No. 2 heading.
317. And do I understand you to say that you did not carefully examine any of those bodies? Yes; I did not examine them.
318. In working in No. 1 heading did you use safety-lamps? Yes.
319. And did you strictly observe the rule of working with safety-lamps? Yes.
320. Were the lamps locked? No; only during the first two shifts, when we started to work.
321. Did you examine any of the props in the heading to see whether they were scorched or burnt in any way? Not in the heading.
322. You did not examine the condition of the heading or the prop? In the bord end we examined the props on one occasion, and found them charred a little.
323. What conclusion did you arrive at from the general appearance of the heading, and the bodies being found there? I scarcely understand you.
324. Did it occur to you that an explosion had taken place? Yes, certainly.
325. Well, that is what I wished to ascertain. As to the cause of the men's death, what conclusion did you arrive at? I thought it was through the explosion.
326. Before the accident did you observe gas in No. 1 heading? Yes.
327. Where did the gas issue from? I think it was on the Friday or Saturday before the accident, we had a roll there, and the gas issued from that.
328. In what way did it first make its appearance—did you hear it blowing? No. We saw it after trying when we got the stone.
329. Was there any quantity of gas in the heading after that? No, not in our heading.
330. Had you much gas in No. 2 heading? No; I was never in it but once. I was in the Monday night before the accident. We had a drilling machine, and a man came and asked us if we would bore a hole with it.
331. There was a roll also in the face of No. 2 heading? Yes.
332. Did you use safety-lamps while you were boring that hole? Yes.
333. Did you of your own knowledge know there was gas in the heading? No; that is, I never tried for it.
334. Did the deputy visit you occasionally while you were at work? Yes.
335. Did you have any conversation with him as to the presence of gas in No. 1 heading? No; except that after we did get it, he warned us one or two shifts after, to be careful with the lamps as there was a little gas in the face.

- Mr. Wm. Scott.
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336. Did you ever have any conversation with the deputy on his rounds as to the presence of gas in the mine? No, sir.
337. You did not report it to him? No.
338. Why did you not report it to him? Well, he knew it himself.
339. Was there a night deputy? No.
340. Can you give any reason why the lamps were not locked? No, I cannot.
341. Have you read that section of the Coal-mines Regulation Act applying to the use of safety-lamps? No, I do not think I have.
342. Are there not special rules applying to safety-lamps? Yes; I have read them since the explosion. But I never had a copy before that took place.
343. You knew you were entitled to a copy of the rules? Yes.
344. Did you not ask for one? No.
345. Why did you not ask for one when you knew that you were entitled to it? Well, I never had any rules since I began to work. There were none at the collieries I was at.
346. You see now, however, that in not reporting the circumstance of those unlocked safety-lamps, you were committing an infringement of the Act? Well, as I have said before, the deputy knew they were not locked.
347. How did he know that? He knew he did not lock them.
348. In not reporting to the inspector, did it occur to you that you were incurring an infringement of the Act? No.
349. How did you work the coal in No. 1 heading? We holed it and shot it; sometimes we cut both sides.
350. In blasting, what explosive did you use? We used compressed powder, and a fuse.
351. How did you light the fuse? With a touch, on which we canted the lamp.
352. Did you fire the shots yourselves? Yes. We sent for the deputy once, and he told us to fire the shots ourselves. He never fired any for us.
353. With what material did you tamp the shots? Sometimes small coal, and at others we used anything we could pick up.
354. Did you damp the coal? Yes, generally.
355. Did you consider that method of lighting the fuse a safe method? I thought it was safe at the time.
356. Did you ever really consider the safety or otherwise of it? Well, I cannot say that I did very much.
357. Did you ever observe the gas to fire at your heading? No.
358. Did you hear at any time of the gas having fired in your heading? Yes; I heard of it having lighted up the night before.
359. Who told you? It was my mate Hope, and the boy.
360. Who told Hope? He saw it, I think.
361. What did he tell you? Well, I was in the face, and he was away back, and he told us to keep down, as the gas had fired. When I got up it was out.
362. Where did it fire? At the wheeler's lamp.
363. Do you know at what point the wheeler fired the gas; was it inside the stenton? It was at the danger-board.
364. And with the heading so full of gas that it fired at that point, do you think it was a safe practice to light the fuse by tilting the lamp? Well, I think it would have been a bad job for us if it had fired that night.
365. You say the gas fired? Yes, but that was about 20 yards back from the face.
366. Did the wheeler on all occasions hang his lamp at the danger-board? I did not take that much notice.
367. Did you ever notice if he came in with a naked light? He never came in with a naked light.
368. How did the deputy come to the face of the heading? He often came up without a light.
369. Did you receive any extra price for working in the gassy section on account of using safety-lamps? Yes, we received 3d. per ton extra.
370. Did you receive the extra tonnage in order that you might display greater care and caution? Well, there is more difficulty in working with a safety-lamp than with a naked light.
371. Was it not a precaution against accident—so that you could take extra care and use caution? Yes, I suppose so.
372. And notwithstanding that, you adopted the plan of lighting the fuse by allowing the flame of your lamp to pass through the gauze? Yes.
373. When you were told that the gas had fired in your heading, did you make any report to the manager or overman? No.
374. Are you now aware that by refraining from reporting this circumstance to the manager or the overman you were infringing the general rules? Well, I never got a chance to report to anyone.
375. How was that? We did not see anyone. It was 12 o'clock before we got home from work that night.
376. Could you not have done so next day? We had not much time next day. We were looking after ourselves.
377. To put it in another light, did you not consider that by not reporting this circumstance you were endangering the lives of your fellow-workmen? Well, I do not know.

[Rule 15 read :—Should fire-damp be found in any place in the pit where naked lights are used, a danger signal must be set up across the entrance to such place, beyond which no person must go (except those authorized to examine and remove the evil) until the place is restored to its proper working order, and permission given. Should any unexpected discharge of gas occur, the overman must order all naked lights to be extinguished, withdraw the men and boys, and make the manager acquainted with the case, in order that the evil may be remedied, and the places restored to their proper working order. Hewers and others, when using naked lights, are strictly cautioned against the discharge of gas, where faults, rolls, and backs are met with, and on its appearance, they shall immediately leave the place and report to the overman, and shall on no account return to the place without proper authority.] 378.

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378. Do you not think that the occurrence of gas in such quantity that it lighted at the danger-board, implied that some danger existed? Well, if there had been much danger I think we should have reported it.
379. Do not you think that gas being present in such quantity as to fire at the nearest cut-through was a sufficient reason why you should have reported to the management? Well, we did not report it.
380. I suppose you are aware that these special rules are intended to ensure safety in the working and maintain discipline? Yes.
381. You say the wheelers or deputy never approached the face of No. 1 with a light? Not with an open light.
382. Before firing a shot did you take any precautions to get quit of any gas that might have accumulated in the heading? We would search for it, and if we found it present in any quantity we would not fire the shot.
383. What measures would you have taken to get rid of the gas if you had found it present in large quantities? There was, as a matter of fact, never much to get rid of.
384. Was there much dust in that part of the mine where you worked—was it a dry mine? Yes. There was not much dust in the heading that I worked in; I could not say what there would be in other parts—in the bords.
385. Did you apprehend any danger from the presence of dust in the mine? No, sir.
386. Were you aware that coal-dust in a mine is liable to explode under certain conditions? I have been told so, but was not aware of it before that.
387. Was that since or before the accident? Since the accident.
388. In that section of the colliery where the use of safety-lamps was enjoined, were the men in the habit of taking tobacco-pipes or matches in with them? Yes, as far as the danger-board.
389. Would they ever take them beyond that? No; we always put our clothes off at the danger-board.
390. Where did you smoke? Outside the danger-board.
391. Would that be immediately against the danger-board? No; not immediately against it—a yard or two away, perhaps.
392. Did it occur to you that there was something inconsistent in men who were obliged to work with safety-lamps taking tobacco to the face? No, sir.
393. Do you know what the practice with regard to smoking materials is in the larger and better regulated collieries in England? Yes; I know they will hardly allow pipes to go into a pit, let alone matches.
394. In the light of subsequent events do you think a similar rule ought to be enjoined in this district, where safety-lamps are used? Yes; I am of that opinion.
395. Then your opinion as to this accident was that it was the result of an explosion of fire-damp? Yes; I thought that was the cause of it.
396. *Mr. Neilson.*] What collieries did you work at in the old country? I worked at a place called Pit Hill for fourteen or fifteen years.
397. Was there any gas there? A little occasionally.
398. You say you were never supplied with any rules? No.
399. When you reached the fall in the main tunnel, did you detect any sign of powder smoke? No; I noticed the smell of after-damp.
400. Was it usual to find some gas when you struck these rolls that have been referred to? Well, I never had much practice in Bulli; I was about seven weeks in it altogether.
401. You were on contract in that district? Yes.
402. On the visits of the overman and deputy, I suppose, a general conversation would take place among you? When we met the deputy we generally asked him about the work, and he would reply. We had started on the night shift just before the explosion, and he told us what it was like.
403. Did your ever have any conversation with the overman and deputy? A little; the same as I would with the other men.
404. Did you ever brush the gas away from the face before you lit the fuse? No; I never saw that much in the face.
405. Did you ever hear of Millwood doing so? No.
406. You stated, in answer to the President, that you left the mine at 12 o'clock on the occasion when the gas fired at your heading. How far do you live from the residence of Mr. White, the overman? About 200 yards.
407. Would it have taken you long to go and report that circumstance to White if necessary? No; it would not have taken us long.
408. But you did not think it necessary? Well, I suppose we did not.
409. *Mr. Hilton.*] Can you say whether or not there was ever any gas in the place previous to your firing the shots? There was gas before we went in—before firing the shots.
410. At the time of firing the shots, did you try immediately previous to ascertain if there was gas in the face? Not until we cut the stone, I think.
411. You say that smoking was indulged in outside the danger-board—was the overman aware of that practice? I cannot say.
412. Do you know if Millwood ever saw anyone smoking there? I cannot say.
413. Did you ever receive a copy of the Bulli special rules? No; I had no knowledge of them before the explosion.
414. Did you apprehend any danger from gas previous to the explosion? No, not in our heading.
415. Did you ever see bratticing used in any of the working places of the mine—in your own, for instance, or any other? I never saw brattice used there.
416. How long did you work in Bulli altogether? I worked there seven weeks.
417. Did you send for the deputy to fire your shots? I sent for him the first morning.
418. Did he fire it himself? No, we fired it.
419. Did he show you how to fire the fuse by tilting the flame of your lamp against the gauze? No.
420. In what way did he tell you to fire the shots? He did not tell us at all.
421. Did he not tell you not to use naked lights? No; he told us to be careful when we got the gas.

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422. Who would lock your lamps? Millwood, the deputy. As a rule, no man has his lamp locked unless the deputy locks it for him.
423. Are you aware of any rule that would prevent you reporting danger to the deputy? Well, I think I would be interfering a little.
424. You are of opinion (referring to rule 13) that if you were out of your own place and seeking for the deputy, say, you would be coming within the meaning of that clause? Perhaps.
425. Do you think you would be interfering with the management in any way if you reported the existence of gas in the pit? I think I should be interfering a little.
426. Then on that account, if you saw danger, you would not report it—is that so? No; I do not say that.
427. Well, if you saw danger, would you report it? If there was great danger I would.
428. *Mr. Jones.*] On entering the mine for the first time after the explosion are you quite sure that it was the stopping on the right side that you saw blown in? I think it was on the right-hand side.
429. What side was the first stopping? The right-hand side.
430. Were you among the first of the explorers? Yes.
431. Are you sure that Millwood's body was found, as you say, between the first and second bord? I would not like to be sure; but I know that it was found in a sitting position somewhere near there.
432. You saw other bodies lying down. Did they look as if the men had been in the act of running out of the mine? Yes.
433. Was there not a bord being turned away close by there? Yes; a little way outside the stenton.
434. Had they worked with naked lights? Yes.
435. Do you think that was an evidence of good mining? No; I think it was a source of danger.
436. Yet they were allowed to work in that way? Yes.
437. And the only reason you had for not reporting the presence of gas to the deputy or the manager was that they were aware of it? Yes.
438. That is the only reason you did not go out of your way to report it? Well, as I have said, I had no call to report it, as they were themselves aware of it.
439. I think you have already stated—I am not sure—that it was the custom for the deputy to fire the shots in some portions of No. 2 heading? Not Millwood. I think Crawford used to before the strike.
440. Do you know how he did it? I never saw him fire one; but, I think, I have heard that he used a wire.
441. *Mr. Clarke.*] Are you personally aware that the management knew of the gas catching fire at night? No.
442. Do you not think that gas in such quantities catching fire was an element of danger? It might be. But I have seen bits of blowers at home when we have not reported them, if we thought there was no danger there.
443. Then it was not in consequence of this 6th rule of the colliery special rules that you did not report the occurrence you have described? No; if we had seen the deputy on that night we should probably have reported it.
444. But do you still think that reporting would be an interference with the management of the mine? Yes; I think it would have a little to do with it.
445. *Mr. Croudace.*] Where you worked in England did they lock your lamps? Yes.
446. Did the deputy examine your lamp here after you received it from the lamp man? No, sir.
447. With the knowledge you had at home of fiery mines, and the great caution used, do not you think that you received sufficient warning or teaching to show you that you should have done or said something yourself relative to these lamps being unlocked as they were given to you—I mean with the view to prevent a recurrence of such experience? Well, I do not think there was any necessity for me to tell him of a thing he knew about as well as I did.
448. You did not think it was necessary, after all the care and caution you had seen exercised at home, to caution anyone out here about it? The fact is, I have not been very much among the men here, and I do not see any more danger in the lamp being unlocked than locked, provided a man keeps the bottom on.
449. That is your opinion? Yes.
450. Now the question I am about to ask has been put before, but I think it necessary to ask you again. When you tilted your lamp to light your fuse, did not the flame come outside and strike the edge of your touch-paper? I do not think if we held the lamp over twenty times the flame would come through the gauze. It would make the gauze red-hot, but the flame would not come through.
451. Could you light the touch-paper before the gauze was red-hot? No.
452. Had you to hold it till the gauze was red-hot? Well, I don't know whether the gauze would be red-hot exactly, but I suppose it would be; I know the gauze has been burnt.
453. Was that in your opinion a right or proper thing to do? No, it was not.
454. Have you not lit your fuse by lifting the top of the lamp, as miners frequently do? No, I have not.
455. You have stated that the mine was rather dusty. Where did you get your damp stemming from? I never stemmed with anything else but coal. I am not accustomed to use dry tamping; it comes back too often.
456. You say that the boy's lamp lit up the gas at the caution-board? Yes.
457. Did I understand you to say that you or your mate were turning away a bord near there? The in-by side of the stenton, and between that and the danger-board.
458. Did not the gas come up to you in the face where you were working? No.
459. Has not No. 1 heading a slightly rising tendency all the way? I think it has; it is ballasted up now.
460. What appears strange to me is this—that knowing the air is travelling along No. 1 heading, and going through the stenton into No. 2 heading, and so on, that you should be on the in-by side of the rise heading and the gas should be on the out-by side. Was the stenton at a higher point than when you were in the face? I do not think it was higher at the stenton than it was in the face.
461. Was there much gas there when it lit up? No, I don't think there was.
462. As a man accustomed to fiery mines, did you think there was anything in the condition of No. 1 heading to cause you the slightest fear or anxiety? Well, if there had been any there that night—that is any large quantity—it would have been a bad thing for us. There was just a little. I tried before I lit the shot, and found a little.

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463. Was there much gas present during the time you worked in that heading? No; there was not much.
464. As much as you would see in fifty mines in England, I suppose? Yes.
465. Did you hear at any time of gas being found in any of the bords off No. 1 heading during the time you were working on the out-by side? No; I never spoke to any of the men who were working in the bords.
466. Have you any knowledge of how your heading was ventilated, or as to how the air reached you? We had a very good supply along the heading.
467. Had you a good current of air generally up to the face from stenton to stenton? We started within a yard or two on the in-by side of the stenton, and it brought a fair quantity of air all the way.
468. From the last stenton up to the face where you were working, did you see any necessity for the use of brattice on account of gas accumulating? I never saw any gas in our place till we got this stone, and that was on the Friday or the Saturday before the explosion.
469. Did you perceive any necessity for the use of brattice? Not in our heading.
470. The gas made its appearance when you reached the roll? Yes.
471. Are these rolls of frequent occurrence in the district? Well, I cannot give you an answer to that, as this I speak of was only the second one I came to.
472. Was there a door across the main engine brow to force the air into your No. 1 heading? Yes, sir.
473. Would the leaving open of that door affect the ventilation of your heading? Yes, it would.
474. Have you ever seen that door left open? There was a trapper kept at the door to open and shut it.
475. Going along the headings, and in the stentons between Nos. 1 and 2 headings, what sort of stoppings had you? They were stone and slack, I think.
476. Could you give me any idea of the thickness of them? No; I could not.
477. Could you give me any idea of the quantity of air you had at No. 1 stenton,—that next the face? No; I could not give you an idea of the quantity of air returned.
478. Have you never heard the manager or overman, or one of the inspectors, pass a remark such as "Well, you have a first-class current of air here—so many thousand feet,"—giving the quantity? No, I have never seen one of the inspectors there yet.
479. When you were on the night shift? Aye, or when I was on the day shift.
480. Did you not know the quantity of air going round them—10,000 or 12,000 cubic feet? I did not know the quantity of air passing.
481. *President.*] The amount of ventilation satisfied you? Oh, yes.
482. *Mr. Croudace.*] Referring to rule 6, I think I understood you to say that it would probably act as a deterrent against your reporting the presence of gas? Well, I think it would a little.
483. The rule says,—“Any employee interfering in any way with the orders issued by the colliery manager or his overman, for regulating the work of the mine, shall be liable to dismissal without notice.” Now, I want to see if you can in any possible shape or form construe this No. 6 rule in such a fashion as seems to have got into your mind—that you should not report gas or any other danger that might appear. For instance, I will ask you in the first place, has there ever been, to your knowledge, an order issued by the manager or his overman, or the deputy, against your reporting gas in the mine, or bad roof, misconduct or carelessness on the part of the men, or anything else that might lead to evil consequences to yourself or others? No, sir.
484. Then do you think that No. 6 rule could possibly, in any shape or form, prevent you from reporting that you had met with gas. After I have read it to you in the way I have done, and asked you the question whether you have received such orders against, do you think No. 6 rule could or should in any way prevent you from giving such information as would possibly lead to the prevention of a serious accident? Well, I would like to know what that rule has been put there for.
485. Well, it is scarcely for me to explain it to you, but if I were to, I should explain it something after this fashion:—Supposing the overman had ordered your heading No. 1 to be stopped, and that no one was to go into that heading, and some one came and said: “What has that to do with it?—you go in, Bill”; that would be a direct violation of No. 6 rule, because it would be a breach of a special order issued by a person in authority. Or to put it in another form—supposing an official in charge were to order the men to go on the western plane instead of the Hill End, and some one else were to order them to do the contrary, that would be a violation of all discipline, would it not? Yes.
486. But surely the reporting of an existing and imminent danger does not come within the rule. Supposing you came across a heavy blower in No. 1, would you not warn the men near you and the deputy? Yes, I think I would.
487. *President.*] Then it was just a question of the amount of danger that would restrain you from reporting, or the opposite? If there had been in my opinion a great amount of danger there, I think I would have reported it.
488. *Mr. Hilton.*] Was there ever an impression created in your mind that it was wrong to allow those who were using Davy lamps to go into the mine with their lamps unlocked? Well, I knew that it was wrong before we went in.
489. Was there at any time within your knowledge a person appointed to see that the lamps were locked? Millwood locked them twice after the strike, and Crawford locked them before the strike.
490. Then Millwood was appointed to see that the lamps were locked? Yes; I think so.
491. Can you say whether it was negligence or oversight that caused the practice to be discontinued? No, I cannot.
492. From the time that the lamps were locked until you were allowed to take them in unlocked, how long was it? I do not know.
493. What period elapsed between the time when Millwood locked your lamps and when he discontinued locking them? He locked them the first two days, and never locked them afterwards.
494. *Mr. Jones.*] Was the method of firing the shots adopted by you the customary method throughout the colliery? I cannot say as to that; it was just a method adopted by ourselves.
495. Was the management aware of your mode of firing the shots? They never inquired.
496. Then you never received any specific instructions on that subject? No.
497. *President.*] Did you ever see shots fired by means of a wire passed through the gauze? Yes.
498. Do you think that would be a safer way of firing shots? Yes; I think it would have been better than the other way.

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499. If, in tilting the lamp, the flame passed from the inside of the lamp to the outside, where the fuse was applied, what additional safety would there have been in locking the lamps, seeing that by your own act the flame passed through the gauze? I do not see how it would come through.
500. You know the flame was on the inside, and the fuse on the outside, and you had to connect the light with the fuse? Well, you can make the touch-paper take hold very quickly.
501. No doubt; but you are convinced that it would be safer to adopt the method of applying the wire? Yes, I think so, certainly.
502. You stated, in answer to a question by Mr. Jones, I think, that it was an evidence of bad mining to allow naked lights in a bord (No. 8) which is broken off about a yard or 1½ yard below the last stenton close to the caution-board? Yes.
503. In what way was it dangerous to permit naked lights in that heading, where there was no gas? I do not think there was much gas in that heading.
504. That is what I am coming to. If no gas existed in the bords, and as far as we have heard we know of no gas in the bords off No. 1 heading, what danger was there in working with naked lights in those bords. You see I want you to revert to the answer you gave to a question by Mr. Jones as to No. 8 bord. You stated that it was an evidence of bad mining, or something to that effect, to allow naked lights there? Well, if they were accustomed to get blowers in the heading, they might expect to get it in the bords as well.
505. You have no right to anticipate the blowers. Of course, if they had reason to fear such, they would require to take precautions. Did you hear of any gas being seen in the bords off No. 1 heading? Yes; I think I heard of it from one of the strange men that came there.
506. Do you know who it was that told you? I heard one of the men going home saying that he had seen gas in his bord that morning. I think it was the morning of the explosion.
507. Do you know the man? No, he was a stranger; I cannot tell his name. I just heard one man telling another.
508. Mr. Jones.] Will you inform the Commission if the name should occur to you? Yes.
509. President.] Try and recollect where you were, and under what circumstances you heard the remark made; that will probably assist you in recollecting, and, if so, will you indicate the name to us? Yes, I will try to find out by asking the man, whom I know by sight.
510. Who was it that turned away the last bord? It was my mate.
511. Is not the in-by side of the bord nearly opposite the caution-board? There are two bords just turned off—one at the out-by side of the danger-board, and the other at the in-by side; that is the one my mate turned off. Very little work had been done in it.
512. Were any naked lights allowed to go beyond the stenton? No.
513. Did you see the boy light up the gas near the caution-board across the stenton? I did not see it; I heard of it.
514. Is it not, in your opinion, dangerous to work with naked lights in such close proximity to the danger-board? I do not think naked lights should be there at all. I think safety-lamps should be used. [The witness withdrew.]

Charles Hope sworn and examined:—

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515. President.] You are a miner? Yes.
516. Working in the Bulli Colliery at the time of the accident? Yes.
517. How long have you been a miner? I think I have been working in different pits for about fifteen years altogether.
518. In this country or in the old country? In this country for about twelve months, and before that in the north of England.
519. Have you worked in fiery mines in the old country? Yes.
520. And you worked with safety-lamps? Yes.
521. You know then the object of safety-lamps? Yes.
522. In what district of the Bulli Colliery did you work? In the gassy section.
523. That is the Hill End section, is it not? Yes.
524. In what position was your working place? No 1 heading.
525. Your mate was William Scott? Yes.
526. Were you working on the day or night shift just before the accident? We had been working on the day shift, but we were working on the night shift the week of the accident.
527. And I suppose you were preparing to go to work when the accident occurred? Yes.
528. How were you apprised of the accident? My mate thought it was a tree that had fallen.
529. Were you in your own house at the time? Yes; I heard a noise and ran outside. The pick-sharper was the first man I saw. I asked him what was the matter, and he told me that the pit had fired. Immediately I got to the pit mouth and asked for a Davy lamp; I got one, and put on my own gauze, which I had with me, and went inside.
530. Who were with you? I was a little advance of some others. Scott came just behind me. We went up about 200 yards. There was a fall of stone there and we could not get any further.
531. Did you see the horse that was accustomed to draw coals about, there? No.
532. Did you see the boy who drove the horse? No.
533. What did you see or do about there? We were joined there by Lang and Chalmers.
534. Do I understand that the fall commenced at the overcast? It was beyond the overcast.
535. How far? About 150 yards.
536. Then you were stopped by the fall? Yes.
537. Were did you go when Lang and Chalmers came up? We then found a stopping blown out just near the fall.
538. On which side of the road was the stopping blown out? On the right-hand side going in.
539. What was it composed of? Stone and slack, I think.
540. Was it blown into the workings or on to the road? It was blown from the workings on to the road.

541. Did you repair that stopping? Yes; we made it up the best way we could, and we asked Chalmers if there was any other road by which we could get up. He told us that we might go through slacky, and we went along that way. Mr. C. Hope.
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542. And you struck the tunnel again? Yes.
543. Were there falls in the main heading? Not in the grip way.
544. Were there any falls beyond that? I did not observe any.
545. Having arrived at the tunnel, what did you do then? When we repaired the stopping near the fall we went up the gripway, and we found no falls until we got through into the tunnel again by means of the horse road. Up to this point the road was clear.
- 545½. You proceeded into the main tunnel through the horse-road? Yes.
546. And you found other falls in the main tunnel? Yes.
547. Did you proceed over those falls? Yes; I could not say the distance, but I think we went about 400 or 500 yards from the bank head. We came back for the purpose of sending in canvas to repair stoppings with. After we had been out twenty minutes we went back again, and this time we got as far as the western junction.
548. Did you pay any attention to the state of the atmosphere and ventilation? The atmosphere was very thick with what I call after-damp.
549. Have you had any experience with after-damp in England? Yes, when a little gas would light.
550. Was the ventilation partially restored at the time you got up to the tunnel the second time? Yes.
551. It was taking its usual course? Yes.
552. Was it hot? Yes, it was pretty warm.
553. Did you see any signs of steam? No.
554. Was the atmosphere laden with dust? I could not say. It was thick and disagreeable.
555. Did you find the western door blown inwards? Yes, and I helped to repair the door with the object of sending the air down the gassy section.
556. You had it closed up for the purpose of sending the air down the main tunnel into the gassy section? Yes.
557. When did you return again? The next morning at six o'clock.
558. With Messrs. Maccabe and Green? Yes.
559. Where did you go that morning? We went into Nos. 1 and 2 headings.
560. On the night before, when you penetrated to the junction of the western, did you pass any bodies on the flat? Yes; on the bank head.
561. Did you pay particular attention as to whether they were burnt? I paid no attention.
562. You simply passed on? Yes.
563. Did you pay any attention at the time when they were being taken out? Not at that time.
564. Did you observe how they were lying? They were lying on their faces.
565. Did you observe the way their heads were turned? Their heads were lying towards the mouth of the tunnel as if they were making their way out, or had been blown that way.
566. Do you know the effects of after-damp, or have you had any personal experience of an explosion? No.
567. You had never been a rescuer before? No.
568. Generally you know the effects of after-damp? Yes.
569. Was there anything inconsistent with the idea that these men had been overtaken by the after-damp and choked? I did not examine them particularly.
570. But their heads were turned towards the mouth of the tunnel? Yes.
571. You proceeded along the main tunnel on the following morning. Did you recover any bodies outside of No. 1—that is before you reach the heading? Yes; there were two boys lying down. That would be about 100 yards on this side of what we call Millwood's cabin.
572. I suppose they had been cleaning the roads? Perhaps so.
573. Did you pay particular attention to the position of the bodies? No, I did not.
574. In going up No. 1 heading did you see any bodies? Yes.
575. How many, and in what position? Well, I believe there would be about sixteen in that heading at different places.
576. You did not see any in the bords? No; I was not in the bords that day.
577. Did you observe the positions of the bodies in No. 1 heading? I believe the first three were lying between the first and second bord, and Millwood was sitting up against a rib of coal.
578. Do you refer to bords that were being worked, for there are two that had been stopped? Yes.
579. Millwood would be sitting near the fourth bord? Yes.
580. How was he sitting? He was just sitting up against the rib; I do not think he was burnt.
581. Did you observe his hair? No.
582. You did not take particular notice of the conditions of the bodies? No, I did not.
583. There were three found at this point, of which Millwood was one? No; there were three bodies besides Millwood.
584. Were they also in a sitting position? No; they were lying across the way. I thought when I saw them that they had been talking to Millwood.
585. Did you identify them? No; they were strangers to me.
586. You then proceeded onwards? Yes.
587. Proceeding onwards there was a group of five found immediately above these? Yes.
588. Did you pay attention to them? No, not particularly, because I did not know the men.
589. Where was the last body got? I believe the last body was that of John Smith, who was one of our mates working on day shift. He was found between the horse's heels, just above the stenton. I believe it was Smith that was found there.
590. Was anyone found at the mouth of the stenton? Yes; a man that worked in No. 2 heading. I believe it was Jerry Westwood; he was also sitting.
591. What do you suppose he was doing there? I could not tell.
592. Did you observe the condition of any of the props. Were they perfectly fresh, or were they charred? I did not take notice of them that day, but I was in on another night with Messrs. Gardiner, Evans, Crawford, and another gentleman, and we examined the main tunnel, No. 1 heading, and the bords off the heading. We did not find any signs of fire in the tunnel, and nowhere until we came to the headings.

- Mr. C. Hope. 593. Did you spend much time over the examination? Yes.
- 10 May, 1887. 594. You were satisfied that there were no traces of fire until you arrived in No. 1 heading? Yes, and in the bords off No. 1 heading.
595. And what evidence of fire did you see there? The props seemed to be burned there.
596. Were they burnt in one position or all round? Mostly the fronts of the props next to the heading were burnt.
597. You were perfectly satisfied in your own mind that these props were burnt by the blast? Yes.
598. You did not observe whether the hair of the bodies was singed? No, I did not.
599. Did I understand you to say that you were working with Scott in No. 1 heading on the night shift? Yes.
600. Did you ever at any time see gas in No. 1 heading? Yes, but not until Friday or Saturday, the week before the explosion, when we came across the stone in the heading.
601. Was it stone or a roll? A roll.
602. And you observed the gas after striking the roll? Yes.
603. Did it show itself in any quantity? No, there was not a great deal; it would take the lamp about 6 inches from the top.
604. There was a danger-board, I suppose, and beyond that board no naked light could be taken? There was a danger-board, and nobody was supposed to take a naked light beyond it.
605. Did you ever see a naked light beyond it? No.
606. Did you ever see a naked lamp hanging on the board? Yes, the wheeler's lamp.
607. Did you think that was safe? Well, if it was safe to go the stenton with a naked light, it was safe to go to the danger-board, because the board was fixed half-way across the stenton.
608. Then No. 1 was the intake of the air, and No. 2 the return? Yes.
609. Had you a sufficient quantity of air in No. 1 heading? Yes; but, of course, the heading was 20 yards in advance of the air.
610. But you did not observe any gas in No. 1 heading until three or four days before the accident? No.
611. Did you ever test the heading for gas? Yes.
612. And found none before this time? And found none.
613. You were careful in testing for gas? Yes, and I found none till Friday or Saturday; I forget what day it was.
614. Can you distinguish the different qualities of gas—did it fill your lamp very rapidly? It would fill the lamp, but not so quickly as I have seen it at home. I have seen it when it would not fail the lamp at all.
615. Did you ever hear of the gas in No. 1 heading being fired? Yes; it was fired by the wheeler's lamp on the night before the explosion.
616. Where was the lamp hanging? I would not be sure whether it was hanging on a prop or on the danger-board.
617. You refer to the prop on which the board was fixed? Yes.
618. The gas coming into contact with the naked light at the danger-board ignited? Yes.
619. The use of Davy lamps was enjoined in No. 1 heading? Yes.
620. Were they locked lamps? No.
621. Were they never locked? Yes; they were locked for one or two days.
622. Can you give any reason why the practice was discontinued? No, I can not.
623. Did you ever complain of the circumstance to the deputy? No.
624. Did you report the fact of the gas being fired to the deputy? No; we had no chance to report it, for the accident happened next day.
625. What time did you leave off work that night? At 12 o'clock, or half-past 12 o'clock.
626. Did you not think it worth while to report the circumstance on the Wednesday to some official of the colliery, the overman, or the deputy? Well, I did not give it a thought.
627. If you had given it a thought, should you consider it your duty to do so? Yes.
628. Did it not alarm you when you were informed that the gas was fired at the danger-board with the naked light? I did not feel alarmed.
629. Can you account for that? I was satisfied there was not much gas in the heading.
630. Although it fired at the danger-board? Yes.
631. You are positive that before Friday, four days before the accident, no gas existed in No. 1 heading? None.
632. Did gas exist in the bords off No. 1 heading? I do not know; I was not working there.
633. Did you ever hear your mate say there was gas there? No.
634. Were the places off No. 1 heading regularly examined before the men commenced work? I could not say for certain, but I believe they were examined.
635. And they would be examined before you commenced work? Yes; we have had to wait some mornings until Millwood came out.
636. Where did you wait? We waited where we got the safety-lamps.
637. When these places were examined by the deputy or overman, did he chalk the face as an indication that he had been there? No.
638. Do you know that it is the practice in England for the overman or deputy to chalk the day of the month in the faces each morning to show that he had been there? Yes; that is the practice at home.
639. Do you know if Millwood ever cautioned you to be careful? Yes, I believe so, on Saturday morning.
640. Did you take care? Yes, when I found the gas.
641. Having received that caution, do you think that you did your duty to Millwood by not reporting the presence of the gas which fired at the danger-board? The gas fired on the Tuesday night, and the accident occurred next day.
642. Yes, he enjoined you to be careful on the Saturday, and the gas fired on Tuesday night; but do you not think that it would only be right to intimate the circumstance to some official of the colliery? Well, you see, it was after 12 o'clock at night when I got home.
643. Did the deputy travel through your section with an open lamp, or with a safety-lamp? With an open lamp in the day-time.

Mr. C. Hope.

10 May, 1887.

643. How did the deputy travel at night? There was no night deputy.
644. The wheeler used an open lamp? Yes.
645. And would light it just outside the danger-board? Yes.
646. Was that, in your opinion, a safe proceeding? Well, it might be safe in the heading where we were working, but I do not think it was a safe proceeding in No. 2 heading, which had the return air.
647. For the reason that the return air would carry with it all the gas that issued from Nos. 1 and 2 headings? Yes.
648. Is this your opinion: That No. 1 heading being the intake, air was safe if no gas existed in the bords, but that it was not safe to use naked lights in the bords of No. 2 heading, because gas existed in a larger quantity in the heading? Yes; that is my opinion.
649. Tell us shortly how you worked the coal in No. 1 heading—did you work it with powder? Yes.
650. Before firing a shot was it the custom to hole the coal? Yes.
651. You never blasted in the solid? No.
652. Did you nick it or side-cut it? We never nicked it.
653. What explosive did you use? Patent blasting-powder.
654. Powder cartridges? Yes.
655. How did you fire the cartridges? With fuse.
656. With ordinary fuse? With ordinary fuse.
657. Beckfort's fuse? I don't know, it was double-take fuse.
658. How did you light the fuse? We used to fire our own shots; but the first day we started we sent out for Millwood to come and fire a shot; he came in, took one of our lamps, examined the face. He said, "She's all right, you can fire the shot," and we always fired them afterwards. We used to light the touch-paper at the gauze of the lamp and then apply it to the fuse.
659. Did you consider that that was a safe operation to allow the flame of the Davy lamp to be applied to the touch-paper outside? Yes.
660. Are you aware whether the lamp used in that way would be liable to destroy the gauze? Yes, in time.
661. Well, if the gauze were so destroyed would it impair the safety-lamp? Yes; of course if the wire broke the flame would have a better chance of getting through.
662. Yet you were in the habit of firing shots in that way? Yes.
663. Would you be allowed to fire them in that way in England? There are very few mines where men are allowed to fire shots at all in gas, but where they do fire them they generally use a wire.
664. Do you consider the use of a wire a safer means? Yes.
665. Do you mean by that it would be a quicker means? I do not think there is much difference.
666. Do you prefer the unsafe way to the safe? Well, we got the touch-paper given to us for the purpose of firing shots and we used it.
667. I suppose a pennyworth of wire would be sufficient to last you ten years? I don't suppose it would cost much.
668. I suppose you know what a safety-lamp is, and the objects for which it is used? Yes.
669. Did you ever know these lamps to be unscrewed and used as naked lights? Not inside of the caution-board.
670. In your opinion would an unlocked safety-lamp be less safe than a locked lamp? Both would be equally safe, provided they were not opened.
671. But could not an unlocked lamp be easily opened? Yes, of course.
672. Nevertheless you did not pass any remark to the deputy that he had omitted to lock them? No.
673. Have you ever seen in the mine any of the men unscrewing their lamps when they ought to have been locked? I have never seen them do it inside the caution-board.
674. Did the deputy or overman prohibit men taking in and using matches and tobacco? Not that I am aware of.
675. If you had struck a match at the face of the heading would anybody have objected to it? Yes; I believe any of the miners would have objected to it if they saw it done.
676. Do you think there was anything inconsistent in the men taking in matches and tobacco where safety-lamps were used? Well, naked lights were allowed to go up as far as the caution-board.
677. You were prohibited from using naked lights in your heading, and yet were allowed to take in matches? I never heard anything to the contrary.
678. Do you think you ought to have been allowed to take matches where safety-lamps were necessary? Not inside the caution-board.
679. Did you ever take them in? No.
680. Did your mates? Not that I am aware of.
681. Do I understand you to say that, had you observed a dangerous quantity of gas in your heading, you would have reported it to the authorities? I would have done so.
682. Then, looking at all the circumstances, what conclusion have you arrived at as to the cause of the accident? Well, I could not say.
683. Was it an explosion of fire-damp? Yes; I believe it was caused through fire-damp.
684. Fire-damp will not explode of itself? I should think not.
685. You made an examination of No. 2 heading after the accident? I was just in there once.
686. I mean since the accident? I was in there since the accident.
687. And you examined it? The day I was in there I could not examine it very well, because the ventilation had not been properly restored.
688. Was there gas there? Yes.
689. You also had an opportunity of inspecting the damage that was done? Yes.
690. And the course taken by the blast? Yes.
691. Would you like to make any statement of your opinion as to the cause of the accident? No, I would not.
692. *Mr. Neilson.*] Where were you at the time that the boy's lamp set fire to gas at the danger-board? I was turning a bord away; it was about 5 or 6 yards in the in bye side of the caution-board.
693. Did you see the lamp when it ignited the gas? I think I was repairing a skip at the time.
694. Did you ask the boy to hang his lamp on the inside of the danger-board? No, not on the inside. I asked him to put his lamp inside the prop so that I could see what I was doing. 695.

- Mr. C. Hope. 695. And by so doing you had a better light? Yes.
696. How long was it before the gas went off? Perhaps 5 or 10 minutes.
- 10 May, 1887. 697. What position was the lamp in? It would be close against the top of the prop.
698. That would throw a light down on the top of the skip? I was only 4 or 5 yards on the in-by side of the light, and I believe his lamp would be close to the roof.
699. You are sure it was on the prop and not on the board? Yes.
700. There was no other prop there? No.
701. Millwood and you were, I suppose, good friends? Yes, always pretty good friends.
702. You talked to each other? Yes.
703. Between Saturday morning, when you first saw gas in the heading, and Tuesday night, when the boy set fire to it, did you ever make any report to Millwood or White? I did not think there was any necessity to report it when the deputy told us himself on Saturday there was a little gas in the heading.
704. Did you always find Millwood in before you on the front shift? Yes.
705. You presumed that he had been examining the working places? Yes, we waited for him once or twice, and that led us to think that he had been examining them.
706. Did you ever see any lamp unscrewed in this heading? Yes.
707. Inside the danger board? Not inside.
708. Were you frequently in No. 2 heading? Only once since the strike, and that was the first week we started.
709. What took you there? Westwood, who worked there, asked me to come in and examine a blower which had been struck there. I went in and found no gas until I put my lamp against the rib where the blower was, and here the gas would fill the lamp.
710. Where was the blower? It was half-way up the seam of coal on the left-hand side.
711. And that was the only place where you detected gas? Yes.
712. Was there nothing in the roof? Nothing; the face was not far from the stenton, for it was just after we started work since the strike.
713. You saw nothing there before the explosion? None.
714. *Mr. Hilton.*] Did you ever notice any difference in the ventilation during the shift? I have noticed it sometimes slighter than at others.
715. Was there any one in charge of the district where you worked at night? Not that I am aware of.
716. Had there been any one in charge of the mine at the time the gas fired in your heading would it have been easier for you to report the matter? I would have reported it that night.
717. You stated that although it fired at the danger-board you did not report it on account of your going home at 12 o'clock at night? Yes, it would be nearly 1 o'clock before we got home.
718. I gather from that it would be somewhat inconvenient for you to go and report the matter to any colliery official? Yes, it would be inconvenient, and "bachelors" have not much time to run about at that time of night.
719. But you say you would have reported it if there had been anybody in charge of the mine? Yes.
720. Where did you get the touch-paper to fire the shots? Well, we generally got it from Millwood.
721. *Mr. Owens.*] You know the western door? Yes.
722. In the event of that door being opened, would it have any effect on the ventilation? Of course it would.
723. Did you ever notice it affected by that door being opened? No.
724. Have you seen the Government inspector in your heading? No.
725. You never saw him there? No.
726. How long have you worked in the mine? Five or six weeks before the strike, and after the strike, up to the time of the explosion.
727. And during all that time you never saw the inspector there? No.
728. How often did you see gas in the heading? We did not see it at all until we struck the roll.
729. *Mr. Jones.*] You stated that in exploring No. 1 heading you did not observe any burning on the bodies? I did not.
730. Did you carefully examine them? I believe Westwood was a little burnt; he belonged to No. 2 heading.
731. Did you carefully examine the other bodies? No, I did not know them; I only examined Jerry Westwood.
732. They may have been burnt as far as you know? Yes.
733. Have you any knowledge of the position of the driver who was found there? No, I did not see the boy.
734. And you were not there when he was found? Yes, he would be in the heading when I was there, but I did not notice him.
735. Did you notice whether the blower that you speak of arose from a crack in the coal? It was a long way back, and it was in the coal.
736. You stated you consider No. 1 heading perfectly safe to work in, provided no gas was found in the bords or anywhere else in the pit? Yes.
737. Are you aware that dust plays a part in an explosion? Yes; I have heard of it.
738. Do you know it of your own knowledge? No.
739. Do you consider the Bulli mine a dusty one? Well, it is dusty, but not nearly as dusty as I have seen mines at home.
740. You would not have considered it safe to work with a naked light under these circumstances? No; it was not safe.
741. Was it a safe thing to work near the caution-board with a naked light? Yes, if there was no gas there.
742. The danger board was put there to prohibit the driver from taking his light inside? Yes.
743. Was it not usual for the driver to hang his lamp on the prop? Yes.
744. He was allowed to put it there? He often did so.
745. He did not hang it there for the special purpose of showing you a better light? I believe it was hanging there before. I asked him to put it up a little higher.
746. Did you ever use a naked light in turning away a bord? No.

747. Would not bratticing up the heading from the stenton be a safe mode of preventing an explosion? Mr. C. Hope. Yes, it would.
748. In your opinion this should be done? Yes.
749. Would the bratticing of No. 2 heading have rendered the bords in the vicinity safer to work in? Well, I would think that if there was a quantity of gas in No. 2 heading naked lamps should not be allowed to be used in the bords off the headings.
750. I want to know if bratticing would be a safer mode of working? It would have rendered the bords off No. 2 heading safer to work in with naked lights.
751. *President.*] In what way? It would have kept the gas out of the heading and the bords. Sometimes when you go into a heading where there is gas, it clears away after you start to work, especially if there are only a few yards of gas there. That gas comes out, and it is liable to be taken into the bords which receive the return air; whereas if the heading was bratticed the gas would have been swept away as it was made.
752. *Mr. Clarke.*] Were you working in the gassy section before the strike? Yes.
753. Where? In the straight in heading.
754. How long did you work there? Five weeks.
755. Was there any gas there at the time? Yes, there was gas, but not until we touched the stone; then Hobbs and Beckton came to turn the stenton away, and that is where we got the most gas.
756. Any quantity? It would take the lamp 2 feet from the top.
757. Were you allowed to work on? Yes; up to the time of the strike.
758. Was gas found anywhere else? I believe there was gas found in the left-hand heading.
759. Have you ever been supplied with a copy of the rules? No.
760. Did you ever ask for them? No.
761. Did you ever make yourself acquainted with them? No.
762. Is this the first mine you worked in in this Colony? Yes.
763. Did it not strike you to inquire for a copy of the rules? We were strangers, and it did not strike us.
764. Did you know that there were any rules issued by the manager? I knew nothing of the rules of this colliery, but I knew the rules that existed at home.
765. And you do not know whether they are similar to rules in England? No; I did not know that it was the duty of the management to supply the rules.
766. With reference to the reporting of this firing of gas which took place on Tuesday night, were you deterred from reporting it by any other reason than that you did not consider it of sufficient importance? No; no other reason.
767. Do you know of the existence of these rules of employment? Yes.
768. You know the rule No. 6, having reference to interference by employees? Yes.
769. That did not deter you? It did not.
770. If you thought there was any immediate danger you would have gone straight away and reported it? I would. I do not think anybody would say anything if I had done so.
771. You do not think anything would have been said to you? I do not think so.
772. *Mr. Croudace.*] In answer to a question from the President, I think you said that an unlocked lamp was quite as safe as a locked one. Do you mean in your own hands? Yes.
773. Do you mean to say that in the hands of all the miners you would have felt it safe? No, I would not.
774. Would you think it better to lock them? Yes, if they were used throughout the mine.
775. You said you had worked five or six weeks before the strike, and a few weeks after the strike, and you had never seen the Government inspector in the mine? Not to my knowledge have I seen him.
776. Was it not possible for the inspector to be around a number of times and yet not to have come in your particular shift? I never saw him.
777. But was it possible for him to make four or five visits without seeing you? Yes, quite possible.
778. You have told us that a portion of air goes through the western door; was that a sliding door? I do not think it was a sliding door.
779. Was that door attended by a trapper? Yes; I believe there was a boy there.
780. When the air goes round there, is it conducted between Nos. 1 and 2 headings, and just after you turn into No. 1, is there not a door on the main road between Nos. 1 and 2 headings, and was that door attended by a trapper? Yes; there is a door there, and it is attended by a trapper.
781. How were the stoppings built? They were built of stone and slack.
782. Were they thick and closely packed? I do not know their thickness.
783. Do you know the measurement of the air at your heading? No.
784. This caution-board was half-way across the stenton in the heading? Yes, about half-way.
785. Do you know the turn leading from Nos. 1 and 2 headings? No; their coals came out of their own heading.
786. Would it not be safer if the caution-board had been on the out bye side of the stenton? Well, it would, especially if any one came through the stenton with a naked light.
787. Then that would be safer? Yes.
788. To the best of your belief, from your knowledge of gas at home, do you think there was such a quantity of gas in the heading to make you specially or extraordinarily careful? No, there was not.
789. Have you seen two or three times as much gas in a heading at home? Yes; there was very little gas in the heading, until we got the stone.
790. And it was your feeling that the deputy knew as much as you did about it, and that there was no necessity for you to report it? Yes.
791. Coming along No. 2 heading there is a diagonal cut through, from which the tubs have been taken as an easier way out to the main road;—was there a door there? I do not know; but I do not think there was.
792. If there was a door left open there, would it affect your ventilation? It would take it all off.
793. You have said there was deficient ventilation sometimes at night? Yes.
794. Was there a night furnace man? I could not say anything about the furnace at all.
795. Was it deficient in quantity? Sometimes there was not as much as usual.
796. You are clearly of opinion that No. 6 rule of this agreement between the management and employees did not in any way prevent you from reporting a blower of gas, or any extensive quantity of gas being found in your heading? No, it would not stop me from reporting it.

- Mr. C. Hope. 797. I will read the rule to you: "*Interference by Employees*—Any employee interfering in any way with the orders issued by the Colliery Manager or his over-man for regulating the work of the mine, shall be liable to dismissal without notice." Does that apply to reporting of gas? No, I do not believe it does.
- 10 May, 1887. 798. *Mr. Jones.*] You say that the stoppings were composed of slack and stone? Yes; they were built of stone, and stone with slack between the two walls.
799. Do you think that stoppings of that character are the best? I would prefer brick before slack and stone; but I believe stone is good enough if properly cemented together.
800. In the event of a blast similar to this, would the stoppings not be more effective if they were properly built up at the back? Of course it would take a larger force to knock the stoppings out if they were so constructed.
801. *Mr. Owens.*] Were you always employed on the night shift? No.

Allan Black sworn and examined:—

- Mr. A. Black. 802. *President.*] You are a miner? Yes.
- 10 May, 1887. 803. Employed in the Bulli mine? Yes.
804. How long have you been employed there? Twenty-three years or better.
805. Have you been employed in any other mine before coming to Bulli? It is twenty-three years since I came to Bulli, but twice, since that time, I have been employed in Newcastle.
806. Did you follow the occupation as miner at home? Never.
807. Your experience is confined to the Colony? Yes.
808. Where have you been employed in the Bulli Colliery? In the 4-foot seam for the last two years.
809. Were you working there on the day of the accident? Yes.
810. When were you apprised of this sad accident? About 3 o'clock on the day of the accident.
811. Who informed you? Someone came in and told us to come out, that an explosion had occurred in the big seam.
812. A messenger was then sent in to warn you? Yes.
813. What did you do? I came out, and went into the big seam with Spinks and with two men named Woods and Charlesworth.
814. Did they also work in the 4-foot seam? Yes.
815. Then you would follow Hope, Scott, Chalmers, and Lang? Yes; they went in before us, I think.
816. Where did you see them? When we first went in we went to the bottom of the incline, to where the overcast was blown down.
817. It was not drawing? It did not draw; it was in connection with the old furnace. We came back, as we could not get over the big fall, and afterwards, in the middle of the horse road I met Lang, who was overcome by the effects of stythe. A little further on we met Chalmers, who went out for some canvas. We afterwards put that canvas a little beyond the centre of the incline, on the left-hand of the heading.
818. Was the stopping where you put the canvas blown in or out from the road? It was blown into the main way.
819. When you first went into the mine you were stopped by the large fall? Yes.
820. Did you notice the stopping blown out almost at the foot of the fall? No, I believe it had been repaired. There was some canvas sent up to put on the western junction. When I got there Spinks took bad, and asked me to come out with him. I then left the canvas with Colton and came out with Spinks. Afterwards I returned and overtook the party.
821. Did you observe any bodies on top of the bank? Yes, the six bodies that were found there.
822. Did you closely inspect them? I closely inspected one, I think it was Bourne, but I could not positively say; I put my hand three times round his head, and found that the hair was short. I could not say whether it was cut short, or whether it was burnt short.
823. Did you see any marks of burning about his face? I did not notice any; his hair appeared to be shorter than usual, and I knew him well.
824. Did you notice any of the others? Well, the young man, Felix Bourne, looked as if he had no hair on his head.
825. How were they lying? When I went up the second time they had been laid out, and sheets put over them.
826. How were their heads when you saw them first? I believe Melville was lying with his head into the main road; Jackson was lying in an opposite way. There are two props just at the western junction, one man was on one side and another on the other, and the other bodies were on the western road.
827. Then you came out? Yes, and we did not proceed further that night, except to see the fall beyond the western.
828. That fall arrested your progress? Yes.
829. Was the atmosphere very thick? It was at first, but it cleared a bit afterwards; but when we first went in nearly all the ventilation was going through the stoppings. When we got the canvas up we could get further along.
830. When did you return to the mine again; or, rather, how long after the accident did you arrive at the western junction? About two hours.
831. What time did you return on Thursday morning? We went in about 6 or 7 o'clock.
832. Where did you go? Over the fall, inside the junction.
833. It is a high fall? I do not call it a fall, as it consists only of stuff that has been stowed on top of the timber sets.
834. Some men had been there during the night and partially restored the ventilation? Yes; there was a strong current going to the western junction.
835. You then went into No. 1 heading? Yes, to where they were bringing bodies on to the main road, and I was helping to carry them from the main road. There was another party ahead of us.
836. Do you know anything about the Hill End district? Not after the district had passed over the fault.
837. So all you know is from hearsay information? That is all.
838. You cannot speak positively of your own knowledge? No.
839. Have you completed your narrative? Yes.
840. Have you any other statement to make as to the condition of the workings? No. S59.

841. *Mr. Hilton.*] You know the door near to the furnace leading to the 4-foot seam? Yes. Mr. A. Black.
842. When that door is open does it make any difference to the ventilation going to the Hill End district? There are two doors there, and I forgot to state that one of these doors was blown out, at least one of the boards of the door was knocked out, and I went in with Mr. Ross to repair that door; that is the door placed at the division of the two mines. 10 May, 1887.
843. Were these doors partially damaged? One was blown open, and one of the boards was blown off the door, and the hinges were damaged.
844. Was there anything the matter with the other door? It was only very slightly damaged.
845. Was the ventilation escaping through these doors at the time? Some of the ventilation was going that way.
846. Would not these doors, if opened, cut off the ventilation from the Hill End district? No. It could not interfere with the Hill End district, but it would cut off the ventilation from the 4 foot seam.
847. *Mr. Owens.*] You never worked in fiery mines in the old country? I said I had never worked in the old country at all.
848. *Mr. Jones.*] You say you found the overcast blown out? Yes, that is the overcast of the old furnace. It has no connection with the new furnace. The witness then withdrew.

WEDNESDAY, 11 MAY, 1887.

Present:—

DR. ROBERTSON, PRESIDENT.

MR. O'MALLEY CLARKE,
MR. CROUDACE,
MR. JONES,

MR. NEILSON,
MR. OWENS,
MR. HILTON.

John Richards sworn and examined:—

849. *President.*] You are a miner? Yes.
850. How long have you been a miner? For twenty years.
851. Have you been engaged for that time in the Colonies, or in England? In England for the greater part of the time. I have been nine years here. Mr.
J. Richards.
11 May, 1887.
852. In what part of England were you engaged in coal-mining? In Lancashire.
853. As a miner in that country, are you acquainted with the presence of fire-damp in the mines? Yes, I have worked with safety-lamps, and know what gas is.
854. In what district in the Bulli Colliery were you prior to the accident? I was working in the gassy seam.
855. Were you working at Bulli before the strike? Yes.
856. That was under the old system of ventilation? Yes.
857. How long has the gassy district been working? It is two years since they first struck it.
858. On passing through a whin dyke you came to the gas? Yes.
859. Did you use safety-lamps before piercing the dyke? As I have said, we found the gas after winning the dyke.
860. Did it give off more gas than before? Yes.
861. So much so that it was deemed expedient to use safety lamps only? Yes.
862. Were you one of the explorers? Yes. I went in along with the first party—Scott, Hope, and others.
863. And you found a large fall in the main tunnel that prevented you from proceeding in that way, and you had to go round by the slacky road? Yes.
864. And there were other falls in the main tunnel beyond the point where the horse road strikes the main tunnel? Yes.
865. The explosion occurred on a Wednesday afternoon, about half-past 2 o'clock;—is that so? Yes.
866. Where did you reside? At Bulli, near the Oddfellows' Hall. I was working on the night shift, and was within 5 minutes' walk of the pit when the accident happened.
867. In what part of the mine were you working? I was working in No. 3 heading.
868. Did you continue the work of exploring the mine until all the bodies were recovered? Yes.
869. That is, you took your regular shift? Yes. I was not at home many hours, although I was bad after being in the first time. I went home till 3 o'clock the next morning, but stopped there all the time after that. We found Felix Bowen's body first, on the bank-head, at the top of the incline.
870. Did you specially examine his body? I just put my hand to him. He appeared to be badly burnt, as the skin was peeling off.
871. Who did you find next? We found the bodies of Luke Jackson, Tom Melville, and others.
872. You found several in a group there? Yes.
873. How many were there? I think there were three lying there altogether.
874. Did you observe the condition of the remaining men? Yes; they were burnt very badly. I got hold of Felix's trousers, and they pulled to pieces like a bit of paper.
875. Did you notice his hair? No, I did not notice much about his hair.
876. Would you not, as one accustomed to fiery mines, take notice of the hair first in a case of that kind? Well, I was very bad at the time.
877. And you returned on the following morning at 3 o'clock? Yes.
878. At that time was the large fall inside the junction cleared, so that you could get over it? Yes.
879. Had the ventilation been restored by that time? Yes.
880. On your first going into the main tunnel what was the condition of the atmosphere? It was very bad.
881. In what way? Well, when I first got in there was no air at all travelling up Hill End. The after-damp was making towards the grip, and we had to wait some time before we could proceed.
882. Could you smell the after-damp? Yes; it was very thick.

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883. Well, on the following (Thursday) morning what did you do? I went into No. 1 heading and No. 2 heading, and helped to carry out the bodies.
884. Before getting to No. 1 heading did you pass any bodies on the road? Yes; they were carrying them out.
885. A party had preceded you, and were carrying the bodies out? Yes; and there were the bodies of two boys found there.
886. Did you see any of the bodies lying in No. 1 heading where they had fallen? Yes. They were strange men, and I could not recognise them; but I saw Millwood back against the bord end.
887. Do you know the number of the bord? No.
888. Did you go up to the top of No. 1 that day? No, I did not go right into the face.
889. What were you engaged in doing? I helped to carry some of the bodies out of the road; and also to carry them outside from the main road.
890. Did you ever work in No. 1 or No. 2 headings? Yes, I worked in both of them before the strike.
891. Did they give off a considerable quantity of gas? Yes.
892. A dangerous quantity? Yes.
893. Did you work with safety lamps consistently? Yes.
894. You never used open lamps? No.
895. Did you ever see any open lamps used in that district before the strike? Well, they worked in a bord off No. 1 heading with a naked light.
896. Were you in those bords before the strike? Yes.
897. Did you see any gas in those bords? No, not accumulated.
898. Did you see any at all there? I have heard bits of blowers occasionally.
899. Did you ascertain what those blowers discharged? Yes, I have gone round the bord, and tried it with my lamp, and have seen it show in small quantity.
900. But the headings discharged a greater quantity, you say? Yes.
901. In driving these headings I believe you passed over a considerable number of rolls? Yes.
902. And on approaching the rolls the coal gave off a larger quantity of gas? Yes, because there were more facings in the coal on top of the store.
903. Have you worked in No. 2 heading? Yes, I did before the strike.
904. Did it give off more gas than No. 1 heading? No, I think it gave off about the same quantity; but if there was any difference I think No. 1 gave off the most.
905. What was the course of ventilation to No. 1 and No. 2 headings? It came on to the main road, and through the cross-cut.
906. It came from the main tunnel up to the heading? Yes, up No. 1 heading through the cross-cut, into No. 2 and out of No. 2 heading into No. 3; there was no air course through the bords.
907. When the bords got in a sufficient distance for cut-throughs, the air would go round the bords, would it not? No, I never saw any round the bords.
908. Then how were the men in the bords supplied with air? By the skips passing, and the like of that.
909. The object of cut-throughs is to take the air so much nearer the face? Yes, in the headings.
910. But I am talking about the bords? I do not know about cross-cuts in the bords.
911. But we are talking about the bords. What is the object and intention of cut-throughs or stentons? The object is to carry air from one heading to another.
912. Then the air was directed up No. 1 heading, passed through a cut-through into No. 2 heading, and from that it supplied the men working in bords off No. 2 heading;—is that not so? It would strike up to them no doubt.
913. Where did the men in No. 2 heading get the air from; was it not by means of the cut-through from No. 1 heading? Yes.
914. Then as the air passed into No. 2 heading by that channel, it supplied the men in the bord, and passed down to the tunnel again? It was supposed to have supplied them.
915. Were they supplied? I cannot say.
916. Then if they had no air how could they exist? I suppose they were supplied by the air driving up from the heading.
917. You said just now they were "supposed" to get it from there; where could they get it but from there? I do not know where else they could get it.
918. Then why not have said so at once. You have said that you worked in this heading before the strike; was the ventilation of sufficient strength there? If it was kept up to the face it was.
919. Well, was it kept up to the face? No.
920. How was it arranged? There were cross-cuts put through with perhaps a distance of 40 yards between.
921. Are you quite certain of that? Yes; the heading that I worked in last was fully that.
922. I am talking about No. 1 and No. 2 headings. Have you seen any cut-throughs in No. 1 and No. 2 with 40 yards of coal between? I never measured them.
923. Then why did you make that statement. I warn you to be very careful to give accurate replies to questions. If you make a statement to me that there were 40 yards of coal between the cut-throughs, I am bound to believe you; but if you say 40 yards, and mean 30 yards, you are speaking wide of the truth? I am telling you nothing but the truth.
924. Are you certain as to the distance between the cut-throughs? As I have said, I never measured them.
925. Then why did you state a particular distance? I am only speaking of what I was working in.
926. Well, what was the distance between the cut-throughs? I cannot say.
927. Was there any bratticing taken up to the face? No.
928. Would you think that a judicious course to pursue? Yes.
929. In that case the brattice would take the ventilation from the last bord, conducted up to the face, and sweep away the gases accumulated there? Yes.
930. It would prevent the accumulation of gas? Yes.
931. Did you work with safety-lamps in those bords before the strike? Yes.
932. Were they locked? Yes, before the strike they were.
933. Were they locked in all cases? There was a time, just at the start, when they were not locked; but afterwards Mr. Crawford locked every one.

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934. Did you work at night-time? Yes.
935. And did you work with your safety-lamps locked in the night shift? No.
936. Was there any greater danger in the day shift than in the night shift? No, not that I know of.
937. Then, as the danger was as great during the night as in the day, can you give any reason why the lamps were not locked at night? Well, there was no one there to lock them.
938. After you resumed work since the strike, did you notice any improvement in the ventilating current? Yes, I believe there was an improvement in the amount of air.
939. In your opinion, as an experienced miner, had brattice in any shape or form been taken up to the face after the strike;—could any great accumulation of gas have existed? Not in the headings, certainly.
940. The air thus carried down would have swept it away? Yes, it would.
941. After the strike did you go into the face of any of the bords? Yes, I did in one bord, in No. 4 heading.
942. You worked in Nos. 3 and 4 since you resumed work? Yes.
943. But you cannot speak as to the condition of the bords in Nos. 1 and 2? No.
944. Since you resumed work have you continued the use of safety-lamps? Yes.
945. Were those lamps locked? No, not since.
946. We have been told that the lamps were locked for a period after the resumption of work, but that the practice was discontinued. Do you know anything about that? On the first night that I started to work in the gassy section after the strike, I went to get my lamp at the cabin. Millwood gave me a lamp, and he locked it. I asked him how I should be able to get a light if the lamp went out. He said that we should have to go outside and get the key to unlock it; but afterwards he remarked that it would be no use locking the lamp if he gave me the key, and he asked me for the lamp back again, so that he could unlock it. I did as he directed me, and he never locked the lamp after that.
947. Was an unlocked lamp in your hands as safe as a locked lamp? Yes.
948. You know the danger of gas? Yes.
949. How did you work the coal in these headings? We used to hold and shoot it.
950. Did you nick it? Sometimes, not always.
951. Would nicking the coal have assisted the shots? Yes; but it was not always pursued.
952. Did you use compressed powder? Yes.
953. Was it a custom in the mine? Well, some used loose powder.
954. How did you fire the shots? We lighted ours with a match.
955. How did you stem the holes? With a little of the "bad" off the roof that was slightly damp.
956. If you were informed that some of the men tamped with small coal, would you consider that in the presence of gas as safe as the material you used? No, because I know there is a lot of spar in that coal.
957. How did you apply the light? I went back to my waistcoat, and struck the match.
958. Do you mean a lucifer match? Yes.
959. And you adopted that means of lighting the shots whilst working with Davy lamps? Yes.
960. Yet you are an experienced miner, and know what gas is? Yes; but we had no gas in our place at all.
961. Then are you referring to Nos. 3 and 4 now? Yes.
962. When you were working in Nos. 1 and 2 headings, how did you light the shots? With touch-paper.
963. And how did you apply the light to the paper? We tilted the lamp, and got the flame to beat against the gauze.
964. Did you think that a safe operation; would you have done that in England? Well there was always a man to light them where I was in England; they used a piece of wire.
965. Was that a safer method? It was as safe.
966. I suppose the large quantities of gas met with in the collieries of certain districts in England would teach people safe modes of firing shot? Yes, I suppose so.
967. There would be some reason for the adoption of that method in firing shots? Yes.
968. Probably on account of the increased safety. Do you know that firing shots by means of a wire is safer than the operation of tilting the lamp? I believe it would be safer; but we never fired a shot in the presence of gas all the time I was in.
969. Then in Nos. 3 and 4 headings, those that you worked in since the resumption of work, have you seen any gas in those places? Not accumulated anywhere in the headings.
970. Had you ever been in No. 3 and No. 4 headings before the strike? I never worked in them, but was in them many a time.
971. Did you ever see gas in Nos. 3 and 4 headings before the strike? I have heard of it, but never saw any.
972. But since the strike you can speak positively as to the condition of those headings? Yes.
973. Have you seen gas there? I have known traces of it, but never actually saw any in the headway.
974. You considered it safe enough to strike a match, and fire your shot? Yes; Millwood and all of them knew it.
975. Indeed; that is what you say, but is Millwood here to answer it? No.
976. Judging from the condition of the heading you worked in, had you any reason to fear an explosion? Well, no; I never thought there would be such an explosion as that.
977. You have gone carefully over the roads since the explosion? I have.
978. Have you noticed evidences of the explosion in the shape of charred props, and burnt bodies, and coal dust, and such like? I noticed a charred prop lying in a bord close to the side of No. 3 heading.
979. Was it only black, or was it charred? It was charred, I think, but I did not handle it to see.
980. There is a difference in a charred prop and one that is merely black; at all events you saw evidences of an explosion? Yes.
981. Have you satisfied yourself that an explosion did take place? I have.
982. Do you know how coal dust behaves in the presence of gas that is exploded; have you any personal knowledge? No, I never read anything about that; but I think it would require a large quantity of gas to pick it up and fire it.
983. Did you make any reports to the Deputy since resuming work as to the advantage or otherwise of having the safety-lamps unlocked? No.
984. You did not consider it mattered, so far as you were concerned, whether you had Davy lamps or not? I did not consider there was any danger of gas where I was working; in fact I knew there was no gas.

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985. Then there was no danger in your place from gas? No.
986. *Mr. Hilton.*] You say that the after damp was making towards the grip? Yes.
987. Can you give any reason for the after-damp going towards the grip? No, only this—that it was the explosion going out that reversed the air.
988. Did you ever work in the western district? Yes.
989. Was that before the strike? Yes, a good while before.
990. Are you acquainted with the return air-ways in the western district? No; I have not been through the return for a long time.
991. You know the door on the western road—at the western junction? Yes.
992. Did you ever know that door to be damaged by the set or any other cause? Not that I know of.
993. Have you ever in the old country worked in a dusty mine that gave off gas? I have worked in mines as dusty as this that gave off gas.
994. Did you ever work in mines that gave off gas, and which in your opinion were dustier than Bulli? No; but I have worked in dustier mines that did not give off gas; the mines I worked at in Lancashire were as dusty as Bulli.
995. You say you worked in the western district; supposing the road was blocked up, by what means would you get out? I do not know, unless we got through to the grip.
996. Do you know that you could get through that way? No; I do not know that we could get to it.
997. You know the overcast from the gassy section in the western district? Yes.
998. You are aware that that is the return road to the furnace? Yes.
999. Supposing the road was blocked up as I have described between the junction and the working face, I presume you would endeavour to get that way out? Yes.
1000. But you do not know whether you could get that way in the event of an occurrence of that kind? No.
1001. *Mr. Owens.*] Was the deputy aware of the method you employed to fire the shots? Yes.
1002. Did you at any time have gas in the western district? I never did; I did hear rumours of it, but I cannot speak of my own knowledge.
1003. *Mr. Jones.*] Were you ever supplied with a copy of the special and general rules for the guidance of the men while you were at the colliery? I do not recollect having one.
1004. You surely know whether you received one or not? Well, I believe I did get one.
1005. Can you point to the particular spot where Millwood, the deputy, was found? I did not take particular notice whereabouts he was found; I know I helped to carry him out.
1006. Was he found anywhere near to the last stenton? Yes.
1007. How far, in your opinion, from that stenton? I do not think he would be above 10 or 15 yards from the stenton.
1008. You have stated that the lamps were not locked during the night shift? Yes.
1009. Did you say that they were locked during the day? Yes, before the strike.
1010. You were employed at nights then? Yes; I worked nights and days—week about.
1011. Are you sure, of your own knowledge that the lamps were all locked during the day shifts? Every one was supposed to go to Crawford to get his lamp locked. I have seen him lock scores of lamps.
1012. You have stated that an unlocked lamp in your hands would be perfectly safe? Yes; it would be perfectly safe with me, because I should not take the top off where there was gas.
1013. Have or had you the same amount of confidence in the other workmen? No.
1014. Then you think it a wrong proceeding to allow all workmen indiscriminately to use unlocked lamps? I do.
1015. From whom did you receive instructions, if any, as to the mode of firing your shots? We did not receive any instructions; every one had to fire his own shots.
1016. Who supplied you with touch-paper? We supplied ourselves.
1017. Then you had no definite instructions as to how the shots were to be fired? No; Mr. Crawford found us some touch-paper before the strike, but since the strike we all had to find our own.
1018. *President.*] At least the deputy did not find it for you? No, sir.
1019. *Mr. Jones.*] When you first entered the mine you found it impossible to get beyond the big fall? Yes.
1020. Now I should like you to consider this question—which may be taken in connection with Mr. Hilton's questions—very carefully. Do you not think it necessary that there should be a second outlet, so that, and by means of which, the men would be enabled to get to the light of day in the event of a large fall taking place? I do.
1021. You say you have seen gas in small quantities in the working bords? Not accumulated there. I have seen little bits of blowers in the bords.
1022. Which satisfied you, I suppose, that gas was present? Yes.
1023. Did you work there with safety-lamps? Yes at that time, before the strike.
1024. *Mr. Clarke.*] Have you formed any opinion as to the particular spot where this explosion could have originated? No, I cannot tell.
1025. Could you localise the centre of the mischief in any way. Have you formed any opinion or theory on the subject? No, I cannot give any idea where it originated. It is supposed to have happened in No. 2 heading, I believe; but it is hard to say.
1026. You have no opinion of your own? No.
1027. How often did you see the overman, Mr. White, during the time you were working in No. 1 and No. 2 heading before the strike? Well we might see him every three or four days, or we might see him oftener.
1028. When he paid you these visits were you in the habit of drawing his attention to the presence of gas? Sometimes when he came in he would say, "Well, boys, is there any gas about?" and I have said many a time, "Yes, there is gas back here," and I have shown it him in the roof.
1029. He was very well aware of the presence of gas there? Yes. He would sometimes tell us to be careful till we came to the next cut-through.
1030. Going back to a former question, did you not say at the inquest that you thought the explosion had not originated in No. 2 heading? Yes I did, on account of the tubs being blown through on the flat.
1031. Then you did form a theory of your own? To that extent I have. I think if the explosion came in that direction it would not have blown the tubs about as they were found.

1032. Where, in your opinion, is the most likely spot for the explosion to have originated? I think it might have originated in the straight heading; there were men working there with safety-lamps, or somewhere in the western.

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1033. Are you still of opinion that it did not originate in No. 2 heading—have you abandoned that theory? Well I cannot give any further idea of it.

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1034. Well would you rather not express any opinion? Yes, I would rather not express any opinion.

1035. *Mr. Croudace.*] I should just like, in the first place, to fall back on the question asked by Mr. Hilton. Supposing the return air-way from the western district to be blocked up, and this explosion to have occurred, do you know if there was any return air-way from the western district to the furnace? Not that I know of; but I should think there must have been a way for the air to go.

1036. You do not know? No, I have never been that way.

1037. Can you say whether the miners in the colliery made their monthly inspection of the mine? I do not think they did. I never heard of it.

1038. To come to the ventilation of this mine. In going direct from the tunnel do you know if there was a door placed at the entrance of the western district? Yes.

1039. Was it a slide or a scale door, or a fly door? I have heard there was a slide there.

1040. Have you been through it? Yes, scores of times.

1041. How did you open it? I pulled it.

1042. Is that a slide door? No, it pulled open in the ordinary way.

1043. Was that door closed when you went through, or partly open? It was closed—that is we had to open it to pass through.

1044. It was not propped open—there was no scaling? Not that I saw.

1045. Did you ever see a trapper boy there? No; I never saw one.

1046. If there was no boy there, who opened the door to allow the sets to go through? There was always somebody there when the sets came out.

1047. That is somebody who attended to the door? Yes.

1048. Then why not have said so at first. Leaving that door, and coming along to No. 1 heading, was there a door between No. 1 and No. 2 heading? Yes, there was a door between Nos. 1 and 2 headings.

1049. On the main engine brow? Yes.

1050. Did any one attend to that door? Yes, a boy.

1051. Was there a door at this diagonal cut-through? I believe there was.

1052. Can you say whether a boy attended it? I cannot speak with certainty.

1053. Then, coming to No. 3 and No. 4 headings, was there a door there? Yes.

1054. And was there a boy in attendance there? I do not think there was.

1055. Are you positive? Well I never saw one; there was not much traffic through it.

1056. Have you ever been in the return from the face in No. 5 up to the western district? Yes, but it is a good while ago.

1057. Now, just for one moment let me refer to the question of locked and unlocked lamps;—did you ever remonstrate or make any suggestion, either to the lampman, the overman, or the deputy that all the lamps ought to be locked? No, because when we knocked off on strike we were all working with safety-lamps, and when we started again they gave us naked lights.

1058. Did you not consider it unsafe for others to have their lamps unlocked? I did not think much about it.

1059. As a prudent man of some experience, do you not think it would have been a judicious and proper thing for you to have remonstrated about the unlocked lamps? I did not think it was any of my business to interfere with the deputy's duties.

1060. Would it not have been a prudent and fairly right thing for you, as a prudent man—when you found that other men whom you say you could not trust were using these unlocked lamps—to have remonstrated about it? Well I cannot say; the men who worked in these headings were supposed to be practical men.

1061. Yet you say you could not trust them? I meant to say that I would not put much trust in unlocked lamps if all the men in the pit were working with them. But there were only a few working with them at Bulli.

1062. You have said that you could trust yourself but not others. Would it not then have been in your own interests to have seen that all the lamps were locked; in fact would it not have been only reasonable for you to have suggested to some one, even your fellow-workmen, that all the lamps should be locked? I believe they ought to have been locked.

1063. Then why not have suggested it? It was not my business.

1064. It was certainly not your business to jeopardise your own life? I did not think it would interfere with us. That is, I thought there was not sufficient gas in the pit to trouble any but those who lighted it.

1065. I am quite satisfied with that. I do not want you to think I am putting you in a corner. My object is to show that we may learn a lesson from the past for our guidance in the future. You, for instance, will be imbued with the feeling that all lamps ought to be locked in gassy mines after this. Did anything else, beyond the belief that there was only a small quantity of gas in the mine, prevent you from making that suggestion to any one? Well if I had known that there was any danger where I worked I think I should have reported it.

1066. You would not have felt yourself prevented reporting by any rules of the colliery? There was a rule, No. 6, I think, that when the men signed it they thought they were signing their liberty away.

1067. Have you read it? Yes.

1068. Is there anything there to prevent you reporting anything that appears wrong to you, as you go out of the mine? It says nothing about reporting; but it says the men are not to interfere in the management of the mine in any way.

1069. The rule is very plain and simple; it says that the employees shall not interfere with the orders for regulating the working of the mine. Now can that possibly be construed or twisted into meaning that the men are forbidden to report upon a dangerous state of things, either as to the roof, an influx of water, the presence of gas, or anything else? Yes, it does, in my opinion, mean that.

1070. Explain how? Supposing I had lodged a complaint about the absence of bratticing, say, do you not think that would be considered interfering? I should have been interfering with the management of the work. Supposing I said to the manager, "There ought to be some bratticing up here," he would tell me to mind my own business.

1071.

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1071. Still, though that be your opinion, you would not call that a correct interpretation of the clause, as to "interference." You would not be interfering with orders for regulating the work, even then; you would be making a suggestion. But is there anything in these rules to prevent you leaving your place and telling the deputy that you apprehend danger from a quantity of gas? It does not say anything about that.

1072. Supposing a blower of gas existed in your working place, do you think you would be prevented by this rule from reporting to your fellow-workmen, or the deputy, or the overman that such had taken place? You see it does not meet with reporting gas.

1073. Answer the question, please. Do you believe in your heart that that simple rule, No. 6, which merely refers to the regulation of the working, could be held to prevent you going into your fellow-workmen and informing them, as also the deputy and overman, that a sudden blower of gas came into your heading? Well, sir, as to reporting gas, I do not know; but if I had gone and told the boys that there ought to have been some bratticing up, which we all knew there ought to have been, would it not have been considered that I was interfering with the overman's work?

1074. Certainly not? Well, that is my opinion.

1075. It would not have prevented you giving information. But the real fact is that you thought the gas would only affect the men that happened to fire it. Is not that so? Yes, I did think that, certainly; but I can see now that there must have been some gas besides what was in the heading to do so much execution.

1076. Did you see more gas there than you have told us of? No.

1077. Have you ever known more gas in that mine—any part of it—than you have stated on oath? No.

1078. Do you know of anyone in the Bulli mine who has ever seen a great quantity of gas in any part of it, and if so, will you give me his name and address? No, I do not; but I have found a body of gas there before now.

1079. I am speaking of a large accumulation of gas. Do you know of anyone who whether rightly or wrongly, has stated that he has found a large accumulation of gas there—either in a heading or place of any kind—because, if such is the case, I will endeavour to ferret it out. Do you know of any such, either by report or of your own knowledge? I have myself seen a lot of gas in that mine. That was about two years ago.

1080. Keep to within a month or two previous to the explosion? I have never seen any more since than in the heading I have mentioned.

1081. *President.*] Do you think the gas that existed in the mine was known to the men; that is, that no unknown magazine of gas existed there? I do not think any such existed; I think they all knew that gas was in the headings.

1082. *Mr. Jones.*] You have stated that there were no monthly inspections by the miners? I did not know of any.

1083. Do you not have any inspections whatever? No.

1084. You have stated that you did not think there was sufficient gas in No. 1 and No. 2 heading to produce any great effect, and you say you have no theoretical knowledge of the part that coal dust would play in an explosion? No.

1085. If you had been in possession of such knowledge, do you think that would have altered your opinion? I do not consider there is a great deal of dust in that pit. There is no dust lying about the roads.

1086. Can you say what quantity of dust would be required to form any part in an explosion? No. [*The witness withdrew.*]

Walter Settle sworn and examined:—

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W. Settle.
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1087. *President.*] You are a miner, residing at Bulli? Yes.

1088. How long have you been employed at Bulli? It is about nineteen or twenty months since I first started.

1089. Before that where were you engaged as a miner? At Mount Pleasant.

1090. Have you been engaged in mining anywhere else? Yes; in Lancashire, England.

1091. Did you work in gassy mines? Yes; we worked with lamps.

1092. Then you are acquainted with gas in mines? Well, not to a large extent.

1093. Were you employed at the Bulli colliery at the date of the explosion? Yes.

1094. In what part were you employed—in No. 4 heading? In the gassy section.

1095. That is further in than No. 1 and No. 2? Yes, beyond that.

1096. Were you on the day-shift or the night-shift? I was on the night-shift.

1097. Where did you reside? At Woonoona.

1098. How were you apprised of the accident? I was going up to work, and was told of it.

1099. Were you one of the exploring parties? No; they were inside when we got up there, and there were no more lamps.

1100. Then you did not go into the mine? Not on the day of the explosion; we went in on Thursday morning.

1101. Where did you go then? We went as far as No. 1 heading—into a bord.

1102. Were the bodies of the men in the main tunnel removed before you went in? Yes.

1103. Then tell us the story of what you did in your own way? When I went in on the Thursday morning it was with the idea of helping to carry the bodies out. I think I was in as far as the second bord in No. 1 heading, and I never got any further. I was engaged in carrying out the bodies.

1104. After the bodies were taken out were you inside the mine? No.

1105. Have you not been in the headings and seen the state they were in? No.

1106. Then you cannot give us any information as to what happened, the cause of it, I mean? No.

1107. Before the strike, in what district were you employed? In the grip district.

1108. And since the resumption of work where have you been employed? In No. 4 district.

1109. Can you give us any information as to the condition of the district known as the "gassy section" before the strike? I never worked in it; so I cannot speak of it of my own knowledge.

1110. Since resuming work did you work with Davy-lamps in No. 4 heading? Yes.

1111.

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1111. Have you ever tested for gas in No. 4 in your own place? I never found any there.
1112. Was the ventilating current sufficient to sweep away any gas that might exist? Close to the stenton it was; but not at the face.
1113. You did not discover any gas at the face? No.
1114. Or at any other part of the heading? No.
1115. Did you notice any blowers at any time? No.
1116. Did you hear of any gas having existed there before the strike? Yes; a man who used to come to my house told me about it.
1117. But you have seen none yourself? No.
1118. Was the safety-lamp you were supplied with locked? No.
1119. Then, so far as your heading was concerned, it was a matter of form using the safety-lamps. How did you fire the shots? With a needle and squib.
1120. Did you communicate the flame of the lamp to the squib? No; we used an ordinary lucifer match.
1121. Then it was quite a matter of form whether you used the Davy-lamp or not? Yes; there it was.
1122. Did you consider there was anything inconsistent in using Davy-lamps, and lighting your shots by means of lucifer matches at the same time? Well, of course, it is not usual to take naked lights into a place where you use Davy-lamps.
1123. Then you used it because you had satisfied yourself that no danger existed from gas? Yes.
1124. Had gas existed even in an infinitesimal degree would you have used matches there? No; not if there had been the slightest danger.
1125. Were you particular to examine for gas before firing a shot? Yes.
1126. Did you make any report to the overman or deputy as to the state of the lamps—you say they were unlocked? We made no report.
1127. Were the lamps unlocked in the situations you occupied in England? No; they were locked there.
1128. You did not make any remark as to the lamps being unlocked at Bulli? No; the first night I started there Mr. Millwood locked two lamps, and one of the men asked him what they should do if they got in the dark.
1129. Was that Richards? Yes; I think so. He (Millwood) considered a moment, and then said, "You must go outside, but I do not see what is the use of my locking the lamps if I leave you the key," and so he unlocked them.
1130. Did the danger-board exist then? Not at that time; he would mean us to go outside the stenton.
1131. Did that appear to be a safe course to you? If there was no gas it was safe enough, but if there was gas it was not safe.
1132. Were you special men, and were there special places? Yes.
1133. In your opinion when working in special places are unlocked lamps as safe as locked lamps? The lamps are safe so long as they are not interfered with; of course, if you unscrewed them, it would be quite unsafe.
1134. I suppose you know the principle of safety-lamps is a measure of precaution against danger? Yes.
1135. And knowing that you would not think of unscrewing a lamp where there was gas? No.
1136. Then was it as safe in your opinion in one way as the other? Yes.
1137. And so far as your place was concerned you say there was no need for safety-lamps at all, as proof of which you lit lucifer matches to fire your shots? Yes.
1138. Did you work on the day shift or the night shift on resuming work after the strike? I was working from the 7th of March to the 22nd, and I believe I was one half the time on the dayshift.
1139. Were the safety-lamps unlocked during the day? Yes.
1140. Did you not think there was any necessity for communicating with the deputy on the subject of the unlocked lamps? No.
1141. Had you any conversation with your mates as to the state of the lamps? No; except to state that it was an unusual thing to have the lamps unlocked.
1142. *Mr. Neilson.*] What was the state of the ventilation the month before the strike? I thought there was a very good current.
1143. After the strike did you find any change? Yes; I thought there was a much stronger current of air going.
1144. You knew that the new furnace was going? Yes.
1145. Who was this man who told you about the gas—the man who came to your house? Robert Calland.
1146. Did you ever receive any instructions from the overman or any other person about firing the shots? No actual instructions. One of our men asked the manager if we could use the needle, and he said, "Yes, we could use the needle and straw."
1147. Have you ever worked in any place in the mine where you have been able to detect gas in the safety lamps? No.
1148. *Mr. Hilton.*] Was the deputy or overman aware as to the manner in which you fired your shots? I believe he was. He has been close to where we fired the shots, but never said anything, and whether he took any notice or not I could not say.
1149. Take this copy of the rules in your hand. [*Copy handed to witness.*] Did you ever receive a copy of these rules? No.
1150. Are you sure? Yes; I am certain. I asked for them. I asked the deputy, Mr. Robbins, twice, and he said he would see I got them; but I did not.
1151. *President.*] When was that? When I was working in the grip.
1152. *Mr. Jones.*] I understood you to say you never saw gas in No. 4 heading. Did you get any extra pay for working in No. 4 heading—was there 3d. a ton allowed? Yes.
1153. Then it was considered a gassy heading? Yes.
1154. I think you have explained that notwithstanding that you worked with Davy-lamps, you fired your shots with open lights and matches? Yes.
1155. Was that proceeding somewhat inconsistent with your position in that heading? Well there was no gas, and we thought we were quite safe.

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1156. *Mr. Clarke.*] Did you see any rules posted up either inside or outside the mine? Not that I am aware of since the strike. I think I saw them before. They were on a prop about 30 yards from the entrance to the mine.
1157. Were they legible—could you read them? Some portions of them.
1158. Did you ever try to read them? I have read some of them, not all.
1159. *Mr. Jones.*] Did you think it a wise precaution to have a caution-board placed at the second stenton back from the heading—that is to say, would it be safer? Yes, certainly.
1160. Would you suggest that as a measure of safety? Yes, it would be better no doubt.
1161. *Mr. Crowdace.*] You have stated that you heard of gas in No. 4 district previous to the strike? No; I did not say No. 4 heading; I said it was in the gassy district.
1162. However you have told us distinctly that Millwood took the precaution to lock your lamps; but at the special request of the miners themselves he unlocked them? I do not think I said that.
1163. You have stated that he locked your lamps on the first night, but that on one of your mates asking what you would do if you got in the dark he unlocked them in your presence. Is that the case or not? Yes.
1164. Very well, that being so, is it not the fact that Millwood took precaution to lock the lamps, but at your request unlocked them? We did not request him to unlock them; mine never was locked.
1165. You say that at first Millwood locked the lamps, but that on the representation of a former witness (Richards) he unlocked them, and told you that should they want trimming again you could go outside for that purpose? Yes.
1166. Well that indicates that Millwood showed great caution in locking the lamps. Whether it was prudent to unlock them afterwards is another matter? I suppose it is usual to lock them.
1167. The man is dead and gone. I do not say that he was over wise in agreeing to your request; but it was on your request that he unlocked them? Had he locked them we should have gone to work with them so.
1168. But you induced him? I cannot see that at all.
1169. In answer to a question, you said you were paid 3d. per ton extra for working in the presence of gas. Is not that extra tonnage really for the use of the Davy-lamp? Is it not a matter of precaution on the part of the management in agreeing to pay 3d. extra for fear of gas? Yes.
1170. You think it a matter of precaution? Yes.
1171. Either previously to the strike, or between the strike and the explosion, did you of your own knowledge know of any large accumulation of gas in this mine? The only large accumulation of gas I know of was reported to me the night before the accident by a man that worked in No. 2 heading.
1172. Then you do not speak of your own knowledge? No.
1173. But you have heard of an accumulation of gas there? Yes; I heard the night before the explosion, from a man who was in No. 2 heading, that the gas was up to the danger-board. He told me as we were going home the night before the explosion. That was James Salisbury.
1174. He told you the night before the explosion that the gas extended from the face in No. 2 heading to the danger-board? Yes.
1175. Did he say what distance that was? No.
1176. Did he make any further remark about it to you? He said at the same time, I think, that the driver lit the gas in the next heading.
1177. Do you know of any other report on the subject? No; I do not. [*The witness withdrew.*]

Joseph Poppett sworn :—

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1178. *President.*] How long were you engaged at Bulli? Up to the strike; not since.
1179. When were you apprised of the accident, Mr. Poppett? In the afternoon; I was in Bulli at the time, and I went up to the mine immediately.
1180. And did you go in? Yes, as soon as I got a lamp I went in, along with another party.
1181. How far did you go? We went to the furnace first; then I came back, and went up the cross-cut to Hill End.
1182. How far did you proceed? I did not go to the bank-head then; it was too hot.
1183. The ventilation was deranged? Yes; I came back.
1184. When did you return again? I returned about 9 o'clock at night, and went into the mine again.
1185. Where did you go then? We went straight to the bank-head, and examined the bodies. Mr. Evans went with me.
1186. Did you particularly examine the bodies lying on the flatt? Yes; I had a brother there in the western.
1187. What position did the bodies occupy? How were their heads lying? Some of them had been shifted then, and wrapped in canvass.
1188. Some one had been there before you? Yes.
1189. Did you go to the fall beyond the junction? Yes, I went to the big fall; there were men working at it.
1190. When did the men get over it? The next day, in the morning.
1191. Did you go over the fall? Yes, carrying the bodies out.
1192. Did you identify the bodies, or had explorers been there before you? I could recognise some of them.
1193. But others had been there before you? Yes.
1194. Who was there before you? I cannot remember.
1195. Was Mr. Green there before you? No; I think I was in the pit before him.
1196. Did you see any of the bodies lying as they were found in the tunnel, or No. 1 heading, or in No. 2 heading? Yes, I saw some that had not been touched.
1197. Where was that? The far end headings; there were two new chums working there.
1198. Did you know No. 1 and No. 2 headings? No, I do not know much about them, as I was not much up there.

1199. Can you tell us anything as to the condition of the bodies as you found them? Some of them were lying face downwards, and had not been touched at all; some in the bords and some in the headings.
1200. Was that in No. 3 or No. 4 heading? I cannot be sure; I do not know these headings.
1201. Where were you working before the strike? In the western.
1202. Were you working in the gassy section? No.
1203. Was there any gas in the western section before the strike? I never saw or heard of any.
1204. Have you been round the whole of the workings since the bodies were found? I was round the gassy and the western, carrying the dead out.
1205. Have you been round with the managers with the view of ascertaining the cause of the explosion? No.
1206. Did you work with Davy-lamps in the western? No, with naked lamps.
1207. And you met with no gas? No; there was none there that ever I heard of.
1208. *Mr. Neilson.*] Did the body of your brother, after being washed, show any signs of being burnt? No, very little.
1209. What part of the mine was he in? In the western, as you come off the flatt, a good way up. [*The witness withdrew.*]

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Wm. Beckton sworn and examined:—

1210. *President.*] What is your occupation? I am a miner residing at Bulli.
1211. Were you engaged at the Bulli colliery at the time of the accident? No, I was not.
1212. Were you engaged at the Bulli colliery before the strike? Yes.
1213. How did you first become aware of the accident? I heard it from a man as I was coming from my work at North Bulli.
1214. At what time was that? It was about 3 o'clock or half-past on the 23rd of last month.
1215. That was some time after the accident occurred? Yes.
1216. Did you go straight up to the mine? I went up after having tea.
1217. Were you one of those who went into the mine? Not at that time; I went in after.
1218. The accident occurred on the Wednesday—when did you go in? I went in on Monday with Mackenna, Hobbs, Mr. White, and the Government Inspectors, Mr. Rowan and Mr. Dixon.
1219. Where did you work in the Bulli mine before the strike? All over the gassy section pretty well.
1220. In what place did you work? We started in the straight heading; then we worked in an airway, following up the main back heading; then we worked in No. 1 left, or No. 6, I think it is, where the back air-way started off. [*Position indicated on Plan. Witness referred to No. 5 heading.*]
1221. Were you working in Nos. 1 and 2 headings? I drilled a hole in No. 1, but never worked in No. 2; I forgot this when giving my evidence before.
1222. Then practically you did not work in No. 1 heading? No, I just drilled a hole there.
1223. Was gas given off in considerable quantities in that district when you were working there? Yes, in the face and on the rib sides—that was on the main heading.
1224. Was there a larger quantity of gas given off in approaching these rolls you were troubled with? I believe there was.
1225. Did it issue from the cracks or joints in the coal? It came in the shape of blowers.
1226. It came out in some force, I suppose? Yes, some of the blowers were stronger than others.
1227. Did you use safety-lamps? Yes.
1228. Were they locked? Yes; that is sometimes before the strike, but not afterwards.
1229. During the day-shift were they locked? I have worked during the day-shift with unlocked lamps.
1230. Can you assign any reason for that? No; I would just go in and get my lamp, and if no one was there to lock it I would take it away with me.
1231. Have you never read the Act of Parliament dealing with regulation and working of coal-mines? No, sir.
1232. Have you not read the special rules dealing with the presence of fire-damp in mines? Well it is so long since I got them that I forget.
1233. Are the rules not posted up at the pit, where you could see them? I have tried to look at them, but they are so high up I could not see with the light there.
1234. Do you know the duties devolving upon you as a miner in working with safety-lamps? No, I can't say that I do.
1235. Rule 16 of the General and Special Rules Bulli Colliery says:—

“Should it be necessary to use safety-lamps in any portion of the pit, stations will be fixed upon and proper notice boards erected, beyond which no person under any pretence whatever shall take any naked lights, pipes, or matches. From these stations no person is allowed to take a safety-lamp to use in the pillar-workings, broken or waste, without it having been first examined and securely locked by the overman or other person appointed. None but the overman or other person authorized shall carry a safety-lamp key.” * * * * *

Do you not remember reading that portion of the rule No. 16? No; I do not remember reading that.

1236. Did you consider that you were incurring any special danger in working with unlocked lamps? No.
1237. You say occasionally they were locked? Yes.
1238. In the majority of cases were they locked? For a while they were; but before the price was settled and the miners came down in bodies to work we never used locked lamps.
1239. Then was the price increased on account of having to use safety-lamps? Yes; we were all working on shift-work at that time, and when the price was settled thirty more men came down there, and I suppose for safety they locked the lamps. I never saw a “safety” key before that.
1240. But after that you say the lamps were locked? Yes.
1241. And was the rule adhered to? They were never locked on the night shift.
1242. Did you receive any special instructions as to the use of safety-lamps in working on the night shift? Not to my knowledge.
1243. What did you in the event of your lamp going out? We had to go back.
- 1243½. Did you receive any instructions to that effect? No.

1244.

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1244. How far did you go back? We went back past the danger-board into the main air-way, as a rule.
1245. Where was the danger-board fixed? At the last stenton, and it was moved forward as the stentons were advanced.
1246. Did you find a considerable quantity of gas in your face each day? I have found from 5 or 6 yards up to 40 yards of it.
1247. Was that every day? No, not every day. As the stentons were driven through, a certain quantity of gas would be carried away; but I do not think I worked a shift there without being in gas.
1248. Was the ventilation sufficient at that time? It was, up to the stenton; but beyond that it was not very good.
1249. Did it ever occur to you that brattice ought to have been used? Have you ever seen brattice used? There was a little brattice used there at first, but I never took any notice of it.
1250. Then has your experience been gained in this colony only? Yes; in the Bulli district.
1251. You know the object of bratticing? Yes; I do now.
1252. How did you fire shots in the presence of so much gas? I did not fire many; I did not care about it. Jim Crawford generally fired the shots.
1253. How did he do it? He generally fired the shots with a touch-paper from his Davy-lamp. He would hold the light on one side and put the touch paper against it.
1254. Had you ever worked with safety-lamps before you worked in the gassy section? No; never before then.
1255. What material did you use in tamping your shots? Sometimes we used slack coal, and sometimes stuff from the dyke. We would put it on and tamp it up dry.
1256. Did you consider that a safe method? I think it was as safe as anything else.
1257. Indeed. Did no one tell you it was unsafe? No.
- 1257½. *Mr. Neilson.*] Do you know anything about No. 1 or No. 2 heading? I know a little about No. 2 heading. I saw a drill hole bored there on one occasion and a gas-pipe put in it, with a tap attached. The deputy one day lit the gas coming through this pipe. It was very strong, and if he turned the tap full on it would not burn, the force was so great.
1258. How long did that blower in No. 2 heading continue? It was there, I think, when I left. I believe the pipe was put in there to convince Mr. White there was gas; at least so I heard.
1259. Who put it in? The deputy.
1260. To convince whom did you say? To convince the management.
1261. Was not the deputy part of the management? I suppose so. But perhaps they would not believe there was gas there.
1262. How long did this blower continue? Well, I only saw it once. As I say, it was so strong it would blow its own light out; but when the tap was turned on about a quarter power it would burn away fine.
1263. You have said you have known as much as from 5 to 40 yards of gas to be present in that heading. How did you manage to work there with that quantity of gas? I know the safety-lamp would be jingling on the bottom, and we complained about it, so they shifted us out of it. I suppose they saw that it was too bad.
1264. How long did you work with your lamps jingling, as you call it? That is the gas playing on the bottom.
1265. *President.*] Did you see the gas—did you have a blue blaze in the lamp? Yes.
1266. *Mr. Neilson.*] How long did it continue? Well, when we started to work the gas would go away to a certain extent; but if we went out for a time it would be just as bad when we came back, so we complained about it.
1267. If there was 40 yards of gas there the tail end of the gas would be close to the danger-board? Yes, so it was.
1268. This was a special place you are talking about—over a fault? No; it was in the main heading.
1269. But it is crossing a fault, as you pointed out on the plan? Yes.
1270. Did you pass over any rolls? We went over two in the 40 yards.
1271. Was the gas there at night time? Yes; more so at night.
1272. How did you manage to fire shots with such a quantity of gas present? Well they did it, that is all I know.
1273. You say you used dry tamping? Yes.
1274. Had you any blown-out shots? No; they always did their work well enough.
1275. Is it customary to use dry tamping? I never saw anything else used there; they used either dyke or slack.
1276. Did you never see any of the holes blown out? No; I never saw any.
1277. Were you at work on your own account all the time that the gas you describe was in this place? We were at that time. We had gas all through, but not always so bad.
1278. *Mr. Hilton.*] Did you ever report to the deputy or overman the presence of the gas? Well, it was a common occurrence. They would come and inquire about the gas, and we would tell them about it.
1279. Did you know it was a part of your duty to report the existence of gas to the overman in case he was not aware of it? No.
1280. Did you ever see a copy of these general and special rules (*produced*)? When I came here first I had a copy, but I have been away since and I have lost them, and I do not remember their contents. I was away about six or seven weeks.
1281. On resuming work again did you receive a copy of these rules? No.
1282. *Mr. Owens.*] Were you employed in No. 3 heading? Yes.
1283. And did you see a considerable amount of gas there? Yes.
1284. Have you ever worked in the western district? Very little; I drove the air-course from Hill End to the western.
1285. Did you ever see gas there? Well we were told on one occasion to clear out with our naked lights.
1286. That is the present return? Yes.
1287. Did you report that to the deputy? I did not see him. This was also abandoned ground.
1288. You found gas there? No; I will show you on the plan. (*Position indicated.*)

1289. Did you see the gas? No, I did not see it, but a man came down and told us to clear out.
1290. When was that? That was about two years ago, just about the time the gassy was struck.
1291. *Mr. Jones.*] When you went to work at night you took the lamps from the cabin, I suppose? Yes.
1292. Did the management ever remonstrate with you? No.
1293. *Mr. Clarke.*] Where was this large accumulation of gas, the presence of which it was necessary to demonstrate? In No. 2 heading.
1294. Did you ever see the overman or the manager there? No; my heading was a different one.
1295. Why did you say that this pipe with a tap was used for the purpose of convincing them? I said that this hole was bored to show the large quantity of gas there.
1296. Did you mean to imply that the management were unwilling to believe that there was that amount of gas there? I cannot say as to that; I know there was talk among the men to that effect.
1297. It meant that there was an unwillingness to believe in the presence of such a volume of gas, I suppose? Yes; that they thought there was only a small portion of gas there, and it was to convince them that there was a large quantity.
1298. Would not the fact of your carrying safety-lamps imply the presence of gas? Yes.
1299. Then there should have been no need of convincing? You would not think so.
1300. Then why use the word? All I know is that that was the word passed among the men.
1301. *Mr. Jones.*] I suppose what you want to convey to the Commission is this: that the pipe was put in simply to show the quantity? Yes; that is what I mean.
1302. You do not mean to say that the existence of gas was doubted? No; but they did not know it was in such large quantities.
1303. *Mr. Croudace.*] How long ago was it that this large flame of gas came from No. 2 heading? I think it was during the last quarter that we came out, but I am not certain.
1304. Say as nearly as you can? It was about three months before the strike. I know it was a good way from the face of the heading.
1305. Did it totally clear away before the strike commenced? I cannot say. I only saw it once, and I never heard anything more about it after.
1306. Did you consider Crawford a cautious and prudent deputy? Well, so far as that goes, he used to caution us pretty often.
1307. Do you think he thoroughly understood his work? Yes; so far as I know, but I have not much knowledge of gas.
1308. You know the use of the Davy-lamp—that in the presence of gas it will light at the flame and expand inside, but cannot come outside? Yes, I could detect it in the flame.
1309. You know of your own knowledge that the use of the safety-lamp is that the gas can be exhibited inside of it, but not come out by ordinary means? Yes.
1310. Then was it a prudent or a proper thing for Mr. Crawford to tilt his lamp up, so as to let his lamp come in contact with the touch-paper? I do not know enough about gas to answer that question.
1311. Knowing that the flame ought to be kept inside of that gauze, was it a prudent thing for Mr. Crawford to tilt his lamp and let the flame ignite his touch-paper outside? So far as my experience went, I saw nothing wrong in it. As I say, I do not know much about it.
1312. Have you been in the mine since the strike? Yes.
1313. Can you give me an idea as regards the state of ventilation with this amount of gas inside previous to the strike, compared to the amount of ventilation after the strike? I have no idea as to that. [*The witness withdrew.*]

John Hobbs sworn and examined:—

1314. *President.*] You are a miner? Yes.
1315. Employed at Bulli? Yes.
1316. Have you been employed in the Bulli Colliery since the strike? No.
1317. Where have you been working? North Bulli.
1318. How long have you been a miner? Twenty-nine years.
1319. In this country or in other parts of the world? Both in this country and in other parts of the world.
1320. Where? In England and in Wales.
1321. What part of England? In Lancashire, Yorkshire, Scotland, and in South Wales.
1322. Have you been accustomed to work in fiery mines? Yes, in some of the most fiery mines in England.
1323. You are well acquainted with the use of safety-lamps? Yes; we use nothing else in these mines.
1324. How long did you work in the Bulli Colliery? About three years.
1325. And where did you work? I started to work in the Hill End for the first quarter, that was before the fault was struck.
1326. There was no gas there at that time? No, the place was free from gas.
1327. There was no gas before the fault was met with? I never saw any.
1328. Where were you on the day of the accident? I was in the house.
1329. Were you with those who went into the mines? Yes.
1330. When did you reach the mine? At half-past 5 on Wednesday evening.
1331. Where did you go? I went up to the western door.
1332. What was the condition of the ventilation of the mine? Very foggy and thick with foul air.
1333. You found a good many falls, I suppose? Yes.
1334. Beyond the western? Yes; there was a heavy fall.
1335. Beyond which you did not deem it expedient to go? A hole over the top of it had just been made, and the manager, Mr. Ross, with three or four others, went through it and got on the other side.
1336. What hour was this? It was about 7 o'clock on Wednesday night.
1337. Did you go over the fall? Yes. I thought there was danger, and I went over to see if those who went before me were all right.
1338. Was the ventilation being restored? No; there was no alteration in the ventilation at that time.

*Mr.
W. Beckton.*
11 May, 1887.

*Mr.
J. Hobbs.*
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- Mr. J. Hobbs.
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1339. Had the canvas been put up at the western junction? Some canvas had been put up, but a great part of the ventilation was oozing through it.
1340. How far did you go? Close to where the dyke was.
1341. What prevented you from going further? Some of the men began to fall down from the effects of after-damp; we had to carry two of them out.
1342. What time was that? Between 8 and 9 o'clock at night.
1343. What time did you return again? I stopped in that night till 12 o'clock.
1344. But you did not get beyond the dyke? No.
1345. You worked to clear away the fall? Yes.
1346. Did that improve the ventilation? It could not improve it.
1347. Would it improve the road? Yes.
1348. Would it give a greater area for the air? Oh, yes.
1349. When did you return after 12 o'clock on Wednesday night? I returned about 9 o'clock next morning.
1350. Where did you go? I went right into the gassy section.
1351. Had any explorers been there before you? I believe so.
1352. Did you see any bodies on the road? Yes, they had not been removed.
1353. How many bodies did you find between the western junction and No. 1 heading? The bodies of two boys.
1354. You found them on Wednesday night? Yes.
1355. Was one entangled in the ropes and the other naked? One of them had no clothes on.
1356. None at all? None that I could see, and the other was entangled in some ropes.
1357. They had the appearance of being blown about? Yes.
1358. Who were with you? Mr. Ross, Fred. Robbins, and three or four more. I believe there were six of us altogether.
1359. Did you notice whether the boy who had no clothes on was burnt to any extent? I had no time to look for burning, the after-damp was too bad.
1360. Was it very hot? It was not very hot, but the after-damp was very bad.
1361. On the Thursday morning when you went into the mine, did you go with Mr. Green to No. 1 heading? No.
1362. Where did you go? I went into the gassy, but I think I went by myself.
1363. What do I understand by gassy, is that not the Hill End district? Yes; we call it gassy inside the dyke. I went through the dyke with Mr. Williams, the Manager of Coalcliff. I stopped there and placed forty-two bodies on stretchers, and other men carried them out.
1364. Did you identify any of them? Yes, some of them.
1365. Did you take any note of the positions of the bodies? Yes, I know the way all of them were lying.
1366. On reaching No. 1 heading, did you see any bodies there? Yes, I believe there was a man lying by the side of Millwood, and I believe Millwood was the second body. It was on the other side of the second crossing that was working.
1367. Were there any men lying in the main tunnel opposite No. 1 heading? No.
1368. Did you pass two bords? Yes, two bords that were not working.
1369. Was there a man lying at the second bord, near the main road? No; there was a man lying a little further out, but the two bodies were near each other.
1370. One of them was Millwood? Yes, I have no doubt about it.
1371. Was Millwood lying in a conspicuous position? Yes, and I took his watch off him.
1372. Where were the other bodies? Just past the next bord. There was one lying in the bord on the road, and another lying in the face of the same bord.
1373. Did you identify them? No, they were strangers to me.
1374. Going up the heading, what did you find? There was a man lying in some slack beside the cut-through, and inside the cut-through there was a horse; and there was a man lying between the front legs of the horse.
1375. You got five men a little above the fifth bord, then opposite or near the next bord you got one lying near the main road, and another man near the face, then you go up and were not two boys found near the next bord? No; I don't think there were.
1376. On the plan there are two other bords, namely, Nos. 6 and 7 working bords, and there are two men lying on the main road, near the entrances of each of these bords? I do not recollect seeing them.
1377. Was Mr. Green there with you? Mr. Williams and Fred. Robbins, and they were taking in men.
1378. Then you came to the cut-through, where the danger-board was placed between Nos. 1 and 2 headings;—was there a man found there? Yes.
1379. Near the entrance of the cut-through of No. 1 heading there was another man found? Yes, on the slack.
1380. Was he on his face? No, lying on his back.
1381. How were these men on the main road lying? Mostly with their face downwards, as if they were proceeding down the road.
1382. With the exception of Millwood? Millwood was sitting with his head on his left shoulder, and his big lamp was by his side.
1383. Then you come into No. 2 heading;—where did you find the men in No. 2 heading going downwards? There was a little bit of a rib in a bord which had just been turned off, and was in about 2 yards. There was one body there. It appeared that he had been sheltering himself, and he was lying down where he had fallen. We went back to where a fault had been blown up, and there were nine bodies in a heap in this fault, which was very narrow. I believe there were nine there altogether.
1384. Was there one in the next bord? No.
1385. Were there two on the main road near the next bord further down? The nine men I refer to were close together, no distance separated any of them, but there were two men in the double bord off No. 2 heading.
1386. Then you come down towards the flat? Yes.

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1387. And you reached the diagonal road? Yes, there was one man lying outside this lot; he had a tea-bottle in his hand, and this was lifted up just as if he had been in the act of drinking when the explosion occurred.
1388. You would conclude from that that his death had been very sudden? Yes, and it appeared as if all the old miners were trying to make their way out, but some of the miners had evidently dropped where they were standing.
1389. At this particular part they were all in the main road? Yes, all of them.
1390. Were their heads lying as if they were making their way down the road? All, except one, who was lying on his back.
1391. Were these men lying on top of each other? No, but they were lying very close to each other.
1392. Did you observe the diagonal road where the coal was brought from No. 1 heading into the main tunnel—what condition was that road in? Yes; there was a set of skips there, and the empty skips were all turned on their sides as if the blast had overtaken them as they were coming down the road.
1393. Was there a boy at the end of those skips? I suppose so, but I did not find him.
1394. Now, come to the main tunnel? There was a horse at the mouth of No. 2, and the boy who drove the horse.
1395. Did you observe the condition of the stoppings? Yes; they were blown towards the return as if blown inwards off the road.
1396. Did you go over the stoppings? No; we bratticed them up all the way down; the first one was a heading where a door is supposed to be, and next was an ordinary stopping; the third had been a horse-road for the return, and it had been shifted further in.
1397. Did you find any men in the main tunnel or the flat between Nos. 1 and 2? On the middle of the flat there were two boys—one was almost battered to pieces, and was lying under a full skip; the other was lying with an empty skip just turned over him as if the blast had come up and blown these skips to pieces. There was another man in No. 3, and every bone in his body was broken, and his inside was out; he was the worst mutilated of the lot, and had no clothes on; he was found in No. 3 turn.
1398. What about No. 2 heading? I finished there.
1399. Coming back to these boys that you got in the main tunnel before coming to No. 1 heading, one of whom was entangled in the ropes, had they any marks of burning on them? Their hair was burnt, but I did not take special notice of their skin.
1400. Coming to No. 1 heading, the first body that you found was opposite the second working bord off the main road? Yes; one of the bodies found there was badly burnt. Millwood, who was also found near there did not appear to be burnt at all; he appeared as natural as if alive.
1401. You conclude that he died from after-damp? Yes.
1402. Coming to where you got five or six other bodies, were they in the same condition? They were all lying with their faces downwards, and they did not appear to be burnt.
1403. Was there a man right in the face? Yes, with a pick by his side, and his light was hanging on his billycan.
1404. The position and condition of that body would lead you to conclude that death had come suddenly? Yes.
1405. Coming up to the cut-through there was a man lying on his back? Yes; he was burnt.
1406. Did you observe the condition of the horse found there? Yes, and I noticed that the body of the horse was awfully swollen.
1407. Some time had elapsed which might account for the swelling? Yes.
1408. Was the man lying near the horse burnt? Yes.
1409. What was his name? He was a stranger to me. Just beyond this horse I found a safety-lamp gauze; it was in No. 1 heading, a little further in than the horse. I picked up another lamp, and I tried it, and found it open.
1410. Was the gauze separated from the lamp? No.
1411. The lamp was intact? Yes, but open.
1412. Not unscrewed? No.
1413. Where was the lamp-gauze you found? Close to the horse.
1414. And where did you get the second lamp? Inside, nearer the face where there is a stone or the beginning of a roll.
1415. Did you find some loose powder? No; I found a coil of fuse burnt to ashes hanging on the prop.
1416. Have you heard that powder was found? Yes, I have heard some one say so.
1417. You have no doubt that the man found in the cut-through and the man that was under the horse were burnt? Yes, they were burnt.
1418. And the man you got further down the heading road had no visible marks of burning? No.
1419. Now come into No. 2 heading? The first one was found in a bord; he did not seem to be burnt to any noticeable extent. I was engaged in taking the bodies and placing them on stretchers, and I noticed that one was burnt very badly.
1420. Who was that? I think it was Jack O'Neill; his was the outside body but one in No. 2 heading.
1421. And he was found in the main road? Yes.
1422. Down in another bord you got two men? Yes; one on the bord and another further in; the one that was furthest out was burnt a little.
1423. Can you speak of those found in the main road? Yes; they were all lying with their faces down; some of them had their hands burnt and some their faces, but not severely. Jack O'Neill was the worst of the lot.
1424. Are you now referring to the group of men that were lying together? Yes; there were nine or ten altogether, but they were not badly burnt.
1425. Did you examine the condition of the bords off No. 2 heading? Yes.
1426. Did you see any marks of fire? Yes; a coil of fuse was found in No. 2 heading.
1427. What bords did you go in off No. 2 heading? I went into every one of them, and tried everywhere for gas, and I found a little in one of the bords; I believe it was Jack O'Neill's bord.
1428. It was a small quantity? Yes.
1429. Did you examine the last two or three bords nearest the main tunnel? Yes; in one there was a set of empty skips, but I saw no evidences of fire on them.
1430. The last bord down, did you go into that? I am not sure.

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1431. On what side of the skips did you go? I went in on one side and came out on the other, and I did not see much evidence of the blast; the skips were all on the road with the exception of one.
1432. Did you observe any evidence of fire on the props as if the blast had swept through the cut-through? Yes; I saw the props were crispy.
1433. Was that an evidence of fire? Yes; fire had been around them and made them crispy.
1434. You examined No. 1 heading? Yes.
1435. Did you see any evidence of fire? The props here seemed to be quite different; they seemed as if they had not been touched, and I saw no evidence of fire about them.
1436. You would not be surprised to learn that traces of fire have been found there? No; because I did not look particularly.
1437. Your examination was necessarily a hurried one? Yes.
1438. Coming down to the tunnel you did not go through the stopping that was blown out? No.
1439. Did you put up a canvas? Yes.
1440. You did not go up Nos. 3 and 4? No, not into No. 4, because we were short of canvas, and as it was getting late. On Friday morning we started out.
1441. Have you any other information to give us as to the examination at that time? Of course I worked in the gassy from the time gas was struck, when we passed over the dyke to where the workings are now, and I turned off No. 4 heading.
1442. In working that heading did you find gas? Well, you could find gas anywhere there; we were never without gas more or less. Sometimes there would be great quantities, and at others, when the cut-through was near the face, it would be much less.
1443. It depended on the ventilation? Yes.
1444. You are only speaking of the time before the erection of the new furnace? Yes.
1445. Was the ventilation sufficient at that time? I did not look much after that.
1446. Did you complain? Yes, both about the gas and the ventilation.
1447. I suppose it would probably be through the representations that the men made, as well as the evidence of gas itself, that caused the new shaft to be sunk? I believe the new shaft was started before much gas was got at all.
1448. How long ago? I think it was before the dyke was struck.
1449. Was it stopped for a time? It is only about a year and a half ago since the gassy started.
1450. But that is a long time to sink a shaft. Did you work with locked lamps? Yes; sometimes they were locked and sometimes they were unlocked.
1451. At night, were they unlocked? Both night and day.
1452. Why was the rule to lock them not continuous? I cannot say.
1453. Was there a rule for the locking of the safety-lamp? There is a rule all over the world.
1454. Did the deputy lock the lamps or not? I believe he locked them for three or four weeks at the latter end.
1455. Then he locked them for a time? Yes, perhaps for six or seven weeks.
1456. Did you complain to the deputy about it? I told him that the lamps ought to be locked.
1457. What did he say? Well, he said, "I will see that they are locked," and then they would be locked for a time. When the men started getting coal the deputy locked the lamps himself, and before that I was always at him about locking them, and about several other things that were not fit to be done.
1458. What were these things? Well, there was a safety-lamp used night and day with the top out, and the gas was coming out in the gassy and in the straight.
1459. Who used this lamp? Bill Beckton and Thomas Wales. My mate used it in the day-shift. I told him about it, and he said, "It is right enough; hang it back on the road."
1460. You know the special rules? Yes.
1461. You know the provision as to the duty of miners in dealing with safety-lamps, to take off the gauze and take it home for cleaning purposes, and if the gauze requires repairing to take it to the lamp-cabin;—did Beckton do so? Yes.
1462. How do you know? I told the deputy about it.
1463. But how do you know he took it to the cabin? Both of them did.
1464. But how did you know? I told the deputy about it myself.
1465. And what did he say? He said, "It is right enough; hang it back far enough on the rib."
1466. That was Crawford? Yes; he said, "I have been complaining to White about it." He also said, "I cannot get any gauze, and White won't take any notice of me."
1467. Who said that? Crawford.
1468. Are you sure of that? Yes.
1469. How did you work the coal in these places? Sometimes with a pick and sometimes we blasted it.
1470. What explosives did you use? Loose powder.
1471. How did you fire the powder? With a fuse and a bit of touch.
1472. How did you fire the touch? With the safety-lamp.
1473. You tilted the lamp? Yes.
1474. Was that safe? No.
1475. You say you have had a great deal of experience; and you said the gas was always present, and you made frequent complaints to the deputy, and yet you say that you perpetrated the awful absurdity in lighting the touch-paper by tilting the lamp? Remember, we did not do that in the presence of gas; if there was any in the face we always brushed it away before firing the shot.
1476. What effect would the flame have in impinging upon the gauze? No effect at all; the proper way to clean the gauze is with a covering of oil.
1477. Is there any other way of cleaning the gauze? You can clean it by steam.
1478. Can you clean it with soda? Yes; but if you boil the gauze it will loosen it.
1479. What was the practice in England? We had nothing to do with the lamps there.
1480. It was a rough-and-ready way you had? Yes.
1481. It does not redound to the common-sense of the people who do it. You cannot state the condition of that district of the mine since resuming work after the strike? No; not since the strike.
1482. Of course you examined the places during the time you were taking out the bodies, and you saw some gas? Yes; in No 2, and a little bit in a bord off No. 2.
1483. And the ventilation was then deranged? Yes.

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1484. On account of the destruction of the stoppings and doors? Yes.
1485. Was that a likely time to find gas? No; there is no gas where there is black-damp.
1486. What effect does that have? It drives it out or kills it.
1487. Are you sure of that? Yes.
1488. Suppose gas was existing in large quantities, how could you test for gas? In black-damp or after-damp we could not test, because the lamp would not burn.
1489. Did you find any gas anywhere else? No; only in one bord.
1490. The ventilation was then undoubtedly deranged? Yes.
1491. Very well, don't you think that with the ventilation so deranged it was a very likely time for the discovery of gas? No; the after-damp would stop it.
1492. How do you account for the gas in No. 2 heading? On account of the poor ventilation there.
1493. It was beyond a cut-through? Yes.
1494. Was the current of air appreciable that was going through the cut-through? Yes; I threw up a little bit of slack and found that the air was going through.
1495. Did you form any conclusion as to the cause of this accident? I cannot form any conclusion, but I have my opinion.
1496. That is what I want? I believe it was a fire-damp explosion, and that most of the damage was done between the Western and the gassy.
1497. Where, in your opinion? In the left-hand heading, off the middle flat.
1498. That is No. 2? Oh, no; it is between the Western and the dyke.
1499. How do you account for the position of the skips from the diagonal road, on that supposition, and if it fired in the left-hand heading who fired it? I don't say it fired there; I believe it fired in the bottom of the straight or No. 5 heading.
1500. How do you account for the position of the skips and the amount of destruction of property? Because everything was blown upwards from the bottom of the flat. The full skips were lifted up there.
1501. And supposing the blast came from No. 2? All these things would have been blown in a different way.
1502. What blew that stopping in towards the left? I cannot account for it; the stoppings were blown into the return, and everything else was blown from the bottom.
1503. And yet you follow the course that the blast has taken? No.
1504. You did not go into the mine with the object of discovering the course of the blast? No; only to help to carry the bodies out.
1505. Your conviction is that the explosion took place where you state? Yes; and that there was not enough gas in the gassy to do the damage that has been done. A large quantity of gas has lit there before a dozen times to my knowledge.
1506. Was that a safe state of matters? It was not.
1507. Did you complain? Yes.
1508. Did you not think it a prudent thing to retire altogether? It was as safe for me as for the others.
1509. Do you think that self-preservation is the first law of humanity? Yes; but men don't always think of that.
1510. I am afraid that men do think of that. Have you formed any opinion upon, or have you studied the behaviour of coal-dust in the presence of gas? I never studied anything of that kind; I only studied the easiest way of working coal.
1511. I think a man of your experience ought to look a little higher, and I am quite sure you do it.
1512. *Mr. Neilson.*] With reference to Millwood's lamp, who picked it up? I did not.
1513. Were you there when it was picked up? No; I was not.
1514. You were working in No. 3 heading? No; in No. 4.
1515. That is the heading going parallel with No. 3? Yes.
1516. What was the largest quantity of gas you have seen there? It was back to the cut-through in No. 3; it was back to the cut-through in No. 4; and it was back 8 or 9 yards in the straight; and it was full in No. 6.
1517. Outside the danger-board? Inside.
1518. Were you near up to the stentons? They were over the distance; 35 yards is the distance according to the rules.
1519. The gas tailed right out to the danger-board? No; I did not say that. The danger-board was outside at No. 3 turn, and there was a cut-through inside of that.
1520. The gas tailed back the full length where you were working? Yes.
1521. What gas had you in the face? The face was full of gas.
1522. Right on the bottom? Down to the stone. I was driving the cut-through in No. 3 up to No. 4.
1523. Your lamp would be full of fire? There was no fire at all in the lamp.
1524. Notwithstanding that it tailed back for 35 yards? I did not say that.
1525. I understood you to say that? It was to the cut-through.
1526. I noticed that you stated before that there were 40 yards of gas? That is not my evidence as you will see.
1527. Crawford fired your shots? Yes.
1528. Did he go back to light the touch? Yes.
1529. Even when he knew there was gas in the face? Yes; but it was brushed clean before it was fired.
1530. Was that the custom? Yes; but it was not the regular custom. There ought to have been bratticing.
1531. Was it the practice? Yes.
1532. A man would take his shirt to brush the gas out? That was our practice.
1533. The shot was lit inside the gas? When we brushed her out we could hardly see any gas.
1534. Did you brush from the face right back? Yes; to the cut-through. There was a cut-through beyond the danger-board, inside of it.
1536. Do you know that door leading into the Western? Yes.
1537. How is it made? It was an open door when I was there.

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1538. When did you see it last before the strike? The last thing before the strike I believe it was there.
1539. You never saw any slide? No; after the explosion there was no door there at all.
1540. Was there any trapper at that door? I think that the man who looked after the set also looked after that door.
1541. There was some one attending it? Yes.
1542. The next door was between Nos. 1 and 2 headings? Yes; a little lower down than the lamp-cabin.
1543. Was there a trapper there? Yes.
1544. There was another door further in? Yes.
1545. Was there a trapper there? Yes.
1546. You are quite sure you never saw a slide in this door? No; that road was not my road for travelling in and out, and I never made it my duty to look after another man's business.
1547. You never heard of a regulator being put on the western door since the erection of the new furnace? I never saw it; I heard them talking about it.
1548. Did you complain about the gas to any other person than the deputy? No; I thought it my duty to tell the deputy, as he was the person to look after that.
1549. *Mr. Hilton.*] You say that the Deputy Crawford complained of the bad state of the lamps? Yes.
1550. Did he say to whom he complained? Yes; he said he told White about them, and he took no notice.
1551. Did you hear him say whether he had complained to the manager? I never heard him say that.
1552. You are sure that Crawford stated to White about the bad state of the lamps? Yes.
1553. *Mr. Owens.*] In reference to that lamp with the top gauze off, I expect you have seen the Government Inspector in the mine? Yes.
1554. Did you see him when you were using that dangerous lamp without a cap? The cap was there, but the top gauze was falling to pieces.
1555. You never unscrewed it and showed it to him? When the inspector came it was all right; a new gauze was put in.
1556. Did you ever hear of a blower being struck in No. 2 heading, and of the gas being carried away with a gas-pipe? Yes; a drill-hole had been put in the side, and a bit of a gas-pipe had been put on a blower, and you could turn it off and on like ordinary gas.
1557. And you were in the habit of lighting this? No.
1558. Who was? Crawford.
1559. Did you see him light it? Yes; when we were a long way back all over the stone we used to strike blowers, and you could hear them buzzing like steam-cocks for a week or a fortnight.
1560. What course did you take? I took no notice of it; we kept our lamps back.
1561. Did you find any gas in any other part of the pit? I found a little gas once between the Western and the Hill End in the return in the heading off the middle flat; it was not so sharp as that which came off beyond the dyke. I saw Crawford as I was going in, and he told me he heard a fall, and he told me to go and see if it was clear; I went in to have a look, and found the gas.
1562. *Mr. Clarke.*] You say you saw Millwood's body with his lamp alongside of him? Yes.
1563. Or did you say you did not see his lamp? I was asked if I saw anybody take it. I saw his lamp and other lamps.
1564. He had a different kind of lamp? Yes; a brass lamp.
1565. Have you heard it was found elsewhere? I don't know about that.
1566. Have you heard it? No.
1567. You are sure it was found alongside of him? Yes; I saw it with my own eyes on Thursday morning.
1568. How far was his body from the main tunnel on the out-by side? I daresay it was about 40 or 50 yards.
1569. In firing shots you had to light the fuse with touch-paper? Yes; we used to go outside the gas to light the touch-paper.
1570. You used to brush out the gas first? Yes; one would be brushing while the other went to light the shot.
1571. Did you ascertain the heading was free from gas before lighting? Yes.
1572. You would light the gauze outside and bring it to the fuse? Yes; the man brushing away the gas would say she was clear, and the other would then come in and light the shot.
1573. Do you know whether fuse will fire gas? Yes; the spitting of the fuse would fire gas.
1574. *President.*] And yet you work with fuse? Yes.
1575. You used means that would fire the gas? Nearly everybody fired the gas but myself in the gassy. Some fired about 12 yards of gas to my knowledge, and men work with their lamp red hot in it.
1576. That speaks volumes for the men? I told them to go to the deputy.
1577. Yet you used to fire shots with fuse that would fire gas? Yes; others did it besides myself.
1578. *Mr. Jones.*] Crawford fired the shots for you before the strike by the same means? Yes; when the men came down to work by the tonnage he fired the shots.
1579. And he fired them in the same way? Yes; the very same. I have seen them fired with a wire; but one way is as safe as the other.
1580. *Mr. Croudace.*] There seems to be some doubt as to the spot where Millwood's body was found—is there any doubt in your mind? Not the slightest.
1581. Where was he found? On the road at the second crossing that was working—the fourth bord out, on the left-hand side.
1582. You are quite sure about that? Yes.
1583. I want just to question you in regard to this lamp which William Beckton and Thomas Wales used with the top of it knocked out? It was burnt out.
1584. Do you think it was a prudent, proper, or right thing, not only in your own interest, but in the interest of everybody working in the mine, for you three or four men to continue working for one minute with such a lamp as that? It was not a right thing.
1585. You must now realise that? But we were bound to do it, or else knock off work.
1586. How were you bound to do it? There was no other lamp available, and if we did not do it someone else would.

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1587. Do you mean to say that you could have induced another man to do so? I could not have stopped him, but I could have stopped at home myself.

1588. Would it not be better to do that than jeopardise the life of your fellow-men? Yes.

1589. There was the fact of a large quantity of gas, and yet you were tempted to work in it with this damaged lamp? Yes; and I tried to alter it as much as I could, but they would take no notice of me.

1590. You say you have seen in No. 3 heading the gas right back to the cut-through, also in No. 4, but you do not know the distance. You also have seen it from the face of No. 5. Further on you say that some of these places were 40 yards from the danger-board. Now, have you ever seen gas from the face back to the last holed stenton, a distance of 40 yards? I have seen it back beyond the danger-board for 30 yards.

1591. Where was the danger-board? By the lamp-cabin.

1592. How far from the face? There was no lamp-cabin there at this time; I mean to say where the lamp-cabin is now.

1593. Was the caution-board put up at the last holed stenton? Yes.

1594. Always? Yes; on the last stenton.

1595. From there to the face, what is the greatest distance that you have seen gas accumulated? I have seen it different distances; sometimes there would be from 10 to 15 yards of gas, and it ran out to a feather in thickness.

1596. Have you ever seen it when it was 40 yards from the cut-through—in other words, have you ever seen gas extending a distance of 40 yards right back to the cut-through? Yes.

1597. Have you worked in it? No.

1598. That is the point that puzzled me, as you could not brush out 40 yards of gas without your lamp becoming perfectly red hot? Quite so.

1599. You have never worked in 40 yards of gas? No; I have sometimes worked in 10 and 15 yards of it, but I have known of the presence of gas in the mine for a distance of 50 or 60 yards.

1600. I will ask you now, have you ever known of any accumulation of gas previous to the strike? Yes.

1601. What is the largest accumulation you have seen? Between 50 and 60 yards.

1602. Where was it? Just by the dyke.

1603. Not in Nos. 1 or 2? No. 1 was just turned away, a prop stood there, and the turn was put down, and the place was being worked for a flat 15 or 16 feet wide; there was a prop there with a danger-board on it?

1604. How long was that previous to the strike? It would be nine or twelve months before the strike.

1605. Have you known any other accumulation (say) within two or three months of the strike? Yes; these headings were all full about three weeks before the strike.

1606. Which headings? No. 3 was full back to the stenton; they reckoned it was 40 yards. The heading I was working in, No. 4, was full back to the stenton, and the straight was full, and there was gas in No. 6.

1607. Were any of these headings stopped? No. 3 was stopped, but I was working there to put an air-course through.

1608. How long was that before the strike? About three weeks.

1609. Do you know whether the gas was cleared out before the strike took place? We had the cut-through through before the strike, and Nos. 3 and 4 were completely clear.

1610. You say that Nos. 3 and 4 were completely clear of gas just previous to the strike. Yes.

1611. That gas having been cleared away, was there any actual accumulation in the mine? I don't know; there was none in these headings.

1612. You don't know whether there was any accumulation anywhere else? There was some in the straight heading, and there was an air-course driving there.

1613. What amount of gas was there there? That was full.

1614. How do you know? Because I had been in there.

1615. Who worked there? Nobody; the men had knocked off.

1616. How far was it from the face of No. 5, called the straight back, to the cut-through? It was 40 yards, or somewhere about that distance.

1617. Was that full of gas? Not all the road; the air-course was full.

1618. You say that the distance from the face back to the cut-through was 40 yards? Yes.

1619. Did the gas remain in that position up to the day of the strike? Yes; No. 6 was full. There was a big stone in No. 6, and the gas was full over that at the time of the strike.

1620. I will ask you to point out the places on the plan? (*Places pointed out.*) Are you perfectly sure that these accumulations were not cleared away before the strike? I am quite sure.

1621. You say that whoever were driving this cut-through did not finish it before the strike? It was not finished, as the men were taken out because there was too much gas there.

1622. Since resuming work after the strike, have you any knowledge as to whether the stentons have been holed through? No.

1623. Can you tell me how much air was going down here? I heard that the air had been measured, and that there were 3,500 cubic feet coming out of No. 2 and going down the road.

1624. What sort of current had you passing through the last stenton? A good current; but it did not work its way into the face of the heading, because there was no bratticing to carry it out.

1625. Did you ever go to see Beckton and his mate? Yes.

1626. You say there were 40 yards of gas there? I said there were 40 yards of gas from the return down to the face.

1627. You said that the face of No. 5 was full—do you mean from the roof to the bottom? Yes.

1628. Then you said that Beckton and his mate were working in this place, and that you saw them? Yes.

1629. Did you notice their lamps? No.

1630. Did you smell the fumes from their lamps? Yes, when they were in the gas; but after they had been working a while it would clear away to a large extent.

1631. Were these men working with their lamps on fire? No.

1632. You are now talking to a man who has seen more gas than ever appeared in the Bulli mine, and I know that you cannot take your lamp into No. 2 heading now without its becoming red-hot; and if your words are to be believed that the cut-through and the face of No. 5 heading were full of gas, you must know

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- know that the lamps were red-hot? Of course, by working in the heading, and by the current produced by the running of the skips, gas would clear away while the men were working in the heading.
1633. Well, the heading was not full then? Not while the men were working; but if they stopped for any time she would fill again; but the men were working in No. 6 heading with their lamps full—that is, their lamps jingled with the gas.
1634. You omitted to say that. I know exactly what you mean by the lamps jingling? Yes; that was in No. 6.
1635. You have no information as to whether that gas has been cleared away? I know nothing about it after the strike.
1636. Now, with respect to the habit of lighting the touch by tilting the lamp, and therefore destroying the gauze, and endangering many lives—was that a proper thing, not only for you, but for the deputy to do? No, it was not; but they do that all over the world.
1637. I undertake to say they do not? I have seen them do it in other parts of the world, and I have done it myself; and I have worked in mines where there was as much gas as in any part of the world.
1638. I undertake to say that if you had been caught doing that you would have been at once called upon to deliver up your lamp.
1639. *President.*] And I am afraid that you would have had your choice of gaols within a week.
1640. *Mr. Croudace.*] Have you ever known a shot to light the gas? Yes.
1641. And that would be perfectly possible here? Yes.
1642. With regard to the ventilation previous to the strike, did you make a close observation of the separate door going into the Western from the main tunnel, and can you describe what it was like? The door I saw opened just like a common door with hinges.
1643. Was there on any portion of it a sliding panel? I never saw it. I opened and shut it like any other door.
1644. Was there one door or two? Only one.
1645. Going through there, alongside the engine brow, you come to the heading through the dyke between Nos. 1 and 2 headings—was there a door there? Yes.
1646. Were there two doors? Only one.
1647. Was there a trapper there? Yes.
1648. In the diagonal road, made for the sets from No. 1 heading, was there a door there? I never saw one; but that crosscut has been made since I worked there.
1649. In any of these places—Nos. 1, 2, 3, 4, 5, and 6—was there any bratticing used by way of taking air into the faces? No.
1650. Would that be a better plan? Yes. This explosion would never have happened if that had been done—that is my opinion.
1651. You cannot at this time fairly suggest such a thing, for I know collieries where every heading was bratticed, and every door doubled, yet accidents happened? Well, nothing of this kind was done at Bulli.
1652. I suppose it is no use asking you anything about the new furnace? No.
1653. Did you hear that there was a great improvement in the ventilation? No; I heard them say it was just about the same.
1654. We have had it, as a matter of fact, that it was trebled by the erection of the new furnace. However, you do not know? I do not know anything about that.
1655. *Mr. Jones.*] In the early part of your evidence I understood you to say that the caution-board was not always placed opposite the last stenton? The caution-boards were kept back until the next stenton was holed through, and then when the heading got away the danger-boards were shifted forward.
1656. Always? Yes.
1657. *President.*] Do I understand you to say that you were the last man that worked in No. 5, or, as you call it, No. 6? Beckton was the last man working in the straight.
1658. Was it full of gas? The air-course in the bottom was full.
1659. What was the number of that heading? No. 5 in the straight.
1660. I also understood you to say Nos. 3 and 4 were full of gas, and that you had put over the cut-through, and that the gas then cleared away? Yes.
1661. The coal continued to give off gas, notwithstanding the cut-through? Yes.
1662. You say that the straight-in tunnel gave off gas, and that a considerable quantity lay in the face of the heading when you came out on strike? Yes.
1663. Also, that No. 5, which you call No. 6, gave off a considerable quantity of gas, and that you left that place with a quantity of gas in it? Yes.
1664. Before the strike, with the old system of ventilation and the old furnace, the quantity of air, you say, amounted to 3,500 cubic feet, and that this quantity circulated through the last stenton? Yes.
1665. Can you explain to me this circumstance, that after the explosion when it had caused a total derangement of the system of ventilation with practically no circulation of air at all, that in none of these places which you have mentioned, Nos. 3, 4, and the straight or No. 5, not a single vestige of gas was found? I can give no account of that.
1666. Do not you think it strange? Yes, it is strange.
1667. You left these places giving off gas in abundance? Yes.
1668. When there was a circulation of only 3,500 cubic feet per minute, yet the time comes when this current is entirely withdrawn, and these same places contained no gas—do not you think that is remarkably strange? I cannot give any account for that, excepting it is accounted for in the new furnace.
1669. But in all of these places, with the exception of Nos. 1 and 2 headings, where you detected a slight quantity, you found no gas in any of them? No.
1670. *Mr. Croudace.*] Have you any idea how it is that the gas which you left in these places does not exist now? I cannot say.
1671. Do not you know that gas will exhaust itself in the course of time? No; I have no idea of that kind.
1672. Have you never heard of a blower expending itself? Of course I have. We have struck very strong ones in the Bulli mine. [*The witness withdrew.*]

Noah Hobbs sworn and examined :—

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1673. *President.*] You are a miner? Yes.
 1674. Employed at Bulli? Yes.
 1675. Were you working on the day of the accident? No.
 1676. Where do you work? Nowhere.
 1677. But you reached Bulli after the accident? Yes.
 1678. How were you apprised of the accident? I heard a number of men shouting out about it.
 1679. And you went to the colliery? Yes.
 1680. Did you enter the mine along with your brother? No.
 1681. When did you go in? At about 7 o'clock at night.
 1682. Where did you go? I went to the other side of the big fall on the other side of the western that night.
 1683. Who were there with you? I can hardly tell who were there.
 1684. Who had you with you when you went in? I believe I was by myself.
 1685. Surely you must know? Yes; I went in by myself.
 1686. Were there any people on the other side of the western when you got in? There was nobody there then.
 1687. No one at all? Not on the other side of the western; the men were then coming back—they had been over.
 1688. What did you do? I stopped there.
 1689. What did you do? Some managers came up and told us to clear the fall.
 1690. Did you give them a hand? No.
 1691. What did you do? Nothing.
 1692. Well you could not do much less. Did you come out? At 10 o'clock at night I came out.
 1693. When did you go in again? I think I went in next day.
 1694. Did you work then? Yes, I worked a little then.
 1695. With whom? With Mr. MacCabe.
 1696. What time did you go in on Thursday morning? I do not know.
 1697. Think? I cannot think.
 1698. If a question is asked you you must answer it—do not trifle with me, please? I am not trifling; I think it was about 5 o'clock on Thursday morning.
 1699. How long did you take to get in? We got right in about 7 o'clock.
 1700. Well, why did you not say it at first—what did you do with Mr. MacCabe? We went down to the cabin and got some tools.
 1701. Did you clear the large fall on the other side of the Western? No; we were clearing on the other side of the flat to get right into the gassy. We went round to No. 1, and went into the furthest stenton in No. 1; I then came back and went out.
 1702. Did you remove any of the bodies? I never touched any of them.
 1703. You passed them? Yes.
 1704. Were your party the first that would pass them? Yes.
 1705. In going over the fall what bodies did you first come to? The bodies of two boys.
 1706. Where were they lying? In the middle of the road.
 1707. Had they been removed by a previous party? I think so.
 1708. Did you identify the bodies in going up to No. 1? I knew Millwood and Jerry Westwood.
 1709. Were those the only two you knew in No. 1 heading? That is all.
 1710. How many bodies did your party find there? Sixteen in No. 1.
 1711. Did you go into the face with Mr. MacCabe? No, not to the face, but I was in the heading and some of the bords.
 1712. Did you see any evidences of fire or of a fire-damp explosion? Yes; all the props were charred.
 1713. Westwood's body was lying at the last stenton? Yes.
 1714. Did you examine him? No; I only just looked at him with the lamp.
 1715. Did you see the horse there? Not at that time.
 1716. Did you examine the danger-board? No.
 1717. You did not go through the stenton? No.
 1718. When did you go through? On the Monday after that.
 1719. Along with whom? With John McKenna, Beckton, and Inspector Rowan, White, and I don't know the other one.
 1720. Did you inspect these workings with the view of ascertaining the cause of the accident? No.
 1721. What was it to do? To see how much one of the places was over the distance allowed.
 1722. To inspect the inspector? Yes.
 1723. You were not actuated by any desire to ascertain the cause of the disaster? No.
 1724. Did you go down No. 2 heading? Yes.
 1725. Did you pay any attention to the state of the workings going down? Yes; I noticed the things in the headings.
 1726. What did you see? I did not see much; I saw that everything was a total wreck.
 1727. Did you satisfy yourself that it resulted from an explosion? Yes.
 1728. What evidences did you see? Everything was upside down.
 1729. Were all the bodies burnt? Yes.
 1730. The bodies had been removed at this time? Yes, but the skips and props and other things were there.
 1731. Where did you work previous to the strike? I worked in the straight, or No. 5 heading.
 1732. Was it off the straight tunnel to the left? Yes.
 1733. We would call that No. 6; you call the straight-in tunnel No. 5? Yes.
 1734. Did you work there up to the last day before the strike? Yes.
 1735. How did you leave the face? What way do you mean?
 1736. Was there any gas there? Yes, full of gas; the return air-course was full up.
 1737. Was there any return at all? No, not there.
 1738. Where was it? Further back, coming off No. 6.

1739.

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1739. You were in advance of the last cut-through, and you say down to the cut-through it was full of gas? It was not full in the heading, and there was always more or less gas there, and the cut-through was full up.
1740. Was there any air passing through the cut-through? No; it was going out of No. 4, and it had no return, and there was no canvas.
1741. Where did it go after leaving No. 4? To No. 6.
1742. Where then? It would go into the —— return.
1743. You said that the return was full of gas? No, not that return; I mean the return off No. 5 heading.
1744. Let us understand that point. There was a door in the main tunnel, which sent the air up No. 3, and from No. 3 to No. 4, and from No. 4 back to the main tunnel? That did not make the air come down.
1745. Was there a door in the main tunnel? Yes.
1746. The object of that door was to intercept the air and to send it into No. 3? Yes.
1747. And it then returned down No. 4? Yes, and then into No. 6.
1748. And was the return full of gas? No.
1749. Well, what return was full of gas? The air-course down the straight.
1750. How much gas did it contain? There was a good bit of gas in the face, and the air-course was full up.
1751. *Mr. Crowdace.*] The last holed cut-through was on the in-by side of No. 4 heading? Yes.
1752. Then you had driven far enough for another cut-through on the inside of that, but which other cut-through was not at that time holed through? Yes, it was not holed through.
1753. And that was the cut-through that was full? Yes; the air was going through to the return.
1754. *President.*] Do you know the quantity of air that was going through the last holed cut-through? I know nothing about that.
1755. Did you work in No. 5 with safety-lamps? Yes; but I worked in the air-course in No. 5, which was not through.
1756. Did you work with a safety-lamp? Yes.
1757. And you are conversant with the use of a safety-lamp? Yes.
1758. You have worked with them before? Yes.
1759. Were the lamps locked? Yes.
1760. In what other parts of the mine have you worked? In No. 3 in the —— return, and in No. 7.
1761. That is down to the left of the tunnel? Yes.
1762. And you found gas in all of these places? Yes, in all of them.
1763. Was gas found up to the last day before the strike? There was none in the return at that time.
1764. Was there any gas in No. 5 heading? Oh, yes.
1765. Do you know whether there was any in Nos. 3 and 4? There was some in No. 3.
1766. Do you know that of your own knowledge? Yes.
1767. Were you in the heading? Yes; I was in No. 3.
1768. What doing? Fetching the tools out.
1769. How did you fire the shots in these places? The deputy fired them.
1770. You never fired them yourself? No.
1771. How did you tamp the holes? With slack.
1772. With slack coal? Yes.
1773. Was it dry? Dry or wet.
1774. If you could not get damp slack you would tamp with dry? Yes.
1775. Do you consider that manner of firing shots safe? Yes; that is the way I have seen them firing shots where I have been working.
1776. What way do you mean? The touch-paper.
1777. With fuse as well? Yes.
1778. Is there any danger attached to that do you think? Not much danger.
1779. No danger with touch-paper? No, not with touch-paper.
1780. Did you ever have any conversation with the deputy with respect to the condition of the mine and the quantity of gas? Yes; we were always making complaints to the overman and the deputy.
1781. With what object? To clear the gas away.
1782. Did you ask him to put up any bratticing? We never asked to brattice the heading, but to drive the air-courses.
1783. Don't you think that bratticing is the much better way? Yes; bratticing ought to be put in there.
1784. Did you ever suggest bratticing to the overman? No.
1785. You suggested the driving of the air-course? Yes.
1786. But you consider bratticing more effectual? Yes; everybody knows that no doubt it would be a good plan.
1787. On going through the mine on the Monday after the explosion, did you examine the places for gas or did Mr. Rowan or any of the others do so? I examined some of the places.
1788. Did you discover gas in any of the bords? Yes; I discovered gas in one bord and in No. 2 heading.
1789. Is that the second uppermost bord? I think it was the fourth bord; it is 42 yards long, without an air-course in it. I believe it is the fourth bord from the face.
1790. And you discovered some gas in it? Yes, but not much.
1791. Did you discover gas anywhere else? No, not in any of the bords, but we discovered it in the headings.
1792. Of course in Nos. 1 and 2 headings? Yes.
1793. You had not been working in any of these bords immediately before the strike? No.
1794. So you know nothing about these bords? No.
1795. Did you examine them on the Monday night after the accident, and the faces of Nos. 3 and 4 headings? Yes.
1796. Did you also go into the face of the tunnel No. 5? Yes.
1797. And into the face of No. 6? Yes.
1798. Did you discover any gas in any of them? No; all the faces were clear.

1799. Did you think it remarkable that they should be clear of gas after the explosion, when there was no circulating current, seeing that they contained a considerable quantity of gas before the strike? I can give no idea as to how they were clear of gas.
1800. You also went through that district with the men? Yes.
1801. You observed carefully and tested for gas in these bords? Yes.
1802. Did you observe any gas with the safety-lamp? I saw nobody look for it.
1803. You must have gone down with a pair of eyes with you? I had my eyes with me.
1804. When you went in on Monday after the explosion you discovered no gas in Nos. 3, 4, 5, and 6? No.
1805. Can you give any reason that no gas should exist in these bords and headings after the explosion with no circulation of air? No; I can give no reason.
1806. Don't you think it a little strange? Yes, it is strange.
1807. *Mr. Neilson.*] What is the greatest quantity of gas you have seen in No. 3? About 40 yards out I have seen it.
1808. Was that close out to the danger-board? Yes; from 10 to 15 yards from the danger-board.
1809. Was your lamp full of flame at the face? Yes.
1810. Was the lamp red-hot? I expect it was about red-hot. We used to fill our skip and then we would come back, because we could not stand it long.
1811. Did you fire the shots? No.
1812. Did you fire them in rolls and stone? Yes.
1813. Was there gas there then? Yes.
1814. And you were bound to fire shots in it? Yes; once when we were on these rolls White came in and the gas put his lamp out, and he went back 6 yards from the face and lit his lamp, he asked my mate if any of us had our lamps open, and my mate said "yes, my lamp is open," he then said "give us a bit of light."
1815. *Mr. Clarke.*] Who was your mate? Beckton.
1816. *Mr. Neilson.*] Are you quite sure the gas put his lamp out? Yes; I am sure.
1817. What sort of lamp was it? A Clanny lamp; we use Davy lamps.
1818. How did you fire the shot when gas was there? We used to fire them at night.
1819. Was the ventilation better at night? No; I don't think so.
1820. Would there be gas there at night? I suppose so.
1821. Did you ever brush the gas out? Yes; we used to brush it off when there was much there.
1822. Were you in the habit of brushing it out before firing? Yes; if there was any there.
1823. With all this gas were you not afraid of the fuse lighting it? We did not fire when all the gas was there.
1824. You said you used to fire in the stone? Yes.
1825. I suppose it was quite up to the face? Yes.
1826. And where the gas existed? There was enough to put White's lamp out.
1827. Where was it? In the right-hand cut, very near the roof.
1828. Your lamp was locked? Yes, mine was, and my mate's was open, and Mr. White told my mate to open his lamp and give him a light.
1829. *President.*] Where was this? In No. 3 heading.
1830. *Mr. Neilson.*] You worked in No. 5 last? Yes.
1831. Was there a large quantity there? Not much in the face, but plenty in the air-course that was turned away.
1832. *Mr. Hilton.*] Did you ever report the existence of gas? I sent out to fetch Mr. White in one day.
1833. How often did you report the existence of gas? Nearly every time he came down there. I reported it when there was 40 yards in No. 3 heading, and he told me to go on as I was strong enough to stand it.
1834. That was to Mr. White you reported it? Yes; and to Crawford the deputy.
1835. You never complained to any one else? No.
1836. *Mr. Owens.*] Did you ever complain about this to the inspector? Yes.
1837. What did he say? He told me to be careful and take care of it, that is all we got out of the inspector. I showed it in No. 3 and in the return. There was about 35 yards in the return, but I only showed it to him in the face of the heading.
1838. Do you know anything of the big blower? Yes, Crawford showed it to me; he asked me to come in and see it, and he turned on the cock and it put the lamp out, and the blower was coming out too strong to light; he then turned it on about half and it then lit.
1839. What was his object in doing that? I don't know; he only took me in and showed it to me.
1840. You are sure it was the deputy? Yes.
1841. *Mr. Jones.*] Am I to infer that your lamp was always locked? I was only working before the strike.
1842. During that time the lamps were always locked? Not always; if the deputy was there he would lock them, if he was not there he would leave the key in the cabin and you could do what you liked—if you lost your light while you were working and your lamp was locked, you could come out and go back as you liked with your lamp locked or unlocked.
1843. You never fired the shots yourself? No.
1844. How did the deputy fire them? With touch-paper.
1845. Was the bord that was 42 yards in advance of the air a violation of the law? Yes.
1846. And that was the only bord in which you discovered gas? That is the only one.
1847. *Mr. Clarke.*] Did Crawford tell you his object in fixing this pipe to the blower? I don't know.
1848. Did he ever say what his object was? No; he said nothing.
1849. Did Mr. White see it? I expect he did see it; I believe he would show it to the overman if he showed it to me.
1850. You don't know that he did? No.
1851. How long was the pipe there? I don't know.
1852. Did your mate see it? Nobody was with me when I was there.
1853. *Mr. Croudace.*] Have you ever worked in English mines? Yes; in South Wales.
1854. In fiery mines? Yes; where Davy lamps were used.

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1855. Did you never fire any of your shots in this Bulli mine? No; never.
1856. Did you ever work by yourself? Yes.
1857. How did you do then? I used to go and fetch in the deputy.
1858. Was this when on day work? Yes.
1859. Have you ever seen him tilting his lamp to light the touch-paper? Yes; that is the way he used to light it.
1860. Is that a prudent or safe way of lighting shots in a fiery mine? That is the only way he did it.
1861. What do you think of it? I believe it is right enough.
1862. Quite right? Yes.
1863. Would it not be equally right to take the lamp top off? No; you need not turn your lamp right over for the touch-paper is supposed to catch fire through the gauze.
1864. In No. 3 heading you saw 40 yards of gas almost within 15 yards of the danger-board; is that correct? Yes.
1865. Was the danger board always at the last hole cut through? It was always supposed to be, but this one was back so as to act for four places.
1866. How far back from the last hole and cut-through was this danger-board? About 15 yards.
1867. And from the cut-through to the face was 40 yards? Yes.
1868. And that was standing full of gas? Yes.
1869. Was that the period when Mr. White took his lamp in and tried the gas? No.
1870. It was two different times? Yes; when White came in the heading was about 20 yards in at that time; he would never want a light again if he did that when there was 40 yards of gas in.
1871. When his lamp went out in the wick, you say he only went 6 yards back to light it? Yes, and I told him not to light it, as it was not safe there; but he was boss, and it was no good for me to tell him not to light it, or he would want to know who was boss, and a boss is no good in there if the workmen are going to rule him.
1872. And you have told us of the greatest accumulation of gas previous to the strike? Yes, that is the biggest quantity of gas I saw; it was in No. 3 heading.
1873. Was that quantity cleared away before the strike commenced? The most part of it was cleared away; the cut-through was put through, but it did not clear all the gas.
1874. How far was the stenton from the face? About 15 yards.
1875. Was any more work done in the face after the stenton was through? No.
1876. Why was the stenton not put right up to the face? Because the other heading was not up.
1877. I can quite understand that. Where was the greatest accumulation of gas, in Nos. 3, 5, or 6 headings just before the strike? In No. 3 there was about 8 or 10 yards, 5 feet wide and 4 feet high.
1878. Did you get more gas when you struck rolls? Yes.
1879. Were Nos. 5 and 6 standing full of gas when the strike took place? Yes.
1880. That gas has been cleared away since, and can you account for that by natural exhaustion? I can't give any account about that.
1881. Is it usual when you strike bodies of gas for these rolls to continue for a time giving off gas, or do they exhaust themselves? The gas dies away.
1882. So that during the strike the gas giving off from these blowers or rolls might exhaust itself, do you think that is possible? I don't know about that.
1883. Is it possible in your mind, seeing that you have got some gas on these rolls, to come suddenly upon a blower either in a drill hole or nick? You are very liable to come across blowers by drilling.
1884. And these blowers exhaust themselves in the course of time? Yes; they work themselves out.
1885. Do you think the exhaustion of gas in these headings may have been caused in this way? Yes; I suppose the gas would work itself all out.
1886. Have you heard of any inspection being made in this mine by the miners, as they have a right to do under the Act? No.
1887. Have you ever attempted to make any inspection? No.
1888. Are you not aware that the men have full power once a month to examine every mine in the colliery? I am aware that the men are supposed to go round at least once a month.
1889. Then why did not the miners in Bulli go round? I cannot tell you the reason.
1890. Was it idleness, indifference, or what was it? I never heard anything about it.
1891. Don't you care anything about it? Nobody asked me to go round.
1892. Do you know anything of your brother working with the top of a safety-lamp out? I know nothing about my brother; I was not working there at the time.
1893. What would you think of a man who went into a fiery mine where they had to use safety-lamps, and yet worked with a lamp that had a burnt-out top—bear in mind that the first gauze had gone, what would you think of such a man? They ought not to do it.
1894. Don't you think they were endangering the lives of every one in the colliery? Yes; but they were not very particular in this mine, not the boss's.
1895. Do you mean to tell me that the Bulli miners—intelligent men, as I suppose they were—did not value their own lives, your brother, for instance—do you mean to tell me that he does not value his life? I expect every man values his own life.
These things come to me as a perfect thunderbolt, for I never heard of them before. [*The witness withdrew.*]

John M'Kenna sworn and examined:—

- Mr. J. M'Kenna.
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1896. *President.*] You are a miner? Yes.
1897. Employed in Bulli Colliery? No, sir; but I have been employed there.
1898. You reside at Bulli? Yes.
1899. You went in to rescue the men in the colliery? I was one of the first party that went in the mine after the explosion.
1900. We have had so much evidence of the conditions of the workings soon after the accident, and the position of the bodies when first found, that I do not propose to examine you particularly with reference to these matters. Were you employed as a miner in the Bulli mine subsequent to the strike? Not since the strike; I was there previous to the strike.
1901.

1901. Were you engaged there up to the time of the strike? Yes.
1902. You cannot speak of your own knowledge of anything in the mine since the strike? No; not since the strike.
1903. But you were engaged there immediately before the strike. Where did you work? About the seventh or eighth bord towards the face in No. 1 heading.
1904. The seventh bord was the last bord? I could not exactly say how many bords there were. It was the second last at the time.
1905. Did you work in any other portion of the gassy section before that? Previous to that I worked here [*pointing out place on plan*].
1906. When was that? Three weeks before the strike.
1907. Where before that? [*Places pointed out on the plan.*]
1908. You drove the return through the dyke? Yes.
1909. And after that you were engaged in bords off Nos. 1 and 2 headings? Yes.
1910. In working these bords off No. 1 heading, did you use a safety-lamp? Yes; up to the time of the strike.
1911. Did you discover gas in these bords at any time? Yes; there was a large quantity of gas being given off in the bords in which I worked.
1912. You worked in the seventh or eighth bord? I cannot exactly remember the number of the bord, but I know it was the second last.
1913. And there was a large quantity of gas in that bord at the time? Yes.
1914. Was there in any of the other bords? I could not say, but there was a large quantity of gas in the heading face immediately below me, I could see that myself without going out of my way.
1915. Was the ventilation not sufficient to carry away the gas that was accumulated there? My place was off the heading, but the current was not sufficiently strong to carry all the gas away from my bord as it was brought round a number of other places.
1916. Have you been in the face of the heading where gas was given off? I have been in it.
1917. By working there, or through curiosity? I would occasionally go for the loan of tools.
1918. Where was the gas; was it contiguous to rolls? Sometimes it was, and at others it was not.
1919. Would a larger quantity of gas be found in approaching a roll? Very likely it would, for I did not take particular notice.
1920. Nothing but safety-lamps were used there while you worked? That is so.
1921. Were they locked? They were locked during the day-time.
1922. Were they locked at night? You could please yourself.
1923. Did you work at night? Yes.
1924. Did you fire any shots? Yes.
1925. Did you fire them at night? Yes.
1926. How would you proceed when firing a shot? We would light the touch at the side of the gauze and fire the fuse in the usual way.
1927. Did you go outside the danger-board? When in the headings the men went right outside the danger-board.
1928. Then you proceeded in with the touch-paper and lit the fuse? Yes.
1929. Did you consider there was no danger attached to firing that fuse in an atmosphere of gas? I was aware of the danger of lighting touch-paper on the gauze of a safety-lamp.
1930. How did you tamp the holes? With soft stone whenever I could get it.
1931. Suppose you could not get it? I would go back to the road and get some cake-dirt that had moistened itself.
1932. Are you aware, or have you been informed that some men tamped with small coal or slack in a dry state, and if so, would you consider that a safe proceeding? It is both unsafe and stupid.
1933. And I quite agree with you. Had you ever had any occasion to complain to the colliery officials as to the state of the bords, or the ventilation? No, sir; that was not my duty. I was supposed to use a pick and shovel only.
1934. Have you thought the people were too careless with the use of safety-lamps? The only occasion that I complained to Deputy Crawford was about eighteen months ago. I could not exactly say, but at that time I was working 80 yards in a bord in advance of the air.
1935. Where was it? [*Place pointed out.*] That was not in the gassy section? No.
1936. No connection with the gassy section? No.
1937. That must have been some two years ago? I think it might be about eighteen months ago. I don't think the gas was struck at the time, but the ventilation was so bad that I could not sit down without falling asleep, and after making several complaints to the deputy he removed me out, and put me to work in another place.
1938. Did you ever make any complaint to the Colliery Inspector about the gas? I never did, simply because I would be exceeding my duty by doing so.
1939. Do you really think so? The management take it as their duty, and I know they consider it as such.
1940. Do you mean to say that it would not be your duty to report anything that you found to be dangerous, or to complain of it? The question is, would I be permitted to make such a complaint, and if so would it be entertained?
1941. You think it was not your duty to complain? I say I had no real occasion to complain, and I say that if I did the complaint would not have been taken from me—in other words, it would not be entertained.
1942. You can know nothing about it then if you had no reason to complain? I had some idea of the management.
1943. *Mr. Hilton.*] Was there anything which caused you not to complain? Not in my time. The obstacle referred to has been brought into existence since the strike began.
1944. You have been several times in the mine since the explosion? Yes.
1945. Do you know the door on the western road? Yes.
1946. You know there used to be a door there? Yes.
1947. Suppose that door was damaged by an accident and knocked down, would it affect the ventilation in the Hill End district? Yes, and cause foul air at once.

- Mr. J. M'Keena.
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1948. Where would the air go in the event of that door becoming damaged? The air would go to the western.
1949. You have been in the western since the explosion? Yes.
1950. And in the Hill End district? I have been all over the two districts.
1951. Have you been all over the mine? I have been all over the three sections, the western, the gassy, and the grip, but not in the grip further than the furnace since the explosion.
1952. *Mr. Owens.*] You were one of the first party that went into the mine after the explosion? Yes.
1953. Did you find any of the bodies burnt? Yes; the first I discovered was burnt—Felix Bourne—he was badly burnt.
1954. Where was he? A few yards outside the brake on the bank heading.
1955. Did you examine the bodies found in Nos. 1 and 2 headings? Well, there were several bodies in No. 2 heading badly burnt.
1956. You proceeded from there to the western? From No. 2 I proceeded along the flat and got the bodies that were along there.
1957. Were they burnt? There were two boys; one of them was found beneath a skip, and one of them was badly burnt.
1958. Did you notice whether the bodies found in the western were affected by fire? No, I did not, though I believe they must have been burnt.
1959. Do you know these rules? Yes.
1960. Do you know No. 6, as to "Interference by employees"? Yes.
1961. Do you consider that reporting would be an interference according to that rule?
1962. *President.*] The witness did not work there when these rules were brought into operation.
1963. *Witness.*] I have been examined on that subject before.
1964. *President.*] It does not matter.
1965. *Mr. Owens.*] Were check inspectors appointed by the Bulli miners? No such officers were appointed in my time.
1966. *Mr. Jones.*] Who were the first party that went into No. 1 heading? Mr. McCabe had charge of a party, and they were a little in front of me.
1967. Did you arrive at the heading before the body of Millwood was removed? Yes; I was twice there before the body was removed.
1968. Could you point out the exact spot where the body of Millwood was found? [*Place pointed out on the plan.*]
1969. Would you be surprised to learn that it has been alleged that he was found on the out by-side of this spot?
1970. *President.*] I do not think it has been alleged at this court of enquiry.
1971. *Mr. Owens.*] In reference to the blower in No. 2 heading it has been alleged that Crawford fixed a pipe there. Do you know anything about that? I did not see it done, but I believe it was the practice.
1972. *Mr. Hilton.*] You heard of it? Yes.
1973. *Mr. Croudace.*] Have you known of any great accumulation of gas previous to the strike? Yes, in the left-hand heading, now called No. 6, I believe.
1974. Where is it? Going towards the dyke.
1975. How long is that ago? It was there at the time that we came out on strike. I saw the gas there the last night I worked, and I believe that was on the 10th of September.
1976. Are you speaking of No. 5? I am speaking of No. 6.
1977. Will you point out the heading? [*Heading pointed out on the plan.*]
1978. Was that gas there when the colliery stopped work? Yes; it was on the 10th September, and I think the strike commenced on the 11th—next day.
1979. Do you know of any other accumulation in the mine? On the same night there was a large accumulation of gas in No. 1 heading, immediately below where I was working.
1980. Was it there the following day? I was not working the following day. I took my tools out that night. The men working there prepared a shot, and requested Crawford the deputy to fire it. He refused, and that shot was left unfired.
1981. Who was the man who prepared the shot and asked the deputy to fire it? Bill Gard.
1982. Who was the deputy? Crawford. Gard's mate came in the same night, and Crawford would not allow him to work there, and took him away to work the last shift.
1983. You know that of your own knowledge? I saw it.
1984. That was the night previous to the strike? Yes.
1985. Would the bratticing of these places have prevented such an accumulation of gas? Yes. In my opinion, if they had been bratticed, the gas would not have been made there.
1986. *President.*] By bratticing, you mean to say that the gas would have been swept away as it was made? Yes, it would have been carried away.
1987. *Mr. Croudace.*] Have you known the gas to light by a shot? Yes; the week previous to that Bill Gard fired a shot in No. 1 heading, which lit the gas.
1988. *President.*] Was he lost? No; he is working in one of the neighbouring collieries.
1989. *Mr. Croudace.*] What did you say the result of his firing the shot was? To fire the gas.
1990. Where? No. 1 heading.
1991. *President.*] That was before the strike? Yes; a week previous to the strike.
1992. *Mr. Croudace.*] Did it do much damage? No.
1993. *President.*] Did you see it yourself? Yes.
1994. *Mr. Croudace.*] Then you are quite satisfied that a shot may light gas? Yes; I saw it.
1995. You have heard that it was the practice, and you have expressed your opinion about lighting shots by tilting the lamp to ignite the touch-paper? It is a bad practice.
1996. I quite agree with you. What do you think of the sworn testimony of two or three men having worked with the main gauze of the safety-lamp burnt out—what would you think of men who actually worked with that lamp in a large quantity of gas? I would think that it was a very unsafe thing, and that practically the man had no safety-lamp.
1997. *President.*] That they were reaching high for an explosion? Exactly.

1998. *Mr. Croudace.*] I should like to examine this witness with a view of getting his interpretation of No. 6 rule, having reference to interference by employees. I have an impression that the intelligence of this witness will lead him to see that it bears a different construction.

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1999. *President.*] I don't think it should come out in this court, as the witness never worked under these rules.

2000. *Mr. Croudace.*] When you get really an intelligent witness, who might not have given much consideration over this rule, it is quite possible that he would give a fair interpretation of it when it is placed before him. This witness has given testimony with respect to this rule at the inquest; I would like to know now whether he is under a different impression.

2001. *President.*] Of the intelligence of this witness there can be no doubt.

2002. *Witness.*] I have been in the mine several times since the explosion; perhaps it is as well that I should state all I saw.

2003. *President.*] We do not think that another detail description of the tunnel and workings or the condition of the bodies would be of value; but if you communicate with me as to what further evidence you wish to give, we will consider it, and we can recall you if necessary.

2004. *Witness.*] I would like to give you my opinion as to cause of explosion.

2005. *President.*] Oh, we will have that.

2006. *Witness.*] I am of opinion that the explosion occurred in No. 2 heading, and that previous to the explosion a shot was fired there, and that the force of that shot drove the gas out to a naked light in No. 2 heading, and that that naked light was the cause of explosion. I have examined the course the explosion has taken, and find that it has gone straight out of No. 2 heading as if out of a cannon. The left-hand heading being immediately opposite, it carried a man, three boys, and horse a distance of about 50 yards. I am of opinion that during this strike the workings in that old left-hand heading became fouled with gas, and that the gas having lodged there, it was impossible for it to be taken out, unless put out wilfully; in other words, that the ventilating current of the mine did not reach it. I believe that the flame of the gas from No. 2 heading, which was ignited at the naked light, communicated itself with that other accumulation, and it exploded, also causing damage all along the road, in the first place death, and the second place destruction.

2007. *President.*] Have you any knowledge as to the behaviour of coal-dust in the presence of ignited gas? Perhaps you will allow me to finish. After the ventilation was restored, it was impossible for the gas that may have accumulated in the workings of this disused heading to be taken out, unless put out by some special means, and I am of opinion that that was not done.

2008. Can you say that it was not done? It was a disused part of the workings, and the air does not go around these workings.

2009. Have you been in these old workings? I have.

2010. Did you observe any gas there? I believed it was lodged there, and that it was beyond the reach of the ventilation; but when the explosion occurred it ignited there.

2011. Did you see any evidence of an explosion there? I have.

2012. Where? There is proof in the fact that the fire of the blast went to the western.

2013. We saw that, and I think we were together when we saw it? The blast, I believe, divided itself there, one portion reaching the main heading face, and travelling out to the tunnel mouth, and in its course upsetting the skips in such a way as to indicate that the force had come outside. The other portion of the blast went to the western, and that second portion was likely to reach the tunnel mouth a little later than the first, from the Hill End straight.

2014. You are of opinion that the explosion commenced in No. 2 heading? What I say is that the fire lighted some distance outside the cut-through. I picked up a man who was blown by the force of the explosion at that point; he was just on the main road. I am of opinion that the gas was lighted by that man's naked light.

2015. Did you see the evidences of an overcharged shot in No. 2 heading? I saw no appearance of an overcharged shot. In my opinion, the shot was a good one. There was not a great quantity of coal blown down by the shot, but that standing in the face is hollow behind; and if the shot had been overcharged, it would have knocked the coal into slack. [*The witness withdrew.*]

THURSDAY, 12 MAY, 1887.

Present:—

DR. ROBERTSON, PRESIDENT.

MR. O'MALLEY CLARKE,
MR. NEILSON,
MR. CROUDACE,

MR. JONES,
MR. OWENS,
MR. HILTON.

Wm. Bolan Green sworn and examined:—

2016. *President.*] You have been for many years a colliery manager, Mr. Green? Yes; about fifteen years. I have been thirty-eight years engaged in coal-mining altogether.

2017. In this Colony, or in England? In both.

2018. In what district were you in England? In the north of England—Northumberland.

2019. You are acquainted with gassy mines? Oh, yes.

2020. When did you hear of this disaster at Bulli? Well, I got out there at about 9 o'clock that evening, and I was not five minutes there before I went inside.

2021. Will you describe to us in your own way—here is a plan of the colliery—where you went and what you did? When I first went to the mine I volunteered my services to go in, and I did so, taking canvas with me, and the first thing I did was to go to the furnace, and finding that it was working all right I was quite satisfied there was no danger, so I came back and went up to the large fall—that is past the western,

Mr.
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- Mr. W. B. Green.
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- western, and is what they call the "big fall." I inquired if any men had gone over it, and was told that two men had gone over, a proceeding which I characterized as foolishly risky. It was, in my opinion, to commence clearing the fall in order to let the ventilation over, and I told the men who were on the top to call them back. When they came back I told them I was there to give instructions, and the best thing they could do was to clear away the top of the fall. They said they would commence to do that, and I then came outside, and saw Mr. Ross, who was complaining of being unwell. He asked me if I would go into the furnace with him? I said yes, and accordingly went back to the furnace with him and examined all round.
2022. Was there any change in the ventilation then? There was in the main road; the ventilation had improved. At my suggestion we went up to look at the fall again, and we then consulted as to what was best to be done to get the bodies out; we then proceeded out again, and met Mr. McCabe and Mr. Evans coming in; we consulted with them, pointing out that we thought it would be best to clear away the smallest of the falls to get the bodies over, and they were satisfied that such was the best thing to do under the circumstances.
2023. And did that finish that night's operations? Yes.
2024. In going in towards the western, Mr. Green, did you observe the bodies that were lying on the bank-head? I did.
2025. There were six bodies lying there? Yes.
2026. Did you observe the condition of those bodies? Yes; they were burnt.
2027. What evidences of burning did they show? The hair was singed on the face and head, and the skin seemed to be burnt in some cases.
2028. There is no doubt in your mind about the condition of these men—did you examine them narrowly? I have no doubt. There was one very big man lying on the crossing, his face being covered with a bag. I took the bag off and examined him. There was another one lying there with no clothing on him; he was burnt also.
2029. You are quite aware, of course, that the hair will show the first symptoms of burning? Yes.
2030. And you found unmistakable evidence of burning? Yes.
2031. Then I suppose you came out and saw that the shifts were properly arranged? Yes.
2032. And when did you return? About 2 or 3 o'clock we went to have a rest, and in the morning we went in again. The big fall was partly cleared, but not to our satisfaction. Mr. McCabe and I went over the fall, and found the bodies of two boys.
2033. You were the first to come on them? Yes; Mr. McCabe and I were the first. I never heard of the boys being seen by anyone else.
2034. Was one of them entangled in the ropes? No; they were on the opposite side.
2035. What was the condition of the bodies? They were burnt.
2036. In proceeding along the main road did you notice the condition of the props? I did not; my principal anxiety was to push forward.
2037. You say these two boys bore evidences of burning. Did you examine them particularly, and if so what evidences of burning did they bear? They seemed to be burnt about the hands. I noticed the hands more particularly than anything else.
2038. Might you not have been led astray by their hands being abraded? No; they appeared to be burnt.
2039. Suppose they had been drawn along the wires now. Did you see their hair? No; I noticed their hands mostly.
2040. Then you are not quite certain about it? Well, I will not be positive, as I did not examine their bodies so particularly.
2041. You arrived through the dyke at No. 1 heading? Yes.
2042. Did you see anything there? We put up two or three stoppings that had been blown out. We then proceeded to the main heading.
2043. Were you the first to come upon the bodies in No. 1 heading? Yes.
2044. Did you take a note of their positions? I did, though we had only a piece of brown paper in which nails were wrapped; but I made a copy on coming outside.
2045. Have you got that copy? No; I gave it to McCabe.
2046. Can you recollect the names of the men? No; I cannot.
2047. Give us the number then. In going up No. 1 heading how far did you go before you came to the first of the bodies? In the first bord we got to in No. 1 heading there was a group of four, three of them were lying in the middle of the road, and one was sitting by the side of the wall, as if he were asleep. This we supposed to be the deputy. I put my lamp to his face. The men who were with me, I think, said it was the deputy, and I thought so by the way he was dressed, differently from a miner.
2048. Did you notice the appearance of these four men? I noticed one of them who seemed to be burnt on one side.
2049. Was it black? No; of a reddish colour.
2050. What about the hair? The hair was singed of one man lying with his head between two props.
2051. Did Millwood, or the man supposed to be Millwood, show evidences of burning? No; I saw no signs of burning on him.
2052. Was this other man that you suppose to be burnt lying in such a position as would convey the impression that he had run some distance? Yes; I should say he had run some distance.
2053. Then you proceeded up the heading, and where did you come upon the next group of bodies? We came across three lying in the next bord.
2054. Were they burnt? I did not take particular notice.
2055. How were they lying—with their heads backwards? Yes; as if they had been suddenly overtaken.
2056. Did you notice whether they were burned? No.
2057. Then what did you do? After going into the third working bord, we came out into the main working heading, and found a body lying on the road at the fourth working bord. Proceeding into that bord we found another body lying at the face. We found two bodies at the fifth working bord, and two at the sixth.
2058. Did you see any evidence of burning upon these two at the sixth working bord? No; but I examined the timber there, and found it charred.
2059. Then you went up to the last stenton? Yes.

2060. What did you see there? We found the body of Westwood just at the corner. He was a worker in No. 2 heading. He was lying on the top of some rubbish or small coal.

2061. Did you see the danger-board here in No. 1 heading? Yes, I did; on the board was written "danger beyond this point." There was a horse and a boy just inside.

2062. Did you observe whether the horse and boy were burnt? No; I did not. We were very glad to get out, the air being bad.

2063. How many bodies did you find? We found sixteen or seventeen altogether.

2064. I think in going up the heading a group of five was found;—in the second group you came upon you mentioned only three? Yes; but there were two close to them.

2065. Did you go into the face of No. 1 heading? No.

2066. Did you go into the face of No. 2? No; I did not.

2067. Did anyone relieve you before you returned? No; by this time we found ourselves pretty well knocked up owing to the after-damp, and we went on to the main heading and sat down for a time.

2068. Were the workings hot at the time? Not very hot; just the ordinary warmth in the bords.

2069. Did you anticipate finding it as warm after what had occurred? Yes; I thought it would be worse than it was.

2070. Did you return to that part of the workings? I did not go down then any more that day. Mr. McCabe told me that I had better get the men to clear away the falls so as to convey the bodies out. On the Friday, Mr. McCabe and I went down to No. 3 and No. 4 headings along with Mr. Ross.

2071. Did you find anything in No. 3 and No. 4 headings? I found a safety-lamp in No. 3 heading.

2072. Who was with you at the time? Mr. McCabe and Mr. Ross.

2073. What was the condition of the safety-lamp? The lamp was broken. The gauze was smashed as if some one had stamped on it.

2074. Was it unlocked? Yes.

2075. Was it unscrewed? No; it was intact.

2076. In going into No. 3 and No. 4 districts on Friday in company with Mr. Ross and others, did you examine these places for gas? Yes.

2077. Did you discover any? Not the slightest.

2078. Did you see any evidences of burning along the main tunnel, or in Nos. 3 or 4 or No. 6? I did not notice. The only place I examined for fire was in No. 4, and I saw evidences of charring there.

2079. When did you first go into No. 2 heading? I have told you how I went in, and of course we went through the stenton; but I did not go to the face.

2080. Did you see any evidence of fire in No. 1 or No. 2 on that occasion? No.

2081. You did not specially test for it? No.

2082. When did you first make a circuit of the workings? I went up to the western on Friday, through the return, our object was to see if the overcast was broken down.

2083. Had any other person been in the western before you? No.

2084. Having gone into the western how did you proceed? We proceeded along the western air-course, and travelled up the overcast.

2085. Did you notice the door at the junction? Yes.

2086. What condition was it in? It was broken and tilted up.

2087. In what condition did you find the main western road? We found a large fall on the top of some skips, and we made a sketch of the position, and we then turned back on to the gassy.

2088. Then you did not go through the western on that day? We did, in the afternoon.

2089. Who accompanied you? Mr. McCabe and other men.

2090. What did you find in the western? We found in a place going down to the left-hand and on the outside end of the flat, two bodies—that was outside the overcast.

2091. There are two bodies marked on the plan as having been found in the air-crossing—is that so? I do not know of anyone having been found there. The first body we found was 40 yards or 50 yards in the flat, and near the water tub. It was just behind the tub. And next we found a boy, and going straight in for 4 or 5 yards we found another. Then Mr. McCabe and I had another conversation, he suggested that we should get the bodies out as quickly as possible, and asked me to get stretchers, &c., for that purpose. So I was not in the pit any more until Saturday morning.

2092. And on the Saturday morning you were accompanied by whom? By Mr. McKenzie, Examiner of Coal-fields; Mr. Dixon, the Inspector; Mr. Rowan, Inspector of Collieries, and Messrs. Neilson, Ross, the Manager, Evans, and Gardiner, I think.

2093. Then I suppose you made a minute examination of the workings with a view to arrive at a knowledge of the cause of the explosion? Yes, and the seat of it.

2094. Very well, did you go into every part of the workings? Yes.

2095. Who went up to the face of No. 2 heading? Mr. Evans and Mr. Dixon.

2096. Did they report the presence of gas? Yes.

2097. Did they report anything else? No; not to my knowledge.

2098. Did you hear of any loose powder being found in No. 1 heading? No; I did not.

2099. Were you aware on the Saturday of a shot having been fired in No. 1 heading? Yes; I was told there had been a shot fired.

2100. That is to say those sent up to examine the face of No. 2 heading reported that a shot had been fired? Yes.

2101. Going down No. 2, did you see any convincing evidence of an explosion having taken place? Yes; I was quite satisfied that an explosion had taken place. There was evidence of the course it had taken by the charring on the props, and the skips were knocked about.

2102. In coming down this diagonal road, between Nos. 1 and 2, did you observe anything special there? I noticed that the skips were tossed about?

2103. Did the positions of these skips convey to your mind the idea that they had been passing through the door at the moment of explosion? Yes.

2104. Did you notice anything peculiar about a stopping just inside the junction of No. 2 with the main tunnel? No; I did not.

2105. Did you notice that it had been blown in? No; I did not notice that.

2106. Did you again examine Nos. 3 and 4 headings? Yes.

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2107. And what was your opinion as to the seat of the explosion? In my opinion a considerable accumulation of gas had been fired by a shot in the face of No. 2 heading; that the course of the explosion was down No. 2 heading, and in its road down had proceeded towards No. 1, and then came down on to workings marked on the colliery tracings with an A. I am of opinion that at this point the current must have been fed with an additional supply of gas; I do not think there was sufficient gas here [*pointing to plan*] to have caused the destruction that I noticed.
2108. Then how do you account for a man being burnt in No. 1? Well, when this stopping was blown out, the explosion would extend in that direction.
2109. Then, in your opinion, there were two currents—one going down No. 1 and one down No. 2, joining in the tunnel? Yes.
2110. And that the combined forces burst out the stopping? Yes; and projected the horse and man through the stopping.
2111. Then you have a fixed opinion as to the story of an explosion having occurred in the district below the tunnel marked A on the plan? Yes.
2112. Did you see separate evidence of an explosion in this place? Yes; I am quite satisfied in my own mind that there must have been an accumulation of gas in one of these old bords.
2113. Supposing it had taken place in any of the three bords marked as going back towards the dyke in district A, what course would it have taken? It would go against the air.
2114. Would it not have had a tendency to blow the stopping the opposite way, as well as the horse and man? No; I do not think so.
2115. In which case, where would it travel? It must have gone into the main road here [*pointing to the plan*] and down to Nos. 3 and 4.
2116. Did you see any evidence of charring there? No.
2117. Would it be possible for the same results as have taken place to have been occasioned by an explosion in No. 2 fouling the intake aircourse—in other words, would these men in Nos. 3, 4, 5, and 6 have been likely to have been killed by an explosion in Nos. 1 and 2 alone fouling the intake air? If there had been any gas coming from here [*position indicated*], the after-damp would have been safe to kill the men.
2118. As a matter of fact, however, you found upon examination on Friday no gas in Nos. 3, 4, 5, and 6? No.
2119. From your experience, would you anticipate that when the air current was deranged would be the most likely time to find gas? Yes; you would be most likely to find the gas when the current was not in its normal state.
2120. Do you incline to the belief that gas did exist in Nos. 3, 4, and 6? Yes; I have no doubt about it.
2121. But you say you found no gas in those places? On the Saturday morning—yes, that was so.
2122. But was not that a likely time to have found the gas? Yes, and more especially in No. 6, as it was going over a fault.
2123. Precisely, and from your knowledge of the district, would you anticipate finding gas contiguous to these rolls or faults? Certainly.
2124. Were you acquainted with this district—that is, with the Bulli Colliery—before the accident? No, I was not—yes, the first time I went over it was subsequent to the explosion.
2125. If you were told that in Nos. 3, 4, and 6 headings gas existed before the explosion, would you expect to find gas in the same positions after the explosions? Not for some time after.
2126. Why not? Well, the gas would be taken out by the explosion.
2127. Would the lapse of two days be sufficient? Yes, I should say so.
2128. Then, would the fact that you found no gas after the explosion convince you that the statement was correct if you were told that there was no gas in those places before the explosion? Yes; I cannot say anything contrary to that.
2129. Then I have only a general question to ask you, Mr. Green; you say you had no knowledge of this particular district of Bulli before the explosion, but you have great experience, I know, in working in fiery mines; have you heard of the practice of shot-firing pursued in the Bulli mine? I have since the explosion.
2130. Would you consider it a safe method to tamp with dry coal-dust? No; I do not think it is safe to fire a shot where gas exists.
2131. But do you consider there is any special danger in fuse, which is the means by which, we are told, the shots were fired at Bulli; would it alone fire the gas? Yes; if the shot were overloaded.
2132. Do you consider it a safe operation to fire shots by turning the flame of a safety-lamp against the gauze? No.
2133. Would that be equivalent, in your mind, to communicating the flame from the inside to the outside? Yes.
2134. Would tilting the flame against the gauze be liable to destroy the gauze? Yes.
2135. And the destruction of the gauze would be a source of danger? Yes; it would be a danger, certainly.
2136. Would it destroy the utility of the lamp? Yes.
2137. With your extensive knowledge of this district, would you be astonished if I were to inform you that men working in places known to contain gas would work there with the top of the gauze removed from a lamp? Well, I think if men were inclined to do that I should like to be outside.
2138. Did you see men that you think would have acted so? No; not to my knowledge.
2139. In a district where the lamps were on some occasions red-hot, do you think lamps could so exist without causing an explosion? They might, but I do not think it should be allowed to continue.
2140. Was that an indication that the flame should be pulled down, and the people removed from the mine? By all means.
2141. In that condition of affairs what would you think of people knowing the properties of gas and the use of the safety-lamp who would work with the top of the lamp removed? Well I should think if men understood gas and did such a thing as that they were trying to commit suicide.
2142. Now I ask you (for I do not know anyone who has a more thorough knowledge of the district than you have) did you ever meet men in this district so careless as to do such a thing? Well I have met careless men in connection with gas. We had a little gas at Mount Kembla, but I do not know whether it would be right for me to give that.

2143. Did you find gas in those bords off No. 1 and No. 2 on the Saturday of your inspection? No, none at all.

2144. In your opinion, had a large quantity of gas been fired in No. 2? I believe that the gas had been almost back to the stenton?

2145. Was that a large quantity of gas to produce such disastrous consequences to human life? I do not think there was sufficient gas there to have effected so much.

2146. Do you know anything of the part which coal-dust would play in an explosion? Yes, something.

2147. Do you think it would communicate flame from one part to another, and explode distant magazines of gas? Yes, that is my idea.

2148. Then if (say A) an explosion took place, it might, through the medium of coal-dust, reach a distant locality though no gas existed between? Yes.

2149. And in that way it might be a powerful factor in producing disastrous explosions? Yes.

2150. *Mr. Neilson.*] On the Saturday, when you were in, Mr. Green, did you observe anything in No. 1? I went into the stenton, and I left Mr. McCabe standing by a horse there.

2151. You are quite certain that the seat of the explosion was in No. 2? Yes.

2152. But that it was assisted by meeting with additional force on the way? Yes; it must have met with a reservoir of gas in these old workings.

[NOTE.—The reservoir in question consists of two bords, about 15 yards in length, between the two returns. Mr. Green explains, however, that he did not examine for the presence of gas in the situations he mentions; his remarks on this point being pure hypothesis.

Witness's attention being directed to the plan, he further explained himself by that means.]

2153. *Mr. Neilson.*] Do I understand you to say now, Mr. Green, that, notwithstanding the opinion you have expressed as to the cause of the accident, and where the explosion was conveyed by separate reservoirs of gas, that the most probable position in which to find gas after the explosion was in the face of Nos. 3, 4, and 6, and probably No. 5? Yes.

2154. *Mr. Hilton.*] From what you have seen, Mr. Green, do you think it necessary in such cases to erect brattice to carry the air to the working face, by way of precaution, for instance? Well, I believe it was necessary in No. 1, in view of gas being there. I believe precautions ought to have been taken from the last stenton to the face.

2155. You are aware that in a mine which gives off gas the quantity given off varies considerably—sometimes it is more than at others? Yes.

2156. That being so, you think it necessary to erect brattice in order to prevent accident occurring? Yes.

2157. I suppose you have a knowledge of the means by which this mine was ventilated? Yes.

2158. You are aware that there was a door placed on the western road at the western junction? Yes.

2159. That was for the purpose of ventilating the Hill End district? Yes.

2160. And that door would be liable to get destroyed providing the trapper boy neglected to open it, say? Yes.

2161. And suppose the door became injured and would not work, would not the effect be to diminish the ventilation to the Hill End district? Yes.

2162. Do you think the door could have been placed in a better position? It might have been placed inside the western flatt so as to avoid the engine train; and if that had been so all these stoppings (*pointing to plan*) would have been scaling the air—that would have been all the difference.

2163. Supposing the door had been placed in the western return so as to admit sufficient air for the men in the western district, and supposing the stoppings were all secure, it would have been better in that case, would it not? Yes.

2164. And by that means there would have been less liability to accident? It would have been less liable, I suppose.

2165. Owing to the position the door occupied at the time of the explosion, if anything occurred to it, as you said before, it would necessarily destroy the ventilation to the Hill End district? Oh, yes, certainly. If the door were placed inside the flatt, as I have suggested might be done, it would be opened so many more times than on the main road.

2166. *President.*] It depends upon the number of skips or trains that pass through? Yes.

2167. *Mr. Hilton.*] You did not understand me, Mr. Green. You know that the return airway is on the out-by side or towards the furnace side of the main workings. If the door was placed in the return airway it would not be interfered with by the transit of skips and so forth? I understood you to speak of having the door placed in the return inside the main road.

2168. Yes; but by placing it there, I say it would not be subject to frequent openings? No.

2169. *President.*] Could it be placed in the return, that is the point? Of course I could understand having the door placed in the return, but I would not approve of it myself.

2170. *Mr. Hilton.*] Would not approve of the door being in that position, and yet you have said you thought it would be better to be there? Oh, no, I did not; at least I did not mean that.

2171. You said that where it was it was liable to be damaged? Yes; there was that danger.

2172. There was also danger in the boy not being there to open it and a set of skips running against it? Yes; no doubt.

2173. It might also get disarranged on account of frequent use? Yes.

2174. And if it were placed in the western return it would be free from liability to such dangers? Yes, no doubt; but I do not think it would be well to place it there.

2175. *Mr. Clarke.*] Would it be as servicable? No; I do not think it would.

2176. *Mr. Owens.*] When you entered the mine first which way did you go—up the left-hand side, through the return? Yes.

2177. Not over the Big Fall? No.

2178. Were you there at all? No. I made enquiries of Mr. Ross why we did not go there, and he said there was a very large fall and we could not get there.

2179. Did you see it? No.

2180. You noticed a smell? Yes; when I went to the furnace.

2181. You have smelt fire-damp before, and powder and dynamite, I suppose? Yes.

2182. Did you detect any smell like that of powder and dynamite on first entering the mine? No.

2183. Would it be possible for hot air to be sent to the Hill End district to cause the singeing of those people in the western district without a good deal of fire? No.

2184.

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2184. Taking into consideration the state of the mine and the bodies, do you consider sufficient gas could or did exist in No. 1 heading to produce such effects? No; there was not sufficient gas in No. 1 and No. 2 headings to cause the destruction that there has been.
2185. Do you think coal-dust would ignite of itself, or do you think it would require to be dissolved by the ignition of gas? Certainly, in my opinion, it would require gas to make it explode.
2186. Do you of your own knowledge know of such a thing as a powder magazine to be kept in the mine? No, I never did.
2187. *Mr. Jones.*] To come to No. 1 heading I suppose you observed the danger-board? Yes, placed at the last stenton.
2188. In your opinion as a practical man, would it not have been a greater precautionary measure to have had those boards placed at a greater distance from the working places? Yes.
2189. That is, so as not to admit naked lights? Yes, I should say it would.
2190. You have said that you think the system of firing shots with a fuse, and lighting touch-paper by tilting the lamp a bad system? Yes.
2191. Would you recommend that the practice pursued in England, that of having some person in authority to fire the shots, should be followed here? Yes, I think so.
2192. You observed, on going into the mine, some stoppings blown out? Yes.
2193. Did you notice of what material the stoppings were composed—were they built of stone and filled in with small coal? Yes, they were good strong stoppings?
2194. Do you think stoppings of that character of a sufficiently good kind for conducting the air in large collieries? I believe all main roads ought to have good brick stoppings with a reasonable amount of backing up.
2195. *President.*] That is in the absence of good building stone, I suppose? Well, they are often better filled in with stone.
2196. *Mr. Croudace.*] As a rule are safety-lamps used where the existence of gas is known, or the fear of gas exists? If gas has been seen safety-lamps are used.
2197. Do you consider all men equally careful in using safety-lamps? No.
2198. Do you consider it prudent or safe to allow lamps to be unlocked? —
2199. I asked you that particular question, Mr. Green, because I think you must have misunderstood a question in reply to which at the inquest you said that safety-lamps were as safe unlocked as locked? I say they are safe so long as they are not unscrewed.
2200. I ask you again, knowing that all men are not careful in gassy mines, do you consider it prudent or safe to allow the lamps to go in unlocked? No.
2201. That is a distinct contradiction to your statement at the inquest? I think my statement at the inquest was just the same, namely, that the unlocked lamp is safe, provided it is not unscrewed. But my opinion is that no man ought to go past the lamp cabin without his lamp being locked, and a man should be stationed there for the purpose in mines where safety-lamps are used.
2202. In answer to a question at the inquest you said, "A safety-lamp unlocked is just as safe as it is locked"; and now I understand you to say, as to a lamp in a gassy mine, that it is not as prudent to have it locked as unlocked? Not at all.
2203. Then do you consider it as prudent in a gassy mine to have the lamps unlocked as locked? No.
2204. You have expressed your opinion about tilting the lamp; now, do you consider it safe to use the ordinary needle and squib in firing a shot? I do not think it is safe in a case like this.
2205. Have you ever known a shot to light up gas? Yes.
2206. With what material would you recommend shot to be fired in a gassy mine—that is, damped or undamped? Damped, certainly.
2207. Would you use coal in the ordinary way, small coal or shale? Shale is always considered the best; but, in general, small coal is used.
2208. Now, to come to the question of the ventilation of this mine. You have been asked about the western door; would it not have been better to have two doors on the western? Yes.
2209. Did you notice whether there was a door between No. 1 and No. 2 on the main road? There had been?
2210. Would it have been better to have two doors there? Yes.
2211. In all cases it would be better? Yes.
2212. Now, I would just like to take you to your opinion about the explosion. You are of opinion that she fired in No. 2, dividing herself in going along the road into No. 1, pierced a stopping here on the main tunnel, a portion going on to the main tunnel, and that at length she fired a small accumulation of gas in two abandoned bords to the left. You observed that the stopping on the left-hand side was blown upward; did you observe which way these stoppings were blown into the face? No. A train of skips was standing there, and I was never down that side.
2213. Do you know or have you heard whether those bodies found at the point where you think she gathered the gas, were those of men who had been working there? They were mostly boys.
2214. Had the boys been working there, do you think? Yes; because the horses were there.
2215. As a matter of fact, did you observe a stopping on the left-hand side of this heading off the main road, and immediately beside No. 2 heading—right through there? I did.
- [NOTE.—Reference was here made to the plan, and Mr. examined the witness as to the probabilities of supporting his hypothesis of a separate explosion.]
2216. You have told us that the explosion came through a stopping on the left-hand side of the main tunnel? Yes.
2217. And you believe there was an accumulation of gas in these unworked bords? Yes.
2218. That being the case, would not that intensify the force and power of the explosion a very great deal? Yes.
2219. Then what would be the result of that intensification of the explosion—which way, for instance, might you then expect the increased force to expend itself? Out-bye—up the tunnel.
2220. Then how do you account for the five bodies being found here, where from every reasonable belief they should not have been, nor could have got, unless they came round by the face here? I think they were forced there by the explosion.

2221. Coming down No. 1, if gas existed in these two bords it would receive an accession of strength by the firing of the gas, and blow the five boys through the stopping as being in the direct course? Yes.
2222. *President.*] I think what Mr. Croudace wants you to consider is this: Supposing your hypothesis to be correct, and gas existed in the two unworked bords in the district marked A, and supposing that gas was fired, the explosion would gather new strength, and, as you say, the force of that would go necessarily down the tunnel? Yes.
2223. Mr. Croudace, in this view, wants you to account for the five bodies and the horse, which were projected through this stopping by the first explosion, remaining at this point, provided there was a second explosion in proximity to the spot where the bodies were found? I think the boys were standing in front of the stopping, and the gas having exploded, gathered more strength, and forced the bodies there. Then you must remember the bodies would be lying down, and if there was more gas to explode, it would not have the same effect upon the bodies in that position as it would if they were erect.
2224. Did you notice the condition of these bodies—were they burnt? Yes, they were burnt.
2225. *Mr. Croudace.*] Were they much burnt? One, lying further up than the rest against the corner of a bord on some small I specially noticed; his hair was singed; the horse was also singed.
2226. Did you notice the props, or any bark, or other material, showing any large extent of fire having been present? I did not.
2227. If there had been any large extent of fire from an explosion, do you not think that the bodies, props, and suchlike would have been charred? I do.
2228. Well, I may tell you that at this point, close to the body of the horse at the bord end, I picked up a piece of bark not even charred—are there indications in this direction, No. 1 and No. 2, of much charring? I was not in there.
2229. You believe that where charring exists there has been fire? Certainly.
2230. Do you think that where no charring exists there is much probability of there having been fire? No.
2231. Just look at these workings, please. [*Draws attention to particular workings affected, as shown on the plan.*] Is not that a very small area of workings altogether? Yes.
2232. And would not a comparatively small quantity of gas, therefore, do a considerable amount of damage in that district? Yes.
2233. Am I right, therefore, in saying that a comparatively small quantity would do the damage you have seen here? I am of opinion that the gas was probably assisted by the coal-dust.
2234. As a matter of fact, do you think there was much gas in any of these workings? I cannot say there was much gas where a naked lamp would be, and I found a naked lamp in this stenton here (*indicating a point on the plan*).
2235. Do you know whether the men working in the bords on the right-hand side of No. 1 used safety or open lamps? I believe they used open lamps.
2236. Did you travel through the return airway here to the west? Yes.
2237. Did you find any signs of much damage in that direction? No.
2238. *President.*] You stated, Mr. Green, that you picked up a lamp in stenton No. 1—what kind of a lamp was it? A copper lamp.
2239. Was it a large lamp? Yes.
2240. Where Millwood was found, did you see a lamp by his side? No.
2241. It was stated to us yesterday that his lamp was lying by his side? I did not see it, and this is the first I have heard of it.
2242. You and Mr. McCabe were there first to see his body? Yes.
2243. And you did not see his lamp? No; but I saw a lamp in the stenton, and I came to the conclusion that it was the deputy's lamp.
2244. You did not know the deputy? No.
2245. *Mr. Croudace.*] How did you know it was his lamp? I knew it was a deputy's lamp.
2246. *Mr. Jones.*] Did you consider the Bulli mine a dusty one? Yes, very dusty.
2247. You have already stated that there should be double doors in the air passages where required? Yes; I think it would be much safer.
2248. Is that the practice in England? Yes; in gassy mines it is.
2249. You, as a practical man, would suggest that it should be followed in all mines where gas exists? Yes.
2250. *President.*] Would you go further and say that on main roads no doors should exist? I think it would be much better if it could be arranged to have no doors on main roads. [*The witness withdrew.*]

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David Howie sworn and examined:—

2251. *President.*] You are a miner, employed at Mount Kembla? Yes.
2252. Did you work in the Bulli mine before the accident? I never did work at the Bulli mine.
2253. You did not know anything about the workings before the accident? No.
2254. When did you first arrive at the mine? On the evening of the day after the accident.
2255. Did you go as a rescuer? Yes.
2256. Tell us where you went? We proceeded into the tunnel for about 400 yards, turned to the right, and went through the airway till we got on to the main tunnel again, and proceeded for a few hundred yards further, when Mr. Evans and Mr. Jones tested the air; we then proceeded on a bit further till we came to the large fall; we got over the fall, and again tested the air; we proceeded on till we came to a heading, of which I do not know the number, but a little further on we came to a heading where there were some skips lying all jammed together; I, at Mr. Evans' direction, jumped over, and I saw a boy's hand underneath a skip; we lifted the skips off, and got the boy out; by that time, another party came in.
2257. Did you observe the condition of the boy—was he burnt? I thought the hand was drawn together, I did not take particular notice of the face.
2258. Where did you go after taking out the boy? We proceeded to carry the boy out, and when we came back again, some more bodies were being carried out from the straight-in heading, and other working places the other side of that.

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- Mr. D. Howie.
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2259. That was Nos. 3, 4, 5, and 6; were you engaged carrying the bodies out? Yes, from the mouth of the tunnel.
2260. Were you in the face of any of these headings? No.
2261. Did you see any charred props on the road? No, I did not take any notice.
2262. You confined your attention to the carrying out of the bodies? Yes.
2263. Then you can state nothing about the condition of the workings? No, I never went in further than that.
2264. How often were you in the Bulli mine that night? Four times.
2265. *Mr. Clarke.*] Who accompanied you on those occasions? My brother, William Howie, Tom Hopkins, and William Wotherspone, and others.
2266. *Mr. Croudace.*] How was it you happened to go all the way from Mount Kembla to assist in this work? We were asked to go.
2267. Who asked you? Mr. Evans.
2268. Was there not plenty of assistance without you? It seems not.
2269. Were there no resident men with you—no Bulli hands? There was only one in our party; there were six of us besides Mr. Evans and Mr. Jones.
2270. Were there no men from Coalcliffe or North Illawarra with you? There were none in our party.
2271. *Mr. Jones.*] Then you simply accompanied Mr. Evans' party? Yes. [*The witness withdrew.*]

William Wotherspone sworn and examined:—

- Mr. W. Wotherspone.
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2272. *President.*] You are a miner, working at Mount Kembla Colliery? Yes.
2273. Did you accompany the last witness, David Howie, into the Bulli mine on the Thursday night after the accident? Yes.
2274. And you entered that mine along with Mr. Evans and party? Yes.
2275. Where did you proceed to? We proceeded up the Hill End, or gassy district.
2276. Had you been in that district before the accident? No.
2277. Having gone to the gassy district, what did you then do? The first thing David Hopkins and I did was to put up canvas bratticing in the straight heading; but before doing that we went up to where the horse was lying dead. We went in there to see if there were any bodies of the men.
2278. Did you see any gas there? No.
2279. Did you pass through the cut-through into No. 2? No, we took the same road, and went along the Flatt, into No. 3.
2280. Did you go to the face? Yes; that is where Newton was lying. The road was all fallen there.
2281. Were the bodies removed out of Nos. 3 and 4 at that time? No.
2282. How many bodies did you find? Two.
2283. Did you notice whether the men were burnt? Their hair seemed to be singed, but I could not say as to the bodies, because they were all black, being covered with dust.
2284. Then having gone to the face of No. 3 heading, did you go also to No. 4? Yes; that is where Bentley was lying; there were other four lying in that heading.
2285. Was a horse there? No; the horse was out on the main heading.
2286. Did you perceive the condition of the bodies in No. 4? Yes, as I have said, they were all black, as it were from dust.
2287. Then going down the main heading, did you and your party go into the face of No. 5? No; we did not go to the face, we came up through the canvas again.
2288. You would then go to the Flatt where the skips were lying? Yes.
2289. How were they lying? Most of them were lying about 6 inches off the rails, and tossed about.
2290. Did you notice any bodies lying under the skips? I saw a boy, and saw him taken out.
2291. Was he burnt? I cannot say; I did not examine him.
2292. Have you had any experience in gassy mines? Yes; I was in about as gassy a mine as any in the world.
2293. Where was that? Cadzow.
2294. *Mr. Neilson.*] Did you witness any explosions there? There was an explosion there, but no bodies burnt.
2295. Were you in No. 2 heading? Yes.
2296. Did you notice the effects of the explosion there? I cannot say much about the effects.
2297. Where men are injured in explosions, it is the hair that fires first, is it not? Yes.
2298. Were the bodies you saw at Bulli much burnt? Just singed only.
2299. Then they were not in that case burnt very much? No; they did not seem very much burnt, none of the skin had come off.
2300. If a man puts his head into fire, the hair on his face and head comes off first? Yes, I have seen that myself, where the hair and whiskers have come off and the man not much burnt in the face.
2301. Have you ever worked where there was fire-damp, and safety-lamps were used? Yes, in Cadzow.
2302. What was the system of firing shots there—who fired the shots? The deputy, or what we called the roads-man.
2303. What was the process? They used touch-paper generally.
2304. How did you light the touch-paper? Always with a match, because there was no danger of gas there, every place being bratticed up to the face.
2305. And you lit the touch-paper with a match? Yes.
2306. Was that in the main current? Yes, generally. There was always a good current if you went outside the bratticing.
2307. The men were never allowed to fire a shot, then? No, and a man always went around after we went out to see that all was right.
2308. What sort of tamping did you use? Damp tamping. Very small dry coal is not a safe thing to use.
2309. *Mr. Hilton.*] From what you have seen do you think it required a large amount of gas to cause the

- the destruction? Yes, and I do not think it was the gas in the headings that caused the explosion. I think the new furnace had a great deal to do with it.
2310. In what way? Well, I think there has been a good deal of gas lying in Bulli for some time, and the new furnace has caused it to come out.
2311. *Mr. Owens.*] Did you test for gas when you were in the mine? Mr. Evans did in my presence in the headings.
2312. Did he find any? No.
2313. Do you know anything about the working of Bulli mine? No, nothing previous to the explosion.
2314. *Mr. Croudace.*] From your experience in gassy mines, would you think of tilting a lamp to light the touch? No, I think it is a very bad practice.
2315. Any man doing so, you think, would be doing a wrong both to himself and his fellow men, and to the community at large? Yes.
2316. That being your opinion, what would you think of a man, or two, or three men who worked in a mine with the top of a lamp burnt into a large hole, and continued so to work for two or three days? I should think it was a very foolish action.
2317. Then, Mr. Wotherspone, would you look at this plan [*pointing to a section of the workings*]; knowing that there is a small area of coal in this gassy district, would it take a large or a small amount of gas to do a considerable amount of damage? It would not take a great amount of gas to do a great deal of damage.
2318. In any gassy district comprising a limited area, you are of opinion that a comparatively small quantity of gas would do a considerable amount of damage? Yes.
2319. In going through the workings of Bulli mine, did you notice any stoppings composed of stone and loose earth blown out? Yes.
2320. Coming down into the main tunnel did you observe a stopping, the first on the left of No. 2 heading? Yes. That was the first put in with canvas.
2321. Did you notice any below that blown out? Yes.
2322. Did you consider that there was a great deal of damage done? Not a great deal of damage inside the workings.
2323. Coming to the Flatts where you saw the tubs displaced, you saw one or two broken tubs? Yes; we removed them to get the bodies away.
2324. Have you ever seen the effects of a really heavy explosion? Never; I have only been where they were slight.
2325. I asked you that question because I wanted you to compare this with a really heavy explosion.
2326. *Mr. Jones.*] You have stated that you believed that the new furnace had something to do with the explosion—what are your reasons? Well, I have worked in a pit where we had a lot of gas lying, “dampit,” and I believe it was in Bulli the same; and if it had been allowed to come out, it would have caused the pit to be blown out, but we kept it down so that it would not fire.
2327. Where would you expect to find light carburetted hydrogen? In the old workings.
2328. And is that where you would find black-damp? Yes.
2329. What effect would hydrogen have upon the furnace? It would burn on the furnace.
2330. Did you ever hear of any displacement having taken place at the furnace? No.
2331. Then what becomes of your belief that there was a large quantity of gas stored up in the return—would not the effect of the air be to diffuse it and render it harmless? Yes, if there was plenty of it.
2332. Yes, and plenty of black-damp would have a similar effect? Yes.
2333. Then these two elements would prevent a realization of your belief? Yes; but a slight current of air would cause the effect.
2334. But not having seen any manifestation of force at the furnace, there is no evidence to support your belief? I never knew of an explosion going to the furnace.
2335. *Mr. Neilson.*] Do you know how long the new furnace has been working? About six months, I see by the papers.
2336. With three times the quantity of air than there was before, would not six months be time long enough to draw out any quantity of gas that might be there? It would depend upon the working of the furnace.
2337. *Mr. Owens.*] You said in answer to Mr. Croudace that in a mine where gas exists the fact of a lamp with a top burning off would be highly dangerous? Yes.
2338. Supposing that you were supplied with such a lamp, say in the Hill End district, and could not get another, what would you do? I would go out. [*The witness withdrew.*]

MR. G. O'MALLEY CLARKE IN THE CHAIR.

David Hopkins sworn and examined:—

2339. *Chairman.*] You are a miner, working at Mount Kembla? Yes.
2340. Did you visit the Bulli mine after the accident? Yes; on Thursday, the 24th, at 10 o'clock at night.
2341. Did you visit the mine? Yes.
2342. In company with whom? Mr. Evans, David and William Howie, and William Wotherspone.
2343. In what direction did you proceed, and what did you do? We went into the gassy section, as far as No. 3 heading. I saw a man lying there; we turned the air into No. 3 and carried the man out.
2344. Did you go to Nos. 1 and 2? No.
2345. Did you notice much damage done? Yes.
2346. Did you go back the same road? Yes. I was only in once. I did not go into the western. All I did was to assist in putting the brattice up and carrying the bodies out.
2347. Did you form any opinion as to the cause of the accident—the origin of it? No.
2348. *Mr. Hilton.*] Have you had much experience as a miner? Yes; I have been at it since I was 12 years of age.

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2349.

- Mr. D. Hopkins. 2349. Have you worked in mines that gave off gas? Yes.
 2350. What sort of lights did you use? Davy-lamps.
 12 May, 1887. 2351. Were you ever in a mine that exploded? I was never inside during an explosion. I have been in after an explosion before this occurrence.
 2352. From your experience, do you think it would require a large amount of gas to cause the destruction you saw in Bulli mine? There must be a large amount of gas to do much damage.
 2353. Is there a great amount of damage done at Bulli? It depends upon the kind of roof. If the roof were bad, the same as it has been in some places where I have worked, there would be much more damage I should say.
 2354. *Mr. Owens.*] You never worked in Bulli Colliery? No. [*The witness withdrew.*]

Isaac Nixon sworn and examined :—

- Mr. I. Nixon. 2355. *Chairman.*] Are you a miner? Yes, working at Mount Kembla.
 12 May, 1887. 2356. Did you visit the Bulli mine after the accident? Yes, on Thursday, the 24th of April.
 2357. At what time? I think it would be about 10 o'clock at night.
 2358. Who did you go in with? I went in with John Chalmers.
 2359. Had you any knowledge of the mine? No; it was my first visit.
 2360. Where did you go? I went into No. 3 heading.
 2361. Was Hopkins with you? Yes; there were seven of us altogether.
 2362. What did you do? I helped to carry some of the dead bodies out.
 2363. Where from? No. 3 heading.
 2364. Did you examine the heading? No.
 2365. Did you only pay one visit to the mine? No; I helped to fetch three bodies out of No. 3 heading.
 2366. Did you leave the mine soon after? I left the mine about 5 o'clock on the Friday morning.
 2367. And all the time you were assisting to carry out the bodies from the main drive? Yes.
 2368. Did you take notice of any of the damage done? All the notice I took was that the skips were knocked about down in the bottom end of the main.
 2369. How many bodies did you find altogether there? I saw about four or five.
 2370. Was there any appearance of burning on them? Well, yes; there was a little appearance of burning on them.
 2371. You did not go into No. 2? No.
 2372. Or any other part of the mine? No; I only went to No. 3.
 2373. Can you give any opinion as to the cause of the accident; this wreckage, or anything of that sort? No.
 2374. *Mr. Neilson.*] Was the hair burnt on these bodies? The hair was slightly singed on the head—singed close to the skull.
 2375. Did you go into the western district of the Hill End district on the left-hand side? No.
 2376. Did you try for gas anywhere while you were in? No; I was simply engaged in getting the bodies out.
 2377. Did you see anyone else try for gas? No.
 2378. *Mr. Jones.*] Did you see any other bodies than the three you helped to carry out? Yes; I saw four or five of them.
 2379. Did you notice any signs of burning on them? No; I only noticed those I helped to carry out.
 2380. *Mr. Croudace.*] Did Mr. Evans ask you to go to the Bulli mine? Yes.
 2381. Did he state any reason? No; he wanted us to go to try and get the bodies out.
 2382. Have you had much experience in fiery mines? Yes.
 2383. But you did not see much in this mine? No; I did not pay any attention. [*The witness withdrew.*]

John Halloran sworn and examined :—

- Mr. J. Halloran. 2384. *Chairman.*] What is your occupation, Mr. Halloran? I am overman at Mount Kembla, in charge of the night shift.
 12 May, 1887. 2385. Had you any knowledge of the Bulli mine prior to the accident? I never worked at Bulli.
 2386. When did you visit the mine after the explosion? On the Thursday night, and entered the mine about 11 o'clock.
 2387. As a rescuer, I suppose? Yes.
 2388. Where did you go to? We went to the face of the main heading, no further.
 2389. What do you see? I saw two dead bodies.
 2390. Did you go into any adjoining heading and make any observation of things? I was in No. 2 and No. 3, I think; but I would not be sure as to the numbers.

[NOTE.—The headings were indicated on the plan, and witness recognises those he entered.]

2391. Did you observe any bodies? Yes; we took some bodies from that direction—one from these two headings, and on the return, not far from the face of the return, we got two bodies.
 2392. Did you go into these headings marked Nos. 1 and 2? No.
 2393. Did you go anywhere else? No.
 2394. Can you describe the condition of the mine—was there much damage done? There was not much damage done up there, there was some going in.
 2395. Are you in a position to give an opinion as to the cause of the disaster, or its effects? Well, no I do not know that I am. I went there more as a rescuer than anything else. [*The witness withdrew.*]

Archibald Gardiner sworn and examined :—

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2396. *President.*] You are a mining engineer? Yes; and a certificated colliery manager.
2397. Residing at Newcastle? Yes.
2398. You produced this plan of the Bulli Colliery? Yes.
2399. It is an accurate plan of the workings of the colliery which have been affected by the explosion? Yes.
2400. Where did you get the information which enabled you to mark the places representing where the different bodies were found, as well as to make other indications on the plan? This blue tracing here was handed to me by Mr. Ross.
2401. Were you present at the mine when any of the bodies were found? I was present when some men were brought out of the western.
2402. So you speak from your own knowledge of the positions of the men found in the western? Yes, of nearly all of them; but I did not see those found to the right-hand of western.
2403. When did you visit the Bulli Colliery first? The second day after the explosion.
2404. That was Thursday or Friday? That was Friday morning.
2405. When did you first go into the mine? On Friday morning at 10 o'clock.
2406. Who took you into the mine? I accompanied the Examiner of Coal-fields, Messrs. Ross, Evans, Neilson, and Inspector Rowan.
2407. With what object? To find out the causes of the explosion.
2408. Where did you go? We proceeded over the western district.
2409. How did you enter the mine? By the grip road.
2410. You did not proceed through the main tunnel? Not through the main tunnel at the beginning.
2411. When did you go through the main tunnel? On the Friday, the first time I went through the Hill End district.
2412. In going through the main tunnel, what conclusions did you form as to the cause of that large fall? The cause of it had been the blast of the explosion; the timber that has been torn away has been loaded with loose stuff, and it came down, and might appear at first sight as if it had been drawn from the roof, whereas it was only stuff used for loading the sets; the wire ropes running along the timber on pulley-wheels would greatly assist in pulling down the timber; but the primary cause of the destruction was the force of the explosion.
2413. Is it your opinion that the roof had previously started from the conglomerate, and was resting on the timber? Yes, and thereby loaded the sets; I have satisfied myself that that has been the case; and it is very easy to see proof of that.
2414. Did you take particular notice of the condition of the main road? Yes, in many places.
2415. Are you decided in the opinion that the large fall in the main tunnel is due to ordinary causes? Yes; I am satisfied it was due to the force of the explosion which knocked out some of the props, and the wire ropes and the stuff lying on the top of the timber have assisted in wrecking it for such a length.
2416. There was no evidence that it was caused by gunpowder or dynamite? No; so far as I could see there were no symptoms of anything of the kind.
2417. In passing along how did you make your examination—did you make particular inspection of the tunnel as you went along? About 10 o'clock on the night of the 30th March, in company with Messrs. Evans and Crawford, I went into the mine, and we minutely examined from the mouth of the tunnel to the commencement of the large fall; then we returned by the way of the grip and came down here for about a chain from the junction of the travelling road back towards the mouth of the tunnel, and then minutely examined the props, falls, and everything that could be seen from that point right to the face of No. 1 heading.
2418. Give us the results as you went along? About 120 yards in we got some coped dust, which was sticking to one of the props.
2419. It was attached to the props? Yes; we took samples of this dust; also some splinters off the props.
2420. Were they burnt? No, not the bark splinters; these things I produced at the Coroner's inquest; we also examined the overcast to the old furnace, to see if there were any effects of the explosion there, and to examine whatever had taken place; the explosion was not traceable there, and there was no disturbance in the old air-course; the top of the overcast was spiked down with 6-inch spikes; three of these were lifted up as if from below, but were not removed out of their places; the air-course was in itself intact, and did not seem to be under the influence of any explosion; the force where we saw indications of it appeared to come from down below; we then proceeded and examined further on. There was nothing particular at the junction of the travelling road with the main tunnel.
2421. Start at the junction of the travelling road and the main tunnel, and describe the result of your examination? We proceeded and examined all the timber at the road sides, and there was nothing remarkable up to the junction.
2422. What was the condition of the stoppings there? They were somewhat disturbed; but the force of the explosion had not affected them very much.
2423. Were they disturbed at all? I could not really say if they were disturbed; but if so, it was very little between these two points.
2424. Now coming to the top of the incline bank? At the junction there, where Melville and other five bodies were found, we took samples of bark and splinters from timber against which Melville's body was found lying, and as far as we could see no signs of fire were there at all; a fall had taken place, and I examined very minutely that place last night to ascertain whether I could see anything particular about that wreckage; that fall had evidently been caused by the concussion.
2425. How do you account for the bodies that were got at the top of the flat being burnt if you saw no signs of fire on the props, or did you examine any of the props with bark on them? Yes.
2426. Is bark sensitive to fire? Yes, very sensitive; particularly the bark I took from there; it was as fine as the hair of my head.
2427. If fire existed there, would you have seen it on the bark? Yes.
2428. And you saw no signs of flame? No.
2429. You are positive of that? Positive.
2430. How would you account for the bodies exhibiting signs of burning? The heated dust will account for it.
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2431. You took samples of dust from the props? Yes.
2432. Was it coke, or dust, or what? There was a good deal of coke amongst it; but it was not all charred, the dust was only partially consumed.
2433. It was adhering to the props? Yes; at one place it was a quarter of an inch thick on a tree standing in the centre of the junction facing the western and Hill End road; I took particular notice of it; found it to be a quarter of an inch thick.
2434. What side was it? The dust was in the in-bye side, as if it came outwards.
2435. After leaving the junction of the western, where did you go? Straight into the Hill End district.
2436. You passed over a large fall? Yes, and then went through several bords.
2437. Was that through the fault? I believe it was over some fault or other. There was a large fall there. From information given to me I was anxious to go into the western district to see the timber there, to ascertain if there were any signs of fire.
2438. Proceeding onward, where did your examination extend, and how was the ventilation at this time? We found the roads and places pretty clear until we got to No. 1 heading.
2439. Two bodies were found before you got there? Yes; 96 yards from the centre of No. 1 heading.
2440. You did not see them? No.
2441. Did you examine the props where the bodies were found? Just near there are no props at all.
2442. Did you examine the nearest? Yes; but there were no traces of fire along there.
2443. You found no traces of fire until you came where? Down in No. 1 heading, and in No. 1 bord off No. 1 heading, were the first traces of fire that I saw.
2444. In making this plan, you put down everything as it exists? Yes; I observed in travelling up No. 1 heading that the first bord off that heading was a disused bord. It is marked on the plan, "Bord stowed up." It was filled up with debris.
2445. And there was access? No, I tried, but could not get in.
2446. Could that act as a reservoir or magazine for gas? No.
2447. The next bord is also a disused bord, marked "Standing burnt coal"? Yes; the face of the coal is burnt.
2448. Did you get into the face? Yes; there was no gas there.
2449. Then you pass over the roll to the bords working coal between rolls? Yes.
2450. Were the spaces a little greater? Yes.
2451. You were not present when any bodies were found in Nos. 1 and 2 headings? No, not when they were found, but after they were taken out. I was there when the man, Olsen, the last man brought out of the pit, was taken out. He was found in the fifth working bord, and he was taken out on the Saturday, having been missed by one of the parties.
2452. That was the only body that you saw? Yes, in that district.
2453. Did you closely examine the body when you saw it? Yes.
2454. There were no marks of burning on it? Well, I could not really say. It was covered with coal dust, and I did not go out with it, and I would not like to pass an opinion unless I saw the body in daylight, after it had been washed.
2455. Passing upwards you come to the last stenton, where there is a danger-board standing almost level with the stenton? Yes; in the centre of the stenton, in No. 1 heading, the danger-board and props are still standing.
2456. And about there was a horse? Yes.
2457. Have you been in the face of that heading? Yes, several times.
2458. Did you find any fire-damp? Yes, every time; and I have seen from 4 to 14 yards of gas.
2459. How thick? It was 6 inches on the out-bye side, and I have seen as little as 4 yards in length.
2460. Was it very pure? Very quick.
2461. Was it remarkable for its quickness? It was.
2462. Was it silver gas, or do you know anything about that? That is what we had in the Forsyth district in Scotland.
2463. *Mr. Croudace.*] Do you know the component parts of silver gas? No, not minutely, but I believe there is something in it that gives it a quicker smell.
2464. *President.*] With reference to this bord, No. 1, was it 80 feet 6 inches in advance of the stenton? Yes.
2465. Can you vouch for the accuracy of the measurement? I can.
2466. At a spot within 6 or 7 yards from the face of No. 1 I see some compressed powder and a coil of fuse was got here unburnt—that is indicated on the plan? Yes.
2467. By whose authority? My own.
2468. Did you see it? Yes.
2469. Where was the powder found? On a canch or bench on the side of the coal, about 6 yards from the face of the heading, and about 3 or 4 feet from the floor, and the coil of fuse was found beside it. I brought out the fuse, and Mr. Dixon, the Government Inspector, brought out the powder.
2470. It was quite unburnt? Yes; and I believe it was produced by Mr. Dixon at the inquest.
2471. Passing through the stenton, you come to the face of No. 2, standing 85 feet in advance of the stenton, that is 28 yards 1 foot? Yes.
2472. That heading is on a roll? Yes. I have omitted to say that last night, when down in the heading, Mr. White had some men put on to put bratticing in the face of No. 2 heading, and while they were working there removing small coal from the front of a canch, and after they had removed the skip which was there, a naked lamp was found on the floor.
2473. Did you see it? Yes.
2474. What sort of lamp was it? An ordinary miner's naked lamp.
2475. Did you notice whether there was any oil or wick in it? Yes, I noticed that the wick was in it.
2476. Could you tell that it had been in recent use? Not very easily. It had been among the coal-dust, and it was not observed until they were putting the bratticing down to the bottom, where it was discovered.
2477. Had it been trampled on? No; it was close to the left-hand side of the heading, and I believe that search parties going in on occasions went to the right-hand side of the skips. We went on both sides of the skips on going in and out of that heading.
2478. You saw the lamp? I saw it.

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2479. Did it have every appearance of having been recently used? It might have been used, but I could not say; I suppose it was.
2480. Did you suppose that it was a suspicious circumstance? Very suspicious.
2481. Did you see any bodies removed from No. 2 heading? No.
2482. Did you see any removed from Nos. 3 and 4 headings? None.
2483. Can you describe to me the course of the ventilating current from Nos. 3 and 4 headings? Yes. The main intake of the Hill End district passes the main engine road to No. 1 heading; it then passes through the stenton to No. 2 heading, and then it passes down, supplying the bords down No. 2 heading, until it comes to the bord next to the engine road, subsequently it passes through out into the main engine road, again it then passes along to No. 3 heading, and is again separated there by a door; it passes up No. 3 to the in-bye stenton, through this stenton to No. 4, then down No. 4 on the main road, ventilating one bord here, also goes down to the straight and passes into its No. 5. It then enters the return air-course, which is parallel with the engine road, back to the entrance of No. 2 heading, passes up the heading road for about 2 chains, and passes by the return air-course through the dyke again.
2484. Did you get into these workings by the return air-course, near the dyke? I did.
2485. Right to the head of these workings? Yes.
2486. Did they contain any gas? None at all.
2487. In this circle of workings, marked on the plan A, did you see any evidence of a separate explosion? Nothing at all attracted my attention, although I examined the places all over it, and this stopping, marked on the plan "stopping good," I found not at all injured; the other stopping is marked partly out. Some debris was lying down for about 15 inches, and that is the reason I so marked it, although a part of the stopping is good the damage extends only 3 or 4 feet, but on the other side of that the stopping is just as good as if it had been recently built up, and all these bords in the section of the plan marked A show no evidence of fire or explosion.
2488. I see there are two bords going down the right of the working marked A, where you have marked "fall." Could you get over that fall? I went forward and looked over it, but I did not go over it.
2489. Did you see any evidence of gas on the top of this fall which stopped up these two bords? No.
2490. In your opinion were these two bords likely to contain a reservoir of gas? No.
2491. Did you see any evidence of a separate reservoir of gas having been fired there? Had there been a reservoir of gas fired there these stoppings must have been blown out.
2492. You pass through into the return? Yes.
2493. Is the return of adequate capacity? Yes.
2494. You then passed towards the western district? Yes.
2495. You get into it by a door? Yes.
2496. Which I see you have marked "slightly damaged but still hanging"? Yes.
2497. Before coming to that door there is a road which leads to the left? Yes; that is the return air-course.
2498. Reaching the western tunnel where did you go first on the Friday? On my first visit I came to the large fall towards the junction in an air-course.
2499. Did you observe the air-course broken down? Yes.
2500. In what way were the planks displaced, had the force come from below or above? The force came from above.
2501. Did I understand you to say that you saw these bodies lying on the western road? No, not these, they were lying under the overcast.
2502. You passed in towards the face of the western district, what was the condition of the face? There was not much wreckage at all in the whole of the western district.
2503. You passed through the door? The frame of the door was lying at an incline of 20 degrees inward, evidently showing that the force of the blast had gone in one direction, but that the recoil of it had taken the frame of the door in another, and the recoil had had the effect of bringing the door back to its position, although the frame was carried slightly inwards.
2504. After an explosion is there generally a recoil of the force? In all cases.
2505. You found a man as indicated here by a blue cross? Yes.
2506. And you found no gas in the face of these workings? None whatever.
2507. Was the ventilating current much deranged? It was. I observe the slacky road to the right of the western road, where six bodies have been 'got, the remark "in good order; canister with powder and fuse got here."
2508. Did you see that? Yes; I got it in searching for a man; it had been overlooked till the Monday morning, when I brought it out.
2509. Where is it? It is in the lamp room of the Bulli mine. There are 3 or 4 lb. powder in the canister, and it is in good order.
2510. Was the fuse burnt? No; I saw no symptoms of burning in all the western district, and no evidence of fire at all.
2511. In passing round this road and in the bords of the Hill End district at various times did you see any traces of fire in Nos. 1 and 2 headings? The traces of fire were in Nos. 1 and 2, and it was right up to the danger-board in No. 1 heading, opposite the in-bye stenton.
2512. The last stenton towards the face? Yes.
2513. Did you see any signs of fire in the bords? Yes; in the bords off the heading for a short distance there were signs of fire, but there were no signs in the faces of these bords.
2514. Did you see any trace of the existence of gas in the bords off the heading? None at all.
2515. Not in any of your examinations? I never found gas anywhere else; in all my visits it was confined to Nos. 1 and 2 headings.
2516. In your opinion do these headings give off gas? Yes.
2517. And that is where the gas of this explosion came from? Yes.
2518. Do you think that the rolls had any influence in the amount of gas given off? They always have.
2519. Do you think that the practice followed in this colliery of driving these headings was a judicious one in the face of the fact that gas was being given off in the leading headings: I mean in respect to ventilation, can you suggest anything that would have improved the ventilation and carry away the gas? I think they should have had canvas up in these headings.
2520. In view of gas being given off you would have recommended bratticing? Yes.
2521. The ventilating current is directed into Nos. 1 and 2 from Nos. 3 and 4 by a door being placed on

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the main heading. In the event of trains of skips passing through, the door would have to be open, would the ventilation be partially impaired for that time? Yes.

2522. In gassy districts of the mine would you consider it an evidence of good mining and management to have doors on a main road? No; it is advisable to dispense with doors as much as possible on main roads.

2523. Would it have been quite safe to have conducted the workings of this mine with the existing arrangements if bratticing had been used in the faces of the headings which gave off gas? Yes; quite.

2524. Of your own knowledge do you know the manner in which this mine was worked with safety-lamps? Of my own knowledge I do not.

2525. You made examinations with other gentlemen on a subsequent occasion for the purpose of ascertaining the circumstances and causes of the accident? I did.

2526. To what conclusion did you come? I came to the conclusion that the cause of the explosion was the firing of a shot in No. 2 heading.

2527. In the face? Yes; and I have every reason to believe that that shot was overcharged.

2528. In the event of shots being tamped with dry coal-dust, would that constitute a danger in itself? A very great danger.

2529. Would fire be shot out? Yes; a considerable distance.

2530. Do you know anything of the behaviour of fine coal-dust in the presence of gas, such as you saw in No. 2 heading? Yes; it would be highly explosive, and it would have the effect of greatly aggravating the little fire-damp that may have been there if the fine dust suspended in the air ignited.

2531. Have you any doubt at all as to the situation of this explosion or of the causes? Not the slightest hesitation.

2532. Would the finding of the naked lamp last night in No. 2 heading cause you to alter your opinion? No; it has not altered it in any way; it only shows the carelessness of the men inside a heading; the finding of the lamp does not alter my opinion, which is that the shot fired in the heading lit the gas.

2533. Can you describe to us the course of the explosion so far as you have been able to ascertain? The gas ignited in No. 2 heading, the blast passed out of the heading, a part of it going through the stenton and passed down No. 1, and the flame extended into the bords as it passed along; the strongest portion of the force expended itself in and about No. 2 heading.

2534. Did you trace the course down No. 2 heading? I did.

2535. How did it go? In my opinion the main force of the blast went right down No. 2; in going down No. 2 it passed into the third bord above the tunnel and through the cut-through into the second bord; then through another cut-through into the first bord, and from the bord into No. 2 and downwards to the tunnel; it passed through the stopping marked "stopping out" on to No. 1 heading.

2536. *Mr. Neilson.*] It passed through the second bord, did it? No; it passed into No. 3 bord off No. 2 heading.

2537. *President.*] A portion of the blast passed through this stopping; then where did it go? Into the main engine road.

2538. What was the damage done on the diagonal road? The greatest force of the explosion after coming from Nos. 1 and 2 headings is exhibited on that flat to the head of No. 1; from the first cut-through on the left-hand side a horse and four boys had evidently been blown; they were found blown into the return away to the section marked by the letter A.

2539. Then a portion of the force passed into the tunnel? These stoppings Nos. 2, 3, 4, and 5 to the left of the main flat are all blown outwards; the door between 3 and 4 was carried away by the force of the blast; the force must have recoiled into the faces of Nos. 3 and 4 headings; there was a small fall in No. 3 opposite the first stenton, and there were some skips turned upside down; the force passed through into No. 4, and there another skip was upset, and in a bord off No. 4 a horse was lying about half-way to the face from the heading road; it then simply passed into the return.

2540. Did you notice two trains of skips, one empty and another loaded, along the flat between Nos. 2 and 3? Yes; the empties were telescoped into each other, the first two or three of the full skips were off the rails, but all the others were on; the empties were very much huddled together, but the full ones were not much damaged.

2541. The blast having arrived at the main tunnel you say it passed out? Yes.

2542. Did any portion of the force separate itself and go into the western? Yes; it separated itself here [*showing place on plan*], and the remaining portion passed through into the western and afterwards into the return.

2543. Would the large fall that occurred in the main tunnel road have had anything to do with it? It would have intensified and increased the shot.

2544. Can you explain how it was possible for the bodies found on the incline bank to be burnt? They may have been burnt by heated-dust, not by actual flame.

2545. Had the actual flame existed, would you have seen evidences of it on the props? Yes, I would; at a point 15 yards on the in-bye side of No. 2 heading I picked up two lines, and I found them still intact.

2546. Were they plumb-bob strings? Yes.

2547. Was that evidence that the destruction which was done to the stoppings and trains of skips was due to the force of the explosion without flame? Yes; force without flame.

2548. Have you ever heard of an explosion of gas in one position transmitting flame so that it exploded another reservoir at a distance, no gas intervening? Well, that depends on the distance one from the other.

2549. Could it be done on the supposition that the intervening distance was laden with dust? Oh, yes.

2550. Is there any limit to the length of flame that might be transmitted in a dust-laden atmosphere by an explosion of gas? The flame might extend for hundreds of yards.

2551. Would you consider Bulli a dusty mine? It is not a particularly dusty mine, but it is dusty.

2552. Is it a particularly dry mine? I never saw any water.

2553. Has the force of this explosion been confined to a comparatively small area of workings? Yes; to a very small area.

2554. Would that have any significance, in your opinion, with the great destruction of life which has occurred; and, notwithstanding this great destruction of life, are you still of opinion that not much gas exploded? There was not an explosion of much gas.

2555.

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2555. Can you account for such a destruction of human life from the explosion of a comparatively small quantity of gas? It surprises me that such a small quantity of gas should cause the loss of so many lives.
2556. Is it explained by the fact that the area of workings is limited? It is largely explained by that fact, and the assistance the explosion derived from coal-dust.
2557. As a mining engineer and manager would you consider it an evidence of good mining to work bords and headings off the intake and off the return at the same time? Not in fiery mines.
2558. For what reason? In the mining of fast headings giving off gas it would be desirable to return the foul air directly to the return, and not into any working bords.
2559. *Mr. Neilson.*] If there had been a large extent of workings on each side of Nos. 1 and 2 when the explosion took place, would that have been the means of intensifying or reducing the extent of the explosion? It would be the means of reducing it.
2560. In what way? Simply because the force would be expended sooner.
2561. It would come out with great force and quickness when confined in the heading? Like a ball out of a cannon.
2562. When the force of the explosion struck against the side of the main tunnel it spread itself in the two directions as you have indicated? Yes; had the workings been more expansive the force would have been dissipated in the larger area, and less damage would have been done.
2563. Within the circle marked B, do you know the first two bords off No. 2 heading which are not working? I do.
2564. Do you think that there is any possibility of any gas having accumulated in there? No.
2565. A witness has given the opinion that there was an accumulation of gas in these two disused bords? Such could not be the case, for this reason: had gas been in there, and exploded from the flame of the original explosion, one of its effects would be to knock out the stoppings in a different direction; whereas these stoppings connecting Nos. 1 and 2 headings are both in good order at the present moment.
2566. *President.*] You say the force would have come out of No. 2 heading as if out of a cannon? Just so.
2567. *Mr. Nielson.*] You say that no gas could accumulate on account of the way the bords were stowed? Yes.
2568. And the stoppings near these disused bords would have been blown out? Yes.
2569. Instead of which they are in good order? Yes.
2570. Now, there are two boards in the A circle of workings marked "fall;" do you think there is any probability of gas accumulating in these two disused bords? No; the same reason I gave in reference to the portion marked B holds good with these; the stoppings almost opposite the bords referred to are in good order, and the other near it is only slightly damaged.
2571. What would have become of these stoppings if gas had existed in the bords? They would have been blown out completely.
2572. You have examined these surrounding bords; how far away from the heading were they charred? Not very far; in some cases not above 15 or 20 yards, and in others a little further; but none of the props of the bords off the headings were charred in the faces.
2573. The inference of that is the fire went directly out? Yes; licking into the mouths of the boards as it passed.
2574. Were the timbers outside mostly charred? Yes, those directly in the course of explosion; those in the in-bye side seem to have come in contact with the flame about a foot from the roof.
2575. The man, Olsen, was found in the face of the fifth bord off No. 1 heading; was his hair burnt? I really could not say.
2576. Assuming that in these old workings between the Hill End section and the western on the western side of the dyke there was an accumulation of gas standing; is it possible that the increased force of the furnace occasioned it? There is a theory now given that the furnace has drawn that gas out; is it possible, do you think, for the increased power of the furnace to have done that? There was not a great force shown there; no gas could have existed there, for the skips near the door of the western were not greatly disturbed; I believe there was only one found off the rails; if there had been a second explosion, the effect of it would have undoubtedly been shown in the air-course, and no indications existed, for there is a good passage through there.
2577. Have you formed any idea where the force of the explosion terminated in the western? I think very little of the force went down to the faces of the western workings, and that it died very quickly as it went down.
2578. What killed the men? After-damp, or gases generated by the explosion.
2579. Have you any idea as to what way the men have been requested to fire shots in these places? No.
2580. In reference to these heading faces being bratticed, what is the usual way of bringing air into these workings, and do you think there was any danger in working the bords off the headings with naked lights? There was plenty of air there to render it safe, provided there was no great quantity of gas being given off.
2581. Supposing these places were bratticed, and the gas diluted as it was given off, would there be any danger to work outside with naked lights? No.
2582. *Mr. Hilton.*] Have you measured the distance of these bords from the headings? Yes; from an actual survey.
2583. Would you give us the measurements? I have marked them all on the plan; if you will point out any one you refer to I will give you the distance.
2584. What is the distance of No. 3 heading face from the last stenton? 120 feet.
2585. What is the distance of No. 4 heading face from the last stenton? 70 feet.
2586. Will you point out to me the return airway from the western workings to the furnace? [*Airway pointed out on the colliery plan.*]
2587. Did you travel it? No.
2588. Why not? I had no instructions to do so.
2589. I suppose that you will be well aware that the return airway from the western workings to the furnace and from the Hill End district ought to constitute a part of the plan in connection with this disaster? It is not for me to say what should constitute the plan; I was instructed by the President of the Commission to prepare the plan.
2590. You have been asked your opinion on certain matters, and I wish to get your opinion on this; I now ask you again, do you think that the return airway from the western working to the furnace and from

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- from the Hill End district to the furnace should not constitute a portion of the plan in connection with the disaster? No.
2591. Why? Because there was no damage done there, and the blast was not fired at the furnace.
2592. Have you travelled the return airway from the western workings to the furnace? No; I have not.
2593. Have you travelled the return airway from the Hill End district to the furnace? No.
2594. Do you think you can travel it? Yes.
2595. Are you sure the airway is open? Yes.
2596. Are you positively sure? Yes.
2597. How long has it been open? All the time I have been visiting the colliery it has been open.
2598. Are you positively sure? Positively sure.
2599. How long ago is it since you first visited the mine? On the 25th of March, the second day after the explosion.
2600. And you say that the western return airway, right from the workings to the furnace, and the Hill End return airway to the furnace, have been in a state to be travelled since the second day after the explosion? I did not say that; I say that the airways are open.
2601. I asked whether it was open so that a person could travel through it, and I understood you to say that it was? I did not say that.
2602. Do you know whether the western return airway can be travelled? Of my own knowledge I cannot say that it can be travelled.
2603. You said to me a short time ago that it could be travelled? Yes; and I believe I could travel it.
2604. But that is simply a matter of opinion? No; I know it is open, because I measured 84,000 cubic feet of air per minute coming across it.
2605. Is it open so that you can travel it? I believe I could, but I never attempted it.
2606. Do you think it is a proper travelling way in the ordinary sense of the term? Not having travelled it I could not say.
2607. *Mr. Owens.*] Did I understand you to say that the men found on the incline top were singed, and that you could not account for the bodies being singed? I do not say that they were singed.
2608. Or did you say that the only way you could account for it was by the heated coal-dust; if it was hot enough to singe the hair would it not be hot enough to singe the bark on the props? I did not use the word "singe," but you might have heated air of sufficient temperature to cause singeing, for instance, you do not put flame into a baker's oven for the purpose of baking bread, nevertheless you can roast things in it.
2609. If the heated air was sufficient to singe the bodies, would it not show on the bark? I did not notice the bodies, and I cannot say they were burnt; they were taken out before I got there; there were no signs of burning on the props.
2610. Would not the heated air have a burning effect on this fine bark? It has not had any effect, for I have given proof of it by production of the bark.
2611. You are not sure whether the bodies found there were burnt or not? I did not see them; I do not know of my own knowledge that they were burnt.
2612. Where did you find the lamp? In No. 2 heading.
2613. Did you come to the conclusion that it was used in the heading? I think it is very suspicious, and that it was probably used in the heading.
2614. Don't you think that it could have been blown there? No.
2615. Why? There were no naked lamps used about there.
2616. You have heard of the practice of hanging lamps on the danger-board, don't you think it could have been carried in the heading by the recoil of the explosion? We got one of the lamps on the danger-board, and in No. 2 heading the danger-board prop had been blown down, and several lamps have been picked up there.
2617. Perhaps the wheeler had a spare lamp? Quite possible.
2618. And it might have been blown in, is that not possible? Possible, but not likely.
2619. *President.*] How many yards distant was the lamp from the danger-board? About 26 yards.
2620. *Mr. Jones.*] In making your survey what was the distance of the longest bord in No. 2 heading from the cut-through? 126 feet or 42 yards.
2621. Was that distance a violation of the Coal Mines Act? Yes.
2622. You said that in examining the timber in the bords off Nos. 1 and 2 headings you found little or no evidence of charring on the props? I said that the charring did not extend to the working faces.
2623. Was that owing to the distance of the cut-throughs? Well, I don't think it was.
2624. Did you not observe that the blast generally went as far as the cut-through from bord to bord? No; in the bords off No. 1 it did not go as far as the cut-throughs.
2625. Was there a cut-through in the first bord off No. 1 heading? There are three cut-throughs in the heading altogether.
2626. Did not the blast follow the cut-throughs from bord to bord? In No. 2 heading it did, but not in No. 1.
2627. You said you found the caution-board opposite the last stenton? Yes.
2628. Do you think that was a measure of safety to allow the danger-board so near whereby a naked light could approach so near the heading? I think it was the proper place for it.
2629. Would it not be better and safer to have had the caution-board further back? Well, seeing that there was a stenton here giving a large current of air, the caution-board was placed right in the air current.
2630. You have already said it would have been better if the headings had been bratticed? Yes.
2631. In the absence of that bratticing would it not be better if the caution-board was placed further back, and thereby not allow naked lights to approach so near? No doubt the further the board was back the safer it would be if gas was in the heading.
2632. Have you not found gas on every occasion you have been in these two headings? Yes; every time I have been down.
2633. *Mr. Clarke.*] Do you think it was prudent to fire shots in these headings in the absence of an air current or bratticing? No; not in the presence of gas.
2634. *Mr. Croudace.*] Can you tell me whether the main tunnel is rising or dipping here [*showing place on*

on the plan]? It is very flat along there, but there is a decline from this place to that [*places marked*]; but in the place you refer to it seems to be very flat.

2635. Are you sure that it is not falling? I could not say exactly.

2636. Are these headings Nos. 1, 2, 3, and 4 dipping? They seem to rise toward the place.

2637. Commencing at the tunnel mouth where the large fall exists, and where you noticed signs of carbonised coal-dust, did you notice whether the dust was thrown in-bye as well as out-bye against the props? At the point where I got the dust from 120 to 150 yards from the tunnel mouth it was on the in-bye side of the props.

2638. Which side of the main fall was that? On the out-bye side of the fall.

2639. On the out-bye side of the fall the signs were on the in-bye side of the props? Yes; the dust was lying against the wall as there were no props there. I did not examine any of the props particularly near there; but at a point which is marked on the plan, I believe the President took some dust from the in-byeside, and the props from which these samples were taken by the President from two different points are marked on the plan.

2640. Are they marked on the in-bye side or out-bye side? I believe they are marked both sides as the dust, I think, was taken from the in-bye side and out-bye side of the timber.

2641. This being a gassy mine, and safety-lamps being used in the Hill End section, do you consider it prudent or safe to allow the lamps to be unlocked? No; all the lamps ought to have been locked.

2642. Do you consider it a prudent or safe thing for any man under any circumstances to tilt his lamp with a view of lighting the touch to fire the shot? No, certainly not, I do not approve of it.

2643. Do you think by so doing the flame could possibly come outside the gauze and ignite the gas? Yes; if a man held the lamp horizontally or in a sliding position any length of time the flame would come through, and consequently light the gas outside the gauze of the lamp.

2644. And that would be wrong? Certainly.

2645. Supposing I told you that we had evidence that more than one man has worked with a safety-lamp, the principal gauze of which was burnt away, and that he continued to use that lamp in this fiery district, what would you think about that? He might just as well have had an open light.

2646. You would not credit such a thing? No; I never heard of such a thing.

2647. Would you consider it safe in gas to fire a shot with fuse? I do not consider it safe to fire shots at all in the presence of fire-damp.

2648. You would not consider it safe to use a needle and squib? Certainly not.

2649. Is it quite unsafe? Yes.

2650. As a matter of fact do you think that shots should not be fired at all where there is the slightest trace of gas? No; but where it is absolutely necessary. The shots should be fired at night by qualified men, as at home.

2651. These heading lines that you have referred to, and which I have seen, did you carefully examine them to see whether they were burnt? Yes; they were small lines, like fishing lines, and were not burnt by the flame.

2652. And that you take as proof that no flame or body of ignited gas had gone outwards? It had not been there, for if the flame had gone outwards it would have undoubtedly consumed these lines.

2653. There were four bodies and a horse discovered here [*marking the place*], and it was thought that the explosion had gathered fresh force from gas existing in the old workings, do you think there is the slightest cause to lead you to believe that was the case? There is not the slightest indication. I have no hesitation in saying that I marked the position of these skips, and I think it is one of a number of evidences that the flame was not carried a great distance outwards. The horse found there has been smashed against the corner of that pillar [*place marked*].

2654. Realising all the gas which you have seen here and the effects found in Nos. 1, 2, 3, and 4 headings and in the western, do you think these effects were caused by any large amount of gas? No; I do not think there was an explosion of a large amount of gas.

2655. Taking the extent or area of this Hill End district, independent of the old workings, which are completely severed by this dyke, does it not represent really a very small area of workings? Very limited area. I have measured this area in one straight line, and I think all these headings and bords would form a straight line area of (say) 62 chains.

2656. In that case, supposing gas to be exploded in the inmost end, where it was known to exist, did it not extend over a small area, and has not the destruction been somewhat limited? Yes; it came out just like out of a gun.

2657. Now, coming to the ventilation of this mine, did you notice the door placed at the western district? Yes, there was a regulating door there, but it is not there now; it was so regulated as to allow a certain quantity of air to go into the western, forming up to Nos. 1 and 2 headings.

2658. There is a door between them? Yes.

2659. And another door between Nos. 3 and 4 headings? Yes.

2660. And one at the diagonal road? Yes.

2661. Would these doors better serve their purposes if they were doubled? If they had been doubled on the main tunnel the distance would be too short to allow a set of skips to pass through; if the distance had been greater it would enable two doors to be put in and one could be opened while the other was shut.

2662. If a trapper boy had always been kept at the door would you consider that a sufficient safeguard? Yes.

2663. Was it the utmost care that could be taken at this particular place? Yes; and the trapper boy must see that the door was always closed immediately the set passed through.

2664. Have you measured the air? Yes; repeatedly.

2665. Can you give me any idea of the quantity of air going from the western district up to the furnace? Yes; I have measured it very frequently. On the 25th, when I first measured it, the return air coming from the western to the furnace was 44,290 cubic feet per minute at 11 a.m. the same morning. At the same time the return from the Hill End district was 37,410 cubic feet per minute.

2666. That is the return air; do you know the quantity that was going into each district? The western intake at the time we got in that day was 10,200 cubic feet per minute, and the Hill End intake was 14,000 cubic feet per minute.

2667. Can you tell me the number of men that were employed in those districts? I was told that there were

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- were between forty and fifty men and boys in the Hill End district and about twenty in the western.
2668. The total number of men and boys killed in the mine was eighty-one? Yes.
2669. How many horses were killed? Five.
2670. So, eighty-six men, boys, and horses would represent the number in these two districts for which you have altogether over 24,000 cubic feet of air per minute going in? Yes.
2671. Equal to 300 cubic feet per man? Yes.
2672. And that is three times the amount required by the Coal Mine Regulation Act? Yes.
2673. Taking these figures of the quantity of air which existed after the accident, would it not likely be more previous to the accident? Certainly there would be, as the conditions of the stoppings and the falls which occurred were all damaging to the intake air.
2674. In taking these quantities we are taking an adverse state of matters? Yes; adverse to what would be the case previous to the explosion.
2675. And we have three times the quantity required by the Act? Yes.
2676. Supposing the western district return airway to be stopped up, do you think it could be so stopped up as to prevent you from getting a large quantity of air? No.
2677. It is open enough now to admit three times the required quantity of air? Yes.
2678. Whether you have travelled it or not? Yes. I have been down the return of the Hill End district and passed the western, and searching for the body of a man named Wilson. We went down some 300 yards to the south-western main road, and we got on the top of a large fall. Although we did not go over it, there was a good space left for the admission of air. One large fall was 3 or 4 feet high, and I understood from the overman, White, that on the day of the explosion he was up there, and that he had previously made an appointment with Wilson to come down on the other side of the fall and to give a shout. That was about the time the explosion occurred.
2679. Whether you have travelled the airway or not, are you perfectly satisfied that there is area enough to admit under adverse circumstances three times the quantity of air required by the Act? Yes.
2680. You stated that the bodies might have been affected by heated air? Yes.
2681. Which would be the most sensitive to the effect of heated air or dust, the delicate skin of a human body, or inorganic substance such as the bark of a tree? The human skin, I think.
2682. Well, might these bodies, or the hair on those bodies, have been affected by excessive heat, and leave the bark of the timber unaffected? Yes.
2683. *Mr. Owens.*] You think it very inadvisable to take a lamp into these headings with the top gauze burnt off. Well, what do you think of a deputy that would allow such a state of things to exist? He was not doing his duty.
2684. And he ought to have provided a new gauze if the man working with the lamp asked him to do so? Yes, or send the man home.
2685. And such a man should not be a deputy? No, or anything else. [*The witness withdrew.*]

FRIDAY, 13 MAY, 1887.

Present:

DR. ROBERTSON, PRESIDENT.

MR. O'MALLEY CLARKE,
MR. NEILSON,
MR. OWENS,

MR. CROUDACE,
MR. JONES,
MR. HILTON.

Thomas Bissell sworn and examined:—

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2686. *President.*] What is your occupation? I am a miner and engine-driver.
2687. In what capacity were you employed in the Bulli mine on the day of the accident? I was working in the blacksmith's shop on that day.
2688. How far is the blacksmith's shop from the mouth of the tunnel? About 150 yards.
2689. How were you apprised of the accident? The noise caused by the explosion drew my attention that way. It was a loud rumbling sound, as if a runaway set was coming down the incline. I thought it was that at first; but on looking towards the tunnel I saw smoke rising up to a height of about 100 feet.
2690. It came out of the mouth of the tunnel? Yes; smoke and dust.
2691. Was that repeated? I cannot say that it was.
2692. You did not observe two ejections of smoke? No.
2693. What did you then do? I went to Bulli to tell the clerk of what had happened.
2694. What did you think had happened? My impression was that the gas had fired. On returning I entered the mine.
2695. Tell us what you did on entering the mine? I went to the main heading first, and after going up about 10 or 12 chains I found the road entirely blocked by a fall. The roof was down, and the timber was lying across. There were others there then. I went through a cross-cut and entered what is known as the horse road.
2696. Between the grip and the main tunnel? Yes; I went no further on that occasion. Later on in the day I went in again as far as the big fall, beyond the western heading.
2697. What o'clock was that? I think it was about 11 o'clock at night, and I worked there clearing away the fall till the morning.
2698. When you first went to the western was the ventilation in a defective state? Yes; it was burdensome to work there.
2699. Did you detect any after-damp? I cannot say that I did.
2700. As you cleared the fall the ventilation improved, I suppose? Yes.
2701. Were you one of those who went into the workings to recover the bodies? I went into the workings on Saturday evening, with about nine or ten others, into the western.
2702. With what object? It was supposed that a man named Wilson was still in the mine, and I went into his working-place.
- 2703.

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2703. To search for him. Did you find him? No.
 2704. You did not go into the Hill End district? Not at that time. I did a few days afterwards.
 2705. With what object? We went through to have a look at the mine.
 2706. Who accompanied you? A man named James Charlton.
 2707. You went in out of curiosity? Well we had been in the mine several times, and knowing that it was supposed a man was still left in the mine we thought it would be no harm to go in with safety-lamps. We went up the Hill End beyond the last stenton, between Nos. 1 and 2, towards the face.
 2708. Did you see a skip there? Yes.
 2709. Did you examine the mine for the purpose of arriving at a conclusion as to the cause of the accident, or did you see anything that led you to form an opinion? I believe there was an explosion of carburetted hydrogen.
 2710. Why did you form that opinion? Because of the presence of gas and the wreckage.
 2711. Anything more? I saw the bodies.
 2712. What did you notice with regard to the bodies? Some of them had no hair on their heads.
 2713. Did you examine the state of the mine, or the props, for any evidences of actual fire? I cannot say that I examined the props.
 2714. You did not make a minute examination then? No.
 2715. Still, the conclusion you arrived at, for some reason or other, was that an explosion had taken place? Decidedly.
 2716. Do you wish to state anything further in regard to the accident? Well, I noticed that it was an exceedingly favourable day for an explosion. There was a sudden change in the weather, from a heavy to a light atmosphere, and knowing that atmospheric pressure has a great deal to do with the action of explosive gas, I came to that conclusion.
 2717. *Mr. Neilson.*] When were you last in the mine? I think that was the last occasion when I was in with Charlton? I do not remember going into the mine since then. I know I was in with Mr. Jones, manager of North Illawarra.
 2718. Had you permission to go in? Yes.
 2719. *Mr. Hilton.*] Were you at the furnace on the day of the disaster? No.
 2720. From what you saw of the state of the mine, do you think it would require a large amount of gas to cause the destruction you saw? Yes.
 2721. Have you ever had any experience of the effects of an explosion previous to the Bulli accident? No.
 2722. Then how do you form an opinion that it would require a large amount of gas to cause the destruction? I think it must have been a terrific explosion to reach so far from the place where it originated.
 2723. *Mr. Jones.*] Were you employed in the capacity of engine-driver at the time of the explosion? No.
 2724. Did you ever hear the workmen speak or refer to the probabilities of an explosion at Bulli mine? Casually I have heard the men talk about that kind of thing.
 2725. When you saw or heard that noise you speak of did it surprise you in any way? Yes.
 2726. Was it from conversations, or previous reports, that you apprehended it was an explosion? My impression was that it was an explosion.
 2727. You say the bodies you saw showed signs of burning? Yes.
 2728. Are you sure that they were burnt? That is my impression; one that I helped to carry out bore every evidence of being burnt.
 2729. You say the men had no hair on their heads—I suppose you mean it was burnt off. Is that the part, the hair, that you would expect to show principal traces of burning? Decidedly.
 2730. *Mr. Clarke.*] Were you employed in the mine during the strike? A little in the mine.
 2731. In what part of the mine? At the new furnace.
 2732. What was the ventilation like during the strike? I was only there while the new furnace was started. I cannot say about the ventilation there afterwards.
 2733. Is the new furnace an improvement on the old one? It is almost identical with the old one—the same pattern.
 2734. Would it increase the ventilation of the mine? That would depend upon circumstances.
 2735. You do not know? Well, it should improve the ventilation.
 2736. *Mr. Croudace.*] You say you noticed a great change in the weather between the morning and the afternoon? It was a very hot day, the 23rd of March.
 2737. You described the change taking place, I understood? I mean that the day the explosion took place was an excessively hot day as compared with days previous to that.
 2738. You had a knowledge of the old furnace? Yes.
 2739. Can you tell me which has the greatest motive column, or, in other words, which has the greatest power, the old or the new furnace? The new furnace is the most powerful.
 2740. Then the new furnace would be much better than the old? Yes.
 2741. *Mr. Jones.*] Did you hear any of the officials speaking as to the change of weather and its effects? No; I knew that from my own study.
 2742. Can you tell us what was the temperature on the day of the disaster? No, I cannot; but we were all remarking how very hot it was. It certainly was a very hot day. [*The witness withdrew.*]

Albert Smithers sworn and examined:—

2743. *President.*] What occupation do you follow? I am a miner, residing at Bulli.
 2744. Were you engaged at the Bulli mine on the date of the accident? Yes.
 2745. In what part of the mine were you engaged? In No. 3 heading—the gassy section.
 2746. How long were you engaged in that section? I worked about thirteen shifts since the strike.
 2747. And before that, how long? Ever since the gas was found.
 2748. That is ever since they pierced the dyke? Yes.
 2749. Were you one of those who went into the mine after the accident? Yes.
 2750. Immediately after? Yes; but I did not go very far in.
 2751. Were you one of those who were employed getting out the bodies? Yes.
 2752. Were you among the first to go up No. 1 heading after the accident? No.

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- Mr. A. Smithers. 2753. Were the bodies out of that heading? No; I carried the first body out.
 2754. Did you go with others to examine the heading, that is, inspect the condition of the workings? No; not in that heading.
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 2756. Did you work in Nos. 1 and 2 headings before the strike? Yes.
 2757. Did you find any gas given off there? Yes.
 2758. Was it given off very abundantly as you approached the roll? Yes.
 2759. Was it confined to the roll or did it exude from the coal? There was gas more or less all the time in the headings.
 2760. Did the bords off the heading give off gas? Yes.
 2761. Have you been into these bords since the accident? No.
 2762. Have you worked in any other mine besides Bulli? I have worked at Mount Pleasant.
 2763. Have you worked in any other—in fiery mines? No.
 2764. Then you had no experience of gas or fire-damp before you went to Bulli? No.
 2765. And you never saw an explosion, or the effects produced by an explosion, previous to that at Bulli? No.
 2766. Before the strike, had you gas in Nos. 3 and 4 headings? I do not know.
 2767. Did not you work in these before the strike? No; I worked in Nos. 1 and 2 headings.
 2768. But since the strike, I understand you worked in No. 3 heading? Yes.
 2769. Did you observe any gas there? No.
 2770. You are quite certain of that? Yes.
 2771. Did you ever complain to the deputy or management as to the quantity of gas, or of your being made to conduct operations in the presence of gas before the strike? Yes.
 2772. To whom did you complain? To Mr. White and Mr. Crawford.
 2773. What was the nature of your complaint? We complained on account of there being so much gas, and on one occasion Jackson went out and fetched Mr. White in about 9 o'clock. He (Mr. White) came in with two safety-lamps.
 2774. Was that the first time you found the gas? Yes; and one of those lamps had a hole in the top.
 2775. How long ago was that? That was when we first struck gas—about eighteen months or two years ago.
 2776. Yes, but come to the time immediately before the strike? Well, on the Friday night before we came out on strike I was prevented, by White and Crawford both, from working in No. 1 owing to the accumulation of gas.
 2777. Well, was that wrong—did you complain of that? I made a complaint on that very day. I was on night-shift then.
 2778. But was that what you refer to as the subject of a complaint, that Crawford and White took you out of the heading on account of gas; I asked you first whether you had complained about the mode of conducting the workings and you said “yes,” and explained that at that time the Hill End section was opening up; I then asked you whether you had complained to Crawford since; that being so long ago, and you said that “on Friday before the strike you complained”; but on interrogation I found that you did not complain, but that, from motives of safety, they asked you not to work—is not that so? They did not ask me until I pointed out it was not safe to work there. There was a blower there you could hear hissing for a hundred yards.
 2779. But they were actuated by consideration for your safety in asking you not to work there? Yes; then they were, no doubt.
 2780. Then since the strike, have you had any occasion to complain, or have you made any complaint to the management? No; I do not know that I have, except that I pointed out to Millwood one day that we had gone beyond the distance from air required by the Act.
 2781. Since the strike—that is, since the new furnace was erected—was there a material improvement in the ventilation? There was in the main airway; but it was not improved much in the face.
 2782. What was the reason of that? Well, there was no brattice.
 2783. Was there any brattice before the strike? Yes; about 30 yards.
 2784. Where was that? From the dyke into the gassy section.
 2785. How long was that before the strike? When it was first struck.
 2786. That, you say, was two years ago; I am asking about the time immediately before the strike? There was none that I know of.
 2787. Then there was no brattice before the strike? No.
 2788. Had brattice been put up to the face after the strike, would the ventilating current have been much stronger? Yes; certainly.
 2789. Would that be on account of the greater force and power that the new furnace exercised for ventilation? Yes, but the furnace would not do it unless the air was carried to the face.
 2790. Well, would that have been due to the greater power exercised by the furnace? I do not understand you.
 2791. I am endeavouring to put it clearly to you—would the ventilating current have been stronger than before the strike if the brattice had been carried up to the face? Yes.
 2792. Then I ask, would that greater current be due to the new furnace? Yes.
 2793. Have you ever worked in any other mines than Bulli and Mount Pleasant? No.
 2794. Then your experience is entirely limited to Mount Pleasant and Bulli? Yes.
 2795. Did you ever fire any shots before the strike? Yes.
 2796. In Nos. 1 and 2 headings? Yes.
 2797. What method did you adopt? We fired the shots with touch-paper.
 2798. And how did you light the touch-paper? Through the gauze of the lamp.
 2799. Having no previous experience did it ever occur to you whether that was a safe practice or not? Well, I saw practical men do it, and I reckoned therefore it was quite safe.
 2800. That is, I suppose you knew nothing to the contrary? No.
 2801. How did you stam the shots as a rule? With clay.
 2802. Did you never stam with small coal? No.
 2803. Before firing the shots did you make any attempt to drive out the gas? Yes.
 2804. Did you always take that precaution? Yes.

2805. And if gas still existed, did you fire the shots? No; we brushed it out clean before we fired them.
2806. Did you use fuse? Yes, when we were working on our own account. We used the squib in the Company's employ.
2807. Do you know whether it was safe in the presence of gas to use fuse? I do not think there could be anything safer.
2808. That is to say you know nothing to the contrary? No.
2809. You have had no experience of any other mode of firing shots? No.
2810. *Mr. Neilson.*] In reporting this matter about the gas the night before the strike, did you think you were doing anything more than your duty;—do you know that when you find gas in the mine, or discover danger, it is your duty to report to the officials at once? Yes, if I considered it was not safe to work.
2811. In this case you did not consider it safe to work, and you reported it accordingly? Yes.
2812. That is, you did your duty—and what did they do? They brought us out.
2813. You say you swept out the gas? Not that night.
2814. In what heading was it? No. 1 and No. 2.
2815. In firing the shots, what length of fuse did you use as a rule? It would be according to the depth of the shot—about 3 feet.
2816. That would take about two and a half minutes to run before the shot went off? Yes.
2817. Was there any danger of the gas being swept back to the face before the shot went off? It might be so; but I was justified in firing a shot when I was given a piece of canvas for the purpose.
2818. Who gave you the canvas? Crawford, the deputy.
2819. *Mr. Hilton.*] You say you always drove out the gas in No. 1 and No. 2 heading? Yes.
2820. How long did it take for the gas to get back after you had driven it away? I cannot say.
2821. Did it ever return again after you had driven it away—I mean within a short time? Yes; it took fire on one occasion.
2822. Can you not give us some notion as to how long it would be after firing a shot when the gas would accumulate again? Well, after brushing the gas back I would light the shot, and I would not go in again directly the shot was fired.
2823. How long would you wait? Well, it might be 10 minutes.
2824. Would there be any gas in the place on your return? I cannot say.
2825. You never took any notice? No.
2826. *Mr. Owens.*] Did you work in any other part of the mine than the Hill End district? Yes; I worked in the grip, and a part they call Darlington.
2827. Did you work in the western district? No.
2828. Did you hear of any one finding gas there? No.
2829. You say that the deputy told you to fire the shots in this manner, that is, with touch-paper? Yes.
2830. And you considered that whatever the deputy told you to do was right? Certainly.
2831. Did you find gas in other parts than Nos. 1 and 2 headings—did you find any in No. 3, for example? No.
2832. Did you find any in Nos. 5 or 6? In No. 5 there was on the Tuesday before the explosion.
2833. How much gas was there? It extended about 2 yards from the face.
2834. Did you report that to the deputy? No; I was on the night-shift at the time.
2835. Did not your mates report it? No; because it was about 12 o'clock when we left that night, and we had not the chance.
2836. Is there any rule that would prevent you from doing it—you know No. 6 rule? Yes; that rule says I shall not interfere with the management in any way.
2837. Do you consider the correct interpretation of this rule prevents you from reporting any danger in the mine? Yes, I do.
2838. And therefore you did not report it? Yes; I had not a chance, any way.
2839. Supposing you had had a chance? I should not have reported it.
2840. Would that be on account of this rule? Yes, and another thing, I had no business to go in there.
2841. Were you not working there? No; I was working in No. 3 at the time; I went there for a dirt skip.
2842. And you found gas there? Yes.
2843. Do you know whether the deputy was aware of the existence of this gas? I think he was.
2844. During the time you were working in that place, did you see the Government Inspector in there? Not since the strike.
2845. Did you ever report the presence of gas to the inspector? No.
2846. Why did you not? I do not know.
2847. Was your lamp locked while you were working amongst this gas? Sometimes it was, and sometimes it was not.
2848. Who would lock them? Crawford, the deputy.
2849. That was before the strike? Yes.
2850. Crawford was not there after the strike? No.
2851. *Mr. Jones.*] Who was the deputy after the strike? Millwood.
2852. Did he lock the lamps? No.
2853. You are quite sure of that? Yes, quite sure.
2854. Did you ever receive a copy of these rules (referring to "General and Special Rules of the Colliery")? I do not recollect having received a copy.
2855. Would you try and recall to your mind whether you did at any time? No, I could not; it is over ten years since I first started in the mine, and I do not recollect ever having received a copy.
2856. Did you work with naked lights after the strike? Yes.
2857. Do you think that a wise proceeding—to allow naked lights in proximity to a large quantity of explosive gas? No.
2858. You say you have seen and heard of blowers in Nos. 1 and 2 headings? Yes.
2859. Did you report that? Yes.
2860. To whom did you report it? To Millwood and Crawford.
2861. What steps did they take to remedy it? None.
2862. Did you suggest the propriety of bratticing this place? No.
2863. Do you think it would have been wise to brattice this place? I do.

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2864. You say that on one occasion you were some few yards before the air? Yes; that was since the strike.
2865. Was that in a bord or in a heading? It was in No. 3 heading.
2866. Did you complain? I spoke to Millwood about it.
2867. What did he say? Well, we were on a fault at the time, and he said that we would have to get over the fault first.
2868. Do you remember the particular day you spoke to White about this blower you have spoken of? One was at the very commencement of the gassy section; it was left standing there for a week blowing.
2869. *President.*] Have you complained since? No; there was no need to; he could see them as well as I could.
2870. *Mr. Jones.*] Was there any one in charge of the mine during the night-shift? No.
2871. Consequently you had no one to complain to without going out of your course? No.
2872. *Mr. Clarke.*] How many reports did you make to the overman or deputy that were not attended to during the time you worked in Nos. 1 and 2 headings? I cannot tell.
2873. You have said that you made general reports, and that no action was taken;—do you not know how many reports you made? Well, when the overman would come in we would show him the gas, and complain about it; it might be once a week. I would not swear how many times.
2874. Did he make any remark on these occasions? He told us to be careful. He told us on one occasion to work with our shirts on, to prevent getting hurt if anything happened.
2875. How long was this before the strike? A good while.
2876. Did you ever hear of a pipe being fixed to a blower? Yes, in No. 2 heading.
2877. Who put it there? Crawford, I believe.
2878. For what purpose? I do not know of any purpose. He put it there to show the manager, I thought.
2879. Did he say why he put it there? He never said so to me. I heard that he put it there to show the manager that there was gas there.
2880. Did the manager see it? Yes, I believe so, both the manager and the overman.
2881. How long was the pipe fixed to this blower? I think it was there till the commencement of the strike.
2882. It was there when you left the mine? Yes.
2883. Now, with reference to this No. 6 rule you take exception to—you say it debars you from making a report to the management. How do you make out it would be an interference by workmen to report the presence of gas? I will read the rule to you; it says:—
“Interference by employees.—Any employee interfering in any way with the orders issued by the colliery manager or his overman, for regulating the work of the mine, shall be liable to dismissal without notice.”
- That is plain enough—“interfering in any way with the orders issued by the manager.” How would you interfere with the orders issued if you were to report any existing evil or danger? Well, that is what the deputy is for.
2884. Oh, yes; but you said just now that you would not have reported any danger, because this rule prohibited you from doing so. How do you make that out? Because it says we are not to interfere with the orders of the management.
2885. Would the orders of the manager be to blow the mine up? No.
2886. Or to have gas in dangerous quantities—that would not be the order of the management? No; but there was a manager there to look after it.
2887. That is another thing altogether. You say you were prohibited from reporting danger because of the existence of this rule;—can you explain that in any way? Well, I considered that when I signed those rules I signed all my “say” away.
2888. Can you say you would be interfering with the orders of the management by reporting the existence of great danger to yourself and brother workmen, and the mine generally? I do not know that I would.
2889. Then why did not you say so before—why mislead people in any way? I did not intend to.
2890. *Mr. Croudace.*] In answer to a question by Mr. Jones, you said that Millwood never locked your lamps? Yes.
2891. Was that on the night or the day shift? The night-shift.
2892. Are you quite sure that is the case? Yes.
2893. Your name is Albert Smithers, and you gave sworn testimony at the inquest. Did you not swear this: “On Monday night, when we first started after the strike, we went to the cabin for our lamps, and Millwood handed us our lamps locked. Richards said to him, ‘What are we to do if we get in the dark,’ and Millwood said, ‘I will leave the key’; afterwards he said, ‘It is no use locking the lamps and leaving the key,’ so he unlocked the lamps, and never locked the lamps afterwards.” Is that practically your sworn evidence at the inquest? I believe it is.
2894. What are we to understand from this. In answer to one of the Commissioners you said Millwood never locked your lamps; and yet you have sworn that he did, and that at your request he unlocked them? Not at my request.
2895. Did he at the request of others? Yes; Richards. We never went to work with locked lamps.
2896. You have stated that you have no knowledge of gas? Yes.
2897. Have you any knowledge of the ventilation of a mine in any shape or form? Only from what I have heard them say.
2898. Then, of your own knowledge of gas, or the laws that regulate gassy mines, and the ventilation thereof? No.
2899. *President.*] You have said you thought you were signing away your liberty, and you would not report the presence of gas on account of a rule which you have since explained away. On that point I wish to put one question to you. Did you ever ask the management if it would be a breach of this rule if you were to report, in order to get a proper interpretation of this rule and its import? No.
2900. Did it never enter your head to put a question to Mr. Ross whether in the event of your reporting danger it would be considered a breach of the rules? No.

2901. *Mr. Jones.*] I understand that at the time of your resuming work the lamps were locked, but that deputy Millwood was quite willing to leave the key? Yes.
2902. Now, what was the difference between leaving an open lamp and a locked lamp with the key—were they not virtually the same? Yes.
2903. *Mr. Owens.*] Assuming you are working in a place with safety-lamps, do you think a prudent overman would allow you to go in with unlocked lamps, even at your own request? No; it was a breach of the rule.
2904. *Mr. Hilton.*] Did Millwood make the proposition to go in with the lamps unlocked? Well, he said it was no use locking the lamps and leaving the key.
2905. *Mr. Croudace.*] In the first part of your examination you said that a lamp was brought in to you with a hole in the top? Yes.
2906. Who brought that lamp in? I suppose it would be Mr. White.
2907. Did Mr. White himself fetch it in? I will not swear that.
2908. What part of the top was broken? The gauze.
2909. Did you see it when it was brought in? No.
2910. You did not notice it till some time afterwards? Not till he went away.
2911. Did you put it out of work? Yes; I gave it to the deputy next day.
2912. Can you tell me who was the lampman? Crawford.
2913. Did you consider it was a prudent act, Crawford giving you such a lamp? No, certainly, if he knew about it.
2914. Should he have known about it? Yes; I should think so.
2915. Should he have ascertained, as deputy of the mine, that the lamps were perfect in all respects? Yes.
2916. And knowing that, was he not, in your opinion, an imprudent man to give you a broken lamp? Certainly. [*The witness withdrew.*]

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Thomas Morgan sworn and examined:—

2917. *President.*] What is your occupation? I am a wheeler, working at Bulli.
2918. Were you a wheeler prior to the date of the accident in the mine? Yes.
2919. In what district? The Hill End district.
2920. What roads did you attend? Nos. 1 and 2 headings.
2921. Were you engaged during the night or the day? During the night.
2922. Did you know that gas was given off in these headings—fire-damp? Yes; I have heard of it.
2923. You know what gas is? I have seen it in Bulli.
2924. Did you work with a safety-lamp? No.
2925. How long have you been aware that gas was given off in these headings? I knew it before the strike took place.
2926. How far did you go with the skips beyond the danger-board? I went in to fetch the full skip out from the face.
2927. You know the object of the danger-board? Yes, for stopping the people from passing with a naked light.
2928. Did you ever pass with a naked light? No.
2929. Where did you hang your lamp? Outside on the prop, sometimes I put it on the ground.
2930. Did you ever see the gas ignited in any of these headings? Yes; I saw it ignited off a shot there one night.
2931. Where were you when the shot went off? I was going into No. 1 heading, and it ignited in No. 2 heading.
2932. When was that? A week before the explosion.
2933. That is since the strike? Yes.
2934. Had they got the roll in the heading at that time? No; I do not think they had.
2935. Where did the flame extend to? It just blazed up the side.
2936. How did you happen to see that? I went in with an empty skip.
2937. What size was the flame? About 6 inches high, at the side of the face near the shot.
2938. Did the men assign any reason for the gas taking fire there? No.
2939. Did they say they had struck a blower? Yes; Westwood did.
2940. Did you ever see the gas fire in No. 1 heading? Yes.
2941. How did it occur? It took fire off a naked light.
2942. When was that? The night before the explosion took place.
2943. Was Hope in the heading that night? Yes. Hope was filling a skip of slack about half-way between the face and the heading. He told me to hang the lamp on a prop at the danger-board, so that he could see better, and it ignited off my lamp.
2944. Where did it go? Into the face of the heading, 4 or 5 yards.
2945. What did you do? I took my lamp off the prop, blew it out, and ran into the next heading and told them the gas had fired.
2946. Did you report that afterwards? Not that night; I never saw anyone to report it to.
2947. Was it not of sufficient importance to mention—did you converse about it with anyone? Not that night.
2948. Did you consider it dangerous? Yes, I did, and if I had seen anybody connected with the mine I would have told him.
2949. Then you did not consider it sufficiently important to seek the overman and report to him—where were you next day? I was down on the beach.
2950. Was it not more important to see the overman than to go on your own pleasure? I would have told him next evening.
2951. That was your intention, was it? Yes.
2952. Have you seen frequent blowers in this heading? Before the strike I did.
2953. They were not as frequent since the strike? No.

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- Mr. T. Morgan.
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2954. Going along the roads, as you were in the habit of doing, did you notice any marked difference in the ventilation since the strike, comparing it with the ventilation before the strike? It was stronger after the strike.
2955. Was the quantity of air going through the last cut-through much stronger? Yes.
2956. That current of air would sweep past the danger-board? Yes, close past—outside the prop.
2957. *Mr. Neilson.*] When you saw the gas fire that night, were you frightened? Well, yes; I was frightened at the time.
2958. How far did you live from the mine? About $1\frac{1}{4}$ mile.
2959. Did you pass by Mr. White's house? No.
2960. How far is Mr. White's house from the tunnel mouth? About 200 yards.
2961. It would not have taken you long to go that far? Well, it was pretty late in the night, and I expect he would have gone to bed.
2962. Supposing this explosion had not occurred, would you have reported what you saw? Yes, I would.
2963. Did you tell your father? After the explosion I did.
2964. You saw your father, I suppose, and you did not even report it to him? No.
2965. Yet you say you had intended to report to Mr. White? Yes.
2966. How did the men fire their shots? In No. 1 heading they fired with touch-paper.
2967. And in No. 2 heading? Sometimes with touch-paper, and once or twice I saw them use a match; that is when there was no gas present.
2968. How many times did you see them fire shots with a match? Once or twice.
2969. Did you not think that strange? No; I supposed they fired with a match if there was no gas present.
2970. Were they working with safety-lamps when they fired with a match? Yes.
2971. *Mr. Hilton.*] Was there anyone in charge of the mine during the night-shift? No.
2972. If there had been anyone in charge of the mine when the gas went off, would you have reported it? Yes.
2973. You have no doubt about that? No.
2974. *Mr. Owens.*] You say you hung your lamp outside the post where the danger-board was? Yes; on the right side.
2975. And the gas caught fire from there? Yes.
2976. Then the gas must have been up to the danger-board? Yes.
2977. Did your work take you to all the bords in No. 1 heading? I was in the headings.
2978. Not in the bords as well? One bord.
2979. Did you ever detect gas there? I never went into the face to see.
2980. *Mr. Jones.*] I suppose you have no practical knowledge of shot-firing? No.
2981. Did you ever hear the men in the headings complain of a deficiency of air at night? No.
2982. Did you not hear them complain on the last night you worked? No.
2983. *Mr. Croudace.*] You know the door between the headings No. 1 and No. 2 on the main road? Yes.
2984. And do you know the door on the diagonal cut-through? Yes.
2985. Did you ever see that door propped open? One night when I went in there I found that door propped open.
2986. Have you any idea who propped it open? No.
2987. Did you ever prop it open? No; only to let the skips pass through.
2988. Did you prop it open regularly in allowing the horses and tubs to pass through? Yes, and I would shut it afterwards.
2989. Did you ever leave it open, or forget to close it? No.
2990. Did you ever hear of it being kept open at any other time than you have mentioned? No, not that one.
2991. Have you ever worked in the daytime as a driver? Yes, but not in the headings.
2992. Did you ever know of that door being left open during the daytime? I do not know that that door was there before the strike.
2993. But since the strike? I have never worked during the daytime since the strike.
2994. Have you heard amongst the lads of that door being left open during the daytime? No.
2995. *Mr. Jones.*] Was it when you first went into your work that you found the door propped open? Yes.
2996. Was there a boy employed as trapper at that door? Not in the daytime.
2997. But at night? No.
2998. About what time would you have to prop it open to take your skips through? I cannot say; it would be taken there at all times.
2999. Then it was frequently open. How long would it take for your skips to pass through a door? Well, we would go straight through. [*The witness withdrew.*]

Thos. Woods sworn and examined:—

- Mr. T. Woods.
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3000. *President.*] You are a miner, and had been working in the mine since the strike, at the time of the accident? Yes; I worked in No. 2 heading.
3001. When were you first in the mine after the accident? About 10 o'clock of the evening it happened.
3002. With what object did you go in? To try and get the bodies out.
3003. How long after the accident was it that you examined No. 1 and No. 2 headings and the bords off them? Well, I never was in them—not to the face.
3004. Have you been in the bords since? I was only in one bord, the sixth, off No. 1 heading.
3005. Was that to recover a body? Yes; it had been reported to me that there was a body there.
3006. Were you in No. 1 and No. 2 headings when the bodies were discovered on the Thursday or the Friday after the accident—did you see the bodies lying on the road? No.
3007. Did you work in No. 2 heading? Yes, on the night-shift.
3008. Where did you work before the strike? Principally down in the Hill End section.
3009. Did you work in No. 1 and No. 2 districts? I worked in both; I worked in the first bord off No. 2 before the strike, and I worked in No. 3 heading when it was turned away, and I also worked in No. 6 heading.
3010. Did you observe gas in any or all of these before the strike? In the bords, no; in the headings, yes.
3011. Did it exist in large quantities? No, not very large. 3012.

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3012. In No. 3, was there a large quantity? No; there was only a little on the main road when I worked in there.
3013. Did you take any notice of the places where the gas showed with the greatest freedom? It was on the top, lying pretty close to the roof.
3014. Was it between or near the faults? We would generally get most of it on the faults or rolls.
3015. Did you ever strike any blowers? Yes, many a one.
3016. In what heading? In No. 2.
3017. Were they more common in No. 2 than in No. 1? I cannot say—I never worked in No. 1 heading.
3018. Did you ever know of those blowers being fired from a shot? No.
3019. Did you ever hear of any—we have been informed that a blower was fired from a shot in No. 2 heading? No.
3020. Did you ever see gas fired in No. 2 heading? No, I did not.
3021. Did you ever hear of gas being fired in any heading? Yes, in No. 1.
3022. When was that? On the night before the explosion—on Tuesday night.
3023. It fired on the Tuesday night? Yes; I heard the young wheeler singing out that she had fired.
3024. Then you were working on the night-shift on Tuesday night? Yes.
3025. And the wheeler informed you? Yes; I was about to go in, but they sung out that the gas was out, and I turned back again.
3026. Since the new furnace was started, was there a larger quantity of air passing through the last stenton than before? Yes.
3027. Did you work with your lamps unlocked since the strike? Yes.
3028. And before the strike? Well, they were both locked and unlocked; for the last fortnight or three weeks they were locked.
3029. Were they locked on the night-shift? No; mine was never locked on the night-shift. Of course I cannot speak for everybody.
3030. Did you complain to the management of the state of the workings since the strike? No.
3031. You had never cause to complain? No.
3032. Were you satisfied with the amount of ventilation in these headings? Yes.
3033. Where was the danger-board erected? Beside the last stenton.
3034. The danger-board thus erected was level with the sweep of the ventilating current as it passed through the stenton? Yes, inside if anything.
3035. Beyond the danger-board no naked lights were supposed to be taken? No.
3036. Did you ever see naked lights taken beyond that danger-board? I have seen them beyond it, but not very far—about a yard perhaps.
3037. Whose were the lights you saw? I have seen the wheeler, but I have seen different men; they were not particular whether they were outside the danger-board or inside.
3038. In the event of the men desiring to smoke, where did you smoke? At the danger-board, outside.
3039. We have been informed that a naked light has been found in the heading near the face where you were employed;—can you account for that? No; I have not heard anything about it.
3040. Your mates, I presume, were lost? Yes.
3041. Were your mates, in your opinion, careful men? Yes; I think they were.
3042. So far as you can judge, do you think they would be likely to take an open lamp into No. 2 heading? I would not think so.
3043. You would give them credit for more caution? Yes.
3044. Did any force of gas exist in No. 2 heading during the last shift you worked? No.
3045. Was the gas greater in quantity during the last shift or less than on any previous occasion? It was greater.
3046. Where did it issue from? Out of the coal, I expect.
3047. What thickness of coal was there in the face on the top of the roll? About 4 feet of coal.
3048. Then in crossing this roll, when it was beginning to descend, going across the top, did you hole the coal? Yes, and afterwards nicked it.
3049. You did not go into the face? No.
3050. Do you consider that the gas, when you were working in No. 2 heading, existed in such quantities as to deter you from shooting? Yes, with the same amount of gas as was present on Tuesday night.
3051. Would there be, in your opinion, any danger in drilling a hole on cutting a joint or blower? There might be.
3052. Have you ever seen a blower struck in a drill-hole? Yes.
3053. In the last shift, did you take off the coal with a pick only? I was only fetching the stone up last shift.
3054. In which case you would use powder? Yes.
3055. In blasting the coal in No. 2 heading, how did you tamp your shots? With wet tamping.
3056. Would you consider wet or dry tamping the safer? Wet tamping I should say.
3057. Did you ever use shale or stone for tamping? No; always coal.
3058. Where did you get your water to damp it? From a billycan.
3059. Did you use fuse? Yes.
3060. How far would the fuse project beyond the hole? It would depend upon the man who has the shot.
3061. Do you consider it dangerous to use fuse in the presence of gas—that is, do you think the gas might be ignited from the fuse? I should not think so.
3062. If you were informed that gas has been lit from fuse, would you be surprised? I should; I do not think it would light from fuse itself.
3063. How did you light the fuse? With touch-paper.
3064. And how did you light the touch-paper? On the lamp.
3065. Did you retire beyond the danger-board? No; I lit it with the safety-lamp by tilting it.
3066. That is, you tilted the lamp so that the flame would beat upon the gauze, and you would put the touch-paper to the flame? Yes.
3067. And you retired no distance towards the danger-board when you lit the touch-paper? No; I lit it opposite the hole.
3068. Did you take any steps to remove the gas from the place? Yes; if gas was there I would brush it.
- 3068½. Did you make it a practice to test for gas? Yes, if it was in the coal; if it was in the stone I would not bother, because the shot would be away from the roof.

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3069. Supposing the stone came within 3 feet of the roof, would you test for gas? It all depends; I should know if there was a great quantity; I could smell and taste it.
3070. Had you much experience in coal-mining before working at Bulli? None in gassy sections.
3071. Then your whole experience of gas has been gained at Bulli? Yes.
3072. You state there was about 4 feet of coal in the face of No. 2 heading—that is on top of the roll. You also say that if you had a shot in the coal you would consider it your duty to test for gas before firing the shot; but that if it was in the stone you would not bother. Now, there was 4 feet of coal on top of this roll;—in blasting off the roll, would you consider it an expedient and a precautionary measure to test for gas? Yes.
3073. Then you want to amend your former answer to that question—that in the case of a roll, such as at present exists in No. 2 heading, you would consider it a precautionary and safe measure to test for gas before firing the shot? Yes, if the shot was up where you say.
3074. Did you notice whether the gas that issued from No. 2 readily took fire—was it a “quick” gas? Yes.
3075. This is probably not a right question to put to you, because you have had no experience in gassy mines other than Bulli. You have seen the gas firing in the lamp? Yes.
3076. In which case what did you do? I have drawn the lamp away.
3077. Did you reduce the length of the flame? I generally pulled down the blaze.
3078. With the lamp full, what would you do? Draw the lamp away.
3079. *Mr. Neilson.*] Did you report the extra quantity of gas that night? No.
3080. What quantity of gas was there in that shift? It was back from the face about 20 yards.
3081. What thickness would it be in the face? About 3 feet from the roof. It would take the lamp 3 feet from the roof in the face.
3082. Did you fire any shot that night? Yes.
3083. What, with that quantity of gas in the face? There was not the same quantity when I fired the shot.
3084. What time was it when you fired the shot? I suppose it would be getting on for 8 o'clock.
3085. And at what time did you find this large quantity of gas? When I went in, about half-past 4 o'clock.
3086. Did you attempt to brush the gas out before firing the shot? No.
3087. Yet you knew the gas was there? There was not much gas there.
3088. Where was your hole? Right on the bottom—straight in.
3089. Were your lamps ever oiled? Yes, at times; if the lamp happened to fall it would get oil on the gauze.
3090. Do you consider there would be danger in the flame of the lamp communicating with the oil on the gauze? There would not be that much of it to take fire.
3091. Have you not seen oil above the flame on the top of the gauze? No.
3092. Did you ever fire a shot with anything else but touch-paper in No. 2 heading? Yes; I have lit a match to fire it twice.
3093. How long ago was that? The first week I started; but she was back against the stenton then.
3094. Did you ever unscrew your lamps to clean them without going behind the danger-board? Yes, I have done that.
3095. Did you ever smoke inside the danger-board? Yes.
3096. How long ago is that? The last time we started.
3097. Were you ever cautioned, just before the explosion, not to take pipes and matches into the face? Yes; that was on Monday night.
3098. What inference did you draw from that? I thought she was beginning to make gas.
3099. You knew Millwood? Yes.
3100. What sort of feeling existed between the men in this heading and Millwood—was it a good feeling, and were you on friendly speaking terms? Yes.
3101. Did Millwood ever tell you to be cautious? No.
3102. Did no one ever tell you to be cautious? No, only Mr. White.
3103. *Mr. Hilton.*] Did you ever see Mr. Millwood take a naked light inside the danger-board? No; I cannot say I did.
3104. You say you sometimes brushed the gas out? Yes.
3105. Did you ever take notice how long it would be after brushing the gas away before more gas accumulated? Not a great while would elapse; but it would give you time enough to fire a shot before coming back.
3106. Would it come back in any quantity half-an-hour afterwards do you think? Well, not in the same quantity.
3107. *Mr. Owens.*] When you brushed the gas out, did you brush it beyond the stenton? No; we just brushed it away from the face.
3108. And was the overman aware of this practice? The deputy would know.
3109. When you were putting horizontal shots in, the flame would naturally fly to the roof? Yes.
3110. Did you ever notice gas fire from the shots? Yes.
3111. Was the deputy aware of it? No.
3112. Did you report it? No.
3113. What was the reason you did not report it? I did not know that there was any reason to do so.
3114. You did not consider it of sufficient importance? No.
3115. Did you find gas in any other part of the pit save in No. 1 and No. 2 headings? Yes; I have seen gas in No. 6, and I have seen gas in the straight, and in No. 3, though I never worked in it. That was before the strike.
3116. Did you see any in the western district? No.
3117. Did you notice whether the bodies you saw were burned? Yes, and some of them were burnt pretty severely too.
3118. Did you notice those you found on the straight tunnel—the incline? Yes; they were burnt.
3119. *Mr. Jones.*] Did you ever receive a copy of these special and general rules for the guidance of the men and boys employed in the Bulli Colliery? Yes.

3120. I understood you to say that previous to the strike safety-lamps were used in the bords in Nos. 1 and 2 headings? Yes.
3121. Do you think the ventilation afterwards had so far improved as to justify the abandonment of safety-lamps in these places? It would be very hard for me to answer that.
3122. I understood you to say you were quite satisfied with the mode of the ventilation up to the time of the explosion. Would bratticing in Nos. 1 and 2 headings have afforded a larger measure of safety in conducting into the waste the gas thrown off? Yes; the gas would not have remained there.
3123. Did you ever receive any instructions as to the method of firing shots? No.
3124. Never from the deputy? No.
3125. You stated that you had seen blowers in No. 2 heading? Yes.
3126. Roughly speaking, in your opinion, did they give off a large quantity of gas? Well, a good deal.
3127. Did you report to any one? No.
3128. Why did you not? I did not think it was worth while making any bother over. I did not think there was any danger in it.
3129. That might arise from your imperfect acquaintance with gas. Supposing you had had an extended knowledge of the subject? That might have made a difference.
3130. *Mr. Croudace.*] In these bords in No. 1 heading, where you say they worked with safety-lamps previous to the strike, were they giving off gas since the strike? No.
3131. Have you looked for any? No.
3132. Do you know, as a fact, that there is none? No; I never saw any.
3133. If there is none, would not that justify them in using naked lamps where they previously used safety-lamps? Yes; I suppose that was the reason.
3134. As to these blowers, did they not exhaust themselves in time? Yes; I have seen them blow for three days and then go off.
3135. Did you ever see the door between Nos. 1 and 2 propped open? No.
3136. Could you give us any opinion of your own as to how this explosion arose? No; I think not.
3137. Have you never talked it over with your fellow-workmen? You have given such straightforward evidence, honestly telling us you have done what is clearly wrong—going inside the danger-board with naked lights, and firing shots in the presence of gas—that it leads me to have confidence in you, and induces me to ask you if you have ever talked over the matter with your fellow-men in any way? No; I have not.
3138. On the night before the explosion, who were your mates? On the day-shift, Joe. Crofton and Jerry Westwood; and on the night-shift, Jim Salisbury. [*The witness withdrew.*]

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Frederick Robbins sworn and examined:—

3139. *President.*] You are a miner, residing at Bulli? Yes?
3140. How long have you worked in Bulli? Twenty-one years—ever since it commenced, until recently.
3141. In what capacity have you been employed? Ten years as a deputy.
3142. In what districts have you worked at Bulli? In No. 1 and the grip.
3143. Do I understand by No. 1 the Hill End section? No; further down in the old workings on the south-western side.
3144. Have you ever worked in other mines than Bulli? Yes; in England and Wales for many years.
3145. In districts where a considerable amount of fire-damp exists? Yes.
3146. And you know the composition and the danger of fire-damp? Yes.
3147. And the principle of the safety-lamp? I do.
3148. Where were you, Mr. Robbins, at the time of the accident? I was at Robbinsville, working at my own place.
3149. And being apprised of the accident, you proceeded to the mine? I did, and arrived at Bulli about half-past 4 o'clock in the afternoon.
3150. Did you proceed into the mine? I did.
3151. As you are conversant with the mine, would you give us your own story, as shortly as possible, as to what you did and where you went? On reporting myself to Mr. White, he asked me to take charge of a gang of men, which I did, and entered the mine. The first thing I noticed was the overcast forced up. We passed on, making everything right as we went, the carpenter, Jones, with others, repairing the overcast. We then proceeded up to the top of the Hill End bank, known as the western junction, and finding a door blown down, put up canvas. Before arriving at this point I found some stoppings had been temporarily repaired.
3152. What was the state of the atmosphere? It was considerably deranged.
3153. Was it hot? Yes.
3154. Did you see men lying on the bank-head? I did.
3155. Did you closely examine them? I did, and ordered them to be wrapped in canvas.
3156. Did you notice their appearance? I did.
3157. Have you had previous experience of explosions? Not as bad as this, but have been in light explosions.
3158. Did you believe these men's bodies were burnt? I did.
3159. Did you actually notice that they were scorched? Yes; Jackson and another. I considered them worse mangled than some of the others on the immediate scene of the action.
3160. Did you consider their appearance denoted actual contact with flame, or that it was due to heated dust? From an actual explosion, I should say.
3161. Why? Owing to the appearance of the hair, which was entirely singed.
3162. Were you of those who first went up No. 1 and No. 2 headings? I proceeded as far as the inner flat that evening. Ross overtook me at that spot. I had to be assisted out that night, as I was overcome by the after-damp. I returned about 10 o'clock next morning.
3163. The doors on the main tunnel between No. 1 and No. 2 headings and also that on the diagonal road were destroyed? Yes; both of them were blown out.

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3164. You proceeded up No. 1 heading? Yes.
3165. And saw the different bodies lying there? Yes.
3166. Did you closely examine them? Yes.
3167. Did you identify the bodies? I identified two of them as being the Brodies—having worked in one bord together. They worked in the right-hand bord in No. 1 heading.
3168. Had they, in your opinion, been overtaken by the after-damp, or were they burnt? My opinion is that they were instantly killed by the explosion, and that they fell in the act of running.
3169. How could they have had any time to run from the face if they fell at the instant of the explosion? A sensation is felt on the drum of the ear in an explosion owing to the stagnation of the air, and a man who is in any way accustomed to such occurrences would immediately run.
3170. But you are quite aware, surely, that an explosion is as sudden as a flash of lightning, and a man would therefore not have time to run a step? I think a man could run a short distance, but of course at the immediate scene of the explosion he might not have time to move a step.
3171. Were these men burnt? Yes.
3172. Did you observe among these men one sitting on a piece of coal? Yes; that was the deputy Millwood; I think he was near the inside cut-through, sitting with his head leaning on his left arm.
3173. You knew him? Yes, well.
3174. Who was present with you at the time? Crawford, and some miners who recognized the bodies better than I did.
3175. So far as the evidence has gone up to the present, the majority of witnesses agree that Mr. Millwood was found amongst the first group above the tunnel? My opinion is that he was found below the inmost stenton, between the two last stentons; and the body of a man who was working in the face of No. 2 heading was found about 6 ft. outside of him on a heap of slack.
3176. Did Millwood bear traces of burning? No; I do not think he did; his body was less affected than any other in the mine that I saw.
3177. Did you afterwards examine that district of the mine for the purpose of arriving at some conclusion as to the cause of the accident? I did not examine the district with a view to giving evidence in any way whatever.
3178. It was simply with a humane object that you entered the mine? Yes, but I could see what was the matter.
3179. Did you examine the headings? Yes.
3180. Did you discover gas in any of the bords or headings? I did not discover gas to the extent that would fire in any lamp, but it might be present.
3181. You mean to say that the quantity, if any were present, would be too small to be indicated by a lamp? Yes.
3182. In what condition did you find No. 2 heading? In No. 2 heading the gas would explode in the lamp—it was as quick as ever I saw it.
3183. In No. 1 heading what was the condition? Much the same as in No. 2—it would show in the lamp.
3184. Did you form any opinion as to the cause of the accident? Yes. Even before I went into No. 2 I cautioned Crawford that we must be careful in going into No. 2, as having seen Westwood's body, I expected to find gas in there if anywhere, as I thought there might be a shot in there.
3185. Was Westwood's body burnt? Yes, it was burnt, but not so much as the other bodies further down.
3186. Did you observe the props charred in No. 1? Yes.
3187. Did you go down and examine the bords off No. 2? Yes, every bord and facing.
3188. Did you observe evidences of burning and flames? Yes.
3189. Then what opinion did you form as to the cause of the explosion? I thought that a shot had been fired in the face of No. 2 heading, and that perhaps there had been an overcharge of powder; and I thought to myself that the shot had done its work, and well.
3190. Had you ever been in that district before? Yes, on two occasions.
3191. Did you observe gas on those occasions? Yes.
3192. From your experience of Bulli, would you expect to find more gas in approaching those rolls so frequent in that colliery? I should.
3193. As a matter of fact, did you know where the gas did issue in greatest abundance from those rolls? Yes; but it does not follow that it all issues from the rolls, because I know to the contrary, from the fact that Bulli gave off carburetted hydrogen since passing the dyke, and it was giving off choke-damp before that.
3194. Did Crawford talk to you about the blowers at Bulli during your examination? Yes. When we were walking along where the air was passing the main tunnel we put a naked light to the side of the rib and it freely exploded.
3195. What was the length? Not a great length.
3196. It would be quite possible to tap one of those blowers in the act of drilling a hole? Yes.
3197. Would a freshly blown-out shot have a tendency to light the gas if it existed near the face? It might if there was an accumulation of gas previous to the drilling of the hole. An overcharge of powder, in my opinion, of course would explode gas—one part of the explosion does its work, and the other expends itself in space.
3198. Supposing a blower to be intersected by the hole, would a shot have any tendency to ignite the gas in the hole? I do not think it would be possible for much gas to exist in a hole that was well rammed up.
3199. Doubtless, it would be stemming up the gas as well? I do not think so much gas would exist as would escape while it was being tamped.
3200. Do you think there was a large accumulation of gas in this colliery? I do.
3201. Where would it be necessarily confined to? That I would not like to say without working there.
3202. You know that it is carried on the air, being the lighter substance. Supposing there was 12,000 ft. of air travelling through the last stenton, would you be likely to detect gas on the outside of the stenton? It might be.
3203. Would that quantity of air be sufficient to dilute it and render it harmless? It would if there was not too much gas.

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3204. We have only the evidence of the men as to the amount. So far as we know blowers had been struck in two places in the mine only? Well, I should think you would not discover gas outside the stenton in that case.

3205. Do you consider Bulli a naturally dry and dusty mine? Yes.

3206. Do you know anything of the action of dust in the presence of an explosion through gas? Well, I know there is a theory on the subject, but I am not prepared to fall in with science as to that.

3207. Do you think coal-dust would intensify the action of gas? I do.

3208. And that it would probably prolong the effects of an explosion? Yes.

3209. In the case of No. 1 and No. 2 headings giving off gas, would you consider it a wise precautionary measure to carry bratticing within a reasonable distance of the face? Certainly; that is the known and best method.

3210. You have no doubt about that? No.

3211. You would have adopted that method in this case? If I found gas being given off, yes, I should adopt that method.

3212. Now, would you look at this plan for a minute. This is the main tunnel and the intake. A door is placed between Nos. 1 and 2, and also in the diagonal road between No. 1 and No. 2 for the purpose of taking the intake air up to No. 1, which is therefore the intake. Would you consider under the existing conditions here, of gas being given off at the face of Nos. 1 and 2 headings, that it would be safe to permit open lights to be used in these bords off No. 1? I should not.

3213. These bords were worked with open lights, the headings were worked with safety-lamps. Suppose these bords gave off no gas, and the heading was the intake, and a large volume of air such as 12,000 ft. per minute, was passing, would naked lights be safe? In my opinion naked lights are safe nowhere where light carburetted hydrogen is given off.

3214. Would you consider it safe for naked lights to be used in those bords without sweeping out the gas from No. 1 and No. 2? I should consider it very dangerous to work with naked lights in those bords, because the gas is carried with the air.

3215. In view of gas being given off in these headings, would you consider it safe to tamp a shot with small coal? No. I should not consider it safe to tamp shots in the presence of gas. From past experience in the world you cannot gauge the exact amount of danger. I think a man ought to be very careful.

3216. Well, shots being permitted, would you consider it a safe operation to tilt the flame of a safety-lamp on to the gauze in order to light the touch-paper? No, I certainly should not consider it safe.

3217. Can you suggest any other mode? Yes, I prefer a wire.

3218. Passing the wire through the interstices? Yes.

3219. Gas is known to be given off in the advanced districts—these headings, Nos. 1 and 2; would you consider it good mining to win all bords, both off the intake and the return? Perhaps it would be better to have a third heading.

3220. In what way would that render these bords more safe? It would be ventilated on the intake then; your return air would go back on the centre heading.

3221. In that way you would consider it quite safe? Yes, provided there was sufficient ventilation going through the bords. It is the accumulation of the gas that brings about the danger.

3222. Supposing a blower was suddenly struck, and the ventilating current was carried round these bords, would it be safe then? Yes, provided there was a sufficiency of air to render the gas non-explosive.

3223. Did you examine Nos. 3, 4, 5, and 6 headings? I did.

3224. Did you discover any gas? I discovered the appearance of gas in the lamp in all of these, the ventilating current at the time being arrested.

3225. You would more readily detect gas if it existed, under those conditions? Yes.

3226. You know the western district? I do.

3227. Have you ever discovered gas there? No.

3228. *Mr. Neilson.*] You say you do not believe there could be a sufficient quantity of gas in No. 2 heading, unassisted, to cause the damage you saw in the mine? I really do not think so.

3229. You think it was assisted? Yes, by accumulations of gas previously unobserved.

3230. Where was it likely that gas could accumulate—in the first bord off No. 1? If No. 1 was the intake it is scarcely likely that it would.

3231. *Mr. Hilton.*] Where would this gas you talk about accumulate? Anywhere in the old workings.

3232. Could you give any reason for such an accumulation? Only an insufficiency of ventilation.

3233. Are you aware that there was a door at the junction of the western? Yes.

3234. The object of that door was to cause a portion of the air to go up to the gassy section? Yes.

3235. Supposing anything happened to that door for an hour, say, or two hours, would not that interfere with the ventilation considerably? Yes.

3236. You say you have worked in the Bulli Colliery twenty years, and ten years as deputy?

3237. You would have some knowledge of the management then, the principal and his overman. Do you think these gentlemen careful and capable? I can speak of Mr. Ross as being an exceedingly careful manager. I said as much at the inquest, and I could not say different. Mr. White is not as able as he was perhaps.

3238. Why not as able? I think he received an injury some time ago that affected him mentally.

3239. How long after the explosion was it when you got to the mine? It was about two hours afterwards.

3240. Were you amongst the first party? No; there were three parties in before me.

3241. Did you notice any stoppings blown out in No. 1 heading? Yes.

3242. During your tenancy of office as deputy, were you using safety-lamps? I was in the grip district—in the south-western side of the western.

3243. Did you know Mr. Millwood? I did.

3244. Do you think he was a cautious man? He may have been sufficiently cautious.

3245. Do you think workmen should be allowed to fire their own shots indiscriminately? They would not if I were deputy.

3246. As an experienced man, do you think the return air-course should be travelling? I do.

3247. You have been connected with the Bulli mine, until recently, ever since it began? Yes.

3248. Have you a recollection of a man being killed there by the gas some years ago? Yes, I have; a man named Twaddle, I think.

3249.

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3249. Then as a matter of fact you had gas in the Bulli mine before you got the dyke? Yes, that was many years ago.
3250. How many years ago? Sixteen years ago, more or less—I cannot say exactly.
3251. *Mr. Croudace.*] I understood you to tell us, Mr. Robbins, that the only time you had known gas in Bulli, was when you struck the dyke in the Hill End district? I do not think so; but if I did I must certainly contradict the statement, because I could not have intended to say that. The gas came as soon as this whin dyke was struck, but there was scarcely any given off so far as I know from twelve to fourteen years previous to that.
3252. Then you also stated that previous to striking the dyke carbonic acid gas, or choke-damp, was given off? I mean by that, in the interval between the time when the mine first opened.
3253. Will you briefly explain to us again what is the true state of the case, because you led me to believe that there was no fire-damp in the Bulli mine previously to striking the dyke, and that the gas that did exist before that time was carbonic acid, which is non-explosive. Now you state in answer to Mr. Hilton, that a man was killed some years ago in the Bulli mine by an explosion? I have freely told you the exact circumstances, but will repeat more fully. For five or six years, perhaps, from the first beginning of the mine, gas was seen in various parts, both in the bords and headings, in moderate quantities. Where Twaddle was killed was in the south-west straight heading, on top of a large fault in the face of the heading. I do not know that gas was ever found in any quantity at Bulli after that for the term I have stated.
3254. Was it after that you noticed the carbonic acid gas come off? Yes, and after getting through the dyke we found carburetted hydrogen.
3255. Have you seen the results of any other explosions than this at Bulli? No, not of any magnitude, as I have stated.
3256. Then you have no knowledge to go by in judging of the effects of an explosion? I have no practical knowledge to judge of the effects of a terrible explosion.
3257. Therefore in stating that you think there must have been an extra accumulation of gas than what existed in No. 2 heading, you have nothing to guide you in forming that opinion? I have my practical knowledge, and reading, and judgment. I really think there was not sufficient space inside of the stenton for men to work with gas present in sufficient quantity to cause that explosion.
3258. Your idea is that there was an accumulation of gas somewhere else? Yes, I think so.
3259. Can you explain to me where it would be? I think it would be somewhere between the western and the Hill End.*
3260. And if you were told that there were very little signs of damage there? I should think it very strange, seeing that a horse was blown from the main heading into that return. [*Plan examined.*]
3261. Is it not likely that those boys and the horse were blown through this place by the force of the explosion from No. 2? I think they were blown from No. 2 right through there—the force would be on those bords off No. 2.
3262. Have you seen any signs of fire there? Yes.
3263. Any timber blown out? No.
3264. Then you think the explosion coming from No. 2, and which blew the stoppings out, was the same explosion that blew the bodies through here? I do.
3265. Then it would seem that there was no other gathering of gas beyond that point? There must have been in that return.
3266. Is it possible for gas to exist in a current of air measuring 12,000 cubic feet per minute? I think it is quite possible, supposing a quantity of gas to be accumulated.
3267. *President.*] The question is as to separation? I do not say it would separate. I think it is possible that before mixing with the current, a portion of it might be deposited in some convenient place being the lighter substance. [*The witness withdrew.*]

James Crawford sworn and examined:—

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3268. *President.*] What is your present occupation? I am a deputy at North Bulli Colliery.
3269. Were you for some time deputy at the Bulli Colliery? Yes, but not at the time of the explosion.
3270. You were there before the explosion? Yes.
3271. How long is it since you left? I left when the strike took place.
3272. Were you deputy of the Hill End section? Yes.
3273. Were you in that position before the dyke was pierced that gave off gas? Yes.
3274. Was there very much gas given off when you first touched the coal inside the dyke? At first, a small quantity came off; it was struck at night-time; two men, Richards and Gard, struck the coal, and they ran and reported to Mr. White that they had struck the coal on the other side of the dyke, and that the gas was coming out freely.
3275. Had you any experience in gas before you found it in Bulli? Yes.
3276. Where? Yorkshire and Scotland.
3277. Who arranged the workings, and laid off the headings and bords in the Hill End section? Mr. Ross and Mr. White laid out the headings.
3278. Were you consulted? No.
3279. Not at all? No.
3280. Up to the time of the strike, what was the amount of ventilating current that supplied that district? I could not possibly tell you.
3281. I mean just before the strike? Before the strike, there was 2,500 cubic feet of air going past the headings of the gassy section.
3282. Were you present when Mr. Rowan, the inspector, took his measurements? Yes, at one place.
3283. Was it you who arranged the doors between these headings and the main road? No, I had nothing to do with the doors.
3284. Were you instructed where to put them? No, White did that.

3285.

* NOTE.—Plan examined, and witness indicates possible positions.

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3285. From the time that Nos. 1 and 2 headings were broken off the main tunnel, had gas been given off up to the time you left? Yes.
3286. In a large quantity? Sometimes a large quantity, and sometimes a small, but they were never clear at any time.
3287. Where did it issue from? The centre of the coal.
3288. Was it more abundant in approaching rolls, or after the rolls had been crossed? I always found it largest in between the rolls.
3289. In approaching rolls, did you find any? Yes, all the way through.
3290. Did it come out in blowers? Yes, considerable quantities would come out from blowers, which you could hear 20 or 30 yards away.
3291. How long would they last? Sometimes from two to three weeks, and after the men had worked several yards past them, they would continue blowing out at the side.
3292. Was gas given off in the bords off No. 1 heading? Yes.
3293. Was it given off in the bords up to the time of the strike? Yes, up to the time of the strike; I know nothing afterwards.
3294. But you say it was given off in the bords? Yes, up to the time of the strike.
3295. In sufficient quantities to require the use of safety-lamps? Yes.
3296. They were used in the whole of that district? Yes, with the exception of two places.
3297. Where were these? In the first bords in No. 1 heading.
3298. Were these abandoned bords at the time of the accident? Yes.
3299. Were these safety-lamps locked? Yes, all the time I was there, with the exception of the time when we started using them; at that time, there were only four lamps for two shifts of four men each, and the day men had to give them up to those men working at night.
3300. Are you quite sure that these lamps were always locked afterwards? I am quite sure they were whilst I was there; I examined the lamps in the morning, and locked them, but of course I was not there at night.
3301. You locked them yourself? Yes.
3302. And you used all possible care for the safety of the men? Yes; all in my power.
3303. Did you ever hear of a safety-lamp being unlocked? Yes, at one time, owing to the scarcity of keys, two men were allowed to use their lamps unlocked; in giving them their lamps in the morning, I told them that the key was broken, but that I had given orders to White to get some more keys; I afterwards went into their working place, and caught them working with unscrewed lamps; I ordered them to screw on their lamps, and to go out of the pit, and report themselves to White.
3304. Did you ever receive complaints from the men on account of having unlocked lamps? I never had a complaint from any party.
3305. Did you ever have any complaints concerning unsafe lamps? Yes, on one occasion.
3306. When was that? A man gave me his lamp and said the top gauze was burnt out; I took his lamp to pieces, and found that one of the gauzes was gone, and I said I have not another to give you; the top gauze was perfectly sound; there are two gauzes, one takes off, and the other is a fixture.
3307. Did you consider that lamp safe? No.
3308. Did you allow that lamp to be used? No.
3309. And you thereby removed a source of danger? Yes.
3310. You considered that the man had done his duty, and that you had done yours? Yes.
3311. You are quite sure that you did not hand back the lamp to the man, and tell him that you had not another to give him? I am not aware of doing so; I know I told him that we had no wire to mend the lamp.
3312. Did you ask for wire? Yes, immediately afterwards.
3313. And they had to send to Sydney for it? Yes, there was none in the district.
3314. In your time, how were shots fired? During my shift, I fired all shots myself; I first examined the place to see if it were safe, and if I found it safe, I fired the shot.
3315. How did you light it? With touch-paper, which I would rub on my clothes, and light it by holding the lamp on one side. I find I have in my pocket a piece of touch-paper that I had when I left.
3316. Do you consider that a safe and proper way of lighting a shot? It is the only way we had; I kept a lamp for the purpose, and when I found the gauze of the lamp softening, I put a new one in; I have fired shots with a small wire, but I do not think it is as safe as the other.
3317. Do you know if any of the men fired shots? Not to my knowledge.
3318. Would this be as safe a means of firing as any other in the hands of any man? Yes, it would if a man properly understood what he was doing.
3319. But if he did not? Well he ought not to be there at all.
3320. How were the shots fired at night? I cannot say. I supplied the night men with touch-paper, and warned them to be very careful, and not to use a naked light whatever they did.
3321. You do not know how shots were fired at night? No.
3322. Were the lamps locked there at night? No; they were left to the men to do what they liked with them.
3323. There was no night deputy? No.
3324. Did you ever find any men unscrewing the lamps? I have already told you of two men doing so.
3325. That was some time ago? Yes; there were only a few men working in the gassy section at the time.
3326. You say that you exercised due care in cautioning the men? Yes. I would show them the gas oozing out of the coal, and gave them instructions to be careful.
3327. The ventilating current you say was 2,500 cubic feet per minute? That was the last report. The first report was between 3,000 and 4,000 cubic feet.
3328. If that current was trebled or quadrupled, would it render that part of the mine more safe? If it was carried into every working place I have no doubt it would.
3329. How did you ventilate the faces of Nos. 1 and 2 headings? There was a cut-through every 23 yards.
3330. Was any bratticing used? No; not to my knowledge.
3331. Did you think it necessary for the safe working of the bords off the headings? Yes, I did.
3332. Did you ever mention it to Mr. Ross? No; but I did to Mr. White.

3333.

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3333. Did you not consider it your duty to mention it to Mr. Ross, seeing that nothing resulted from your mentioning it to Mr. White? I did not think it my duty to pass Mr. White in anything.
3334. But in a matter of life and death, for the safety of yourself and others depended upon the mode of ventilation, do you mean to say that you would not approach Mr. Ross—was he such an unapproachable man? I thought it was Mr. White's duty to report the matter to Mr. Ross at once.
3335. But having no result from your appeal to Mr. White, don't you think it was your duty to go to the court of last appeal? No; not to pass my superior, and Mr. White was my superior.
3336. Now, do you think you did your duty? Yes.
3337. Was the gas at all times given off in Nos. 1 and 2 headings? Yes, at all times. It never ceased.
3338. Did you ever hear of men firing shots by means of matches in No. 2 heading? I did not.
3339. Would you be surprised to learn that it has been done? I am not at all surprised at it.
3340. But you never saw or heard of it? Never.
3341. When you found any quantity of gas in these headings, were you in the habit of reporting it? Yes, regularly to Mr. White on all occasions.
3342. Had you any book at the mine for entering these reports? I never had a scrap of paper at the mine for any report whatever.
3343. If you found a dangerous condition of affairs could you not have procured some paper and entered your protest, for you were in a responsible position? I exercised my duty, I thought, when I reported to Mr. White everything that happened every day, and when I saw a place dangerous for men to work in I removed them.
3344. Had you opportunities of conversing with Mr. Ross? Not many.
3345. Not during the time you were deputy ever this fiery section? I had one occasion when he was in, and I then showed him the gas oozing out. A drill-hole had been bored in the wall side, in which I inserted a gaspipe, and I showed him the gas alight from this pipe to prove to him that it was not diminishing with 3,000 cubic feet of air passing.
3346. Had you any other object? I wanted to satisfy him that the gas was still strong.
3347. What did you follow that up with. Did you not say something to this effect—"Now, Mr. Ross, don't you think it is advisable to put bratticing in the headings"? I left that to him.
3348. No doubt, but is it the custom for deputies to do so? There is no doubt that it is.
3349. Had you no fear of any calamity happening from this gas which you showed to Mr. Ross? Yes, I had.
3350. Then why did you not warn Mr. Ross by suggesting some proper measures for the safe working of these headings. You say that in your opinion bratticing should have been used, and was not that the proper occasion to suggest its use to Mr. Ross. Had you not a good opportunity of doing so? I had, but I did not do so.
3351. Don't you think you failed in your duty? No; for Mr. White was present at the time.
3352. Why do you think it was not your place. You were the person who inserted the pipe into the blower for the purpose of showing the gas to him, and is it not a natural conclusion that you would say, "Now, Mr. Ross, don't you think this gas ought to be specially dealt with"? When I showed Mr. Ross this it was on the main road.
3353. But don't you think that you lost an opportunity of doing a great service to the colliery? If I had suggested such a thing I would have got a "snubby" answer.
3354. How do you know that you would when you did not tell him. You must see that that is not logical? I don't think that I violated my duty in any way, because I reported to White on all occasions.
3355. If you showed Mr. Ross that the gas was not diminishing in No. 2 heading, surely you had some intention in showing him that gas. What could be more natural, seeing that you believed that bratticing should be used, than for you to say, "Don't you think, Mr. Ross, that bratticing should be taken into these headings"? I was not paid for suggesting to Mr. Ross.
3356. Were you not paid for doing your duty? Yes; and I did it.
3357. You saw that valuable lives were imperilled, and you lost your opportunity? No; I lost no opportunity.
3358. You knew the mine better than Mr. Ross? Yes.
3359. You put yourself to some trouble to show him the gas, and if you thought he was wrong or sceptical about the quantity of gas, don't you think that you lamentably failed in your duty in not suggesting the remedy you believed in? No; I do not think I failed at all in my duty.
3360. You don't? No, I don't; I did my duty in showing the gas to Mr. Ross and Mr. White.
3361. Did you state to some man that you believed the colliery would blow up some day? I stated after the strike that if proper care was not taken the colliery would blow up, because I believed that Mr. Ross and White were not taking proper care.
3362. Was it on that account that you left? No; I left because my wages were reduced, and I was not paid sufficiently for my responsible charge.
3363. Did you state this danger to any of the officials higher than yourself? Yes; I told it to Mr. White the last time that we came out of the mine together. I said to him, "If this is a prolonged strike I will never enter this mine with a naked light." I said that because I thought that during the time the furnace would not be working regularly the gas would accumulate in the old workings. I have cautioned him many times about the existence of gas, and that he would insist upon men not working with naked lights.
3364. Where was that? In these places off No. 1 heading.
3365. You stated that they did not work with naked lights? Neither they did, with the exception of two bords.
3366. You expostulated with Mr. White upon the consequences? Yes.
3367. Yet you did not suggest any improvement in a mild way to Mr. Ross. He is an experienced man, is he not? Yes.
3368. Knowing what you do now, don't you think you failed in your duty? No; as I have said before, I do not think that I failed in my duty all.
3369. Were you in this district since the accident? Yes; I was.
3370. Were you one of those who went in for the purpose of recovering the bodies? Yes.
3371. Did you make an accurate examination of the seat of the explosion? Yes; I was in Nos. 1 and 2 headings.

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3372. Did you go into the face of the bords off No. 1 heading? Yes; I went into two bords.
3373. Did you examine for gas? Yes; and I found none.
3374. Did you go to the faces of the bords off No. 2 heading? Yes; I went into four faces.
3375. Did you examine for gas in any of them? No; not carefully.
3376. Did you go into the faces of Nos. 1 and 2 headings? Yes.
3377. Did you examine for gas? Yes; and I found it there.
3378. Was the quantity as great as that when you were deputy there? Yes; the day before the strike took place I stopped a man named Gard from working in No. 1 heading. He had a shot waiting to be fired, everything was ready, and his coal cut; but when I went into the place and examined the gas I said, "I will not fire this shot for you as this place is full of gas for 12 yards back." I then put two boards across each other, some distance back in the heading, and wrote the word "Danger" over them, and left the shot unfired, and put him to work in another place. When I went into the same place after the explosion I found there gas 10 yards in length, and 3 feet in thickness.
3379. Almost as much as when you left? Yes.
3380. After the explosion the ventilating current would be totally deranged? Yes.
3381. You are not surprised at that? No.
3382. It was a natural consequence? Yes; but I was somewhat surprised to find the ventilation so good after such an explosion.
3383. Were you surprised to find no gas in the bords? No.
3384. You stated before that up to the time of the strike the bords gave off gas? So they did.
3385. And yet you are not surprised that without the ventilating current no gas was found in them? I did not make a minute examination of these bords.
3386. How would you account for no gas being found in them after the accident? I did not say there was none.
3387. I suppose that you were informed that there was absolutely no gas in these bords, or none visible in the safety-lamps after the explosion. I presume that you mean that before the strike the gas would show itself in these bords in a Davy lamp? Yes.
3388. The general expression "no gas" means that it is not visible in the safety-lamp, does it not? Yes.
3389. Would you conclude that gas had ceased to be given off seeing that there was none found there after the accident when the ventilating current was very low? No; I would conclude that if the coal was once cut again the gas would come off again.
3390. We are informed that immediately after the explosion no gas came off in these bords? I believe if they were minutely examined, gas would be found in any of them.
3391. That is your opinion? Yes; I would not like to go into them with a naked light.
3392. But you do not charge the people who saw these bords with being less able to detect gas than yourself? No.
3393. Did you consider the mode of working Nos. 1 and 2 headings, with bords off each heading, safe? Yes, it was safe.
3394. No safer could be followed? No. The distance between the headings was about 10 yards, and the cut-throughs were put in nearly every chain, or a little more.
3395. After this explosion, can you suggest anything better? Nothing better, excepting bratticing the headings.
3396. In your time did Nos. 3, 4, 5, and 6 give off gas? Yes.
3397. In your time did you ever discover gas in any of the abandoned bords off No. 1 heading? No.
3398. There are two bords driven back to the dyke? Yes; but I never saw gas in them.
3399. Would that be a likely situation for gas? Yes, provided the ventilation were stopped altogether. Gas might have settled in there, as they were not properly stowed up.
3400. Was it a likely place? Yes; if there was no air going, it might accumulate there; but if the current was kept up, it would drive it away.
3401. What conclusion do you come to as to the cause of the accident? I examined No. 2 heading, and I saw that a shot had been fired there recently, and I consider that due care had not been taken in firing that shot.
3402. In what way was care not taken? So far as my knowledge would lead me to believe, I saw that the coal had been smashed down a good deal, and no hole had been cut underneath. If this is not done, the shot will more likely cause a blast, and I would think from the position of the bodies of the men who worked in that heading that the shot had ignited the gas.
3403. Have you ever seen a shot ignite gas in that district? No.
3404. Have you heard about it? Yes; but I have no proof of it.
3405. Do you think that it is an improbable event? No; but I have not seen it.
3406. Do you think that the shot was overcharged? Yes.
3407. It is not a blown-out shot? No; there is a good quantity of coal driven down, but I am inclined to think that the shot was slightly overcharged.
3408. In examining the gas issuing from these headings, did you notice whether it was of a very quick description? Yes.
3409. It would rapidly fill the safety-lamp? Yes.
3410. In other words, it was very pure gas? Yes, no doubt about it.
3411. Did you form any conclusion as to the course of the explosion? I believe there has been an accumulation of gas on the opposite side of the main tunnel in the old workings. I maintain that there has been an accumulation of gas there, and that the fire in No. 2 heading has reached it.
3412. You do not say that the shot did not ignite the gas in the heading? No.
3413. You are of opinion that it did? Yes, I am of that opinion.
3414. And in proceeding down both headings it ignited other gas on its way out? Yes, that is my opinion.
3415. Gaining force as it proceeded along? Yes.
3416. Have you any knowledge of how an atmosphere of coal-dust behaves in the presence of ignited gas? Undoubtedly it increases the intensity of the explosion.
3417. Was the Bulli colliery of a dusty character? Yes, it was dusty.
3418. During the working hours the dust would be mingled with the air more or less? Yes.

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3419. The gas having been exploded, the intensity would be increased? It would add a little to the fury of it; but I do not believe in the theory to any great extent.
3420. Would it intensify the action of the explosion? I have no reason to doubt that it would.
3421. *Mr. Neilson.*] You say that you always brushed the gas out before lighting a shot? I was always very particular in seeing that there was no gas in the face when I fired a shot.
3422. Where would the gas go? It would go out of the heading and into the air, but it might get into an old bord if it was in the way.
3423. Did you ever allow any oil to remain on the gauze of your lamp? I took good care that there was not any, and I took great care that no one used my lamp but myself.
3424. How long would you use the same gauze? Perhaps a week or more; but whenever I found it any way weak I renewed it, but I always took good care to keep a good one on for myself.
3425. You did not lock the lamps for the men at night? No, I was not there.
3426. These lamps were then unlocked? Yes; but I gave orders to the men to lock them themselves.
3427. Was the key left outside the cabin? Yes.
3428. Was it there in the daytime as well? Yes; but I was generally knocking about there during the day; it would be a pretty hard matter for a man to come there and unlock his lamp without my seeing him.
3429. It is now nearly eight weeks since the explosion, and would you be surprised to hear that there is no gas in the bords off No. 1 heading? I am not much surprised.
3430. Did you know Millwood? Yes.
3431. What sort of a man was he? A very good workman.
3432. How long did he work under you? I never considered he worked under me at any time.
3433. How long did you know him? Seven or eight years.
3434. Was he a steady man? Yes, a very steady man.
3435. And a good workman? Yes, good for what he had to do.
3436. And very intelligent? I cannot say that.
3437. Do you think he had a good knowledge of coal-mining? I do not.
3438. What reason have you for saying that? I thought the man was careless in detecting gas.
3439. In point of fact, have you ever seen him trying to detect gas, or have you shown him how to detect it? Yes, I have shown him on many occasions that gas was existing, when he would come in to the places to fix up a stopping or hang a door.
3440. He then had experience with you in the detection of gas? Yes; I kept it no secret from any man who wished to see it.
3441. You stated in your evidence that after the strike you prophesied that there would be a blow-up some day? I have stated before the strike that if due care was not taken with the gas, she would blow up some day, because Mr. White was not in my opinion going the right way about it.
3442. You considered that Mr. White was not competent to deal with it? Yes, I did.
3443. You knew of the danger that was existing, and you considered that Mr. White was incompetent, and yet you did not pass an incompetent man, and go to head quarters? I beg your pardon. Did I not say that I showed it to Mr. White and to Mr. Ross at the same time? Surely that was good enough?
3444. Was that doing your duty? I think so.
3445. How many times did you show it to Mr. Ross? Once.
3446. How often did Mr. White see it? Twice.
3447. Is that all? Yes, in my presence; but he has seen it hundreds of times by himself.
3448. And you saw it hundreds of times yourself? Yes.
3449. And you considered White incompetent? Yes; I have already said that.
3450. And you allowed an incompetent man to stand between you and the manager? I showed the gas to the manager in presence of his overman.
3451. I do not suppose there was a good feeling between you and the other officers at the pit after the strike? I never had any disagreement during the strike.
3452. Is it a fact that you have lately stated that you intended to make it hot for Mr. Ross and the Company, when you were called before the Commissioners? I have never said such a thing, and Mr. Ross and myself were always good friends.
3453. And yet you would not pass Mr. White to show him a danger? Yes; I passed him on the occasion that I showed it to the manager in the presence of White. The manager knew of it, and what is more, he knew White had been delegate for years.
3454. *Mr. Hilton.*] Did you consider it White's duty to report all matters to Mr. Ross? Undoubtedly.
3455. Have you read these general rules for the working of collieries? Yes.
3456. Do you find anything in these rules that requires you to go beyond the overman? No; I do not see anything.
- Mr. Hilton.*] Nor do I.
3457. *Mr. Owens.*] How long after the explosion did you enter the mine? The night afterwards.
3458. Did you notice that big fall on the engine plane? No, I did not go that way; I went the slacky way.
3459. Did you notice the stoppings blown out in No. 1 heading? Yes; but I did not go around them.
3460. Did you notice the first stopping? I did not pay particular notice; as I did not go in for the purpose of taking particular notice of everything.
3461. Did you know these stoppings [*Marking places on the plan*]? Yes; I think they were blown out, but I am not sure.
3462. What bords do you refer to when you speak of where an accumulation of gas might take place? In the old workings on the west side of the dyke. [*Places marked.*]
3463. You stated that your attention was once drawn to a safety-lamp with a burnt top? Yes.
3464. Are you sure that that lamp was not again used in the mine? I am positively sure that it was not.
3465. To whom did you give the lamp? I cannot positively recollect whether it was Beckton or his mate. We had only four lamps, and Mr. Ross had to send to Wallsend to get some more lamps. I believe we got half a dozen more afterwards, and when these lamps came I took out the old gauze on some of these lamps, and I recollect putting a new gauze in the top of this particular lamp.
3466. After danger had been reported you remedied it? Yes, as far as lay in my power.
3467. Did you ever notice any gas in the western district? Never.

3468. Did you ever notice it in any other part of the Hill End district? I have heard that it was seen ten or twelve years ago, but I was not there.
3469. Was it common for the gas to accumulate in any of these bords off Nos. 1 and 2 headings before the strike? I never saw any accumulated, but it came off at the working faces, and what I say is that if the furnace was slack at any time during the strike, the gas would get into the old workings because there was a great amount given off.
3470. Do you consider you did your duty in reporting to Mr. White? Yes; according to the colliery rules he was my superior.
3471. It was his duty to report to Mr. Ross? Yes.
3472. And if he did not do that? Well, I reckon I was clear.
3473. *Mr. Hilton.*] What reason had you for thinking that Mr. White was incompetent? On one occasion when I sent those two men out for having unscrewed their lamps he sent them back immediately and I had to find them other places. I found one of the men a place in No. 1 heading. There was no gas in there at that time. I asked Mr. White some days afterwards what Mr. Ross had said about the men, and he said he had never reported it to Mr. Ross.
3474. *President.*] That is some time ago? Yes.
3475. When you were opening out the district? Yes.
3476. *Mr. Jones.*] Do you know if Mr. White reprovved those men for neglect of duty? I do not know.
3477. He merely sent them back again? Yes.
3478. There has been a great deal of stress laid on the matter of reporting to officials. Does not this rule 3 prescribe your duty. Read it and see? Yes; I reported to the overman.
3479. And there your duty ended? Yes.
3480. Do you think it is an evidence of good management not to provide a system of reporting by which the report of each and every official would reach the head manager? If there was a book kept at the mine for entering these reports, the manager would see everything, but in the absence of that he would not.
3481. Do you think it is also a good system for each officer to send in his own report? Yes; either to do that or to enter it in the ordinary report book.
3482. Of course I am aware that in many of our large collieries and in some small ones as well, each official sends in a distinct report of his own. Don't you think that that would be a much better system? I do not see there is much difference if you had a report book in which these daily reports could be entered.
3483. But you believe a system of reporting in writing would be much better? Yes.
3484. Than the systemless system pursued at Bulli? Yes; and if it had been carried out there would have been no call for this inquiry.
3485. Was it any part of your duty to suggest the adoption of such a system? It was no part of my duty.
3486. You think you would be told to mind your own business? I have very little doubt about it.
3487. *President.*] I am sure you would not.
3488. *Mr. Owen.*] During your time were the roads from the Hill End to the western, and from the western to the grip in a travelling state? Yes; I was on the western road almost every day, so I can say positively that there was no accumulation of gas there then, for there was a good travelling road.
3489. You have already been asked as to your opinion of the competency of the late deputy—do you think it was a prudent matter on his part to allow men to work with open safety-lamps? No; I think it was a great neglect of duty and a violation of the rules.
3490. *Mr. Clarke.*] When you showed Mr. Ross this pipe fixed in a blower of gas, what was the conversation that took place—what did you say to him? I showed the gas to him in that way so that he could see that it was not diminishing, and his reply was to be careful.
3491. Is that all? That was all.
3492. Were no steps taken? None.
3493. *Mr. Croudace.*] During the time you were deputy did you examine the various working places previous to the men commencing work? Yes, every morning.
3494. Was that in compliance with any special instructions? It was in compliance with a rule.
3495. Rule 4:—"No workmen or boys shall enter any working place until it has been examined by the overman, or other person duly appointed, whose duty it is to make such examination before work is commenced." Is that the rule you refer to? Yes.
3496. And you complied with that rule? Yes, in all instances.
3497. Did you consider these places in your time properly ventilated? The places were very well ventilated, that is when the headings were not driven too far from the cut-throughs.
3498. Is there any difference between the system of ventilation which you have seen after the strike, than before? No alteration that I could see.
3499. None at all? None at all.
3500. Now I will read the rule a little way further on:—"If on examination any working place is found insecure from a defect in ventilation, or from insufficiency of props or timber, work shall not be commenced there until the insecurity is remedied. And if in the course of being worked any place prove insecure from any of the causes above mentioned, the overman, or other person appointed, shall, if he think necessary, stop the workmen there and remove the workmen. Immediately upon doing so he shall cause a danger signal or 'danger cross' to be erected across the entrance to the place, beyond which no person shall go on any pretext whatever, unless duly authorized so to do." Did you comply with that part of the rule? Yes.
3501. But would not the proper ventilation of these headings have consisted in carrying bratticing into the faces? Yes; no doubt that would have been the proper way.
3502. Knowing that, why did you not suggest to the overman, or to Mr. Ross, your way of improving the ventilation in the faces, or why did you not actually carry it out? When I went beyond their instructions I had to leave.
3503. You actually carried out a certain portion of No. 4 rule in examining every working place every morning, and there you seem to have stopped. Why not insist upon carrying out this better system of ventilation; you have full power, and you would not be amenable to any consequences that might arise? I cannot say that. When I gave my report to the overman it was his duty to attend to it.

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3504. No. 4 rule also distinctly says:—"No workman or boy shall, unless duly authorized, go into any part of the mine, excepting that to which he is appointed by the overman or other officers." Did you carry that out? Yes, I carried that out also.

3505. And it also says:—"And until such examination shall be made and leave given, no workman or boy shall go beyond the flat, or other station appointed by the overman." Did you carry that out, too? Yes, I did, and I saw that all the places were properly ventilated then.

3506. Are all the places properly ventilated now? The headings are driven further past the cut-throughs than when I was there.

3507. But there is no difference in the system of ventilation? I did not notice any.

3508. You say that you told Mr. White that if he was not careful the pit would blow up some day? Yes; that was just about the time of the strike.

3509. But would not that state of affairs implicate you as well as any one else? I was leaving the service of the Company. I told him the last day before the strike took place.

3510. But supposing an accident happened before the strike, and it was found that the mine was not properly ventilated? It was properly ventilated.

3511. Have you not said that bratticing would have been a better system? Yes; but before I left, the places were safe.

3512. Are they less safe now? Yes; the bords and headings are driven further in advance of the air, that is the only difference.

3513. What was the distance between the stentons when you were there? They were about a chain apart.

3514. But did you not drive the last stenton that has been put between these headings? I could not say.

3515. How many stentons did you put through between these headings? I should say about seven.

3516. You admit you have put seven stentons between Nos. 1 and 2 headings? I am not sure.

3517. Shall I say six, will that please you? No, it will not, that might be one less.

3518. Now look at the plan and see what becomes of your statement that you drove the stentons more frequently than they have been driven since? I did not say that exactly; I said these places were driven further in advance of the air, and if you understood the rules of these headings you would find that Mr. Ross' instructions were to get the cross-cuts in coal as much as possible, and not over rolls.

3519. I want to know exactly what you said to White. You state that on one occasion when Mr. White was there, that you told him there would be a blow-up in this mine. I want to know what justification you had for such a statement. You say you left the places safe, and you see that you drove the last stenton? What I did was to drive the stentons as near as I could at every 22 yards.

3520. But does not the plan prove to you that the stentons in these headings, from beginning to end, are driven most irregularly? They were driven according to orders, and if you examine that plan you will see rolls coming down 18 inches from the roof, and extending perhaps 10 or 12 yards in length, these would interfere with the driving of the stentons.

3521. But you led me to believe that you drove the stentons every 22 yards until I show you that they are driven most irregularly, and that not one stenton has been driven since you left the colliery; what then becomes of your statement that you considered the system of ventilation was not so good after you left? My statement was this, that I warned Mr. White to be careful owing to the quantity of gas that was coming off.

3522. If the furnace was stopped for a few days during the strike, I would like to know where all this gas would go—could it go to the furnace, would it go outside, or would it stop there? I say it would get into the old workings. I also say that my idea was that these bords and headings were driven further in advance of the air than when I was there. I would like to know how long did men work in these bords during the strike.

3523. Was there any alteration or likely to be any alteration in the manner of working, which would cause you to believe that there would be some dreadful explosion after your time? I did not see any great alteration after the explosion.

3524. Are you aware that the ventilation was better after the explosion than when you left? If the stoppings were well built up there ought to be four times more.

3525. Have you any reason to think that the manner of building the stoppings has been altered? I do not know.

3526. Have you any reason to believe so? I have no reason to believe that they were altered in any way.

3527. Then with the new furnace giving a largely increased current, the probability is that the whole ventilating system was improved? Yes.

3528. In your time was there a door in the western junction? Yes.

3529. Was it a regulating door? Yes.

3530. Had it a slide? No.

3531. Was it a swing door? What do you call a door with hinges?

3532. *Mr. Croudace.*] I call that a swinging door. *Witness:* So do I.

3533. You stated that you told the overman that if he was not careful there would be a terrible explosion? I did say something of that kind, and I have never denied saying so.

3534. If you can prove to me that there has been any alteration in the stoppings, or any decrease in the quantity of air supplied to these headings, I will give you all credit; but if you cannot, it will be the reverse. You have admitted that there has been no alteration in the ventilating system as far as these headings themselves were concerned, and you have also said that there was a large increase in the quantity of air going in after the explosion. I will now ask you if there has been any alteration in the ventilating doors? I cannot tell you; I can only tell you what there was there, when I was there.

3535. Well, was there a door at the western? Yes; a swinging door.

3536. Was it kept open or shut? It was kept open as a rule, but the engine set of 20 skips had to come through there, and it had to be opened on many occasions every ten or twelve minutes to let the set through. There was no air allowed to pass when it was open, and when the door was shut there was a small hole in it to allow the wire rope to work, and on the right hand wall there was a hole 18 inches wide.

3537. Now, between Nos. 1 and 2 headings, was there a door there? Yes.

3538. Was it a closed door? Yes.

3539. Was a trapper kept there? Yes.

3540. Was it a double door? No; there was only one door.

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3541. Proceeding from there to the diagonal cut-through, was there a door there? Yes.
3542. A closed door? Yes.
3543. Was it a double door? No; only one door.
3544. Between Nos. 3 and 4 headings, was there a door there? Yes.
3545. Was it a closed door? Yes; it was a swinging door.
3546. Was there a trapper kept there? No; this used to be the flat, but a day or two before the explosion they finished it and pulled the coal from here [*place pointed out on plan*].
3547. When you went down after the explosion did you look for this door? Yes.
3548. What did you find? I saw a sheet of canvas had been put up there.
3549. But did you not find the door? No.
3550. Where was it? I don't know; and I saw nothing there but a sheet of canvas.
3551. Did you see the No. 3 door? No.
3552. We have evidence that after the strike these doors were in existence as well as the western door, and that three of the doors were kept by trappers, and that the other was attended to by the man at the flat. Did the same state of things exist in your time? Yes.
3553. Then there is no alteration in the system of ventilation as far as the doors are concerned? No alteration.
3554. You stated that you believe that there could not have been sufficient gas in No. 2 heading to cause the effects of this explosion, and that there must have been some gathering of gas in these old workings west of the whin dyke? Yes.
3555. Do you think that she fired anywhere this side of the dyke? I could not tell you.
3556. Did you examine any of these old workings? No.
3557. Did you examine any of the workings in the western district? Yes; but not in the return.
3558. Did you see any sign of fire or of the force of the explosion? I saw a few slight indications of burning.
3559. Did you see the door at all? Yes.
3560. Were there any signs of burning on it? The door was not charred.
3561. Did you not think that if the explosion had gathered intensity by lighting gas in the old workings, you would have seen greater signs of fire in the western district? I did not go into the return; but if you go there you will see that the road is in a very ragged condition.
3562. But do you not think that if the explosion had gathered gas as it went along, that you would have seen greater signs of fire down here? I saw signs of fire, but of no great fire.
3563. I ask you still further—In getting into these old workings is there a continuous opening, or is the overcast carried right away through to the furnace? Yes.
3564. But are there many openings opposite the road? Yes.
3565. I ask you as a fair and good deputy, is there any chance of gas accumulating when the air is regularly sweeping to the furnace? Yes; in some of these places on the right and on the left, falls have taken place, and both roads are very ragged, and if this is the case is it not possible for the gas to leave the working faces and to pass into these old workings.
3566. Not with the current of air that is reported to have been passing. You know that Nos. 1, 2, 3, 4, 5, and 6 headings all produce gas; but did you ever hear of any gas lighting at the furnace? No.
3567. Did you ever hear any man say that he had seen gas in the western district at any time? No; but one morning there were some men working contiguous to the dyke, and when they fired a shot it lighted a small quantity of gas right in the dyke. That is the first gas I saw ignited in that locality.
3568. Do you know of your own knowledge that the new furnace has been working since the strike, and was the new air shaft sunk in your time? It was being sunk.
3569. But it is now complete? Yes.
3570. Have you heard of any large improvement in the ventilation from that new furnace? I saw the new furnace the last night I was in the pit. I went in with a friend, and I could see that it was a grand furnace, capable of ventilating over ten times the ordinary amount, if the other ventilating arrangements were properly constructed.
3571. Have you heard that there was a current of air passing amounting to 12,000 cubic feet per minute? Yes, that was a great improvement upon 2,500 feet, which I believe was Mr. Rowan's last report before the strike.
3572. You have stated that you handed a man a broken safety-lamp at one time? No, the man handed the lamp back to me.
3573. Was that man Albert Smithers? I could not positively swear.
3574. Did you ever give any person a broken safety-lamp? I never did to my knowledge.
3575. Will you swear that you did not on a certain day or night give a miner a broken safety-lamp? I swear now that I did not do so to my knowledge.
3576. *President.*] We are now speaking of a witness who swore that you gave him a broken lamp, and that you said it was the only one available? I gave no man a broken safety-lamp.
3577. Consider the circumstances. The man who made this statement explained it in this way: They were asked whether they had ever complained as to the condition of the gauze of the safety-lamp, and I think two witnesses said, "Certainly": one witness, I know, said that on one occasion he handed Mr. Crawford a safety-lamp, the top gauze of which was burnt through, and that you handed the lamp back and said you could not get any gauze? I never did such a thing as that.
3578. *Mr. Croudace.*] You have told us that very strict and proper care was taken by you in dealing with all safety-lamps, and that they were all locked during the day shifts, and that you locked them yourself. Did you know that the night lamps were not locked? I had no reason to believe that they were not.
3579. How was it that this carefulness became lax at night time? I don't know. I was only a servant and not an employer of labour. That was Mr. White's duty.
3580. I disagree with you there. Did you not consider that the lives of the men working on the night shift were as valuable to them and to their families as the lives of the men working in the day-time? Undoubtedly they were.
3581. Would it not have been a prudent thing for you to insist upon these lamps being locked at night as well as in the day-time? I insisted as far as lay in my power, and Mr. White was fully aware that the night men using safety-lamps were left to their own free will.

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3582. To my mind you do not free yourself from all responsibility in trying to throw it on to Mr. White. You admit the performance of a portion of No. 3 rule, and then you failed in carrying out another portion of it? When 4 o'clock in the afternoon came my shift was done, and I had no further control over anybody.
3583. I am astonished that so competent an officer as you appear to be in many respects did not realise fully the extent of the duties which were yours? I did my duty, and I left my superior to carry out his.
3584. You stated that you believe you would have been snubbed if you had gone past Mr. White and reported these dangerous state of things to Mr. Ross? I have no hesitation in saying so, because I would then be going beyond Mr. White's authority.
3585. What sort of man do you consider Mr. Ross? A nice man, but a man of very few words.
3586. But are these words angry words or pleasant ones? Sometimes one, sometimes the other; it all depends.
3587. Did he ever on any occasion when you met him find fault with you, or censure you, or quarrel in any shape with you? I took good care not to do anything that would give him cause.
3588. Do you remember ever having any words with him which would give you the slightest reason for saying he would have snubbed you for reporting to him a dangerous state of things—anything to justify you in thinking so? Yes.
3589. Then tell it to me? Very often he would give me very short answers.
3590. Was there ever any occasion on which this nice man with very few words gave you any justification for thinking that he would have snubbed you if you had brought these important matters directly under his notice? I will not lay any charge against Mr. Ross.
3591. Is there anything that you can remember Mr. Ross doing that would justify or warrant you in making this statement? [*Question unanswered.*]
3592. *Mr. Jones.*] Was Mr. Ross aware that the men worked with unlocked safety-lamps at night? So far as I know he was; if he was not White should have reported this information to him.
3593. I suppose he knew that there was one in charge of the mine at night-time? He knew perfectly well. [*The witness withdrew.*]

John Barnes Nicholson sworn and examined:—

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3594. *Mr. Clarke.*] You are a miner? Yes.
3595. And you reside at Bulli? Yes.
3596. Have you worked in the Bulli mine? Yes.
3597. Was that before the strike? Yes.
3598. How long did you work there? Nearly four years.
3599. Where did you work? In the Hill End, in the western, and in the grip.
3600. Where, just before the strike? In the grip.
3601. How long before that was it that you worked in the Hill End district? A little over two years ago.
3602. And you did not work in the mine at all after the strike? No.
3603. You remember the explosion? I do.
3604. Did you enter the mine after the explosion? No, not the day after the explosion. I was up at the pit and offered my services, but they were not accepted.
3605. Were they refused? I asked the overman if I should go in, and he turned round and did not say anything.
3606. He gave you no encouragement? No.
3607. But you went in on the Monday following? Yes.
3608. What time was it? About half-past 2.
3609. Who were with you? Messrs. Ross (senior), Ross (junior), Gardiner, Evans, Inspector Owen, and two other miners, Doyle and Greenhalgh.
3610. For what purpose did you go into the mine? To make an inspection on behalf of the miners.
3611. You and the two other miners were appointed for that purpose? Yes, at a meeting of miners.
3612. And you made the inspection? Yes, a slight one.
3613. Where did you go? First into the furnace, and from there into the gassy section.
3614. Did you notice anything at the furnace that attracted your attention? Nothing; we simply tested the air and came back. We went to the bank head, and from there to the gassy section.
3615. What part of it did you examine? We first went into No. 1 heading, and from there into No. 2. We found a considerable body of gas in No. 2 heading.
3616. Did you make any examination of the bords off No. 1 heading? Yes; two at the mouth of the heading, and one old bord, and two bords that were working.
3617. Did you test for gas in them? No, I did not; I only went down to the face of one of the bords where the last body in the pit was found.
3618. Did you go to the face of No. 1 heading? Yes.
3619. Did you find any gas? Not at that time.
3620. Did you go into the face of No. 2 heading? Yes.
3621. Did you find any gas there? Yes. Mr. Evans said that the gas was back 22 yards from the face of the heading, and that it was not safe to go in with the lamp.
3622. Did you go in? I set my lamp down and went in without a lamp.
3623. What was the appearance of the face? I could not see.
3624. Did you notice the destruction in the mine at this time? We did not take particular notice of everything, but we noticed the extent of the destruction. In these headings the roof is very good, and there was not much timber to be knocked about.
3625. Did you make a particular inspection of the heading? As well as I could by feeling over the face. By feeling the coal in the face I thought a shot had been fired there. The gas was very strong; it was down from the roof to the top of the coal; I could feel it while I was in there, especially when right up to the face.

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3626. Did you examine the bords off No. 2? No, not particularly.
3627. Did you see any wreckage in No. 2? No; there is a good roof in there, and nothing to fall.
3628. Did you notice anything particular anywhere else? We went into No. 3 and found no gas there, and in one working place we found the stenton was 41 yards from the face.
3629. Did you find any gas? Not at that time.
3630. Did you examine any other heading about there? We went into No. 4 and into the straight which I believe they call No. 5, but we did not find any gas in either of them.
3631. Was there much wreckage or destruction? Hardly any.
3632. Did you make any other visit to the mine afterwards? Not until the inquiry was being held at Bulli. I then went in with the jury.
3633. From what you saw did you form any idea as to the origin of the explosion? That is very difficult to determine. I should almost fancy that it came from the straight, or in the old workings, from the position in which many of the bodies were described to me.
3634. From what you know of the mine since the strike, have you heard anyone remark that there was a large accumulation of gas there? I heard several men mention it; one in particular. It was Jerry Westwood.
3635. Where did he work? In No. 2 heading.
3636. What did he say? He told me that night, at Bulli—I think it was the Friday night week before the explosion—that they had struck a heavy blower that day in the heading, which was giving off gas all day.
3637. What did he say? He remarked it was a very heavy blower, and said they could hear it whistling 100 yards away.
3638. Did you make any remark? I asked him if there were any men working round about him with naked lights, and he said there were. I said, "God help you; one of these days you will get it."
3639. Were you secretary of the Miners' Union at that time? I was.
3640. Having heard of that enormous escape of gas did you take any action? I did not.
3641. Did you not bring it under the notice of the Association? I did not.
3642. Did you consider it your duty to do so? I did not.
3643. Why? I believe the management were thoroughly aware of it at the time.
3644. Did you believe what Westwood told you? Was he a truthful man—I had no reason to doubt his word.
3645. A blower giving out such an enormous quantity of gas would be a very dangerous element, would it not? Yes, undoubtedly it would be if there was not a sufficient quantity of ventilation to carry it away.
3646. Did you know that the men were working in its vicinity with naked lights? I was told that that was the case.
3647. That would be another element of danger, would it not? Yes; particularly those on the return side.
3648. And it was imperilling lives of all working there? It would depend on the quantity of gas coming off.
3649. A blower that could be heard a 100 yards away must have given off a considerable quantity of gas, was that not in itself a danger? It might be dangerous to the parties working there, but I do not believe it would be to the other portions of the pit.
3650. Holding the responsible position you do, and being the leader of others, did you not think it was your duty to take steps to avert such an evil as that? I did not think I had any right whatever.
3651. Not from a motive of humanity? It was purely a matter of business.
3652. I am asking you to take it from a human point of view. You knew that numbers of lives were being held as by a thread, did you not think it your duty, as a responsible officer, to bring that state of things under the attention of the management or Union? With regard to our own Union, I believe that every man in the Union knew it. I also knew that the manager knew it, and if I thought that any communication from me would have altered it, I should have been very glad to have made it, I can assure you; but I had every reason to believe that every man in the pit knew of it, for it was a matter of common conversation.
3653. But no steps were taken to avert it? Every man was afraid to do anything, for fear of losing his work.
3654. Why? Because of the rules that were signed after the strike.
3655. They were deterred by these rules from making reports? That is what I mean.
3656. I suppose you refer more particularly to rule 6 having reference to interference by employees? I refer to rules 3, 6, and 13.
3657. Rule 6—"Interference by employees—any employee interfering in any way with the colliery manager, or his overman, for regulating the work of the mine, shall be liable to dismissal without notice." That is the one? Yes.
3658. And the interpretation generally put upon this rule was, that if they reported any danger they would be dismissed? Yes.
3659. Was this matter ever discussed at the Union? All of the rules have been discussed and condemned *in toto*. A resolution was passed to the effect that none of us could work under them.
3660. What interpretation was put upon rule No. 6? That I have already given, that it would involve the loss of a man's work if he reported anything whatever.
3661. And that is your present interpretation? It is.
3662. How do you come to that conclusion? Because it is stated also from the fact, that I mentioned it to Mr. Hamilton and Mr. Ross, who told me that the rule could not be altered.
3663. Well, let us clearly examine the rule, and read it carefully. It says—"Any employee interfering in any way with the orders issued by the colliery manager, or his overman, for regulating the work of the mine, shall be liable to dismissal without notice." How can you interpret a complaint, or reporting the presence of a great danger, as an interference with the workings of the mine? Yes, easily; if I had been working and pointed out that a cross-cut should be put through to avert danger. That would be pointing out danger, but it would be an interference with the duties of the overman or manager, and he would tell me to go about my own business, as he has done.
3664. When was this—before the strike? Yes.

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3665. What did you do? I pointed out that it was unsafe for the boys to wheel the tubs from a particular part of the mine where I was working, and I was told to mind my own business, and that I had nothing whatever to do with it.
3666. Was that the only occasion? Yes.
3667. Does that rule convey that interpretation to your mind? Strictly speaking it does, for making complaints would be an interference with the duties of others.
3668. Would the reporting of a great danger be an interference with the orders of the management? Decidedly.
3669. Would a great danger be any part of the orders of the management? If I pointed out something that required a remedy, would not that be interfering with orders.
3670. No. Would you be interfering with the orders of the management in reporting the presence of gas? In a manner of speaking it would be. If Westwood had said that there was such a blower in existence, and that it would be necessary to put in some bratticing, that would be interference, and would be a contravention of these rules, and would have rendered him liable to dismissal.
3671. So you think that the management of the mine is of such a character, that a great danger being pointed out the man so reporting would be dismissed? I did not say that—what I said was, that a man would render himself liable to dismissal.
3672. Did you think that there was the slightest likelihood of a man being dismissed for reporting danger? I could not say.
3673. Did you ever hear of a man being dismissed for reporting a great danger? I have never really known a great danger existing there, so of course I cannot reply to that question. The only time I had occasion to point out danger I did so, and I have given you the reply I got.
3674. But you never took any steps to report this great blower of gas to the management? I did not.
3675. Did you hear whether the gas accumulated there in any great quantities up to the time of the explosion? No; I did not.
3676. Although it was well known to the members of the Union, they took no action? Not that I am aware of.
3677. Did it ever occur to you to appoint two miners, inspectors, under the 30th clause of the Act? It has occurred to me, but it was never done.
3678. For what reason? The best in the world.
3679. Did the miners themselves appoint two of their number to make periodical inspections, which they had a right to do, and which right could not be refused? The miners who did this work would want to be paid for it, and unless it was taken up by some organization of labour there would be no means of payment.
3680. The reason the Union would not undertake the responsibility was that the management would dismiss the inspectors—is that it? Not that exactly. Something like a year ago I notified to all the managements in the district that we requested a conference to arrange certain matters for the more satisfactory working of the different collieries. They refused to grant us a conference on every occasion, except one manager; that was Mr. McCabe, of Mount Keira Colliery; so we could not get arrangements made for the appointment of miners' inspectors.
3681. But it was not necessary for you to have a conference to do that? I think it was.
3682. Do you think the management would have prevented you? I did not say that.
3683. However, it was not done? No.
3684. When the mine was in a dangerous state you said to one of the men working there "God help you one of these days?" That was only a few days previous to the explosion, and it was the general idea that the new furnace had improved the ventilation.
3685. When you made this remark—that there would be an explosion, or something tantamount to it—was the new furnace going then? Yes, I suppose so; it was supposed to be going; I am not sure that it was.
3686. However, after making that remark, you took no steps to have a miners' inspection made? I brought the matter twice before meetings of miners, and nothing was done; as a matter of fact, men were so cowed down that they dared do nothing.
3687. Was that before the blower? Yes.
3688. The inspectors were never appointed? Never.
3689. Mr. Neilson.] You were appointed by the miners of Bulli to make a complete examination of the mine after the accident? Yes, with two others.
3690. To ascertain the cause of the explosion? Yes, for that purpose.
3691. What were your special instructions at the meeting? I do not think any resolutions were passed, but we were appointed to look through the mine and see if we could trace the cause of the explosion.
3692. I think you said you went down to make a special examination? Yes.
3693. How many places did you examine? Five headings, and two or three bords in the gassy section.
3694. How many bords are there in the gassy section? I could not tell you, never having worked there since they were opened out.
3695. You went down specially to make an examination to find out the seat and cause of the accident, and you only examined two or three bords in the Hill End section? I did not say that we only examined two or three bords, but there was nothing very special in the bords; I went more especially to find out how far the stentons were back from the headings.
3696. In point of fact then, you were sent to make a special examination of a trifling little matter, and not to see the cause of the accident? We knew the cause of the accident, and we could not get round as well as we wished, and there was no one to show us from the Hill End through to the western district. Mr. Ross could not find his way through, and I could not, never having been there before.
3697. Did you examine the props? Yes, several; one especially at the end of the stenton in No. 1 heading.
3698. Was that the inmost stenton? Yes, close to the end of No. 1 heading.
3699. Did you examine any props in No. 2 heading? I cannot say that we did examine any of them very specially, but in No. 1 we saw one charred $\frac{3}{8}$ of an inch deep.
3700. Do you call that a special examination? Yes, but we were chased round as if we were going on a walking-match.

3701. You considered it of more importance to go round and examine these places than making any attempt to find out the seat of the accident? The seat of the accident seemed to be generally understood. At any rate, a good number of men were under the impression that it occurred in No. 2 heading.

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3702. In point of fact, you had no business down the pit? Perhaps so, but the miners thought I had, or they would not have asked me to go.

3703. Did any of the miners report to the management when they heard of the dangers existing; you say it was a matter of general conversation, and you were so impressed with the danger that you exclaimed "God help you; one of these days you'll get it;" did any of this general conversation reach the ears of the management? I cannot say whether they reported it to Mr. Ross or not; I am not aware of it if they did.

3704. You are perfectly aware that you have full power to appoint two check-inspectors? I did not have full power myself; the miners have power, providing they had the means of paying for the work.

3705. But the management could not possibly stop you from doing that? I brought the subject under the notice of the men at several meetings, but the inspectors were never appointed. I do not know, but suppose it was because there was no means of paying them for the time they would be away from their work.

3706. What did you report to the miners when you made the special inspection of the mine? Several of the most important facts in connection with it. We reported that we found a number of props charred, and that we found a bord driven much beyond the distance required by the Act; that the bord was in No. 3 heading, and that it was 41 yards beyond the stenton, and that we could not get through the return from the "gassy" section into the western, and consequently that we had to come out by the main road. When we reached the junction of the western road, I asked if it would not be better to postpone the inspection until next day, but they said we had better finish it that day, as the horses were smelling very badly, and that it would be easier to finish it then than to come in again next day.

3707. Were the miners satisfied with the inspection? No, they were not.

3708. You only examined a few bords? We examined a number of bords when we got into the western.

3709. You only examined three in the Hill End district? I believe only three.

3710. *Mr. Hilton.*] You have just stated that you could not travel the return from the "gassy" to the western—was it from the "gassy" to the western, or from the western to the furnace? It was from the gassy to the western. We went a certain distance, but owing to a fall of rock, the road was partially blocked. However, Mr. Ross could not find his way through.

3711. *Mr. Owens.*] You were outside when the bodies were coming out? I was there the greater part of the time.

3712. And you viewed the bodies? Yes, a good many of them.

3713. Did you notice signs of burning on them or not? I did, and I saw that a good many of them were badly burnt.

3714. And were several of them not burnt at all? Yes, I believe so. There were several that I only examined about the head and face, and on a good many of them I saw no traces of burning on these parts; but a large number of them had traces of burning on their faces.

3715. When you went into the mine, the fifth day after the explosion, which way did you go? We went by the main incline first.

3716. Did you go over the big fall? As we came back we went over the big fall, and up to the Hill End district. We did not go over the big fall in the main tunnel.

3717. When you were near it did you smell any powder or dynamite smoke? Not the slightest.

3718. You say you only examined three bords in the Hill End district? I believe so.

3719. Did you try for gas in any of these places? We tried the faces of one of the bords, but found no gas. No gas was supposed to be in any of these bords; and while we were there I was told by Inspector Owen and Mr. Evans that there was no gas in any of them.

3720. Before the strike where did you work? In the grip, close to the return air-course.

3721. Have you worked in the Hill End district? Yes, but not since the gas was struck.

3722. Can you vouch for the statement that the miners never attempted to appoint check-inspectors? There was a resolution passed by the district to the effect that we were justified in making use of the Coal Mines Regulation Act wherever it would benefit us. Three times I communicated with the Bulli miners on this subject, but it was never acted upon.

3723. Did Mr. Ross ever object to it? Not to my knowledge.

3724. You have given us your interpretation of No. 6 rule; are you aware that the majority of the miners so interpreted it to mean that if they reported danger they would fall out with the management? Yes, that was the unanimous feeling.

3725. Was this interpretation put to any meeting of the men? These rules were all condemned by the men, and I pointed out the matter to Mr. Hamilton.

3726. I mean this 6th clause? The men thought it would mean dismissal if they reported.

3727. Are you thoroughly convinced in your own mind upon that point? Yes.

3728. *Mr. Jones.*] Did you communicate or indicate that interpretation to Mr. Hamilton? I did indicate it. I told him what the feelings of the men were in connection with these rules.

3729. You have stated that you did not consider it your duty to inform the manager of the blower of gas of which you had been informed? Yes.

3730. Does this explain what you mean: Rule 15 says:—"Should any unexpected discharge of gas occur, the overman must order all naked lights to be extinguished, withdraw the men and boys, and make the manager acquainted with the case, in order that the evil may be remedied and the places restored to their proper working order"; was that the simple reason why you did not write to the manager? I knew that these rules provided for it, and that a certain number of men were working where gas was known to exist with safety-lamps. More than that, the management for a long time had been paying those men who used safety-lamps 3d. per ton extra; therefore they must have been aware of the existence of gas.

3731. Do you know that the manager was aware of the large blower of gas? I could not say he knew of the existence of that.

3732. Was it possible for a blower of gas to exist that could be heard at 100 yards without the overman becoming acquainted with it? I should think not, but I do not know, as Westwood did not say whether he had reported it to the overman.

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3733. I have read you the law in reference to the duty of the overman—was that the reason that deterred you from taking any steps as Secretary of the Union? Yes, that was the reason.

3734. *Mr. Croudace.*] In answer to Mr. Jones, you said that that portion of rule 15 referring to the duty of the overman prevented you from reporting this blower to the management? I did not consider it necessary under that rule.

3735. But I will read another part of the rule; going on from where Mr. Jones left off, the rule says: "Hewers and others, when using naked lights, are strictly cautioned against the discharge of gas where faults, rolls, and backs are met with; and on its appearance they shall immediately leave the place and report to the overman, and shall on no account return to the place without proper authority"; were you aware of that part of the rule? The hewer in question was using a safety-lamp.

3736. The rule still applies, does it not? I do not think so.

3737. *Mr. Croudace.*] The spirit of it shows what you are to do.

Witness. I beg to differ from you.

3738. *Mr. Croudace.*] You may differ with me if you like.

Witness. I do. I think there is a very great doubt about it; for a safety-lamp is very different from a naked light.

3739. *Mr. Croudace.*] Well, we will come to No. 6 of the new rules of employment; I would just like to ask you a few questions on it, with a view of putting yourself right—an order is, I presume, a command, or some instruction given? Certainly.

3740. You are quite sure of that? Yes.

3741. No. 6 rule says:—"Any employee interfering in any way with the orders issued by the colliery manager or his overman for regulating the work of the mine, shall be liable to dismissal without notice"; you see it applies only to "orders"; can you apply it to anything else by any twist you like to give it? I do not think it requires any twist. I take this rule in conjunction with rule No. 3, and I say it prevents men from making any complaint whatever.

3742. By any twist can you, as an honest man, say that you misunderstand so simple a rule as that; it says, "Any employee interfering in any way with the orders;" you see you are confined to one thing—"orders" for regulating the work—it actually stipulates how the rule is confined? I will explain my meaning by stating, that if I objected to drive my place in the colliery further ahead from the cut-through, on the ground that it was too far in advance of the air, and the management said it should be driven ahead because I was going over a fault (which has been done), that would be interfering with the orders, strictly speaking.

3743. Am I to presume that, in the first place, you had received orders to go on with it? I have known such to be the case when men have been driving over stone.

3744. *President.*] Since these new rules came into operation? No; I have not been working in the Bulli Colliery since.

3745. *Mr. Croudace.*] I will put this rule to you again: "Any employee interfering in any way with the orders issued by the colliery manager or his overman for regulating the working of the mine shall be liable to dismissal without notice." Is not that very simple? It is very simple.

3746. An order, I take it, is this: Suppose the overman ordered a wheeler to wheel from Nos. 1, 2, and 3, and afterwards some miner ordered him to wheel from Nos. 5, 6, and 7, would not that be clearly a breach of the rule? Decidedly.

3747. Suppose, then, the overman ordered you and your mate to work in No. 1 heading, and Smith and son to work in No. 2 heading, and that afterwards you reversed the order, would not that be a breach of the order? It would.

3748. But would it be any breach of this rule or order if you suddenly struck a blower of gas or came across a bad piece of roof or a quantity of water (I do not care what it is), would it be a breach of any order if you went and reported the same at once. Do you really think that would be any infringement? Mr. White considered it an interference even previous to these rules being enforced.

3749. But would you think it a breach of No. 6 rule if you told the deputy and overman that you had met with a blower of gas unless they had previously said to you "If you strike a blower of gas you must not report it to anyone." Did you ever receive an order from the manager, or from the overman or deputy not to report to them a blower of gas or the presence of gas in any form? Never.

3750. Have you ever heard that any man had received any such order? I have never heard it personally, but I have heard the men say that they would be discharged for reporting.

3751. But you never heard any such order given? Never.

3752. Now, in reference to this rule 3, which says "*Absence from regular duties*" "Any miner or other employee found in any part of the mine or colliery other than that in which he should be working without the consent of the colliery manager, shall be liable to dismissal without notice." Is not that, in this particular mine, an absolutely necessary rule, particularly in this Hill End district? It would be if everything else was properly carried out.

3753. We are told that the men in the bords off No. 2 heading worked with naked lights. In the headings where a large quantity of gas existed, safety-lamps were used. Would it not be necessary to prevent the men working in the bords going into the headings with their naked lights? Exactly.

3754. Of course it would, and why allow the wheeler to go in the heading and hang his safety-lamp on the danger-board?

3755. *Mr. Croudace.*] The wheeler receives a positive order that he is not to take his lamp beyond the danger-board. If he did he would clearly break the rule. In this particular instance, there should be no misunderstanding, and I take this opportunity of having all these rules explained as best I can so that no one should turn and twist such a simple rule as this when, as far as I can discover, there is honestly and fairly no occasion.

Witness.] What other construction could the miners put upon the rule when they were told by Mr. Hamilton that the management would not allow any interference whatever.

3756. Did you mention anything of this blower to Mr. Hamilton? No; it was previous to the striking of the blower. I am not aware that any body was working in the pit at the time I speak of.

3757. Have you seen Mr. Hamilton since the blower was struck? Not to speak to him.

3758. What did Mr. Hamilton point out to you in reference to this particular rule? He said they could not alter the rules, and that they would have no interference with the management whatever.

3759. But did he specially mention rule 6? No.

3760.

3760. Did you not see the urgent necessity of having stringent rules, particularly in a colliery where gas exists? Yes; and I have always tried to observe them.
3761. Have you observed the system of ventilation that was pursued in this mine. Do you know the western door? I did know that a door was in existence before the strike.
3762. Did you know the door which separates No. 1 heading from No. 2? I was never in the gassy district while that turn was working.
3763. We are told that the turn and the bords off No. 2 heading were working with naked lights, and that gas was always being given off in No. 2 heading. Do you consider that a prudent principle? I do not, and I think it was done to save 3d. per ton charged when safety-lamps were used.
3764. It is a fact then that it was done, and that the 1st, 2nd, 3rd, 4th, 5th, 6th, and 7th bords were working with naked lights, and lights were also allowed in the cut-throughs? Yes.
3765. Is it a fact that the return air from No. 1 heading goes into No. 2 heading and returns by way of these bords? Yes.
3766. Would not the gas from this large blower have a tendency to go into these bords supplied by the return air? Yes; if there was not sufficient ventilation to carry it away. But of course, if it was sufficiently mixed with pure air the air the gas would become harmless.
3767. Did you ever hear the men working in these bords complain of any extra gas coming towards them, or of the danger of its doing so when this blower was coming off? No.
3768. Don't you think it likely that if there was such a large blower that they would have felt the effect of it? I had not an opportunity of knowing or of hearing their conversation.
3769. Is it natural to suppose so? It would be a natural supposition.
3770. When you were in the western district did you see any gas whatever there? We did not see a bit in the western.
3771. Independent of what masters may do, or masters' associations may do, the men can undoubtedly shelter themselves behind a much higher power for the purpose of making their own inspections of the mine at least once a month. Do you know that you can do that without interference? We have the right, but we were unable to carry into effect.
3772. Would you have me to believe that this was an impossibility at the Bulli Colliery where there were at least 160 men working. Was it impossible to get that number of men sufficiently interested in their own lives to pay 3d. per month each for the purpose of sending two men round the mine to inspect it? I believe they would very readily do it.
3773. Then why did they not do it, for there is no power to stop them? Had that conference been granted it would have been done.
3774. Would you have me to believe that the men so utterly disregarded their own safety that they would not pay 3d. per month to secure it? I do not know, but I believe that the men would not object to the expense, for I have always found them very willing to shell out where there is any cause for it.
3775. *Mr. Hilton.*] Have the miners got an anemometer for the purpose of testing the air when making inspections of the mine? I believe there are two or three in the district. [*The witness withdrew.*]

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SATURDAY, 14 MAY, 1887.

Present:—

The PRESIDENT (DR. ROBERTSON), IN THE CHAIR.

MR. O'MALLEY CLARKE,
MR. NEILSON,
MR. CROUDACE,

MR. JONES,
MR. OWENS,
MR. HILTON.

Henry Osborne McCabe sworn and examined:—

3776. *President.*] You are a mining engineer, and manager of the Mount Keira Colliery, Wollongong? Yes.
3777. I believe you have had extensive experience as a mining engineer in different parts of the world, Mr. McCabe? Yes, since 1881?
3778. And in some of the larger and better regulated collieries in the north of England? Yes.
3779. And consequently you have gained considerable knowledge of the properties of gas? Yes.
3780. When did you visit Bulli Colliery after the accident? At about half-past 10 o'clock on the night of the accident.
3781. Did you proceed into the mine on your arrival? Yes.
3782. Where did you go to first? I went into the straight, up Hill End, and got as far as that big fall.
3783. Did you go over the fall at that time? Not at that time. There was not sufficient room for the air to travel, and we arranged to make room.
3784. Did you afterwards proceed over the fall? Yes.
3785. With what object? To recover the bodies.
3786. Did you go over the fall in the straight-in heading? Yes.
3787. Did you come to any conclusion as to the cause of that fall in the straight-in heading? Yes; I considered it was the natural result of an explosion.
3788. Have you been long acquainted with the Bulli mine? Yes.
3789. I believe you were surveyor for the landowners, and as such you have travelled the tunnel several times? Yes.
3790. Did you observe whether any body of stone was resting on the top of the timber? Yes.
3791. And if that timber from any cause was knocked down it would have a tendency to cause a fall? Yes.
3792. We understand that the regulating door at the western was destroyed, and that the air that formerly went into the Hill End district was coursing down into the western? Yes, that was so.
3793. Did you repair that door temporarily? No; that stopping was put in some little time before I got to the mine.
3794. The following day did you search the No. 1 and No. 2 districts, in the Hill End section, with a party of men whom you conducted? Yes.
3795. Were you the first to arrive there? Yes.

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3796. When you reached the top of the bank head, or the top of the incline, did you notice six bodies lying there? Yes, five or six.
3797. Did you examine those bodies to ascertain whether they had or had not been burnt? No, I did not examine the bodies there; but here are some tokens that we got on the top of the incline. [*The witness produces portions of bark from a prop, also several tokens picked up by him at the top of the incline.*]
3798. Does that bark appear to be burnt? No; it does not seem to be burned; it seems to be blackened with dust.
3799. Did you not examine the bodies? No, sir.
3800. Did any one of your party examine the bodies? Some of them did.
3801. But you have no personal knowledge as to whether they were burnt or not? No.
3802. Did you examine the props and other combustible material along the road to ascertain whether fire had travelled along that road? Here and there I did.
3803. Did you observe any at that point? No fire, or a trace of it.
3804. Before going to No. 1 and No. 2 headings did you discover the bodies of two boys? Yes.
3805. Were they burned? I did not look at them to discover that. I would sooner take evidence from the props, &c.
3806. Did you, or any of your party, take a note of the position of the bodies for the purpose of identification and otherwise? When we were down in No. 1 heading Mr. Green entered them on a piece of paper; I had no book.
3807. Mr. Green was along with you? Yes.
3808. How many bodies did you pass in No. 1 heading? Seventeen, according to Mr. Green's tally.
3809. Did you examine those bodies to ascertain whether they were burnt? No, I did not.
3810. In what way were they lying on the road? As if they were making out-bye. One man appeared to have been running, and knocked down in the act.
3811. Did you go into any of the bords? Yes, I went into several bords along No. 1 heading.
3812. Did you discover any gas in the bords? None in the bords.
3813. Your examination of the bords would be on Thursday—the day following the accident? Yes, on the Thursday morning.
3814. Had gas existed there, would you have discovered it on the Thursday at that time? Yes, I think so.
3815. The ventilating current was deranged on account of the accident? Yes.
3816. And the full quantity of air did not pass round the bords? No.
3817. Is that your reason for stating that, had gas existed in any of the bords, you would most likely have discovered it? Yes.
3818. In the face of No. 1 heading, did you examine it? Yes.
3819. Did you see bodies lying in the cut-through? There was one lying there.
3820. Was there a deputy's lamp beside it—a copper lamp? I did not see the lamp that day; I heard next day that one had been found.
3821. Did you examine that man to discover traces of burning? No.
3822. Did you find gas in the face of No. 1 heading? We found just a little there.
3823. Did you penetrate into the face of No. 2 heading? Not until later in the day; I got into No. 2 heading about 1 o'clock.
3824. Were you the first to get into No. 2 heading, as far as you know? Yes.
3825. Did you examine for gas in No. 2 heading? Yes, there was a little gas there.
3826. Did you roughly examine the quantity? It ran about 6 or 7 yards, I think.
3827. How deep was it? I just got the trace of it in the roof.
3828. Did you go to the face of heading, beyond the skip? Yes, I went in to look for a body.
3829. There was no body there? No.
3830. And what did you discover at the face of the heading? There appeared to have been a shot fired there.
3831. Then, where did your exploration extend to after passing through the cut-through from No. 1 heading, down to the bords of No. 2 heading on the main road—did you examine for gas in those bords? Well, I did not go down every bord. Robins was with me, and being slightly sick, I asked him to go, which he did, but saw no gas. I have no personal knowledge.
3832. Did you go into Nos. 3 and 4 afterwards? No, the next shift took those.
3833. When did you return to the mine, Mr. McCabe? On the Friday morning, at 6 o'clock.
3834. Where did you go to on Friday morning? The first thing we did was to look for four bodies said to be missing in Hill End.
3835. Did you find them? Yes; they were found through the stopping at the foot of Hill End.
3836. What other portion of the mine did you visit on Friday? We travelled down the Hill End return to the Western.
3837. In what condition did you find the return? It was in good condition—better than we found it last Saturday; that bit of a fall there took place since the explosion.
3838. Separating the return from the western main tunnel there is a door? Yes.
3839. Was that deranged? Yes, it was blown down, and the overcast too.
3840. How does the return from Hill End pass the western road? By the overcast.
3841. Did you examine that overcast? Yes, it was blown down.
3842. In what condition did you find the western, or did you explore it, after travelling the return? Not then. We went back into Hill End and made arrangements to get the bodies out. We were rather short of men, and we went out to send more men in before we opened up the western to get the bodies out.
3843. Had you also the exploring party that penetrated the western? Yes.
3844. How many bodies did you find in the western? Sixteen.
3845. Was much damage done to the roads there? No, with the exception of the fall on the flat.
3846. Proceeding from the overcast towards the face of the western tunnel, did you observe any damage done to the doors? Yes, there was a door blown down, that was driving the air up the right-hand heading.
3847. Where did you find the men in the western? They were all on the roads, as if they were coming down the roads.

3848. As if they had been apprised of danger? Yes; as if they had been apprised of danger and were making out. Mr. H. O. McCabe.
3849. Did you examine the timber in other parts of the western roadways to ascertain whether a good deal of fire had penetrated that part of the colliery? Yes. 14 May, 1887.
3850. Did you find any trace of fire? No.
3851. Did you examine the quantity of air on your visits to the Bulli mine since the accident? No; I had no anemometer with me, but Mr. Rowan had, and he told me.
3852. Do you recollect whether the quantity was materially diminished by the explosion? It was materially diminished, of course.
3853. Did you go to the furnace? Yes.
3854. How was the furnace working? It was burning very brightly and working well; there was any amount of air there.
3855. On what day was that? On the Friday.
3856. By that time the workings would naturally be cleared out and the ventilation partially restored? Yes.
3857. How long had you been acquainted with the gassy section, or Hill End district? I have known the colliery for the last five years.
3858. At the entrance to the western road from the main tunnel a regulating door was placed? Yes.
3859. Can you describe to the Commission the character of that door, as some little dubiety appears to exist on the point; was there a slide—a regulator upon it, or was it simply a hinge door? It was a door that opened and shut to allow the sets to pass. I think it had a hole in the middle to allow a certain quantity of air to pass through. That is what I understand.
3860. You have never measured the quantity of air on any occasion that you found passing down the western? No.
3861. Generally speaking, did you consider Bulli a well ventilated colliery? Since this new furnace was put up there has been plenty of air there.
3862. How long has this new furnace been in working order? Since the beginning of the year, I understand.
3863. Do you know of your own knowledge whether an attendant was placed at the western to open and shut the door on the passing of the sets? No; I presume there would be; I was never in the pit when she was going there.
3864. There is also a door between Nos. 1 and 2 headings on the main tunnel? Yes; it was to drive the wind up No. 1.
3865. And also a door on the diagonal between Nos. 1 and 2? Yes.
3866. Was that for the same purpose? Yes.
3867. Do you know of your own knowledge whether trappers were kept to attend these doors? No.
3868. Is the presence of suchlike doors on main roads an extraordinary circumstance in mining? No; it is done occasionally.
3869. Have you frequently seen doors that regulate the currents on main tunnels? I have them myself.
3870. Do you provide trappers to attend them? Yes.
3871. We are told that a train of skips in the Bulli mine consisted of twenty; how long do you think such a train would occupy passing through a door? Running at the rate of 3 miles an hour, it would take about half a minute to a minute.
3872. The duty of the attendant is to open the door as soon as a train comes forward, and shut it immediately the train passes? Yes.
3873. Would the opening of such a door materially alter the ventilating current in Nos. 1 and 2 district? Not if it was merely open long enough to allow a set to go through.
3874. If it had been propped open by a prop or stone, would that have a different effect on the current? Yes.
3875. Have you ever heard, Mr. McCabe, or do you know of your own knowledge, whether on any occasion they were found propped open? No.
3876. You never heard of it? No.
3877. No. 1 was the intake? Yes.
3878. And the bords of No. 1 would necessarily receive the fresh air before the ventilating current reached the face of No. 1 heading? Yes.
3879. No. 2 heading, and the bords off it, would be on the return from No. 1? Yes.
3880. Do you know how much air circulated through Nos. 1 and 2 since the new furnace was put in operation? I have heard that it was 12,000 feet.
3881. Who informed you? I think it was Mr. Rowan, the inspector.
3882. Would you think that an adequate amount of ventilation? Yes.
3883. Would you consider that with 12,000 feet of air passing over or through seven or eight working bords, the use of naked lights in those bords was a dangerous operation? No; not if there was no gas giving off.
3884. Have you ever seen any gas given off in these bords? No; I was only in them on this occasion.
3885. You say that on the occasion upon which you examined for gas, had it been present, it would very probably have shown itself? Yes.
3886. On account of the derangement of the ventilation? Yes.
3887. Would you apply the same remarks to the bords off No. 2, gas being found in the headings of Nos. 1 and 2? It would, doubtless, be better to use safety-lamps there.
3888. Although safe to use naked lamps in the bords off No. 1, you consider it would be better to use safety-lamps in the bords off No. 2, that being on the return? Yes.
3889. The air current being fouled more or less by the gas issuing from Nos. 1 and 2? Yes; that is my meaning.
3890. Did you find any brattice in Nos. 1 and 2? No.
3891. Do you consider that the presence of gas in No. 1 and No. 2 headings ought to have suggested brattice being applied or adopted? Yes.
3892. For what purpose? In order to keep the ventilation right up to the face, and sweep out the gas in small quantities as it issued.

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3893. Do you, of your own knowledge, know anything of the condition of the returns from the western to the furnace? No, I have never travelled them; but there must have been a return, for there was 12,000 feet of air at Hill End, and 10,000 or 12,000 from the western. There must have been room for it to travel somewhere.
3894. Have you come to some definite opinion as to the cause of the disaster? I consider that the gas fired in No. 2 heading, proceeded down the heading, a portion of the flame, on passing through the last cut-through, shot towards No. 1, and probably picked up a little gas from No. 1, and proceeding down No. 1 the two currents joined. The blast proceeded down No. 2 into the third bord above the tunnel, through the cut-through, out of the third bord, into the tunnel.
3895. What evidence of destruction have you in the tunnel? These stoppings blown down here [*tracing the positions on the plan*]. The current going against the stoppings on the main tunnel, blew these upwards from the tunnel, and separating, one portion of the blast proceeded out to the tunnel, and another towards No. 3. and No. 4.
3896. Trace the position that goes in towards the face. The portion of the blast that passed inwards towards Nos. 5 and 6 expanded itself at the face. The portion that passed through the stoppings followed the return, and on reaching the door leading into the western, tilted it, and proceeding over the overcast to the left, blew the overcast down.
3897. Having blown the overcast down, where was it likely to go then? Finding an exit at the overcast, this portion was carried inwards towards the face of the western workings, and another portion backwards, the entrance to the western.
3898. In your opinion that is the course the blast took, and you are guided in your opinion by the evidences of the workings, charred props and coal-dust? Yes; and the position you see the skips in, the skips in the western workings having been blown towards the face.
3899. You have had considerable experience, Mr. McCabe, in large and well-regulated collieries, where strict discipline requires to be maintained, in the North of England? Yes.
3900. In the presence of gas what practice is followed as to the firing of shots in any of the collieries with which you are acquainted in England? The miners were not allowed to fire their own shots at all; they were always fired by the deputy.
3901. How did you fire them? With touch-paper, lighted by a heated wire passed through the interstices of the gauze.
3902. Do you consider that preferable to lighting the touch by tilting the flame of the lamp? Very much; I would not like to see that done.
3903. You think it would be unsafe? Yes; and it would damage the gauze.
3904. Would there be a liability of the flame passing through? Yes, there would be danger; but where you can detect the trace of gas, shots should not be fired.
3905. In England you refer to? Yes.
3906. The theory has been propounded here that it is possible an accession to the force and intensity of the blast might have been derived from a quantity of gas stored in the first or second disused bord off No. 1 heading. Do you consider that a feasible theory or hypothesis? No; I hardly think any gas would be stored there.
3907. Knowing the position of these bords with respect to the intake air, supposing this second bord to have contained a magazine of gas, and it had been fired from No. 1 heading, would you have expected to see second evidences of an explosion? Yes; I should have expected to see the stopping blown down.
3908. Would you have expected to have seen it blown out towards No. 2? Yes.
3909. Did you observe any other stoppings to be blown down between Nos. 1 and 2? No; the tops were blown off them.
3910. How many? I do not think more than four.
3911. From the time of the explosion the current of ventilation would be suspended? Yes.
3912. You carried the ventilation with you as you went along? Yes.
3913. Do you think that the quantity of gas in Nos. 1 and 2 headings, unassisted by other explosives, would have caused the damage done? I hardly think it would. I have an idea that coal-dust assisted the gas explosion.
3914. Picking up the coal-dust, it went along, and increased in this way in volume? Yes; the coal-dust provided fuel, as it were.
3915. If the area of the workings had been considerably larger, do you think the effect of the explosion would have been so remarkable? No; I think it would not have been much more than a puff if it had not been so confined.
3916. The whole of the force, in fact, was directed into these two places? Yes.
3917. *Mr. Hilton.*] I understood you to state to the President that you did not find any evidence of brattice being used in the gassy section? Correct.
3918. Do you consider it was necessary to use brattice in the gassy section? In those headings I would use brattice.
3919. *Mr. Owens.*] Which way did you proceed to the headings? Up the engine plain. I went up the slacky way first.
3920. Did you go over the big fall near the tunnel mouth? Not till last Saturday, because I could not get that way at first.
3921. You are of opinion that if a magazine of gas existed at the point which has been indicated, that the force of an explosion from that would have shown itself on the nearest stopping? I am of opinion that if a separate magazine of gas existed in the second bord above the tunnel, that the stopping opposite the mouth of that bord would have been blown clean away towards No. 2.
3922. *Mr. Jones.*] I think you have already stated that after arriving at the last stenton through No. 1 heading, you found little or no gas, and you have further stated that you found a similar amount in No. 2 heading. I suppose that would be at a time when the ventilation was virtually suspended? Yes.
3923. Now, with an air current of something like 12,000 feet passing, would you have expected to find any gas at all? That would depend. You see, there is a roll in the face of this heading, and the gas might make at one time and not at another, coming off that roll.
3924. You say that on the occasion of your visit you found little or none. I ask you, would you have expected to have found any with 12,000 feet of air passing? I do not say you would not see gas at all with a bigger ventilation.

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3925. Do you think there could be a sufficient accumulation with that amount of air passing to cause the destruction you saw at Bulli? It would depend upon how much gas was making off that roll at the time the air was passing.
3926. The roll was there at the time? Yes; it is there now.
3927. And you say you found little or no gas there? Yes.
3928. Then I suppose you would say the probabilities are that the roll gave off less when you visited it than when the explosion took place? Yes.
3929. Do you think it possible that an amount of gas had accumulated sufficient to cause the destruction you have described? No.
3930. Do you consider the Bulli mine a dusty mine, such as you have seen in the North of England? No. It is not a very dusty mine; but it is dusty.
3931. Do you consider it dusty in Nos. 1 and 2 headings, travelling to the Flatt, where only the men and horses travel? It is dusty.
3932. Do you think there is sufficient dust to be likely to participate in an explosion? Yes. You see we do not know this gas yet. We have not experimented upon it. But we must take dust as a factor which would increase the force of an explosion.
3933. Can you point to any instance in your experience where an explosion has taken place, and dust has played an important part, in a mine such as this? I have only seen one explosion before this.
3934. But from your reading you may be able to speak? Well, I was reading the other day of an explosion in a mine that gave off no gas at all—the explosion being caused simply by dust.
3935. You have already referred to the door on the main engine bank opposite No. 1 and No. 2? Yes.
3936. Presuming that one of these doors had been left open, would that cause an accumulation of gas? Yes; you would expect an accumulation of gas there if that door was left open.
3937. Can you refer to any dusty mine in the old country that would compare at all with the circumstances of Bulli, where an explosion has taken place? I know of none.
3938. We have been told that previous to the new furnace being started it was a custom to work with safety-lamps in the bords off Nos. 1 and 2 headings? Yes.
3939. Now, in view of what has happened, and in view of your own knowledge and experience that little gas could have accumulated in these headings, do you think it would have been a greater measure of safety to work the whole of these places with safety-lamps? Yes. But where you take in safety-lamps you also bring in a new element of danger.
3940. Do you think it judicious of the management to consult with the men on the question of a danger, both for the protection of the lives of the men and the property? Well, the manager is supposed to be competent, and the men are supposed to report to the manager if they see any danger.
3941. But in view of these places having been worked with safety-lamps previous to the new furnace being erected, and the fact that they had been known to give off gas, would it not have been only a wise precaution to have used safety-lamps in these particular places—No. 1 and No. 2 headings? Do you mean in the headings?
3942. I am referring to the bords? Yes; I think it might have been better to have kept safety-lamps in them.
3943. *Mr. Clarke.*] In what way do you think the gas was fired? I think it was fired from a shot in No. 2 heading.
3944. In what different ways might the gas fire from a shot? Well, the shot might be very slightly tamped, and it might be blown out, in which case the flame would come from it.
3945. Would the nature of the material used in tamping have anything to do with it? Yes. Coal-dust would be a very dangerous element.
3946. Then you think the gas did fire from a shot? Yes.
3947. Would the finding of an ordinary miner's lamp near the face two days ago have an influence upon your opinion? Well, it might have fired at that lamp if it was alight.
3948. *Mr. Jones.*] Respecting the finding of the miner's lamp, is it not possible that the lamp might have been taken there for special use? Yes.
3949. That is travelling outside Nos. 1 and 2 headings to the mouth of the tunnel? Yes; it might have been that.
3950. *Mr. Croudace.*] We have been told, Mr. McCabe, that there was a certain door here between Nos. 1 and 2 headings? Yes.
3951. There is one on the diagonal course, and a single door at a point between Nos. 3 and 4? Yes.
3952. Now with the same course or system of ventilation previous to the strike—that is, on the intake tunnel—and the same number of doors existing, and the same course of ventilation, but with this addition that since the strike there was a trapper-boy placed on the door between Nos. 3 and 4, which would you consider showed the greater precaution? I should think greater precaution was shown since the strike by placing the trapper-boy to open and shut the door.
3953. We have also in evidence that, previous to the strike, there was only a quantity of from 2,000 to 4,000 feet of air going through the last holed stenton in No. 1 heading, and between Nos. 1 and 2, and ventilating the whole of this Hill End district. Since the furnace, we have the statement that a new furnace has been put in operation, and that there has been measured 12,000 feet of air going through the same stenton, and ventilating the same district. Would you consider that a great improvement was shown there? Yes; the increase in the ventilating current to 12,000 feet of air would be a great improvement.
3954. Single doors are placed at these different points; do you consider that these portions of the mine would have been rendered safer had there been two doors placed at a sufficient distance apart to allow travelling sets to pass through without both being opened at the same time? Yes, it would, no doubt, have been safer to have two doors.
3955. But having only one door do you consider that all knowledgable care was taken in placing one trapper at each of these doors? Yes; I do.
3956. Now, we have been told that it has been the custom to fire shots at Bulli by tilting the lamp to light the touch-paper. Do you consider that unsafe? Yes.
3957. What would you say, if I told you that it has been known for a man to work with the top of the gauze of his lamp actually burnt out? I think it would be highly dangerous, and I think the man who would do such a thing ought to be put in goal.

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3958. In using safety-lamps, do you consider it prudent to have them locked? Yes. [*Plan examined.*]
3959. It has been advanced that the explosion in its course might have ignited gas from two or three bords started on the left-hand side of this return airway, and which are driven up to the dyke. Do you think that at all probable? No; I do not.
3960. Did you examine these stoppings between the two headings [*referring to the workings to the west of the main tunnel*]? No.
3961. Do you think a second explosion took place there? No; it would not have been possible, because the body immediately opposite to these bords would have been charred to a cinder.
3962. If I told you that the stoppings immediately opposite these bords were not disturbed at all? That would upset any theory about gas being there.
3963. What would have been the result of any body of gas being there? It would have blown those stoppings out.
3964. *President.*] Does that place bear any evidence of being the centre of a separate explosion? No; none at all.
3965. *Mr. Croudace.*] It has also been advanced that the explosion might have gathered force from the admission of gas in the old workings here [*pointing to old workings west of the dyke*]. Do you think that probable or possible? No; I cannot see any reason for gas being in those old workings at all. There was sufficient air going through the old workings to keep them clear.
3966. Have you heard of any gas being taken up to the furnace, or showing any signs of being near the furnace? No.
3967. Have you any idea of the extent of face open at Hill End—that is, in that particular part of the pit? I have not.
3968. Roughly, do you think it would be more than an acre? About that, I should say.
3969. Would an acre of opened-up coal be a very small limit in which to confine an explosion? Yes.
3970. In other words, would a comparatively trifling amount of gas in such a limited area cause the damage that we have seen? Yes; I have said before that it would only have been a bit of a puff if it had not been so confined.
3971. Coming to Nos. 3 and 4 headings, would it have been more prudent to have driven the main tunnel much further ahead—that is, to have had Nos. 3 and 4 much more in advance of Nos. 1 and 2, and separate the two pairs of headings by a greater distance, retaining Nos. 1 and 2 for a return airway? Working by panels altogether, yes.
3972. Would it have the effect of confining any explosion to each district? Yes; the effect of panels would be to confine an explosion.
3973. In other words, instead of breaking away the bords from both the headings to keep Nos. 1 and 2 wholly and solely in a return? Yes.
3974. Have you on any of your visits, either before or since the strike, seen any accumulation of gas in that mine anywhere that you know of? Never any accumulation at all. When I have been surveying the men I have had with me occasionally would say not to go in such and such a cut-through, as there was gas there. If I had met with any accumulation of gas I should have been blown out of the pit, as I used to go all over with a naked light.
3975. Have you heard of any such accumulation? No. The only gas I ever heard of was in the headings past the stenton, approaching the whin dyke.
3976. *Mr. Owens.*] Assuming that this door, between Nos. 1 and 2, was kept open for a considerable time, which shut off the air from No. 1 and No. 2, do you think that the effect would be to cause an accumulation of gas in No. 2? Yes; if it was kept open any length of time.
3977. And the bords here being worked with naked lights, would there be any danger of the gas being carried on to the lights? If the gas accumulated there, owing to the door being opened (and thus carrying the air past the headings), when it was shut again and the ventilation was restored the air would probably drive the gas on to the naked lights, and thus cause an explosion, if the gas was present in sufficient quantity.
3978. How long would the door have to be opened to do that? About half an hour, I should say.
3979. In your opinion where was the accumulation of gas that caused this explosion in Bulli mine? I consider that the gas and coal-dust have done it together. The explosion evidently started in No. 2 heading. The cut-through is scorched with fire from top to bottom.
3980. You do not consider that there was an accumulation of gas in any other part? No.
3981. *Mr. Jones.*] Do you know of your own knowledge whether any steps were taken to water the roads in Bulli mine? No.
3982. Do I understand you that as a general practice you would not permit ordinary workmen to fire their own shots in the presence of gas? Yes.
3983. *Mr. Hilton.*] Supposing anything occurred to the door at the junction of the western, would it cut off the ventilation to the Hill End district? Yes; it would diminish it considerably.
3984. Supposing those stoppings along the western road were in a good state of repair, and a regulating door was placed in the western return, would not that be a better arrangement than a door at the western junction? Yes; I am sure it would.
3985. And there would be less liability of accident? Yes. [*The witness withdrew.*]

John Evans sworn and examined:—

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3986. *President.*] You are the manager of the Mount Kembla Colliery, Mr. Evans? Yes.
3987. Are you a certificated colliery manager under the British Act of 1872? Yes.
3988. Have you had considerable practice as a mining engineer in the larger and better regulated collieries in Wales? Yes; I have been brought up from my boyhood in fiery mines.
3989. Where quantities of explosive gas existed? Yes; in very fiery mines.
3990. Did you know Bulli Colliery previous to the accident? I did not.
3991. Had you been through the workings of the colliery previous to the accident? No.
3992. And you know nothing about the conduct of the ventilation and the operations of the colliery before that? No; I knew nothing whatever about the colliery before the accident. 3993.

3993. When did you arrive at the colliery? I arrived there on the evening of the accident.
3994. Will you very shortly tell us what you did, and where you went? Having ascertained that an explosion had taken place, I went to the mine, and meeting Mr. Neilson and Mr. Ross, I offered my services to direct a search party, and they were accepted; the party was organized, and we proceeded into the mine to explore as far as we possibly could; I was satisfied that an explosion had occurred, and I set the members of the search party to clear the falls, put up stoppings, and penetrate into the mine as far as possible; we came across several bodies on the top of the incline.
3995. Did you carefully examine the bodies? I did.
3996. Did you find any marks or traces of burning upon them? No; I was satisfied they were not burnt.
3997. Did you examine the hair of any of the bodies? I did.
3998. Did you notice whether the hair was singed? Well, the hair was a little singed, as if it had been exposed to slight heat.
3999. And where could you expect the heat to come from—would you say it was from the flame caused by an explosion? I consider that the heated air after the explosion might probably singe the hair.
4000. Did you examine any of the props round the bodies to ascertain whether they bore any evidence of burning? Yes; I carefully examined them, and found no evidence of charring or burning or anything of the kind.
4001. Here is some string, Mr. Evans, evidently the string of some tokens picked up near the bodies; does that string present any evidence of burning [*string handed to witness*]? No; I do not consider it does.
4002. Would the hair of a man's head, or this string, be most sensitive to flame? Well, I should think the hair would be the most sensitive.
4003. You say the hair seemed to be singed? Yes.
4004. Were the clothes of these men burnt? No.
4005. Did the skin show signs of burning? The skin was affected as if by friction; they bore evidence of having been blown some distance, being very much lacerated and cut.
4006. Very well; what did you do then? After completing the shift up to 6 o'clock that morning I left, and was relieved by Mr. Green and Mr. McCabe.
4007. When did you return? I examined the mine again that day, in company with Mr. Rowan; measuring the ventilation we found 44,000 cubic feet passing.
4008. Of that amount how much was going into the Hill End district? Just at the entrance of the tunnel (No. 1) I found 10,000 cubic feet, but before reaching the place that quantity was reduced by leakage to 2,000 feet.
4009. Had the stoppings been blown down? Yes.
4010. Would that account for the leakage? Yes.
4011. Did you measure the quantity of air going into No. 1 heading? I do not think we did measure it on the heading; I have no recollection of measuring it there; but at the bottom we found on one occasion 10,000 cubic feet; there was a stopping or curtain put up to direct the current into No. 1, so that, with the exception of a little leakage there, this 10,000 feet was directed into No. 1; that was on the Thursday.
4012. On the Thursday morning you found 44,000 feet passing through the main tunnel, of which 10,000 feet was found passing through at the foot of No. 1? Yes.
4013. Did you examine the amount of air passing through the last stenton? Yes.
4014. How much was there? 2,000 odd feet; I remember that exactly.
4015. Were you present when the bodies were found in No. 1? I was not.
4016. Did you examine any of them afterwards? I only examined the body that was found in the 5th bord, I believe in No. 1.
4017. Was that Olsen's body? Yes; we found it had been accidentally left by the search party.
4018. Was it burnt? No.
4019. Do I understand you to say that you went through these workings on a tour of examination with Mr. Rowan? Yes.
4020. Did you examine for gas in all the bords off No. 1 heading? I did.
4021. Did you find any trace of gas on the Thursday? No; I did not find a trace of gas in any of the bords.
4022. Did you find any gas in No. 1 heading? I did.
4023. How much did you find? About 8 or 9 yards of it, a foot thick.
4024. Passing the cut-throughs did you find gas in No. 2 heading? Yes; there was 15 to 20 yards of gas there, about 18 inches thick.
4025. Was it a quick gas? Yes; it filled the lamp quickly.
4026. Did you observe a danger-board opposite the stenton at No. 1? Yes.
4027. It was standing? Yes.
4028. We are informed that an open lamp was found on a prop to which the danger-board was fixed. Did you see that board? Yes; it was a small wheeler's lamp.
4029. In what condition was the lamp? The solder on the lamp had been melted as if by great heat.
4030. Did you find any other lamps? Not in that heading.
4031. In No. 1 heading did you discover anything? No; I discovered nothing except that the danger-board had been blown down in the direction of the heading; but I discovered a coil of fuse in one of the bords off No. 2 heading, which was burnt or charred.
4032. Were you present on a subsequent occasion when some one discovered some loose powder in No. 2 heading? Yes; I believe that Mr. Dixon and Mr. Carpenter and some other gentlemen found a quantity of loose powder in the face of No. 1.
4033. Was there any fuse found there as well? I do not remember the finding of any fuse.
4034. Did you examine, with Mr. Rowan, the face of the bords off No. 2 heading? Yes.
4035. Did you discover any gas in any of these bords? No; none whatever.
4036. Would you infer from that, looking at the then deranged state of the ventilation, that no gas had been given off by these bords immediately previous to the accident? Yes.
4037. Did you examine the main tunnel, the stoppings at the foot of No. 2, and the Flatt on the main tunnel, and also Nos. 3, 4, 5, and 6? Yes.

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- Mr. J. Evans. 4038. Did you examine those places for gas? I did.
4039. Did you discover any? None whatever.
- 14 May, 1887. 4040. Does the same remark apply to these places that you applied to the bords off No. 2 heading? Yes.
4041. That is, if gas was given off in these places at the moment of the accident, you would probably have discovered it the day after the accident? Yes.
4042. Did you hear any gas issuing from crevices or blowing in either No. 1 or No. 2 headings? Well, yes, I noticed a little humming in Nos. 1 and 2 headings.
4043. That was probably due to gass issuing from the coal? Probably, and perhaps to a slight quantity of water.
4044. Did you notice whether the doors at the foot of and between Nos. 1 and 2 headings were or had been destroyed? I noticed they were destroyed.
4045. In what direction had they been blown? I believe this door [*pointing to the plan*] was blown towards the face of the tunnel. I cannot be sure, but I believe I saw fragments blown towards the face of the tunnel.
4046. Which door do you apply your remarks to—the one on the tunnel or the one on the diagonal road? The one on the tunnel.
4047. In the presence of gas in Nos. 1 and 2 headings, do you consider that it was prudent to permit the workmen in the bords off No. 2 heading to work with naked lights? [*Question not answered.*]
4048. With gas known to exist in Nos. 1 and 2 headings, was it safe, in your opinion, to work with naked lights in the bords off No. 2 heading? Yes.
4049. You think so. Were the bords off No. 2 ventilated by the return current? Yes.
4050. Would that be likely to be fouled by gas from Nos. 1 and 2? Not to a dangerous extent.
4051. Would that depend upon the amount of gas issuing from Nos. 1 and 2? Yes.
4052. Supposing a dangerous quantity of gas to be issuing from Nos. 1 and 2, would you still say so? No; but I do not consider the amount of gas given off by No. 1, in view of the amount of air passing, sufficient to cause a vitiation of the air.
4053. How was the gas from No. 1 and No. 2 removed from these headings—that is, how were they ventilated? Simply by means of the cut-through.
4054. Was that sufficient to remove the gas from the face? Well, no; I would have put a small quantity of brattice up to carry the air into the face, and dilute the gas as it was made, and so sweep it away in small quantities.
4055. So far as you have observed, was that done? No; I do not think it was.
4056. What are your views as to the firing of shots in the presence of gas? I am of opinion that no shots should be fired in the presence of gas under any circumstances.
4057. You would not use explosives? No.
4058. If you were told that high explosives, such as dynamite, nitro-glycerine, and such like explosives were used with wet tamping would you alter your opinion? No.
4059. You do not think it prudent? No.
4060. If you were informed that the Commission, which for a number of years has been directing its attention to this subject, by a series of elaborate experiments, had arrived at conclusions which pointed to the safety of firing high explosives with wet tamping, would you be inclined to accept their views? Well, I would, because they would have made searching and diligent investigation into such matters.
4061. Have you ever made any such experiments? No; I have not.
4062. According to the evidence, the method of firing shots adopted in Bulli Colliery was this: The common way of lighting a shot was to strike a lucifer match and light it, or, as in the great majority of cases, to tilt the safety-lamp to one side, allow the flame to impinge upon the gauze, and apply the piece of touch-paper outside the gauze in order to light it by means of the flame inside, and then ignite the fuse. Was that in your opinion a safe or prudent step? No; in my opinion it was a most dangerous practice.
4063. Can you suggest any other mode whereby greater safety or less danger would be secured? Yes; the shot should be fired with a red-hot wire.
4064. Passed through the interstices? Yes. But in no case should a shot be fired in the presence of gas. I lay down that as a basis.
4065. How would you proceed in places where there were stone rolls, as in Bulli? I would cause a sufficient quantity of air to circulate, and thus dilute the gas.
4066. You qualify the rule you have laid down to the extent that you would sweep out the gas as it was made? Yes.
4067. In saying that "Shots should not be fired in the presence of gas," you mean when the gas will show in the safety-lamps? Yes.
4068. Did you closely examine the western district of Bulli? I did.
4069. Did you observe any evidences of an explosion, or the effects of an explosion there? Yes.
4070. What were those evidences? Well, falls had occurred; the skips were blown in different directions, and other damage was done. On my first inspection I did not see any trace of fire in the western district; but since then I have had an opportunity of re-examining the mine, and I noticed some small incrustations of coal-dust about.
4071. In what part? In the western; in the return, I believe, from the Hill End.
4072. In what position from the return? Facing the main tunnel, contiguous to the door.
4073. The air-crossing over the main tunnel was blown down—is that so? Yes.
4074. Did you examine for gas in the face of the western workings? Yes.
4075. Did you find any trace of gas in the safety-lamp? No; not the slightest trace of gas.
4076. In your second examination of these districts did you notice any place in Nos. 1 and 2 where a pipe had been inserted in a blower? No.
4077. Have you ever heard of such a thing? No; I have not.
4078. From your inspection of the districts have you come to any decided conclusion or opinion as to the cause of this accident? Yes.
4079. And what is your opinion? I believe that an explosion caused by the firing of a shot occurred in No. 2 heading, the shot having been fired in the presence of gas which might, or might not, have been detected by the aid of a safety-lamp.

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4080. Have you satisfied yourself as to the course pursued by this blast? Yes.
4081. Will you shortly state the course? Yes. I am of opinion that the seat of the explosion was at the face of No. 2 heading. Proceeding down to the first stenton, a portion of the blast travelled through No. 1 heading, down to the main tunnel and outwards. The other portion went down through No. 2 heading near the entrance to the bords which had no cut-through, and travelled into the bords that had a cut-through down to the lowest bord, and coming out, blew straight through the stenton into No. 1 heading.
4082. Would that account for the stopping opposite No. 2 entrance being blown into the old workings? It would.
4083. Are you aware whether a horse and man were also blown through that stopping? Yes.
4084. About what distance from the tunnel were they lying? I should think the horse lay from 22 yards to 25 yards distant, and the men were lying in close proximity to the horse.
4085. Did you observe any skips on the diagonal road leading from Nos. 1 and 2, approaching the main tunnel? Yes.
4086. How do you account for the skips being in that position—where in all probability had this train of skips been at the moment of the explosion? I believe they must have been going down No. 1 heading.
4087. And do you think they were blown into the position they occupy now? Yes.
4088. Do you know if the positions of the skips have been altered in any way since the explosion? Yes; they have been slightly altered, because I found a body under one of them, and we had to tumble the skip in order to get the body out.
4089. Proceeding on to the Flatt, did you observe any evidence of the explosion? No evidence of fire, but I noticed evidences of force.
4090. Where did you notice evidences of force? Right along the main road, as if it had travelled towards the entrance of the main tunnel.
4091. There are two trains of skips on the Flatt between Nos. 2 and 3—were these damaged or tossed? Yes.
4092. As if considerable force had been expended upon them? Yes.
4093. How do you account for such a large loss of life from such a comparatively small accumulation of gas in No. 2 heading having been exploded? I have no doubt that the coal-dust on the Flatt played an important part in the explosion.
4094. In what way? By aggravating the force of the explosion, and creating a large percentage of carbonic oxide, which is very fatal to life.
4095. Would you be inclined to ascribe the terrible sacrifice of human life to the fact of such a small area of workings being involved in the workings? Yes.
4096. Had it been possible for the quantity of gas that you suppose to have exploded in No. 2 heading to have expended itself in a large area of the old workings, would you have anticipated the same disastrous results? No; I should not.
4097. Do you think, from your rapid inspection of these districts, that there have been separate centres of the explosion—in other words, that the flame from the face of No. 2 heading was transmitted to distant parts containing explosive gas? I do not think so.
4098. Have you ever considered the possibility of one or two disused bords towards the bottom of No. 1 heading holding gas at the point marked B on the plan? No; I do not think it is possible.
4099. Supposing for an instant that these two bords had contained a magazine of gas, and supposing also that the flame from No. 2, either by itself or through the medium of a dust-laden atmosphere, were transmitted to this distant centre marked B, what would be the results? Well, I consider if that bord there did contain a small accumulation of gas—and it could not be a large accumulation—it would not have added very much to the force of the explosion.
4100. Do you mean it would not have added to it? Oh, yes, it would have added to the force, but not very much.
4101. Did you examine the stoppings between Nos. 1 and 2? Yes.
4102. Did you find the first and second stoppings at all injured? Yes; the first and second were blown to No. 1.
4103. You mean to say that No. 2 stopping has been blown from No. 2 towards No. 1? Yes.
4104. Is that against the theory of a separate centre of explosion being in No. 2 abandoned bord, off No. 1? Yes.
4105. Had an explosion taken place in this second abandoned bord, in what way would you expect to see the force of such explosion expend itself? I should expect to see the stopping blown in the opposite direction.
4106. Did you examine the workings marked A, to the west of the main tunnel? Yes.
4107. A little below where the horse is at present lying, did you observe the entrance to some abandoned bords to the left, and going back towards the whin dyke? No; I did not observe that.
4108. Did you observe anything in these workings to lead you to believe that gas had existed and exploded in these two abandoned bords? No; I did not.
4109. Had a separate explosion taken place in the bords that I refer to, a little to the west of where the horse is lying, what effect would you expect, or where would the force have expended itself? It would have gone down the tunnel.
4110. And did the force not go down the tunnel? Yes; a certain amount went down the tunnel. But there would have been other evidences. This horse and man would have been blown through the stopping in a different direction—exactly opposite—and the props in that district would have shown some evidences of the explosion.
4111. Did you observe whether this horse showed evidence of burning? Yes; the hair was slightly singed.
4112. Not charred? No; not charred.
4113. Mr. Neilson.] You measured the air when you went in the second day? Yes.
4114. How much air did you find passing in the intake? I cannot give you the exact measurement from memory; but there was upwards of 44,000 feet going into the tunnel, and upwards of 80,000 going in the returns.
4115. Is there any probability of an explosion having taken place in the direction of the western return? No.

Mr. J. Evans. 4116. Supposing there had been an explosion there? Well, Mr. White would not have come out alive; neither would there be a furnace there to-day. All these stoppings would have been blown into the main tunnel. By the time the force reached the western district it had expended itself, and was unable to do any damage.

[NOTE.—In reply to further questions as to the course of the explosion the witness indicates the course on the special plan.]

4117. It would take a large amount of gas to vitiate 12,000 feet of air? Yes.

4118. When you entered the mine on the Thursday you examined these bords off Nos. 1 and 2 and found no gas? Yes.

4119. I suppose you had no difficulty in getting volunteers for exploring parties? Well, if I were to give my opinion I should probably offend. I do not consider I had the proper assistance I ought to have had on such an occasion at Bulli.

4120. Did you bring men with you from Mount Kembla? Yes.

4121. How many? I brought seven men with me.

4122. *Mr. Hilton.*] You have said you would fire shots with a red-hot wire, Mr. Evans? Yes, it is much preferable to tilting the lamp.

4123. I see that you said in your previous evidence that even the use of a red-hot wire might cause an explosion? Yes; that is true.

4124. To your knowledge, is a red-hot wire the best means yet discovered of firing shots? Well, it is a comparatively safe means; but it is not perfectly safe, of course.

4125. *Mr. Owens.*] If gas existed in any part of the mine, and yet not visible to the eye, would it explode in contact with a naked light? It would probably explode if the air was vitiated with coal-dust, or overheated with a shot.

4126. You think it improbable that gas could have accumulated in these abandoned bords that have been mentioned? Yes; I do not think it at all likely.

4127. You have stated that you had not the assistance that you would have expected on the occasion of the explosion. Were you refused assistance by any one? I consider that the spirit and energy that should have been displayed on such an occasion was wanting.

4128. Were you offered assistance? I was offered assistance, such as it was; but I may say that it was with great difficulty I could induce the men to explore the mine when I made up the first party. Taking into consideration the small amount of damage done in Bulli mine, the bodies ought to have been out much quicker than they were. We could travel as fast as we could put the stoppings up; but the indifference displayed by some of the men literally shocked me. Even the presence of death did not seem to nullify their bitter feelings, and I was horrified to hear one man, turning over a body, exclaim, "I wonder if this is a white-leg or a — black-leg." And that man's name is Poppett. He had a brother in the pit.

4129. *Mr. Jones.*] Was that expression used in your hearing? It was.

4130. I am sorry to hear it. But as to this apparent hesitancy in entering the mine—might not that be in consequence of the men being unacquainted with gas? Well, looking to the evidence given at the inquest, they seemed to be pretty well up in such matters.

4131. Is gas usually found in the Illawarra mines? It is found in that district, I believe.

4132. But that district is a very limited one, is it not? Yes.

4133. Then only a few men could have had experience of gas in that particular district; might not that be a reason for the feeling of apparent absence of feeling you speak of? Well, perhaps a small amount of it might have arisen from that; but I consider that with competent men to direct search parties they should have no fear; they should have had sufficient confidence in myself and Mr. McCabe to direct the search parties.

4134. I am not doubting your word, Mr. Evans, but would it surprise you to hear that one man offered his services and the overman turned away and refused to speak? No; I know there were a number of persons there whose services I would not accept if I were in the overman's position; that was not the time to go into the mine and find fault; I went there to save life if possible, and I could not get assistance.

4135. I do not doubt that; but we have it on the sworn evidence of individuals that they offered their services, and the management refused to recognise them? I can understand that; while there was a kind of assistance that would have been invaluable, on the other hand there were scores of offers from those who could be well spared; that is, they could do better without them than with them.

4136. That is quite possible; but why cast wholesale censure upon those individuals for not offering their services? I am not condemning the whole body of the men; some of them conducted themselves admirably, and stayed there from the time of the explosion till the whole of the men were got out; but I am sorry to say the majority of them displayed indifference.

4137. Do you speak of your own knowledge? Yes.

4138. That they were indifferent as to rescuing those in the mine—is that what you mean? Yes; that is my impression.

4139. You have stated that you believe the explosion would have been perfectly harmless if it had taken place in a wider area, where it would have had room to expand? I do not say it would have been perfectly harmless, but it would not have been so destructive in its effects.

4140. Considering that the workings in No. 1 or Hill End district were so limited, and knowing that everything depended upon a constant supply of fresh air to these workings, are you still of opinion, having in view the doors which regulate the ventilation in that part of the workings on the main tunnel, that it was perfectly safe to work with naked lights in the bords off No. 1 and No. 2 headings? Yes; I consider it was.

4141. What would be the effect of that door being propped open for a short time, that is, the door on the main tunnel, past No. 1 and No. 2 headings? The effect would be to cut off the air from Nos. 1 and 2.

4142. Then, as a measure of protection, would it not have been better to cause these men to work with safety-lamps in the bords referred to, in view of the whole of the circumstances? It would have been better, in my opinion, to put that division of the workings on an independent split by putting an air-crossing over the main tunnel, and doing away with that door altogether.

4143. Which would have contributed much more to the safety of the workings? It would have given a constant supply to No 1 and No. 2 headings, instead of an intermittent supply.

4144. That being your opinion, do you not think it would have been better to have no bords turned off at No.

- No. 2 heading, and so make it a clear return for the time being? Yes; it would have been better to work on the panel system; the bords should be on the intake.
4145. Are you of opinion that all return airways ought to be travellable? Yes, practically.
4146. Do you consider the Bulli mine a dusty mine? Yes, a very dusty mine.
4147. Do you consider the travelling road to the headings dusty to an extent likely to contribute to an explosion? Yes.
4148. Speaking from your own experience of dusty mines in Wales, does Bulli approach what you would call a dusty mine in Wales? Yes; it is as dusty a mine as any I have seen in Wales.
4149. If these roads were watered with a view of laying or damping the dust, would it reduce the extent to which dust would contribute to an explosion in Bulli Mine? It would lessen the part that dust would play, no doubt.
4150. *Mr. Croudace.*] You state that you consider the tilting of the lamp and the lighting of the fuse by touch-paper is dangerous. Would you consider the lighting of the fuse or squib (say) by an ordinary wax match much more dangerous? Yes; certainly.
4151. What would you think of any one in a mine working with a lamp the top of which he knew to be burnt—not merely the cap of the lamp, but actually the top of the gauze itself, by which the flame is confined? If that person worked for me, or in mines that I have had experience in, he would have been put in prison for six months, or six years, probably.
4152. Just so. And would not the officials have been censurable to have allowed it? Yes.
4153. As a matter of fact such a practice would be dangerous to the men at large? Yes.
4154. Now, you have been asked about the best method of firing shots. Would the method of using water tamping, and firing the shots by means of electricity, be the most perfect system we know of? Yes; I should say so. But I have just heard of a disaster that occurred in South Wales, where Sir Frederick Abel's water cartridge was used. So I disapprove of firing shots in the presence of gas, even by the best methods known.
4155. You were asked by Mr. Jones about the door being propped open between Nos. 1 and 2 headings. Is it likely that the door would be propped open when a trapper boy was stationed there? No; it would not be likely, because it is the trapper boy's duty to keep the door closed.
4156. Would you be inclined to think that the explosion was caused by any door being propped open? No; but if I may express my opinion, I should say that no doors should be on the main hauling plain.
4157. We have had it stated in evidence that a certain witness had had reason to believe that if care was not taken there would be an explosion in this mine. We have also had it stated by the same witness that when he was in charge of a portion of the mine known as the gassy section a door was erected on this western road just at the intake and off the main tunnel, at which there was a flat-keeper attending it; also, a door between headings Nos. 1 and 2, on the main road, where a trapper was kept; also a door on this diagonal cut-through between Nos. 1 and 2 which was attended by a trapper boy, and a door between Nos. 3 and 4 on the main engine brow, at which during his time no trapper was kept. Since then we have had it stated that the door at the western was attended to in a similar manner; also that the doors between Nos. 1 and 2 had trappers attached to them, and that there was a trapper boy attached to the door last referred to on the main engine brow. That was after the strike. Now, looking at these respective conditions, would you consider that there was any improvement in the matter of care and attention as to ventilation in the latter period as compared with the former? Yes; I consider that greater care was exhibited during the latter part, inasmuch as a trapper was stationed at the door between Nos. 3 and 4.
4158. Now, in the same district exactly, and under the same conditions, previously to the strike, there was a ventilating current of between 2,000 and 4,000 cubic feet of air passing through the last holed stenton; since the strike we have it that there was 12,000 feet of air going through. Do you consider that indicates any considerable improvement? Yes, a very great improvement.
4159. Now, to come back to the general system, for any improvement that you may be able to suggest. Do you consider that it would have been better to have double doors at the points I have referred to? No; I do not.
4160. Why not? Because double doors would lose their object on the Hill End plain, unless you could keep one door shut while the other was open.
4161. Would double doors, placed sufficiently far apart so that only one would be open at a time, be more efficient than single doors? Yes.
4162. Would it not have been better altogether, as a matter of proper and scientific ventilation, to have abolished all the doors on the engine plain? Yes; I have said so.
4163. Coming into this western district from the tunnel mouth, would it not be possible to abolish this door at the junction without seriously affecting the Hill End district? Yes.
4164. *Mr. Hilton.*] I understood you to say, in reply to the President, that brattice should have been used in those headings where gas existed? I did not say it should have been; but I say this, that where gas exists, and you cannot dilute it by putting cut-throughs every 35 yards, brattice should be used to carry the air to the face and sweep the gas away in small quantities.
4165. So far as we have been able to ascertain, gas was present in these headings previous to the explosion? If gas was present previous to the explosion I would have put up brattice to dilute it.
4166. These headings have been giving off gas for some time according to the information we have received. That being so, and from your own experience, would you say that brattice should have been used as a means of ventilation? I do not say that brattice should have been used necessarily, but I do say that the gas ought not to have been allowed to accumulate. If brattice was necessary to prevent this it should have been adopted.
4167. *Mr. Jones.*] Respecting the firing of shots, Mr. Evans, are we to understand that as a general rule you would not allow shot-firing, except by persons duly authorized to do it? No, not in fiery mines. [*The witness withdrew.*]

John Williams sworn and examined:—

4168. *President.*] You are manager of the Coalcliff Colliery, Mr. Williams? Yes.
4169. Did you arrive at the Bulli Colliery shortly after the accident? I did.
4170. About what time did you arrive? About 4:30 o'clock.

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- Mr. J. Williams. 4171. Did you proceed into the mine? Not immediately.
4172. When did you proceed into the mine? About 11 o'clock, I think.
4173. Did you proceed to the fall that exists in the main tunnel? Yes.
- 14 May, 1887 4174. With what object? I was supposed to be in charge of an exploring party on the Thursday afternoon. I relieved Mr. McCabe, and my object in passing the big fall was to go into No. 2 workings in order to recover as many bodies as possible.
4175. Did you come to my conclusion in your own mind as to the cause of that fall—was there anything singular in its appearance differing from any other fall that you have seen? I did not stop to notice very particularly. My object in going there was chiefly to recover the bodies.
4176. Were you one of the first to reach Nos. 1 and 2 headings? No.
4177. Did you examine the bords off those headings to prove the existence or non-existence of gas? At the time I did not, but in company with two others I noticed that several props in No. 2 heading, and in the bords particularly, were charred.
4178. Did you examine the faces of these bords for gas? We visited all the bords and examined them, but could not discover any gas.
4179. The ventilation would be practically deranged? Certainly.
4180. Would that be a likely time to find gas had it existed? Yes, I should think so.
4181. Did you examine No. 2 heading? Yes.
4182. Did you observe any gas there? Yes, in the face.
4183. How many yards? I cannot say.
4184. Did it fill your lamp? Yes.
4185. Was it of a very quick nature? Yes.
4186. Did you examine the face of the heading? Yes.
4187. Did you satisfy yourself as to whether a shot had been fired there? There was an unusual quantity of loose coal there.
4188. Did you observe any hole as of a shot? No.
4189. Did you observe any traces of fire in No. 1 heading? No.
4190. In No. 2 heading you did see evidences of fire? Yes.
4191. Did you go round the workings of Nos. 3 and 4 headings, also the straight-in and No. 6? I will explain how far we went on the Thursday afternoon. After getting the bodies out of No. 1, and depositing them on the main road, we commenced exploring the main tunnel. Going towards No. 3 we had to put up temporary stoppings. We visited No. 2 first, and at 20 minutes past 10 o'clock we reached the top of No. 3.
4192. Did you observe any bodies? Yes; we saw a man and a boy at the top of No. 2 in the main tunnel, and a man in the face of No. 3.
4193. Were these bodies burnt? I cannot say, as I did not examine them.
4194. Did you pay any attention to the system of ventilation that had been in operation in this district? I saw that the ventilation was sent down No. 1 by a separation door between Nos. 1 and 2, which had been blown away, and canvas had been put up there.
4195. In view of gas being given off in these headings, do you consider that the system pursued was the best that could have been pursued, or does any other mode suggest itself to your mind? I think the system was a very good one.
4196. Do you think the system of breaking bords off No. 2, or the return, in the face of gas being given off in considerable quantities in Nos. 1 and 2 headings, a right and proper system? With sufficient ventilation it would not be considered a dangerous process.
4197. In view of gas being given off in Nos. 1 and 2 headings, is the system pursued for ventilating those headings the best—in the first place, ought gas to be removed as it issues from the coal? I should think so.
4198. What is the best and easiest way to remove gas from the face? By means of brattice.
4199. Had brattice been used in these headings, in your opinion? I cannot say.
4200. Did you see any evidences of it having been used? I did not. The probability is that, if brattice had been used there it would have been blown away.
4201. Do you think it would have been prudent to use brattice? Yes; it might have been as well.
4202. Did you satisfy yourself as to the cause of the explosion, or where it originated? I must explain that when I entered the mine I did so chiefly for the purpose of getting the bodies out. I had been three nights away from home, and had not the privilege on the Saturday of going in with the others. Therefore you must excuse me from giving clear and definite evidence on that point.
4203. In a general way, Mr. Williams, is it advisable to have regulating or directing doors upon a main intake or engine road. Would it be desirable to abolish all doors on main roads? Well, I suppose there should be a certain amount of check—for instance, this door would be necessary between Nos. 1 and 2.
4204. Under the present system, no doubt, but does any other system suggest itself to you, or have you given the matter any consideration? [*Question not answered.*]
4205. Mr. Hilton.] Had you opportunities of witnessing gas in the mine during your visit? I discovered some gas in No. 2.
4206. Did you discover gas in any of the bords? I did not; and I do not think there was any, although I would not be positive.
4207. Did you find much gas in No. 2 heading? No; there was only a small quantity when I went in.
4208. It is generally understood that since the strike the ventilating current to the gassy section measured 12,000 cubic feet of air per minute. Did you feel any way surprised that an explosion should take place with a current of air like that going to the Hill End workings, considering that you found such a small quantity of gas when the ventilation was deranged? Well, yes.
4209. Does not that lead you to believe that the ventilation must have been deranged previous to the explosion? It may have been. [*The witness withdrew.*]

MONDAY, 16 MAY, 1887.

Present:—

DR. ROBERTSON, PRESIDENT.

MR. O'MALLEY CLARKE,
MR. NEILSON,
MR. CROUDACE,

MR. JONES,
MR. OWENS,
MR. HILTON.

Jacob Carlos Jones sworn and examined:—

4210. *President.*] You are manager for the North Illawarra Company? Yes.
4211. Did you visit the Bulli Colliery shortly after the accident? Yes, about two hours after the accident. I suppose about 4 or 5 o'clock when I got there.
4212. Did you proceed into the tunnel? Yes; I went as far as the furnace.
4213. In what state did you find the furnace? It was in first-class order then—nothing damaged in the slightest.
4214. And was it taking a good current of air? Yes.
4215. Did you observe whether the ventilation in the tunnel was deranged? The ventilation in the tunnel as far as the furnace cross-cut was as good as ever it was I suppose—not the slightest trace of after-damp, sulphur, or fumes of any kind.
4216. Did you notice the state of the straight-in tunnel? I did not visit that part. I simply went in by the left-hand tunnel towards the furnace.
4217. When did you first enter the tunnel and examine it? The tunnel was not examined until the Commission arrived, I think; I went in with Mr. Croudace; that was the first time I examined the tunnel where the falls are. I travelled the other way up to the Hill End district immediately after the accident.
4218. You went down the slacky road and then by the horse road? Yes; and in coming from the furnace I met Mr. Ross and accompanied him.
4219. Was the ventilation in a defective state when you reached the main tunnel? Yes; it was rather hot, and you could feel the effects of the after damp; but it was improving.
4220. We have pretty well satisfied ourselves, Mr. Jones, as to the progress made by the different exploring parties along the tunnel. How often have you visited the workings since the accident? About six or seven times.
4221. Did you examine the working bords off Nos. 1 and 2 headings? Yes, fairly well.
4222. How often have you examined them? On several occasions.
4223. Have you found any appearance of light carburetted hydrogen in any of the bords? No, not in the bords. The only appearance of gas I have seen was in the two headings beyond the last stenton.
4224. Have you found gas beyond the cut-through in Nos. 1 and 2 headings? Yes.
4225. Did you find gas on every occasion on which you examined for it? No; on the first occasion after the accident I did not find any trace of gas.
4226. When was that? I think it was on the Thursday night—that is, the day following the accident.
4227. Did you carefully examine those headings at that time? I went in beyond the dead horse in No. 1 heading.
4228. Did you go into the face? Not actually into the face. I went in as far as the skip and the horse.
4229. Have you, from your repeated examinations, satisfied yourself as to the cause of the accident? Yes, I have quite satisfied myself. I believe that there was an accumulation of gas in the No. 1 or No. 2 heading, and became ignited by a shot, because there is ample evidence of a shot having been fired in No. 2. I think they must have struck rather an extraordinary quantity of gas at this point.
4230. A blower? Yes.
4231. Did you hear any sound as of a blower? No; I did not hear the slightest sound of blowers anywhere.
4232. Have you satisfied yourself as to the course of the blast? Yes; you cannot go wrong I think. The appearance of the charred props, and the dust, and so on, indicate pretty clearly the course it took. It left the back heading and came down through the bords where the cut-throughs are.
4233. One portion travelled through the cut-through into No. 1, and proceeded outwards? Yes.
4234. And the other portion went down Nos. 1 and 2, through the cut-through, and through the last three bords and out again? Yes, into the main heading.
4235. Do you think the force of the explosion was intensified by the presence of gas in the atmosphere? I would not like to say that the force was intensified. Of course the effect was greater in consequence of the dust, but there was not sufficient dust to explode of itself.
4236. Was there sufficient dust, in your opinion, to intensify the action of the gas? Yes; there was plenty of dust to intensify the action or the effects of the gas, but not the actual explosive force.
4237. Did you satisfy yourself as to the cause of the death of the majority of these men who were killed at Bulli? I am quite satisfied that most of them were suffocated either by after-damp or carbonic oxide. All the bodies showed indications of that. One or two, perhaps, were killed by the explosion.
4238. Where or by what means would the carbonic oxide be generated? By an imperfect explosion—by incomplete combustion of the gas. There might have been gas in the western that imperfectly exploded.
4239. Do you think there could have been much gas? No; I don't see how there possibly could have been.
4240. Where, in your opinion, was it confined to? Simply in the face of Nos. 1 and 2 headings.
4241. Then, in view of the 12,000 ft. of air travelling through Nos. 1 and 2 headings, how would you explain an imperfect explosion of gas? Well, either too much or too little gas might cause it.
4242. Would 12,000 ft. of air be too little to render explosive any gas that might be there along with the air in the headings? I think it possible that the gas near the face had not sufficient air.

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4243.

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4243. But that coming out after the explosion and mixing with such a quantity of air per minute—would that be sufficient to render that amount of gas explosive? Quite.
4244. In which case could there be an imperfect explosion? I can't thoroughly explain everything. This is only an opinion of mine.
4245. Would an imperfect combustion of coal on an ordinary fire produce carbonic oxide? I think so, but am not clear.
4246. Wherein does an imperfect combustion of coal-dust differ from that of an ordinary fire? It would not be a fire; it would simply be intense heat, with no flames.
4247. So is fire an intense heat. You are not prepared to demonstrate your idea on the subject? No; I cannot explain it.
4248. However, you are satisfied in your mind that these men met their death by suffocation, and not by the direct effects of an explosion or flame? Yes.
4249. Did you observe any evidences of charring on the bodies? No; I was astonished at the absence of charring on the bodies.
4250. You have seen the effects of an explosion in Wales, Mr. Jones? Yes, on several occasions.
4251. Have you compared the appearance of men you have seen affected by severe explosions there with the appearance presented by the victims to the Bulli disaster? Yes; in explosions I have seen in South Wales the bodies were charred; but the bodies at Bulli presented no appearance of that kind.
4252. They did not bear such evidences of intense heat? Certainly not.
4253. And from the positions they were found in, combined with the absence of charring, you formed the opinion that they met their death by suffocation? Yes.
4254. *Mr. Neilson.*] You have stated it as your opinion that the explosion originated in No. 2 headings? Yes.
4255. And that there was not a large accumulation of gas there? Yes; I do not see how it could be possible.
4256. And do you think it is possible for any accumulation of gas in any other part of the mine to have supplemented that which originated the explosion? No; not to any extent, at all events, with that amount of air constantly travelling through the workings.
4257. Then how do you account for such a small quantity of gas creating such havoc on the main road a mile away from the seat of the explosion? So far as the western, I would trace the damage to the effects of the blast; but lower down I cannot say so.
4258. In what part of the mine were the greatest effects of the explosion noticeable? In the Hill End district certainly.
4259. On the main engine plain? On the main straight, as they call it, between No. 1 and Nos. 4 or 5.
4260. The inference you draw from that is that the blast went straight from No. 1 and No. 2, and jammed straight up against the wall in the main road? Yes; a portion went outwards, and a portion went inwards. The damage was greater than it would have been owing to the confined space, there being no room, as it were, for the force to expand or lose itself.
4261. In your opinion, if the dyke had not been on one side, and the coal only just opening out on the other, or if there had been room for the explosion to play round, there would not have been nearly such striking effects? Certainly. I am of opinion that if the district had been worked for some years, and several acres of coal had been taken out, the explosion would have spent itself in the immediate district.
4262. *Mr. Hilton.*] Have you been over the fall between the tunnel mouth and the Hill End incline? Yes.
4263. What do you ascribe the fall to? From the appearance of the roof I should say the effect of the explosion on the ropes would do it. The falling of one or two props and the loose stone overhead would cause all the loose timber and debris to come down, and the concussion on the rope would be considerable.
4264. Are you sure in your own mind that powder or dynamite was not an agency in the fall? I do not think it was that, although, of course, it is not impossible. Dynamite would do anything of that kind if it were present.
4265. *Mr. Owens.*] You have been in Nos. 1 and 2 headings, Mr. Jones? Yes.
4266. Did you see any gas there? Yes.
4267. Do you think where gas is generated in headings of that kind it is a wise measure to put brattice there in order that the gas may be swept out? Yes, I do. It is better to do that than for the men to be working in the gas.
4268. You know the door at the junction of the western and the main tunnel? Yes. There was a door there.
4269. Assuming that door was open, what effect would it have upon the ventilation of the Hill End district? It would take some quantity of air away, but not much, because Hill End has a separate return, and that return, I think, was better than the western return.
4270. But there is no separate intake? No. But what I meant to say was that if the western door had been open a much greater quantity of air would not reach in there, because the Hill End is just as near a course for it.
4271. Then, in your opinion, that door not being at the western would make no difference? Certainly it would make a difference; but what I mean to say is, that the door being open would not prevent any air from going into the Hill End.
4272. Do you think that door being open would enable the gas to accumulate? Yes; it might affect the ventilation so far that it would not go right into the face of Nos. 1 and 2.
4273. *Mr. Jones.*] If I understand you aright, Mr. Jones, your answer is, that the opening of that door would scale the very large current of air going to the Hill End district? Yes. There are certain parts of the western that would not take the whole of it.
4274. I am quite satisfied, Mr. Jones. I suppose during your experience you have observed very dusty mines in the old country, and I think you have already stated that you do not consider Bulli a dusty mine? No; I do not.
4275. Then, looking at the very limited area of Nos. 1 and 2 workings (the headings), do you think it was possible for a small accumulation of gas in these headings to work the amount of destruction you noticed in the mine? Yes. I have satisfied myself as to that; the strain on the ropes and other things would have an indirect effect.

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4276. But do you think it could have arisen purely from a gas explosion unaided by dust? Yes, unaided by dust, certainly.
4277. If this door opposite Nos. 1 and 2 and that on the diagonal road were open, would that have a serious effect upon the ventilation of these workings? Yes. It would virtually shut off the ventilation so far as the face of Nos. 1 and 2 headings.
4278. Have you considered how far the fact of these doors being open would contribute to the explosion? It is possible that the doors being open the gas would have time to accumulate, and then if they were shut again, and the current being restored, it might carry the gas on to a light, but I do not think it is probable.
4279. Do you think it a wise mode of working to allow the bords to be so near the exploding headings, which are known to give off gas? I think in all cases the headings should be a good distance ahead of the bords.
4280. That is a principle approved of by mining experts generally? Yes.
4281. That they should be at least 100 yards in advance of the bords? Yes. But I do not say that length. In this case, at Bulli for instance, there may have been some delay owing to this dyke. I suppose they drove the headings as fast as possible.
4282. I think you have already stated that Nos. 1 and 2 headings should have been bratticed? What I mean is this, that if gas showed in the lamp, rather than have the men work in it I would put brattice there.
4283. That is the custom pursued in the old country? Yes.
4284. Do you think it right and proper to allow workmen to fire their own shots? Do you mean generally speaking, or only where gas exists?
4285. Where gas is known to exist? I do not think it is advisable to use shots at all while the men are in where gas is generating.
4286. In going up No. 1 heading, did you observe one or two abandoned bords to the right? Yes.
4287. Were these bords, to your knowledge, driven up to the dyke? I really do not know. I did not go up there.
4288. If you were told that these bords were driven up to the dyke, would you consider that a likely place to find gas—near the fault? I do not know. I could understand it being given off.
4289. Do you think these disused bords should be securely walled off? I do not think so, if they generated gas, unless you stowed them up completely.
4290. Does the Act provide for such a measure? I do not think so.
4291. It does so provide. Now, we have been told that the men working in Nos. 1 and 2 headings were permitted to do so with unlocked lamps. In your opinion, was that a wise proceeding? No; I cannot say it was; indeed, I think, it was most unwise for the men to take unlocked lamps into the mine.
4292. The law provides, I think, that some authorized person shall be put in charge of the lamps, and that no person shall be allowed to take a lamp into the mine unless it is locked? Quite so; and that is why I say the men should not have done it.
4293. Was it a violation of the rule to give the men unlocked lamps? Yes; I should say so.
4294. In your experience of mines that have generated gas, and where doors are required to be frequently opened for trains to pass through, is it not usual to duplicate or double the doors? Yes, if it is a very important place.
4295. Then, having in view the small area of the workings of Nos. 1 and 2, which you have already described as being very limited, do you think that double doors would have answered a good purpose as a precautionary measure opposite Nos. 1 and 2 headings? Yes, I do.
4296. *Mr. Croudace.*] Did you examine the workings from the Hill End district right round from the Western, Mr. Jones? I did.
4297. Supposing the first explosion to have taken place in No. 2 heading, did you in travelling round see any signs of a second explosion having taken place? No, I did not.
4298. Do think it possible that there was an accumulation of gas in any portion of the old workings? No, I do not think so, in that vicinity at any rate.
4299. You think there could not have been any accumulation of gas in any of the old workings west of the dyke? No; I think not.
4300. Supposing there had been any accumulation of gas there, what would have been the probable effect upon the main tunnel in the western district? It would probably have caused a complete wreck.
4301. Would it have affected the furnace there? Yes.
4302. Therefore you do not think there could possibly have been any accumulation of gas in any other part of the workings, so far as the effects can guide you in forming an opinion? No.
4303. Looking at Nos. 1 and 2 headings, and seeing that there are bords broken away in No. 2 heading, and that there has been an acknowledged accumulation of gas in the face of No. 2, do you think it was prudent to allow those bords to be worked with naked lights? No; I do not think it was.
4304. Looking at the positions of Nos. 1 and 2 headings, and Nos. 3 and 4, do you think it was advisable to have had these pairs of headings so near to each other? I do not think they are near—they are about 2 chains apart.
4305. Now, with regard to these doors, you have stated that it would be better to duplicate them. Supposing single doors to be in existence and a trapper to be kept at each of them, do you regard that as being as great a precaution as could possibly be taken to prevent these doors being left open? Certainly. The doors would not affect the ventilation if they were only opened while the trains were passing through.
4306. Assuming this accident to have occurred between 2 and 3 o'clock in the day, is there any probability of that door having been left open by the trapper boy, or by any one under any circumstances, a sufficient length of time to allow the gas to accumulate in Nos. 1 and 2, and therefore to cause the accident? No; I do not think so.
4307. Now, if you notice, there is a small pillar of coal between these headings, Nos. 1 and 2;—would it be possible to have two doors there, on that road, and at the same time allow five or six sets to pass through? No; you would lose the advantage of having two doors; unless one could be kept shut they would require to be 30 or 40 yards apart.

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4308. As a matter of ventilation, would it not have been better to have abolished all these doors in the main intake, and to have ventilated the district by scaling doors in the return? Certainly, that would have been a more precautionary measure in a case of the kind.
4309. Did you examine the big fall near the mouth of the main tunnel? Yes.
4310. Did you see any indication of fire there? I think I saw some charred timber there.
4311. Did you see any signs of explosives being used there (other than gas) that might have shattered the stone? No.
4312. You saw nothing but a heavy fall of the roof, caused, as you think, by the explosion? No.
4313. In the firing of shots would you consider it a desirable practice to tilt the safety lamp on one side in order to light the touch-paper by the flame up against the gauze? No; I think it unwise to do that.
4314. Going further than that, what would you consider the state of matters where a miner would work in the presence of gas with the top of his lamp burnt out? It would show great ignorance, and I think it would be folly on the part of any man to do such a thing.
4315. Supposing that the deputy or other person in charge, in compliance with a general rule laid down here, had locked a lamp and given it to one of the workmen, and the man specially asked him what he was to do in the event of the lamp going out, whereupon the deputy unlocked the lamp and allowed him to take it in unlocked—what would you infer from that? I should think the official allowed himself to do a wrong thing in order to oblige that man. [*The witness withdrew.*]

John M'Kenna recalled:—

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4316. *President.*] We understand you wish to say something by way of supplementing your former evidence? Yes; I have it here.

[The witness had prepared a statement of the views he desired to offer by way of supplementing his former evidence as to the cause of the accident, and this statement he read, as follows:—“As to the singeing of horse at foot of incline, in dealing with this subject I must begin with the flame at the far end of the gassy flat, and describe its outward course. At the time of the explosion I believe there were nearly 2,000 cubic feet of gas in No. 2 heading (inside the caution-board), and that there were over 3,000 cubic feet in the disused workings in the old left-hand headings. My reason for supposing that there would be over 3,000 cubic feet of gas in these disused workings is on account of them being at a higher level than Nos. 1 and 2 headings; and during the strike the ventilation was reduced to a minimum. While the ventilation was in this low state the gas would naturally find its way into these disused workings; and after the ventilation was restored this 3,000 feet of gas would still remain there, for this simple reason, that the ventilation does not act upon the places in that heading.

When those two quantities of gas exploded the volume of flame would be equal to 40,000 ft., the temperature of which would be nearly 1,500 degrees Fahrenheit, and the destructive power would be equal to about 1,340 lb. of blasting powder. Allowing that half this volume, namely 20,000 ft., came direct from Hill End, and that the other half took the western course—such was the case, as I showed you a sample of coke half-an-inch thick, and nearly as large as my hand, which I took off a prop in the western, this being a proof that the fiery blast was in the western district—we would have, coming from Hill End, a volume of flame 20,000 ft., with a destructive power equal to about 670 lb. of powder, rushing headlong outwards and leaving its first victim on the turn of No. 3 heading. The second indication of its course was on the flat, where the skips were blown outwards, and one full skip was blown outwards on top of a little boy. About 160 yards further out were the lads Ralph and M'Kay, and on the bank-head were four or five men and two lads, all of whom were frightfully burned. The next forms of life in the course of the blast were the boy and horse who were within a few yards of the tunnel mouth. The fiery blast was almost exhausted when it got this length, and the tunnel being high and wide at this point the force of the blast knocked the boy down, and the almost exhausted flame passed over without injuring him; but the horse, whose height was near to the roof, got singed about the tail, mane, eyelashes, and other superficial parts. The horse is a living proof that the quantity of gas fired was so great that it did not exhaust itself until it became lost in space outside the tunnel.]

4317. *President.*] Can you speak positively of the state of the ventilation of the mine before the strike? Not of my own knowledge.

4318. Very well, you can make any statement you please to supplement your former evidence as to the state of matters before the strike? Very well; I say there were no doors or screens erected for regulating the air current in the workings of the gassy section. I was in there with Mr. White previous to the explosion.

[NOTE.—Witness was shown the position of the doors on the plan. But he was understood to explain that in his opinion these doors did not carry the ventilation where it was required, and pointed out that one of the places was 40 yards in advance of the air current.]

4319. You say you visited the mine after the strike and before the explosion? Yes, with Mr. White and others.

4320. For what purpose? For the purpose of looking at some headings that were to be tendered for.

4321. Then you observed that the ventilation was insufficient, and that these doors were not properly placed in your opinion;—did you make any complaint of that to anybody? No.

4322. You are a member of the Union, I suppose? Yes.

4323. Did you bring this matter under the notice of the Union? I did not.

4324. You believed that danger existed? Yes.

4325. And you also knew that miners have a perfect right to appoint check-inspectors from among their number? Yes. But the law is so evasive in itself that employers are allowed to drive this distance, as I have said, over that prescribed.

4326. I am not talking about that. You found a dangerous state of things there, you say. You know that the miners generally have the right to make inspections of the mine for the purpose of securing their own safety and for other reasons; and I ask, did you bring this state of things to their knowledge with the object of having a proper inspection made? No.

4327. Why have you bottled all this up till now;—why not have brought it out before, when you had an opportunity of averting a great danger according to your own opinion? The management would not have taken any notice of me, and whether the Union would have taken any steps I cannot say.

4328. You waited till an explosion took place, and then you bring these facts forward? Probably my name would have been "Walker" if I had interfered.

4329. Do you believe the gas which you say was in the old bords was ignited? I do.

4330. Would that create great destruction immediately it was ignited, as in the case of No. 2? Yes; if there was anything to destroy about the place.

4331. When I tell you that there was a stopping immediately opposite the place where you suppose the 3,000 feet of gas to have been stored, and that this stopping was not disturbed, do you not think it interferes with your theory to some extent? I assisted to close up four or five stoppings near the place I am speaking of.

[NOTE.—Witness being referred to the plans says he did not assist to close the particular stopping referred to.]

4332. *Mr. Jones.*] Are you quite sure that the horse you saw showed signs of burning? Yes. I also inspected the Big Fall, where the powder explosion was said to have taken place.

4333. *President.*] With what result? I saw nothing there but what bore the appearance of everything having been blown outwards. I did not see anything to justify the powder theory.

4334. *Mr. Croudace.*] In going down the main tunnel, did you observe any appearance of fire on the road? No, except on the bodies of the persons who were found.

4335. None on the timber? No; I did not observe any on the main incline going down.

4336. *Mr. Hilton.*] Do you know of any defects in the ventilation other than you have already described, of your own knowledge? The ventilation, in my opinion, was not in my way regulated round the working places where it ought to have been. There was good ventilation passing along the main roads.

4337. *Mr. Croudace.*] Then surely it must go into these other places? I contend that it passed along the main roads for a vain purpose. To do its work it ought to have been carried into the bords.

4338. How many bords or headings were driven beyond the prescribed distance? One heading, No. 3. It was over 40 yards.

4339. How many bords? There was one bord a little over 40 yards.

4340. Then are these the only violations of the law in that respect? Yes.

4341. *Mr. Owens.*] Did any of the men working in those places make any complaint to your personal knowledge? I cannot at present recollect that they made any complaint. [*The witness withdrew.*]

John Cavell sworn and examined:—

4342. *Mr. Clarke.*] Are you a miner, residing at Bulli? Yes.

4343. Do you remember the 23rd of March, the date of the explosion? Yes.

4344. Where were you at the time of the explosion? I was with the overman, in the old workings, between the grip and the western district. 16 May, 1887.

4345. What did you observe there first? I heard a loud report about half-past 2 o'clock, and felt a great rush of air from the western; it put out our naked lights.

4346. What did you do? We got a light, and went from the old bord we were in to an old heading where the air was running along, to see if there was any difference in the current of air. We found that it had not changed, and we came to the conclusion that there had been a heavy fall, so we turned back. After going about 60 yards the overman turned to me, and said, "Do you smell anything?" I said, "Yes; I smelt something like powder smoke." He then said, "Let us turn back; some disaster has happened."

4347. Which direction did you take then? We went out of the mine by the grip road, past the furnace.

4348. Did you observe anything unusual at the furnace? No. The furnace-man was there, and he wanted to know what was the matter, as the air was very much greater. He came out afterwards. We met Chalmers, Hope, Scott, and Lang at the bank-head.

4349. Did you go into the mine again? Yes; I was there helping to get the bodies out, on the Hill End Road, and I was in next morning again at the top of the flatt in the gassy.

4350. Do you wish to make any other observation, as to the state of the mine, for instance? I did not take much notice when I was in; I was simply assisting to get the bodies out.

4351. *Mr. Neilson.*] What was the object of your going in the old workings with Mr. White? We were exploring the road through where he was going to make a new return.

4352. Between the furnace and the western district? Yes.

4353. Were men working on the other side? I understood that from Mr. White.

4354. What sort of a road was there where you went? It was over old falls.

4355. Could you hear any men working on the other side? No. We were in the act of trying to get through to where these men were working when the explosion took place.

4356. *Mr. Hilton.*] You stated you were a miner—now, I want to distinguish between a miner and a coal-bewer. Were you a deputy, an assistant-deputy, a wasteman, or what? I was a miner, and signed the rules as a miner.

4357. Were you ever up in the old workings or return air-ways between the furnace and the western previous to that occasion? Not since the strike.

4358. Were you previous to the strike? Yes; I went through from the grip to the western.

4359. Was there a travelling way between the western and the furnace at the time you were in the old workings on the day of the explosion? I cannot say, because I never tried to get there. 4360.

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- Mr. J. Cavell. 4360. How long before the strike was it when you travelled these return air-ways? About a month before the strike.
- 16 May, 1887. 4361. You say the object with which you and Mr. White went into the old workings on this last occasion was to mark out a new return air-way;—was there anything amiss with the old air-way that you were endeavouring to find a new one? I cannot say; I understood the old return to be practically closed with falls.
4362. When you travelled this return air-way, as you say, a month or so before the strike, what sort of a road was it? There was a good road then; in fact the return man used to go out that way—it was a near cut out.
4363. Were you met by any smoke or after-damp in the old workings on the day of the accident? I did not notice the smell of it until we got on to the grip road.
4364. Did you go into the mine again shortly after the explosion? I did not go any further than the cut-through that evening.
4365. *Mr. Croudace.*] At any time, either before or after the strike, have you ever noticed any sign of gas in the old returns? No, none whatever.
4366. Did you work with a safety or a naked lamp? With a naked lamp.
4367. And you never had any gas? Never on any occasion. [*The witness withdrew.*]

Richard White sworn and examined:—

- Mr. R. White. 4368. *Mr. Clarke.*] You are overman at the Bulli Colliery, Mr. White? Yes.
- 16 May, 1887. 4369. How long have you been connected with the Bulli Colliery? For twenty-two years.
4370. You remember the explosion that took place on the 23rd of March last? Yes.
4371. Where were you when the explosion took place? I was in the grip—what we call the grip heading.
4372. In company with the last witness, John Cavell? Yes.
4373. Well, what was the first indication you had of anything having occurred? I was in an old bord where I had some work done to meet a place coming in an opposite direction.
4374. A party of men were working towards you? Not at that time. I had come up to this old bord on this particular occasion to see if any falls had taken place.
4375. Well, what was the first indication you had of anything having taken place? I was holding a light to Cavell, when we heard a great rumbling noise and a rush of air, which put our light out.
4376. Then what did you do? We got a light as soon as we could, and went back on the return, and finding that the air was not affected I felt sure that nothing more than a fall had taken place. So we went back again, and worked our way up there; but when we had proceeded about 60 yards I smelt the after-damp a little, and on questioning Cavell I found that he had detected it too. So we made our way back the same way as we came, past the furnace. The furnace was all right, but the attendant was nearly done—exhausted.
4377. When did you go into the mine again? I went in on the Friday.
4378. Just tell us where you went and what you did, Mr. White? I followed Mr. M'Cabe in. I thought I would go up and see if I could be of any use. I proceeded to the Hill End district, and when opposite to No. 1 heading I met Mr. Robbins. I proceeded on, and went into No. 6 heading, to the left, towards the face of the main tunnel, and I discovered a horse and two boys and two men.
4379. Did you see any gas there? No.
4380. Where did you go to next? We went from the Hill End to the western, proceeding along the flat to the overcast, which was blown down, and as I was about creeping under the fall Mr. M'Cabe called me back.
4381. Did you see any other destruction or wreckage there? No. We returned then and made further inspections of all the headings—Nos. 1, 2, 3, 4, and 5.
4382. Do you remember what you observed in No. 1;—did you go into the bords there? Well, I went into work more than for inspection.
4383. Did you go into the face of No. 1? No.
4384. Did you find any gas in Nos. 1 and 2. No; I do not think I did.
4385. Subsequently, did you make any minute inspection of that district? Yes, I did.
4386. Within a week after, say? I think I was in before, but it was within a week after that M'Kenna and the miners went in.
4387. Did you go in at any time with the Government inspectors? Yes, I think I did. I went in almost every day.
4388. How did you find the ventilation? Very bad after the explosion.
4389. On the occasion of your special inspection, did you go into the bords? Yes.
4390. Did you search for gas in any of the bords? No.
4391. Did you go to the face of No. 1 heading? Yes.
4392. Did you find any gas there? Yes.
4393. Was it present in any quantity? No, only slight.
4394. Did you find any in No. 2? Yes; there was more there than in No. 1.
4395. Did you observe anything in the face there? I certainly found something strange on the Friday. I was in there superintending the erection of some brattice, and I saw a lot of loose coal there. I saw that it had been intended to put a shot in. A hole was drilled about 2 or 3 inches in, but the shot had not been fired. I pulled the loose coal away from the bottom, and found that the coal had been holed about 3 feet. This seemed to indicate that no shot had been fired there. A portion of the coal had fallen away at an acute angle from the face. After putting the brattice up I told the men to spread the slack along the bottom, and in spreading this out with my hand I suddenly found an open oil-lamp. Allan Black had put it there in a shovel of coal. I asked him where he got it, and he pointed to the place where he had taken the coal from.
4396. Did you see any indication of a shot having been fired immediately prior to the explosion? I can not say that, because they might have put a shot in on the right-hand side, and that coal might have been blown down by a shot.
- 4397.

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4397. Have you got that lamp? Yes. [*Lamp produced.*]
4398. I think you said you searched for gas in the bords off No. 2, and that you found none? Yes.
4399. Did you see much wreckage in Nos. 1 and 2 headings? Very little.
4400. Further in—at Nos. 3, 4, and 5—did you notice much? No; I did not see much there.
4401. From your inspection and observation can you form any opinion as to the cause of the explosion? Well, at first I formed the opinion that it was by the action of a shot, but since finding this lamp I do not think so.
4402. And what is now your opinion? That the owner of that lamp was working with it there.
4403. You are of opinion that the gas was fired by some man working with a naked lamp which you now produce, and which you found near the face of No. 2 heading? Yes; and he must have been working close up against the roof, because the coal was not more than 4 feet thick.
4404. After the strike what official was employed in the Hill End district—the gassy section? Millwood.
4405. He was the deputy? Yes.
4406. There was no back deputy? No.
4407. Have you ever had any back deputies in the Bulli mine during your period of office there? No; I do not recollect any.
4408. Did you know Millwood well? Yes.
4409. Was he a capable and careful man? Yes; I considered him a very capable man.
4410. Do you know whether he was in the habit of examining the headings previous to the men going into work? I believe he was; but he had not been deputy very long.
4411. Did you give him instructions? Yes.
4412. And you had reason to believe he did so? Yes; I used to go down to the mine after 6 o'clock, and I only saw him on two occasions there.
4413. Were you aware of headings Nos. 1 and 2 giving off gas? I was aware that they were giving off a little.
4414. You were aware that gas existed there? Yes.
4415. Did you yourself make inspection of bords No. 1 and No. 2? Yes; we never found gas there.
4416. Was any report ever made to you of the presence of gas in these bords? Never.
4417. Did Millwood accompany you on your visits of inspection? Sometimes he did.
4418. Did he on any occasion ever draw your attention to any large extent of gas there? No, sir; every day when I saw him I would ask him how things were.
4419. Did you ever examine the faces of Nos. 1 and 2 prior to the explosion? Yes.
4420. What was the result of your inspections so far as gas was concerned? I never saw any till the Friday previous to the explosion.
4421. What happened then? Hope told me there was a little gas there. He was working in No. 1 heading.
4422. What did he say to you? He said there was a little gas there.
4423. With what object did he say that? To draw my attention to it.
4424. Did you search, and if so, what amount did you find? I had to hold the lamp a considerable time, half-a-minute or so, near the roof, and then it would flash.
4425. How near the face was it? Close to the face. Of course the men being at work there, you know, it would be very slight.
4426. Was bratticing used in any of the headings? No, sir.
4427. Why not? Well, we had never found it necessary.
4428. Did you think there was sufficient ventilation without it? Yes; we had never used brattice all the years I was there. Of course, if we had known what we do now we should have used it.
4429. Did it never occur to you to be necessary to use brattice where gas was given off? Not where the gas was so slight as when I saw it.
4430. Would it not be well to use it as a precautionary measure, even with that small amount of gas? I think not. If we had seen a large amount I would certainly have put brattice there, or recommended it.
4431. Do you know the system that was in vogue among the miners as to the firing of shots? I only know since the accident.
4432. You did not know the practice in vogue? No.
4433. Did you give instructions on the subject? Yes.
4434. To whom did you give instructions? To Millwood. I instructed Millwood to fire all the shots in the bords, and not to allow the men to do it.
4435. And in the headings? Yes.
4436. And you did not know whether he carried out your instructions, or how the shots were fired? No.
4437. Now with regard to the lamps—what instructions were given as to the use of the lamps in the gassy section? Open lights were used in the bords, and safety-lamps in the headings.
4438. Did you give instructions to that effect to Millwood when he became deputy? Yes.
4439. Did you instruct him to lock the safety-lamps? Yes; I gave him positive instructions on that point.
4440. Were you aware at any time that those instructions were not carried out? No; I was not.
4441. Did you see the men working with safety-lamps in those headings when you visited them. Yes.
4442. Did you ever examine the lamps with the object of seeing whether your instructions were carried out? No.
4443. Who would be responsible for the lamps on the back shift? The men themselves.
4444. Where would they get their lamps? At the lamp cabin.
4445. They could please themselves then as to whether the lamps were locked or unlocked; is that so? No; I put him (Millwood) on shift on purpose to lock their lamps for them.
4446. Was he present in both shifts? Yes.
4447. Then he was to lock the lamps on both shifts? Yes.
4448. After he would deliver the lamps to the men on the back shift, who would have charge of that portion of the mine then? There was no official there then.
4449. Then supposing anything went wrong with the lamps in that part, what would the men do? They would have to go back to the lamp house.
4450. Do you know where the key was kept? Yes, in a cupboard there.
4451. As a matter of fact, then, if the key was there the men could unlock their lamps and do what was necessary

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- necessary to them, and they could either lock them again or leave them unlocked, as they chose? It would be the case, yes.
4452. Have you ever had any large blowers in the gassy section either before or after the strike? Well, no; I have not seen any particularly large ones; but I have seen blowers.
4453. Who was the deputy before the strike? Crawford.
4454. Did he ever draw your attention to any issue of gas—a blower? Yes.
4455. *President.*] Do you remember the occasion, Mr. White? No, I really could not say to a week or two. I should say it was about a month or so back.
4456. What was the nature of his report, or what did he draw your attention to? The largest blower I ever saw there was the one he showed me. As we were going in one morning he said "Stop a moment and I will show you something." He then produced a pipe with a tap attached to it, and he placed this in a hole which he had made where the blower was. He then put a light to the pipe and lit the gas. In a conversation that ensued he asked me to let it burn, as it would be a convenience to the lads, and it would at the same time exhaust the gas. I told him not to let it burn, as although it would exhaust the gas it would eat up the air. I ordered him to put it out. Mr. Ross saw the pipe when he was in with me on one occasion.
4457. Was Mr. Ross shown the gas too? Yes.
4458. Did Mr. Ross give any instructions? I do not know whether Mr. Crawford made the same remark to him about letting it burn. He turned the gas on, and Mr. Ross told him not to make use of it in that way.
4459. Whereabouts was this blower—in what heading? In No. 2 heading.
4460. In what part of No. 2? It was about 100 yards in.
4461. How far would that be from the face, have you any idea—was it beyond the last stenton? Oh, no.
4462. What was the length of the hole? I cannot say exactly.
4463. Do you know what became of that blower? Did it become dissipated, or did you make any inquiries about it? I did not see it afterwards.
4464. Did you have any report made to you about it subsequently? No.
4465. Did you consider it a dangerous blower, or one calculated to have ill effects? No. Of course it would have been better for it not to have been there.
4466. Did any of the men complain of this to you? No, never.
4467. With the exception of the observation made by Hope, did you hear any complaint from the miners as to an accumulation of gas in any of the headings? No.
4468. Did Crawford say for what purpose he put this tap on? No; I believe he just put it on for curiosity.
4469. It has been stated here that he did it in order to convince the management of the presence of gas. You knew that gas existed there? Yes, I never denied it.
4470. Were you unwilling to believe that any large quantity of gas existed, or was any complaint made to you to that effect? No.
4471. Therefore you would say this pipe could not have been put there to convince you? No, sir.
4472. Whenever you saw Crawford, did he say to you what amount of gas existed in these headings? Yes, he did.
4473. What was the purport of his reports as a rule? I told him it was best to report everything he saw. I told him if he saw gas in any of the bords not to allow the men to find it out, and if he found any indication of gas, to put the men on with safety lamps immediately. On no occasion did he report any large quantity.
4474. Were attendants provided for each door on the main road? There were previous to the strike, but not at all times, because the lads were so irregular at their work.
4475. What steps did you take to prevent this irregularity? We allowed the wheelers on several occasions extra money for minding their own doors.
4476. What kind of doors were provided? Single doors.
4477. Do you think single doors sufficient? I do.
4478. Which do you think the best system? Double doors might be necessary in some places, but not at all necessary in others.
4479. If you were asked your opinion what would you suggest as a matter of precaution, double or single doors? I should suggest a single door, unless I saw a particular reason to adopt the other system; double doors should only be used in special places.
4480. As a rule, which would be the better plan to carry out, between Nos. 1 and 2 for instance? I should say a single door ought to answer all purposes if properly attended. It depends a great deal upon which way the heading is turned.
4481. Was the ventilation much improved after the strike? Yes.
4482. Was any alteration made in the system of regulating doors since the strike? No.
4483. The doors were left as they were? Well, there was some alteration made at the western junction.
4484. But not in the Hill End district? No, I think not.
4485. As to trapper boys, for instance? There were plenty of trapper boys after the strike. There was one for each door and plenty to spare.
4486. Then your observation as to the irregularity of attendance refers to a period previous to the strike? Yes.
4487. And since that, so far as you know, they attended to their duties? Yes, I requested Mr. Ross to put on more boys, and we had plenty of them—more than we wanted in fact—which accounts for the destruction of boys in the explosion.
4488. You never use bratticing in any portion of the Hill End district, since the strike? I never used it.
4489. Did you ever make any suggestion to Mr. Ross as to bratticing? Well it has just occurred to me that there was some bratticing used on one occasion in the Hill End district, when we were going through the dyke.
4490. That was about two years ago? Yes.
4491. Have you ever used any since in any of these headings off the main road? No.
4492. Did you ever suggest to Mr. Ross the propriety of using bratticing? No, sir, I did not.
4493. You did not think it necessary? No.
4494. Is there a travelling road between the western and the furnace? Yes.
4495. Is it a good travelling road? I cannot say it is a good one.
4496. But it could be travelled? Yes.

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4497. Have you been there since the explosion? Yes, on two occasions.
4498. You have travelled right through it? Yes.
4499. Did you examine any of the places while the men were on strike? Yes.
4500. Did you go alone? Sometimes I was accompanied by men, but generally I went alone.
4501. Did you travel the air-course? Yes, from the Hill End to the return, and from the western to the furnace, and I have travelled twice to a place midway between the western and the furnace, where we got through to the grip.*
4502. Did you ever see any gas in these old workings before or since the strike—any gas at all? No.
4503. Was the ventilation as good during the strike as it was before the strike? No, not by any means.
4504. Before the strike, what quantity of air was travelling round the Hill End district? I think the measurement Mr. Rowan took at the time, gave 2,500 feet; but I cannot say exactly as I did not take a note of it.
4505. After the strike what amount had you in the Hill End district? I think Mr. Rowan told me it was 12,000 feet on two occasions.
4506. Previous to the strike were you working with naked lights in the Hill End district? No.
4507. They all used safety-lamps? Yes, with the exception of the boys on the flat.
4508. Did you use safety-lamps in the headings after the strike? Yes.
4509. In the bords? No.
4510. What reason had you for discontinuing the use of safety-lamps in the bords? Because we had such a quantity of air that we thought it was unnecessary.
4511. Was there any other reason? Well, they are very troublesome to work with; for myself I would as soon be transported as work with a safety-lamp.
4512. You thought that the increase of air from 2,500 feet to 12,000 feet, did away with any possibility of danger from gas? Yes.
4513. When were you last in No. 2 heading before the explosion? On the Sunday morning, three days before the explosion.
4514. There would be no one working on the Sunday morning? No.
4515. Were you in by yourself? No; Millwood was with me.
4516. Then you did not see him any more? No.
4517. Did you find any gas there on the Sunday morning? Yes, a little in No. 1 and No. 2.
4518. Was the furnace man in that morning? Yes.
4519. Then the furnace would be going as hard on Sunday as on any other day? Yes.
4520. How often did you report general matters to Mr. Ross? As often as I saw him, we would talk about something or other in connection with the mine.
4521. Did you report to Mr. Ross about the small portion of gas that you saw on the Sunday morning? I cannot say that I did.
4522. You have stated in answer to Mr. Clarke that you gave Millwood instructions to fire all shots in the bords? Yes.
4523. Was that after the strike? Yes.
4524. And yet you worked with naked lights in the bords? Yes.
4525. What object was there in the deputy firing the shots where naked lights were used? Well, it was to keep the men out of danger as much as possible, there being a number of new hands there.
4526. You say that it is three months since this blower was shown to you by means of a pipe with a tap attached? Yes.
4527. The headings have been considerably advanced since then I suppose? Yes.
4528. When you first passed through the dyke did you get a large quantity of gas? We had gas; but I would not consider it a large quantity.
4529. Was it as much as you got in Nos. 1 and 2 headings? Yes, I believe there was even a larger quantity then.
4530. Is there any opening in the door at the western—is there any regulator attached to it? Yes, there are two openings.
4531. What size are the openings? I cannot say the exact size; but I should think not less than a foot and a half.
4532. Then there is another place where the rope runs through? Yes.
4533. If that door were propped open, would it do the Hill End district much harm? I do not think so.
4534. Is the return from the Hill End better than the return from the western? Yes, a good deal.
4535. Is there much difference in the respective distances that the air has to travel by these two routes—which is the longest? The western.
4536. The suction is to the Hill End, that being the best return? Yes.
4537. What good is the door then? To make the split for the required quantity per man.
4538. *Mr. Hilton.*] Have you a good knowledge of the special rules of the Bulli Colliery, and of the Coal-mines Regulation Act? Yes.
4539. Was there any one in charge of the door at the western junction? There were two boys and a man working there.
4540. Was there any one specially appointed to open and shut the door for the sets going through? No, not specially; but this man, who was working within a yard or two of the door, attended to it.
4541. *Mr. Croudace.*] Was that part of his duty? Yes.
4542. Then he was specially appointed? Yes.
4543. *Mr. Hilton.*] Were you in the habit of travelling the air-ways? Yes, occasionally.
4544. Was it not your special duty to travel the air-ways? No, I think not.
4545. Rule 8 of the Bulli Colliery rules says: "The overmen shall examine the main air-courses every morning and every evening, and report any defect they may notice to the master-wasteman, who shall remove any obstruction in the air-courses as soon as possible." According to this rule, you see, it is the duty of the overman to travel the returns? Do you mean to travel them right through every day?
4546. The rule says "travel the air-courses"? I examine them every morning by the light at the entrance, and if I found any defect or obstruction to the ventilation, I would set a man to clear it. I should have enough to do if I travelled right through every day from one district to another. 4547.

* NOTE.—Witness indicates position on the plan, and refers to the bord he was in at the time of the explosion, marked (C).

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4547. Have you ever travelled the return air-courses since the strike? Yes.
4548. How long before the explosion? I cannot give you the date; but the furnace-man knows that I did travel them, if you want any one as a witness.
4549. Have you used, or caused to be used, any brattice as a means of ventilation in the gassy section since resuming work after the strike? No.
4550. Do you know the distance from the face of No. 3 heading to the last stenton? Yes; I think it is about 41 yards.
4551. The Coal-mines Regulation Act says: "No place shall be driven more than 35 yards before the current of air without a cut-through, put through, or bratticed up, within 3 yards of the face of such working place." Were you aware when you drove this place 35 yards without putting brattice up that it was a contravention of the Coal-mines Regulation Act? I am aware of the fact; but I was not aware that the place was in so far when it was measured.
4552. Did Crawford ever send any men to you previous to the strike for having their lamps unscrewed? Yes; Woods and Wells.
4553. Did you report the circumstance to Mr. Ross? I think I did.
4554. Have you at any time had a book for the purpose of entering reports as to the working of the mine? No; not previous to the explosion.
4555. Rule 5, section 2, of the Mining Act says: "If at any time it is found by the person in charge of a mine, or any part thereof, that by reason of any cause whatever, the mine, or any part of it, is dangerous, every workman shall be withdrawn therefrom," and so on. Are you acquainted with that clause? Oh, yes. And I would just like to remark that these men you have referred to were never sent back into the same place again. I think all these facts should come out in evidence, because certain witnesses may state what they wish to say, and go no further, although they have probably not disclosed the whole truth.
4556. Did you ever unscrew your lamp to get a light in a place where there was gas? I do not think so. I should be a fool to do so, at any rate.
4557. It has been stated here, Mr. White, that you unscrewed your lamp to get a light a short distance from the working face in a place where there was gas at the time? It is not true; and the man who made such a statement is either a fool or a rogue.
4558. Was anyone specially employed to keep the air-ways in good order? Yes, previous to the strike two men were so employed, namely, Thomas Wilson and Sproule. They had nothing else to do.
4559. Was the system of ventilation employed previous to the explosion the best so far as you know? I could not answer that without comparing the system with some other systems. All I can say is, that it answered the purpose.
4560. Had Mr. Ross any fixed periods for going into the mine, either fortnightly or monthly? No; he frequently went in. Some days he would go in, and some days he would not.
4561. Did any lengthy period elapse at any time between the visits of Mr. Ross, for the purpose of examining the workings? I cannot say; sometimes he would be in two or three times a week.
4562. Were you in the habit of reporting matters connected with the mine to Mr. Ross? Yes.
4563. *Mr. Owens.*] Did the Hill End deputy report to you the presence of gas in these headings, Nos. 2, 3, 4, 5, and 6? Yes.
4564. Did you report that to the manager? Yes.
4565. I understand that you did not use brattice as a means of carrying the gas out of the headings? No.
4566. Were they working in those places with safety-lamps? Yes; no man has ever worked in the headings without safety-lamps since the strike.
4567. Have you ever carried a naked light up to the danger-board? We consider it safe to carry naked lights to the danger-board, but no further.
4568. Did the men use naked lights to go in and out of the mine—that is, take their lights in with them as far as the cabin, and substitute safety-lamps for them? Yes, they usually did; they would blow their lights out.
4569. Where did you find that lamp which you have produced? I found it 4 or 5 yards inside the stenton on a canch. The men were carrying slack coal back from the face of the heading, and I was regulating the slack being thrown down. Allan Black picked the lamp up in a shovel of slack in the face and brought it to me. I called his attention to it directly, and he said, "I took that shovelful of stuff from the top of the canch."
4570. Might not one of the men have taken that lamp there after blowing it out, and placed it on the canch till he was going out again? No; they would under ordinary circumstances leave the lamp with their food.
4571. Was it possible for the lamp to have been blown there by the force of the explosion? It was more impossible I should say.
4572. How is that? How could you fire a lamp in there when the force of the blast came out of the headings?
4573. We are told that the wheeler at No. 2 heading was in the habit of hanging his lamp on the prop that supported the danger-board—did you know that? No, I never saw it.
4574. You knew that the wheeler was in the habit of carrying a naked light? Yes, but he was always told to put his light on the ground and never to take it beyond the stenton.
4575. Were you in this district the night before the accident with a naked light? No. I would like to see the man who reported it.
4576. Did you give the same strict orders to Crawford as you did to Millwood with regard to safety-lamps? Yes, I did.
4577. Are you aware of a lamp being used in the gassy section of the mine with the top burnt out of it? No; but I have heard of it since.
4578. How? I became acquainted with it from the newspaper report of the evidence.
4579. Did Mr. Crawford never tell you of the circumstance? No, never.
4580. Did he never ask you for a new gauze to replace one that was destroyed, and you stated you had no gauze? No.
4581. You say you gave instructions to the deputy to fire shots in the bords in No. 1 heading? Yes.
4582. What instructions did you give as to firing shots in the headings? None.
4583. The men were allowed to fire their own shots? Yes. 4584.

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4584. You have stated that you knew that gas existed in these headings, and yet you allowed the men working there to fire their own shots? Well, I do not know.
4585. *President.*] You have said you knew it on the Friday before the accident? Yes, I did, so recently as that.
4586. *Mr. Owens.*] The men in the bords, who worked with naked lights were not allowed to fire their shots? No.
4587. And the men in the headings working with safety-lamps were allowed to fire their shots? Yes. But then these men in the headings were working by contract, and they were special miners—practical men.
4588. Were there no other practical miners in the pit? Yes, plenty. As I have said, I did this for precaution sake, because there were new hands, just to keep them out of danger.
4589. Were they all new hands? Some of them were miners, and some of them were new hands.
4590. Were you aware of the way in which they were firing their shots? No.
4591. Do you think the practice of tilting the lamp to ignite the touch-paper is a safe method of firing shots? I should not consider it a safe method; at the same time I do not consider it very dangerous—not in the absence of gas, or a large quantity of gas.
4592. But in the presence of gas? It all depends upon circumstances. A man appointed to look after a body of men does not necessarily confine himself to one line of conduct. A man must suit himself to circumstances.
4593. We have evidence here that on one occasion, in No. 1 or No. 2 heading, you lost your light; that you came into the heading and asked for a light; and that you went within 6 feet of the face and lit your lamp? It is a wilful lie—a fabrication. I am aware of my light going out. But as a matter of fact there has been nothing in such large proportions as has been represented. I will tell you the reason of this lamp going out. It was a Museler lamp, and these lamps require great care to handle, whether there is gas or not. Unless you are very careful, if you draw them down, they will go out instantly. On this occasion you refer to, a man named Hobbs wanted me to find him another place—to let him go on shift on his own account, because the men in that way were gaining more money. I said I would not shift him, and if he did not like it he could go; and when I was going back my lamp went out. I do not know who it was gave me a light.
4594. You were not within 6 feet of the face when you got a light? Certainly not. It was not I who went in that night. One day I was in with Millwood, and as we were going by the danger-board I saw a man going by me with a naked light. He was a man named Browning. I said to him, “Where are you going with your naked light?” He said, “I am going into the mine.” I said to him, “Do you not know that the rules prohibit you from going into this place with a naked light?” I was a very good mind to discharge him; but Millwood asked me to let him go that time, as he did not think he would do it again. These men may have seen that light; but there was no light beyond the danger-board.
4595. Who was supposed to lock the lamps of the night-shift men? Millwood.
4596. If I were working in the gassy section of the mine would you, in order to oblige me, unlock my lamp if I asked you? No, but another man might, and I believe he did.
4597. Do you know of your own personal knowledge? No.
4598. You say the reason that the men were allowed to fire their own shots in No. 2 heading was because they were trustworthy and skilful? Yes; I am sure Mr. Ross would not have put them in the headings otherwise.
4599. At the same time you think that they used naked lights in No. 2 heading, knowing that gas was given off in that particular heading? It is my opinion that someone had been in there with a naked light.
4600. Might not that lamp have been taken there for twenty reasons other than working. Is it not possible that it might have been rolled into the road and buried amongst the small coal? It is possible; but I do not think it is reasonable to suppose so, because a man would naturally expect to lose his lamp altogether with a shot going off there.
4601. You say that two men were sent out by Deputy Crawford for having an unscrewed lamp? Yes.
4602. And no record was made of that in a book kept for the purpose? No.
4603. Did you report that to the inspector? No; I have no recollection of it.
4604. Do you not think you ought to have reported it—why did you not put the law into operation? The only reason I can give for that is, that I was too lenient with them. Perhaps one man would have a large family, and perhaps in the case of another there might have been a little spite on the part of the deputy. You cannot punish men without consideration. As it was, I did punish them by not giving them the same place again.
4605. You are aware that such a violation of the Act might be calculated to bring about such a calamity as that of the late disaster? Not at all.
4606. Is it customary to use safety-lamps where there is no gas? Yes, if there is a suspicion of its existence. I have used them plenty of times in England on the mere suspicion.
4607. To close the matter, you did not think it of sufficient importance to report to the inspector? No, I did not.
4608. Did you report the circumstance of this blower, which was shown you by means of a pipe, to the inspector? No.
4609. You did not think it of sufficient importance? No.
4610. In the light now of what has happened, do you not think that bratticing should have been used in Nos. 1 and 2 headings? I can hardly answer the question, because if we had known that the gas was there we should most likely have used it for precaution.
4611. You were pretty well aware that gas was there; in the light of what has happened; therefore, would brattice, do you think, have given a larger measure of safety, putting the question in a general way? It would have been better, no doubt.
4612. Have you a night watchman at the Bulli mine? Yes.
4613. Previous to the explosion had you? Yes.
4614. Did anyone ever report to you that the furnace man, on the night previous to the explosion, went to his work in a state of intoxication? No, that was never reported.
4615. This is a matter I want to understand very clearly, and I want to understand whether any such report was ever made to you? No such report was made.
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4616. The watchman did not report to you that the furnace man went to you in a state of intoxication? No, he did not.
4617. You are quite sure of it? Yes, quite sure.
4618. *Mr. Crowdace.*] Who is it that lays out and designs the system of work generally at Bulli mine? Mr. Ross.
4619. In opening out this Hill End district from the dyke, did you receive instructions from Mr. Ross as to the points at which you were to start away these headings? Yes.
4620. Do you notice that the headings are turned away quite close to the dyke, within a few yards? Yes.
4621. Then you received instructions from Mr. Ross to turn away the pair of headings, Nos. 3 and 4? Yes.
4622. And the bords in No. 2 heading? Yes.
4623. Did you receive instructions from him to turn away the bords in No. 3 heading? Yes.
4624. Did you ever suggest to Mr. Ross the undesirableness of working away the bords in No. 2 heading for any reason? No.
4625. Not as a reason of economy, as it were, nor because it was a return air-way for the bords working in No. 1? No.
4626. Did you ever give the matter any consideration as one affecting the best interests of the colliery generally? Well, I have a reason myself for turning the bords away. We were so hampered up with rolls that we might get only 10 or 15 yards of coal between each (say), at this heading.
4627. Seeing that gas was known to be given off more or less in No. 2 heading at about the time of the strike, do you not think it would have been better and safer to have left No. 2 heading purely as a return? It would have been better.
4628. Would it not have been prudent, in your opinion, to have run a little bratticing into Nos. 1 and 2? Yes.
4629. Knowing, as you did, that you were meeting with gas in the Hill End district, would it not have been desirable to increase the distance between these headings, so that you could have had two doors between Nos. 1 and 2, instead of a single door? Well, I did not give it a thought.
4630. Do you think now that two doors would be better than one under the circumstances? Oh, yes.
4631. Do you not think it would be better to abolish the main road doors, and place regulating doors in the returns? I should not think it would be best to abolish the doors.
4632. Have you on any occasion, on measuring the air previous to this strike or disaster, found the ventilation affected by any one of these doors being left open? No.
4633. Do you recollect Mr. Rowan and yourself measuring the air and finding it deficient? I do. We stopped at that stenton between the 5th and 6th bords, I dare say, for twenty minutes, and he took the measure of the air three times, and we got the same register every time. I proceeded along the heading, and to my surprise, when I reached the left hand door leading into the return, I found it open. The deputy (Crawford) was standing not 15 yards from it, and I had some words with him.
4634. Well, what did you do? Well, I shut the door, and asked Mr. Rowan to go back and measure the air again. He did so in the same place, and got 1,500 feet more air in the same place.
4635. Therefore the leaving open of that door was the cause of your getting so much less air along there? Yes.
4636. *President.*] You mean to say that 1,500 feet of air escaped through the door on the main tunnel? Yes.
4637. *Mr. Crowdace.*] You think it was not the western door? No, sir, it was not.
4638. You say you had high words with Crawford? I told him I would report him.
4639. Had you any reason to believe that the door was left open wilfully? I had strong reasons to believe that the door was left open purposely, because the man had followed us down, and when we got down to this place (*pointing to the plan*) he left us; I went nearly to the stenton before I missed him, and when I came back the door was open.
4640. Was there any misunderstanding or ill feeling between you and Crawford previous to the strike? No; I have no ill feeling against any man.
4641. Did he caution you about being very careful in the Hill End district for fear there should be an explosion? Yes, he did, the last time he was in the mine.
4642. Was that to be taken as a friendly warning or as a vicious statement, in your opinion? In my opinion I do not think it was done in a friendly manner, although it would imply that. It was known there was gas there, and he wanted to make as much of it as possible.
4643. Previous to the strike had you the same system of ventilation in the Hill End district as you have now? Yes.
4644. The doors were in the same position? Yes.
4645. Previous to the strike had you men to attend these doors regularly? Well, no, they were more lax then.
4646. Since the strike have you been careful to have each of these doors carefully and systematically attended? Yes, I have.
4647. Did that arise from a fear you had in your own mind of this warning of Mr. Crawford's, or how was it you came to be more careful than you were before? No; as I have said it was because I had a good supply of boys, and before that there was a deficiency of boys.
4648. You believe that the explosion occurred in No. 2 heading? Yes.
4649. Do you believe there was an accumulation of gas in any of those bords off No. 1? No.
4650. Or in the bords off No. 2? No.
4651. Do you believe there was any accumulation of gas in these workings marked A? I do not think so.
4652. Have you seen any accumulation of gas in the old workings? No, sir.
4653. Have you seen any in the western district? No.
4654. Or any tailing at the furnace? No.
4655. Coming to this lamp you found, do you believe that lamp had any connection with the explosion? It seems to point to that conclusion.
4656. Do you believe that a man was working with it at the time of the explosion? I cannot say.
4657. Did you find or did you hear of a dead body being found at the face of No. 2? No.
4658. Supposing a man to have had that lamp while working, and to have thus lit the gas, do you not think

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- think there would be some signs of his having been there? I cannot say; he might have been in the act of filling a hole on the right hand side, and he might have been blown a long way from his lamp.
4659. Who were the men who worked in No. 2 heading at the time? Westwood and Crompton.
4660. Do you know where the bodies were found? No.
4661. Do you believe either of them could have had that lamp in the face of the heading when the explosion took place? They might have lit the fuse and ran away; dropping the lamp at the time.
4662. Did you see any fuse there? No.
4663. Does the lamp in any shape or form show signs of having been in a heated atmosphere or great flame, or subjected to a heavy fall of coal upon it? This lamp looked very different when I first picked it up.
4664. Did you have a special man to clean and trim the lamps? No; not a special man. Millwood did the whole of that.
4665. Would it not have been better under the circumstances to have had a man to properly attend to these lamps before passing them into the hands of the deputy? Well, we gave the deputy any assistance he wanted; and there would have been a special man if we had kept on a while longer, but a fresh start had been made at that time.
4666. Would it not have been better to have had a man to clean and feed the lamps previous to their being examined by the deputy, so that the deputy's examination would be a second safeguard as it were? Yes.
4667. Was this never thought of, or did you never suggest it to Mr. Ross? No.
4668. Did you report matters connected with the mine to Mr. Ross every time you saw him? Yes.
4669. If you did not see him, did you take any steps to report? No, not necessarily.
4670. Would it not have been better in the opening out of a gassy mine like this, and particularly since the workings were extended, to have had a regular system of daily reports as to the operations of the colliery, and with respect to gas particularly? Undoubtedly it would.
4671. *Mr. Jones.*] Are you quite sure that Millwood also examined the working places previous to the night-shift men starting work? Yes.
4672. Did you ever hear of fire-damp in the Bulli mine previous to striking the dyke in the Hill End district? Yes.
4673. Did you ever hear of a man being killed in the mine? Yes.
4674. In what district? In No. 2 tunnel, we used to call it.
4675. It was not in the Hill End district? No.
4676. *Mr. Neilson.*] Did you ever on any occasion hear a report as to a blower that could be heard hissing for a hundred yards?
4677. Did Smithers ever report such a thing?
4678. *President.*] Had it existed you would have been certain to have heard of it? Yes, I am sure I should.
4679. *Mr. Clarke.*] Did Millwood ever report to you about having found a door propped open? Yes.
4680. What time was that? It was about two nights before the accident occurred. He said it was the second time he had found that door open.
4681. What door was that? It was the straight-in door.
4682. Did he say how it was propped open? No.
4683. Was it Millwood's duty to see that all the doors were shut, all the lights put out, and everything attended to generally for the safety of the men before he left the mine? Yes.
4684. *Mr. Hilton.*] I think you stated, in reply to Mr. Owens, that the reason you did not give the men in the headings instructions as to firing shots was because they were practical miners and trustworthy men? Yes.
4685. Now, is the man Woods, that was working in No. 2 heading since the strike, and the Woods whom Crawford sent to you for unscrewing his lamp, one and the same person? Yes.
4686. Do you think it was a prudent thing to allow a man to fire his own shots, who had been sent to you by the deputy for such an act as he was guilty of? I see nothing in it. A man may forget himself once, and after a good caution might exercise as much caution as any other man. You cannot punish a man everlastingly for one fault.
4687. Would that explanation apply to No. 6 of the Bulli General Rules? I do not know much about those rules.
4688. Have you never read them? Oh, yes. [*The witness withdrew.*]

Alexander Ross sworn and examined:—

4689. *President.*] You are the mining manager of the Bulli Colliery? Yes.
4690. How long have you been manager? For twenty years.
4691. How long has the mine been working? For about twenty-five years; but I could not say exactly.
4692. What mining experience have you had? I have had mining experience as a deputy at home, and in this Colony I have been engaged here and at the Wallsend Colliery.
4693. In what districts were you engaged at home? In Northumberland, Newcastle-on-Tyne.
4694. For how many years in mines that gave off gas? For twenty years at home in mines that gave off gas.
4695. Has it been your practice to give copies of the special rules to workmen? Yes.
4696. Has this practice been rigidly adhered to? Occasionally a man might be missed by accident, but, as a general rule, it was done.
4697. Upon whom did that duty devolve? Mr. White.
4698. To the best of your knowledge did all your workmen receive copies of these rules? To the best of my knowledge they did.
4699. Were the general and special rules posted up in a conspicuous part of the mine? Yes.
4700. And in addition copies given to each man? Yes.
4701. Before opening out the Hill End district of your colliery, did any working place give off gas? No.
4702. At no time? A little was observed on one or two occasions, but it was only a small quantity.

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4703.

- Mr. A. Ross. 4703. Have you ever had a fatal accident from an explosion of gas? Yes; one occurred some seventeen or eighteen years ago.
- 16 May, 1887. 4704. Since that time has gas been given off? Only on one or two occasions.
4705. In what district? In the old workings.
4706. In what position were they? Going to the south-west from the tunnel mouth.
4707. That is to the right? Yes.
4708. And these workings are now abandoned? Long ago.
4709. Did the gas that was given off in the Hill End section necessitate your improving the ventilation? Yes; but that was not the only cause for the improvement of the ventilation; it was for the improvement of the ventilation of the mine altogether that we made the alterations.
4710. Did the quantity of gas given off necessitate the use of safety-lamps? Yes.
4711. What amount of air circulated in this section under the old system of ventilation by the old furnace? Between 4,000 and 5,000 cubic feet per minute.
4712. Did that go into the Hill End section? Yes.
4713. When the new furnace was started what difference did it make? It increased to 12,000 and 13,000 cubic feet per minute.
4714. Nearly trebled? Yes.
4715. Was your colliery a dusty one? Yes; particularly the Hill End section.
4716. Have you worked in dusty mines in the old country? Yes.
4717. Compared with the mines at Newcastle-on-Tyne, would you consider it dusty? Yes; much more dusty than I have been accustomed to.
4718. Did you consider the dust in the Hill End section a source of danger? I did not previous to the accident consider it so.
4719. Did the mine produce any water? None in that district.
4720. Was it absolutely dry there? Yes, absolutely dry.
4721. Did the dusty nature of the roads in this district necessitate your watering them? We occasionally watered the horse-road.
4722. That only? Yes.
4723. Was this done to secure the comfort of the men and horses, or because of the feeling of danger? Only to secure the comfort of the men, boys, and horses by keeping down the dust.
4724. It was not for the purpose of purifying the air in the workings? Not especially for that.
4725. Had you no danger in view? I had no danger in view. The dust used to fly up upon the axles of the skip and interfere with the lubrication and velocity of the sets, and we used to water the roads to keep down.
4726. What directions did you issue with regard to the use of safety-lamps? That they were to be attended to by the overman, and given out to the men locked.
4727. Did you at any time see whether these directions were carried out? Not exactly. I did not see them actually locked, but I understood that they were.
4728. Did you ever hear anything to the contrary? Never, until the accident occurred.
4729. Previous to the accident, you heard nothing? Nothing.
4730. Did you give any directions as to the manner of firing shots? No special direction; only the shots were not to be fired in the presence of gas.
4731. To whom did you give these orders? To the overman and deputy.
4732. Had they the charge of these safety-lamps? The deputy had charge of them in the morning, and there was a man appointed to clean them during the day.
4733. Did you ever inspect the condition of these lamps yourself? I have.
4734. Were you generally satisfied with them? Yes.
4735. Has it been your practice to converse with the deputies about the districts under their charge? Yes.
4736. Do you know Crawford? Yes.
4737. Was he a careful and capable deputy? I considered him so.
4738. Who appointed the deceased Millwood deputy? I did.
4739. Did you consider him capable? Yes; a capable and careful man.
4740. Did you ever discourage deputies coming direct to you with their reports? I never discouraged them or anybody else.
4741. Did you ever speak sharply, or, to use his own phrase, snub Crawford when he spoke to you? No.
4742. Would you reprove a deputy for bringing the dangerous condition of the mine under your notice? Certainly I would not.
4743. Have you been careful to keep a supply of gauze in stock for the repairing of the safety-lamps used in the mine? Yes.
4744. Do you recollect Crawford informing you that a certain lamp wanted a new upper gauze cap? I do not remember his doing so; he might have informed me, and if so I must have given him gauze to repair the lamps.
4745. Whose duty was it to remedy the lamps when they were defective? It was my duty to see that they had good safety-lamps, and it was the deputy's duty to see that defective lamps did not go into the mine, and it was the duty of the men themselves that they did not use lamps in such a condition.
4746. You say you appointed a man to clean the lamps, would a lamp in that condition be likely to be observed by him? Assuredly it would.
4747. You do not recollect on any occasion Crawford, or any man, bringing under your notice a safety-lamp which had been used in the mine with the upper gauze removed or burnt off? I do not recollect anything of that.
4748. Do you recollect Crawford showing White and yourself a blower with a gas-pipe inserted in it? Yes.
4749. Was it a strong blower? No, it was not a very strong blower. He had put a pipe about the size of an ordinary gas-pipe in it.
4750. What object had Crawford in calling your attention to this blower, and what object had he in fixing the pipe into it? I don't know, except it was to show his ingenuity.
4751. Had you any doubt as to the existence of gas in any quantity in these headings? I knew the coal gave off a little gas in the headings.

4752. Did that convince you that it existed in a large quantity? No, it was not a very strong blower. Mr. A. Ross,
 4753. What did it convince you of then? Simply that there was a little gas there.
 4754. Can you tell us the conversation you had with Crawford on the subject? Well, when I came there 16 May, 1887.
 he showed it to me by igniting the gas at the end of the pipe, and I told him to do away with the pipe and not to practice that sort of thing.
 4755. What reason had you for saying that? Because I did not think it right to light gas wherever it was found, and Crawford said that if it was left burning it would lessen the gas and improve the air, and I replied that there was sufficient ventilation to carry away the gas without burning it.
 4756. How long was that before the strike? It might be about six months.
 4757. Where did you proceed on that occasion with White and Crawford after seeing the blower? To Nos. 4 and 5 headings.
 4758. Had you previously been up to Nos. 1 and 2 headings? Yes.
 4759. Did Crawford call your attention to the gas in these headings? I do not think so.
 4760. Did he suggest any special means of clearing the gas away from the headings? No.
 4861. Would the reporting of danger by any one of the workmen be considered an offence by you? Certainly not.
 4762. Would you encourage the reporting of dangers? Yes.
 4763. Would you consider it an ordinary workman's duty to report danger directly to you? Yes.
 4764. Did you provide report books for this purpose at the mine? No.
 4765. In the event of the deputy discovering a dangerous condition of things, what course would he pursue? He would report to the overman and the overman reports to me.
 4766. Before the new furnace started you say the safety-lamps were locked? Yes.
 4767. How long was the mine at work after the strike? We commenced again about the 10th January.
 4768. To work coal? Yes, with a few men.
 4769. Were safety-lamps employed in the faces since January? Yes; in the faces of the headings.
 4770. Were they used in the bords? No.
 4771. When was the use of safety-lamps discontinued? We discontinued the use of safety-lamps in the bords after the strike, when we started the new ventilating furnace.
 4772. Did you alter your orders relating to the locking of the lamps? No.
 4773. Did you relax your orders in any way? No.
 4774. Were you aware of the lamps being used unlocked? No, I was not.
 4775. Are you aware that your orders for the locking of lamps extended to those used by the night men? They ought to have extended to all lamps.
 4776. Who was appointed to look after the night lamps? The deputy, as they were going in.
 4777. Did you provide a night overman or deputy? No.
 4778. In the event of the lamps going out where would the men go to get them relit? No provision was made for that.
 4779. In the absence of any provision where could they have gone? Only outside the mine to get their lamps re-lighted.
 4780. Are you aware whether any man ever did come outside for that purpose? I do not think so.
 4781. After the new furnace was started you say that naked lights were used in the bords? Yes.
 4782. Was it done with your orders? Yes.
 4783. Can you explain to us the reason of that order? Because there was no gas in these bords even before the furnace was started.
 4784. Did no gas exist in these bords immediately before the strike commenced? No, not in the bords; but there was a little in the faces of Nos. 1 and 2 headings.
 4785. Were there any sign of gas in Nos. 3, 4, 5, and 6 headings? A little was drawn off the faces of these headings occasionally; but there was none in the bords.
 4786. So gas was coming off more or less in all the headings of the Hill End district? Occasionally.
 4787. Do you mean since the strike? It was only reported to me on one occasion since the strike, and that was a small quantity in No. 1 heading.
 4788. Before the new furnace was started the bords in this district were worked with safety-lamps, and you have since discontinued their use? Yes.
 4789. Did you depend entirely upon the increase which the new furnace gave to the ventilating current? Not entirely; one reason was the absence of gas, and the other the largely increased ventilation.
 4790. Do you think it is wise to place too much reliance upon increased ventilation when gas is being given off? Where it is being given off it is perhaps not wise.
 4791. Do you think that the gas coming out of Nos. 1 and 2 headings was sufficient to foul the nearest stenton between them? A large quantity of air was employed to dilute any gas that came off as far as I was aware of, and it would require a large quantity of gas to foul the air in that stenton.
 4792. The fresh ventilating current passed up No. 1 heading into No. 2, supplied the working bords of No. 2, and after entering the main tunnel, supplied the bords of Nos. 3 and 4, as well as the faces of those headings, then went into Nos. 5 and 6 headings, and afterwards passed into the return. Was that its course? Yes.
 4793. Was that a judicious system to pursue? Yes, under the circumstances.
 4794. In view of gas being given off in Nos. 1 and 2 headings, was it a judicious system? Yes, considering the small quantity of gas given off.
 4795. But, suppose a large quantity was given off? No, it would not be.
 4796. Would it not have been better, in view of gas being given off in these headings, to pass the return air directly into the return? Yes, if large quantities of dangerous gas were given off.
 4797. Do you consider, in view of the amount now being given off in Nos. 1 and 2 headings, and the occasional occurrence of blowers in No. 2, that it was a wise system to pursue, to carry the air that supplied No. 2 heading afterwards around to the bords off it, which were worked with naked lights? Yes, in consideration of the quantity of gas given off, and the experience we had in that district.
 4798. Did you adopt any special means to free the faces of these headings, Nos. 1 and 2, of gas? We adopted the means of driving stentons through it at short distances.
 4799. Did you adopt any other means? No.
 4800. Did it not occur to you that bratticing ought to be put in these headings to sweep away the gas as it was made? No, not with the quantity of gas we have experienced.

- Mr. A. Ross. 4801. In view of gas being given off in such faces as these, was it obligatory for you to use bratticings? Not under the circumstances, because I did not think the quantity of gas sufficient to require that. The quantities found in these headings was small.
- 16 May, 1887. 4802. Have you frequently examined these places? Yes.
4803. And have you had daily reports of their condition? Yes.
4804. And you came to the conclusion that the quantity was too small, considering the largely increased ventilating current that the new furnace gave, to induce you to put in bratticing? Yes; I did not think it necessary.
4805. Are you conversant with the manner adopted for the firing of shots in these places? No.
4806. Have you never inquired? No.
4807. If you were informed that in portions of this district where gas was given off that shots were occasionally tamped with dry coal or dust, and that fuse was inserted in it and fired by touch-paper lighted from the flame of a Davy lamp at the gauze, would you consider it a right and proper means of dealing with shots? No, the tamping ought to have been damped, and in firing a shot a wire should be put through the gauze of the lamp.
4808. Do you consider that a safe means? Yes, as safe as any other, and it is a less clumsy way of lighting shots.
4809. Respecting a system of ventilation, the air is directed by doors fixed in the main tunnel. Do you approve of doors in a main tunnel, or on engine roads? Not if it can be obviated, and the mine well ventilated in any other way.
4810. Could it have been obviated in this colliery? Not very well.
4811. Would special provision require to be made in the Hill End district? Considering the distance I expected to go, and the limited coal-field, I considered the doors the best plan to adopt.
4812. There is a door in the main tunnel? Yes.
4813. Is there anything to recommend a single door in the main tunnel—would double doors not be better? Certainly, double doors are better than single ones, but on account of the limited field of coal which we are likely to expect from former experience, and as it would occupy such a large space for double doors, I thought the present system was equally good under the present circumstances.
4814. How many skips apart would the doors require to be? To let a train through of twenty skips not less than 6 feet for each skip.
4815. How much would that be? That would be 120 feet.
4816. So you would have required a space of 120 feet to be of any practical value? Just so.
4817. For that reason, and owing to the limited and very troubled nature of the coal-field, you did not deem it expedient to adopt the double door system? No, I did not.
4818. Did you provide attendants at those doors? Yes; boys were kept at the doors.
4819. Did the opening or shutting of the doors tend to weaken the ventilation in Nos. 1 and 2 headings? Probably it would when they were open.
4820. How long would they be open when the sets were coming from Nos. 1 and 2 headings? About a half or three-quarters of a minute.
4821. There were twenty skips in a train, and how many trains would there be in a day? I could not say exactly, probably eight or ten.
4822. So the opening of the door to allow trains to pass would only occupy a few minutes during the day? Yes.
4823. In providing attendants for these doors are they peculiarly liable to be injured? No.
4824. As a matter of fact, do these doors get injured by the skips? Not that I am aware of.
4825. Are you aware whether any gas existed prior to the accident at any time in the abandoned bords off No. 1 heading? I am not aware of any gas having existed there.
4826. Do you know whether they were ever examined. The first two bords that were broken off No. 1 heading which had been worked back to the dyke have been abandoned. Do you know whether they ever contained gas? No, they did not.
4827. How do you know? Because I was in them just before they were stopped, and they had not contained gas for a long time previous to that.
4828. Did they ever give off gas? Yes, when they neared the dyke, but not since.
4829. How long is it since you were in them? I cannot say how long it is, but I know that they only gave off gas when they were near the dyke.
4830. Then the whole current passed the mouth of these bords? Yes.
4831. Was gas likely to accumulate in them considering their position? I do not think so.
4832. Have you examined all these bords to ascertain whether any gas which came from the headings did exist there, and to see if any of them formed a separate centre of explosion, and did you also notice the stoppings in this locality? I examined the stoppings that were blown away from Nos. 1 and 2.
4833. Had gas existed in these two abandoned bords, would you expect these stoppings to be blown through in that way? No; I would expect them to be blown in a contrary way.
4834. Did the western workings give off any gas? No, none at all.
4835. You have often inspected the mine subsequent to the accident? Yes.
4836. Have you come to any conclusion as to the cause of the lamentable occurrence? I have come to the conclusion that the explosion occurred in No. 2 heading.
4837. On what do you base that conclusion? From the probability of a shot which was fired there having ignited the gas.
4838. An overcharged or a blow-out shot? It might have been an overcharged shot, I do not know.
4839. But you have come to the conclusion that the gas was ignited then? Yes, but by what means I could not determine.
4840. And that the loss of life was caused by that explosion? Yes.
4841. Do you think it likely, considering the limited reservoir for the existence of gas in No. 2 heading, that coal-dust has played an important factor in the explosion? I think it must have done, and I do not think that the quantity of gas which exploded there could cause the destruction without some other cause to help it, such as coal-dust.
4842. Have you ever examined a colliery after an explosion? I never did.
4843. Did you expect to find the workings and plant more severely wrecked than they are? No; I did not expect to find them so badly wrecked.

4844. How do you account for the large fall in the main tunnel? I can only account for it by the force of the explosion blowing out the props. Mr. A. Ross.
4845. Did it ever occur to you that dynamite or powder had been used to bring this fall down? No, it did not occur to me. 16 May, 1887.
4846. Before the accident were you aware that the roof or a portion of the roof was resting upon the timber sets there? Yes, I believe it was.
4847. In which case if some of these sets had been displaced do you think that alone would be sufficient to cause the fall? Yes.
4848. Do you think that the wire ropes attached to the timbers had anything to do with the distribution of the fall? In some cases it might.
4849. Do you attribute this fall to any extraordinary cause? Well, there is something very extraordinary about it, from the fact that some of the timbers are blown in one way and some another.
4850. I ask whether the fact that the ropes being connected with the sets might not account for that? In some cases it might, but not in others.
4851. Suppose a fall took place in the centre of a large quantity of timber which carried the ropes down to the floor, would not that have any effect upon the manner in which the timbers were found? Yes; wire ropes were attached to the timbers, but there are props to which the ropes were not attached that are driven inwards.
4852. Are you aware whether a large fall causes any displacement of air? Yes; but that could not have done so.
4853. Have you ever heard of falls of roof causing great destruction to property and air-ways? Yes.
4854. Is that fall not sufficiently large to do so? No, it is not.
4855. Do you think or have you any reason to doubt that your overman, Mr. White, would conceal from you any complaint made by the men to him? I have no reason to doubt that he would or to think that he would.
4856. Has he ever reported to you any complaint made to him by the men as to the condition of the safety-lamps? No.
4857. If your orders to White with regard to the safety-lamps had not been carried out, would you consider that he has been guilty of negligence? Yes, if he knew it.
4858. So far as you are able to judge, do you consider that this accident has been brought about by the unlocked state of the lamps? No, it has not.
4859. Some evidence has been given to us as to the correct interpretation of rule 6 of your engagement rules. Do you know whether this rule ever prevented a man from making any report to you, I presume you know the rule, it is this: "*Interference by employees.* Any employee interfering in any way with the orders issued by the Colliery Manager or his overman for regulating the work of the mine, shall be liable to dismissal without notice." Did that rule prevent any man from complaining to Mr. White or yourself? It ought not to have done.
4860. Did you ever issue any orders for men not to report to you? Never.
4861. In which case would the rule read as the men have indicated? I do not see how that rule can be construed to mean the interpretation that the men put on it.
4862. Did any man ever ask you to explain whether it bore that interpretation? No; I do not remember any man asking me about that.
4863. Try and recollect? I do not remember if any man did so; I would certainly say it does not mean that in English.
4864. What does it mean? It means that the men would not be allowed to interfere with the management or discipline of the colliery.
4865. Is it necessary that strict discipline should be maintained? Certainly.
4866. Is it necessary that men should interfere with the discipline of the colliery apart from the management? I do not see that; it is only to assist in maintaining discipline.
4867. Would a report by any workman be construed by you to be an interference with the management? Certainly not?
4868. You cannot construe this rule to read as the men read it? No; there is nothing in it to imply that interpretation.
4869. Did you hear anything of this construction of this Rule 6 prior to the accident? No, I never did.
4870. Had you heard it would you have put the men right on it? Certainly.
4871. *Mr. Neilson.*] You stated, Mr. Ross, in the beginning of your evidence, that in the old workings you found gas—was that the time you worked through the dyke or afterwards? It was while we were driving the headings, the gas came off a roll in the heading.
4872. Was it permanent or temporary? It was temporary; it would last perhaps one day only.
4873. Did it have a chance of going off into the bords? No.
4874. Have you been through the old workings at all since that? Yes; many times I have been through these places with a naked light.
4875. Then there could not possibly have been any gas there? No.
4876. In reference to the locking of the lamps, in giving your officials instructions I presume that each was supplied with a copy of the rules? Yes.
4877. Would a manager consider it necessary to verbally detail the duties out to his officers? Not so far as the rules would relate to them; but if there was anything special it would be necessary.
4878. What quantity of air circulated in the Hill End district before the strike? About 4,000 cubic feet per minute.
4879. When were you last in the mine before the explosion? On the 15th or 16th of March last; on one of those days, I do not know exactly which, I was in the Hill End district.
4880. Since the explosion when were you in the mine? On Saturday last.
4881. What part of the mine? Through the return from the furnace to the western.
4882. Is that the part of the mine alluded to in your evidence at the inquest, where Mr. White was trying to get somebody to shout to him when the explosion happened? Yes, it was in that return.
4883. You have completed that road now? Yes; we got through on Saturday, and I believe White was through earlier.
4884. You are quite confident that you have examined the old workings, and that there could not have been any accumulation of gas there? Not the slightest.
- 4885.

- Mr. A. Ross. 4885. Did you enter the first or second bords? No.
 4886. Is the first bord in No. 1 heading stowed up? No.
 16 May, 1887. 4887. It was because of the increased quantity of air given out by the new furnace that you discontinued the use of safety-lamps in the bords? Yes, and the absence of gas as well.
 4888. You never found gas in them since the strike? No.
 4889. In reference to these doors, do you think if the west end door was left open that it would make much difference in the air? Not a great deal; it might make a little difference.
 4890. Were trappers kept by all these doors? Yes.
 4891. How many doors are there in the Hill End district? There are three doors in the Hill End district.
 4892. Is it a fact that in the old country in the most fiery mines the ventilation is intersected to a great extent by doors kept by trappers? Yes, by single or double doors as the case might be.
 4893. You expected that single doors would be a sufficient protection? Yes.
 4894. Did Millwood ever report to you that one of these doors had been propped open? It was reported that one had been propped open, but I never got to the foundation of it.
 4895. Did you hear of it before the explosion? No.
 4896. The fact of no gas being found in the face of the bords and some of the headings when the ventilation had been suspended, the natural inference is that even if the doors had been left open for half an hour, much gas could not accumulate? I do not think it could.
 4897. After 48 hours with very little ventilation there was only a little gas found? Yes.
 4898. You distinctly stated that you never received a report from anyone concerning the existence of gas? Only once since the strike, and that was a small quantity in Hope's heading No. 1.
 4899. Who reported it? White.
 4900. What time? On the Friday previous to the explosion; it was a very insignificant quantity as he told me that it just touched the lamp in the cut.
 4901. You say that in your opinion the explosion took place in No. 2 heading? Yes.
 4902. It then went to the wall side, to the stopping in front of No. 2? Yes; blowing away the door and the stopping behind it.
 4903. The explosion taking place in the face of No. 2, what space had it to expand when it reached that point? Only about 12 or 14 feet each way.
 4904. It had then no wide space to get down to the right or to the left? No.
 4905. Does that account for the confined state of the explosion? Yes.
 4906. Being confined to this narrow space? Yes.
 4907. If these places had been old, and had it not been for the dyke, it would have extended itself? Yes.
 4908. Mr. Hilton.] You stated to Mr. Nilson that you were in the mine on the 15th or 16th of March last? Yes.
 4909. Have you made it a special point of duty to travel the air-ways, to see that they were in proper order? Some of them, but not all of them.
 4910. Did you not think it was a portion of your duty to make yourself acquainted occasionally with the whole of the air-ways, to see that they were in proper order? The wasteman has charge of the air-ways.
 4911. Had you wastemen? Yes.
 4912. Who were they? Millwood, and he had a mate with him, who travelled with him through the air-ways and kept them in repair.
 4913. Millwood was wasteman and deputy? Not at this time—I was speaking before the strike.
 4914. Was the system of ventilation the best you could have adopted? Yes, under the circumstances.
 4915. Did Mr. White ever report to you the circumstance that two men, Woods and Wells, had been sent out of the mine for having their lamps unscrewed? Yes, I think he did so some days afterwards.
 4916. In view of these persons having their lamps unscrewed, and being sent out of the mine for it, do you think it was prudent to allow them to work on the night-shift without someone in charge of them? It would be better, probably, if there had been someone in charge of them; but there were practical miners working on the night-shift.
 4917. Did Mr. Nicholson ever state to you that No. 6 of these rules, which has reference to interference by employees, was regarded by the miners as a rule that would prevent them from making any remarks with reference to the condition of the mine, and that if they did so, some disability would be attached to them for so doing, under this rule? I don't remember that he did.
 4918. Mr. Owens.] You say that the night-shift men were supposed to have their lamps locked, and that in the event of their losing their lights, they would have to come outside? Yes, they would have to go somewhere for a light. If their lamps went out they would be very awkwardly situated.
 4919. Do you think that they could come out all that distance in the dark? No, but there were naked lights used outside the headings.
 4920. President.] In the air-ways? Yes; the drivers use naked lights in the headings outside the danger-board.
 4921. Mr. Owens.] Did ever anyone inform you that it was not safe for the wheeler to bring his naked lamp up to the danger-board in the heading? No.
 4922. Don't you recollect anything of the kind, and did you tell the man to mind his own business? Never. Mr. Nicholson never spoke to me about it, or anybody else.
 4923. Did the miners appoint check-inspectors at Bulli? No.
 4924. Would you allow that to be done? Yes, certainly.
 4925. Do you consider Mr. White a competent overman? Yes.
 4926. Is he a careful and efficient overman? I considered him a careful and efficient overman.
 4927. Mr. Jones.] I understood you to have said that you considered the Bulli mine more dusty than any you have seen? Yes.
 4928. Did you, before this disaster, know that dust played an important factor in a gas explosion? Well, I have seen it referred to, and have read about it; but I have only learnt about it not long ago. It is a new theory to me.
 4929. Then the watering of the horse roads was not done in view of danger? No.
 4930. If you had believed or known that dust does play an important part in explosions, would you not have thought it necessary to have watered the main roads where the trains travelled at a high speed in a strong ventilating current? Yes, it would have been more necessary. 4931.

4931. You say that your instructions were that all safety-lamps used in the mine were to be locked? Yes. *Mr. A. Ross.*
4932. Did you ever make any inquiry, to satisfy yourself that they were locked? I inquired of Crawford if they locked them, and he said, "Yes." *16 May, 1887.*
4933. Did you ever inquire of Millwood? No.
4934. Did it come to your knowledge that they were unlocked? No. In fact I was fully persuaded that they were locked.
4935. You gave instructions that no shots were to be fired in the presence of gas? Yes.
4936. Were you aware that shots were being fired in Nos. 1 and 2 headings? Not in the presence of gas.
4937. You knew there was gas there? I knew the coal gave off a little gas in the heading.
4938. Did you know that there was gas in Nos. 1 and 2 headings, when shots were being fired?
Witness: When?
Mr. Jones: At the time they were being worked after the strike? I was not aware of that.
4939. Why, then, did you instruct them to use safety-lamps? As a precaution, for fear gas might come off.
4940. Did White ever inform you that gas was coming off? Yes, once only after the strike.
4941. When was that? The Friday before the explosion, and that was in No. 1 heading, which I have referred to.
4942. You say you cannot believe that sufficient gas could accumulate to cause the disaster and the wreckage which has taken place in the mine? I did not say that exactly. I say that I don't believe that the amount of gas which accumulated there caused the destruction.
4943. Would it have required a very large amount of gas to cause the destruction, considering the limited area of the workings? It would have a larger effect coming through narrow headings than if there had been an expansive space for it.
4944. You have already stated that White reported to you that some men had been sent out for working with unlocked lamps? Yes; they had taken the top of their lamps off.
4945. Did you report that matter to the inspector? No.
4946. Did you not think it of sufficient importance? No.
4947. Did you consider it a breach of the Coal-fields Regulation Act?
Witness: What part of the Act?
Mr. Jones: That regarding the locking of lamps? Yes; working with an unscrewed lamp was a breach.
4948. Do you consider it a prudent measure to allow bords working with naked lights to be commenced in close proximity to new workings. That is, the exploring headings Nos. 1 and 2, under the circumstances, and the circumstances are these, that gas was known to exist in these headings? The presence of gas was not known when the naked lights were ordered to be used there; but safety-lamps were used in the headings, as there might be a probability of gas coming off.
4949. Were any safety-lamps used in the bords off No. 1? No.
4950. They were used in the heading on account of the presence of gas, we have been told? They were used on account of the probability that we might come across some gas.
4951. Is it not held by mining authorities that exploring headings giving off gas should be a reasonable distance from bords worked with naked lights? A reasonable distance, no doubt.
4952. Don't you think that a wider margin of safety would have been better? I thought that the margin was sufficient, from the former experience we had.
4953. Is it not a very narrow margin, considering that safety-lamps were used on one side of the prop of the danger-board and a naked light on the other? It depends upon the quantity of the air passing at the prop.
4954. We are told that the air was considerable; but in spite of that, an explosion has occurred which proves that there was not sufficient to prevent an explosion. Would it not, then, have been better for these headings to be further in advance of the naked lights? Perhaps it would have been better.
4955. Did you ever inquire from the deputy as to the mode of firing shots? No.
4956. You gave instructions that shots were not to be fired in the presence of gas. Would you be surprised to hear that your overman had appointed someone to fire shots in the bords off Nos. 1 and 2 headings?
Witness: In the presence of gas?
Mr. Jones: There was no gas at all.
Witness: I am aware that shots were fired in the bords and headings, but my instructions were that they were to fire no shots in any place in the presence of gas.
4957. You knew that shot-firing was carried on? Yes.
4958. Don't you think that some qualified person should be appointed to fire shots? There was a man to see that the places were clear before shots were fired.
4959. Did he do so? I have reason to believe so; of course I was not there.
4960. Do you believe that Crawford did so? Yes, I believe he did.
4961. We have it on oath that Millwood did not? I believe so.
4962. Did I understand you to say that the displacement of rock could have brought about the wreckage at the big fall? It could not displace the timbers, and put them in their present positions.
4963. But the haulage ropes pass at the back of some of these timbers? Yes.
4964. Would that not have a tendency to draw them out? Yes, if that rope was drawn down against them.
4965. Did Mr. White ever report to you that the men were working with unlocked safety-lamps? No.
4966. Ought he to have done so? Yes, if he knew it.
4967. Did you see the horse that was said to have been burnt at the mouth of the tunnel? Yes.
4968. Was it burnt? The hair seemed to be singed.
4969. How do you account for that? I cannot account for it.
4970. Can you offer any suggestion with regard to it? Probably it might have been caused by heated air.
4971. *Mr. Croudace.* Are you solely responsible for the laying out of these workings in the Hill End district? Yes.
4972. You laid out a plan or sketch? Yes.
- 4972½. Did you consult the overman? Sometimes I did. 4973.

- Mr. A. Ross. 4973. In opening out this Hill End district, that is, in going through the dyke, did you meet with gas there in the first instance? Yes.
- 16 May, 1887. 4974. And have you had gas in the Hill End district since that time? Yes, off and on, but not at all times.
4975. Was there any time when all portions of the mine were without gas? Yes, at times.
4976. The whole of it? Yes, the whole of it.
4977. Did you use safety-lamps before the strike, and from the time of first opening out the district? Yes.
4978. And ever since? Yes.
4979. In some instances they were used more as a matter of precaution? Yes, in the headings.
4980. In laying No. 1 heading out, you opened it quite close to the dyke; within some 20 yards? Yes.
4981. As a matter of economy, was that a prudent thing to do, knowing that your bords would only go 20 or 30 yards? Well, we could not study economy, as we had not sufficient places, and another reason was that I expected the dyke to run away back, as we got it on the other side of the workings, and I expected it to fall back the same way again.
4982. In opening up Nos. 1 and 2 headings, you took the fresh air from No. 1 to No. 2; and you stated that you believed the explosion occurred in No. 2 heading? Yes.
4983. Now, if there had been many bords broken away from No. 2 heading, do you think there would have been the amount of death? There would have been more if there had been men working in them; but the explosion would not have been so confined. Of course, if there had been no bords there, there would have been no men, except those in the headings.
4984. Under these circumstances, don't you think it would have been better not to have had bords in the return of the gassy section? I did not think there was sufficient gas to lead me to believe that.
4985. You say you had reported to you the presence of gas in Nos. 1, 2, 3, 4, and other headings? Yes, a little gas occasionally.
4986. But never reported since the strike? No, not in No. 2 heading or any other place, with the exception of a little in No. 1 heading.
4987. How then do you come to the conclusion that the explosion took place in No. 2? By the appearance of the heading, the charring of the props, and the destruction about there.
4988. Does that convince you that there was gas in No. 2? Yes.
4989. If White, Crawford, and other witnesses have sworn that gas has been there all along, how do you account for not knowing it since the strike? Well, I did not know of it, because it was never reported to me, and I had never seen it myself.
4990. Your system of reporting was simply verbal? Yes.
4991. As you saw the overman you got reports from him, and if you did not see him of course you did not get them? I always expected reports from him if there was anything important for him to report.
4992. As a matter of fact did you get reports daily? Yes, I saw the overman daily, and I visited the mine daily.
4993. And he never reported to you the existence of gas in No. 2 heading? No.
4994. Are you sure you saw him every day? Every day excepting Monday or Tuesday before the explosion.
4995. Would it not be better if you had written reports daily whether there was danger or no danger, gas or no gas, and that these reports came direct to you? Probably it would be.
4996. To me it is most unaccountable that gas existed, and yet you did not know it? The first time I heard of it was Monday or Tuesday before the explosion, and that it was very little.
4997. So it was practically the necessity of having coal that led you to start the heading near the dyke, and to break away the bords on each side? That was the principal reason, and I have already stated that I expected that the dyke would lay away from these headings, and I put these headings on on that account.
4998. Suppose there had been no pressure, would you have laid out these headings further away from each other? I think I would, but from former experience I did not expect a large coal-field there.
4999. Knowing that there was gas in No. 2 heading, do you not think it would have been better to have had bratticing running into it, and do you not think it best to run bratticing wherever gas exists? Probably it is if the gas is continuous.
5000. Coming to the doors, you say you did not think, on account of the nearness, that two doors would be better than one. As a matter of fact, if they were only 50 feet apart would it not be better to have only one door open at one time? Yes.
5001. Well, would not that be a better system? Of course two doors are always better than one in a main air-course where there is a pressure on.
5002. Have you seen the ordinary miner's lamp said to have been found in the face of No. 2 heading? Yes, one of that description. [*Lamp produced.*]
5003. Knowing that, and believing that the accident occurred in No. 2 heading, do you think that the explosion was owing to that lamp having been used by some one? I cannot say; I am not sure.
5004. Would it be possible for a man to be using that lamp in the heading when the explosion occurred without being blown away, and the lamp as well? Quite possible.
5005. Do you not think that the body of the man using the lamp would have been found in the heading? I should fancy he would.
5006. Do you attach any weight to the finding of that lamp as being the cause of the explosion? I hardly think so; of course I could not form any decided opinion.
5007. Have you ever had reported to you any accumulation of gas in any part of the mine, either in the old workings or in the bords in Nos. 1 or 2 headings, or in the return air-ways, or seen near the furnace, or in the western district, at any time previous to the strike? Oh, yes, gas was reported in the headings occasionally.
5008. Accumulated gas? Yes, in places which were stopped until the stentons were put through.
5009. Where? I think in No. 4 heading, but I am not certain.
5010. A long time ago? Yes, a long time before the strike.
5011. Between the commencement, after the strike, and the explosion, did you know of any accumulation? I had no idea of any accumulation that could take place since the new furnace was lit, and I never had it reported to me.

5012. *Mr. Neilson.*] In the event of there being a considerable quantity of gas which kept a safety-lamp full of fire, would you allow the miners to work in that? Certainly not. I would not allow a miner to work where gas would fire in the lamp at all. Mr. A. Ross.
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5013. With 12,000 cubic feet of air per minute did you think that quantity was sufficient to render any gas that might come off from these headings harmless? Yes, for it would take 1,000 feet of gas per minute to render that air explosive.
5014. Then 12,000 cubic feet of air per minute would render a large quantity of gas harmless? Yes.
5015. *Mr. Hilton.*] I understood you to say that you had never seen gas in the mine since the strike? No, I have not.
5016. And never reported to you? Not with the exception of that reported on Friday in No. 1 heading, and that was a very small quantity, which was just rising out of a small fissure.
5017. What day did the mine resume work when the strike terminated? The contracts for the headings were taken on the 7th March, but previous to that there had been four men in these headings, Nos. 1 and 2, for three weeks, and no gas was reported.
5018. According to your statement the strike was virtually over on the 7th or 8th of March? Yes.
5019. And the disaster occurred on the 23rd? Yes.
5020. That is fifteen or sixteen days? Yes.
5021. During this time were you in the gassy section? Yes.
5022. You never saw any gas? Never.
5023. Not in No. 1? No; but it was reported to me; I never saw any myself.
5024. How often were you in the mine since the termination of the strike and up to the day of the explosion? I do not know. I recollect being in on the 21st of February, on the 26th of February, and on the 15th or 16th of March.
5025. *Mr. Crowdace.*] Your overman was in daily? Yes, daily.
5026. *Mr. Jones.*] Are you aware that it has been reported to the Commission that some bords are as high as 41 and 42 yards in advance of the air? Yes. It has been an oversight on the part of the overman.
5027. You admit that it is a violation of the Act? Yes, certainly.
5028. Had you trappers employed at all times up to the time of the strike? Yes.
5029. Are you sure that you are not making a mistake? I do not think so. If there were not trappers there were some other persons appointed to look after the doors.
5030. We have it that such was not the case? If there were not boys there was somebody else appointed to look after them.
5031. *Mr. Clarke.*] Would the overman have authority to put in bratticing or order it to be done, or would he consult you? He would probably have consulted me first.
5032. *Mr. Crowdace.*] Have you been restricted in any way by any false idea of economy in the use of material for bratticing or doors? No, never.
5033. The Company are liberal enough in that way? Yes; I was never restricted by them.
5034. *Mr. Owens.*] Was the powder magazine in the mine? No, it was down near the jetty.
5035. Was no powder kept in the mine? Yes, some was kept there for supplying the men.
5036. How much? Sometimes 20 lb. or so.
5037. *President.*] Only a small quantity? Yes; the powder magazine, where the bulk of the powder is kept is down near the jetty, and it was brought up in small quantities, in bottles as we wanted it. [*The witness withdrew.*]

James Rowan sworn and examined:—

5038. *President.*] You are the Government Inspector of Coal-mines for the Southern and Western Districts? Yes. Mr
J. Rowan.
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5039. You hold a certificate of competency under the Coal-mines Regulation Act of 1872? Yes. I passed a Government examination and received a certificate of competency.
5040. What experience have you had in mining—How long have you been engaged in coal-mining? Since I was a boy 9 years of age.
5041. How many years? I am now 45; during that time I was ten years a colliery manager in two collieries in Scotland.
5042. Did these mines produce fire-damp? Yes, both gave off fire-damp more or less; and I may state that I, on one occasion, had charge of the safety-lamps in connection with an examiner of mines, when taking the ventilation of other collieries.
5043. In your present official capacity did you make periodical inspections in accordance with the terms of the Act in this colliery? Yes, every eight weeks, more or less.
5044. Were these examinations of a thorough character? I consider that they were careful examinations.
5045. Did your inspections include the examination of the return air-ways? They included the intakes, the returns, the main-ways, the bords, and the headings.
5046. Generally speaking, were you satisfied with the result of these inspections? As a rule I was; but I had occasion to complain to Mr. Ross on account of the condition of the return air-way from the western down to the grip. That is where the new furnace is.
5047. When was that? Previous to the strike I complained about it. After the strike of course the road was in a worse state owing to the heavy falls which had taken place during the time that operations were suspended, but before that it required a little repair.
5048. Have you ever had any complaint made to you regarding the condition of the workings of the Bulli Colliery? I never had a complaint good, bad, or indifferent.
5049. No complaint of the unsafe state of the roads? I never had a complaint of any kind whatever from the Bulli miners.
5050. Do you know Mr. Nicholson, miner at Bulli, and secretary of the Miners' Union? Since the strike he has been pointed out to me; I did not know him before that.
5051. Do you know whether he ever made a complaint to you of the unsafe state of the roads in this colliery? Never, to my positive knowledge.

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5052. Are you quite certain? Yes; but if he did it has clearly gone away from my mind, for I have not the slightest recollection of anything of the kind.
5053. Were the management of this colliery always ready to comply with any request you made for the better condition of the mine? I never had reason to complain except the instance I have referred to.
5054. Were they disposed to meet you in order to better the condition of the colliery? Yes.
5055. Have you had occasion to doubt the competency of the manager at Bulli? I always looked upon him as a competent, careful, and anxious man.
5056. You think him a competent man? I considered him so.
5057. Were you satisfied with the qualifications of White, the overman? Well, he was somewhat peculiar in his habits.
5058. His habits or manner? Well, I should say that his manner was peculiar. I have had to enforce him to be careful, and he would generally want to know what was wrong now.
5059. Do you consider him a careful man? As far as I saw he appeared to be.
5060. Was he anxious? Yes, anxious.
5061. Did you consider him competent? I used to question him very often, and from the answers he gave I would consider he was qualified.
5062. Do you know Crawford, the former deputy? Yes.
5063. Did you consider him a careful and competent deputy? I have found nothing important against him except some little things. One day Mr. White had a dispute with him when he charged him with wilfully leaving a door open which considerably reduced the ventilation; that is the only thing I can remember.
5064. Did White impute that the door had been opened by Crawford purposely to reduce the ventilation? Yes; I was taking the register of No. 1 heading, and I found it was down below the requirements of the Act. I told White that it was so, and that I would have to serve the Company with notice. He seemed astonished, and I said I would go around the workings into the furnace, and would then take another register to see if there was any difference. After we had gone around a certain portion of the workings we came to the door that was open. Crawford was near it, and White charged him in high words with wilfully leaving the door open.
5065. You have no knowledge whether he was guilty or not? No.
5066. You knew Millwood, the last deputy? Yes, I have spoken to him.
5067. Were you satisfied of his qualifications? I had no personal knowledge of him. My only knowledge of him was from statements he made to me. He told me that he was thoroughly acquainted with the mine, and he examined it every morning with a safety-lamp; he also said that he had knowledge of fiery mines. I asked him if he had ever seen fire-damp in the mine. He said not very often; but he might at times see very little in some of the headings, but it was very slight.
5068. Did he not accompany you while you were last inspecting the mine? No; White was with me.
5069. When was your last inspection? My last official inspection was on the 15th February of this year.
5070. Did you carefully examine the bords for gas? I examined every bord in the Hill End district.
5071. Did you find any gas? I never found the slightest trace in any of the bords.
5072. Did you find any in the headings? I found a slight trace in one of the headings; a cut had been put in about 3 feet, and putting the safety-lamp right in the cut I saw a slight cap upon the lamp.
5073. Was the statement made by Millwood that he had seen very slight traces of gas confirmed by your own inspection? Yes.
5074. We are informed that the bords off Nos. 1 and 2 headings gave off gas before the strike? I never found the slightest trace of gas in any of the bords, and only on rare occasions in any of the narrow headings.
5075. Such a sweeping assertion as I have narrated is not in accordance with your examination? Not with the examinations I have made.
5076. We are also informed that no gas was given off in these bords since the strike. Is that in accordance with your examinations? Yes.
5077. Are you aware what would account for this circumstance, presuming that the bords gave off gas up to the time of the strike. Is the condition of the bords different now to what it was previous to the strike? I believe they are just the same.
5078. Then you would expect these bords to be giving off gas at present if they did so before the strike? Yes.
5079. Did anything occur during the strike that would cause gas to be given off in these bords? No; I examined the mine during the strike, and found no gas in the bords.
5080. So the strike would in no way account for it? No.
5081. Would the improved ventilation cause it? No, I should think not.
5082. You made particular examinations of all parts of the mine? Yes.
5083. You knew that the Hill End district gave off gas to some extent? Yes, a slight percentage of gas.
5084. Have you observed gas in any other district of the mine? Never.
5085. Did the knowledge of gas being given off in one district make you more careful in your inspections? I was always very careful in my examination of the Hill End district, and I made it a point to question and inquire of the miners in these places. I would say words to this effect: "Men, are you satisfied that this district is carefully examined before you come into your work." They would reply, "Yes." Then places were examined. I would also ask if the deputy ever came in during the day, and they would tell me that he came in several times. Before I left I would sometimes say, "Now is there anything that I have overlooked, and, if so, will you let me know what it is?" On many occasions I have said words like these to the men.
5086. You have not received any complaints from the miners as to the amount of gas, or any other dangerous condition of the mine? I never received a complaint before the explosion. I have heard a great deal since, but never before the explosion.
5087. You gave the miners every opportunity to complain if they wished to do so? Yes; I have often sat down with the miners, and was always friendly with them, and they with me.
5088. Gas was never found by you in dangerous quantities? Never in dangerous quantities.
5089. Was the quantity sufficient to render the use of safety-lamps expedient? Yes; because there was a limited amount of ventilation at that time. The average varied from 3,000 to 3,500 and 3,600 cubic feet

Mr. J. Rowan.
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feet per minute, and that intake being rather low I approved of the precaution of working the narrow headings, and the bords about them with safety-lamps.

5090. Your examination included the return airways. Were they sufficient? Yes; in one way I was satisfied, but not in another. There was a large enough area in the return airways to take 100,000 cubic feet per minute, but I wanted a travelling road through it, and I urged the manager to have a recognised travelling way.

5091. These airways did not impede the air? No; they are taking now 60,000 cubic feet of air per minute through the returns.

5092. You wanted a thorough travelling road and what was the result? The manager promised to comply with my request and said it would have been done earlier, but at the commencement of the strike, all the deputies left with the miners, and he could not get men, but stated that he would make it his first business after the strike to have the road completed.

5093. Do you know whether he complied with his promise? Yes; he had two shifts of men on the work.

5094. Could you have expected more? No; although I made myself disagreeable to him by urging him on, and he told me that he was doing all that he could. I considered it necessary to press the matter as I wanted a proper travelling way down to the furnace.

5095. Did you satisfy yourself of the amount of the ventilating currents? Yes.

5096. Could you give us the amount of these currents before the strike? The average amount of ventilation going in the main tunnel was 15,000 cubic feet per minute.

5097. Of which the Hill End section would get how much? From 3,000 to 4,000 cubic feet, and the balance would go to the western and grip districts—which were about equally balanced by the regulating door having from 5,000 to 6,000 cubic feet per minute each.

5098. Since the new furnace was put into operation what has been the difference in the ventilating current? We have got as high as 64,000 cubic feet per minute, of which amount 12,000 cubic feet was brought up to the Hill End district.

5099. And this large ventilation was due to the new furnace? Yes; it is in 43 chains from the entrance of the tunnel; and the air shaft is 320 feet deep.

5100. Were you satisfied with these results? Yes; I was satisfied so far as the ventilation was concerned, and I said to White "You are now in a position to send 20,000 cubic feet per minute into the Hill End district, and I hope next time to take a register of 20,000 cubic feet instead of 12,000."

5101. Knowing the quantity of air circulating in the Hill End district, was that sufficient to dilute and render harmless any quantity of gas which you supposed could have been given off in Nos. 1 and 2 headings? Oh, yes.

5102. In the course of your inspections of this gas, did it strike you that it was peculiarly quick? Yes; it seemed to come very quick upon the lamp. It acted very sharp upon the light.

5103. Had you ever to complain at the distance of the cut-throughs from one another? I never had any complaint; but of course in going round the mine to make an official examination, you have not time to measure everything.

5104. Does the Bulli Colliery contain many rolls? Yes; numbers of rolls.

5105. Do these offer any impediment to the cut-throughs? Yes; I have seen places where they had to drive 20 yards through stone, but in the bords they are inclined to work down and then back upon them.

5106. In view of these rules would you be disposed to extend any latitude to the manager in particular instances with respect to the distance which separated the cut-throughs? I have no power to do so by the Act.

5107. We are informed that safety-lamps were alone used prior to the strike in the Hill End district? Yes.

5108. And that open lights have been used in the bords of this district since the strike? Yes.

5109. Can you give any reason for this change? Owing to the increased ventilation and the new furnace having power to again increase it by another half and no fire-damp having been seen in any dangerous quantities in the Hill End district, I did not see that I could enforce the management to continue working with safety-lamps.

5110. Did you examine the condition of these lamps? I made no careful examination of them. I have gone into the bords and asked for a lamp from the miner to examine the condition of the working place, but not exactly to examine the condition of the lamp itself.

5111. You never said whether they were locked or unlocked? I never tried to twist them to see if they were locked. Of course I understood that the rule for locking these lamps was obeyed, and it was the province of the deputy overman and manager to see that it was carried out. The same rule applies to matches and pipes, and surely I cannot be called upon to search the men to find out if that rule is broken.

5112. It was beyond your power? Yes.

5113. Did any of the miners complain to you of the circumstance that the lamps were not locked? I never received any complaint at all about it.

5114. Was the change from safety-lamps to naked lights made with your approval? No.

5115. Were you consulted? I was not.

5116. Is your approval or consent required under the Act? No, not directly; but it would have been prudent for the management to have done so.

5117. Were you satisfied with the change that was made in the bords? I looked upon the change as safe, seeing that they were free from gas when the ventilation amounted to 3,000 cubic feet per minute, and when they received the ventilating current of 12,000 cubic feet per minute with power in the new furnace to increase that amount, I did not see how I could object to the management working with naked lights at a respectable distance from the headings.

5118. More or less gas always came off in these headings? Yes; I believe a small quantity of gas always came off in the narrow headings.

5119. In your opinion did not this require some special provision to sweep it out from these headings? No; with the quantity I have seen in any heading I did not think there was anything urgently necessary; I thought cut-throughs placed at the proper distance would meet the case.

5120. Have you seen any bratticing used in the Bulli Colliery? No; although had I been manager of the colliery I should have dealt with the ventilation in a somewhat different way.

5121. Did the use of bratticing in these headings ever suggest itself to you? Not particularly, because

Mr. J. Rowan. I did not see anything dangerous in the quantity of gas coming off, and even now with the crippled condition of the ventilation there is not a bord or heading in the Hill End district where the slightest trace of fire-damp can be found with the exception of Nos. 1 and 2 headings.

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5122. We have evidence all round of a quantity of gas coming off in these headings. Did the men ever complain to you of it as dangerous? I never had a solitary indication of any amount or accumulation of gas from any man.

5123. No complaint? No complaint whatever.

5124. Was any complaint made to you as to the state of the lamps? No complaint at all.

5125. Do you find the men generally backward in making complaints of these things? No; the men I find generally talk pretty freely.

5126. Are you perfectly positive that you never did receive a complaint as to the amount of gas in the mine or state of the lamps? I never received the slightest intimation concerning one or the other.

5127. Do you know the miner Hobbs? Since this inquiry commenced I have heard about him, but I never knew him before personally.

5128. Did he call your attention to the state of the lamps and gas? Never; my attention was never called to one or the other by Hobbs or any other man in the Bulli Colliery.

5129. Are you positive? I am as certain of it as death, sir.

5130. Were you in a general way satisfied that the colliery was carefully conducted? I had no complaint to make of it except what I have referred to in connection with the returns.

5131. Did you observe how shots were fired in this colliery? On my last inspection in February Mr. White told me that he had tried to insist upon doing away with shot-firing, but that the men said they could not make wages without it. He also said that since the new hands came in no shots were fired in the Hill End district, and that he intended to fire no shots in the district in future. That was his statement to me.

5132. Did you know whether shots were fired in the headings by the men working there on the day of your inspection? No shots were fired while I made my inspection in February.

5133. Did you ever enquire as to whether explosives had been used? White told me that all shots were done away with in the Hill End district.

5134. Would you be surprised to learn that inside the gas in No. 2 heading with the danger-board fixed at the end of the stenton, men have acknowledged here having lit shots in the face of that heading by striking a match? I have been awfully surprised to hear it.

5135. You were not aware that shots were fired at all? Not since the strike. I was informed that previous to that the deputy, Crawford, fired the shots in this district.

5136. These headings intersected numerous rolls? Yes.

5137. Is gas given off in greater abundance near these rolls? Yes; there is a likelihood of its being found in larger quantities in proximity to rolls and when fissures are cut. It is likely to come off in the shape of blowers, although I have seen rolls in other districts where there was no gas and have never heard of any blowers in connection with them.

5138. Was a blower never reported to you? Never; a blower, fissure, or any additional quantity of gas of any description.

5139. Is it customary for a tongue of flame to be projected some distance by a blown-out shot? Yes.

5140. If the shot is tamped with dry dust, would this flame be increased? Yes; greatly.

5141. If in addition to that the atmosphere is laden with fine dust, would that intensify an explosion? Yes; the proportion of 16 oz. of this coal-dust to 160 cubic feet of air is sufficient to cause an explosion?

5142. *Mr. Crowdee.*] Do you know that of your own knowledge? No; not from my own knowledge, but from experiments made by others.

5143. *President.*] Would this flame be intensified if, in addition to dust, there was a small percentage of marsh-gas present? Yes; it would increase it greatly.

5144. Have you examined the face of heading No. 2 since the accident? Yes.

5145. Do you think a shot had been fired before the explosion? It had all the appearance of a shot having been fired. The coal lying down in the face of the heading indicated that.

5146. Do you think that that shot was fired under the conditions I have narrated—a small quantity of marsh-gas, a dusty atmosphere, the probability of the shot being tamped with small coal, and of its being a blown-out or overcharged shot? I am of opinion that there has been a quantity of gas about the face of No. 2 heading, and that has been ignited by the shot, and that in the act of firing gas, or rather immediately after the explosion, it increased its force eight times, and came out of the heading in the shape of flame, which would instantly raise the coal-dust right throughout the Hill End district.

5147. So you believe that the explosion was due to the explosion of light carburetted hydrogen gas? Yes; I cannot define the quantity, but I believe there has been a mixture of coal-dust with it. I have been six or seven times in the mine since the accident, and from the indications of charred props, and indications where the force passed, I am positive in my own mind that it came from No. 2 heading, and that it was largely assisted by coal-dust.

5148. Can you give us the cause of the explosion as far as you could judge? It commenced in No. 2 heading and came straight out, separating itself in two parts at the stenton dividing the two headings. One portion went out of No. 1 heading, and the heavier body went straight out of No. 2 heading to the last bord of the main heading. It passed down then through the stenton, where we found the props literally charred, and in some places coke about 2 inches deep, where she has apparently lingered as she went down. Then I believe that the two divisions met in the main heading, and afterwards one division went down the main tunnel, and the other went into the western district. The latter part, in going down, then broke through the air-crossing, and again split itself into two. Subsequently, it went again into the main tunnel; but I believe a few seconds would elapse between these two currents reaching the tunnel-mouth. The other force went down to the western and exhausted itself, and that owing to the furnace it could only do a little damage.

5149. Then the combined force partly dissipated itself by blowing down the stopping at the foot of No. 2 heading? Yes.

5150. Do you believe that flame can be transmitted by means of fine dust to a distant locality and explode a magazine of gas in that locality, no gas intervening? I should think it would be hard to reconcile.

5151.

5151. You say that a dust-laden atmosphere will produce an explosion. Could a flame be carried by dust? **Mr. J. Rowan.** Yes; if the dust is in a fused state.
5152. If an explosion takes place in one spot, and there is a dust-laden atmosphere, could the flame be transmitted to a distant locality by means of the coal-dust? Yes; I believe it could. **16 May, 1887.**
5153. You have inspected this mine repeatedly since the accident? Yes.
5154. Do you believe that there were any separate reservoirs of gas ignited by the flame projected from the explosion at No. 2 heading? No; I do not think so.
5155. Do you believe that gas had accumulated in some of the abandoned bords off No. 1, I mean the first two bords that were driven off that heading? No; I do not think that any existed there, because I inspected all that locality, and I never found any gas in there.
5156. Are you of opinion that no gas existed in the abandoned bords off the return before the accident? I have travelled that way, and I never found any fire-damp, and I cannot see where it could exist there with 12,000 cubic feet of air per minute passing.
5157. If a reservoir of gas exploded here would these old bords have presented evidences of a separate explosion? Decidedly.
5158. Are there any indications shown on the stoppings? No; not in the stoppings. If gas had exploded in them, the stoppings would have been blown outwards.
5159. Then you don't hold to that opinion that gas existed in the bords in the locality that I have indicated? No.
5160. Is the damage in the mine very great? Not very great; there are two extensive falls, but these could have been done by a set breaking away at the top of the incline. The damage is not so great as one would expect after an explosion in which so many lives were lost.
5161. Considering the comparatively small area of workings, the destruction of life is unusually great? Yes; it is.
5162. Would the limited area of the workings account for the total annihilation of life? Yes; as the explosion was concentrated to this small area.
5163. If the force of the explosion had been dissipated in the old workings, do you think the same destruction of life would have occurred? No; because it was confined to certain limits in which all the men were working. It had a straight road to go out of the Hill End district, and a clear way down to the western. It had two tunnels to pass through; but if there had been a larger area that force would have been distributed, instead of which it was confined like the barrel of a gun.
5164. You made an examination of the condition of the bodies? Not the first day, as I was away at Mittagong, and it was some twenty hours after the accident when I got down.
5165. Have you formed any opinion as to the cause of the majority of deaths? I believe the majority died of suffocation from after-damp.
5166. What does after-damp consist of? In it there are seventy-one parts of free nitrogen, nineteen parts of steam, and nine of carbon; that is, the moment after explosion. Of course after a little while it undergoes some change, as soon as the steam is condensed.
5167. Free nitrogen is destructive to human life? Yes; there is no oxygen to carry on existence.
5168. Do you know of the destructive nature of carbonic oxide? Yes; 1 per cent. is fatal to animal life; but a light will burn in some cases in connection with it.
5169. How do you expect carbonic acid after an explosion? It is generated by imperfect combustion.
5170. Will the firing of fine dust account for its presence? Oh, yes.
5171. Composed as it is of nitrogen, it would be quite sufficient to destroy life? Quite sufficient.
5172. Are you satisfied with the system of ventilation by means of doors practised here? If I had been the colliery manager I would have tried to do away with the doors altogether in the mainways. Nevertheless, I have never found that the provisions of the Act require that.
5173. You are aware that many of the large collieries are ventilated by means of trap doors? Yes.
5174. Were these doors attended by trappers? Yes; placed there specially for the purpose.
5175. Would the opening of the door during the passage of trams through it be a source of danger in Nos. 1 and 2 headings? No, not for the passing of the sets; but if it had to be left open any length of time there would be a certain amount of risk in it, as the air would go another way.
5176. Would the door require to be open any considerable length of time during the passing of a set? No; I have been in the Hill End district when the traffic was going on for two hours, and I never saw any visible change in the ventilation by the traffic.
5177. It would only manifest itself if the door was allowed to remain long open? Yes.
5178. Do you approve of the position of the door fixed at the entrance of the western main road? Yes. It is what they term a regulating-door, allowing a certain portion of air to go one way, and another the other way. It had to be so regulated, because it would have taken the road into the furnace.
5179. Considering the circuitous routes which the air from the western district had to pass through, could not the regulator be placed on the return instead of where it is? Yes. I might be allowed to explain that this door on the western had a stationary man or boy specially to open or shut it. In the event of that door being open for any length of time it might seriously interfere with the ventilation, but no serious stoppage would ensue if only left open for a few moments, because the air would divide itself, and by its circuitous routes round the western and its straight way into the Hill End district, the straight route would get its proportion of the ventilating current.
5180. Do you consider that the opening of this door may have been the cause of this explosion? If the door was left open for any length of time, it would certainly deprive Nos. 1 and 2 headings of their proportion of air.
5181. Have you any reason to suppose it was left open in view of the fact of the attendant being found on the flat in the vicinity of the door? I could not say as to that; it is impossible to say.
5182. Do you consider that any interruption of the return airways from the Hill End district may have been the cause of the accident? No; because even now they are capable of discharging 100,000 cubic feet of air per minute.
5183. What quantity of air was passing through these returns on the day after the accident when you visited the colliery? There was a current of 30,000 cubic feet of air coming from the western, and 24,000 cubic feet coming from the Hill End district.
5184. Was that any evidence of any interruption in the returns? I should say not. I have tested them

Mr. J. Rowan. six or seven times since the accident, and I always got an average coming from the two returns of 60,000 cubic feet per minute.

16 May, 1887. 5185. With gas issuing from Nos. 1 and 2 headings, would you consider it an evidence of mining erudition to work the bords off No. 2 heading, or in the return air with naked lights? As I have previously stated, I thought that with this increased ventilation, and no fire-damp having been seen in the bords when the ventilation was much lower, I could not reasonably object to the bords being worked with naked lights, when the ventilating current was 12,000 cubic feet per minute, and when there was power in the new furnace to increase that in the same district up to 20,000 cubic feet.

5186. They had ample means of rendering harmless all the gas that you had ever known in these headings? Before that quantity of air could have been brought up to an explosive point it would require 1,300 cubic feet of gas per minute to be mixed with it; and such an enormous quantity of gas would be quickly felt as you approached it. [*The witness then withdrew.*]

TUESDAY, 17 MAY, 1887.

Present:—

DR. ROBERTSON, PRESIDENT.

MR. O'MALLEY CLARKE,
MR. NEILSON,
MR. CROUDACE,

MR. JONES,
MR. OWENS,
MR. HILTON.

James Rowan—examination continued.

Mr. J. Rowan. 5187. *Mr. Hilton.*] I notice, Mr. Rowan, that on the occasion of your last inspection of Bulli mine, previous to the explosion, you found 12,000 cubic feet of air passing into the workings? I may explain to the Commission that the inspection of the 17th March was not an official inspection, as it were. I was only down there with the Examiner of Coal Fields when he was taking the measure of the coal area for royalty. My last official inspection was on the 15th February.

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5188. On that occasion you found 12,000 feet of air going into the Hill End district. Now, considering the present defective state of the ventilation, and the small amount of gas found in the headings, would you be disposed to believe that the ventilation must have become deranged immediately before the explosion (say) for three or four hours before? Well, as to that, I can only fall back upon the state of matters as I have found them, comparing the results of inspection previous to the explosion, with the examinations made since, when there was a very low percentage of air passing, and not a trace of fire-damp could be found, except in Nos. 1 and 2 headings.

5189. Well, Mr. Rowan, would you reasonably expect that the same amount of air that you found on your last inspection was passing through the workings on the day of the explosion? I cannot say what took place, as it was an ordinary day, and everything was going on in the ordinary routine.

5190. *Mr. Croudace.*] Is there any part of the system of ventilation that could become deranged? I do not think so.

5191. Supposing it did become deranged, where do you think such derangement would take place, so as to diminish the amount of ventilation going to the Hill End division? You are well aware that there is a door on the western, at the junction with the main tunnel? Yes.

5192. Supposing that door was knocked down? You might as well ask me if all the doors were knocked down.

5193. Well, Mr. Rowan, supposing this door on the western had been open three or four hours before the explosion, would it considerably diminish the amount of ventilation going to the Hill End district? Yes; it might diminish it to the extent of 2,000 or 3,000 cubic feet per minute.

5194. Supposing this door (at the western) were knocked down by the sets passing, you say that the ventilating air would divide itself into two currents; on which road do you think the greater volume of air would go—on the western or to the Hill End division? Well, I can scarcely say; it would depend greatly on the friction of the respective airways.

5195. Supposing these stoppings on the tunnel were in good order and a regulating door was placed in the western return, do you not think it would be a better system of ventilation than having this door on the western road? Yes; I believe it would; and if I were the colliery manager I might adopt it.

5196. *Mr. Neilson.*] Can you assign any cause for the large fall on the main tunnel, Mr. Rowan? The only explanation I can give of that is that the blast as it came down dislodged a number of props, and caused the roof to fall.

5197. Can you assign any cause for the bodies on the top of the incline being burnt? No.

5198. Was the timber all charred in that part? I carefully examined all round there, and I saw no effects of flame passing that way.

5199. In view of gas giving off in Nos. 1 and 2 headings, do you think it would be advisable to dispense with these two doors on the main road? Well, it could be done; but it never occurred to me, because the requirements of the Act were complied with, and that is all I had to see to. If I were a colliery manager, and had to concentrate my attention on one colliery, I would use methods both as to trimming and ventilation to suit my purposes.

5200. It has been suggested that the doors on the main roads might be abolished. Where would you place your regulating doors? Well there is a door on the main road [*pointing to the plan*] you could dispense with, and put an air-crossing at the foot of No. 2 on the main road, and enter it on the return, taking the split at No. 1 heading. You could deal with Nos. 3 and 4 in the same way.

5201. But the gas is given off from Nos. 1 and 2. Do you think it would be advisable to carry the air round past the two points where gas is, and pass these bords here [*consulting plan*]? All the gas I ever saw there, with the exception of Nos. 1 and 2, was practically harmless.

5202. Could these doors be dispensed with altogether? Yes. You are aware that it is one thing to inspect a mine and see that the requirements of an Act are complied with, and quite another thing to manage a mine.

5203. Quite so. Fifty managers may have fifty different ways of doing things? Yes.

5204. *Mr. Croudace.*] We wish to see if any improvements could be made on the present system here? *Mr. J. Rowan.*
Yes. I have said these doors could be dispensed with altogether, and regulate the ventilation on the returns. 17 May, 1887.

5205. *Mr. Neilson.*] Have you any reason to believe that any of these doors were left open previous to the explosion? Well, I have no way of ascertaining that. There were boys stationed at the doors, and it was their duty to look after them. I only found a door neglected on one occasion. I generally found the boys attentive to their duty.

5206. You have no suspicion of any door being left open immediately before the accident? No.

5207. Is it usual to take any greater precautions as to the doors than you found at this colliery? No. In the best regulated collieries it is usual to have one in charge of each door, that is all.

5208. *Mr. Owens.*] I think you have stated that you consider the ventilation in Nos. 1 and 2 was sufficient to diffuse all the gas given off there? Yes.

5209. Then how do you account for the explosion? I account for it in this way: I think a shot had been fired in No. 2—an overcharged shot—and that a certain accumulation of gas was present in the roof or face. The shot ran out, and from the flame and coal-dust produced the explosion was caused.

5210. During your inspection at Bulli mine at any time did you see that the miners' lamps were locked and had been properly attended to. Well, I answered that yesterday.

5211. How often did you visit the mine? Periodically, about every eight weeks. I might be a week earlier or later, of course.

5212. You never found gas in any other part of the mine than these two headings, Nos. 1 and 2? I do not know that I ever saw fire-damp in Nos. 1 and 2 headings at all before the explosion. I did away down in the lower workings.

5213. Did you at any time receive a complaint from one, Hobbs, or any of the miners as to the condition of Bulli mine? Honestly I never did receive a complaint from any of the miners at any time. If I did, it has entirely vanished from my memory, and I have a pretty good one.

5214. How did you first become acquainted with the presence of gas in the Bulli mine? It was on one of my usual visits of inspection when they were working in the cinder coal. A certain quantity was being given off. They were then working with safety-lamps.

5215. Then the management did not inform you when gas was first discovered. Do you not think it was their duty to do so? Yes, I think so.

5216. According to your last report on Bulli mine, 12,000 cubic feet of air was passing the stenton between Nos. 1 and 2 headings, and you further stated that it would take 900 cubic feet of fire-damp to pollute that current of air or render it dangerous or explosive? Yes; it would take about 1,000 feet.

5217. You further stated that you thought it was quite improbable that Nos. 1 and 2 headings were giving off that amount of gas? Well, it has never been seen yet.

5218. But an explosion has taken place, and I now ask you how do you account for an explosion taking place under the circumstances in such a large volume of fresh air? I have already explained that I think it was caused by a shot in the first place, and the gas that might be in the roof or face assisted by the coal-dust converted into a gaseous state would account for it to my mind.

5219. Are you aware whether the roads were watered with the view of rendering the dust harmless? The engine plain was, I believe, not the headings.

5220. *President.*] Where did the engine plain end at the date of your last inspection? I cannot say precisely; it is shifted since, however.

5221. How far in? Several hundred yards. I cannot say from memory.

5222. *Mr. Jones.*] Presuming these parts of the mine were watered, would that in any way alter your opinion? Not very much. It would minimise it a little. This being a dry district, the dust would go all through the bords, and round everywhere; and then a shock or concussion would raise it even if the floor was a little damp.

5223. Considering the large quantity of air passing, does it in any way occur to you that one or more of these doors on the main heading, and that on the diagonal road leading to the flatt might have been open, and thereby contributed to the cause of the accident? No; I have no special reason to suppose so. You can go in the cross-cut now and you will have to go several yards off the cross-cut before you can catch it in the safety-lamp with only 1,000 feet of air passing.

5224. According to your own statement there was a very large quantity of air travelling before the accident, and scarcely a sufficient quantity of gas to show in the lamp, and yet we have had an explosion which has caused a considerable amount of destruction in the mine. How do you account for that? Simply because it was so confined. If a couple of sets had broken away it would have caused as much destruction almost as you see there.

5225. Did Mr. Ross ever report the existence in either of these headings of a blower of gas to you? No.

5226. To your own knowledge were boys always employed in attendance upon these doors? I cannot positively say that there was one at the western.

5227. Would you be surprised to learn that previous to the strike boys were not so employed? It is not to my knowledge. Since the strike I have spoken to the boy when I have been passing the western.

5228. Can you account for the singeing of the horse, Mr. Rowan? Well, I can say nothing but what I have previously stated. I am not so clear upon it as I would like to be.

5229. Was it ever suggested to you that a change in the weather had any material effect upon the ventilation? Well, that is an understood fact.

5230. Did it so operate? We have no barometers on the bank heads here, the same as we have in England, so I cannot say with certainty as to that.

5231. Do you think it necessary that each colliery should be supplied with a barometer? Yes; and there should be provision made for it in the new Act. There should be an instrument of that kind at every bank head, and the man who makes inspection of the mine should keep a register of it.

5232. I think you have already stated, Mr. Rowan, that you never made any inquiry as to the provision made for firing shots in this colliery? Yes; but I said that Mr. White gave me to understand in very clear terms that shots were to be done away with in the Hill End district.

5233. Do you think that the firing of shots in the presence of gas should be delegated to some authorised person? Yes.

5234. *Mr. Croudace.*] You said, Mr. Rowan, that you first came to the knowledge of the existence of gas in this mine when they struck the dyke in the Hill End district? Yes. 5235.

- Mr. J. Rowan. 5235. Are you aware that up to the present time that district has received the name of the "gassy section"? Yes; it is a very common thing in all places to give all kinds of names to particular parts of a mine; I have known curious names to be given, "the hospital," for instance.
- 17 May, 1887. 5236. Do you not think that the name, "gassy section," is a signification of gas being in the division of the mine so designated? I do not think so, necessarily; it may have taken its origin from the fact of safety-lamps being used there.
5237. Are safety-lamps used as a rule where there is no gas? They may be used where gas has not been actually seen, but where a mere trace of gas has been seen I consider it a wise precaution to use safety-lamps.
5238. Do you know, of your own knowledge, of a blower being exhibited by means of a gas-pipe in No. 2 heading previous to the strike? I never heard of such a thing until after the explosion.
5239. Am I to understand, as I did just now, that in your examinations you never saw gas in any part of the mine, except in Nos. 1 and 2 headings? As I have said, it was only on occasions when new cuttings were being put into the face.
5240. Would that be in No. 1 heading? I cannot refer to any headings in particular.
5241. You think you did see gas in some other heading? Yes.
5242. Coming to the question of these doors, Mr. Rowan, do you consider that under any circumstances, with or without gas, single doors are as good as double doors for purposes of ventilation? No.
5243. Then, where gas exists, would it not be infinitely better to have two doors instead of one? Yes; I think so.
5244. You have further stated the opinion that it might be well to abolish the doors on the main road, and have regulators on the return? Yes.
5245. In the diagonal road leading to No. 1 heading, and between Nos. 1 and 2, did you observe some tubs lying off that road after the explosion? Yes.
5246. May it not have been possible for these tubs to have been off the road previous to the explosion? I do not think so.
5247. Do you think it impossible? No; I do not think it impossible.
5248. Did you see any place in the Hill End district where any second explosion might have occurred? No.
5249. Whenever there is any fear of gas in any leading headings, would it not be advisable to put up brattice between stenton and stenton into the face? Yes; it might be advisable to do that.
5250. Then, where gas is actually known to exist, would it not be better to erect brattice as they proceed? Yes; I think it would under certain conditions.
5251. I will ask you, under any conditions would it not be better as a matter of precaution to use the most efficient means of bratticing where gas is known to exist either in large or small quantities? Yes.
5252. In dealing with gas in a mine, I understand you to say, or to be of opinion, that the question of cost or expense ought not to be considered? Yes.
5253. You are quite clear on that point that no expense ought to be spared? Yes.
5254. In your visits to the furnace recently, or while travelling the return airways, have you ever seen any indication of an accumulation of gas in the old workings? No; and I have made extensive examinations of the old workings in company with three witnesses; I have gone over large regions of the old workings with a naked light, and have never discovered any gas.
5255. *President.*] One word about barometers; are you aware, Mr. Rowan, whether much dependence is now placed on barometers as an index in fiery mines? I am aware that it is a good index, but at the same time fire-damp is sometimes 10 per cent. quicker than the barometer.
5256. Are you aware whether changes in the weather take place before the barometer gives indication of such changes? Decidedly.
5257. Is the instrument sensitive enough for rapid changes of atmospheric conditions, or are you aware that changes in the weather will take place without any indication being given by the barometer for some time afterwards? Yes; it may be under certain conditions.
5258. In that case, would you say that much dependance is to be placed upon the barometer in England, say, as an index to danger? Well, I have found it a great guide there.
5259. In the event of a rapid change? I do not say that, as I have already stated fire-damp may be developed a long time before it is indicated in the barometer outside; nevertheless it is a great guide.
5260. If it does no good it does no harm? No.
5261. *Mr. Neilson.*] How were the timbers lying at the big fall? Portions of the timber seemed to be lying towards the Hill End district, and others were lying outwards.
5262. Was there any appearance of charring on the timber? A portion of it appeared to be calcined.
5263. Was the timber shattered at all? No.
5264. What would be the effect of an explosion of powder or dynamite? If it was close to the timber, of course it would shatter it. The effect would very much depend upon where the explosive was placed.
5265. *Mr. Hilton.*] You have said, Mr. Rowan, that you examined a large region with a naked light, and found no gas? Yes.
5266. Supposing you had come across a large body of gas under those circumstances? I was in the hands of two guides—Cavell and an old man who was almost born in the mine. They had passed through many times themselves, and it was convenient to carry a light.
5267. *Mr. Croudace.*] Do you not think it possible that there may be an accumulation of gas in a place where it does not show itself? Yes.
5268. Then how were these guides to know? Well, it was a low level where we were going, and you do not expect to find gas in low regions.
5269. Do you think it prudent for an inspector of collieries to examine the workings of a mine with a naked light? Well, I was not examining the workings in that way on this occasion—I was examining for royalty.
5270. Do you make your examinations with a naked light or a safety-lamp usually? There are mines where no fire-damp exists, and you would not have me go in with a safety-lamp in such cases.
5271. We have a report from Great Britain that an explosion occurred in a mine where gas had not been seen for some months previously, yet the colliery was worked with safety-lamps. Let me ask you again, Mr. Rowan, do you think that the examination of a colliery should be conducted with or without safety-lamps? I would not like to lay down a fixed rule. The condition in the Coal Mines Regulation Act provide

provide that where fire-damp has been seen for so many months, an examination shall be made by some competent person with a safety-lamp. Mr. J. Rowan.

5272. Do you know whether there is a fairly good travelling way from the western district to the furnace? I have travelled it, but there is difficulty. 17 May, 1887.

5273. A portion of the road is a good traversable airway, and then it is interrupted by falls? Yes.

5274. *Mr. Owens.*] What velocity of air would be required to render a Davy-lamp unsafe, where the atmosphere contains gas? It would require a velocity of 600 ft. per minute.

5275. You are aware that the haulage ropes passed behind the timber? Yes.

5276. A small fall having taken place, would it tend to produce an increased force? Yes. It would be like a stone coming out of a bridge—it would make room for the rest, and there being great tension on the rope the timber would fall in the direction of the strain. [*The witness withdrew.*]

Alexander Ross recalled:—

5277. *President.*] We have recalled you, Mr. Ross, as some little doubt exists with regard to the watering of roads in Bulli mine. Some of the members believe that, in your evidence on this point, you meant that the main roads were watered, while others believe that you referred to Nos. 1, 2, 3, and 4 headings, and the Commission wish to have this point cleared up? I meant the main roads. Mr. A. Ross.
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5278. Were Nos. 1, 2, and 3 headings watered? No; they were not.

5279. Another point—where did the haulage system end about the time of the strike? Inside Nos. 1 and 2.

5280. Before you extended it to that point where did it end? It was outside Nos. 1 and 2.

5281. How far was it extended? There was about 300 yards difference between the two. [*The witness withdrew.*]

John Dixon, sworn and examined:—

5282. *Mr. Clarke.*] You are the Government Inspector of Coal-mines? Yes; for the Northern district Collieries. Mr. J. Dixon.
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5283. For what period does your mining experience extend? Since my boyhood days.

5284. How many years? Thirty odd years.

5285. How long in the home mines? Four years.

5286. In fiery mines? Yes; the mine in which I first started was a very fiery mine—the Haswell Colliery in the county Durham—that was a very fiery mine.

5287. And you have had experience in this Colony? Yes.

5288. Did you ever visit the Bulli mine previous to the explosion? Yes; it was over four years ago, that was before Mr. Rowan was appointed inspector for this district.

5289. That was before the gassy district was opened out? Yes.

5290. How many times have you been in the mine since the explosion? Five times through the Hill End district and three times through the western.

5291. You made a thorough examination of the mine? I did.

5292. Particularly the supposed seat of the explosion in the gassy district generally? Yes.

5293. Did you at any time find gas in any quantities in any portion of the Hill End district? Yes; on Monday evening after the explosion I found about 23 yards of gas in No. 2 heading; it took the lamp 18 inches from the roof, 23 yards from the face that night.

5294. Did you find any in the other heading? Yes; a small quantity in No. 1.

5295. Did you examine the bords in this district? Yes; every bord, and I tested for gas in all of them and never found the slightest trace of it or any indication of it in any of the bords.

5296. You observed the destruction that was caused by the explosion? Yes.

5297. Can you give any theory as to the immediate cause of it? It looked as if the seat of it was in No. 2 heading of the Hill End district.

5298. What had occurred? A shot had been just fired in No. 2 heading.

5299. In the face? Yes; in the face.

5300. Which ignited the gas? Yes.

5301. Would that be an overcharged shot? I believe it has been what we call a pretty tight shot; I thought that from the look of the face.

5302. Did you think that the gas which exploded there was assisted by any other means? Yes.

5303. By what other means? The explosion was aggravated and intensified by coal-dust.

5304. Can you trace the direction the explosion pursued from the face of that heading? Yes; a part of it came through the stenton of No. 1 heading striking the fore side of the wall and licking both props where the danger-board is placed. It went along the danger-board and into No. 1 heading and looked into the nearest bord in its road, but not into the face of any of the bords, as we could find no traces of fire right up to the faces. The main force went along No. 2 heading playing the same part in and out until it reached the last bord; it then went down through the cut-through back among the empty skips standing there, out again, and part of it split through one of the stoppings; one part united with that which went around No. 1 heading, and the greater force went through the cross-cut, up through the back heading, and a part of it went into Nos. 3, 4, 5, and 6 headings. I believe the greatest force was exhibited where a horse was blown through a stopping.

5305. Do you think there was a second or third explosion? I have studied the matter and thought it out in every conceivable way, and I cannot locate a second or third explosion.

5306. You think that the big fall in the main tunnel had no connection whatever with a second explosion? None.

5307. If a second had taken place it would have left appearances and traces? Yes.

5308. Unmistakably? No doubt of it.

5309. Do you approve of the system of ventilation pursued in the Bulli Colliery? Well, that is rather a delicate question, for we all know the saying that we can all be very wise after a thing happens.

5310. What is your present opinion? Well, I can give an opinion if it is of any importance, although people will be ready to say he knows all about it now, but I think I know how the system could be improved.

- Mr. J. Dixon. 5311. Will you suggest any improvement in the present system of ventilation? Well, I believe Nos. 1 and 2 headings could have been formed into a separate and distinct split very easily. That would have done away with the door in the main tunnel by the overcast, which I can point out on the plan. I would continue the second bord to the first bord off No. 2 heading and across the main tunnel. I held that opinion when I first came down. Here [pointing out place] where I would form the overcast over the main tunnel and put a door at No. 2, which would send all the air away clear of everything else. My opinion is that this air had no right to circulate in any of the bords off the heading, being already somewhat fouled after supplying the heading.
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5312. *President.*] It would serve the purpose of better ventilating Nos. 1 and 2? Yes; and it ought to have been done.
5313. *Mr. Clarke.*] Was it prudent to allow the use of naked lights in the bord on the return side? No; I do not think the air should have been carried to No. 2 after it had been in No. 1 heading.
5314. Do you approve of bratticing headings? Yes; by all means when driving such distances beyond the stenton.
5315. And in advance of the air-current? Yes.
5316. What is your opinion with regard to the firing of shots in the presence of gas or where gas is suspected or liable to show itself? I would certainly prohibit it altogether. I do not believe it is a correct thing to fire shots where gas is given off, for you don't know the moment that you might meet with a blower from a roll or other cause. I believe that blowers were occasionally met with and that sudden accumulation of gas occurred before the explosion.
5317. You have seen the large fall in the main tunnel? Yes; I have been all over it.
5318. Can you account for that fall? It is my opinion that for the most part it has been caused by the ropes jerking the props out. By the way in which the place was timbered you would only want to jerk one or two sets out and they would bring the rest down. Owing to the length of the timber between the cap pieces if one or two of the sets were displaced the probability is that it would bring the others down backward and forward. I believe that a great deal of the destruction in the main tunnel is due to the great tension placed on the ropes after the first fall had taken place.
5319. *Mr. Neilson.*] Would it be possible to place powder or dynamite on top of this 4 feet of shale above the sets? Yes; it would be possible.
5320. In sufficient quantities to do the damage? I could not say that it would be possible to place it on top and to displace sufficient timber to cause the fall.
5321. Do you think the fall is of sufficient area to stop the ventilation of the mine for any length of time? When I first examined that fall it was almost as close as that wall side [pointing to the wall]; it was a very close fall, so close that we could not see any distance beyond it.
5322. If there had been any heavy explosion of dynamite or powder would there be evident signs on the props? Yes; it would have shown itself downwards, especially if dynamite had been used.
5323. If dynamite had been used there would undoubtedly have been evidences of it? Yes; that is my experience. It would have powdered the hardest rock, for that is how it acts; if you fire a hole with dynamite it generally powders at the bottom; its peculiar feature is to strike downwards.
5324. You stated that your plan would be to bring the air down the inmost stenton? That overcast could have been placed opposite No. 2 heading for the purpose of getting the air out.
5325. You said that you did not think it was safe for any place to work with naked lights off these headings? If a place is giving off gas, my opinion is that the return air should be drawn immediately from it, and not allowed to go into the bords, as it is very impolitic to have naked lights between Davy-lights. I do not think that is a right thing, and I think the plan I suggested would have taken all the air away, as the remedy would keep each district separate and distinct. I can see a better plan than even that, which could be adopted there, that is, to put away a pair of cross-cuts and get your short headings off in other directions.
5326. Is not the course adopted the usual one all over the Colony? No. I know a colliery driving three main headings, and I believe in the three-heading system above any other. I believe it is better than any other system followed, and Mr. Neilson himself drives three headings at Wallsend, and a very good way it is too.
5327. Trappers being placed at these doors, is it possible that these doors could have been left open altogether, or if one was open, would not the others be likely to be shut? If the doors between Nos. 1 and 2 had been left open very little air would go up the heading. Perhaps the door on the main tunnel between Nos. 1 and 2 was open at the time of the explosion. That, I think, was indicated by the position of the horse. My experience of trapper boys is this, that they have to be kept in terror of a yard-stick to keep them at their doors. I have seen them 100 yards away, and they are particularly liable to leave their doors if there is a horse about to play with.
5328. *Mr. Hilton.*] Which is the best system of ventilation, having ventilating doors on the main road or in the return airways? It is a question which the greatest philosophers in England have not been able to decide yet, that is, according to my reading of the latest information. It was not a cablegram, but it is the latest news by mail. My own opinion is that there should not be a door on a main road, and if I do see one in my district I generally grumble about it till it is shifted.
5329. You would place regulating doors in the return airway as much as possible? Yes; the regulator should be placed in the return.
- 5330-4. *Mr. Owens.*] Assuming that there had been a big fall at the western junction and all the men were inside, which way would they get out? If the fall had occurred between the tunnel-mouth and the western door how could the men get out, seeing that there is no travelling way.
- President.*] We have not got that information; don't assume anything.
- Mr. Owens.*] We have information that it could not be travelled.
- President.*] We have also information that it has been travelled.
- Witness.*] Mr. White informed me that if we had liked to have gone on we could have got into the western. I have been up the road as far as where they were working at a pillar of coal. It is my opinion that if that road had been conveying a good current of air through and was clear of all falls the men would not have been got out in a fortnight, as the furnace would have been wrecked. It was owing to the distance which the air had to travel that so little wreckage was done in this part of the mine; and I am further of opinion that never in the history of the world have men been got out so quickly after such an explosion, where so many were killed.

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5335. *Mr. Jones.*] Do you approve of a report-book being kept at every colliery? My opinion is that there should be a report-book kept at every colliery, and that every deputy and overman should enter daily reports in it, and that the inspector should look at it to see that they were carrying out their duties. I also think that the engineer in charge of ropes, cages, &c., should make daily reports. I have established this system of reporting in several places, and I find it is a good thing.

5336. You are aware that traces of gas have been seen in this mine ever since the Hill End district passed the dyke? I have heard so.

5337. You are aware that Nos. 1 and 2 headings were turned away very near the dyke? Yes.

5338. Would that be an additional reason for not allowing the air-course in Nos. 1 and 2 headings to ventilate any other portions of the workings? Yes. I believe that the most mischief is done by dykes where there is inflammable gas.

5339. *Mr. Croudace.*] By the dyke or the inflammable gas? Now, don't you try to catch me. I said where there is inflammable gas.

5340. *Mr. Jones.*] Do you think the small area of the workings had anything to do with the wreckage in the mine? I certainly do. It is the smallest area of workings I know of for the length of the main road, and I think that the confined state of the force had a great deal to do with the loss of life.

5341. We have been told that it was the custom to work with unlocked safety-lamps; was that a safe thing to do? It depends upon whose hands they were in.

5342. In the hands of any person? I know people in whose hands they would be safe, but I know others that I would not allow to use safety-lamps at all.

5343. Does not the law provide that they should be locked? Yes; in the presence of gas.

5344. And it was a violation of the law to have them unlocked? Undoubtedly.

5345. *Mr. Croudace.*] Knowing that there was gas present in the workings, would you consider it safe to tilt a safety-lamp for the purpose of lighting touch-paper? No.

5346. And still more unsafe to light a shot by striking a match? Rather.

5347. What would you think of sworn testimony that men worked in a heading where gas was known to exist with a hole in the top gauze of a safety-lamp? Well, I think he ought to have been placed were you and I were the other day—in East Maitland.

5348. Suppose it was known to the officers that such a lamp was used? It was very wrong that such a lamp should be allowed to be used anywhere.

5349. Quite culpable on both sides? By all means.

5350. You believe in places being bratticed? Yes.

5351. Now, coming to the question of these doors, seeing the doors were used, would it not have been better to have had them doubled? In that particular place you could not get double doors to work very well.

5352. Would it not have been prudent for the manager to have foreseen the necessity? In answer to that, you know what a bearing up door is, that is a door where the current depends upon it, and where there are such doors they should be doubled.

5353. Did you notice the second door in the diagonal roadway, and did you notice some tubs near it? Yes.

5354. Is it not possible that some of these tubs may have been off the road just before the explosion? Quite possible.

5355. If so, would not that have kept the door open—the door at the diagonal road open, if these tubs which were off the road were in the way of it? Yes; if they were against the door.

5356. Is it probable that this door might have been open at the time of the explosion? Highly probable. I thought that from the first.

5357. Coming from the western to the Hill End district, don't you think that there ought to be a good travelling road used as a return? Yes; my opinion is that in every colliery there should be a well-defined road for any man to travel, and at the same time, I would not confine the return air current to that road. Immediately the air is pitched into the return I believe in ventilating everything.

5358. If that had been so the wreckage of this explosion would have been greater? Yes.

5359. But you think the return airway should have one good travelling road? Yes.

5360. You are quite clear upon the seat of the explosion? Yes.

5361. That it arose from the firing of a shot in No. 2 heading? Yes.

5362. With reference to this lamp which was found only a day or two ago in the face of No. 2 heading on a canch on the left-hand side, do you think that lamp could have been used at the moment of the explosion by either of the men working there? No. I think I told you that I thought it was used by a man working in the heading when he was travelling out of the mine, and that he would light it when he put away his "glow-worm," as the light of a safety-lamp is often called. I arrived at the conclusion that a shot had been fired in the heading, and that nothing had been done there afterwards. I believe that from the fact that the tools, drills, picks, and scraper were found back from the face, and one of the men working in the heading was found in the stenton, and no body was found in the face of the heading. Putting everything together, I am firmly of opinion that the firing of a shot was the last thing done in No. 2 heading, and I believe that one of the men had been in the habit of carrying the lamp which he used to travel in and out of the mine so as to have a better light into the heading. I don't say that he kept it alight in there.

5363. Might not anybody else have carried it there? Yes; but that is my idea.

5364. Could this lamp have been placed there subsequent to the accident? Certainly.

5365. You don't think that this lamp has had any effect upon the cause of this explosion? I do not.

5366. You have given us the effect of the explosion; did you notice close to Nos. 1 and 2 headings two very delicate strings? I did.

5367. Were they singed, charred, or burnt? Not in the slightest.

5367½. If there had been any body of fire, would it not have completely consumed the strings? Yes.

5368. *Mr. Neilson.*] If Westwood and his mate cautioned their mates on the night-shift the evening before the explosion, to be careful with their lamps, is it probable that under the circumstances they would have taken a naked light into the heading? No; I believe the man who used that light to travel with put it in there simply to prevent anyone running away with it.

5368½. *Mr. Croudace.*] In view of the way in which men used lamps, are you of opinion that very stringent measures ought to be enforced to compel every workman to report such a state of things, and otherwise to prevent their occurrence? Yes; and I would strip them of all tobacco and matches, because I believe tobacco is one of the greatest curses about a gassy pit. I like a smoke myself, but I know too well what men will do for the sake of a smoke. [*The witness withdrew.*]

John Mackenzie sworn and examined:—

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5369. *President.*] You are Examiner of Coal-fields for the Colony, Mr. Mackenzie? Yes.

5370. After the accident on the 23rd of March you visited the Bulli Colliery? I did.

5371. And as a result of your visitation and inspection you sent in a full and particular report of your examination to the Department of Mines? Yes.

5372. To save the time of the Commission I propose that you read this report, on the understanding that you have liberty to supplement it by any additional statement you feel disposed to make. Will you be kind enough to read your report? [*Mr. Mackenzie reads his report, for which see Appendix.*]

5373. *President.*] This [*receiving the manuscript from witness*] is your report, Mr. Mackenzie. Do you desire to make any supplementary statement?

Witness.] Well, I have written a report as the result of an inspection I made yesterday, which I will read to the Commission. [*Mr. Mackenzie reads as follows*]:—

I made yesterday (Monday, 16th May) a close and minute examination of the Bulli mine, to see if it was possible to arrive at any other conclusion with regard to the cause of the disaster than that which I announced at the close of the late inquest. I was most anxious, if possible, to find ground for altering my conviction upon the subject, because I knew I stood almost alone in the view I took, and there was such an array of witnesses on the other side that it placed me in a position of apparent egotism to run entirely counter to their judgment. I therefore visited the mine, as I have said, with a desire to alter my views if I could find evidence which would justify their change. I regret to say that so far from finding anything to controvert my previously expressed opinion, I found evidences which more than ever confirms me in the opinion that the original seat of mischief was the heavy fall, however produced, at the bend of the Hill End incline plane, about 380 yards from the tunnel mouth. I found there unmistakable signs of a double and exceedingly fierce blast—one on the eastern side going to the tunnel mouth, and the other on the western side of the fall going to the interior of the mine in the direction of the Hill End and western districts. There is no mistaking the evidence offered by these mute witnesses of the catastrophe. The diverging currents are marked on either side of "the fall" by the torn ribbons of bark which stand at right angles from the props in the directions the blast took, also on the incline taken by the props as they were forced from their position, as well as by the angle at which cap-pieces lie that remain suspended by one prop only. These are themselves strong indications, but they are as nothing compared to the state of things revealed at the junction of the western road with the main tunnel. Here is to be found evidence which shows unmistakably that the destruction worked upon this portion of the mine came from the direction of the tunnel mouth, and therefore entirely contradicts the theory (and it is only theory) that the disturbing force came from a contrary direction, and as the result of a shot being fired in the No. 2 heading. The evidence to which I refer is that of the blowing away of the regulating door in the western heading, about 20 yards from its junction with the Hill End tunnel. Very little of this door or its framework and supports is to be found in its original position. It is blown to splinters and shreds; not out-by towards the tunnel mouth, as they must have been if the theory I have alluded to as erroneous were correct, but in the opposite direction. I saw pieces of the door 66 yards inwards from its original position. At a distance of 3 yards I found that a slab about 6 feet long, which belonged to the door-frame, had been driven endways, diagonally, through a cracked prop, and the upper end was jammed in the roof at an angle of about 35 degrees. One of the hinges of the door I discovered twisted and bent like a ribbon. Around a prop at the left-hand side of the road, 9 feet distant from the original position of the door, the bolts and nuts bent, from which the woodwork had been wrenched; and at 53 feet, lying between the centre of the rails, I saw the other hinge twisted and distorted, and alike divested of any woodwork. These hinges were heavy in construction, being of $\frac{3}{8}$ iron 2 inches wide and over 2 feet in length, evidently made at the works, and their great strength, coupled with their present condition, shows the violent force to which they were subjected. The blowing in of the door entirely upsets what appears to be the received theory, and I give it as my deliberate conviction that the trouble had its origin in the vicinity of the tunnel mouth. The terrible disturbance and concussion at this point sent a current with the force of a whirlwind in both directions. That which went outwards bore with it the first heavy shower of debris which witnesses have described, and the other rushed inwards up the incline plane, carrying with it upper coal-dust lodged along the ribs, and opening out at the meeting of the rails at the junction of the western road, split into two currents, one-half hurling itself against the western door and carrying it away, and the other continuing its course along the Hill End district to Nos. 1 and 2 heading. Here the current, heavily charged with coal-dust, came into contact with the gas escaping from these workings, and possibly ignited at the naked light hanging on the danger-board near the stenton in No. 1 heading, and from there proceeded with terrific force down No. 2 heading. This being the seat of the second explosion which wrought all the remaining mischief, adding its force to the recoil of the first explosion (that would take place at this point), and eventually producing at the tunnel mouth the second but weaker outthrow, as described by Lang.

5374. *President.*] Were you in the habit of inspecting the Bulli Colliery at intervals? No; not at regular intervals.

5375. When did you inspect the colliery, before the 15th of March? I cannot say when; it was some considerable time before then.

5376. How long was it? I cannot say without reference to my papers.

5377. Was it months or years? Well, I do not think I had been in the year before.

5378. At the examination you made before the 15th March, with a knowledge of gas existing in the Hill End district, you did not examine that district? No. I have said so in that report; I did not go into it.

5379. You state in your report as a result of the 15th March examination that the returns were defective and untravellable. Did you make that statement of your own knowledge? No.

5380.

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J. Mackenzie.
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5380. Did you attempt to travel them? No.
5381. Upon whose information did you depend? That of the inspector for the district, Mr. Rowan.
5382. You did not desire the inspector or the manager to take you to the impediment on the return? No.
5383. What district did you visit on the 15th March? The western.
5384. The western only? I visited the western and the furnace.
5385. What was the object of these visits? The company are working coal in coal land for which they pay a royalty, and I went on that account principally, and to see anything Mr. Rowan might think it necessary for me to see.
5386. In visiting a colliery known to produce gas, did it not occur to you that it would be well if you satisfied yourself of the presence of that gas by personal inspection? As I have stated in my report, if I had gone there, the mine being at work, I should not have been able to see anything probably.
5387. Would it not have been some satisfaction to you to test the accuracy of the reports as to the existence of gas? Well, Mr. Rowan reported that there was very little gas—nothing dangerous.
5388. The workings at that time were of a very limited character,—would it not have been consistent with your duty to have inspected the Hill End district as well as the western? I do not think so in view of my inspector's reports to me.
5389. A portion of the western district is within Government land;—was it not part of your duty to inspect all workings within Government land? No; I do not know that it is.
5390. In your report you speak of an infringement of the provisions of the Act in reference to unlocked lamps;—did you state that from the evidence given at the inquest only? Yes; from the evidence at the inquest.
5391. You also state that Millwood was lax in the performance of his duty;—was that taken from the evidence at the inquest? Yes.
5392. Millwood was one of those lost in the mine—the statement is therefore of an *ex parte* character? Yes.
5393. Did you also at the inquest hear the manager and the overman examined upon this point, as to the orders given to their subordinates? That is, Mr. Ross, yes.
5394. Were they of a positive character? Yes; I think so.
5395. And from your own knowledge you are not aware whether Mr. Millwood carried out those orders or not? No.
5396. With respect to the cause of the explosion, I understand from your report that you agree with some witnesses that have been examined as to the seat of the explosion in Nos. 1 and 2 headings? As to the seat of one explosion.
5397. You are inclined, from your own examinations, to believe that two explosions occurred? Yes.
5398. The first explosion being in the main tunnel? Yes.
5399. Have you any distinct evidence of an explosion in the main tunnel? There appears to be strong evidence of it at the fall.
5400. In your report you give the circumstances of these explosions. You are inclined to believe that an explosion in the main tunnel occurred prior to a subsidiary explosion in the Hill End district. Could not the effects be produced by a fall of the magnitude we see there? No; not in my opinion. There is a centre there where anything is blown one way and another.
5401. Would not the force of debris coming down by a fall be as great as by an explosion? No; I cannot see that any fall there could possibly have caused such a fierce blast to go in opposite directions.
5402. To what cause would you be inclined to ascribe the explosion—to the ignition of certain explosives or an accumulation of gas? There could be no gas there to my mind.
5403. Then you fall back upon the other explosives;—in what way do you consider it possible? I cannot say.
5404. Have you any evidence of explosives having been used? No.
5405. You have described with some minuteness the damage to the western door;—could not the damage sustained by that door have been caused by the recoil of air after the explosion in Hill End? Certainly not, because in that case the force came outwards.
5406. Would the blast going outwards be in a compressed state?—
5407. Then in going to the western door the space widens out considerably;—would that compressed air, or gas and air, be liable to expand suddenly on coming to a wider part of the road? I do not think so.
5408. Would it still go on in a compressed state? Yes.
5409. Could the damage to the door be caused by a fall of the magnitude you have described in the main tunnel? There are different falls. I believe this point [*referring to the plan of the tunnel*] to be the centre of the explosion, and the other parts fell afterwards.
5410. Would that have the effect of compressing the air out towards the tunnel mouth and in towards the workings? Yes.
5411. Would that account for the damage to the western door? Yes.
5412. With respect to the ventilation, you have accurately described the general scheme of this colliery. You had an opportunity of examining the plan before the accident? Yes.
6413. And knowing that gas existed in Nos. 1 and 2 headings, did it ever occur to you that a safer system of ventilation could have been pursued than the one they had? No; because my attention was never drawn to it.
5414. In the light of recent events, Mr. Mackenzie, are you of opinion that a safer system of distributing the air could be pursued in this colliery? Yes.
5415. In what way? In the western district I would have two doors instead of one, and there might be an overcast from the Hill End district into the return.
5416. And make the return direct into the main return? Yes.
5417. *Mr. Neilson.*] You say there are a number of falls in the main tunnel;—do you think they all fell simultaneously? I cannot say that. Of course we know the roof has been falling since. They would not all come down at once.
5418. *Mr. Hilton.*] How long ago is it since gas was first reported to you in the Bulli mine? It was in November, 1886. Mr. Rowan reported it in his report of December, 1886.

- Mr. J. Mackenzie. 5419. You know, according to your own statement, that gas was present in dangerous quantities? I did not say that. I said I knew gas was there.
- 17 May, 1887. 5420. To-day there may be a small quantity, to-morrow a large quantity? Yes; but I say it has only been reported to me as being present in small quantities. The inspector did not consider there was a dangerous quantity there.
5421. Is it not possible that the quantity given off there might become larger in the course of a day or two? Yes.
5422. Was it or was it not your duty, knowing that gas existed in the Bulli mine, to visit it for the purpose of seeing that the workings were in such a condition that the management would be able to cope with a larger quantity of gas, in the event of a larger quantity being given off? No; it is the duty of the inspector to do that, or report to me.
5423. Section 4 of the Act, as to "Duties of Examiners," says, "it shall be the duty of the Examiner or inspector to ascertain the state and condition of all mines," &c. Do you rely wholly and solely upon the inspector for reporting everything to you in connection with mining matters? No.
5424. That being the case, I ask again, as you knew that gas existed in the Bulli mine, did it never occur to you to visit the mine, and ascertain for yourself whether due precautions were being taken to meet with a possible increase of gas? No; I have a competent inspector to go round every eight weeks, and I read his reports when they are sent in to me. I ought not to have any occasion to go.
5425. Then what are the duties of the Examiner? The Act tells you what my duties are. I am the head of the coal-mining department. The inspectors go round the mines every eight weeks, and they report to me, and if anything requires my attention at any place I go there. It would be impossible for me to go through every mine in the Colony.
5426. *Mr. Owens.*] Would you explain to me how this second explosion, as you put it, was brought about? I have explained that everything from this centre in the main tunnel was blown outwards and inwards for a certain distance, and the coal-dust would be carried with the blast.
5427. Did it ignite? The coal-dust and gas together. There would be 2 to 3 per cent. of explosive gas in Nos. 1 and 2 headings, besides what was in at the far end.
5428. And do you mean to say that the coal-dust driven by the force of this fall into Nos. 1 and 2 headings is the explanation of the second explosion? Yes.
5429. Do you think there was any accumulation of gas in the old workings? No; there could not possibly be, because no gas was seen until they crossed the dyke. I wish to say further this: There appears to be an impression that the gas could separate itself after once being mixed with the air, and go into the old workings, whereas if no gas was made there it could not get there from the headings Nos. 1 and 2.
5430. *Mr. Jones.*] In your report you say on going up the tunnel the cap-pieces showed signs of being driven inwards? No; I said of them.
5431. Are there not a number of cap-pieces showing signs of being driven outward? Yes; that would be from the recoil that took place from the explosion in the Hill End district.
5432. Would not the haulage ropes, being attached to the timbers, and in some instances passing behind them, have a tendency to determine the position of the timbers, supposing a small fall to have taken place, and caused a tension on the ropes? Yes; it might do with some of the timber, but not the whole of it. It would not affect the pieces I have specially referred to.
5433. You have stated that you depended upon the evidence at the inquest for your remarks upon the lax discipline at this colliery? Yes.
5434. Have you any reason to doubt the truth of the evidence? No.
5435. You think there could not have been enough gas in Nos. 1 and 2 headings to cause the whole of the destruction you saw? Certainly not.
5436. If either of these doors—the one on the main road, or the one in the diagonal cross-cut leading to the Flatt—were left open for a short period, would not that allow of gas accumulating in Nos. 1 and 2 headings? Well, yes; but they were not open. This door at Nos. 1 and 2 was shut.
5437. What evidence have you of that? The position of the doors prove it. The frame-work of one is still hanging. If the doors had been open they would not have been damaged.
5438. On the diagonal road leading to the Flatt there is a train of empty skips? Yes.
5439. Presuming that they were passing at the particular time of the explosion, would not that allow of them being open? I tell you it was not open—you can see for yourself. [*Refers to plan.*] The set is clear of the door.
5440. Subsection 3 of the 24th clause of the Coal Mines Regulation Act says, as to the powers of Examiners, that they may "examine into and make inquiry respecting the state and condition of any mine or any part thereof, and the ventilation of the mine, and the sufficiency of the special rules for the time being in force in the mine, and all matters and things connected with or relating to the safety of the persons employed in or about the mine or any mine contiguous thereto." When you last visited the mine, I understand you knew that the Hill End district was giving off gas? Yes; a small quantity.
5441. You have further told us that you are the head of the department whose duty it is to see that the provisions of the Coal Mines Regulation Act are carried out for the safety of the men? Yes; with the aid of the inspectors I do that.
5442. Being in the mine, and knowing from the reports of Mr. Rowan that this portion of the mine was giving off gas, did you not consider it your duty to personally inspect that portion of the mine? No; not after what Mr. Rowan had told me. I put a question to him on the subject, and he told me that there was so little gas there that while the men were working I would very likely not see anything.
5443. *Mr. Croudace.*] Will you kindly tell me what is really your opinion as to the cause of this big fall? I cannot say; it appears to me to have been an explosion. I do not see how an incidental fall alone could do it.
5444. Could it have been brought about by an explosion of gas there? No; not by gas, as there could not have possibly been any there.
5445. By powder or dynamite? I could not possibly say.
5446. Have you any reason, from information received from the inspector, or from information received from any other person connected with this mine, to lead you to believe that it was not caused by the explosion of gas? It could not possibly be an explosion of gas, as there has never been any found until we got into the Hill End district.

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J. Mackenzie.
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5447. Supposing it was brought about by an explosion of gunpowder or dynamite, would there not be a report as that of a large cannon? There was a report, I am told, as if a large quantity of sticks had fallen, and one witness has said that he thought it was a large tree that had fallen.
5448. A rumbling noise? I don't know what it was myself, but it has been represented as like falling of trees.
5449. If a barrel of powder or a heavy charge of dynamite exploded, would not the report be like that of a cannon? I did not hear it, but I should think there would be a report.
5450. Have you ever heard an ordinary miner's shot? Yes.
5451. Does that not go off like a gun? Yes; but it would entirely depend on the quantity of powder put into it. My own opinion is that there must have been some explosive there to cause this wreckage, and that a fall itself would not so displace the timbers as I found them.
5452. If there was an explosive used there would be a very heavy report—such as that of a huge cannon;—you admit that? I could not say how it would be where that fall took place. It is a long way inside the tunnel, and it is hard to say whether a report like that of a cannon would be heard outside.
5453. Is the report of powder or dynamite not a sharp, quick sound, as if a gun went off? Yes; but I cannot tell how it would sound 380 yards in from the tunnel mouth, and with a bad roof above it.
5454. Have you ever heard of an explosion of powder bringing down that amount of stone? Not the whole of it; but if the props were displaced that would increase the amount.
5455. Have you ever seen a fall take place in pillar workings? Yes.
5456. Can you tell me the result of a sudden heavy fall upon the atmosphere? It will sometimes blow stoppings out, and in that and other ways will affect the ventilation of the mine.
5457. Have you ever seen an ordinary bord fall 30 or 40 yards long and 7 or 8 yards wide? Yes; and I have seen very large falls which have taken place in the Co-operative Colliery, in Newcastle.
5458. Is the effect there like this? No; nothing like it.
5459. You believe that when this fall or explosion took place there was immediately a tremendous blast of air going in? Yes.
5460. And that blast was sufficient to blow away the western door, doubling up the hinges of the door, and that another portion of the blast went down the main tunnel? Yes.
5461. And that it was of sufficient strength not only to blow away the door, but to double up the hinges, as you have described? Yes.
5462. Now, as a matter of fact, would not such a force immediately put out every light in the mine, naked or otherwise? I don't know what lights were there.
5463. Don't you think it would? I don't know where the lights were. We don't know, as far as the western headings are concerned, that there were any signs of burning there.
5464. I don't care twopence about the western, before or since the explosion. I merely ask you if you think the power which would blow away a door and double up its hinges would not be sufficient to put out all the lights? I presume it would in the western district.
5465. Would it not in the Hill End district? I don't know that it would, for there is another fall between the very heavy fall and the Hill End district.
5466. Would this fall not assist the large fall in doing so? The other fall might have closed before the blast smashed the western door.
5467. But let us get to the point. Don't you think that this volume of air, carrying this coal-dust, smashing the western door and skips to pieces, would not that power be sufficient to put out every light in the Hill End district? I don't know that it would, because of this fall between the western and Hill End might have closed before the force reached it.
5468. Did these other falls take place from the explosion of gas, or are they the result of the first fall? I believe it was simultaneous with the blast.
5469. Did the blast of the large fall get beyond the smaller falls before they occurred, or did the force go over the top of them? Some of the force would get through, perhaps, but not the whole of it.
5470. But suppose a moderate quantity went in, would not the effect be to blow out the lights? It might not, for if the lights were much beyond the fall the force would not likely blow them out.
5471. You think, then, that this great blast would not likely blow out an ordinary lamp? I say it would blow out all the lights in the western district.
5472. But not in the Hill End? I have told you the fall might have prevented it.
5473. But you do say that it would not blow out the lights in the Hill End district? I don't say that all of the lights would keep burning. It might blow out those this side of the stenton.
5474. How do you think the second explosion took place? A quantity of dust might have gone through there, and this might have been ignited at the naked light which I have referred to, and that an explosion of gas occurred in No. 2 heading on the other side of the stenton.
5475. You admit, then, that the cloud of dust then went over the fall, and that this dust ignited at the lamp. Don't you think that the power which blew the dust there would blow the light out? My opinion is that she did not blow the light out.
5476. You would lead us to believe that the power which carried the dust did not blow the light out? Yes.
5477. Is such a thing possible. Is it really creditable? I think so. There were a number of naked lights in the bords.
5478. I only ask you to reflect for one moment. What you are asking the Commission to believe is that the lights could not have been blown out? I say that the force of the blast would not go into the bords to the same extent, and that it might not have blown them all out.
5479. Between No. 1 heading and the dyke, are there any signs of flame? No.
5480. Is there any debris on the main tunnel inside the western? No.
5481. Are there any signs of charred coal-dust in there? I think not.
5482. Then how do you reconcile this blast leaving the return from the western to the dyke free from signs of fire? Because she went round the return to the western.
5483. Are there any signs of any fire at all in that route. You can see that she did not go down.
5484. Are there any indications of charring on the props between the dyke and the western district? I cannot say.
5485. In your evidence you charged Millwood, the deceased deputy, with being negligent. That, of course, means that White, the overman, had been also careless, as well as Mr. Ross, the manager, in really allowing Millwood to be careless? I am judging only from the evidence.

Mr.
J. Mackenzie.
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5486. We have sworn testimony that the western door was in existence up to the very hour of the explosion; that No. 1 door, that is the first between Nos. 1 and 2 headings, is in all respects the same; that the diagonal door in No. 1 heading was identically the same before and after the explosion; that No. 3 door in this district, between Nos. 3 and 4 headings, was also the same; that there were trappers kept at these doors, with the exception of the western door; and that, since the strike, these trappers have been systematically and regularly employed. Now, would that show less attention to these doors on the part of the overman or deputy after the strike? No; that is not the laxity I refer to.
5487. Since the strike we have evidence of a great improvement in ventilation, by the erection of a new furnace; so much was it improved that we find 12,000 cubic feet per minute, where previously there were only 3,000 or 4,000 cubic feet;—does that show any laxity? No.
5488. We also have it that the safety-lamps were locked previous to the strike by Crawford, but that they were not locked at night-time by him. Since the strike we have it that they were neither locked day or night. Is that the laxity you refer to? Yes.
5489. That is where the greater laxity comes in? Yes; in the men being allowed to take the lamps in unlocked.
5490. Has that anything to do with the bords off No. 2 heading, which were being worked with naked lights? Yes.
5491. You think that is not desirable? I do.
5492. Is there any other source of laxity that you can point out to us? Nothing in addition to what I have stated.
5493. Then, having been made acquainted that gas was coming off in this mine, did you attach so little importance to it as to render it unnecessary for you to visit the colliery specially to see it? Yes.
5494. Did you not think, knowing that our mines had been hitherto free from gas, and that being a new feature and a dangerous element in mining, did you not think it desirable to visit that gassy district, if only with a view of cautioning the management? I had no cause. Of course I had no idea that there was so much as there was, and you must bear in mind that gas has been found as far back as 1864 in the Bulli mine, and that some time later than that a man was killed there from the effects of a small gas explosion. So this was not by any means the first time that gas was found.
5495. Knowing that a man had been burnt in the Bulli mine many years ago, and that gas was again showing itself, did not that lead you to think that it was necessary for you to personally go down and warn the management of that mine? No.
5496. It did not? No. It was only reported in small quantities.
5497. *President.*] I am very anxious to have a clear understanding from you with reference to the large fall in the main tunnel, and I see that my colleagues have not touched one point in connection with it. You have clearly described the condition of the western door, and assigned as the cause that the blast or compressed air would travel from out-bye to in-bye—is that so? Yes.
5498. This current of air, rolling in the main tunnel, you stated would have a tendency to divide at the western? Yes.
5499. The door giving way before it would allow a portion of that blast to proceed down the western road, and the other portion would proceed down the main tunnel and into the bords of the Hill End district? There was a fall between there.
5500. Have you any evidence that this fall occurred before the blast reached it? At the time, I presume.
5501. Then the bulk of the blast must have entered the Hill End district before that fall occurred, if it was the result of the force supplied? Yes.
5502. You have accurately related the condition of the door on the main tunnel between Nos. 1 and 2 headings, and that at the present moment it stands on an incline, or opened partially towards out-bye? It is broken to pieces, and only some portions of the frame are left.
5503. In what direction would that door have been blown had it arrested the force of this blast from out-bye towards in-bye? If the explosion had occurred first in No. 2 heading, I should have expected to have seen that door blown away altogether, the same as in the western, but there has evidently been less force there than in the western.
5504. If that blast had been as far as you have narrated, where would you expect to find the remains of that door? She had spent herself before she had got there, for at that time the blast had gone 500 yards.
5505. What direction should that door be blown if the force came in-bye? The same as the western door. It would have had been blown in-bye if the force had been as great as at the western.
5506. Suppose it was not as great, in what direction would you expect that door to be blown by any force at all, out-bye to in-bye? I did not expect that there was a great force here.
5507. You say it was sufficient to go down and reach a naked light there, and, if so, would not that door have arrested the force? She would not have the same force there as elsewhere.
5508. But would not the door give some indications of the directions of the force? Yes.
5509. Was it so little as to leave the door intact? It is not intact.
5510. Do you think that this door would show that it was blown from the inside if the force came the other way? I do not think the force was sufficient.
5511. Would it take much force to displace a large door like that? I could not say how the door was fixed.
5512. Would it likely resist any considerable force? I think the force had spent itself before reaching there.
5513. Don't you think the position of the door was rather against your theory? I think it substantiates my theory that she came this way and recoiled.
5514. *Mr. Neilson.*] Can you define what you mean by an explosion at this place some 380 yards from the tunnel mouth? Some explosive material has been fired, that is my opinion about it.
5515. Is there any evidence of it on any of the props about there? There is coke to be seen on them on the out-bye side, and I ascertained that there is coke to be seen on the props on the other side of the fall.
5516. Are there any of the timbers about there much shattered? They are blown in different directions, some in-bye, some out-bye.
5517. As a man of experience, I suppose you know that if there had been a large explosion such as to cause all this damage which you have described, there would be some evidences of powder or dynamite in close proximity to it? I cannot tell; I can say nothing more concerning it; I have given you my opinion.

5518. Would you not naturally expect such to be the case if powder or dynamite had done this damage; would there not be direct evidences of it? I could not say; I have given my reasons for thinking so; I cannot say anything more.

Mr.
J. Mackenzie.
17 May, 1887.

5519. If this explosion in the tunnel occurred first, and it extended right into the western and Hill End districts, what caused the second explosion? It might have been caused by the coal-dust that was driven in there.

5520. You think that the first explosion would have the effect of compressing all the air? Yes.

5521. Would it be fresh air? It would take up the coal-dust with it.

5522. What would it do with the fresh air before it? The blast would collect the dust as it went along.

5523. But would there not be a certain proportion of fresh air before the dust? I do not think so.

5524. If the force could knock down skips, doors, and create big falls, would it not also put out the naked lights? How could the western door be blown in by an explosion coming out from the Hill End district. The western door is blown away, and I believe shreds of it have been found 66 yards away inside the place where the door stood.

5525. *Mr. Owens.*] Did you at any time see gas in the Bulli mine? No.

5526. You never saw it yourself? No.

5527. *Mr. Hilton.*] When was the last time you were in the Bulli Colliery? The 17th March.

5528. Are you certain? I am not certain; I think it was the 15th or 17th that I was there.

5529. February or March? Some time in March.

5530. How long previous to that were you there? Last year, perhaps; I do not know exactly.

5531. At any time has there been anything to specially cause you to visit the Bulli Colliery? No; I believe I was there (when I come to think of it) less than a year ago, but I cannot keep all these things in my mind. [*The witness withdrew.*]

Joseph Poppett miner.

5532. *President.*] Mr. Poppett, you desire, I understand, to correct the statement made by witness, Mr. Evans? Yes; and I will make the contradiction on oath if necessary.

5533. The proceeding is rather irregular in this way, and if we commence to allow one witness to come here to contradict statements made on oath by another there will be no end or finality to this inquiry. The statement made by Mr. Evans had no reference at all to the cause of the disaster. With me it is forgotten; it will have no weight with me whatever; and I believe it was wrung unwillingly from the witness; and I believe that if the Commissioners had known what Mr. Evans was going to say the statement would not have been made; however, you appear to give a contradiction to it? Yes; and I will swear there is no truth whatever in the statement.

Mr.
J. Poppett.
17 May, 1887.

5534. Very well, then; that will be taken down, and a remark made that you appeared and contradicted it. *Witness.*] I do contradict it.

This concluded the list of witnesses thus far summoned.

President said: It has been determined to adjourn this inquiry for a time, meanwhile, any communications from persons desirous to be examined on matters touching the accident at Bulli Colliery, addressed to the Secretary, at the Mines Office, Sydney, will receive due attention.

The Commission then rose.

TUESDAY, 7 JUNE, 1887.

Present:—

J. O'MALLEY CLARKE, Esq., ACTING PRESIDENT.

MR. NEILSON,	MR. JONES,
MR. CROUDACE,	MR. OWENS,
MR. HILTON.	

Alexander Ross sworn and examined:—

5535. *Chairman.*] The Commission wish to ask you a few questions upon your former evidence, Mr. Ross. Can you give us the exact orders that you issued to Mr. White and the deputy with respect to the locking of the lamps? I cannot exactly.

Mr. A. Ross
7 June, 1887.

5536. The orders you gave to Mr. White for instance, did you give him any positive instructions? I cannot say that I gave him positive instructions, unless it was to see that the lamps were locked.

5537. And as to Millwood? He had similar directions.

5538. Did these orders as to locking the lamps extend to the night-shift as well as the day-shift? Yes.

5539. The locking of the lamps for the night-shift was under the immediate supervision of the deputy—that is the deputy was to lock them? Yes. And here I may say that when I last gave my evidence I was a little confused about the question of the key being left in case any of the lights went out. I did not remember that when I gave my evidence before. It was only for the use of the night-shift men.

5540. Did you make any inquiries as to the carrying out of your orders? No; not specially.

5541. How often were you in the habit of inspecting the mine at stated periods, if you did inspect it periodically? I had no stated periods. Sometimes I would inspect it once or twice a week; sometimes once a fortnight—just as occurrences turned up, or something demanded my attention.

5542. From your knowledge of the gassy district, did it ever occur to you that it was necessary to use bratticing there? I did not think so.

5543. Did Mr. White ever express any desire to have bratticing in any of the headings? Not that I remember.

5544. If he had expressed a desire to use bratticing, would you have ordered it? I would have acted on his suggestion if I had thought it necessary.

5545.

- Mr. A. Ross. 5545. Did he ever make such a suggestion? Not that I remember.
- 7 June, 1887. 5546. Do you know the extent of the air current that passed into the western district before the strike? About 4,000 feet, more or less.
5547. And into the gassy district? About the same amount.
5548. Of your own knowledge, do you know whether any of the bords off No. 1 heading ever gave off gas? They gave off gas before the strike.
5549. And afterwards? It was never seen afterwards to my knowledge.
5550. *Mr. Neilson.*] Is it the custom when a general order is given in regard to the working, and the officers and men are supplied with the rules, to discuss these matters daily or weekly with your officers? It is not the practice, unless I suspect that the general orders are not carried out.
5551. You presume that having the rules and receiving general instructions they will carry out your instructions? Yes; I take it that is as it should be.
5552. How many men were on the night-shift? Eight men.
5553. What was the reason you had not back workmen on the night-shift? There were so few men I did not consider it necessary. These men I considered to be practical miners.
5554. Am I to understand you specially selected them as practical men? I tendered the headings for the purpose of getting practical men.
5555. Did you know any of these men? I knew them all.
5556. As practical men? Yes. These were all old hands.
5557. *Mr. Owens.*] Did Mr. White report to you the result of each day's work every day? I saw him every day, and he would report anything that it might be necessary to report.
5558. Did you examine the face of No. 2 heading after the explosion? Yes.
5559. Are you of opinion that a shot had been fired there? I am sure there had been, and that it was a partially blown-out shot, because there was 10 or 12 inches of coal left on, and the back of the hole is intact.
5560. How often did the overman travel the return airway? I cannot say, because before the strike we had a man to travel the western. He worked in the waste, and another man was appointed to go with him and make it right where necessary.
5561. *Mr. Jones.*] Did you engage the whole of the workmen employed in the mine? Yes.
5562. No other person had the power to employ them? No.
5563. Did you explain to the men on being engaged the risk or danger likely to accrue to them from the existence of gas in the mine? No.
5564. You never gave them instructions as to being careful or attentive for their own safety? Well, not particularly. I might on some occasions perhaps.
5565. You did not explain to them that gas existed, and that it was a source of danger? No.
5566. Did you ever use brattice in any part of the workings? We use brattice in going through the dyke.
5567. You thought it necessary then? Yes; until we got a return.
5568. But you did not consider it necessary in the case of Nos. 1 and 2 headings? No; not after the strike.
5569. Was not the practice of having a lamp-key for the men employed at night a violation of your own rules? Well, perhaps it might be to some extent.
5570. It was important, I suppose, in the interests of the colliery that these men should be employed at night? It was important in this way, that we required more places to be opened out.
5571. But in the light of what has happened, and the admission on your own part that a rule was violated, do you not now think it right and proper that the deputy, or some other authorised person, should be placed in charge of the mine during the night-shift? I can only say that I did not think it necessary on account of the small number of men employed, and the fact that they were all practical men.
5572. Did your business as manager of the colliery ever take you away from home? Yes; it did sometimes, for one or two days perhaps.
- 5572½. Then how were you to ascertain on each and every day what took place at the mine? If I were away from home of course I could not ascertain.
5573. *Mr. Croudace.*] Did Crawford ever suggest to you the advisability of using brattice in any part of the mine? Not that I remember.
5574. And you yourself did not consider it necessary? No.
5575. In view of what has recently occurred, Mr. Ross, would you consider it necessary to use brattice? Yes; I would use it now on account of what has happened.
5576. Have you been clearing away the big fall at the mouth of the tunnel, Mr. Ross? Yes; we are clearing it now.
5577. Have you observed any indications of a large body of gunpowder or dynamite or other explosive substance having been used? No; I have seen nothing to suggest anything of the kind. There have been a number of fresh falls from the roof there since the explosion.
5578. That would lead you to believe that the stone was of a tender or free nature? Yes; no doubt it is of a tender nature.
5579. And would be very liable to fall through concussion? Yes.
5580. *Mr. Hilton.*] Were the danger-boards fixed in Nos. 1 and 2 headings put there at your request? Yes; they were to be put at the last stenton to prevent any one going further with a naked light.
5581. *Mr. Neilson.*] Would not the rules of the colliery compel the overman to put these danger-boards up without your orders, if necessary? Yes; and he did so.
5582. *Mr. Jones.*] Was it the practice to place the danger-board from stenton to stenton? Well, this was the first time it was placed at the stenton, because previous to the strike we worked with Davy lights in all these places; we had it further out before; but on account of the large increase of ventilation we thought it was quite safe to work the bords with naked light. I may state that Mr. White and myself went through every hole and corner of the Hill End district yesterday, and we did not find a particle of gas in any place, except at this barehole, where the shot was fired in No. 2 heading.
5583. The ventilation, I suppose, is in a great measure restored now? No, not in there, because we have done nothing to the stoppings yet.
5584. *Mr. Croudace.*] You say you travelled all round this district and did not find any gas, except a trace in No. 2 heading, have you brattices up in the face of the headings now? In Nos. 1 and 2. 5585.

5585. Did you try the experiment of taking away the brattice to see whether gas would accumulate? No. *Mr. A. Ross.*
 5586. Do you think if you took away the brattice it would probably accumulate? Probably.
 5587. That would show the advantage of brattice? Yes. [*The witness withdrew.*]

7 June, 1887.

[NOTE.—Mr. Ross adds a remark with reference to the skips on the diagonal road, to the effect that the skips were apparently coming out of No. 2 heading, and not in the position where the “diagonal” door stood, so that the door would not be open through skips being there.]

Richard White sworn and examined:—

5588. *Chairman.*] You have been recalled, Mr. White, to clear up certain points upon which the Commission are in some doubt; can you tell us the exact orders you received from Mr. Ross with reference to the locking up of the lamps? I cannot, except that I believe that he has told me to be careful, and see that the lamps were locked on all occasions. *Mr. R. White.*
 5589. What orders with reference to that did you give to the deputy? I gave him the key, and told him to be sure and see that the lamps were locked before giving them to the men.
 5590. Did your orders extend to the night shift? Yes; I impressed upon him several times to always see that the lamps were locked.
 5591. Did you know where the key was kept? No.
 5592. Did you ever inquire as to whether your instructions were carried out with reference to the locking of the lamps? No; I did not; we had not very long started to work.
 5593. Then you did not know that the men were working with unlocked lamps, as a matter of fact? No, sir, I did not.
 5594. Did you ever consider the use of bratticing necessary? Well, I always considered it a useful thing, but I did not consider it necessary there.
 5595. You did not suggest its use to the manager? No.
 5596. Did you ever hear of any rumours that an accident was likely to occur from the mode of operations carried on in the mine before the disaster took place? Well, I did hear Crawford say when he was going away when the strike commenced, that the mine would likely blow up some day, but I did not think anybody believed it.
 5597. You did not attach any importance to it? No.
 5598. Was Crawford the only person who made use of such an expression? No, I believe a good many more of them did.
 5599. But to you did any one else make such a remark? No; nor did any of them make use of such an expression when they were happily at work. I believe it was only to intimidate the strangers from working there.
 5600. *Mr. Owens.*] You give that as your opinion? Yes; you may take it for what it is worth.
 5601. *Mr. Hilton.*] Were the danger-boards fixed in Nos. 1 and 2 headings by instructions from Mr. Ross, or upon your own authority;—did Mr. Ross give you instructions? Yes.
 5602. *Mr. Owens.*] Do you know what reason Crawford had for saying that the pit would blow up one of those days? Yes; I believe I do.
 5603. What was his reason, Mr. White? Well, I believe, he went away in a very bad frame of mind.
 5604. Was there any other reason? No; he might have a dozen reasons, for all I know.
 5605. Do you not think he might have been simply influenced by the knowledge that there was gas in the mine? No; I do not think so.
 5606. How often did you examine the return? Every day I examined parts of it, more or less.
 5607. You are the overman at Bulli Colliery? Yes.
 5608. The rules say you shall examine the return every morning and evening? Do you mean right through?
 5609. Yes? I never heard of such a thing.
 5610. You did not do it? No.
 5611. You had a man for the purpose of looking after the waste? We had two.
 5612. After the strike? Yes, and before the strike.
 5613. Was there a master wasteman? Yes.
 5614. *Mr. Jones.*] You have stated that you were not aware of the lamps being unlocked after the strike? Yes.
 5615. In your visits through the mine did you ever make any inquiries of the men on that subject? No.
 5616. Did you engage any of the men in the colliery? No.
 5617. It would be your duty, I suppose, to show the men to their working-places? Yes.
 5618. Did you ever explain to them the danger to be apprehended from the existence of gas in the mine? No; I have asked them if they had ever worked in gas, and so on. I cannot call to mind everything I may have said.
 5619. Before he left did Crawford ever suggest to you the use of brattice in these headings, Nos. 1 and 2? No.
 5620. It has been stated that Crawford, on leaving the employ, told you that unless great care was exercised the mine would blow up some day? Yes.
 5621. And you believed that in making that remark he was actuated simply by a spirit of vindictiveness? Yes.
 5622. And you still believe so? Yes.
 5623. In the light of what has happened do you believe that Crawford had no foreknowledge, or that he was not reasonably justified in making such a statement? No, not the slightest. As a matter of fact more care was taken in that place after he left than before.
 5624. Does not that prove, very forcibly, the truth of what he said? No; it might have happened at any time. Things like that cannot be accounted for.
 5625. Unfortunately the fear expressed by Crawford has been realised—does not that convince you that there was something more than vindictiveness in his statement? No.
 5626. *Mr. Owens.*] Have you examined the face of No. 2 heading since the explosion? Yes; a number of times.
 5627. You stated in your former evidence that you were of opinion no shot had been fired there? I do not

- Mr. R. White. not think I said that; I thought that a shot was fired on the right-hand side, but not on the left. A hole had been started there, and part of the coal was standing at an acute angle from the face. The facing went from left to right, and probably the shot only brought down a portion of the coal.
- 7 June, 1887. 5628. Did they keep a cut on one side and simply tear it down, or did they put shots on both sides? Sometimes they would fire at both sides, and sometimes not. This coal is jointed, and sometimes it is necessary to fire at one side and sometimes at another.
5629. Mr. Croudace.] I should like to be clear about Mr. Crawford's statement to you. I understand he told you if they were not careful he believed an explosion would take place? It was on the last day he worked there. He came outside and he told me then, when he was going away.
5630. It was after he had actually come out of the mine that he told you this? Yes; he told me that if the waste got fouled at any time the pit would be likely to blow up. But I could have told him that myself.
5631. That would be on the supposition that a naked light was taken into the place? Yes, I suppose so.
5632. Did he receive notice from the Company to leave before that? No, I think not.
5633. Had his wages been reduced? Yes.
5634. Was he dissatisfied? Yes, he had expressed great dissatisfaction.
5635. Did he offer to work on at the reduced wage? No.
5636. He joined the men that went out on strike? Yes.
5637. Did he on any day previous to that speak of the probability of the gas being ignited? No, he always made little of it.
5638. And as he never spoke to you in this warning manner before the very day of his leaving, you were led to believe that he was actuated merely by vindictiveness? Yes.
5639. If he had warned you before you would have thought much more of his statement? Yes, I should.
5640. You have been clearing away the big fall in the main tunnel, Mr. White? Yes.
5641. Have you seen any signs of explosive materials having been used in any quantity to cause the damage you saw there? No.
5642. Do you believe there was any explosion of dynamite or powder there? No, I do not.
5643. Since clearing away the fall have you had greater reason to believe that the stone there might be easily disturbed by a concussion of air taking away the timber supports? Yes, the incline at this place is in proximity to the old workings.
5644. Have you any faith or belief in the dynamite theory? No.
5645. In reference to the 8th of your colliery rules, as to examining the air-courses every morning and evening, what is your opinion about that, or how do you examine the returns? I examined them by going into the entrances of the return and examining them and measuring the air at certain places. It would be impossible for me to go through the whole mine.
5646. When Crawford told you the mine was likely to blow up, that was before the new furnace was started? Yes.
5647. He never saw the new furnace? No.
5648. Mr. Jones.] Were the returns travelled daily in Mr. Crawford's time? Yes, more or less.
5649. Mr. Crawford told you that there would be danger of the mine being blown up if the return got fouled? Yes.
5650. Was the return travelled every day during Mr. Crawford's time, or was it merely examined as it was subsequent to his time at the colliery? The returns were carefully examined.
5651. The inference seems to be that Mr. Crawford had some doubts as to the returns becoming fouled, therefore I ask were they examined daily or not? I cannot say.
5652. Up to the time of the explosion do you know, of your own knowledge, that two men were employed clearing away the falls on both sides in the western? Yes, I am quite sure of that.
5653. Mr. Owens.] Do you now consider it necessary to use bratticing where gas may exist? Yes.
5654. I think you have stated that since the strike you kept a master wasteman? Yes.
5655. Who was the master wastemen? Thomas Wilson.
5656. Did Mr. Ross know that? I do not know.
5657. You gave the master wasteman instructions, I suppose? Yes, I told him never to go away from the waste on any consideration.
5658. Do you recollect whether you told Mr. Ross that? I believe I did.
5659. What length of time elapsed between the termination of the strike and the explosion? Five or six weeks.
5660. Mr. Jones.] Up to the time of the strike the whole of the headings and bords in the gassy district were worked with safety-lamps? Yes.
5661. What lights did you use during Mr. Crawford's time in travelling the returns? Sometimes we used open lights and sometimes Davy lamps. [The witness withdrew.]

Senior-Constable Henry sworn and examined:—

- Senior-Constable Henry. 5662. Chairman.] You are the Senior-Constable stationed at Bulli? Yes.
- 7 June, 1887. 5663. And you are, I suppose, intimately acquainted with the people of the district and its surroundings? Yes.
5664. You were at Bulli during the strike and subsequently? Yes.
5665. Did anything ever come to your knowledge that would lead you to suppose that there was any foul play in connection with the explosion at Bulli? No; nothing whatever.
5666. Either in the shape of remarks or rumours, or anything of the kind? No. I made every inquiry and could find nothing to arouse suspicion.
5667. You made a thorough inquiry? Yes.
5668. Then any allegations of threats and foul play you found upon investigation to amount to nothing? Yes.
5669. And I suppose, from your intimate knowledge of the place and the inhabitants, and from your intercourse with the miners, if any feeling of that kind had existed it would have come to your knowledge in all probability? I am certain it would.

5670. Have you any suspicion yourself, as a police officer, in connection with that explosion? No.
5671. *Mr. Hilton.*] You are aware, I suppose, of a statement made by the Examiner of Coal-fields, Mr. Mackenzie, as to the probability of the accident having occurred through an explosion of dynamite or gunpowder? Yes, I heard of it.
5672. Did that prompt you to make a close and searching investigation into the matter? Yes.
5673. *Mr. Clarke.*] Certain statements were submitted to you for special examination? Yes.
5674. *Mr. Hilton.*] And you made inquiry to ascertain if there was any truth in them? Yes. Of course I made inquiries as to the remarks I heard before, and I found there was no truth in them. Then I made further inquiries as to the statement of the Examiner of Coal-fields.
5675. Were you led to believe that perhaps some foul play had occurred? No, I was not. I came to a contrary conclusion. [*The witness withdrew.*]

Senior-Con-
stable Henry.
7 June, 1887.

John Caldecott sworn and examined:—

Mr.
J. Caldecott.
7 June, 1887.

5676. *Chairman.*] What are you? A labourer.
5677. Have you been working at the Bulli Colliery at any time? Yes; since February last.
5678. That is since the strike? Before and after the strike.
5679. Did you commence work during the strike? Yes.
5680. How long before the strike terminated? Could not say.
5681. About how long? A month or six weeks before the end of the strike.
5682. Were any threats used towards you? Yes.
5683. Of what character were these threats? I was threatened one time whilst working outside the mine. Some of the miners on strike came up and threatened to throw me and my mate into a pond, but for some women who were looking on and who would see the act. They said but for that they would have thrown us into the pond.
5684. Who were your aggressors? They were supposed to be Union men.
5685. They did not carry their threat out? No.
5686. Were these the only threats made to you before the explosion? That was the only one used towards me.
5687. Did you ever hear any threats with reference to damaging the mine, or any statement as to what might take place in the mine? No; but I have heard of other men being threatened. I heard of men going to church and being threatened there.
5688. Did you hear the threats? No.
5689. I only want you to give your actual experience? I never heard anything beyond what I have stated.
5690. You heard no remarks before the explosion as to what might take place in the mine? No; nothing.
5691. Is there anything else you wish to say on this matter? No.
5692. Your name has been submitted as a person who could throw some light on the matter? That is all I know. I never worked inside the mine, and I was engaged outside at the time of the explosion.
5693. And you knew nothing of what was going on inside? No.
5694. *Mr. Hilton.*] Were you ever inside the mine? Yes.
5695. Have you any knowledge of underground mining? No, I have not.
5696. Were you ever employed inside the mine at any time? I have been since the explosion; not before.
5697. Can you throw any light whatever on the cause of the recent disaster? No; I cannot.
5698. *Mr. Owens.*] You stated you had been in the mine—how often? I never worked in the mine before the explosion.
5699. For what purpose did you go into the mine? I went in simply to put in a set where it came off the rails.
5700. Your usual employment was outside? Yes.
5701. And you merely went in to assist in putting the tubs on the road? Yes; that is all.
5702. *Mr. Oroudace.*] Why were these threats held out to you? Simply because I came to work before the strike had finished.
5703. I suppose it was to show the spirit of animosity towards you or anybody else that worked during the strike? Yes.
5704. Did it give you the idea that you were living in a free country? No.
5705. Had you done anything to cause it? Not that I know of, except it was because I went to earn an honest and respectable livelihood.
5706. And I think it highly creditable to you.
5707. *Mr. Owens.*] Have you worked in any other mine? No.
5708. You are not a miner by occupation? No.
5709. *Mr. Hilton.*] Did you not think that the threats were of sufficient importance for you to take legal proceedings to obtain redress? Had I known the men at the time I would have done so, but we were in such dread of going down to the village that I did not think it worth my while to run any risk. We seldom went down to Bulli to see a constable for fear of being molested by a crowd of miners.
5710. This threat you speak of was held out while you were at work? Yes.
5711. Could you not recognize them? Yes.
5712. I thought you said you would have taken proceedings if you could have recognized them? Yes; if I could have got away to do so, but in going down to Bulli I would have had to get half a dozen others to keep me company.
5713. *Mr. Owens.*] What prevented you from getting away? Because I knew that others had revolver shots fired after them.
5714. You are only speaking of what occurred to others? Yes.

Thomas Abel Jones sworn and examined:—

- Mr. T. A. Jones.
7 June, 1887.
5715. *Chairman.*] What is your occupation? I am a miner.
 5716. Where are you working at present? Nowhere.
 5717. You worked in the Bulli Colliery? Yes.
 5718. It has been suggested that you are able to give some evidence as to the cause of the explosion at Bulli;—how long did you work there? I worked there about six and a half years altogether.
 5719. When did you leave off working there? In August last year.
 5720. That was before the strike? Yes.
 5721. Do you know when the strike commenced? Late in August I believe.
 5722. What part of the mine were you employed in? I was working in the grip during the last quarter.
 5723. That is three months before you left? Yes.
 5724. Previous to that where did you work? Up in the "gassy."
 5725. What part of it? In Nos. 6 and 7 headings.
 5726. What was the state of these headings—did you ever observe any quantity of gas in them? There were slight traces in No. 6, and in No. 7 there was a quantity of gas.
 5727. What was the state of the ventilation at that time? Well it was good, but occasionally it was deficient.
 5728. From what cause? Well I should judge that it was on account of the doors.
 5729. Through their not being properly attended to? Yes; I think so.
 5730. Did this deficiency last for any time? No, for a few minutes only.
 5731. Would it occur frequently during the day? Yes; sometimes.
 5732. To what extent did the gas accumulate during these periods? Well, I could not say exactly.
 5733. What lamps did you work with? With Davy lamps.
 5734. Were any naked lamps used? Yes; they were used in about five bords.
 5735. But in none of the headings? No.
 5736. Did you ever make any complaint of an accumulation of gas or the deficiency of air? I had no reason to complain.
 5737. You did not think it of sufficient importance or the accumulation of gas sufficiently great to cause danger? In the place I was working there was no reason to complain, but in the other places there was reason for complaint.
 5738. Which headings do you refer to, and do you know this of your own knowledge? Yes, in Nos. 1, 2, 3, 4, and 7 headings.
 5739. Did you visit all these headings? Yes; every heading in the gassy section.
 5740. For what purpose did you visit them? Only to look in and see how the men were getting on.
 5741. Casual visits, not on business? Yes; sometimes on business.
 5742. For what purpose? Sometimes I would go in for powder and fuse or for anything else which I required.
 5743. But you were not working there? No; I was working in No. 6 heading.
 5744. And you visited others for the purpose of borrowing things? Yes.
 5745. And there you observed the gas? Yes.
 5746. To what extent—take No. 1 for instance? Well, I should say there would be about 4 yards in No. 1 heading from the face.
 5747. How much in No. 2 heading? There would be a little more in No. 2, but the worst heading was No. 4.
 5748. What was the largest accumulation that you have seen there? Well, I should think there would be 16 yards in that heading.
 5749. Were there men working in the face of that heading at the time? Yes.
 5750. With Davy lamps? Oh, yes.
 5751. Did you ever hear any complaints made of these large accumulations of gas? Yes; I remember Neah Hobbs one day went to Mr. White, the overman, to complain about it.
 5752. In your presence? No, I did not hear what he said, for he went outside.
 5753. For the purpose of calling on the overman? Yes.
 5754. Did he come in? No.
 5755. Do you know what transpired? No, I do not.
 5756. Do you know what steps were taken in consequence of the representations made by Hobbs? I did not hear what was done.
 5757. You know nothing of the mine since the explosion? I was in after the accident.
 5758. As a rescuer? Yes.
 5759. Have you formed any theory as to the cause of the accident? Yes.
 5760. Have you made sufficient observation to enable you to propound any theory as to its cause? The cause of it I think was the want of air in the back headings. That is what I think of it.
 5761. But can you tell us the immediate cause of the accident? There might have been two causes, but I believe it was caused either by the firing of a shot in No. 2 heading, or the gas was blown on to a naked light.
 5762. Where? In No. 2 heading.
 5763. Either one of these two causes? Yes. The gas was either fired by the shot, or blown on to a naked light.
 5764. How would it be blown to a naked light? By the shot.
 5765. Where, in your opinion, was the naked light? Hanging just outside the danger-board.
 5766. Then you think it might be accounted to the shot or this naked light? Yes.
 5767. That is your theory? Yes.
 5768. Do you think there was only one, or two separate explosions? I think it is possible that there were two.
 5769. Where would the second be? Between the western and the gassy sections.
 5770. Where? There is a heading off the straight that runs into the western, and I think there is a vacant place where the gas could have lodged, and that after the gas fired in No. 2 it might have reached the other accumulation, which helped to carry the blast into the western.
 5771. Have you seen any indications of a second explosion having taken place? I examined the positions of the skips and other things that were blown that way.

Mr.
T. A. Jones.
7 June, 1887.

5772. Is it impossible for these indications to have been caused by one explosion, or must there have been a second? They may have been caused by one, but I am inclined to believe that the blast was helped by the other. That is my opinion.
5773. You say it might have been caused by one explosion, but in your opinion it was assisted by a second? Yes.
5774. Did you know of any accumulation of gas in that particular spot before, or did you ever hear of it? Yes; I heard that when they were driving an air-course over the roll or fault that gas was found there.
5775. Was that at the dyke? Yes; on the left of the gassy section.
5776. How long was that ago? It is a year and a half or two years since that occurred.
5777. Do you know whether that accumulation was displaced afterwards by the air-courses? No, I do not know of it.
5778. It was soon after opening up the gassy section that it was found? Yes, at the beginning.
5779. The air-courses were not built at that time? It was in operation.
5780. Is there anything else that you would wish to say to the Commission with regard to the state of the mine before or after the accident—if so, we will be glad to hear it? I only wish to say that I am sure that the accident could not have happened if the air had been taken up to the back headings.
5781. Do you mean if bratticing had been used? Yes; I am confident that the explosion would not have occurred if it had.
5782. You believe, then, that in the presence of gas bratticing should be used in old headings? Yes, of course.
5783. Is there any other recommendation which you wish to submit for the proper working of the mine? I consider that every mine ought to be properly ventilated. The Bulli mine is not, and never has been, that I know of.
5784. Do you know whether the ventilation has been improved since the strike, or since you worked there. Yes, I believe it has been improved of late.
5785. Do you know to what extent? I think there have been a few hundred feet of extra air.
5786. It has been stated that the ventilation has been improved threefold? I have no doubt that it has been considerably improved.
5787. You have no reason to disbelieve that? No; but it is no use improving the ventilation if the air is not taken into the right places. I think if double doors had been used in these headings it would have kept up the ventilation continually; but it has been greatly hindered at times by the single doors.
5788. Is there any other recommendation? I may remark that I have mentioned to the deputies when I was going through the doors that they ought to have been doubled, and I recollect mentioning it to Crawford.
5789. What did he say? He did not say anything.
5790. Did you mention it to anybody else? Yes, to Harris and Robbins, two other deputies.
5791. Have you any idea whether they submitted your recommendation to any higher authority? I do not know.
5792. They were not followed by any result at any rate? No.
5793. Is there anything else that you would like to say? Yes; there is one thing. On the day of the election, when we elected Mr. Woodward, I had a conversation with Mr. White, the overman, and asked him whether he thought there would be any gas when he opened up the gassy section again. That was during the strike, and he said that he did not think there would be any gas at all in the Hill End section.
5794. Did he say why? We said it would all be drained away, and I said to him, "You will find yourself mistaken." I have been in several gassy coal pits in England, and I know the results of gas.
5795. Did you say anything more to him on that occasion? No.
5796. Did you not make any suggestion to him? No, because I was under the impression that he understood everything in connection with coal-mining, and I thought he knew as much as I did.
5797. *Mr. Neilson.*] Where is this No. 7 heading? It is the last heading in the section on the left.
5798. Going into the western? Oh, no.
5799. Is it on the left-hand of the straight run? Yes.
5800. *Mr. Hilton.*] Did you hear anything after the termination of the strike of the dangerous state of the mine on account of gas? Do you mean immediately after the strike?
5801. Yes. When the men resumed work after the strike, did you ever hear anything between that time and the explosion about the dangerous state of the mine? I did hear that there was still a quantity of gas in the headings. That is all I heard.
5802. *Mr. Owens.*] You stated, Mr. Jones, that you had seen gas in No. 6 and 7 headings? I said in No. 7 heading.
5803. I thought you said very slight traces in No. 6 and a quantity in No. 7? Yes, that is right.
5804. Did you report that to any of the officials at the mine? No, it was an understood thing.
5805. What was your reason for not reporting this gas? Because I knew that the officials knew of it, or I would have done so.
5806. How do you know? Because I have heard them warn men about it, and I have heard them tell the men to hang their lamps low on account of the gas.
5807. You stated that you were in the mine as a rescuer after the explosion? Yes.
5808. During that time were you in No. 2 heading? No, I was not in the heading; I only went up to the entrance of No. 1.
5809. Did you work in any of these bords off Nos. 1 and 2? I opened up the air-course off No. 7 heading.
5810. I mean in Nos. 1 and 2 headings or in any of the bords off them? No, I never worked in any of them.
5811. You say that you found gas in No. 7 heading, and that you did not report it to the officers? No, I did not report it.
5812. You stated further that you were perfectly sure that if bratticing had been used, the accident would not have occurred? Yes; in my opinion it would not.
5813. By that you mean to imply that you believe in bratticing? Yes.
5814. And that bratticing should have been used in these two headings? Yes.
- 5815.

Mr.
T. A. Jones.
7 June, 1887.

5815. *Mr. Jones.*] You stated that previous to the strike the doors were not attended to. Do you mean to imply that there were not trapper boys there? Yes, trappers were kept at the doors; but the hindrance would occur in this way: A set might get off the road, or an axle might break, and if this occurred at the door it would have to be kept open until the set was got away, and during all this time the air would be going in a wrong direction.
5816. For that reason you suggest that the doors should have been double? Yes.
5817. You further stated that in some portions of the gassy district bords were worked with naked lights? Yes.
5818. What bords were these? There were three bords off No. 1, I believe, and two in No. 7 heading.
5819. We have it in evidence that the whole of these places were working with safety-lamps previous to the strike? It is untrue.
5820. Do you make that statement of your own knowledge? Yes.
5821. What was the course of procedure with reference to the locking of lamps during Crawford's time, prior to the strike? I don't believe they were locked until Wales and Woods were sent out of No. 7 heading for working with the gauze of their lamps off.
5822. Can you say that the lamps were not locked at that time? You must understand that I can only speak from my own experience.
5823. If you were told that the whole of the lamps were locked previous to the strike would that be untrue? Yes.
5824. You stated that the air was sometimes deficient previous to the strike? Yes.
5825. Can you assign any special reason for that? Only the opening of the doors; that is the only reason I can give.
5826. Did you ever hear amongst the workmen or officials that the way in which the wind blew operated upon the furnace, and thereby brought about a depression in the air? I never heard of it, but it might be true.
5827. You stated that you believe a second explosion took place. Do you make that statement in the belief that gas was known to exist in a heading off the straight road? I do not understand.
- 5827½. You said that you worked in Nos. 6 and 7 off the straight, and that gas was known to exist there. Is that your reason for saying that a second explosion took place? I believe that gas got out into the place I referred to.
5828. But in the light of the ventilation having been improved threefold, do you still believe that gas existed there, and was ignited in the way you described? Yes, I believe so; for instance, if the furnace was idle, the gas would get up there.
5829. Have you any reason to suppose that the furnace was idle at the time of the explosion? I could not say whether it was idle or not.
5830. But, assuming that it was working as you say, and that you were told that something like 12,000 cubic feet of air was going over the Hill End district, that being the case do you still think that gas could have lodged in Nos. 6 and 7 headings, and that it operated as a second explosion? I believe a little of it would get out there, in consequence of the way in which the air-course was constructed. There was a big opening there; but if there had been a proper air-course gas could not have accumulated.
5831. Was not the return almost parallel with the intake, and were not the workings off Nos. 6 and 7 headings very limited? Yes.
5832. And there would be very little room for gas to lodge there? Yes, there would be very little.
5833. *Mr. Croudace.*] Had you a copy of the rules given you at any time during your employment at Bulli? I never had any rules.
5834. You never had? Never.
5835. Do you know whether there was any rule prohibiting men from going from one place to another in the pit? No, I did not.
5836. Do you know whether it is customary to allow men to travel about in fiery mines? I never heard anything to the contrary.
5837. Have you ever worked in fiery mines in England? Yes.
5838. Where? In Derbyshire and Staffordshire.
5839. Were you allowed to travel from one place to another in those mines? Yes; I never had any hindrance; we could go about them any way we chose.
5840. How long is it since you worked there? About eight years ago.
5841. Well there is a rule preventing it in the Bulli mine. No. 4 of the special rules says:—"No workman or boy shall, unless duly authorized to, go into any part of the mine excepting that to which he is appointed by the overman or other officers." You, by travelling about this fiery mine, have been breaking one of these rules? Well, if so, I was in ignorance of it.
5842. You stated that the Bulli mine, during your time, was not properly ventilated; in what way do you mean? Well all the air-courses were not properly built up in the headings; they were not properly constructed.
5843. Then you said that the system of ventilating by means of doors was imperfect? Yes. I have recommended that the doors should have been doubled.
5844. And with the exception of bratticing have you any other fault to find? The ventilation of the mine was not sufficient at the time I was working there.
5845. You say that this would have been remedied if bratticing had been used, and the doors had been doubled? Yes.
5846. Was there any other deficiency in the system of splitting the air and anything else? Yes. The ventilation could have been improved in different ways, and the Act specifies, I believe, that every seventy men shall have a separate split.
5847. Were there any more than seventy men in any part of the Bulli mine? Yes, I believe so.
5848. Are you perfectly sure; can you tell me in which districts there were more than seventy men? I am positive that there were more than that number.
5849. In which district? In the Hill End district and in the western.
5850. Were they supplied by one system of ventilation? Yes.
5851. No split in the ventilation? No, there was not.
5852. Are you quite sure of it? If there was I was ignorant of it.

Mr.
T. A. Jones.
7 June, 1887.

5853. Were there not a distinct travelling road, a distinct airway, and a distinct overcast over the western district? I cannot say that there were.

5854. Have you any knowledge of what you are saying; have you ever travelled that way? I have travelled from the "gassy" into the western, and from the western into the grip.

5855. Was that in one continuous airway, as far as the doors and the overcast were concerned? Yes, previous to the strike.

5856. And I am speaking previous to the strike; the air went round No. 1 return up the back heading, passed Nos. 6 and 7 heading, went away to the western, then to the grip, and thence to the furnace;—is that the route? I think there was some alteration some two or three years ago.

5857. I am referring to the time just previous to the strike; did the ventilation go round Nos. 1, 2, 3, 4, 5, 6, and 7 headings, thence to the western, then into the grip in one undivided course? Yes, I believe it did.

5858. Since the strike have you any knowledge as to its course? No, I have not.

5859. If I were to tell you that Nos. 1, 2, 3, 4, 5, and 6 in the Hill End district had, in fact, a distinct split, a distinct return air-course, and an overcast to the furnace, and that the western had a regulating door to give it a distinct split in the ventilation, would you consider that an improvement? Oh, yes, if that were so.

5860. Well that is sworn to be the case by several witnesses? If so it would be a great improvement on the system that existed when I was working there.

5861. Did I understand you to say that, after the explosion, you only went along the main road as far as the entrance to No. 1 heading? Yes.

5862. Then all your statement about a second explosion is not from observation or from the effects you witnessed after the explosion, but merely supposition; you did not examine the headings on the return air-course? No.

5863. Have you anything to substantiate your theory, or is it merely supposition? I had not an opportunity of making a complete examination.

5864. I am speaking of what you did; am I right in saying you only went to the entrance of No. 1 heading? Yes.

5865. And you think that a second explosion took place in the big heading going to the western? Yes.

5866. Were you in there at all? No.

5867. Then it is only supposition on your part; you have seen no effects on which to base your theory? No, I have not.

5868. You have already answered, but I want you to be very careful in answering it again; you said that, prior to the strike, you for some time worked with an unlocked lamp;—is that really the case? Yes.

5869. You make that statement without hesitation? I have none.

5870. It was only after two men were sent out of the mine for working with the gauze off their lamps that your lamp was locked? Yes.

5871. You are quite sure? Yes, I am quite sure.

5872. If Mr. Crawford, the former deputy, swore before the Commissioners that the lamps were all locked previous to the strike, and that, in fact, he locked them himself, is that true? So far as my lamp was concerned it was not.

5873. I am referring to your own knowledge? Well it was not so.

5874. And we cannot believe his testimony as far as you are concerned? No.

5875. You also made some remark that, providing the furnace was idle at any time, gas would accumulate in a certain part of the mine;—can you describe to me that position? I think it was No. 7 heading that you speak of. I will give you a rough sketch by which, I think, you will be able to point out where you mean. I think there is a probability of gas having accumulated in this heading (No. 7), which would be very liable to increase in quantity if the furnace was allowed to remain idle any length of time, and if there was a large accumulation there it might have been the cause of a second explosion.

5876. *Mr. Neilson.*] Can you tell me where the danger signals were fixed in the gassy district immediately you got through the dyke; you say there were several bords working with naked lights? The danger-board was fixed at the entrance of No. 1 heading.

5877. Was there not one fixed at the entrance of No. 2 heading? At that time there was only one danger-board, which acted for both headings.

5878. Was there any danger signal between the bords working with naked lights and those working with safety-lamps? Yes, there were bords off Nos. 1 and 7 headings working with naked lights.

5879. *Mr. Hilton.*] Did you work in the western district before the strike? Yes.

5880. Was there a door between the Hill End and the main western road fixed at the junction? Yes; there was a door in the junction.

5881. Was it an ordinary door? Yes, it was an ordinary door.

5882. When you entered the tunnel mouth you left the grip road on the left-hand side and went up the Hill End district, before getting there you came to the western road and found a door at the western junction. Did you notice whether there was any hole through that door, to admit air into the western district? No; I did not notice it.

5883. Then the air would have to go up the Hill End district, around by the return into the western, and from the western down into the grip, and then to the furnace? Yes; that was its course.

5884. And that leads you to make the statement that it was a continuous system of ventilation? Yes.

5885. Was the 4-foot seam working in your time? Yes, it was.

5886. *Mr. Owens.*] Do you know anything of the furnace? Yes.

5887. You say that you have been in since the explosion? Yes; but only as an explorer. I went up to the furnace the first thing.

5888. That was the first time that you saw the new furnace? Yes.

5889. It was not there before the strike? No.

5890. *Mr. Neilson.*] Do you understand the route of the air-course? Yes.

5891. If there was an air-crossing in the western, over the main road, would that air be utilized by the men in the Hill End district? There was no crossing there before the strike.

5892. *Mr. Hilton.*] Who was the deputy in the western district previous to the strike? Harris was the deputy.

5893.

Mr. T. A. Jones. 5893. Did Harris ever, within your knowledge, request that the western door should be opened to admit air to men working in the western district? I never heard anything of that kind, so I cannot say whether he did or not.
7 June, 1887.

The Commission then adjourned *sine die*.

MONDAY, 27 JUNE, 1887.

Present:—

DR. ROBERTSON, PRESIDENT.

MR. O'MALLEY CLARKE,	|	MR. OWENS,
MR. CROUDACE,	|	MR. JONES,
MR. HILTON.		

Eward Kerrison sworn and examined:—

Mr. E. Kerrison. 5894. *President.*] What is your occupation? I am a miner.
27 June, 1887.

5895. Where are you at present working? At Maryville colliery, Newcastle.

5896. Before that were you working at Bulli? Yes.

5897. Were you engaged there on the date of the explosion at that Colliery? Yes.

5898. When did you go from the mine—at what o'clock? I left the mine at 20 minutes past 1 o'clock on the day of the explosion.

5899. What was the reason of your leaving your work so soon? I met with an accident and got a cut on the head.

5900. Where were you working? We were for some time working in the western district.

5901. Were you working at the coal? Yes.

5902. What kind of an accident was it you met with? In pulling down a piece of coal I knocked out a prop, which struck me on the head.

5903. That was the cause of your leaving the mine? ———

5904. In going out of the mine what road did you strike? The Hill End incline.

5905. In coming down did you meet with anything unusual? No; I met Mr. Wade.

5906. Who is he? He was looking after the rails and that. It was near the tunnel mouth.

5907. How far in the tunnel was it? About 50 yards.

5908. Did you pay any particular attention to the state of the incline in going down? Not particularly. I did not feel very well after getting the knock.

5909. You met no one except Mr. Wade? No.

5910. And you saw nothing unusual in the appearance of the incline? No.

5911. Had you been working at Bulli for some length of time? For seventeen years.

5912. Were you working in the gassy section? No, sir; I did not work much in the gassy section, since the gas was found.

5913. Not for about two years? About two years and six months, or three years.

5914. Was Wade one of those who were lost in the mine? Yes.

5915. Do you know where he was found? From what I hear I think his body was found near the top of the incline.

5916. Had you any conversation with him when you met him, on the occasion you speak of? I told him about being cut on the head, and he said I ought to be careful, and things like that.

5917. And you saw nothing unusual in the state of the mine on your leaving? No; things were about the same as usual in the intake.

5918. You saw nothing unusual in the state of the incline? No.

5919. Do you know anything about the accident—did you enter the mine after the accident? Yes; I was on the Friday.

5920. Where did you go on the Friday? The first thing in the morning I went down to the gassy section to search. I went in on purpose to go to the western district, as I was of opinion that some men would be found alive there.

5921. Did you go into the western? I did in the evening.

5922. Had the men been taken out then? No; Mr. McCabe and others were going in.

5923. *Mr. Hilton.*] What part of the mine were you in on the day of the explosion? I was in the furthest in bord in the western. Previous to that I was working in the return air-course going into the furnace.

5924. Not having worked in the gassy section then you have nothing to say about it? No.

5925. Do you know any of the men that were working in the gassy section? I know one or two of them.

5926. Did you ever hear anything about gas existing there? Yes; Noah Hobbs told me there would be a blow-up. He was working there previous to the strike.

5927. Have you heard anything about the gas since the strike? No, I have not.

5928. You know nothing yourself? No, not from my own knowledge.

5929. *Mr. Croudace.*] When you heard Noah Hobbs say there would be a blow-up did you recommend him to tell the manager or the overseer of the mine? I did not reckon it to be my place, as he knew more about it than I did, because he had been working in it all his lifetime.

5930. You did nothing yourself towards informing the management of what Hobbs had said to you? No; it would not be my business, as I was not working in the gassy.

5931. You were working in the same mine? Yes; but a good distance away from there.

5932. Do you not think that, as a miner of old standing, it was your duty to make the officials acquainted with the circumstance? I thought they would know more about it than I did.

5933. Supposing you had no experience of gas at all, and you heard a man say there was gas, and that there would be blow-up, do you not think it would be your duty to tell about it? Under these circumstances it would perhaps.

5934. Those were the circumstances, and why did you not do it? Well, Mr. White and Mr. Ross knew it, and I did not see why they wanted telling.

5935. *Mr. Owens.*] When was it you heard Hobbs making this observation;—was it before or after the strike? Before the strike, when he was working there. 5936.

5936. *Mr. Jones.*] Who engaged you, Mr. Kerrison? Mr. Ross.
5937. Did he make any remarks to you or mention anything about the existence of gas in the mine? No. Mr
E. Kerrison.
27 June, 1887.
5938. Did he ever tell you to be careful or cautious? No; I did not work in the gassy section.
5939. Did you receive a copy of the rules? Yes.
5940. On coming out of the mine on the day of the explosion you came down the incline you say? Yes.
5941. Was there any other way out? No.
5942. You are quite sure? Yes; there was no other way. The only other road was to be the one we were driving through to the new furnace for air.
5943. On the day of the explosion did you notice any material difference in the air current? Not the slightest.
5944. You think the ventilation was as good as usual? It was about the same.
5945. You have said that Hobbs and others spoke of a probable explosion before the strike? Yes.
5946. Did you hear any similar remarks after the strike? Not to my knowledge. He often told me that the men were too careless.
5947. That was before the strike? Yes.
5948. Was there a considerable improvement in the air after the strike? No; I think it was the other way about. There was no proper return to the western, that was why we were driving there.
5949. Do you not think that since the new furnace came into operation there was an improvement in the ventilation? The air was a little better where I was working; but I reckon the reason was there were not so many men working there; there were only eight men working where there used to be forty.
5950. Do you mean to say there was no improvement after the new furnace started? I say the air was better; but I think the reason was that there were not so many men and horses to be supplied.
5951. Do you think the improvement in the air satisfied the men that there was less danger to be expected from an explosion? Where I worked we never had any thought of an explosion, and I cannot say anything about the other part.
5952. Did it never occur to you that an explosion in the Hill End district would affect the men in the western? No; that was the last thing to enter my head.
5953. *Mr. Owens.*] During your seventeen years' experience in the Bulli mine did you ever see any fire-damp or gas in any part of it? No.
5954. You never saw it yourself? No.
5955. You only heard of its existence? That is all.
5956. *Mr. Jones.*] So far as you are aware you never heard the men complain of the existence of gas after the strike being a source of danger—it was only before the strike? Yes, before the strike.
5957. You did not even hear about it afterwards? Not that I recollect; I never had much to say to any of them.
5958. Did you never hear of any unusual quantity being found, such as blowers, for instance? I heard of a blower in Westwood's heading.
5959. You did not take the trouble to go and see it? No.
5960. You did not think it was a source of danger? By our rules I did not think I should be right in going there.
5961. *Mr. Owens.*] Is or was there any rule that would prevent you reporting danger if you saw or heard of it? I can hardly think that.
5962. You did not regard the rules as preventing you reporting the existence of danger? I know that if I had seen any danger I would have reported it.
5963. *Mr. Hilton.*] You say you got a copy of the rules, was it a copy like this [*holding up a small book of rules*]? Yes; it is about seven years since I got those rules. [*The witness withdrew.*]
- This concluded the evidence.

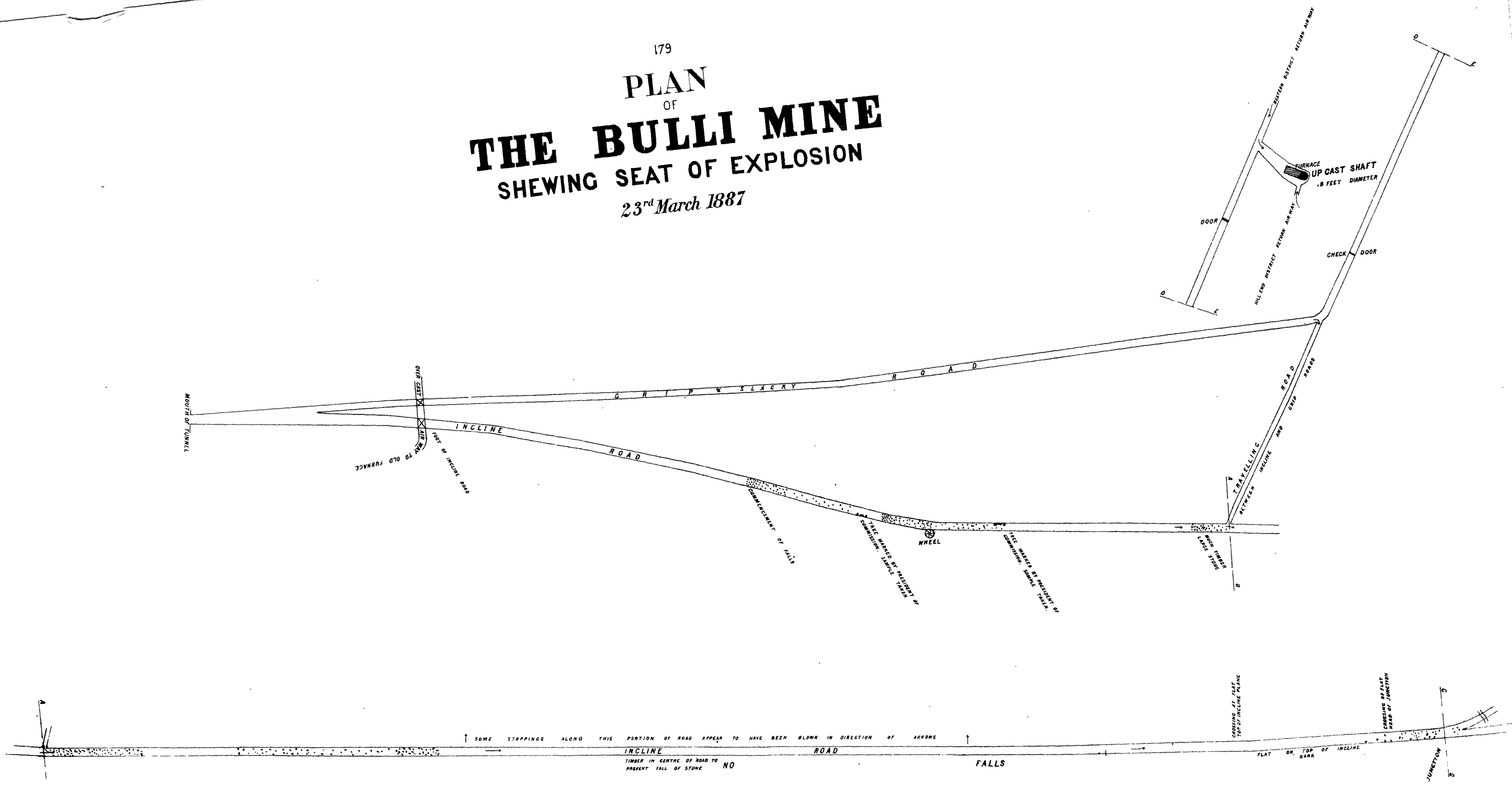
APPENDICES.

[Appendices Nos. 1 to 5 comprise Plans.]

179

PLAN OF THE BULLI MINE SHEWING SEAT OF EXPLOSION

23rd March 1887



(Sig 514-2A)

PLAN

SHEWING

THE POSITIONS &c. OF COAL LAND HELD BY COMPANIES

IN THE

ILLAWARRA DISTRICT

Taken from Plan Compiled by the Examiner of Coal Fields

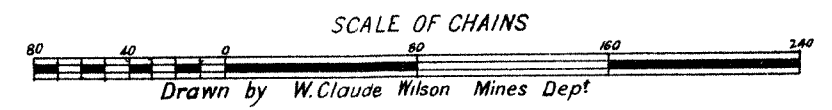
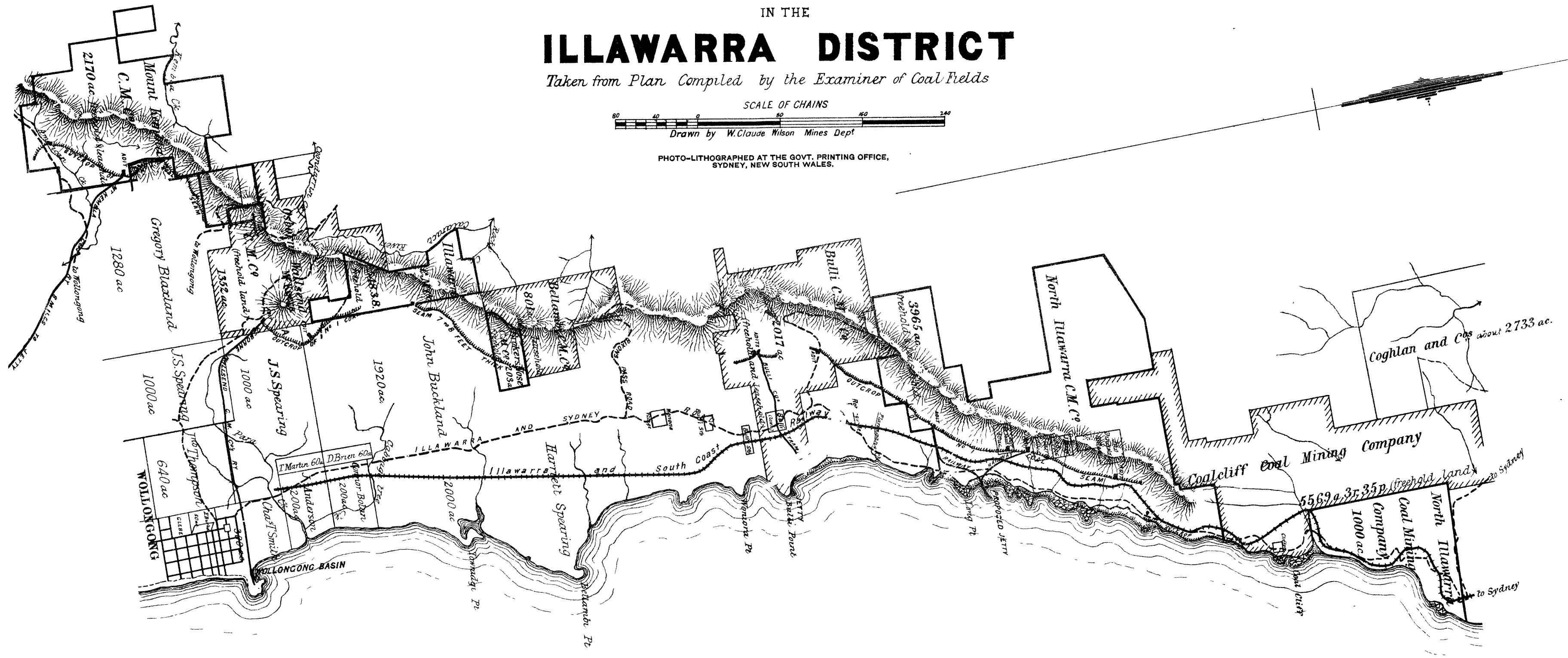


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S O U T H

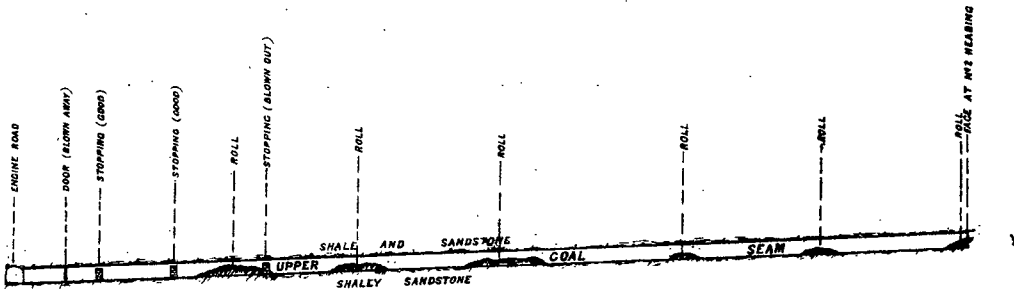
P A C I F I C

O C E A N

**HORIZONTAL SKETCH SECTION
ALONG LINE XY N^o 2 HEADING, PLAN N^o 5.**



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SECTION OF COAL SEAMS

ft.	ins.	Strata	
		SANDSTONE	
4	6	SHALE AND SANDSTONE	
	6	BLACK SHALE	
3	0	UPPER COAL	
		SHALEY SANDSTONE	
35	0		
		SANDSTONE	
		SHALE	
3	11	FOUR FOOT COAL	
		SANDSTONE AND SHALE	

(514-2C)

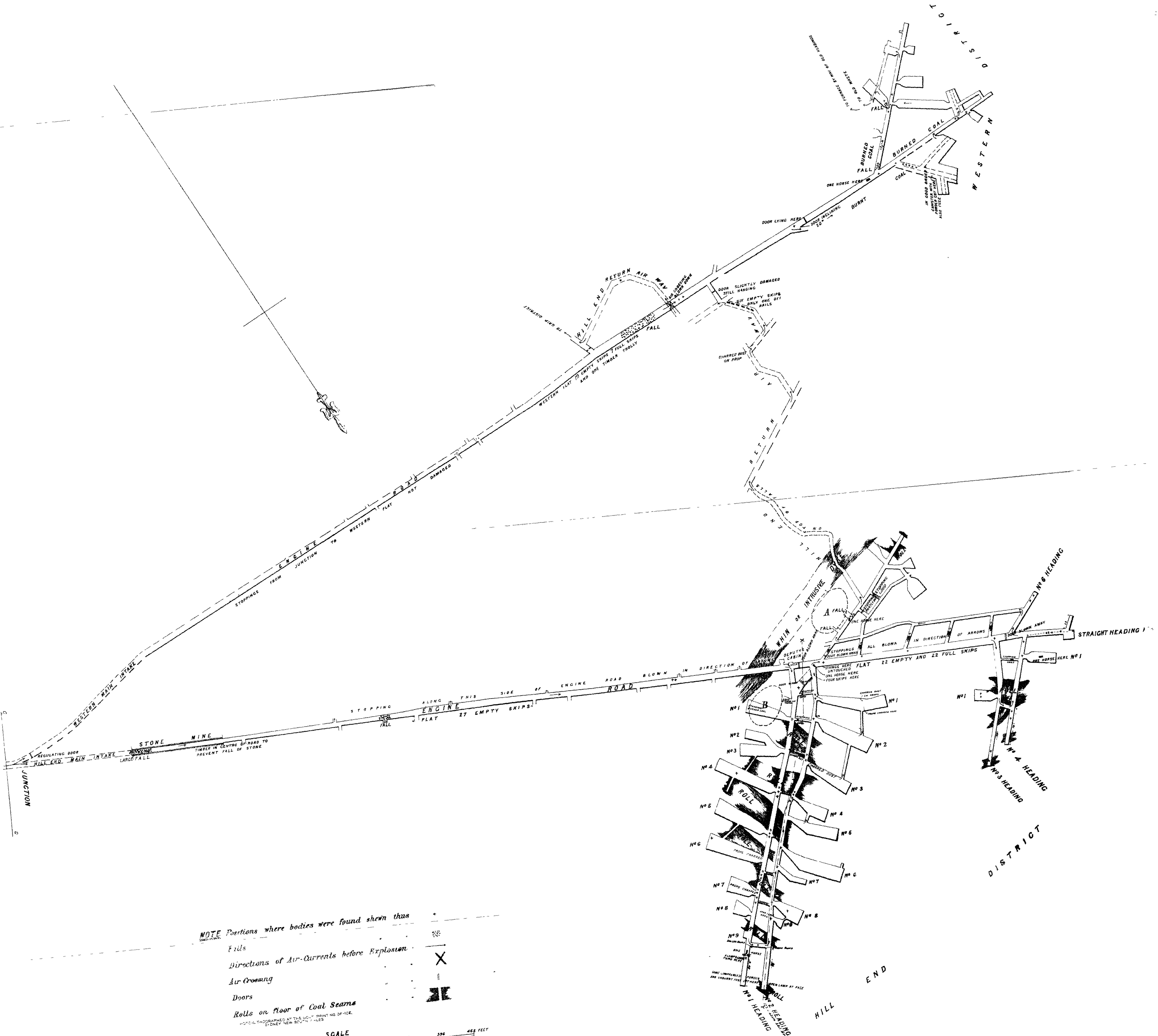
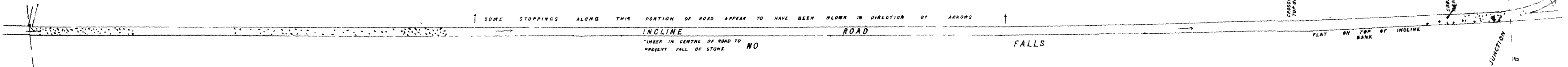
THE WORKINGS OF THE BULLI MINE





NOTES


- Positions where bodies were found shown thus +
- Direction of Air-currents before Explosion - - -
- Air-Crossing X
- Doors I


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



NOTE Positions where bodies were found shown thus 

Falls 

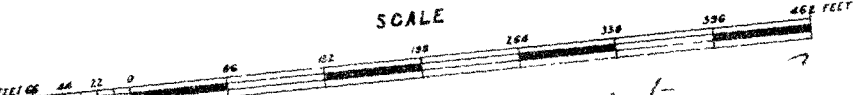
Directions of Air-currents before Explosion 

Air Crossing 

Doors 

Rolls on floor of Coal Seams 

NOTE—PHOTOGRAPHED AT THE MINE, MOUNT ROSE, CALIF., BY STONEY NEW BROWN, 1915.

SCALE 

Francis Wm Robertson
President

APPENDIX No. 6.

Inspector Rowan's Reports in reference to the Bulli Colliery :—

Sir, Wollongong, 2 September, 1886.
For your information, I have the honor to inform you that I have inspected the Bulli Colliery on August 5th and 9th instant :—

Bulli old Tunnel.—About 130 men and horses are employed, and served with 12,500 cubic feet of air per minute in three different splits.

Hill End district.—Thirty-six men and horses employed, and supplied with 3,600 cubic feet of air per minute. The miners in this division are working with safety-lamps, as the coal gives off a small portion of fire-damp. Strict discipline is exercised by the management to ensure safety, viz., the bords are examined every morning by a competent person, and the same reported to be safe before the miners commence work. Four danger signals are placed at a respectable distance from the working faces, cautioning persons not to pass said boundaries with a naked light. I carefully examined every bord with a safety-lamp, but in no case did the fire explode in the lamp. I also asked the miners if they considered every care was taken; they said they believed so, and that the deputy made several inspections during the day.

Hill End, West.—About forty-six men and horses employed, and served with 5,500 cubic feet of air per minute.

Slacky heading.—About thirty men and horses employed, and served with about 3,400 cubic feet of air per minute. I went through a large portion of the waste workings, which from the return air-course, for the Hill End district, heavy falls of roof have taken place. I pointed out the defective condition of this return air-way. The manager showed me a new return air-way he was making through a portion of the waste workings and solid coal; which is expected to be finished in a few weeks, as he was driving it from each side, with two shifts of men. This air-course will come along all the working faces, and will be the future permanent air-course for the colliery.

I have, &c.,
JAMES ROWAN,
Inspector of Collieries.

The Examiner of Coal-fields.

Sir,

Wollongong, 25 October, 1886.
For your information, I herewith forward report of my inspection made at Bulli Colliery on the 20th instant.

On making my inspection of the workings I found that heavy falls of roof had taken place in the return air-ways, also in Harris's heading. In this heading, where about forty men were employed, the manager has lifted all the plant, as there was no possible way of keeping the roads in order.

This, Harris's heading has a very bad class of roof, and requires a constant staff of way-men to keep it in order. The manager informed me at the commencement all the day-men and deputies struck work with the miners, leaving him without a man; even the underground furnace man left, and it was with difficulty he could find another to fill his place. I mentioned in my last report that a new air-course was in course of construction, which by this time would have been finished, but that also was at a standstill for want of workmen.

The new furnace which is being built about 43 chains from the entrance of the tunnel is almost finished, which will be a great boon for the ventilation of the colliery.

I have, &c.,
JAMES ROWAN,
Inspector of Collieries.

The Examiner of Coal-fields.

Sir,

Wollongong, 22 December, 1886.
I beg to state that I have inspected Bulli Colliery on the 20th instant.

The miners are still on strike. Five men employed underground doing general repairs. I examined the Hill End division of workings. This is the division of workings that used to generate fire-damp, and where the men when working had locked safety-lamps. I examined this portion with a safety-lamp, and found the same clear from fire-damp or any other foul gases. I could not pass through the other two divisions of workings on account of heavy falls of roof, especially in the return air-ways. I drew Mr. Ross, the manager's attention to the condition of the return air-ways. He stated he could not get men to work to keep the air-ways in order, and they were constantly falling. (See October report on the Bulli Colliery.) But it would be his first business to put the air-ways in order, when the strike was settled. The new ventilating furnace is now finished, and in working order.

I have, &c.,
JAMES ROWAN,
Inspector of Collieries.

The Examiner of Coal-fields.

Sir,

Wollongong, 2 March, 1887.
For your information, I have the honor to inform you that I inspected Bulli Colliery on the 17th instant.

Hill End District :—Fifty men employed, four of them working in narrow headings with safety-lamps, owing to the coal giving off a small per cent. of fire-damp. I carefully examined this division of workings and found the ventilation good in every bord, 12,000 cubic feet of air being brought up to within 20 yards of the furthest in working face. On examining the return air-way I found that heavy falls of roof had taken place. The falls were so heavy I could not make a passage through. I drew the manager's attention to this matter. He stated that he had three shifts of men working, making a new air-course, and the same would be kept working until a proper recognized air-way was made from the working faces to the ventilating furnace. As I have formerly reported, a number of these falls took place during the recent strike.

Harris's heading, where forty men were employed previous to the strike, is so completely crushed, caused by the bottoms heaving, in this district. The boards will require to be cut out anew with a pair of headings.

I have, &c.,
JAMES ROWAN,
Inspector of Collieries.

The Examiner of Coal-fields.

APPENDIX No. 7.

Dr. Llewellyn's Evidence.

James Davis Llewellyn sworn :—

The Coroner.] What are you? I am a duly qualified medical practitioner, registered in this Colony, practising in this district, and residing at Wollongong.

Do you remember the 23rd inst.? Yes. On that day I went to the Bulli colliery, arriving there, from Wollongong, at about 10 o'clock on the night of the explosion. About 12 o'clock that night the body of a young man was brought out. I made an examination of the body, so as to discover the cause of death. The man was covered with coal-dust, and on the top of his head was a penetrating wound leading down to the skull cap. There were thin layers of skin well blackened with coal-dust, but not charred, detached from the palms of both hands. After his face was washed, both cheeks, both lips,—and upon feeling the skin further off—the palms of the hands were also florid. The elasticity of the detached portions of the skin from the palms of the hands was unimpaired. He had the appearance of a man who had died from carbonic oxide poisoning. The florid colour of the face and other parts was due to a chemical combination which carbonic oxide forms with the colouring matter of the blood. It possesses the chemical property of displacing oxygen from the blood. The hair on the head was short.

514—2 F

Were

Were there any signs of singeing? I could not say that. The hair was short and covered with coal-dust, but there was no evidence of the slightest burning on any part of the body; no vesication. I saw No. 2 body, said to be the father of the young man who was first brought out. He was very much injured. The left leg, at the junction of the lower forepart, was fractured, both bones being fractured also. The lower fragments of the limb were tilted outwards, so as to form about a right-angle with the long axis of the limb. Upon coming up the side of the body both bones of the corresponding forearm were fractured near the wrist. There was also a deep cut close to the wrist. The lower jaw on the left side was also fractured. There was hemorrhage within the interior chamber of the left eye, and on the head were several cuts, some down to the bone, and some going past and penetrating the soft tissues. The palms of the hands presented the same appearance as No. 1 body, with this exception that when peeling off the skin the pallid surface was exposed to view. This man must have died from the sudden shock before he had time to be poisoned. The hair on this man's head was also short, but there was distinct hair on the head. I saw several other bodies brought out, but I did not take particular notice of the cause of death, as with the first two. I took notice of the external marks of violence, and that the skin peeled off. I saw five or six bodies altogether. I thought at first that the appearances of the palms of the hands were due to burning, but I found that I had made a mistake. When the skin is burned it does not detach. It is due to friction or pressure. In burning, the skin always remains a fixture. The six degrees of burning, according to Charcot, the great French surgeon, are—

First.—Redness and tenderness of the surface; after a few hours these symptoms may subside, the cuticle possibly desquamating. *Second.*—Inflammation is the result. This action is manifested by the formation of blisters from the effusion of serum beneath the cuticle. *Third.*—The superficial layer of the true skin is destroyed, the surface appearing of a gray-yellowish or brown colour; not painful unless roughly handled. The vesicles that exist contain a blood-stained or brown fluid. The papilla of the skin with its nerves are first destroyed; but when in the course of a day or so the dead surface has been “shed,” and the nerves exposed, the pain is very severe, and the exposed surface has a reticulated appearance. *Fourth.*—The whole thickness of skin is destroyed, with more or less of the subcutaneous cellular tissue, the parts being converted into a hard, tough, dry, and insensible eschar, mottled with blood. Vesication does not exist in this degree, all the superficial tissues having been destroyed. The skin surrounding the eschar may be blistered, but when it comes in contact with the injured part it will be drawn into folds, from the contraction owing to the drying of the burnt integument. This puckering fairly indicates the important fact that the whole skin has been destroyed. The eschar does not begin to separate for four or five days, an inflammatory zone of redness, with pain of some severity, indicating the commencement of a process that will not be completed for two or three weeks. *Fifth.*—The skin with the deeper parts are involved, a black brittle charred mass taking the place of healthy tissues. *Sixth.*—The whole thickness of a limb is carbonised.

I never saw anything indicating the burning of the skin beyond the first degree of burning which is shown by redness alone. All I saw was the redness, and its cause I have already explained—namely, carbonic oxide poisoning. No. 2 body died instantaneously. He died before No. 1. I can give you the cause of the deaths of these two men, and from these causes I suppose the others died as well. I am satisfied of the causes of death only in two cases, but seeing that the men were all together it is reasonable to suppose that they all died in a similar manner.

Do you remember who identified the first body? No; there was someone in the room who recognized the body as that of Felix Bourne. An old woman named Mrs. Jones recognized both bodies.

Do I understand that Felix Bourne died from the effects of after-damp? After-damp usually contains carbonic acid, and in these two cases there were appearances of this cause of death.

In the case of death by asphyxia, from after-damp, how long does life continue? You must take two features into consideration. If you have pure carbonic acid a man falls down immediately. If there is a mixture of oxygen he might live 5 or 6 or 7 minutes until he becomes poisoned.

Mr. Bull.] Would you say what effect it would have upon the hair of the head? No effect at all. Of course everything depends upon the heat with it.

The oxide would have no effect upon the hair itself? Not knowing the appearance of the men of course I cannot tell.

But was not the hair of these men shorter than you would expect to see it? Well, if I were a miner myself I would have my hair cropped very short.

Had the hair the appearance of burning? I did not pay minute attention to it; I wanted to find out what the men died from. If there had been a flash of fire I think there would be bound to be obvious indications.

You said the hair was well coated with coal-dust? Yes; but the faces after being washed presented no appearances of burning.

But would not a coating of coal-dust protect the body? It would be a safeguard.

Mr. Gibson.] Have you had any experience in mining accidents? Yes; and I have seen men burned in the fourth degree, and I can tell the effects of strong burning immediately. I never saw anything of the kind on these bodies.

Is there any difficulty in persons who have seen bodies burned to tell whether these bodies were burned or not? If a man is burned after death the appearances are different; but I should not like to take the evidence of any man as to burning, unless he were a medical man.

Is it not a fact that numbers of bodies have been thought to be very seriously burned—from the general appearances—and yet have not been burned at all? I have not heard of it.

Mr. Bull.] I suppose a body that was burned would have a strong smell of fire? No; there would be no smell.

But you made a mistake at first? Yes, I did, about the hair.

Was it not the appearance of the hair itself which misled you? Yes.

What impression did you form when you first saw the hair? Well, the hair was very short, and it appeared as if it had been singed. I thought so until I pondered and thought well over the matter, when I came to the conclusion which I have given you.

Mr. Wallace.] If you had not thought the matter out and seen that the condition of these bodies negated the idea of burning, you might have remained under that impression? Quite so.

APPENDIX No. 8.

The Examiner of Coal Fields to The Under Secretary for Mines.

Reports on the explosion at Bulli Colliery by the Examiner of Coal Fields.

Sir,

Mining Department, 30 April, 1887.

About 2:30 p.m., on 23rd of March last an explosion occurred in the workings of the No. 1, or 7 feet, coal-seam at Bulli Colliery, which I regret to say has resulted in the death of eighty-one persons.

This is the greatest number of lives that has ever been lost in a colliery accident in New South Wales, the largest number in any previous accident having been five.

I have made several examinations of the workings, with a view of ascertaining the cause of this terrible disaster, and I have also heard the evidence given at the public inquiry in the Oddfellows' Hall, Bulli, and, having considered all the circumstances, I now submit the following report for the information of the Honorable the Secretary for Mines.

The Bulli Colliery is situated about 8 miles from Wollongong Harbour and $1\frac{1}{2}$ mile from the Bulli jetty. It belongs to the Bulli Coal Company (Limited), and is under the care and direction of Mr. George Hamilton, Manager, and Mr. Alexander Ross, Colliery Manager.

The mine was commenced to be opened out in 1863, and since then to the present time 1,794,685 tons of coal have been raised from the No. 1, or 7 feet, coal seam. The coal is won and wrought by two adits driven into the coal seam, facing the Pacific Ocean, on the Illawarra Ranges, at a height of about 400 feet above sea level, which adits intercommunicate with each other, and by means of either of which openings all persons employed in the colliery may at all times pass in or out.

Area of the coal workings.

The coal workings cover an area of about 588 statute acres, and the coal has been wrought by the pillar and stall system.

Ventilation of the Mine by the old furnace.

The mine was, previous to November, 1885, ventilated by a furnace capable of producing 17,000 cubic feet of air per minute, situated about 55 yards, in a direct line, from the entrance of No. 2 adit (*vide* C on plan) and about 1,960 yards from the far end of the Western and Hill End district workings, where on August 5th and 9th last Inspector Rowan reported that in the Hill End district the miners were working with safety-lamps, "as the coal gives a small portion of fire-damp;" that strict discipline was exercised by the management to ensure safety, the bords being examined by a competent person and reported to be safe before the miners commenced work; and that he (Rowan) examined every bord with a safety-lamp, but in no case did the fire explode in the lamp, and also asked the miners if they considered every care was taken; they replied that they believed so, and that the Deputy (Crawford) made several inspections during the day.

On 20th October last Inspector Rowan made another examination of the workings, and reported to me, "that heavy falls of roof had taken place in the 'return air-ways, also in Harris's heading'" (Grip). In this heading, where about forty men were employed, the manager had lifted all the plant, as there was no possible way of keeping the roads in order, in consequence of it having a very bad roof and requiring a constant staff of day men to keep it in repair; that the Manager informed him that at the commencement of the strike all the "day men and deputies" struck work along with the miners, thus leaving him without a man; the underground furnace-man also left, and it was with difficulty he found a person to fill his place; and that, as he stated in his previous report, the new air-course which was being constructed would have been completed if it had not also been at a standstill for want of workmen.

Ventilation of the Mine by the new furnace.

On 22nd December last Inspector Rowan reported that the new ventilating furnace was finished and in working order, and that on the 20th idem he examined the division of the Hill End workings which formerly generated fire-damp, and where the men when working had locked safety lamps; that he examined the district with a safety-lamp, and found the same clear of fire-damp or any foul gases; that he could not pass through the other two divisions of workings (western and grip) on account of heavy falls of roof, especially in the "return air-ways," and drew Mr. Ross's attention to their condition, when he promised to get men to keep them in order, as they were constantly falling; that Mr. Ross said he would put the air-ways in order when the strike was settled, and concluded by saying that the new furnace was finished and in working order.

On March 2nd Inspector Rowan reported that he had made an examination of the mine on the 17th ultimo, and found fifty men employed, four of them in narrow headings, working with safety-lamps, owing to "the coal giving off a small percentage of fire-damp"; that he carefully examined this division of the workings and found the ventilation good in every bord, 12,000 cubic feet of air per minute being brought up to within 20 yards of the furthest in-working place; that on examining the return air-way, he found heavy falls of coal had taken place, which falls he could not make a passage through, and that he drew the Manager's attention to the matter, who said he had three shifts of men at work making a new air-course, and that they would be kept at work until a proper recognized air-way was made from the working places to the ventilating furnace; that, as formerly reported by him, a number of the falls took place during the recent strike; also, that Harris's heading (grip district), where forty men were employed previous to the strike, was completely crushed, caused by the bottoms heaving, and that the bords would require to be cut out anew, with a pair of headings; no men have been working in Harris's heading since the strike.

On 15th March I went with Inspector Rowan for the purpose of examining the workings where the Company had been extracting coal from under Crown Lands in the western district, measuring the thickness of the coal so taken out, seeing the new furnace, measuring the currents of air, and to see anything that Inspector Rowan deemed it necessary for me to see. I asked him and Mr. Ross about the small

small quantity of explosive gas he had reported to me in the Hill End district, and they said that on account of the pit being at work I should not be able to detect any with a safety-lamp, and from what I have since seen in the Nos. 1 and 2 headings I have no reason to doubt it. We found 30,000 cubic feet of air per minute circulating through the western district workings, and 24,000 through the Hill End, or a total of 54,000 cubic feet of air per minute passing up the furnace shaft, the furnace not being full on at the time.

Since the strike, and at the time of the explosion, the air was distributed to the men, boys, and horses in the following manner:—At about 100 yards from No. 2 tunnel mouth the intake air is split, one portion of it goes into the mine by the main heading incline plane, and the other by the slackey heading (*vide A on plan*), which latter is connected with the former by a cross-cut lettered B at about 600 yards from the tunnel entrance. From this cross-cut the air travels up the incline plane heading in one current for a distance of about 760 yards, where it is again split, a portion of it passing through a regulating door into the western district, and the remainder along the incline plane and main heading, and through the Hill End headings and bords in the Hill End district.

At the time of Inspector Rowan's visits, previous to and since the strike, the requirements of the Coal-mines Regulation Act, so far as a sufficiency of ventilation is concerned, have been complied with.

When and where gas was first met with in the gassy or Hill End district.

Carburetted hydrogen gas (fire-damp) was first seen in the Hill End district about two years ago, when crossing a "dyke" in the main heading incline plane, at about 1,800 yards (*vide D on plan*) from the No. 2 tunnel mouth, and 220 yards from the far end of the Hill End district and the Nos. 1 and 2 headings. Since then gas has been reported to me in small quantities by Inspector Rowan.

Lights used in the Mine at the time of the explosion.

Naked lights were used in the whole of the workings with the exception of a few places past the dyke in the Hill End district, viz., 1, 2, 3, 4, 5, and 6 headings, where, according to Ross (manager), White (overman), and Inspector Rowan, small quantities of fire-damp had been found, and the men worked with Davy-lamps, all of which should have been, but appear not to have been, locked. Mr. Rowan, in his report of 2nd September, when the old furnace was at work, says he carefully examined every bord with a safety-lamp, and that in none of them did the fire explode in the lamp.

Disregard of General and Special Rules by the Management.

From the evidence of Deputy Crawford and others it appears that, previous to the strike, when Crawford was deputy, the provisions of sub-section 7, section 12, of the Coal-mines Regulation Act, referring to locked safety-lamps, and special rule 4, with respect to no person entering his working place until it had been examined, appear to have been strictly carried out by the management, and the men worked with Davy-lamps in the bords of Nos. 1 and 2 headings, as well as in the headings, which places were examined every morning by Crawford, and reported by him to the men to be safe before they commenced work. Danger signals were also placed at a proper distance from the working places where gas was found to exist.

Since the strike, and after Millwood was appointed deputy, great laxity of the regulations appear evidently to have prevailed, and from the evidence given at the Inquiry there is no doubt that the provisions of sub-section 7, section 12, of the Coal-mines Regulation Act, and special rules 3 and 4, have not been complied with by the management, inasmuch as there was no back overman for the night-shift, and the persons employed in the mine were allowed to go into their working places without an examination of them having been made by the overman or deputy previous to commencing their daily work.

Section 15 of the Coal-mines Regulation Act, which requires a printed copy of the general and special rules to be supplied to every person before he is employed in the mine, has also not been complied with by the management, and a bord and a heading had been driven 43 yards and 40 yards respectively, before the current of air, without a cut-through having been put through, or the places bratticed up within 3 yards of the face, as required by sub-section 4, section 12, of the Coal-mines Regulation Act. This took place after the date of Inspector Rowan's last report.

Disregard of General and Special Rules by persons employed in the Mine.

From the evidence of miners who were employed in the Nos. 1 and 2 headings it is very evident that there was great recklessness displayed by many persons working in the Hill End district, that they disregarded some of the special rules, &c., and committed breaches of:—

Special rule 15, in not reporting the discharges of gas they say they found, and immediately leaving their working-places when finding it, and reporting it to the overman.

Special rule 16, in taking Davy-lamps into the mine without their having been locked by the overman or deputy.

Special rule 17, in not informing the overman or other officer in charge of the danger anticipated by them.

And of general rule 4 of the Coal-mines Regulation Act, for driving a bord and a heading more than 35 yards before the current of air.

Mr. J. B. Nicholson, the Miners' Secretary, did not report to the Miners or others the danger anticipated by him.

J. B. Nicholson, in his evidence, said that he had a conversation with Westwood, a miner, ten days before the explosion, when Westwood told him he had struck a heavy blower in No. 2 heading, and that he could hear it humming 100 yards from the face.

That

That he asked Westwood if the men in the bords were working with naked lights, having heard they were, and upon his saying that they were, he replied, "God help you; one of these days you will get it." And that he inferred from what Westwood said that the lives of many in the pit were in danger, but did not report it to the manager or Government officials, and took no steps to make the matter known.

Appearance of the explosion at Tunnel mouth, and in the Mine.

According to Alexander Lang, screenman, &c., who was near the mouth of No. 2 heading at 2:30 p.m., the appearance of the explosion at the tunnel mouth was a blast of air accompanied by coal-dust, and a sound as if several skips had broken away, and immediately after the first blast came a second and third, accompanied by smoke. He also saw a boy named Cope staggering out of the tunnel, with his hands to his head, crying out for his mother. About a quarter of an hour afterwards a horse, which the lad was driving, from the bottom of the Hill End incline plane to the mouth of the tunnel, came out of the mine with his mane, ears, and the hair under his tail singed.

I arrived at the mine about 10 a.m. on the 24th of March, and after putting in an appearance at the inquiry then being held by Mr. Smith, the Coroner, I went to the Colliery office, and after seeing the working plan, and ascertaining how the air was being conducted to the Hill End and Western districts by the exploring parties, I went into the mine with Inspector Rowan, Mr. Ross (Bulli Colliery Company's manager), and Mr. Neilson (Newcastle Wallsend Colliery manager), and proceeded to the new furnace to see if there were any signs of gas having fired at the furnace, measured the return air coming from the Hill End, Western, and Grip districts, and then went to the entrance of the Western and into the Hill End district. In the No. 1 Hill End heading we found Mr. McCabe, manager of Mount Kiera Colliery, with a gang of men clearing out the foul air, and saw sixteen dead bodies of miners who had fallen down when running out of their bords, a distance of 20 to 30 yards. We then returned to the surface, it being impossible at that time to go any further until the ventilation was restored in the far end of the Hill End district.

On Saturday, the 26th of March, I made an examination of the mine with Inspectors Dixon, Rowan, and Bates, Mr. Ross, Mr. McCabe, Mr. Neilson, Mr. Ross, junior, and Mr. Gardiner, my object being to view the mine under the guidance of, and with the information provided by the colliery managers who had been engaged in directing the operations of the exploring parties, and, if possible, to arrive at the probable cause of this sad disaster and locate the seat thereof.

After measuring the intake and return air-ways, we proceeded to the No. 1 and 2 Hill End headings, where we saw two stoppings partly blown out, examined with safety-lamps the face of all the bords on the right-hand side of the No. 1 heading, and in the latter place we found a coil of fuse within 7 yards of the face, a plug of compressed powder, and a Davy-lamp. From the face of the No. 1 heading we also found 8 yards in length and about 1 foot in depth of explosive gas, and from the face of No. 2, 12 yards in length and about 18 inches in depth of explosive gas. The current of air travelling through the stenton, which is 20 yards from the face of the headings, was about 4,680 cubic feet per minute, and when Mr. Rowan inspected it on February 17th last, there was 12,000 cubic feet of air per minute passing up the No. 1 heading, through the stenton, and down the No. 2 heading; and if there had been the same current of air on the 26th of March there would not have been as much explosive gas to be seen, which was only a small quantity, diluted with fresh air, and could not, in my opinion, unless aided by "coal-dust," have caused such destruction in the Hill End headings, bords, and main headings, &c. From there we examined with a Davy-lamp the face of all the bords on the left-hand side of No. 2 heading, and with it saw no trace of explosive gas.

In the bords of No. 2 heading the props for a depth of 18 inches to 2 feet from the roof were charred and burnt, and coked coal-dust was on some of the props and in skips, of a set of skips, which had been much knocked about in the first bord of No. 2 heading. From here we went to the far end of the Hill End and Western districts.

My attention having been drawn to the blocking up of the Hill End main incline plane, between the "cross-cut" lettered B and mouth of the tunnel, which place we did not examine or go into on the 26th of March, I made an inspection of it on the morning of April 15th, and from that examination I am of opinion that there were two explosions, and that the first occurred at E on plan, about 374 yards from the No. 2 tunnel mouth, where there are heavy falls in the heading for a distance of 165 yards, and great wreckage of timber, pulley wheels. The bark on the props exhibits signs of a fierce blast in a north-western direction, towards Hill End, and on the opposite side of E there has been a similar wreckage in a contrary direction, viz., towards the tunnel mouth and in a south-easterly direction.

And I further believe that the second explosion occurred in the Nos. 2 and 1 headings of the Hill End district and was the result of the former. This, however, the Royal Commission, now appointed to inquire into the causes of the explosion, &c., may be enabled to throw further light upon. Powder unburnt
in No. 1.

Recommendations as to future mode of working, &c.

Keeping in view the present great calamity, I recommend that the former mode of working with naked lights in the Hill End district be discontinued, and that the headings be bratticed up to within 3 yards of the face, and that a more judicious system of ventilation be adopted by having double doors instead of one, doing away with the doors where possible, and constructing overcasts in their stead.

And in conclusion would add that I consider it was most injudicious to work with naked lights in the bords of Nos. 1 and 2 headings, especially in those of No. 2, when it was found necessary to use safety-lamps at the face of the headings, and that a system of locking should have been adopted similar to that in operation in all well-regulated collieries.

I have, &c.,
JOHN MACKENZIE, F.G.S.,
Examiner of Coal Fields.

APPENDIX No. 9.

The Under Secretary for Mines to The Secretary Bulli Inquiry Commission.

Analyses of coal-dust collected by members of the Commission.

Department of Mines, Geological Survey Branch,

2 July, 1887.

Sir,

I have the honor to inform you that the samples of coal, taken from the Bulli mine, submitted by you, have been analysed, with the following result:—

No.	Description.	Moisture.	Volatile Hydrocarbon.	Fixed Carbon.	Ash.	Sulphur.	Specific Gravity.	Coke. %
1	From wheel bend of main tunnel, about chains from entrance.	2·15	19·02	48·92	29·39	0·52	1·52	78·31
2	From top of a fallen prop chains from entrance.	2·40	16·30	50·43	30·24	0·63	.....	80·67
3	From main road 40 yds. from No. 1 heading.	2·25	16·45	51·27	29·50	0·53	.....	80·77
4	From No. 1 heading from shelf on coal near No. 4 bord.	1·40	19·00	55·37	23·70	0·53	.....	79·07
5	From No. 2 bord, No. 2 heading.	1·46	19·14	51·94	26·91	0·55	.....	78·85
6	From half-way down No. 2 heading.	1·40	20·25	50·90	25·81	0·64	1·480	77·71
7	From recess in coal near face of tunnel, Hill End.	1·98	16·87	57·32	23·25	0·58	.....	80·57

REMARKS.—All these samples were received in fine powder, and contained much dirt; in one or two of the samples pieces of wood were visible. This will account for the high percentage of ash obtained. The colour of the ashes was from white to gray. Where the specific gravity of the sample is not given there was not a sufficient quantity of the sample left after analyses for that purpose. The samples were rather small for analysis.

I have, &c.,

GERARD E. HERRING,

(For Under Secretary).

APPENDIX No. 10.

Copies of General and Special Rules in force at the Bulli Colliery.

RULES FOR THE BULLI COLLIERY.

Department of Lands, Sydney, 20 February, 1866.

THE undermentioned Rules, to be observed in the Bulli Colliery, having been approved by His Excellency the Governor, with the advice of the Executive Council, are now published in conformity with the provisions of the Coal-fields Regulation Act of 1862.

J. BOWIE WILSON.

General rules to be observed in every Colliery in the Colony of New South Wales under the Coal-fields Regulation Act of 1862, being 26 Victoria No. 17.

1. Within one year and six months after commencing the workings of any bord, stalls, or longwall workings in any colliery, there shall be made and completed at least two separate and distinct openings to the day or surface of the colliery, intercommunicating with each other by means of either of which openings all persons employed in the colliery may at all times whatsoever pass in or out, provided that, if in any colliery, such bords, stalls, or longwall workings shall have been commenced before the passing of the Act; and without a second such opening as aforesaid, the same shall be completed at or before the termination of the year 1863; and the owner of every colliery, wherein such two openings shall not be completed as aforesaid, shall be liable to a penalty not exceeding one hundred pounds (£100) for every month during which the same shall remain incomplete.

2. Ventilation shall be constantly produced of adequate amount to dilute and render harmless all noxious gases, and to such an extent that all working places of the pits, levels, and workings of the colliery, and the travelling roads to and from such working places shall be so ventilated, except in the cases of such colliery being abandoned, as herein before referred to.

3. All entrances to any place not in actual working and extension, and suspected to contain or be liable to engender dangerous gas of any kind, shall be properly walled or fenced off so as to prevent access thereto.

4. Whenever any safety-lamp is required to be used, it shall be first examined and securely locked by some person duly authorized for that purpose, who shall keep the key thereof.

5. Every shaft or pit, which is not in use or used only as an air-pit, shall be securely fenced.

6. Every working or pumping pit or shaft shall be properly fenced when operations shall have ceased or been suspended.

7. Every working or pumping pit or shaft, where the natural strata are not safe, shall be securely cased or lined or otherwise made secure.

8. Every pit or shaft shall be provided with some proper means of communicating distinct and definite signals from the bottom of the shaft to the surface, and from the surface of the shaft to the bottom.

9. All underground self-acting and engine planes on which persons travel shall be provided with some proper means of signalling between the stopping place and the end of the planes, and with sufficient places of refuge at the sides of such planes at intervals of not more than 20 yards.

10. A sufficient cover over head shall be used when lowering or raising persons in every working, pit, or shaft.

11. No single-linked chain shall be used for lowering or raising persons in any working, pit, or shaft, and no material shall be lowered or raised in the cage with any person.

12. Flanges or horns, of sufficient length or diameter, shall be attached to the drum of every machine used for lowering or raising persons.

13. A proper indicator, to show the position of the load in the pit or shaft, and also an adequate break shall be attached to every machine worked by steam or water power, used for lowering or raising persons.

14. Every steam-boiler shall be provided with a proper steam-gauge, water-gauge, and safety valve.

15. The fly-wheel of every engine shall be securely fenced.

16. Sufficient boreholes shall be kept in advance, and on both sides, to prevent inundations in every working approaching a place likely to contain a dangerous accumulation of water.

17. Every examiner and inspector taking any copy or transcript of any plan of a colliery, as aforesaid, and of the workings thereof, accompanied or not by any observations and documents explanatory thereof, or applicable thereto, shall, from time to time hand over the same to the keeper of mining records, by whom they shall be kept as of record; provided that no such keeper of mining records shall furnish any copy or tracing of any such plan, or permit the same to be open to public inspection.

Department of Mines, Sydney, 27th June, 1877.

SPECIAL RULES FOR THE BULLI COLLIERY.

THE undermentioned Special Rules to be observed at the Bulli Colliery, in the District of Wollongong, are now published in conformity with the provisions of the Coal Mines Regulation Act, 1876, 39 Victoria No. 31.

GEO. A. LLOYD.

Special Rules for the conduct and guidance of persons acting in the management of the Bulli Colliery, in the District of Wollongong, and all persons engaged in or about the same.

1. One or more copies of these rules shall be fixed up in the principal office at the colliery, and all persons accepting employment in such colliery shall be engaged subject to the regulations contained in them. A printed copy of the rules shall be supplied to every person before he is engaged in or about such colliery.

Manager.

2. The Colliery Manager shall have full command over all other officers and persons employed in the colliery who shall receive their orders from him, and apply to him, or to such other person as may be appointed to act on his behalf, for instructions as often as may be necessary, and he shall, either by his deputy or some other person appointed for that purpose, take care that the following duties are duly performed.

Overman.

3. The responsible charge of the mine shall be with the overman and back overman, in their respective shifts, who are to see that the Rules in the different departments are closely and rigidly carried out, and suspend anyone infringing any rule. The back overman shall see all men and boys out of the mine safely, and all lights extinguished, and he and the deputies shall give a daily report of the proceedings to the overman, who shall report to the manager the result of each day's labour.

4. No workman or boy shall enter any working place until it has been examined by the overman or other person duly appointed, whose duty it is to make such examination before work is commenced, to ascertain that the place is properly ventilated and provided with sufficient props and timber, and until such examination shall be made and leave given, no workman or boy shall go beyond the flat or other station appointed by the overman. If, on examination, any working place is found insecure from a defect in ventilation or from insufficiency of props or timber, work shall not be commenced there until the insecurity is remedied. And if, in the course of being worked, any place prove insecure from any of the causes above mentioned, the overman or other person appointed shall, if he think necessary, stop the working there and remove the workmen. Immediately upon doing so, he shall cause a danger signal or "danger cross" to be erected across the entrance of the place, beyond which no person shall go on any pretext whatever, unless duly authorized so to do. No workman or boy shall, unless duly authorized to, go into any part of the mine excepting that to which he is appointed by the overman or other officers.

Waggonways and Tramways.

5. All waggonways and tramways shall be kept in a proper working state by the persons in charge of them, to whom it is a special instruction to secure them properly. No person except the driver or persons in charge of the setts, or those whom the manager may permit, shall ride in or out of the setts

Timbers and props.

6. The overman shall see that a sufficient quantity of timber and props are sent into the pit and into the several flats when needed. Any workman finding an insufficiency of props, and his place unsafe for the want of them, he shall stop work at once, leave the place, and report it to the overman, in order that props may be supplied. The workman must then first secure his place before again commencing work. Every working place shall be sufficiently timbered by the hewer in such place.

Waste.

7. The waste shall be examined from time to time by the master wasteman and other wastemen, who shall report its condition to the manager. The intake and return currents shall be carefully examined every morning by the overman or master wasteman, and if any deficiency of ventilation be experienced he shall ascertain the cause of such deficiency and take proper steps to have it remedied. He shall keep the air-courses in a proper state and of sufficient area; and if any part of the waste be foul, he shall inform the viewer of the same. The overman and other officials shall travel the air-courses with the master or other wastemen occasionally, in order to make themselves acquainted with the same.

Ventilation.

8. The overman shall examine the main air-courses every morning and every evening, and report any defect they may notice to the master wasteman, who shall remove any obstruction in the air-courses as soon as possible.

Machinery.

9. The pit ropes and chains, with the several bolts, shackles, springs, and cages, shall be examined by the banksman twice a day as they pass slowly for the purpose from the engine. If found faulty in any respect, he shall immediately report the same to the engineer; and if any defect be found in either rope or the apparatus connected therewith the banksman and onsetter shall reduce the number of men using that rope, or restrict them to the use of the better rope until the requisite repair or removal shall be made. The engine and machinery shall be examined by the engineer once a day. The brakesman, banksman, and onsetters shall make themselves thoroughly acquainted with the signals, and should any signal not be thoroughly understood the engine must remain at rest or be stopped until a properly understood signal shall be given. The brakesman shall not on any account leave the handles while the engine is in motion; and no other person shall be taught the duty of brakesman, or allowed to touch the handles of the engine without authority of the manager. The fireman shall be under the control of the brakesman, who shall not allow an apprentice to be left in charge of the engine nor to move it, except in his presence, until such apprentice shall have obtained a certificate of competency from the engineer. If any part of the engine or machinery be at any time found unsafe, the brakesman shall immediately give notice thereof to the engineer, with a view to the same being at once repaired. The brakesman shall exercise the greatest care while lowering or raising men out of the pit. The machinery upon the colliery, with its appendages above ground and below, is under the special charge of the engineer, who shall examine once a day the pits, ropes, guides, cages, and chains, and all other apparatus belonging thereto, the renewing and repairs of which at all times are under his direction.

Shafts.

Shafts.

10. No person shall be allowed to descend the pit without permission from the manager. It is the duty of the brakeman to see that this rule is attended to, and that no workman or other person goes down in a state of intoxication. No ale, spirits, or other intoxicating drinks shall be taken down or consumed in the pit without permission of the manager, who is only to give such permission in cases of necessity. The number of persons allowed to descend or ascend at one time will be prescribed by the manager. When men are to ride, the onsetter, or other person appointed, shall alone give the signal. No person shall ride on a full tub, or on the cage top. While men or boys are riding, a banksman shall remain next the signal-rope, lest an accident should happen. The onsetter shall work the signal himself, and not allow any other person to do so. The back overman, banksman, and onsetter shall remain in attendance where their respective duties require them after work in the pit has ceased, and until all the men and boys are out of the pit.

Stoppings.

11. It is the duty of the master wastemen to examine and keep in repair all the stoppings and air-crossings in the waste, and it is the duty of the overman to examine and keep in repair all the stoppings and air-crossings in the workings. The master wasteman is to examine all regulating stoppings, and to see that the same are kept locked, and no one else shall interfere with them.

Brattice.

12. Whenever brattice is necessary, it must be set up and kept in proper repair by the persons duly appointed, and they must examine the same daily.

Doors.

13. The main and other ventilating doors shall be examined daily by the overman; no door shall be propped open or fastened back whilst on its hinges; doors, giving access to waste, and separating the fresh from the return air-current, shall be kept securely locked by the master wasteman. The persons appointed to set doors necessary for the ventilation of the mine shall keep the same in proper repair, and see that all doors are so hung as not to stand open of themselves.

Furnace.

14. The ventilating furnace shall be kept clean by each furnace man in his shift, and supplied by him with a sufficient quantity of coal. The furnace man shall change at the furnace, so that some person be always in attendance, and no slackening of the fire be occasioned by absence. The master wasteman shall be responsible for the clearing out of the furnace drift when requisite, and he shall travel occasionally the air-ward at each side of the furnace. The furnace man shall frequently observe the velocity of the air-current, and should the indicator not show the requisite number of revolutions, he shall immediately fire the furnace so as to gain an increased amount of heat.

Fire-damp.

15. Should fire-damp be found in any place in the pit where naked lights are used, a danger signal must be set up across the entrance to such place, beyond which no person must go (except those authorized to examine and remove the evil) until the place is restored to its proper working order, and permission given. Should any unexpected discharge of gas occur, the overman must order all naked lights to be extinguished, withdraw the men and boys, and make the manager acquainted with the case, in order that the evil may be remedied, and the places restored to their proper working order. Hewers and others, when using naked lights, are strictly cautioned against the discharge of gas, where faults, rolls, and backs are met with, and on its appearance, they shall immediately leave the place and report to the overman, and shall on no account return to the place without proper authority.

Safety-lamps.

16. Should it be necessary to use safety-lamps in any portion of the pit, stations will be fixed upon, and proper notice-boards erected, beyond which no person, under any pretence whatever, shall take any naked lights, pipes, or matches. From these stations no person is allowed to take a safety-lamp to use in the pillar-workings, broken or waste, without it having been first examined and securely locked by the overman or other person appointed. None but the overman or other person authorized shall carry a safety-lamp key. Should any accident happen to the lamp by which the gauze is injured, or the oil spilt on the gauze, or the lamp is in any way rendered unsafe, the person using such lamp shall immediately pull the wick down carefully, and take the lamp out to the nearest station. Any person using a safety-lamp must clean the same every day after work-hours; but should it require repairs, it must be taken to the proper authority. No safety-lamp shall be used within 2 feet of the swing of the pick or other implement.

General Instructions.

17. Any person observing any door standing open, or any stoppings injured, or any other thing whereby the ventilation of the mine or its safety in other respects may be affected, shall immediately inform the overman or other officer in charge of the pit, so that there may be as little delay as possible in applying a remedy. No person acting in a place of trust shall depute anyone to do his work without the sanction of the manager. It is particularly enjoined upon the overman, engineer, and all other officers, to acquaint themselves with the foregoing rules and regulations, and to enforce and observe the same throughout the various departments. Workmen and boys are also required to inform themselves of the rules. Each workman shall be furnished with a printed copy of them, which shall be taken care of and produced when asked for; the loss thereof will be considered a delinquency. Officers and heads of departments who fail in the due and right observance of the rules, or in enforcing the same for the safety of the mine and the workmen, render themselves liable to degradation from their respective ranks. Workmen and boys who neglect the rules, or refuse obedience to the officers, shall be sent out of the mine, with a view to the investigation of the case and the punishment of the offender.

18. Every person who pulls down, injures, or defaces any notice hung up or affixed as required by this Act, shall for every such offence be liable to a penalty not exceeding forty shillings (£2).

A. ROSS,
Colliery Manager.

N.B.—By the 34th clause of the 39th Victoria, No. 31, it is enacted:—Every person who shall be guilty of any offence against this Act, or who shall wilfully violate or neglect to observe any provision of this Act, or any general or special rule established hereby or hereunder for the violation or neglect of which no penalty is hereby expressly imposed, shall for every such offence be liable to a penalty not exceeding ten pounds (£10), recoverable summarily before two or more Justices of the Peace. By the 33rd clause of the same Act it is enacted: Every person who pulls down, injures, or defaces any notice hung up or affixed as required by this Act, shall for every such offence be liable to a penalty not exceeding forty shillings (£2).

B.C.M. Co.'s Offices, Exchange, Sydney,
1st August, 1877.

GEO. HAMILTON,
Manager.

APPENDIX No. 11.

Copy of Engagement Rules.

BULLI COLLIERY.

RULES of employment, and rates for hewing coal, and yardage, &c., at the Bulli Colliery.

Engagement.

1. All persons accepting engagement in or about Bulli Colliery, shall do so subject to the following rules, rates, and conditions, and also to the general and special rules approved by the Executive Council, which a copy shall be supplied to each employee on attaching his signature hereto, and shall be bound hereby and thereby.

Time of labour.

2. Except in cases of sickness, or some cause which the colliery manager can accept as sufficient, miners, or other employees shall, if required, work regularly eleven (11) full days, of not over nine working hours each (unless specially and mutually arranged) in every fortnight or pay. Any employee absenting himself from work, without giving a sufficient reason, will be liable to dismissal without notice, and to prosecution for breach of agreement under the Masters and Servants Act.

Absence

Absence from regular duties.

3. Any miner or other employee found in any part of the mine or colliery other than that in which he should be working without the consent of the colliery manager, shall be liable to dismissal without notice.

Notice from and to employees.

4. Every miner or other employee shall give to the colliery manager fourteen (14) days' notice before leaving the Company's employment, or absenting himself from work for more than two (2) days (not necessarily consecutive) during any fortnight, unless leave has been granted; and on the other hand, except as otherwise provided, for infringement of rules, every employee shall receive fourteen (14) days' notice before his employment can be terminated by the colliery manager. Any employee leaving without giving due notice, shall forfeit any wages then standing in his name.

Control.

5. The colliery manager shall have full command over all employees in or about this colliery. They shall apply to, and take their orders and instructions from, him or such other person as may be appointed to act on his behalf.

Interference by employees.

6. Any employee interfering in any way with the orders issued by the colliery manager or his overman for regulating the work of the mine shall be liable to dismissal without notice.

Right to enter mine.

7. No person other than those immediately connected with the mine shall be allowed on any pretext whatever to enter same, unless by written consent of the colliery manager.

Pay day.

8. The pay day shall be on a Saturday in each fortnight as heretofore.

Hewing rates, yardage, &c.

9. The rates for hewing coal, compensation for yard-work, turning off bords, and small coal which cannot be thrown back shall be as follows:—

	"Bulli" seam.	s. d.
Hewing (screened) coal	2	4 per ton.
Extra where Davy-lamps are used	0	3 "
Driving headings 6 feet wide	3	8 per yard.
Turning off bords, from 2 yards to 8 yards	8	0 per bord.
Small coal	0	9 per skip.
	"4-feet" seam.	s. d.
Hewing (screened) coal	2	10 per ton.
Driving headings 6 feet wide	3	3 per yard.
Driving headings 9 feet wide	2	6 "
Driving headings 12 feet wide	1	6 "
Small coal	0	8 per skip.

Day or other wages.

10. Rates of day or other wages not specified in foregoing shall be as per arrangement made at time of engagement and set forth on this sheet, and initialled by colliery manager.

Wheeling and prop-cutting.

11. The hewer or hewers in each bord shall wheel his or their full or empty skips any distance not exceeding 50 yards from the working face free of any expense to the Bulli Company. The hewer or hewers shall set the necessary props, lay the rail after the turn is laid, and keep his place secure from the spot where he commences such place after balloting to the face of coal, and before leaving that place at following ballot.

Partners at work.

12. Unless otherwise arranged, each working place shall be occupied by two hewers, who will be considered to work as partners during the term of cavel. The signature of either partner, shall be a full and sufficient discharge for wages due by the Company to both parties. Any miner who for good and sufficient reason suspects the integrity of his partner, will so far as is possible be protected by the colliery manager, on the latter receiving in good time a written order to retain his half of the pay due to both.

The turn.

13. The colliery manager and overman alone shall have control of the turn, and any other person or persons interfering with the turn shall be liable for breach of agreement.

House or land rent.

14. The colliery manager shall deduct from the pay of each employee the rent of any house or land belonging to the Bulli Company, and occupied by such employee.

Doctor's fees.

15. The colliery manager shall have the right to deduct from each pay, employees' levies for their doctor or benefit societies, and his responsibility shall cease upon handing over the sum so deducted to the doctor, or to the secretary or treasurer of such benefit society as the case may be.

Fire coal.

16. The colliery manager shall have power to deduct from an employee's pay the amount due by such employee for fire coal supplied.

Breach of rules.

17. A copy of the foregoing rules, and also the general and special rules referred to therein, shall be fixed up in the office at this colliery, and any and every employee subscribing hereto shall be liable for each breach by action at law.
Bulli, N.S.W., 13th September, 1886. By order of the Board,

.....
Colliery Manager.

Bulli.....188 .

I, the undersigned, hereby agree to accept employment from the Bulli Coal-mining Company upon and subject to the rates, conditions, and rules above referred to.

Addenda to Rule 9.

N.B.—The above hewing rates, &c., have been fixed on an average selling price of 11s. 10d. per ton, and such shall be declared average price for January and July, 1887. Not later than 15th January and July in each succeeding year, the Associated Collieries shall determine what has been the average selling price for the previous half-year, which shall be declared, and the hewing and yardage rates shall be thereby fixed for the then current half-year.

An additional 1d. per ton on the hewing rates, and an additional 1d. per yard on the yardage will be paid to the miners, for every 4d. per ton advance in the price of coal above 11s. 10d., and 1d. per ton and 1d. per yard reduction shall be made in every 4d., the average price is reduced below 11s. 10d.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

BULLI COLLIERY CATASTROPHE.

(CORRESPONDENCE RESPECTING.)

Ordered by the Legislative Assembly to be printed, 6 April, 1887.

The Principal Under Secretary to The Police Magistrate, Wollongong.

Sir,

Colonial Secretary's Office, Sydney, 28 March, 1887.

I am directed by the Colonial Secretary to request that you will be good enough to carefully collect and report to the Government, information under the following heads in respect to the late deplorable occurrence at Bulli:—

1. The number of men whose lives were lost in the colliery.
2. The number of women who have been left widows, giving the name and the number of children in each case.
3. The cases where women are near confinement, or are otherwise in weak health.
4. Particulars as to the interment of the bodies of the unfortunate men, and whether the graves are sufficiently secure to prevent exposure, or danger to the living.
5. The names of persons who have meritoriously exerted themselves in the exploration of the mine in searching for the dead, or otherwise in connection with the disaster.
6. Any other particulars which you may deem important.

I have, &c.,

CRITCHETT WALKER,
Principal Under Secretary.

The Police Magistrate, Wollongong, to The Principal Under Secretary.

Sir,

Court-house, Wollongong, 1 April, 1887.

I have the honor to acknowledge the receipt of your letter of the 28th ultimo, and in compliance therewith to forward a list of the men whose lives were lost by the late deplorable occurrence in the Bulli colliery.

I also furnish a list of the women who have been left widows, with the number of children in each case.

A list showing the names of the women who are near confinement, or are otherwise in weak health, is also enclosed.

The names of those persons who meritoriously exerted themselves in searching for the dead or otherwise in connection with the disaster are furnished in a separate list. This list is very large, and there may be some names yet to be added to it.

Nine bodies were interred in the Presbyterian Church-yard, at Woonoona. The graves in these cases, I am assured, are the regulation depth, and there is no danger to public health.

In the Roman Catholic burial-ground, at Cox Hill, eight bodies are buried, and in these cases the graves, I am also assured, are the regulation depth, and there is no danger to the health of the living.

All the other bodies are interred in the Church of England burial-ground at Bulli. In three or four cases the coffins were placed on the top of others, and in those cases the coffins are within 2 feet 6 inches or 3 feet of the surface. I have inspected all the graves and cannot discern anything offensive; but in those three or four cases to which I have alluded it would, I think, be desirable to build brick work round the graves to the height of 2 or 3 feet and to fill up with lime and earth to that height; I think this would be effective and allay any fears of danger to the living.

I have, &c.,

ALFRED A. TURNER, P.M.

[Enclosures.]

List of men whose lives were lost in the Bulli Colliery disaster.

Names.	Remarks.
James Adamson	
William Adamson	
John Barcroft	
Edwin Bean... ..	Boy, 14. Left father and mother.
John Bentley	Left widow and four children.
William Birch	Left widow and two children.
William Ottaway Bourne	Left widow and two children.
Felix Bourne	21... ..
William Bourne	16 or 18
James Bourne	14 or 15
Greener Brodie	Widow and six children.
William Brodie	Widow and four children.
Robert Browning	Widow and one child.
Samuel Carr	
Cecil Cavill	16.
John Crane	Widow and three children.
Joseph Crompton	Widow and two children.
James Curvis	
Thomas Davis	Widow ; no family.
Joseph Davis	
Henry Dean	Widow ; no family.
John (or Michael) Doyle	
Henry Ehman	Widow and five children.
John Galloway	16. Father and mother living.
Thomas Gibbons	About 15. Leaves a widowed mother, of whom he was the part support.
Louis Gorresen	
George Graham	
Thomas Harris	Grown-up family ; no widow.
Thomas Harris	18.
Frank Harris	16.
John Hay	
William Hickman	Widow and four children.
James Hicks	Widow and two children.
Luke Jackson	Widow and four children.
Thomas Jones	Widow and grown-up family.
Charles Jowett	Widow and one child.
James King... ..	
John Lansdale	Widow and five children.
William Lucas	
John Mackey	16. } Left father and mother, but they were the bread-winners
Thomas Mackey	14. } for five children.
John M'Bride	
John M'Carthy	Widow and three children.
John M'Lelland	
Thomas Melville	Widow and five children.
Robert Milward	Widow and one son.
William Neill	
Robert Newton	Widow and seven children.
Abel Newton	Widow and one girl.
Henry Olsen	
John O'Neill	Widow and two children.
Isaiah Poppett	Widow and three children.
George Ralph	20. Father and mother living.
John Rees	
John Rigby... ..	Widow and three children.
George Robinson	16. Father living.
John Robinson	
John Ryan	16. Father and mother living.
William Schofer	Widow and two children.
John Smith	Widow and seven children.
George Smith	
Henry Sprowle	Supposed to have a widow and family at Parramatta.
George Stephens	Widow and one child.
John Sullivan	Widow and six children.
Henry Thomas	Widow ; no children.
William Thompson	
John Traise... ..	Widow ; eleven children and step-children.
William Verco	Mother (Mrs. A. Hockin), living at Wentworth Road, Burwood.
William Wade	Widow and three children.
Richard Wade	16. Son.

Names.	Remarks.
William Walker	Widow and five children.
George Walker (or Cole)	17. } Step-sons of W. Walker.
Henry Walker (or Cole)	18. }
Edward Watts	
Jeremiah Westwood	Widow and four children.
William Williams	Four children.
Lewis Williams	23. Father living at Newcastle.
Thomas Wilson	Widow and five children.
Thomas Wishart	Widow; no family.
William Woodland... ..	22. Mother living at Rookwood.
John Wynn... ..	15. Father living.

ALFRED A. TURNER, P.M.

Wollongong, 1 April, 1887.

NAMES of Widows and number of Children.

Names of Widows.	Children.	
	Number of.	Ages of.
Mrs. John Bentley	4	6 to 1½ years.
Mrs. William Birch	2	1 to 3 years.
Mrs. William Ottaway Bourne... ..	2	9 and 11 years. (<i>See note.*</i>)
Mrs. Greener Brodie	6	3 months to 12 years.
Mrs. William Brodie	7	4 to 20 years.
Mrs. Robert Browning	1	5 months.
Mrs. John Crane	3	3 to 9 years.
Mrs. Joseph Crompton	2	3 to 5 years.
Mrs. Thomas Davis	None.	
Mrs. Henry Dean	None.	
Mrs. Henry Ehman	5	Ages not known.
Mrs. William Hickman... ..	4	2 to 8 years.
Mrs. James Hicks	2	4 months and 7 years.
Mrs. Luke Jackson	4	6 months to 8 years.
Mrs. Thomas Jones ... ..	.....	Grown-up family.
Mrs. Charles Jowett	1	Age not known.
Mrs. John Lansdale	5	7 months to 8 years.
Mrs. John M'Carthy	3	Ages not known.
Mrs. Thomas Melville	5	2 to 12 years.
Mrs. Robert Milward	1	18 years (son.)
Mrs. Robert Newton	9	3 months to 21 years (eldest daughter married.)
Mrs. Abel Newton	2	17 and 21 years.
Mrs. John O'Neill	2	5 and 7 years.
Mrs. Isaiah Poppett	3	3 to 8 years.
Mrs. John Rigby	3	7 to 13 years.
Mrs. William Schofer	2	2 and 3 years.
Mrs. John Smith	7	2 to 18 years.
Mrs. Henry Sprowle ... ..	.....	Supposed to have a family, and to be residing at Parramatta.
Mrs. George Stephens	1	2 years.
Mrs. John Sullivan	6	2 to 13 years.
Mrs. Henry Thomas	None.	
Mrs. John Traise	11	3 to 16 years (children and step-children.)
Mrs. William Wade (lost husband and son.)	3	12 to 21 years (eldest daughter, 21, in bad health.)
Mrs. William Walker	5	3 to 13 years.
Mrs. Thomas Wilson	5	5 months to 11 years.
Mrs. Thomas Wishart	None.	
Mrs. Jeremiah Westwood	4	3 to 13 years.

William Williams did not leave a widow, but five children, 2 to 18 years.

Mrs. Gibbons, who is a widow, has lost a son (Thomas Gibbons), has three children, 8 to 20 years.

Albert Cavill, aged 68, very feeble, and his wife, aged 62, have lost a grandson (Cecil Cavill, aged 16), who was their support.

* Mrs. William Ottaway Bourne left her husband about eight years ago, and has returned since the disaster; some caution will be necessary in dealing with her case.

ALFRED A. TURNER, P.M.

Wollongong, 1st April, 1887.

CASES where women are near confinement, or are otherwise in weak health.

Mrs. John Bentley	...	...	Near her confinement.
Mrs. William Birch	...	...	Do do
Mrs. John Crane	...	...	Do do
Mrs. Joseph Crompton	...	...	Do do
Mrs. William Hickman	...	...	Do do
Mrs. John Lansdale	...	...	Very sad case; crippled in hands and feet with rheumatism, has five children, 7 months to 8 years, and is unable to attend to them herself.
Mrs. William Schofer	...	...	Near her confinement.
Mrs. John Smith	...	...	Do do
Mrs. John Traise	...	...	Do do (very large family.)
Mrs. William Walker	...	...	Do do
Mrs. Jeremiah Westwood	...	...	In delicate state of health.

ALFRED A. TURNER, P.M.

Wollongong, 1st April, 1887.

NAMES of those who acted as relief parties after the Explosion at Bulli Mine, on Wednesday the 23rd of March, 1887.

No.	Name.	No.	Name.	No.	Name.
1	John Chalmers*†	52	Jno. M'Donald	103	Hy. Pearce
2	Alexander Lang††	53	George Buttle	104	Jno. Caldwell
3	William Scott†	54	Peter Johnson	105	Thos. Swales
4	Charles Hope†	55	Edward Bradley	106	Ralph Davidson
5	John M'Kenna§	56	John Ryan	107	Wm. Tooth
6	John Richards§	57	David Green	108	Chas. Graham
7	Thos. Ball§	58	Robt. Bradley	109	Thos. Hall
8	George Smith§	59	David Reece	110	Jno. Thompson
9	Joseph Allen§	60	Jas. Wilson	111	Jno. Baker
10	David Ralton§	61	Hy. Jones	112	W. Reid
11	Thos. Bissell§	62	Jno. Hennessy	113	Dougal M'Kinnon
12	John Woods§	63	Thos. Gillies	114	Jno. Griffiths
13	Edward Charlesworth§	64	W. Hennessy	115	Alfred Haynes
14	Allen Black§	65	John Gibson	116	Jas. Moore
15	Edward Spinks§	66	Andrew Mackieson	117	Jos. Hilton
16	James Robinson§	67	T. Proudlock	118	Sharman Graham
17	W. H. Wynn§	68	T. M'Kinnon	119	Richd. Buchanan
18	William Dew§	69	T. Casley	120	Wm. Buchanan
19	Jas. Charlton§	70	Jno. Coulton	121	George Buchanan
20	Thos. Woods	71	B. Coulton	122	Chas. Barton
21	Chas. Hegharty	72	Thos. Hegharty	123	Jno. Barton
22	John Hobbs	73	Peter Smith	124	J. Lawson
23	Noah Hobbs	74	Stephen Adey	125	Thos. Greener
24	Robert Smith	75	Thos. Dizne	126	Thos. Jones
25	Frederick Robbins	76	Thos. Seagraves	127	J. Love
26	Jas. Peck	77	Archibald M'Laughlin	128	Benjamin Partridge
27	Jno. Miller	78	D. Hopkins	129	David Tibbetts
28	George Doel	79	H. Howie	130	David Ritchie
29	Thos. Greenalgh	80	W. Howie	131	George Cobb
30	George Davidson	81	— Weatherspoon	132	J. Wall
31	Thos. Bowes	82	Jas. Carter	133	George Sawyer
32	Saml. Hughes	83	John Halloran	134	Benjamin Ray
33	Albert Smithers	84	Isaiah Nixon	135	J. Martin
34	Thos. Farrell	85	Jos. Pearse	136	P. Cunningham
35	Hy. Vigel	86	Peter Rodriguas	137	Jas. Allen
36	William Ryan	87	Hy. Alderson	138	— Clark
37	Abel Jones	88	George Richardson	139	Wm. Parton
38	David Jones	89	Jos. Sparks	140	M. M'Nulty
39	Wm. Guard	90	Jno. Lay	141	Jos. Poppitt
40	James Metcalfe	91	W. S. Halford	142	P. Smith
41	George Gunn	92	J. S. Reid	143	J. Lane
42	Robert Rees	93	Robert Roys	144	J. Meolyn
43	George Hodges	94	Wm. Brien	145	M. Johnson
44	John Harris	95	Robt. Gilmore	146	Frank Williams
45	Thos. Urwin	96	George Cole	147	J. Street
46	S. M. Reid	97	William Smith	148	J. Curry
47	Chas. Ogden	98	Jno. Charlesworth	149	G. Wilson
48	P. T. Murphy	99	Walter Settle	150	F. Castle
49	J. Murphy	100	Jno. Dean	151	C. Yates
50	W. Harvey	101	Jno. Sparkes	152	J. Hayes
51	A. Parsons	102	Rd. Gane	153	M. Peace

* Engineer on the ground; first leading spirit after the explosion.

† Weighman and Screen Overseer.

‡ Miners at Bulli.

§ Miners

and others on the ground; and preceded those whose names come after them.

No.	Name.	No.	Name.	No.	Name.
154	G. Dean	181	R. Hayles	208	W. Birch
155	J. Dryden	182	W. Johnson	209	T. Birch
156	Jno. Wynn	183	E. Patterson	210	P. Biddulph
157	Wm. Wynn	184	D. Johns	211	Jno. Davis
158	T. Fishlow	185	F. Deflon	212	Walter Woollett
159	T. Tresedda	186	R. Reen	213	R. Woollett
160	George Stephens	187	Jos. Davis	214	Jno. Pritchard
161	W. Tresedda	188	George Simcox	215	J. Todd
162	F. Ashman	189	E. Round	216	Jas. Bywater
163	J. Edgar	190	J. Poggi	217	P. Griffin
164	J. Openshaw	191	M. Ryan	218	D. Craig
165	G. Habberley	192	J. Buckley	219	R. Kenny
166	A. Cole	193	J. Mackay	220	C. Williamson
167	S. Johns	194	J. C. M'Kay	221	J. Williamson
168	T. Pratt	195	T. Morris	222	J. Domage
169	W. Pratt	196	E. Morris	223	J. Haig
170	W. Hill	197	A. Allen	224	C. Hargraves
171	R. Wales	198	W. Allen	225	E. Kerison
172	G. Wales	199	W. Perry	226	Jas. Robinson
173	H. Bill	200	J. Walker	227	A. Galloway
174	T. Watt	201	R. Hamilton	228	W. Galloway
175	David Young	202	T. J. Pallaster	229	J. Browning
176	George Stewart	203	J. Salisbury	230	W. Downie
177	Hy. Brooks	204	J. Crawford, sen.	231	F. Arnold
178	F. Murray	205	J. Crawford, jun.	232	A. Morgan
179	T. Hopkins	206	Alex. M'Cauley	233	F. Robinson
180	Jas. Donnan	207	S. Hartland	234	Dennis Poppitt

MANAGERS of other Collieries who rendered great assistance.

- Mr. Henry Osborne MacCabe, of Mount Keira.
 „ John Evans, of Mount Kembla Mine.
 „ J. C. Jones, of North Bulli Mine.
 „ Williams, of Clifton Colliery.
 „ W. B. Green, late Manager of Mount Kembla.

ALFRED A. TURNER, P.M.

Wollongong, 1st April, 1887.

The Police Magistrate, Wollongong, to The Principal Under Secretary.

Sir,

Court-house, Wollongong, 2 April, 1887.

Referring to my letter of yesterday's date, relative to the Bulli Colliery disaster, and to the list of persons who acted as relief parties. I have the honor to inform you that that list was supplied from what I considered the most reliable sources. It is somewhat invidious, where so many rendered such ready and valuable assistance, to single out individual cases, but I think it would be an omission if I did not say that the gentlemen whose names come last in that list, viz.—Messrs. H. O. MacCabe, Evans, Jones, Williams, and Green—rendered assistance of especial value.

I have, &c.,

ALFRED A. TURNER, P.M.

Telegram from The Colonial Secretary to The Police Magistrate, Wollongong.

In the cases of the eleven women in list to your Report who will require medical aid and other assistance you will take care in every case, where help is necessary, to see that all proper steps are taken for their comfort and safety.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

BULLI COLLIERY COMMISSION.

(INFORMATION RESPECTING.)

Ordered by the Legislative Assembly to be printed, 15 June, 1887.

RETURN (*in part*) to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 2nd June, 1887, That there be laid upon the Table of this House,—

“Copies of all letters, papers, and correspondence between the Minister for Mines, the Colonial Secretary, and the Members of the present Bulli Commission.”

(Mr. Melville.)

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No. 1.

The Under Secretary for Mines to Dr. J. R. M. Robertson.

Sir, Department of Mines, Sydney, 21 April, 1887.

I have the honor, by direction of the Secretary for Mines, to inform you that the Government has under consideration the appointment of a Commission to inquire into the late disaster at the Bulli Colliery, and Mr. Abigail desires me to inquire whether you would be willing to serve upon the Commission if appointed, and act as President

I have, &c.,
HARRIE WOOD,
Under Secretary.

No. 2.

The Under Secretary for Mines to G. O'M. Clarke, Esq., S.M.

Sir, Department of Mines, Sydney, 21 April, 1887.

I have the honor, by direction of the Secretary for Mines, to inform you that the Government has under consideration the appointment of a Commission to inquire into the late disaster at the Bulli Colliery, and Mr. Abigail desires me to inquire whether you would be willing to serve upon the Commission if appointed.

I have, &c.,
HARRIE WOOD,
Under Secretary.

No. 3.

The Under Secretary for Mines to J. Y. Neilson, Esq.

Sir, Department of Mines, Sydney, 21 April, 1887.

I have the honor, by direction of the Secretary for Mines, to inform you that the Government has under consideration the appointment of a Commission to inquire into the late disaster at the Bulli Colliery, and Mr. Abigail desires me to inquire whether you would be willing to serve upon the Commission if appointed.

I have, &c.,
HARRIE WOOD,
Under Secretary.

No. 4.

The Under Secretary for Mines to T. Croudace, Esq.

Sir, Department of Mines, Sydney, 21 April, 1887.

I have the honor, by direction of the Secretary for Mines, to inform you that the Government has under consideration the appointment of a Commission to inquire into the late disaster at the Bulli Colliery, and Mr. Abigail desires me to inquire whether you would be willing to serve upon the Commission if appointed.

I have, &c.,
HARRIE WOOD,
Under Secretary.

No. 5.

J. Y. Neilson, Esq., to The Under Secretary for Mines.

Sir, Wallsend, 22 April, 1887.

Your favour of yesterday, asking me to act as a member of the Commission to inquire into the Bulli disaster, to hand.

I have no objection if I can get the permission of my directors, which I have no doubt will be granted.

I have, &c.,
J. Y. NEILSON.

Submitted.—H.W., 23/4/87. Seen.—F.A., 25/4/87.

3

No. 6.

T. Croudace, Esq., to The Secretary for Mines.

Sir,

Sydney, 22 April, 1887.

I received a telegram this morning from my son, stating he had received a letter asking if I would act on a Royal Commission to inquire into the cause of the recent accident at Bulli, &c.

I have pleasure in stating that I shall be glad to act in such capacity, and will honestly and fearlessly endeavour to reach the truth in such matter.

I have, &c.,

THOMAS CROUDACE.

P.S.—As I return to Lambton this evening please address any further communication there.—T.C.

No. 7.

T. Croudace, Esq., to The Colonial Secretary.

Sir,

Sydney, 22 April, 1887.

You mentioned the name of Mr. Neilson this afternoon as being one of the Royal Commission to inquire into the late Bulli catastrophe.

I would respectfully remind you that Mr. Neilson should be an important witness in this matter, he having been engaged at the very time of the accident making an examination and report upon the mine.

I have, &c.,

THOMAS CROUDACE.

Ask Mr. Neilson if the facts are as stated, and, if so, if he will permit the offer of a seat on the Commission to be withdrawn?—H.W., 26/4/87.

No. 8.

G. O'M. Clarke, Esq., S.M., to The Under Secretary for Mines.

Sir,

Central Police Office, 23 April, 1887.

In reply to your letter of the 21st instant, I have the honor to state that if appointed I shall be willing to serve on the proposed Commission to inquire into the late disaster at the Bulli Colliery.

I have, &c.,

G. O'M. CLARKE, S.M.

No. 9.

Dr. J. R. M. Robertson to The Under Secretary for Mines.

Sir,

97, Pitt-street, Sydney, 25 April, 1887.

I have the honor to acknowledge receipt of your favour of 21st, requesting me to state whether I would be willing to serve upon the Commission that the Government propose to appoint to inquire into the late disaster at Bulli, and to act as President.

I am deeply conscious of the responsibility of the position, and the honor proposed to be conferred upon me by Mr. Abigail, and will be willing to accede to the request of the Minister for Mines, and will do my very utmost to carry out the instructions of the Cabinet.

I have, &c.,

JAMES R. M. ROBERTSON.

No. 10.

The Under Secretary for Mines to J. Y. Neilson, Esq.

Sir,

Department of Mines, Sydney, 26 April, 1887.

I have the honor to inform you that it has been stated that you were engaged at the very time that the Bulli accident happened in making an examination and report upon the mine, and would probably be an important witness, and I am to request that you will be so good as to inform me if the facts are as stated, and if so that you will permit the offer of a seat on the Royal Commission to be withdrawn.

I have, &c.,

HARRIE WOOD,

Under Secretary.

No. 11.

Telegram from J. Y. Neilson, Esq., to The Under Secretary for Mines.

Wallsend, 27 April, 1887.

My business at Bulli was apart from and had nothing whatever with Pit A, which exploded. The colliery I was reporting on is miles from it.

J. Y. NEILSON.

Your telegram is perfectly satisfactory, denying as it does positively the correctness of statements made concerning your connection with the Bulli Mine.—F.A., 27/4/87.

No. 12.

No. 12.

Telegram from The Under Secretary for Mines to J. Y. Neilson, Esq.

Department of Mines, Sydney, 27 April, 1887.
 THE Minister deems your telegram perfectly satisfactory, denying as it does positively the correctness of statements made concerning your connection with the Bulli Mine.

HARRIE WOOD,
 Under Secretary.

No. 13.

Telegram from Mr. T. Croudace to The Secretary for Mines.

Newcastle, 27 April, 1887.
 RUMOURED that Robertson will be Chairman of Commission; if so, I decline to sit. Quite willing if Clark is appointed.

THOMAS CROUDACE.

The Government urge a reconsideration of your decision *re* Bulli Commission. It would be a disappointment to the public whose confidence you possess in large measure if you did not sit on the inquiry.—F.A., 27/4/87.

No. 14.

Telegram from The Under Secretary for Mines to T. Croudace, Esq.

Department of Mines, Sydney, 27 April, 1887.
 THE Minister urges a reconsideration of your decision *re* Bulli Commission, as it would be a disappointment to the public whose confidence you possess in a large measure if you did not sit on the inquiry.

HARRIE WOOD,
 Under Secretary,

No. 15.

Telegram from T. Croudace, Esq., to The Colonial Secretary.

YOUR telegram received; am writing by to-night's post.

Lambton, 27 April, 1887.

THOMAS CROUDACE.

No. 16.

T. Croudace, Esq., to The Under Secretary for Mines.

Sir,

Lambton, 27 April, 1887.
 I am really anxious to assist the Government if I possibly can in the Bulli inquiry, but I feel it a very difficult matter to accept the position of Dr. Robertson being Chairman. I am quite willing and ready to act with Mr. Clarke as Chairman, and I believe the latter appointment will give general satisfaction.

Before giving you my final answer will you kindly let me know what powers and privileges (if any) are attached to the position of Chairman, as over any ordinary member of the Commission.

I have, &c.,

THOMAS CROUDACE.

Acknowledge receipt and inform that Dr. Robertson's position was fixed, and the Commission had to be appointed without delay. The Minister deeply regrets that Mr. Croudace could not see his way to accept a seat on the Commission.—H.W., 28/4/87.

No. 17.

The Under Secretary for Mines to T. Croudace, Esq.

Sir,

Department of Mines, Sydney, 29 April, 1887.
 I have the honor, by direction of the Secretary for Mines, to acknowledge the receipt of your letter of the 27th instant, in respect to the matter of your forming one of the members of the Royal Commission on the Bulli disaster, and I am to inform you that the Commission had to be appointed without delay, and that Dr. Robertson's position was fixed. Mr. Abigail, nevertheless, deeply regrets that you could not see your way to accept a seat on the Commission.

I have, &c.,

HARRIE WOOD,
 Under Secretary.

No. 18.

Telegram from Dr. J. R. M. Robertson to The Under Secretary for Mines.

Waratah, 29 April, 1887.
 For reasons I will explain on Monday, if possible, include Croudace on Commission; all his objections have been removed.

J. R. M. ROBERTSON.

No. 19.

No. 19.

T. Croudace, Esq., to The Under Secretary for Mines.

Sir,

Lambton, 30 April, 1887.

I have to acknowledge receipt of yours of yesterday.

Please tell Mr. Abigail I would have been but too glad to have in any way I could aided the Government, but for certain reasons I felt a strong prejudice against Dr. Robertson. I, however, for the first time since the issue of the Ferndale Report, saw Mr. R. yesterday, and we had a lengthy discussion upon various matters, when he removed from my mind certain ill impressions. He expressed himself as most anxious that I should sit on the Commission. I told him it was too late now, as it was formed, but I said I was willing, should any change take place, to act.

I would ask you specially to thank Mr. Abigail for his kindly consideration to myself in every way in this matter. From the first I understood that Mr. Clarke would be Chairman; it was probably my mistake.

I have been engaged the last four days at East Maitland, on behalf of the Government, in the case of Dibbs and Brown v. Commissioner of Railways.

Should there have been any neglect to telegrams or letters it will have arisen from this.

I have, &c.,

THOS. CROUDACE.

No. 20.

Minute by The Secretary for Mines.

TELEGRAPH to Mr. Croudace he is appointed to Bulli Commission, also to Joseph Hilton, miner, Bulli, and inform Mr. Woodward, M.P., Wollongong, of the latter appointment being made.

F. ABIGAIL.

No. 21.

Telegram from The Under Secretary for Mines to T. Croudace, Esq.

Department of Mines, Sydney, 5 May, 1887.

THE Minister has appointed you to serve upon the Bulli Commission. Letter by post.

HARRIE WOOD,

Under Secretary.

No. 22.

The Under Secretary for Mines to T. Croudace, Esq.

Sir,

Department of Mines, Sydney, 5 May, 1887.

I have the honor to inform you that the Secretary for Mines has appointed you a member of the Royal Commission to inquire into the cause of the Bulli disaster.

I have, &c.,

HARRIE WOOD,

Under Secretary.

No. 23.

Telegram from The Under Secretary for Mines to J. Hilton.

Department of Mines, Sydney, 5 May, 1887.

THE Minister has appointed you to serve on the Bulli Commission.

HARRIE WOOD,

Under Secretary.

No. 24.

The Under Secretary for Mines to J. Hilton.

Sir,

Department of Mines, Sydney, 5 May, 1887.

I have the honor to inform you that the Secretary for Mines has appointed you a member of the Royal Commission on the Bulli disaster.

I have, &c.,

HARRIE WOOD,

Under Secretary.

No. 25.

The Under Secretary for Mines to Dr. J. R. M. Robertson.

Sir,

Department of Mines, Sydney, 5 May, 1887.

I have the honor to inform you that the Secretary for Mines has appointed Mr. Croudace, Lambton, and Mr. Joseph Hilton, miner, Bulli, members of the Royal Commission on the Bulli disaster.

I have, &c.,

HARRIE WOOD,

Under Secretary.

No. 26.

T. Croudace, Esq., to The Under Secretary for Mines.

Sir,

Lambton, 5 May, 1887.

Just returned home in time to reply to your telegram; will wait arrival of your letter by to-night's post and leave for Bulli by to-morrow night's steamer.

I have, &c.,

THOS. CROUDACE.

No. 27.

Dr. J. R. M. Robertson to The Secretary for Mines.

Sir,

109 Lankelly Terrace, Macleay-street, 5 May, 1887.

The members of the Commission met this forenoon, when a feeling prevailed in favor of holding the inquiry in Wollongong instead of Bulli, the reasons assigned being the general bitter feeling that exists in Bulli against the Company and the Commission.

Personally I ignore the wrath of an excited multitude and would prefer giving the Bulli people an opportunity of seeing for themselves how ignoble such ebullitions of impotent rage is, and how unjust and unseemly the position they have taken is. My colleagues are of a different way of thinking; but I have postponed a decision until to-morrow when we will inspect the mine. May I ask your views on this subject. A telegram addressed to me, on receipt to Bulli, would reach me in time to lay before the Commissioners before I finally fix.

I have called for plans, sections, daily or weekly report books, special rules or others from the Company.

In event of Mr. Croudace being appointed I have arranged for him to meet us at Bulli.

The whole of the Commissioners will reside at Wollongong—"Freemasons' Hotel."

I have, &c.,

JAMES R. M. ROBERTSON.

It rests with the Commission to sit where in its judgment the duties devolving upon it can be best discharged. Inform by telegram.—H.W., 6/5/87.

No. 28.

Telegram from The Under Secretary for Mines to Dr. J. R. M. Robertson.

Department of Mines, Sydney, 6 May, 1887.

It rests with the Commission to sit where, in its judgment, the duties devolving upon it can be best discharged.

HARRIE WOOD,

Under Secretary.

No. 29.

Dr. J. R. M. Robertson to The Minister for Mines.

Sir,

Wollongong, 7 May, 1887.

On reading the Commission, under the Great Seal, to some of my colleagues to-day, I noticed that the letters "F.R.S.," instead of "F.G.S.," have been affixed after my name, probably through some clerical error.

It is right for me to say that I was not consulted as to this, else I would have requested either that no reference to titles should be inserted, or, if this was deemed advisable, the letters "M.D.C.E., F.G.S., F.R.G.S.," be added. I mention this lest misconception should arise.

The Commissioners have spent two long days thoroughly examining the underground workings. The surveyor is busy with the surveys and plans, and I will issue summonses or circulars to seven or eight witnesses for Tuesday morning.

Mr. Croudace and Mr. Hilton go through the mine on Monday.

I have, &c.,

JAMES R. M. ROBERTSON.

The same titles were used in the Commission on the Ferndale Colliery.—H.W., 9/5/87.

Will the Principal Under Secretary please say how the error herein referred to occurred, and whether it can now be corrected? A question on the subject is on the business paper of the Legislative Assembly.—H.W., B.C., 9/5/87.

A fresh instrument will be prepared with the affix of "F.G.S." to Dr. Robertson's name, instead of "F.R.S.," which was an error.—C.H.M., 10/5/87.

No. 30.

Dr. J. R. M. Robertson to The Under Secretary for Mines.

Bulli Inquiry Commission.

Sir,

Town Hall, Wollongong, 9 May, 1887.

I have the honor to acknowledge receipt of your letter of the 6th (see No. 28).

On arrival in Wollongong this letter was transmitted to Bulli, where I was engaged inspecting the mine, but unfortunately it crossed me, and was only received this morning.

On Saturday, on reading over the Commission to some of my colleagues, I observed that by some error, of which I can give you no information, the letters "F.R.S." were affixed to my name. Thinking that a clerical error had been committed, I advised the Honorable the Minister for Mines direct. No one communicated with me as to my professional titles, or asked me whether it was my desire that any should be affixed before issuing the Commission. Had my feeling been consulted I would have replied in the negative.

As

As it is, the letters "F.R.S." have, I presume, inadvertently been inserted instead of "F.G.S."

If the information is necessary, I may be permitted to state that I am a duly qualified Mining and Civil Engineer, and as such I am in extensive practice. I am likewise a Fellow and a Life Member of the Geological and Royal Geographical Society and several of the leading Mining Institutes.

I can offer you no explanation of the letters "F.R.S." being affixed to my name; this must be sought for elsewhere. I pay little attention to these, and that is my only reason for not sooner anticipating your inquiry.

I have, &c.,
JAMES R. M. ROBERTSON.

No. 31.

The Under Secretary for Mines to Dr. J. R. M. Robertson.

Sir,

Department of Mines, Sydney, 10 May, 1887.

I have the honor, by direction of the Secretary for Mines, to inform you that the matter concerning the place at which the Commission should hold its sittings has been brought before the Cabinet, and after very careful consideration it has been decided that the Government should not interfere, lest such interference be taken to relieve the Commission of some portion of its responsibility.

I have, &c.,
HARRIE WOOD,
Under Secretary.

No. 32.

Answer to Question.

LEGISLATIVE ASSEMBLY—THURSDAY, 10 MAY, 1887.

Question :—

Mr. WALKER to ask the SECRETARY FOR MINES,—

(1.) Is the person lately acting as President of the Royal Commission on Collieries, and recently gazetted as President of the Commission about to inquire into the cause of the Bulli catastrophe, &c., entitled to the affix of F.R.S.?

(2.) Is the said Mr. Robertson entitled to the affix of C.E.?

Answer :—

(1.) No; it appears the letters F.R.S. were affixed in error in place of F.G.S.

(2.) It is understood that he is qualified, and is practising as a Civil Engineer.

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

MINERAL CONDITIONAL PURCHASES,
PARISH OF METZ.

(APPLICATIONS FOR.)

Ordered by the Legislative Assembly to be printed, 7 July, 1887.

RETURN to an *Order* made by the Honorable the Legislative Assembly of New South Wales, dated 2 June, 1887, That there be laid upon the Table of this House,—

“Copies of all papers in connection with the applications for mineral conditional purchases of portions 109, 110, and 113, parish of Metz, county of Sandon; also copies of all papers in respect to applications to mine for gold on the above-mentioned portions.”

(*Mr. Copeland.*)

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MINERAL CONDITIONAL PURCHASES PARISH OF METZ.

No. 1.

Application by J. Moore.

• C.

[Alienation Act, section 19.]

Application for the conditional purchase, without competition, of unimproved Crown Land.

District of Armidale.

No. 266 of 1881.

Application by John Moore for the conditional purchase, without competition, of 80 acres, unimproved Crown Land.

Received by me, with a deposit of £40, this 29th day of September, 1881, at 10 o'clock,—

J. BRAY,

Agent for the Sale of Crown Lands at Armidale.

Sir,

29 September, 1881.

I am desirous of purchasing, without competition, under the Crown Lands Alienation Act of 1861, the portion of unimproved Crown Lands hereunder described, containing 80 acres; and I herewith tender the sum of £40, being a deposit at the rate of 10s. per acre on the area for which I apply.

I am, &c.,

JOHN MOORE,

Armidale.

The Agent for the Sale of Crown Lands at Armidale.

Description.

County of Sandon, parish of Cooney, 80 acres, extending along the eastern boundary of mineral conditional purchase of 80 acres, made by James Powrie and James Glass, on the 3rd March, 1881, and adjoining said portion from south-east corner to north-east corner, and extending towards the river or creek.

Mr. L. S. Martyn,—For measurement in accordance with regulations, due regard being had to the river or creek mentioned in the application in view of circular 80/18 of 21st April, 1880.—J.H. (for Sur.-Gen.), B.C., 27th Oct., 1881. Replied to by my letter to the Surveyor-General, dated 11th March, No. 82-13.—JOHN G. MARTYN.

No. 2.

Application by J. Moore.

C.

[Alienation Act, Section 19.]

Application for the conditional purchase, without competition, of unimproved Crown Land.

District of Armidale.

No. 274, of 1881.

Application by John Moore for the conditional purchase, without competition, of 40 acres, unimproved Crown Land.

Received by me, with a deposit of £20, this 13th day of October, 1881, at ten minutes past 10 o'clock,—

J. BRAY,

Agent for the Sale of Crown Lands at Armidale.

Sir,

Armidale, 13 October, 1881.

I am desirous of purchasing, without competition, under the Crown Lands Alienation Act of 1861, the portion of unimproved Crown Land hereunder described, containing 40 acres; and I herewith tender the sum of £20, being a deposit at the rate of 10s. per acre on the area for which I apply.

I am, &c.,

JOHN MOORE,

Armidale.

To the Agent for the Sale of Crown Lands at Armidale.

Description.

County of Sandon, parish of Cooney, 40 acres, extending along the eastern boundary of mineral conditional purchase, No. 59, of 100 acres, and adjoining the said portion from south-east corner to north-east corner, and running towards the creek or river.

Lapsed 30th June, 1882, *vide* Register, 27/5/87.

[Enclosure 1 to No. 2.]

Mineral conditional purchase 81-274, Armidale.

Description.

Forty acres, county of Sandon, parish of Cooney, portion 113: Commencing on the right bank of Baker's Creek, at the eastern end of the northern boundary line of portion 110 of 80 acres, and bounded thence on the north-east and east by that creek upwards to a point in a direct line, about 14 chains; on the north by a line bearing west 29 chains 18 links to the south-eastern boundary of portion 59 of 100 acres, parish of Metz; on the north-west by part of that boundary south-westerly to the north-western corner of portion 109 of 80 acres; and on the south by the northern boundary of that portion and the northern boundary of portion 110 aforesaid,—in all bearing east 41 chains 15 links to the point of commencement.

Examined.—R.U., 8 May, 1885.

No. 3.

No. 3.

Mr. Licensed-Surveyor J. G. Martyn to The Surveyor-General.

Sir,

Armidale, 11 March, 1882.

I have the honor to transmit herewith the plan of one portion of land, containing forty acres, numbered 113, in the parish of Cooney, county of Sandon, applied for by John Moore under the 19th section of the Crown Lands Alienation Act of 1861, and surveyed in accordance with instructions dated the 17th November, No. 81-65. Improvements, nil. See Appendix A

This portion is situated in a deep gulf, the sides of which are excessively precipitous. Some idea of the precipitous nature of this land may be formed from the fact that the south-west corner of the portion is 1,400 feet higher than the south-east corner. The southern boundary, as far as practicable, has been marked, but the greater part of it is inaccessible.

I have, &c.,

J. G. MARTYN,

Licensed Surveyor.

C.P., No. 81,274. Forwarded 17th March, 1882. Two tracings received, one of which forwarded to the Land Agent.—J. S. CHARD, District Surveyor. Exd. and charted on Co. map.—G. H. DOUBLEDAY, 8 Oct., 1884. According to C.S. 84-5,754 Sur., the within M.C.P. 81-274, Armidale, with other M.C.Ps., specified therein, was on 12th July, 1884, demised by way of mortgage (for seven years) from Charles Henry Hodson (the presumed present transferee from applicant), in consideration of loan of the sum of £1,300 to Alfred Van Rompaey. Surveyor-General.—It is submitted whether survey may be accepted with Cliff as boundary (unmarked), or whether the portion should be bounded by marked right lines along edge of cliff.—D. H. CHISHOLM, 27 Aug., 1884. *Vide* my minute of this date on C.S. 82-1,807 Survey, accepted under above decision.—D.H.C.

This M.C.P. is not measured with an average depth of 60 acres to Baker Creek, as a deep gorge has been adopted as the back boundary. The M.C.P., as measured, is submitted for acceptance under 13th clause of C.L. Amend. Act of 1875.—ROBT. D. FITZGERALD (for Sur.-General), 27th November, 1884. Chief Commissioner Conditional Sales.

Appd.—J.S.F., 24th December, 1884. Dealt with in the Charting Branch. Tracing herewith for Inspector. Mr. Underwood for description.—ARTHUR J. BURNELL, 30th Jan., 1885. C.S. Branch. Description prepared, 8th May, 1885.—R.U. Cat. No. noted. Records, 21/5/85.

No. 4.

Mr. Licensed-Surveyor J. G. Martyn to The Surveyor-General.

Sir,

Armidale, 11 March, 1882.

I have the honor to transmit herewith the plan of one portion of land containing 80 acres, numbered 110, in the parish of Cooney, county of Sandon, applied for by John Moore, under the 19th section of the Crown Lands Alienation Act of 1861, and surveyed in accordance with instructions dated the 27th October, No. 81-57. Improvements nil.

This portion consists of excessively steep and barren spurs; the north-west corner is inaccessible and the northern boundary impracticable.

For explanation as to form of survey *vide* my letter dated 11th March, No. 82-20.

I have, &c.,

JOHN G. MARTYN,

Licensed-Surveyor.

No. 81-266 C.P. and plan herewith. Forwarded, 17th March, 1882, two tracings received, one of which forwarded to the Land Agent.—J. S. CHARD, District Surveyor. Survey approved (*vide* decision on copy 82-1,957, min. herewith).—D. H. C., 27th Aug., 1884. Exd. and chartered on Co. map.—G. H. DOUBLEDAY, 8th Oct., 1884.

According to C.S., 84-5,754 Cor. M.C.P. 81-266, Armidale, with other M.C.Ps. specified thereon was on 12th July, 1884, demised by way of mortgage (for seven years) from Charles Henry Hodson (the presumed present transferee from the applicant), in consideration of loan of the sum of £1,300 to Alfred van Rompaey.

M.C.P. 81-266 (Armidale), is not measured with a depth of 60 acres to Baker's Creek, but the Surveyor reports that the possession of this creek as a boundary cannot be considered an advantage, as it is quite inaccessible to stock on account of the precipitous nature of the falls. In view of the above it is submitted whether M.C.P. as measured may be accepted under 13th clause of Crown Lands Amend. Act of 1875.—ROBT. D. FITZGERALD (for Sur.-General), 27th November, 1884. Chief Commissioner Conditional Sales.—D.H.C., 23rd Oct., 1884. Tracing herewith for Inspector.—ARTHUR J. BURNELL, See Appendix B. 29th Jan., 1885. Cat. No. noted. Records, 11/2/85.

No. 5.

Mr. Licensed-Surveyor Martyn to The Surveyor-General.

Sir,

Armidale, 11th March, 1882.

With respect to the forms of measurement in the survey of portions 109, 110, and 111, in the parish of Metz, county of Sandon, viz., not being measured with frontage to "Baker's Creek," I have the honor to report that although portions 109 and 111 are situated within 60 chains of the creek, and portion 110 is bounded by it, still the possession of this creek as a boundary cannot be considered an advantage, as it is quite inaccessible to stock on account of the exceeding precipitous nature of the falls.

Until antimony was discovered in this neighbourhood the falls were looked upon as being utterly useless country, and consequently the edge of the tableland has been made the body of agricultural and pastoral lands, although many of these measurements are situated within the 60 chains limit. The falls are quite

quite devoid of pasturage, and are only available for mining purposes, and should the regulations regarding frontage portions be enforced it would seriously interfere with what is fast becoming an important industry of the district.

I would have submitted the cases for your consideration before survey, but owing to possibly conflict of leases it was very necessary that they should be measured with as little delay as possible, and as I trusted that an explanation would be sufficient, I therefore measured these lands as applied for, and I would respectfully request that my surveys may be accepted.

I have, &c.,
J. G. MARTYN.

A deviation from the usual practice of survey has been allowed under special conditions somewhat similar. (See C.S. 81-33,184, with Mr. Martyn's letter 82-16.) Mr. Martyn asked my advice on this point before survey. Taking into consideration the object of frontages, viz., to prevent a monopoly of the water I advised measurement as applied for and effected for the following reasons:—The edge of the falls has been adopted as the boundary between the available and unavailable land for grazing and agriculture, the sudden and precipitous falls into what may be considered a gulf or chasm nearly 2,000 feet deep, prevents any possibility of obtaining water from the creek and benefit derived therefrom. In a similar manner, were minerals found on Sydney cliffs, a portion would be unreasonably measured fronting the ocean and extending over the cliffs and back 60 chains. This gulf, though not so perpendicular, is seven times the depth, and walking access is only obtainable down it in parts, and then by climbing down it in a zig-zag manner. The regulations provide, in the case of land taken up for occupation, grazing, &c., that precipitous cliffs may form a boundary irrespective of the depth from the creek, thus dividing available from unavailable land. In this case the unavailable land has been found to contain minerals, and in view of the above and carrying out the spirit of the other regulations, I suggested measurement in the most suitable form, according to the special circumstances. (See paragraph 68 of Sur. Instructions.) These have been carried out by Mr. Martyn, and I would recommend acceptance of his surveys.—J. S. CHARD, D.S., 17 March, 1882.

It is submitted whether in view of the report by Licensed-Surveyor Martyn and report of the District Surveyor covering same (of which these are copies) the surveys of portions 109, 110, and 111, parish of Metz, county Sandon, may not, under the special circumstances herein mentioned, be accepted, notwithstanding that the form of measurement is apparently not strictly in accordance with the regulations.—ARTHUR J. BURNELL, 11th August, 1884. The Surveyor-General.

I may point out that the object of frontage is not a subject for consideration, inasmuch as in respect of land measured for alienation it is a point which is decided by the law. A cliff, which may be a natural boundary, may be adopted for a portion; it is advisable to exercise discrimination in such a matter, and it is requisite that such boundary be marked. Under the circumstances, and on the recommendation of the District Surveyor, the surveys of portions 109 and 110 may be accepted. I observe that portion 111 is partly within a gold-field; let inquiry be made whether the mineral selection is valid. I am inclined to the opinion that, viewing its position relatively to the water course, this area should be measured with frontage for further consideration as to portion 111.—E. TWYNAM (for Surveyor General). 21 Aug., 1884.

No. 6.

Declaration of Conditional Purchaser.

(C.P. 81-266.)

(F.)

[Alienation Act, 1861.]

Declaration of conditional purchaser for mining purposes.

I, JOHN MOORE, of Armidale, do solemnly and sincerely declare that I am the lawful owner, by conditional purchase, of the land hereunder described, and that an expenditure equal to £1 4s. per acre for the area of the land has been made on mining operations other than gold-mining on the land, and since the selection on 29th September, 1881. And I make this solemn declaration, conscientiously believing the same to be true, and by virtue of the provisions of an Act made and passed in the ninth year of the reign of Her present Majesty, intituled "An Act for the more effectual abolition of oaths and affirmations taken and made in various departments of the Government of New South Wales, and to substitute declarations in lieu thereof, and for the suppression of voluntary and extra-judicial oaths and affidavits."

Description.

County of Sandon, parish of Metz, 80 acres, on Hilgrove Run, being (part of) conditional mining purchase No. 266 of 1881, in the district of Armidale.

Taken and declared at Armidale, this 24th }
day of December, 1884, before me,— }

JOHN MOORE.

LAMBART S. GORDON, Commissioner for Affidavits.

Instalment (£8) credited at Treasury, 30th December, 1884.—J.C., 15/1/85. Inspector Harper, 18/4/85.

No. 7.

Final Declaration of Conditional Purchaser.

(Final C.P. 81-266.)

(F.)

[Alienation Act, 1861.]

Declaration of conditional purchaser for mining purposes.

I, JOHN MOORE, of Armidale, do solemnly and sincerely declare that John Moore, Peter Speare, and John M'Bean are the lawful owners, by conditional purchase, of the land hereunder described, and that an expenditure equal to £2 per acre for the area of the land has been made on mining operations other than gold-mining on the land, and since the selection on 29th September, 1881. And I make this solemn declaration, conscientiously believing the same to be true, and by virtue of the provisions of an Act made and

and passed in the ninth year of the reign of Her present Majesty, intituled "An Act for the more effectual abolition of oaths and affirmations taken and made in various departments of the Government of New South Wales, and to substitute declarations in lieu thereof, and for the suppression of voluntary and extra-judicial oaths and affidavits."

Description.

County of Sandon, parish of Metz, 80 acres, being (part of) conditional mining purchase No. 266 of 1881, in the district of Armidale.

Taken and declared at Armidale, this 30th }
day of December, 1886, before me,— }

JOHN MOORE.

LAMBART S. GORDON, Commissioner for Affidavits.

Instalment (£8) credited, 31/12/84. (*Vide* 1st declaration.)
Register.—C.C., 14/1/87.

Examined and entered C.P.

No. 8.

Office Memorandum.

(C.P. 81-266.)

[Section 19 of the Alienation Act of 1861, 25 Vic. No. 1.]

District of Armidale; name of applicant, John Moore; area, 80 acres; date, 29th September, 1881.

DECLARATION upon the above described mineral conditional purchase requires verification. All available papers in connection with it were referred to the Chairman of the Local Land Board, Armidale, 10/3/85, with a view to the necessary instructions being issued to the Inspector of Conditional Purchases at an early date.

If the report when furnished by the Inspector shows that the improvements are not sufficient to satisfy the requirements of the law, or that they have not been effected *bona fide* for mining operations as contemplated by the 19th section of the Alienation Act of 1861, an investigation by the Local Land Board may be instituted, subject to the provisions of the 20th section of the Crown Lands Act of 1884. C.C., 29/1/87.

The above recommendation by the Minister for Lands (*vide* S7-3,158 D.)
The Chairman Local Land Board, Armidale.

F.H.W.

(For the Under Secretary),

21/2/87.

To come before the Board, June sittings. Mr. Moore and Mr. M'Kinley to receive notice.—
S. BLYTHE, Chairman, 28/5/87. Notice to attend Court on 24th June, 1887. Posted, 3/6/87.

No. 9.

Memo. from Mr. District Surveyor Elwin to The Under Secretary for Lands.

District Survey Office, Armidale.

WILL the Under Secretary kindly inform me whether any application for portion 113, parish of Metz (?), Cooney, county of Sandon still exists, it is believed to be a M.C.P. of John Moore.

T. ELWIN,

(For the District Surveyor),

5/4/87.

Lapsed Gaz., 30/6/85. Should be parish of Cooney. Can Charting Branch please give the No. of C.P.—C.C., 18/4/87. C.P., 81-274, Armidale. Mr. Oatley. Please let Mr. Ballhausen see the portfolio.—E.S. M.C.P., 81-274, 13th Oct. John Moore appears to be lapsed by Gazette notice of 30th June, 1885.—J.T.K., 31st May, 1887. C.S. Records. (See papers above).—C.C., 14/6/87.

No. 10.

Mr. J. Carroll to The Secretary for Lands.

Sir,

Wentworth House, Sydney, 28 April, 1887.

In accordance with the provisions of the 168th Article of the Regulations of the Crown Lands Act of 1884, I beg to apply for permission for Joseph Francis M'Kinley, Keiran M'Manus, and Thos. Taylor, to dig and search for gold on the portions of land particularized in the margin hereof.

I have, &c.,

JAMES CARROLL.

(Pro J. F. M'KINLEY, KEIRAN M'MANUS, and THOS. TAYLOR).

Forward to the Under Secretary for Mines, for consideration.—W.H.C., 18/5/87.
(for the Under Secretary), 18/5/87. Inform. Forward proper forms of Application.
herewith.—W.H.C., 23/5/87. Two forms to J. Carroll, 2/6/87.

F.H.W.
Forms

Armidale, M.C.P. 81-54, of 3rd March, 1881, J. Powrie and J. Glass, now Moore, Speare, and M'Bean, 80 acres, portion 109, parish of Metz, county of Sandon, and M.C.P. 81-266, of 80 acres, 29th September, 1881, Moore, Speare, and M'Bean, portion 110, parish of Metz, county of Sandon.

No. 11.

Statutory Declaration.

[Crown Lands Act of 1884—Part II, section 14, sub-section 5.]

Statutory Declaration by a person desirous of prosecuting a complaint before the Local Land Board.

New South Wales, }
to Wit. }

I, JOSEPH FRANCIS M'KINLAY, of Armidale, in the Colony of New South Wales, miner, do hereby solemnly declare and affirm that I am desirous of prosecuting a complaint before the Local Land Board, and that the notice on the other side hereof correctly sets out the grounds of such complaint; and I make this solemn declaration as to the matters aforesaid according to the law in this behalf made, and subject to the punishment by law provided for any wilfully false statement in any such declaration.

Made and signed by the declarant at Armidale, this } JOSEPH F. M'KINLAY.
10th day of May, 1887, before me,— }

LAMBART S. GORDON, Commissioner for Affidavits.

[Crown Lands Act of 1884—Part II, section 14, sub-section 5.]

Notice of prosecution of complaint before Local Land Board.

I HEREBY notify to you, as Land Agent at Armidale, that I am desirous of prosecuting a complaint before the Local Land Board, for that the provisions of the law have not been fulfilled as regards conditional purchase of 80 acres, selected at Armidale by John Moore on the 29th day of September, 1881, in the county of Sandon, parish of Metz. The supposed present holders being John Moore, Peter Speare, and John M'Bean.

The grounds of complaint are that no conditions have been fulfilled, inasmuch as the land has not been improved, and I herewith deposit the sum of £10 as security for any costs which may be awarded against me by such Board.

Given under my hand, at Armidale, this 10th day of May, 1887,—

JOSEPH F. M'KINLAY.

To the Land Agent at Armidale.

Received the sum of £10 above mentioned.

Date, 10th May, 1887.

LAMBART S. GORDON, Land Agent at Armidale.

No. 12.

Memo. by Mr. Crown Land Agent Gordon to The Chairman, Land Board, Armidale.

Land Board District, Armidale, 12 May, 1887.

THE enclosed notice of prosecution of complaint before Local Land Board now forwarded to the Chairman.

LAMBART S. GORDON,

Crown Land Agent.

Mr. Makin, get the papers in this case, and let the matter come on before Board, June sittings.—
S. BLYTHE, Chairman, 16/5/87. C.P. 81-266, 80 acres, 29th September, 1881, Armidale.

No. 13.

Office Memo.

Department of Lands, 31 May, 1887.

M.C.P. 81,266, 19th September, 1881, 80 acres, portion 110:—John Moore, transferred to John Moore, Peter Speare, and John M'Bean, 3rd May, 1886. Both declarations made and now under reference for verification, having been forwarded to the Chairman at Armidale on the 22nd February last.

M.C.P. 81-54, 3rd March, 1881, 80 acres, James Powrie and James Glass, portion 109; to James Powrie, James Glass, and John Moore, 10th September, 1881; to John Moore, 9 December, 1884; to John Moore, Peter Speare, and John M'Bean, 3rd May, 1886. Declaration 84-14,789 Dep. at end of three years, under reference to Armidale Board for verification having been forwarded on the 23rd May, 1885. 87-1,976 Cor. and 87-2,259 Cor. application to prospect by other parties now under reference to Under Secretary for Mines. W.H.C.

Paper 82-1,809 Sur. regarding M.C.P. 81-274 of 40 acres, portion 113 by John Moore are enclosed. It will be seen that the C.P. was declared lapsed on the 30th June, 1885. No further action has been taken apparently.—W.H.C., 31/5/87. The Under Secretary.

With regard to portion 58, it is covered by an application by John M'Carthy, dated the 29th July, 1880, transferred to James Powrie and James Glass, 26th January, 1881; transferred to James Powrie, James Glass, and John Moore, 10th September, 1881, transferred to John Moore, 9th December, 1884; transferred to John Moore, Peter Speare, and John M'Bean, 3rd May, 1886. The C.P. was transferred from one under the 13th to one under the 19th section, and the papers are now under reference to the Local Chairman for verification of the declaration.—W.H.C., 1/6/87.

Inform Mr. Copeland, M.P., to the effect of this memo. in reply to personal inquiries.—C.O., 1/6/87. To-day. H. Copeland, M.P., informed., 1/6/87.—H.L.T.

No. 14.

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No. 14.

The Under Secretary for Lands to H. Copeland, Esq., M.P.

Sir,

1 June, 1887.

In reply to your personal inquiries respecting the mineral conditional purchases quoted in the margin, I am to inform you that the papers relating to the three first mentioned purchases are under reference to the Local Land Board for verification of the declarations, and that the other purchase was declared lapsed on the 30th June, 1885, and still stands as lapsed according to the Registers in use in this office.

I am to add that an application to prospect the land by other persons is now under reference to the Under Secretary for Mines for consideration.

I have, &c.,

STEPHEN FREEMAN,

(For the Under Secretary.)

Armidale—M.C.P. 81-266; 80 acres; 19th Sept., 1881; John Moore to Moore, Speare, and M'Bean.

M.C.P. 81-54; 80 acres; 3rd Mar., 1881; Powrie and Glass, now Moore, Speare, and M'Bean.

M.C.P. 80-357; 100 acres, 29th July, 1880; John M'Carthy, now Moore, Speare, and M'Bean.

M.C.P. 81-274; 40 acres; 13th Oct., 1881; John Moore.

No. 15.

J. Moore and Party to The Secretary for Lands:

Sir,

Armidale, N.S.W., 1 June, 1887.

We have the honor to report that we are the holders of the following M.C.Ps. situate county Sandon, parish of Cooney or Metz, district of New England, viz.: No. 80-357, 100 acres, taken up 29th July, 1880; No. 81-54, 80 acres, taken up 24th February, 1881; No. 81-266, 80 acres, taken up 29th October, 1881; and we desire to call your attention to the fact that these blocks are all adjoining; that we have spent the large sum of £2,500 upon improvements upon the first two mentioned areas, we have, however, made declarations of having spent £2 per acre upon the whole three blocks, and we have now the honor to request that you will allow the three blocks to be consolidated for the purposes of the improvement under the 26th section of the Crown Lands Act of 1875.

We have, &c.,

JOHN MOORE & PARTY,

(pro JOHN MOORE.)

The papers are with the Board. So far as can be stated in their absence, there is no objection to the request being complied with. Mr. Moore may be so informed, and this letter referred to the Board.—C.O., 3/6/87. Approved.—T.G., 3/6/87. Inform at once, and refer to Chairman.—C.O., 3/6/87. Informed, 4/6/87. The Chairman Local Land Board, Armidale.—S.F., B.C., 4/6/87.

No. 16.

The Under Secretary for Lands to J. Moore and party.

Gentlemen,

4 June, 1887.

Referring to your letter of the 1st instant, requesting that the mineral conditional purchases noted in the margin may be consolidated, I have the honor to inform you, by direction of the Minister for Lands, that the papers relating to the purchase referred to are under reference to the Local Land Board at Armidale, but so far as can be stated in their absence, there is no objection to your request being complied with.

I am to add that the letters under reply have been referred to the Local Land Board Armidale.

I have, &c.,

STEPHEN FREEMAN,

(For the Under Secretary.)

M.C.P. 80-357,
" 81-54,
" 81-266,
Moore and party.

No. 17.

Report by Mr. Inspector Harper.

Respecting the mineral conditional purchase of J. Moore, made at Armidale on 29th September, 1881.

Sir,

Armidale, 9th June, 1887.

I have the honor to report that I visited and inspected the above-described conditional purchase on the 6th day of June, 1887, and that I found the selector then not resident upon this selection.

The land, which consists of precipitous gulf and steep spurs, inaccessible in places, and comprises 80 acres, is held by applicant for mining purposes, and the selector, who follows the avocation of merchant, had at the time of my visit made the improvements hereunder particularly described, the value of which I estimate at the sums respectively stated, viz.:—Pot holes, 12 feet x 3 feet average, and 5 feet deep, £6. No other improvements on the block made by selector.

From the appearance of the land and the circumstances stated in the following remarks, I am of opinion that the selector has been continuously resident upon the selection.

REMARKS.

A gold bearing reef has been recently discovered on this land which promises to be very rich.

The dividing line between this portion and No. 109 has never been marked, I presume because of the precipitous nature of the country. At the south-west corner, however, an apple-tree is marked 109 over 110. A line due north from this tree to a position on top of high spur about 10 chains. A line north would cut perpendicular cliffs, inaccessible deep gulf intervening.

I have, &c.,

WM. HARPER,

Inspector of Conditional Purchases.

The Chairman of the Local Land Board at Armidale.

No. 18.

No. 18.

Telegram from The Under Secretary for Lands to The Chairman Land Board,
Armidale.

17 June, 1887.

PLEASE return papers Departmental, 444 of 87, *re* M.C.Ps. by Moore, Speare, & M'Bean to you 22nd
February last.

STEPHEN FREEMAN,

(For Under Secretary Lands).

No. 19.

Caption to Deposition of Witness.

New South Wales, }
to Wit. }

[Crown Lands Act of 1884—Part II, section 14, sub-section 1.]

The examination of Joseph Francis M'Kinlay, of Armidale, in the Colony of New South Wales, publican,
William Weston, of Hillgrove, John Moore, of Armidale, and Mordaunt Alister Maclean, of
Armidale, in the said Colony, draftsman.WHEREAS it hath been alleged that the necessary expenditure required by law has not been made in
mining operations (other than gold-mining) on the mineral conditional purchase mentioned in the margin,
made at Armidale on the 29th September, 1881, 80 acres, county Sandon, parish Metz, and it hath been
found necessary to investigate the said matter on oath, the depositions of the several witnesses are
appended hereto.

[Enclosure to No. 19]

Examined by Mr. Kearney, solicitor: This witness being duly sworn, on oath, states: My name is *Joseph Francis M'Kinlay*; I am the person who lodged the complaint against the mineral conditional purchase, John Moore and others; I know the mineral conditional purchase portion 110, subject of inquiry; it adjoins mineral conditional purchase portion 109 on the eastern boundary; I have known this portion under inquiry about three months; I have been over the land; there is one place on it that there is a small hole about 5 or 6 feet deep x 2 feet wide; this comprised all the improvements on portion 110.*By Mr. Simpson, solicitor:* I know the boundaries of the lands as far as they are surveyed; I know the portion subject of inquiry, it adjoins portion 109; I know portion 58; they all adjoin each other; on portion 58 there is a good deal of improvements; as far as the tracing in my possession shows *me* there is little expenditure on 109; there is a good deal of mining expenditure on portion 109 in the tracing now shown me by you, and I will not say there is not £850 worth of improvements on this portion.Sworn at Armidale this 24th day of }
June, 1887, before us,— }SYDNEY BLYTHE, J.P., Chairman.
C. E. SMITH, P.M.

JOSEPH F. M'KINLAY.

This witness on oath states: My name is *William Weston*; I am a miner; I have been out in the neighbourhood of Hillgrove for this fourteen or fifteen years; I know a mineral conditional purchase of Mr. Moore, portion 110; it is only a short time ago that I knew it; the place I know now as 110 I have known for a number of years; I did not know it was a mineral conditional purchase until very lately; I do not consider there are any mining operations on this portion; there is a bit of a pot hole on it that a man could work for about £1; it is on the falls.Sworn at Armidale this 24th day of }
June, 1887, before us,— }SYDNEY BLYTHE, J.P., Chairman.
C. E. SMITH, P.M.

WM. WESTON.

This closed the evidence for the complaint.

This witness being duly sworn on oath states: My name is *John Moore*; I, Peter Speare, and M'Bean are the holders of three mineral conditional purchases, portions 58, 109, and 110, Nos. of conditional purchases, 80-357, 100 acres, 81-54, 80 acres, and 81-266, 80 acres; all these three selections belong to myself, Peter Speare, and M'Bean; I produce the receipt for payment of interest at the rate of 2s. per acre, dated 31st of March, 1887; on portions 58, 110, and 109 of 80 acres we have actually expended £2,566, the greater part of which has been spent on portion 109; I could produce vouchers for £1,743, money actually expended in men's wages; I have been in possession of this land uninterrupted since 1881; M'Bean resides on the land; it has been his home since it was taken up; these three blocks named above all adjoin each other; the letter which has been read by the Chairman, dated 1st June, 1887, is the one forwarded by me to the Minister for Lands, and I produce the reply to the same.*By Mr. Kearney, solicitor:* We made separate declarations on the three portions named; I could not state when I made declaration on portion 58; when I made this declaration I could not state if it stood in the name of Powrie, Glass, & Moore; I could not tell unless I saw the papers whether I made the declaration on mineral conditional purchase 80-357; I could not say from memory whether the expenditure was made by Powrie, Glass, & Moore; I do not think we applied for an extension of time; the property I think when I made declaration on 109 belonged to Powrie, Glass, & Moore; I made declaration on portion 110; this always belonged to me; I supposed the improvements on 109 would more than cover the 24s. improvements on 110; when I made the first declaration of 24s. per acre it was my own, not in the name of Powrie, Glass, & Moore; I subsequently transferred this to the firm, and made the declaration at the end of five years at £2 per acre in the name of firm, John Moore, Peter Speare, and John M'Bean.Sworn at Armidale this 24th day of }
June, 1887, before us,— }SYDNEY BLYTHE, J.P., Chairman.
C. E. SMITH, P.M.

JOHN MOORE.

This witness being duly sworn, on oath, states: My name is *Mordaunt Alister Maclean*; I am in the Survey Office; I represent the District-Surveyor; I produce the original plans showing portions 58, 109, and 110, parish Metz and Cooney; I look at plan of portion 109; portion 109 is surveyed for 80 acres, including portions applied for as gold leases; I have no doubt whatever; nor of portion 58, 100 acres, surveyed inclusive of any application for gold leases; there was a gold-field proclaimed Gwyr, 29th June, 1883; that embraces only portion 58 of these three portions; portions 109 and 110 have never been within any gold-field.*By Mr. Kearney, solicitor:* These plans are from the Surveyor-General's Office; they do not show any gold lease applications; the local map does show the boundaries of gold lease applications as being within portion 109; three of them are upon portion 109 and one on portion 58; the fact of their being shown on the local map would not necessarily show that these gold leases had been surveyed before the mineral conditional purchase; the mineral gold lease on portion 58 is the only one that is really included within the gold-field.Sworn at Armidale this 24th day of }
June, 1887, before us,— }SYDNEY BLYTHE, J.P., Chairman.
C. E. SMITH, J.P.

M. A. MACLEAN.

This closed the evidence.

No. 20.

Decision of Local Land Board.

[Crown Lands Act of 1884—Part II, section 14, sub-section 4.]

New South Wales, }
to wit. }

WHEREAS on the 24th day of June, 1887, it became a matter for investigation before us, whether the necessary expenditure required by law has been made in mining operations (other than gold-mining) on the mineral conditional purchase mentioned in the margin, made at Armidale on the 29th September, 1881, 80 acres, county Sandon, parish Metz; and having taken evidence and inquired into the said matter, we find that in this case a complaint is lodged by Joseph F. M'Kinlay that no conditions have been fulfilled, "inasmuch as the land has not been improved." Of course this legally is no complaint at all, as the Act (19 section) does not require improvements but expenditure for mining operations. No objection was however taken to the complaint. We find that John Moore and party are entitled to this mineral conditional purchase by virtue of the improvements (or rather expenditure) made on the adjoining mineral conditional purchase 81-54, portion 109, which was the sole property of John Moore when he made his declaration on this mineral conditional purchase, on 24th December, 1884, that he was then therefore entitled under 26th section 39 Victoria No. 13, to claim the mineral conditional purchase under inquiry, to be held as one holding and conditional purchase with the conditional purchase 81-54, 109, on which there had been an expenditure of £1,743 for men's wages alone for mining purposes. We, therefore, under the 20th section of the Act, dismiss the complaint and uphold this conditional purchase in the name of Moore and party, and further order that the sum of £2 2s., professional costs, and £1 1s. for Mr. Moore's costs be deducted from the £10 lodged.

M.C.P. 81-266
John Moore,
Peter Speare,
and John
M'Bean, Armi-
dale; 80 acres
parish of Metz,
county of
Sandon.

Given under our hands at the office of the Local Land Board, at Armidale, in the Colony of New South Wales, this 24th day of June, 1887.

SYDNEY BLYTHE, Chairman.
C. E. SMITH, P.M., Member.

No. 21.

Notice of Appeal.

[Crown Lands Act of 1884—Part II, section 17.]

Notice of appeal to the Minister from decision of Local Land Board to be lodged with the Chairman.

New South Wales, }
to wit. }

WHEREAS on the 24th day of June, 1887, a certain matter wherein Joseph Francis M'Kinlay complained that Messrs. Moore, Speare, and M'Bean, the holders of a conditional purchase for mining purposes, 81-266, portion 110, parish of Cooney, county of Sandon, had not expended the sum of £2 per acre thereon in mining operations (other than gold-mining) as required by law, came before the Local Land Board at Armidale, in the Colony of New South Wales, for decision, I being a complainant, and the said Board, after having inquired into the premises, decided that though the original expenditure was not on portion 110 there was enough expenditure on portions 58 and 109, adjoining lands, to cover same, and dismissed the complaint and upheld the claim of John Moore and party to portion 110, and directed that the sum of £2 2s. for professional costs for defendant, and £1 1s. costs be allowed to John Moore, defendant, to be deducted from the £10 deposited with the complaint. And whereas I am dissatisfied with such decision, and intend to appeal therefrom to the Minister. These are, therefore, to give you notice of my intention to appeal as aforesaid, and I herewith tender the sum of £10 as security for the costs of such appeal. And the grounds of such appeal are annexed.

Dated the 25th day of June, A.D., 1887.

To the Chairman of the Local Land Board at Armidale.

JOSEPH FRANCIS M'KINLAY.

Received the sum of £10 referred to above.

SYDNEY BLYTHE, Chairman.

Armidale, 27th June, 1887.

GROUNDS OF APPEAL.

1. That John Moore, Peter Speare, and James M'Bean, present holders of mineral conditional purchases 80-357, portion 58, 100 acres, parish of Metz, county of Sandon; 81-54, portion 109, 80 acres, parish of Cooney, county of Sandon; and 81-266, portion 110, 80 acres, parish of Cooney, county of Sandon, are not entitled to amalgamate the said mineral conditional purchases, for the reasons that at the time required by law for expenditure of £2 per acre in respect to the said mineral conditional purchases respectively, portion 110 was held by John Moore solely, and the said portions, 58 and 109, were held jointly by James Glass, James Powrie, and John Moore, and that it appears by the evidence herein that there was not an expenditure of £2 per acre upon the said portion 110, nor in fact was there ever at any time an expenditure exceeding 2s. per acre upon the said portion 110.

2. That the present holders aforesaid claim to be entitled to amalgamate the said mineral conditional purchases by virtue of expenditure upon the said portions 58 and 109, and claim that there is sufficient excess of such expenditure to cover that required by law in respect to portion 110, which the appellant submits they are not legally entitled to do, inasmuch as all the declarations as to expenditure required by law in respect of the several portions referred to were made separately and independently of each other, and that it is apparent that the said portions were separately held, as the said John Moore made a declaration on his own behalf, on the 29th day of December, 1884, that the sum of 24s. per acre had been expended by him upon the said portion 110; and subsequently a further declaration was made on the 30th day of December, 1886, by the said John Moore, that the sum of £2 per acre had been expended on the said portion 110 by or on behalf of the said John Moore, Peter Speare, and James M'Bean, and that declarations were made previously to the said 24th day of December, 1884, by the said John Moore, that the expenditure required by law had been made upon the said portions 58 and 109 by the said James Glass, James Powrie, and John Moore, as the joint holders of the said portions.

3. That to entitle the said holders to amalgamate the said mineral conditional purchases by virtue of the Lands Act Amendment Act of 1875, section 26, it is necessary that the conditions and requirements of the Crown Lands Alienation Act of 1861, section 19, and the existing Crown Lands regulations relating to conditional purchases for mining purposes, should be complied with, under which, it is submitted by the appellant, that adjoining portions conditionally purchased for mining purposes may only be treated as one holding if held by the same owners or partners at the time when it is necessary to expend the sum of £2 per acre on mining operations, as required by law. And in this case, the one of the said owners—the said John Moore—was not a joint owner with the said John Glass and James Powrie in all the said mineral conditional purchases at the time when the said expenditure in mining operations was required by law to be made; the said holders as alienees of the said mineral conditional purchases from the said John Moore are not entitled to hold the said mineral conditional purchases as one holding.

No. 22.

Memo. from the Chairman of the Local Land Board, Armidale, to The Under Secretary for Lands.

Transmitting papers in connection with the mineral conditional purchases named in the margin.

Armidale,
80-357—100 ac.
81-54 — 80 ac.
81-266 — 80 ac.

THESE papers are transmitted together, as they relate to three mineral conditional purchases, formerly taken up in different names, but now all owned by John Moore, Peter Speare, and John M'Bean.

With regard to mineral conditional purchases, 80-357 and 81-54, there can be no question that the expenditure for mining operations is very far in excess of the requirements of the law, £2,566 being sworn to. This expenditure was made chiefly by John Moore, James Powrie, and James Glass. Mineral conditional purchase 81-266 was taken up by John Moore, in his own name; but, before it became necessary for him to make any declaration as to expenditure, the two former mineral conditional purchases were transferred to John Moore, viz., on 9th December, 1884, he then, afterwards, on 24th December, 1884, made a declaration as to expenditure to the amount of 24s. per acre on the mineral conditional purchase, considering that under the 26th section 39 Vic. 13, the expenditure on the former mineral conditional purchases would count as expenditure on this last, although there had been actually little or no expenditure on mineral conditional purchase 81-266 itself. A complaint that no conditions had been fulfilled on this mineral conditional purchase was lodged by Joseph F. M'Kinlay, and on the hearing of the case, the Board, on the foregoing facts, dismissed the complaint, and ordered the sum of £2 2s. professional costs, and £1 1s. costs, to John Moore, to be deducted from the £10 lodged. The case was sent to the Board under the 20th section of the Act of 1884, and against this decision of the Board, who upheld the claim of Moore and others to the mineral conditional purchase 81-266, M'Kinlay now appeals on the grounds as set forth in this notice.

SYDNEY BLYTHE, Chairman.

27th June, 1887.

Applications to mine for Gold, parish of Metz.

SCHEDULE.

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No. 1.

Application for Conditional Purchase.

C.

[Alienation Act, section 19.]

Application for the conditional purchase without competition of unimproved Crown Land.

District of Armidale.

No. 540 of 1881.

Application by James Powrie and James Glass for the conditional purchase, without competition, of 80 acres unimproved Crown Land.

Received by me, with a deposit of £40, this 3rd day of March, 1881, at 10 o'clock.

J. BRAY,

Agent for the Sale of Crown Lands at Armidale.

Sir,

Sir,

3 March, 1881.

We are desirous of purchasing, without competition, under the Crown Lands Alienation Act, 1861, the portion of unimproved Crown Land hereunder described, containing 80 acres, and we herewith tender the sum of £40, being a deposit at the rate of 10s. per acre on the area for which we apply.

We are, &c.,

JAMES POWRIE, 275, George-street.
JAMES GLASS, of Gara, Armidale.
ROBERT PHILLIPS, as Agent.

To the Agent for the Sale of Crown Lands at Armidale.

Description.

County of Sandon, parish of Cooney, 80 acres, extending along the eastern boundary of our mineral conditional purchase, portion No. 58, and adjoining the said portion No. 58 from its south-east corner to its north-east corner.

I certify that these applicants are over sixteen years old.—J. BRAY.

Mining Act in this locality it is not safe to deal with this case, which with others are with 81-15,376, conditional sales, I believe of M'Carthy's conditional purchases, with which this should be put, or perhaps it would be as well to refer to Mines as to whether my recollection is or is not correct.—F.H.W., 22nd April, 1881.

The Under Secretary for Mines.—W.B. (for Chief Commissioner), B.C., 8th June, 1881.

Enclosure (see Appendix C).

No. 2.

Notification of alienation of conditional purchase.

H.

[Alienation Act, sections 13, 14, 19, 21, and 22.]

Notification of alienation of conditional purchase under the Crown Lands Alienation Act of 1861.

Notification of alienation of conditional purchase by James Powrie and James Glass, in the district of Armidale.

I HEREBY notify to you, as the Agent for the Sale of Crown Lands for the district of Armidale, that we have (after a residence thereon of at least twelve months), in consideration of the sum of 10s., this day alienated to James Powrie, of Sydney, and James Glass and John Moore, both of Armidale, the 80 acres of land, situated in the county of Sandon, parish of Metz, which were selected at Armidale by James Powrie and James Glass, as a conditional purchase, under the 19th section of the Crown Lands Alienation Act of 1861, on the 3rd March, 1881.

Witness to the signature of }
JAMES POWRIE,— }
A. H. PRITCHARD.

JAMES POWRIE,
of Sydney.

Witness to the signature of }
JAMES GLASS,— }
THOMAS H. BROWNE, J.P.

JAMES GLASS,
of Armidale.

Dated at Singleton, this 10th September, 1881.

To the Agent for the Sale of Crown Lands at Armidale.

I have duly registered the above notification of alienation in the Records of this Office.

Fee paid :—7s. 6d. for registration fee and Stamp duty, £1, and fine, 4s.

JAMES BRAY, Agent for the Sale of Crown Lands.

District of Armidale, Land Office, Armidale,
3 December, 1881.

Received into the Office of the Registrar-General, at Sydney, this 4th day of February, A.D. 1882, at 10 o'clock in the forenoon, from Fred. Murray, of Sydney, a copy of the above transfer, verified by Edwd. G. Markham, of Armidale, and numbered 978, book 38.

JAS. BOSCAWEN DUFF,
Deputy Registrar-General.

No. 3.

Messrs. Farnell and Martin to The Chief Commissioner, Conditional Sales Branch.

Sir,

295, George-street, 21 September, 1881.

We have the honor to request, on behalf of Messrs. Powrie and Glass, that you will cause a survey to be made, as early as possible, of the additional mineral selection of 80 acres, applied for at Armidale on the 3rd March, 1881, situated in the county of Sandon, parish of Metz. The reason why we urge the survey of the land is that persons are illegally working upon it, and carrying away the antimony ore, and proceedings cannot be taken against the parties until the boundaries are defined.

We have, &c.,

FARNELL & MARTIN.

C.P. 81-54, Armidale. The case is now under reference to the Mines Department, application having been sent them on 8th June last. The U.S. Mines should be requested to return same.—A.B.C., 29/9/81. Inform.—J.W., 39/9/81. Mr. Blackman, a letter recently sent to Sur. Orr this case.—J.L., 1/10/81. Mr. Capper. U.S. Mines. Messrs. Farnell & Martin, and H. C. Mitchell.—21 Oct., 1881

No. 4.

No. 4.

Mr. H. C. Mitchell to The Secretary for Lands.

Sir,

40, Hunter-street, Sydney, 4 October, 1881.

I have the honor to request that you will give instructions to the Surveyor at Armidale to survey the 80 acres of land, county of Sandon, parish of Metz, taken up by Messrs. James Powrie and James Glass on the 3rd March, 1881.

Mr. John Moore, of Armidale, has requested me to ask you to give this matter immediate attention.

I have, &c.,

HENRY CHAS. MITCHELL.

C.P. 81-54, Armidale. Application to U.S. Mines, 8/6/81. This paper should be placed with the previous paper 81-42,441. It does not appear to relate to papers 81-44,110.—C.N., 6/10/81. Have not these papers been applied for and sent as within stated to the Mining Department so long ago as 8 June last.—A.O.M., 19/4/82.

No. 5.

Mr. H. C. Mitchell to The Secretary for Lands.

Sir,

40, Hunter-street, Sydney, 18 October, 1881.

Referring to my letter of 4th instant, wherein I had the honor to request you to give instructions for the survey of certain land taken up by James Powrie and James Glass on 3rd March, 1881, I have the honor to inform you that up to the present no instructions have reached the local Surveyor at Armidale, nor has any intimation reached me as to when it is likely that such instructions will be given.

I have, &c.,

HENRY CHAS. MITCHELL.

Urgent.—The Chief Commissioner of Conditional Purchases. Please let me know how this matter stands at present.—J.H., 18/10/81. The case is stated to be under reference to the Department of Mines.—A.O.M., 19/10/81. The writer should be informed to that effect as soon as possible, and the Department of Mines should be asked to expedite their report thereon.—J.H., 21/10/81.

No. 6.

The Chief Commissioner to The Under Secretary for Mines.

Sir,

Department of Lands, Conditional Sales Division,
Sydney, 21 October, 1881.

Referring to the application of Messrs. James Powrie and J. Glass, noted in the margin, which was referred to your Department on the 8th June last, I am directed to request that you will be pleased to cause its early return with the necessary report thereon.

I have, &c.,

W. BLACKMAN,
(For Chief Commissioner).

C.P. 81-54,
Armidale, 80
acres, 3rd
March, 1881,
19 section, J.
Powrie and J.
Glass.

No. 7.

The Chief Commissioner to Messrs. Farnell & Martin.

Gentlemen,

21 October, 1881.

Referring to your letter of the 21st ultimo, urging early survey of the selection noted in the margin, I am directed to inform you that the application was referred, on the 8th June last, to the Department of Mines for report, and that the Under Secretary for Mines has been requested to cause the necessary report to be furnished.

I have, &c.,

W. BLACKMAN,
(For the Chief Commissioner).

C.P. 81-54,
Armidale, 80
acres, 3rd
March, 1881,
19 section, J.
Powrie and J.
Glass.

No. 8.

The Chief Commissioner to H. E. Mitchell, Esq.

Sir,

21 October, 1881.

Referring to your letter of the 4th instant, requesting on behalf of John Moore that instructions may be issued to the surveyor in connection with the selection noted in the margin, I am directed to inform you that the application was referred, on the 8th June last, to the Department of Mines for report, and that the Under Secretary for Mines has been requested to cause the necessary report to be furnished.

I have, &c.

W. BLACKMAN,
(For the Chief Commissioner.)

C.S. 81-54,
Armidale, 80
acres, 3rd
March, 1881,
19 section, J.
Powrie and J.
Glass.

13

No. 9.

The Chief Commissioner to H. E. Mitchell, Esq.

Sir,

24 October, 1881.

Referring to your letter of the 18th instant, urging that instructions may be issued to the surveyor in connection with the selection of James Powrie and James Glass, I am directed to inform you that the case is at present under reference to the Department of Mines, but that as soon as the necessary report has been received, your request will be considered.

I have, &c.,

W. BLACKMAN,

(For the Chief Commissioner).

No. 10.

The Chief Commissioner to The Under Secretary for Mines.

Sir,

Department of Lands, Sydney, 24th October, 1881.

Referring to a letter received from H. C. Mitchell, urging that instructions may be issued to the surveyor in connection with the selections of James Powrie and James Glass, the papers relating to which are stated to have been referred to your Department, I am directed to request that you will be pleased to cause the papers, with the necessary reports thereon, to be furnished at your earliest convenience.

I have, &c.,

W. BLACKMAN,

(For the Chief Commissioner.)

Minutes on No. 9.

Can the report asked for be supplied in the absence of the papers relating to the applications to lease.—H.W., 31/10/81.

It appears that three applications made at Armidale for gold-mining purposes, as under, are entirely within the area intended to be embraced by Messrs. Powrie & Glass. Mineral conditional purchases 81-54, of 3rd March, 1881, viz. :—*Application 1,287, made 12/10/80, at Armidale; †1,288, made 15/11/80, at Armidale; †1,289, made 28/1/81, at Armidale.

These are all that I have any knowledge of.—H.C., 7/10/81. The Under Secretary for Mines. Where are these papers?—H.W., 16/11/81. Herewith.—W.K., 18/11/81.

Referred to Charting Branch. Opinion given in M'Carthy's case referred to on the application enclosed. Application for a mineral lease does not exempt land applied for from conditional purchase during the pendency of such lease application, and until the lease is granted by the Governor and Executive Council.—C.N., 30/11/81.

Mining Department.—How do applications 1,287, 1,288, and 1,289 stand, and has the lease been granted by the Governor and Executive Council.—C. H. DALE (for Surveyor-General), 16/12/81. The Under Secretary for Mines. Very urgent.—Applications 1,287, 1,288, and 1,289, Armidale, not yet approved.—J.W.C., 17/12/81. Gazetted refused, 10th October, 1882, *vide* 82-10,488 Mines. The plan of mineral conditional purchase 81-54 was transmitted to the Surveyor-General with my letter dated 11th March, No. 82-12, No. of portion being 109.—JOHN G. MARTYN, 31/8/82.

* Papers 80-10,031 Mines.

† Papers 81-5,281 Mines.

No. 11.

Mr. H. C. Mitchell to The Secretary for Lands.

Dear Sir,

40, Hunter-street, Sydney, 7 November, 1881.

Referring to your letters of the 21st and 24th ultimo, numbered respectively, C.S. 81-44,121, and C.S. 81-47, 289. I have the honor to inform you that I have just received the following telegram from Armidale:—"In consequence of the lines of land not being surveyed, six men are working our land," and to request you to be good enough to press the matter forward as much as possible, as my friends Messrs. John Moore, James Glass, and James Powrie are suffering loss from the delay on survey. The loss is the more aggravating in that they have done so much in developing the resources of the district.

I have, &c.,

HENRY CHAS. MITCHELL.

Urgent. The other papers in the case, 81-44,121, should be attached.—C.N., 16/11/81. Papers herewith, 18/11/81. Mr. Neale. Has a reply been received from the Mining Department, *vide* 81-47,289?—C.N., 21/11/81. Yes, *vide* 81-52,908.

No. 12.

Mr. Licensed-Surveyor Martyn to The Surveyor-General.

Sir,

Armidale, 11 March, 1882.

I have the honor to transmit herewith the plan of one portion of land containing 80 acres, numbered 109, in the parish of Cooney, county of Sandon, applied for by Jas. Powrie and Jas. Glass, under the 19th section of the Crown Lands Alienation Act of 1861, and surveyed in view of enclosed copy of C.P. No. 81-54, instructions for survey of which have not been received. Improvements consist of mining plant of a far greater value than the requisite £2 per acre.

The greater part of this portion is situated in a deep precipitous gulf.

For explanation as to form of survey *vide* my letter dated 11th March, No. 82-20.

I have, &c.,

J. G. MARTYN.

Forwarded

Forwarded 17th March, 1882. Two tracings received, one of which forwarded to the Land Agent.—J. S. CHARD, D.S. Survey approved so far as regards 60 chains depth not being given. *Vide* copy of 82-1,957 Min. with 82-1,808 Sur.—D.H.C., 27th Aug., 1884. Exd. and chtd. on county map.—G. H. DOUBLEDAY, 8th October, 1884. Surveyor-General. It is submitted whether the portion should not be bounded by marked right lines along the edge of cliff, and if so, should such lines be the common boundary of portions 59 and 109. Or may the edge of cliff be considered the boundary and not marked.—D. H. CHISHOLM, 27th August, 1884.

Inasmuch as the adjoining portions, 58 and 59, were measured, November, 1878, and survey approved, June, 1882, and are represented as having a natural boundary (not defined by right lines), there is no alternative to adoption of the same boundary in the latter survey of portions 109 and 113. Undoubtedly the portions 58 and 59 should have been defined by right lines marked along the edge of the cliff (*vide* par. 33 of Reg.), which would then have constituted the common boundary of portions 58, 59, 109, and 113. Send memo. stating the circumstances, directing the surveyor's attention to paragraph 33 of Regulations, and informing him that his survey has been accepted.—E. TWYNAM (for Surveyor-General), 3rd October, 1884.

According to C.S. 84-5,754, Cor., M.C.P. 81-54, Armidale, with other M.C.P.'s specified therein, was on 12th July, 1884, demised by way of mortgage (for seven years), from Charles Henry Hodson (the present transferee from applicant), in consideration of loan of the sum of £1,300 to Alfred Van Rompaey. Dealt with in Charting Branch.—D.H.C., 23rd October, 1884.

Tracing herewith for C.P. Inspectors. Underwood, for description.—ARTHUR J. BURNELL, 5th November, 1884.

No. 13.

Declaration of Conditional Purchaser.

(C.P. 81-54.)

F.

[Alienation Act, 1861.]

Declaration of conditional purchaser for mining purposes.

I, JOHN MOORE, of Armidale, do solemnly and sincerely declare that James Powrie, James Glass, and John Moore, the lawful owners, by conditional purchase, of the land hereunder described, and that an expenditure equal to £5 per acre for the area of the land has been made on mining operations other than gold-mining on the land, and since the selection on 3rd March, 1881, and I make this solemn declaration, conscientiously believing the same to be true, and by virtue of the provisions of an Act made and passed in the ninth year of the reign of Her present Majesty, intituled "An Act for the more effectual abolition of oaths and affirmations taken and made in various departments of the Government of New South Wales, and to substitute declarations in lieu thereof and for the suppression of voluntary and extra-judicial oaths and affidavits."

Description.

County of Sandon, parish of Metz, 80 acres, on Hillgrove Run, being (part of) conditional mining purchase, No. 54 of 1881, in the District of Armidale.

Taken and declared, at Armidale, this 31st }
day of May, 1884, before me, — }

JOHN MOORE.

LAMBERT S. GORDON, Commissioner for Affidavits.

Instalment £8, credited at Treasury, 4th June, 1884. Notice issued to parties to attend Court, Armidale, on 24th June, 1887. Poster, 3/6/87.—F.H.W., 3/6/87.

No. 14.

Office Memo.

MR. G. LEWIS.—Enclosed are plans and papers of portions 109, 110, and 113, parish of Metz, county Sandon.

Are these surveys within Gyra River gold-field or not? The chief draftsman considers that the parish boundary was intended to follow the edge of gorge. If so, those surveys are in parish of Cooney, and are outside Gyra River gold-field.

1st Sept., 1884.

D. H. CHISHOLM.

County maps and plans altered accordingly.—G. H. DOUBLEDAY, 8th Oct., 1884. Adopt the edge of the gorge.—J. W. ELLIS, 9/9/84. Mr. Chisholm. Description prepared, 8/1/85.—R.U.

No 15.

Office Memo.

CHARTING BRANCH.

(Papers No. 7 82-1,807 Sur.)

THE following is forwarded for the information of Mr. L. S. Martyn:—

In connection with plans of portions 109 and 113, parish Metz (now Cooney), county Sandon, transmitted by letters Nos. 82, 12, and 14 respectively, of 11th March, 1882, the following is a copy of Surveyor-General's minute thereon.

Inasmuch as the adjoining portions, 58 and 59, were measured November, 1878, and survey approved June, 1882, and are represented as having a natural boundary (not defined by right lines) there is no alternative to adoption of the same boundary in the later survey of portions 109 and 113.

Undoubtedly,

Undoubtedly, the portions 58 and 59 should have been defined by right lines marked along the edge of the cliff (*vide* par. 33 of regulations), which would then have constituted the common boundary of portions 58 and 59 and 109 and 113.

The surveys have, however, been accepted, but Mr. Martyn's attention is directed to the paragraph above referred to, which he is requested to observe more carefully in future.

ARTHUR J. BURNELL,

(For Surveyor-General.)

6 October, 1884.

In returning this memo., I beg to draw attention to the concluding paragraph thereof, which would appear to have been intended for the surveyor who measured portions 58 and 59, and not for me. Portions 58 and 59 having been measured with a natural boundary, I was consequently compelled, when joining on to them, to adopt the same boundary for my surveys, and I fail to see how any careful observance of paragraph 33 could have altered the circumstance of the case. I have measured several portions with frontage to the edge of the Falls, and I have always been careful to observe paragraph 33, but in this case I was prevented from doing so owing to the form of measurement of previous surveys.—J. G. MARTYN, 11th October, 1884.

Observed. As Mr. Twynam is away, I did not consider it necessary to keep the case back.—D.H.C., 23rd October, 1884.

No. 16.

Office Memo.

Mineral conditional purchase 81-54, Armidale.

Description.

EIGHTY acres, county of Sandon, parish of Cooney, portion 109: Commencing on the edge of the cliffs at the south-western corner of portion 113 of 40 acres, and bounded thence on the north by part of the southern boundary of that portion, bearing east 21 chains 96 links, and on the east by the western boundary of portion 110 of 80 acres, bearing south 35 chains 69 links; on the south by a line bearing west 16 chains 59 links to the edge of the cliffs aforesaid, and on all other sides by those cliffs northerly to the point of commencement.

Examined.—R.U., 8/1/85.

No. 17.

Report by Inspector William Harper.

Respecting the mineral conditional purchase of James Powrie and James Glass, made at Armidale, on 3rd March, 1881.

Sir,

Armidale, 9 June, 1887.

I have the honor to report that I visited and inspected the above-described conditional purchase on the 6th day of June, 1887, and that I found the selector then not resident upon this selection:

M.C.P. 81-54,
section 19th,
portion 109.

The land, which consists of precipitous walls of rock, inaccessible in places, and steep spurs, and comprises 80 acres, is now occupied by John Moore for mining purposes, and the selector, who follows the avocation of merchant, had at the time of my visit made the improvements hereunder particularly described, the value of which I estimate at the sums respectively stated, viz. :—

435 feet of shafts, tunnels, and cuttings, with wooden supports to walls, and tram partly made on floor of tunnel, top and sides of excavation varying from 3 and 2 feet x 6 and 7 feet by 4 feet, at £1 10s. per foot,—£652 10s.

From the appearance of the land, and the circumstances stated in the following remarks, I am of opinion that the selector has been continuously resident upon the selection.

REMARKS.

There are cross-drains in main tunnel, and a quantity of ground has been stopped, the value of which it would be impossible to determine now, as some of the timber has slipped away making it dangerous.

The works seem to have been suspended here for one year or more, and when in operation were used for raising antimony ore.

A person named M^r Bean resides on portion 58, an adjoining block, and has charge of the property on account of John Moore, present holder.

I have, &c.,

WM. HARPER,

The Chairman of the Local Land Board at Armidale.

Inspector of Conditional Purchases.

No. 18.

Caption to Deposition of Witnesses.

New South Wales, }
to wit. }

[Crown Lands Act of 1884—Part II., section 14, sub-section 1.]

THE examination of William Harper, of Armidale, in the Colony of New South Wales, Inspector of conditional purchases, and Charles James Ramsay, auctioneer, of Armidale, in the said Colony.

WHEREAS it hath been alleged that the necessary expenditure required by law has not been made in mining operations (other than gold-mining) on the mineral conditional purchase mentioned in the margin made at Armidale on the 3rd March, 1881, 80 acres, county Sandon, parish Metz, and it hath been found necessary to investigate the said matter on oath, the depositions of the several witnesses are appended hereto.

Mineral conditional purchase 81-54—James Powrie, James Glass, and John Moore, Armidale, 80 acres, parish Metz, county Sandon.

[Enclosure.]

[Enclosure.]

THIS witness, being duly sworn, on oath, states : My name is *William Harper*, Inspector of conditional purchases for this district ; on the 6th June last I visited the mineral conditional purchase subject of inquiry (mineral conditional purchase 81-54, section 19, portion 109, of 80 acres), which stands in the names of James Powrie and James Glass ; the land consisted of inaccessible wall of rock and steep spurs ; it is situated on the face of the falls now occupied by Mr. John Moore for mining purposes ; I might state before I go into the particulars of valuation I did not go down into these tunnels and shafts ; however, I employed a practical man, an auctioneer in the city, named Ramsay, who understands mining matters ; my son accompanied him, measuring the lengths and depths, and saw the tunnels, but did not go down myself, and it was principally from them I got my estimate ; the excavations vary from 3 to 3 x 6 and 7 x 4 ; there were 435 feet of shafts tunnelling and castings, which I valued at £652 10s. ; there are cross-drains in the main tunnel and a quantity of ground has been stopped, the value of which would be impossible to determine now, as some of timber has slipped away, making it dangerous ; these works appear to have been in operation for raising antimony from the mine ; a person named M'Bean resides on portion 58, of 100 acres (about which I have just given evidence), and appears to be in charge on account of John Moore, the present holder.

By Mr. Kearney, solicitor : This was the first inspection of this block, portion 109 ; I found the number on the tree, and the tracing (see Appendix D.) guided me, showing the expenditure stated had been made on portion 109 ; there were a number of other marks, G.L. and C.L., but I took no notice of them ; I was asked to look at these, but I did not consider it my duty to take any notice of them ; the expenditure I refer to was near the western boundary of portion 109, and near the edge of the falls ; they extended from the edge of the falls eastward, probably 10 chains down the falls ; I found the surveyor's number at the south-east and south-west corner of portion 109 ; the dividing line between portion 109 and 110 was not marked on the ground ; I determined its position by compass from the top of the spur across the gulf to the mountain the other side.

Sworn at Armidale this 24th day }
of June, 1887, before us,— }

SYDNEY BLYTHE, J.P., Chairman.
C. E. SMITH, P.M.

W. HARPER.

THIS witness, duly sworn, states :—My name is *Charles James Ramsay* : I am an auctioneer in Armidale ; I was employed by Mr. Harper recently.

By Mr. Harper : I identify the portion 109 by the tracing ; I remember on the 6th June, at your request, that I visited some mineral conditional purchases ; I measured the works, sinkings, and shafts on portion 109, shown on tracing ; your son accompanied me in the tunnel ; I measured the shaft by dropping a line from the surface to the bottom ; I found the shafts, tunnels, and cuttings to be 435 feet ; I valued this work at £2 per foot ; I saw some numbers on the trees which indicated this portion 109 ; I was satisfied that the expenditure of money of mining works was within the boundaries of portion 109, as shown in the plan of Mr. Harper ; I have been accustomed to see mining operations.

By Mr. Simpson : I have had some experience in surveying matters.

Sworn at Armidale, this 24th day }
of June, 1887, before us,— }

SYDNEY BLYTHE, J.P., Chairman.
C. E. SMITH, P.M.

CHARLES JAMES RAMSAY

This closed evidence.—S. BLYTHE, Chairman.

No. 19.

Decision of Local Land Board.

New South Wales, }
to wit. }

[Crown Lands Act of 1884—Part II, section 14, sub-section 4].

WHEREAS on the 24th day of June, 1887, it became a matter for investigation before us whether the necessary expenditure required by law has been made in mining operations (other than gold-mining) on the mineral conditional purchase mentioned in the margin, made at Armidale on the 3rd March, 1881, 80 acres, county Sandon, parish Metz, and having taken evidence and inquired into the said matter, we find that according to the evidence of Mr. Inspector Harper there has been an expenditure of at least £652 10s. in mining operations, other than gold-mining. We beg, therefore, to recommend that this conditional purchase be upheld, and certificate issue to the persons entitled thereto.

Given under our hands, at the office of the Local Land Board, at Armidale, in the Colony of New South Wales, this 24th day of June, 1887,—

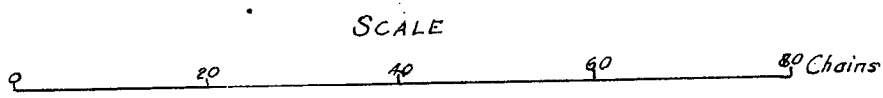
SYDNEY BLYTHE, Chairman.
C. E. SMITH, P.M., Member.

[Four plans.]

M.C.P. 81-54,
James Powrie,
James Glass, and
John Moore, 80
acres, parish
Metz, county
Sandon.

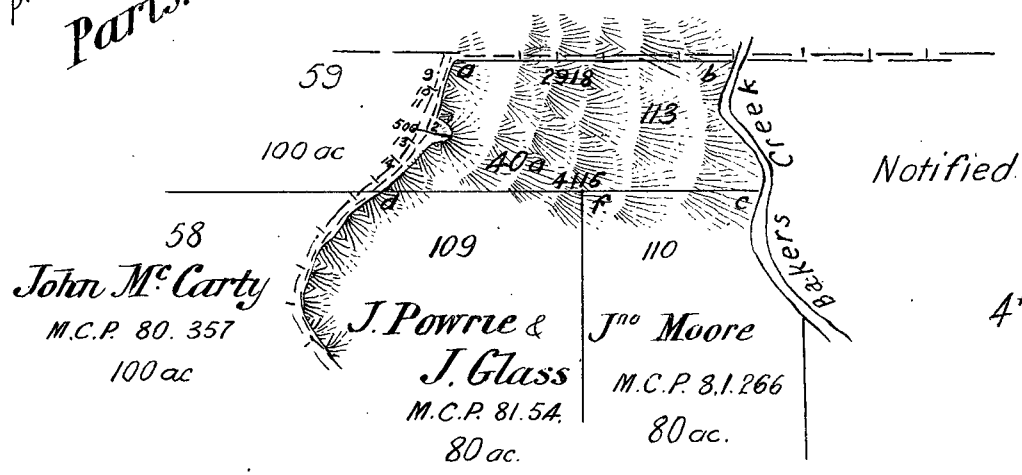
Land Dist
Armidale.

PLAN
Of Portion 113 in the Parish of Cooney
County of Sandon
 Applied for by John Moore under the 19th Section of the C.L. Act of 1861.
 M.C.P. N^o 81. 274 Oct 13th



Cyra Gold Field
 proclaimed 29th June 83
 Parish of Metz

Res 1393 A



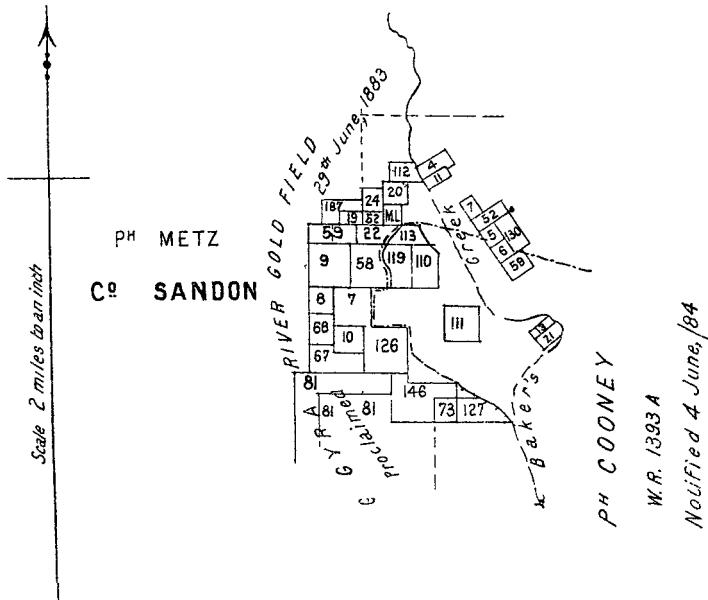
Parish of Cooney

Reference to Corners				
Corner	Bearing	From	Links	N ^o on Tree
a	345.35	St. Bark	28 1/2	113
b		Oak		113
c	173.20	Apple	43	110.113
d		Stake		
e	1.0	Pepper mt	60	59
f		inaccessible		

Reference to Traverse		
N ^o	Bearing	Links
9	187.37	92
10	183.3	177
11	204.34	477
12	114.34	370
13	204.34	500
14	237.7	492

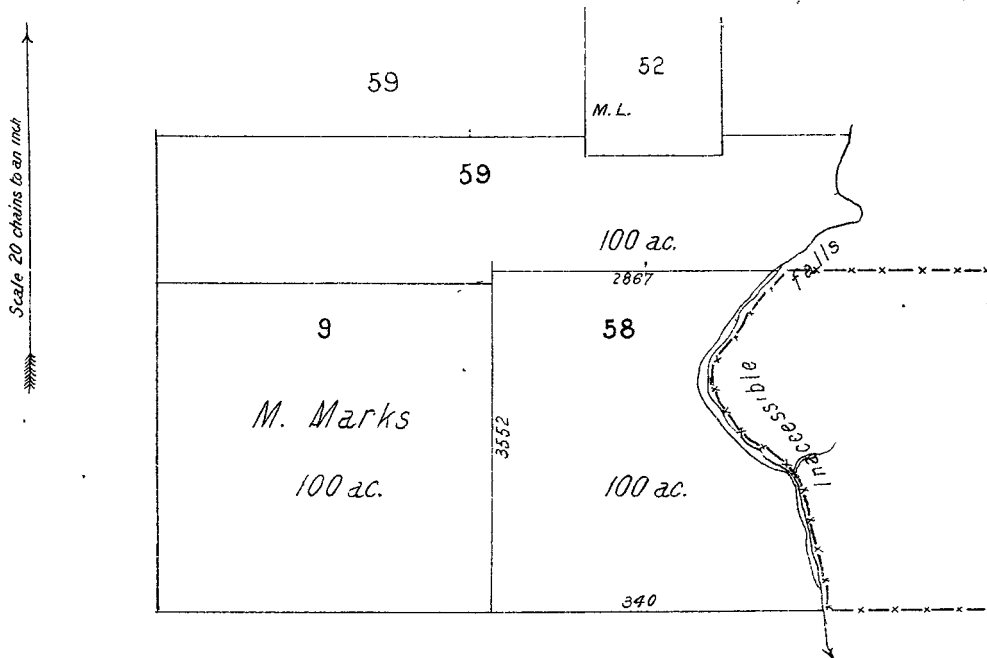
Appendix B.

Enclosure to N^o 4



Appendix C.

Enclosure to N^o 1.



Note—The lines shown thus—x—x— were shown red on original.

(Sig. 492.)

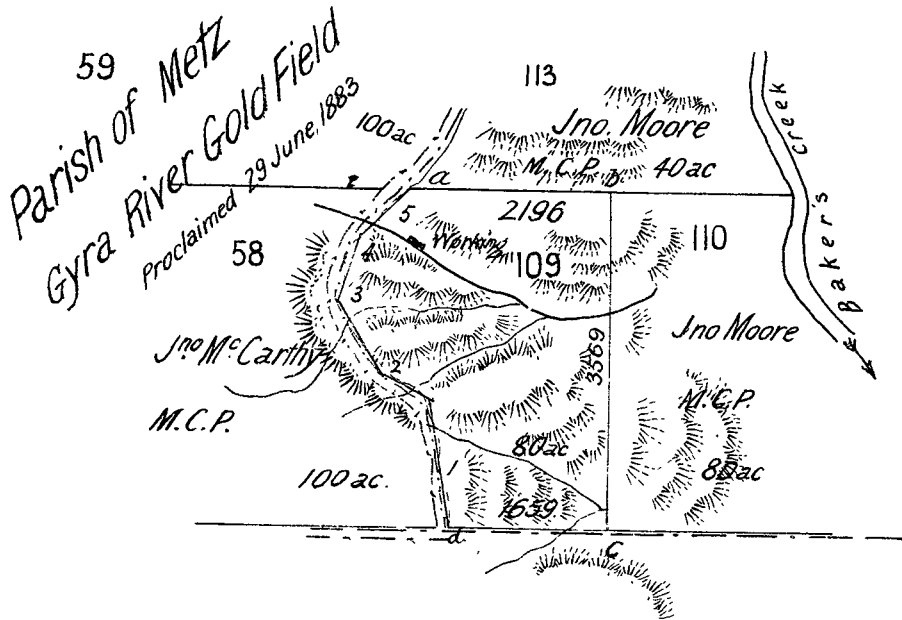
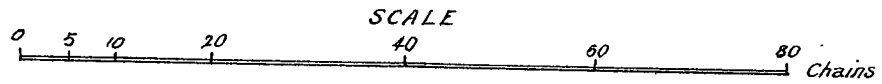
PLAN OF PORTION 109

in the

Parish of Cooney, County of Sandon

Applied for by James Powrie & Jas. Glass under the 19th Section of the C.L. Act of 1861.

M.C.P. N^o 81-54 March 3rd



Res. 1393

Notified 4th June 1884.

Reference to Corners				
Corner	Bearing	From	Links	N ^o on Tree
a		stake		
b		inaccessible		
c	242° 0'	apple	19 1/2	109-110
d	224° 10'	Gum	23	58-109

(Sig 492-)

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

COAL MINING LEASE.

AND RENEWAL OF LEASE OF THE ANGLO-AUSTRALIAN MINING COMPANY: BETTER KNOWN AS THE LAMBTON COLLIERY COMPANY.)

Ordered by the Legislative Assembly to be printed, 24 March, 1887.

NO.	SCHEDULE.	PAGE.
1.	The Acting Surveyor-General to Messrs. Morehead & Young that applications for lease of land at Newcastle have been approved of, and enclosing description. 12 January, 1863.	1
2.	Messrs. Morehead & Young to the Acting Surveyor-General for amalgamation of leases Nos. 22 and 23, and re use of surface, with minutes. 29 January, 1863.	2
3.	The Acting Surveyor-General to Messrs. Morehead & Young in reply to No. 20 April, 1863.	2
4.	The Manager Scottish Australian Mining Company, Limited, to the Honorable the Secretary for Mines for renewal of mineral lease No. 22, with minutes. 14 December, 1875.	2
5.	The same to the same for renewal of mineral lease No. 23, with minutes. 31 December, 1875.	2
6.	The Under Secretary for Mines to Mr. R. A. A. Morehead in reply to No. 7 January, 1876.	2
7.	The same to the same in reply to Nos. 3 October, 1876.	3
8.	The Sub-Manager of the Scottish Australian Mining Company to the Under Secretary for Mines that fine for renewal of leases has been paid, with minute. 28 November, 1876.	3
9.	The Under Secretary for Finance and Trade to the Under Secretary for Mines asking for instructions, also stating that fine has been paid, with minute. 30 November, 1876.	3
10.	The Under Secretary for Mines to the Under Secretary for Finance and Trade stating fine fixed by the Secretary for Mines. 5 December, 1876.	3
11.	The Under Secretary for Mines to the Manager of the Scottish Australian Mining Company that renewal of leases will be granted to Messrs. Morehead & Young upon their making application. 15 December, 1876.	3

No. 1.

The Acting Surveyor-General to Messrs. Morehead & Young.

Gentlemen,

Sydney, 12 January, 1863.

In reference to your application dated 18th January last, to lease, under the Crown Lands Occupation Act of 1861, for mining purposes, four portions of land situated at Newcastle, each containing 320 acres, I have the honor to inform you that your applications for those portions have been approved of and the land measured.

With reference to your applications of same date for two other portions—320 acres, being M.L., No. 23, and 160 acres being M.L., No. 22, I have the honor to inform you that in both these cases the surface right is wholly reserved to the Government, the land being situated within the Newcastle Pasturage Reserve, and that the first mentioned portion, No. 23, has been reduced to 120 acres in consequence of Dr. Mitchell's prior application for part of the land in question.

You will be good enough to apply to the Treasury for a refund of the money due to you in consequence of such reduction. I enclose copies of the descriptions for your information.

I have, &c.,

W. R. DAVIDSON.

Consolidated Description.

280 acres, county of Northumberland Parish of Newcastle, Mineral Leases Nos. 22 and 23,—Commencing at the north-western corner of Mineral Lease No. 25, and bounded thence on the south by part of the northern boundary line of that lease bearing east 40 chains; on the east by the western boundary line of Mineral Lease No. 24, bearing north 70 chains; on the north by part of the southern boundary line of Mineral Lease No. 12, bearing west 40 chains; and on the west by the eastern boundary of Mineral Lease No. 14, and part of the eastern boundary of Mineral Lease No. 15; being in all a line bearing south 70 chains to the point of commencement. Examined—R.B.R.

No. 2.

Messrs. Morehead & Young to The Acting Surveyor-General.

Sir,

Sydney, 29 January, 1863.

We have had the honor to receive your letter of the 12th instant, transmitting descriptions of the portions of land in the neighbourhood of Newcastle, which have been leased to us by the Crown for mining purposes.

It is probable we shall make an early communication to the Government on the subject of mineral lease No. 23, the contents of which we perceive have been reduced to 120 acres. In the meantime, however, all we consider it necessary to submit to your Department, in connection with this portion of land, is the request that it may be joined in a lease with the portion comprised in No. 22 consisting of 160 acres, so as to constitute one portion of 280 acres.

I would beg to add that we take it for granted, as regards the land just adverted to, which forms part of the Newcastle Pasturage Reserve, that although the surface will not be leased to us, the use of such a portion thereof as is required for mining operations will be conceded.

I have, &c.,

R. A. A. MOREHEAD,

For self and M. Young.

There will be no objection to this arrangement, the area being under 320 acres.—W. T. D.

The only question which can be replied to, in this communication, is with regard to the amalgamation of Mineral Leases Nos. 22 and 23, to which there is no objection, and description may be accordingly prepared with regard to surface right on the Commonage Reserve; no doubt some small area will be allowed.—W. R. D., 18/2/63. Messrs. Morehead & Young informed, 20/4/63.

No. 3.

The Acting Surveyor-General to Messrs. Morehead & Young.

Gentlemen,

Sydney, 20 April, 1863.

In reference to your letter of the 29th January, on the subject of the land in the neighbourhood of Newcastle, leased to you for mining purposes, I beg to inform you that there will be no objection to portion No. 23 being joined to portion No. 22.

With regard to the surface right of the Commonage Reserve no doubt some small area will be allowed.

I have, &c.,

W. R. DAVIDSON.

No. 4.

The Manager of the Scottish Australian Mining Company (Limited), to the Minister for Mines.

Sir,

Sydney, 14th December, 1875.

On behalf of this Company, as holder of mineral lease No. 22 (or promise thereof), I have the honor to apply, under sub-clause 5 of section 22 of the Crown Lands Occupation Act of 1861, for a renewal of that lease.

In making this application, I assume that the fine, provided for under the clause above cited will be levied with reference to the area of coal, which will be ascertained to the satisfaction of the proper officer of your Department, to be unworked at the date of the expiration of the existing lease.

I have, &c.,

R. A. A. MOREHEAD.

Inform that the fine must be paid upon the area of the land demised by the lease of which he applies for renewal.—J. L., 3/1/76. Informed 7th January, 1875. The fine on renewal of mineral leases 22 and 23 shall be at the rate of £2 10s. per acre of land demised.—J. L., 27/9/76. Mr. Morehead informed 3rd October, 1876.

No. 5.

The Manager of the Scottish Australian Mining Company (Limited), to The Minister for Mines.

Sir,

Sydney, 31 December, 1875.

On behalf of this Company, as holder of Mineral Lease (or promise of lease No. 23), I have the honor to apply under sub-clause 5 of section 22 of the Crown Lands Occupation Act of 1861, for a renewal of that lease.

This application is made as supplementary to the application as to the Lease No. 22 made on the 14th, and with reference to an uncertainty as respects the boundary between the areas comprised in these two leases, or promises of lease.

I have, &c.,

R. A. A. MOREHEAD.

Application approved. Renewal lease shall be prepared with the least possible delay.—J.L., 3/1/76.

No. 6.

The Under Secretary for Mines to Mr. R. A. A. Morehead, Manager of Scottish Australian Mining Company, Limited.

Sir,

Department of Mines, Sydney, 7 January, 1876.

In reference to your letter of the 14th ultimo, applying on behalf of the Scottish Australian Mining Company, Limited, for a renewal of Mineral Lease No. 22, I am directed by the Secretary for Mines to inform you that the fine must be paid upon the area of the land demised by the lease of which you apply for a renewal.

I have, &c.,

HARRIE WOOD.

3

No. 7.

The Under Secretary for Mines to the Manager of the Scottish Australian Mining Company (Limited).

Sir,

Department of Mines, Sydney, 3 October, 1876.

Referring to my letter of the 7th January last, in which it was pointed out that the fine to be paid for removal of mineral lease No. 22, must be paid upon the area of land demised by the removal of such lease, I am now directed to inform you that the Secretary for Mines has decided that the fine upon renewal of mineral leases Nos. 22 and 23, shall be at the rate of £2 10s. per acre of the land demised, as provided by Regulation No. 37, relating to Mineral Leases under the Mining Act, 1874.

I have, &c.,
HARRIE WOOD.

No. 8.

The Sub-Manager of the Scottish Australian Mining Company Limited, to the Under Secretary for Mines.

Sir,

Sydney, 28 December, 1876.

With reference to your letter of 3rd October last, I have the honor to intimate to you that I have this day paid into the Colonial Treasury £700 sterling, being fine for renewal of leases for fourteen years from 31st December next of Nos. 22 and 23, portion of the Newcastle Town Pasturage Reserve, containing 280 acres, and I would request that deeds of lease should be issued in the name of this Company in due time.

I have, &c.,
H. SHANNON.

Prepare the leases so that they shall be ready for issue at any time after the 31st proximo. Inform the Treasury that the fine has been paid at £2 10s.—J.L., 30/11/76.

No. 9.

The Under Secretary for Finance and Trade to The Under Secretary for Mines.

Sir,

The Treasury, New South Wales, Sydney, 30 November, 1876.

I have the honor to state that a sum of £700 has been lodged in this office by the Scottish Australian Mining Company (Limited), in payment of fine of £2 10s. per acre on certain mineral leases at Newcastle, and I am to request the favor of instructions as to the disposal of the money.

I have, &c.,
G. EAGAR.

Inform the Manager that a renewal of the lease of portions 22 and 23 at Newcastle will be issued to Messrs. Morehead & Young, and that they can obtain the formal deed at any time after the 31st instant on application therefor.—J.L., 14/12/76. Informed 15 December, 1876.

No. 10.

The Under Secretary for Mines to The Under Secretary for Finance and Trade.

Sir,

Department of Mines, Sydney, 5 December, 1876.

I have the honor to inform you that Mr. A. Shannon, Sub-manager of the Scottish Australian Mining Company (Limited), has intimated to this Department that he, on the 28th ultimo, paid into the Treasury the sum of £700, as the fine for renewal of the leases of portions Nos. 22 and 23, comprising 280 acres, of the Newcastle Town Pasturage Reserve, for a period of fourteen years from the 31st of December instant, and I am to state that in this case the Secretary for Mines has fixed the fine at £2 10s. per acre.

I have, &c.,
HARRIE WOOD.

No. 11.

The Under Secretary for Mines to the Manager of the Scottish Australian Mining Company (Limited).

Sir,

Department of Mines, Sydney, 15 December, 1876.

With reference to your letter of the 28th ultimo respecting the issue of the deeds of lease of portions Nos. 22 and 23, being part of the Newcastle Town Pasturage Reserve, I have the honor, by direction of the Secretary for Mines, to inform you that a renewal of the lease of the aforesaid portions of land will be issued to Messrs. Morehead & Young, and that they can obtain the formal deed at any time after the 31st instant, on making application therefor.

I have, &c.,
HARRIE WOOD.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

MINING ON PRIVATE PROPERTY.

(PETITION FROM MINERS AND OTHERS INTERESTED IN MINING.)

Received by the Legislative Assembly, 23 June, 1887.

The humble Petition of the miners of Mount M'Donald.

To the Speaker and the Legislative Assembly of New South Wales,—

We, the undersigned, being miners or interested in the mining developments of New South Wales, respectfully request that the Bill about to be introduced on our behalf by Mr. C. L. Garland, M.L.A., for the purpose of mining on private properties be favourably entertained by you.

There are without doubt, in this extensive territory of New South Wales, large areas of land known to be highly auriferous, and to contain vast deposits of mineral wealth, but which, under existing laws, cannot be touched, thus retarding all tendencies towards natural progress and advancement in the line referred to.

The Bill about to be brought forward by Mr. Garland is we believe a step in the right direction, and as such should be entitled to the hearty support of all classes.

It is undoubtedly a matter of the deepest importance, not only to the mining but also to all other industrial classes, that the mineral resources of the country should be fully developed, as by those means new centres of industry would be established, which, with consequent advantages to the country by opening up new avenues of commercial activity, would contribute largely to the prosperity and welfare of the whole Colony.

We therefore hope and pray that the said Bill will be treated in the manner in which we desire. And we your most humble Petitioners will ever pray.

[Here follow 119 signatures.]

Similar Petitions were received,—

On 24th June, 1887, from miners of Uralla and others—125 signatures.

On 27th June, 1887, from miners of Lucknow and others—49 signatures.

On 28th June, 1887, from miners of Bowling Alley Point and others—49 signatures.

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

MINING ON PRIVATE PROPERTY.

(PETITION FROM MINERS OF HOME RULE AND OTHERS.)

Received by the Legislative Assembly, 29 June, 1887.

The humble Petition of the miners of Home Rule and others interested in the mining interests of the Colony.

To the Speaker and the Legislative Assembly of New South Wales,—

We, the undersigned, being miners or interested in the mining developments of New South Wales, respectfully request that the Bill about to be introduced on our behalf by Mr. C. L. Garland, M.L.A., for the purpose of mining on private properties be favourably entertained by you.

There are without doubt, in this extensive territory of New South Wales, large areas of land known to be highly auriferous, and to contain vast deposits of mineral wealth, but which, under existing laws, cannot be touched, thus retarding all tendencies towards natural progress and advancement in the line referred to.

The Bill about to be brought forward by Mr. Garland is, we believe, a step in the right direction, and as such should be entitled to the hearty support of all classes.

It is undoubtedly a matter of the deepest importance, not only to the mining but also to all other industrial classes, that the mineral resources of the country should be fully developed, as by those means new centres of industry would be established, which, with their consequent advantages to the country by opening up new avenues of commercial activity, would contribute largely to the prosperity and welfare of the whole Colony.

We therefore hope and pray that the said Bill will be treated in the manner in which we desire.

And we your most humble Petitioners will ever pray.

[*Here follow 71 signatures.*]

A similar Petition was received,—

On 30th June, 1887, from miners of Tarcutta and others—25 signatures.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

MINING ON PRIVATE PROPERTY.

(PETITION FROM MINERS OF BULLI.)

Received by the Legislative Assembly, 12 July, 1887.

The humble Petition of the miners of Bulli and others interested in the mining interests of the Colony.

To the Speaker and the Legislative Assembly of New South Wales,—

We, the undersigned, being miners or interested in the mining developments of New South Wales, respectfully request that the Bill about to be introduced on our behalf by Mr. C. L. Garland, M.L.A., for the purpose of mining on private properties be favourably entertained by you.

There are without doubt, in this extensive territory of New South Wales, large areas of land known to be highly auriferous, and to contain vast deposits of mineral wealth, but which, under existing laws, cannot be touched, thus retarding all tendencies towards natural progress and advancement in the line referred to.

The Bill about to be brought forward by Mr. Garland is, we believe, a step in the right direction, and as such should be entitled to the hearty support of all classes.

It is undoubtedly a matter of the deepest importance, not only to the mining but also to all other industrial classes, that the mineral resources of the country should be fully developed, as by those means new centres of industry would be established, which, with their consequent advantages to the country by opening up new avenues of commercial activity, would contribute largely to the prosperity and welfare of the whole Colony.

We therefore hope and pray that the said Bill will be treated in the manner in which we desire.

And we your most humble Petitioners will ever pray.

[Here follow 38 signatures.]

Similar Petitions were received,—

On 12th July, 1887, from miners of Tambaroora— 5 signatures.

”	”	Cobar	—60	”
”	”	Rockley	—66	”
”	”	Muttama	—12	”
”	”	Stannifer	—30	”
”	”	Parkes	—43	”
”	”	Tomingly	—34	”
”	”	Clifton	—47	”
”	”	Thackaringa	—27	”
”	”	Nana Creek	—14	”
”	”	Cadia	—25	”
”	”	Armidale	—52	”
”	”	Bermagui	—29	”
”	”	Junee Reefs	—35	”
”	”	Sofala	—42	”

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

DIAMOND DRILLS AND WATER AUGERS.

(AMOUNTS DUE TO MINES DEPARTMENT FOR.)

Ordered by the Legislative Assembly to be printed, 26 April, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly, dated 18th March, 1887, That there be laid upon the Table of this House, a Return showing,—

“The amounts and particulars of all outstanding accounts due to the
“Mines Department for the use of Diamond Drills and Water Augers.”

(Mr. Garland.)

STATEMENT of all Outstanding Accounts in connection with Diamond Drills and Water Augers
to 26th March, 1887.

Name.	No. of Drill.	Locality.	Amount.	Total.
DRILLS.				
			£ s. d.	£ s. d.
Brookdale Coal Co.	A	Clarence Siding	993 18 8	
Sydney and Melbourne Coal Co.	3	Bundanoon	487 4 8	
Great Western Coal Co.	10	Ballimore	97 2 6	
Cumberland Coal Co.	11	Heathcote... ..	1,071 0 1	
Sydney Coal Co.	11	Sutherland	1,560 10 0	
Sunny Corner Silver-mining Co.	13	Mitchell	239 2 6	
Folly Coal Co.	13	Waratah	251 5 8	
David Wilson	8	Monk-wearmouth... ..	150 0 0	
Thompson and Johnson	2	Branxton	240 1 3	
Department of Justice	4	Maitland	279 0 5	
Under Secretary for Works	12	Pelican Flat	934 11 0	
Sir Edward Strickland, K.C.B.	8	Currabong	27 7 8	
				6,331 4 5
AUGERS.				
Irving Winter	7	Tulcumbah	359 11 9	
Daniel Capel	9	Gorian Station	136 0 9	
				495 12 6
			£	6,826 16 11

[3d.]

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1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

REPORT FROM THE SELECT COMMITTEE

ON THE

CLAIM OF MATTHEW M'IVOR TO A TIN-MINE
AT PHEASANT'S CREEK ;

TOGETHER WITH THE

PROCEEDINGS OF THE COMMITTEE.

ORDERED BY THE LEGISLATIVE ASSEMBLY TO BE PRINTED,
21 *April*, 1887.

SYDNEY : CHARLES POTTER, GOVERNMENT PRINTER.

1887.

1887.

EXTRACTS FROM THE VOTES AND PROCEEDINGS OF THE
LEGISLATIVE ASSEMBLY.

VOTES No. 9. TUESDAY, 22 MARCH, 1887.

8. CLAIM OF MATTHEW M'IVOR TO A TIN-MINE AT PHEASANT'S CREEK :—*Mr. Melville*, for Mr. Jones, moved, pursuant to Notice,—
- (1.) That a Select Committee be appointed, with power to send for persons and papers, to inquire into and report upon the claim of Matthew M'Ivor to a Tin-mine at Pheasant's Creek.
 - (2.) That such Committee consist of Mr. Abigail, Mr. Henry Clarke, Mr. Kethel, Mr. Neild, Mr. Vaughn, Mr. O'Mara, Mr. Day, Mr. Gibbes, Mr. Garvan, and Mr. Jones.
 - (3.) That the reports and evidence of the Select Committees on the same subject, brought up on 9th October, 1884, and 27th August, 1886, a.m., respectively, be referred to such Committee.
- Question put and passed.
-

VOTES No. 22. THURSDAY, 21 APRIL, 1887.

8. CLAIM OF MATTHEW M'IVOR TO A TIN-MINE AT PHEASANT'S CREEK :—Mr. Jones, as Chairman, brought up the Report from, and laid upon the Table the Minutes of Proceedings of the Select Committee for whose consideration and Report this subject was referred on 22 March, 1887. Ordered to be printed.
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1887.

CLAIM OF MATTHEW M'IVOR TO A TIN-MINE AT PHEASANT'S CREEK

REPORT.

THE SELECT COMMITTEE of the Legislative Assembly, appointed on the 22nd March, 1887,—“with power to send for persons and papers, to inquire into and report upon the claim of Matthew M'Ivor to a Tin-mine at Pheasant's Creek,” and to whom was referred on the same date *the Reports from the Select Committees of Sessions 1883-4 and 1885-6*, in reference to the said claim,—have agreed to the following Report:—

1. Your Committee having considered the Reports referred to them, find as follows:—

- (1.) That application for a mineral lease of block No. 9, of 20 acres, parish of Moogem, county of Clive, was made by Matthew M'Ivor on the 27th day of July, 1881, which application was duly received on the 5th day of August, 1881, by the Warden's Clerk at Glen Innes.
- (2.) That an application for a mineral conditional purchase of the very same land was made on 25th May, 1882, by one G. K. King.
- (3.) That a mineral lease of the said land was duly granted on the 9th day of May, 1882, and afterwards issued to the said Matthew M'Ivor, and a notification thereof appeared in the Government Gazette.
- (4.) That the said Matthew M'Ivor complied with all the regulations respecting said land to entitle him to a lease thereof.
- (5.) That in consequence of unnecessary and unaccountable delay in the Department of Mines, twelve months and five days elapsed between the time the application for lease was made and its being issued.
- (6.) That no less than forty-eight applications for mineral leases made by other applicants, subsequently to Matthew M'Ivor's application, were issued to them before the said lease was issued to the said Matthew M'Ivor.
- (7.) That the said lease was signed by His Excellency the Governor as if executed on the 9th day of May, 1882, whereas actually it was not executed until the 3rd day of June, 1882; and in consequence thereof the said Matthew M'Ivor lost the said land in an action brought by the said G. K. King against him.
- (8.) That the said Matthew M'Ivor had no knowledge of this illegal practice until the point was taken at the trial in the Supreme Court, and by it he lost, not only his land, but was put to very great expense, &c.
- (9.) That, on the faith of the validity of the lease other persons purchased large interests from the said Matthew M'Ivor, and that it is most probable that the mine would have been floated into a public Company, with a capital of £45,000.

2. Your Committee, in view of the foregoing facts, are of opinion :—

- (1.) That as the land applied for was a measured portion, and as in the application the said Matthew M'Ivor said "the previous survey is accepted, being measured portion block No. 9," the lease should have been issued shortly after the application was made.
- (2.) That inasmuch as the said land was in a proclaimed Gold-field it was not legally open to conditional purchase.
- (3.) That upon the evidence of professional and practical men of high standing (in this Colony and Victoria) the said land contains great mineral wealth.
- (4.) That the claim of Matthew M'Ivor is entitled to the most favourable consideration of the Government.

TRAVERS JONES,

No. 3 Committee Rooms,

Chairman.

Sydney, 21st April, 1887.

PROCEEDINGS OF THE COMMITTEE.

WEDNESDAY, 6 APRIL, 1887.

MEMBERS PRESENT:—

Mr. Jones,	|	Mr. Vaughn,
	Mr. Day.	

Mr. Jones called to the Chair.

Entry from Votes and Proceedings, appointing the Committee, and referring Reports from Select Committees of Sessions 1883-4 and 1885-6, read by the Clerk.

Printed copies of the Reports before the Committee.

Committee deliberated.

(Reassembling of the Committee to be arranged by the Chairman.)

THURSDAY, 21 APRIL, 1887.

MEMBERS PRESENT:—

Mr. Jones in the Chair.

Mr. Henry Clarke,	|	Mr. Vaughn,
Mr. Day,		Mr. Gibbes.

Committee deliberated.

Motion made (*Mr. Vaughn*) and Question,—“That the Report brought up by a former Committee on this subject, and dated 5 August, 1886, be the Report of this Committee,”—put and passed.

Chairman to report to the House.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

PROSPECTING FOR GOLD AND OTHER MINERALS.

(REGULATIONS FOR DISTRIBUTION OF VOTE FOR.)

Ordered by the Legislative Assembly to be printed, 12 July, 1887.

REGULATIONS RELATING TO THE VOTE IN AID OF PROSPECTING.

1. From out the sum of £15,000 voted by Parliament for the encouragement of prospecting, such sums may be granted by the Minister for Mines to any miner or party of miners applying for the same, as shall be recommended by the Prospecting Board, as hereinafter provided.

2. Before recommending the grant of any money to any miner or party of miners for the purpose of prospecting any site selected by them, the Prospecting Board shall be satisfied by inquiry and examination that the tract of country proposed to be prospected, and the mode of prospecting proposed, are suitable and shall then estimate the cost of the proposed work, and of the materials and implements necessary therefor.

3. The Prospecting Board shall in no case recommend the granting of a sum exceeding 50 per cent. of the estimated cost of the proposed works and necessary materials and implements.

4. In the event of any money being granted to any miner or party of miners as aforesaid, such miner or miners may, from time to time, claim such instalment thereof as the Warden or other officer authorized thereto by the Minister shall certify as due under these Regulations. But before giving any such certificate, the Warden or other officer shall inspect the work, materials, and implements, in respect of which the instalment is claimed, and shall see that the work has been done within the site, and in the manner approved of by the Board, and that the sum claimed does not exceed 50 per cent. of the value (according to the estimate made by the Prospecting Board) of the work done, and of the cost of materials and implements necessary therefor.

5. The Prospecting Board may in any case in which it shall appear expedient so to do, recommend that, as a condition precedent to the granting of money, the miner or party of miners to whom it is proposed to make the grant, shall enter into a contract to perform the work in the place and manner recommended by such Board, and the miner or party of miners shall, if required, enter into a bond for the satisfactory completion of such work. And every such agreement shall set out in what manner, at what times, and subject to what conditions the money granted, or any instalment thereof, may be claimed.

6. Upon the recommendation of the Prospecting Board, any portion of territory selected as a site for prospecting may be reserved from sale, selection, or leasing, and from occupation under miner's rights or mineral licenses.

7. At any time after the discovery of gold or other minerals within any such reserve, so much of the area as in the opinion of the Minister for Mines shall not be necessary to recompense the miner or party of miners for having made such discovery, shall be thrown open to occupation under the Acts and Regulations relating to Mining.

8. No miner or party of miners to whom aid shall be granted under these Regulations, shall be entitled to claim any money reward which has been, or shall be offered by the Government for the discovery of new gold fields.

9. The Prospecting Board aforesaid shall consist of the Under Secretary for Mines, the Geological Surveyor, and the Inspector of Mines: Provided that the Minister for Mines may at any time appoint any other person a member of such Board, in addition to or in substitution for any of the officers aforesaid.

1887.

(SECOND SESSION.)

NEW SOUTH WALES.

REPORT,

MINUTES OF PROCEEDINGS, RESOLUTIONS, &c.,

OF THE

AUSTRALASIAN STOCK CONFERENCE,

HELD IN SYDNEY IN SEPTEMBER AND OCTOBER, 1886.

Presented to Parliament by Command.

SYDNEY: CHARLES POTTER, GOVERNMENT PRINTER.

1887.

113—*a*

[3s.]

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PAPERS AND REPORTS.

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[A name in parenthesis signifies that the Member named has moved a resolution.]

CONFERENCE of Chief Inspectors of Stock, Veterinary Surgeons,
and Stock-breeders of the Australasian Colonies, held
in Sydney in September and October, 1886.

REPORT OF AUSTRALASIAN STOCK CONFERENCE.

THE Conference commenced its sittings on the 27th of September, and concluded its labours on the 8th of October.

It was called together by the Hon. the Minister for Mines, with the view of assimilating the regulations in force in the Colonies for the prevention of diseases in stock.

The following were the representatives of the several Colonies :—

<i>New South Wales</i>	{	Mr. A. BRUCE, Chief Inspector of Stock. Mr. R. G. HIGGINS, Stock Breeder. Mr. E. STANLEY, F.R.C.V.S., Government Veterinarian.
<i>Victoria</i>		Mr. E. M. CURR, Chief Inspector of Stock.
<i>Queensland</i>	{	Mr. P. R. GORDON, Chief Inspector of Stock. Hon. H. C. WOOD, M.L.C., Stock Breeder.
<i>Tasmania</i>	{	Mr. T. A. TABART, Chief Inspector of Stock. Mr. A. PARK, M.R.C.V.S., Government Veterinarian. Mr. J. MEREDITH, Stock Breeder.
<i>New Zealand</i>	{	Hon. W. S. PETER, M.L.C., Stock Breeder. Mr. J. D. LANCE, M.H.R., Stock Breeder. Mr. J. M'KENZIE, M.H.R., Stock Breeder. Mr. G. S. COOPER, Under Secretary, Wellington.
<i>South Australia</i> ...	{	Mr. C. J. VALENTINE, Chief Inspector of Sheep. Mr. J. BAGOT, M.P., Stock Breeder.

The following is a copy of the circular letter, dated 30th July, by which the Conference was called together :—

“ Sir, Colonial Secretary's Office, Sydney, 30th July, 1886.

“ Referring to my letter of the 8th February last, in which attention was invited to the desirability of assimilating the regulations in force in all the Colonies relating to sea-borne sheep, I have now the honor, at the instance of my colleague the Secretary for Mines, to enclose, for the consideration of your Government, a copy of a minute by the Chief Inspector of Stock for this Colony, with reference to the holding of a Conference in Sydney for the purpose abovementioned, and to suggest that each Colony be represented at such Conference by its Chief Inspector of Stock and two gentlemen connected with stock-breeding.”

The Conference was opened by the Minister for Mines, who pointed out the vast interest with which the Conference were about to deal. He said that the value of horses, cattle, and sheep in the Colonies was estimated at £78,994,871, and the income therefrom £33,669,973. Taking the capital value of land with improvements and plant and the capital value of stock, the total was £359,000,000.

The Minister having declared the meeting opened, withdrew, and Mr. A. Bruce was appointed Chairman.

RESOLUTIONS PASSED BY THE CONFERENCE.

1. *Preliminary.*

1. That each Colony have three votes.
2. That the following be the subjects for discussion, and the order in which they are to be taken :—
 - (I.) The consideration of Regulations with respect to diseases in animals.
 - (II.) Regulations relating to the introduction of Australasian animals—
 - (1) by sea, (2) by land.
 - (III.) Regulations with respect to the introduction of Foreign animals.
 - (IV.) The collection and publication of information with respect to diseases in animals.
 - (V.) Regulations in regard to the travelling, movement, or conveyance of animals.
 - (VI.) The destruction of noxious animals.
 - (VII.) The destruction of weeds and noxious plants.
 - (VIII.) The branding and marking of animals.
 - (IX.) Any other subject which may be suggested and agreed to by the members of the Conference connected with the object for which it is convened.
3. That the term "Australasian Colonies" comprise the Colonies on the Continent of Australia, also Tasmania and New Zealand; and that the term "Foreign" shall be held to include all other parts of the world.

2. *Diseases in Animals.*

4. That Legislative power be taken to compel the destruction of all animals which have died of or are suffering from Anthrax, and that all other animals which have been in contact with the diseased animals be, where practicable, placed in proper quarantine until certified free from disease.
5. That the travelling, selling, or offering for sale, or slaughtering for food, of any animals affected with the disease known as Tuberculosis, or the using of cows affected with Tuberculosis for dairy purposes, be punishable by law.
6. That power be taken to destroy animals actually diseased with Pleuro-pneumonia; that penalties be enforced for leaving diseased animals or dead bodies undestroyed; and that stockowners be compelled to give notice in writing of every outbreak of the disease to the Chief Inspector of Stock and to the nearest Inspector of Stock.
7. That the Conference desires to express its belief in the efficacy of inoculation as a preventive of Pleuro-pneumonia.
8. That inoculation for Pleuro-pneumonia be not made compulsory.
9. That communication be opened with M. Pasteur with a view to ascertain whether the virus or contagium of Pleuro-pneumonia has been or can be cultivated apart from the living subject; and if so, to state the mode of cultivation, as also the best methods of preparing and preserving virus for inoculation.
10. That all sheep infected with Catarrh be destroyed; that the owners be recompensed to the extent of two-thirds the value of sound sheep at the date of destruction; and that the run or place on which the sheep were pasturing be strictly quarantined for six months.
11. That, as the conditions are so various in the different Colonies, each Colony should legislate for itself, where practicable, on the subjects of fluke, worms, and foot-rot in sheep.
12. That the Government of Western Australia be urged by the Governments of the Colonies represented at the Conference to take all possible steps for the speedy eradication of Scab.
13. That the Conference having heard from Mr. Lance, one of the New Zealand delegates, the steps taken by the Government of that Colony with regard to Scab are satisfied that the stringent measures being adopted will result in the speedy eradication of the disease.
14. That the several Governments obtain power, in the event of an outbreak of Scab, to destroy at their discretion the infected sheep, and those that have been in direct or indirect contact with them, and to take every other means for the absolute and immediate eradication of the disease.

15. That steps be taken by the several Australasian Colonies to thoroughly eradicate Ticks and Lice in sheep.

16. That any animals found to be infected with Glanders, Farcy, Foot-and-mouth disease, Rinderpest, Sheep Pox, Swine Fever, Rabies, Trichinosis, or any other infectious or contagious disease not existing within the Colonies be at once destroyed.

17. That it is desirable that an efficient and competent staff of Inspectors of Stock be maintained in each Colony, to prevent the introduction and to arrest the spread of Scab or any other contagious or infectious disease.

Interchange of Australian Animals.

18. That no sheep from any of the Australasian Colonies in which Scab exists be introduced into any of the other Australasian Colonies.

19. That no Colony shall be deemed to be a clean Colony in which Scab exists or has existed within the next preceding twelve months.

20. That no breeding sheep shall be imported except by vessels that have not traded to any but a clean Australasian Colony within the next preceding six months, nor by any vessel which shall within that period have had any sheep on board from any Colony or country other than a clean Australasian Colony.

21. That all breeding sheep be accompanied by a certificate of an Inspector of Sheep, or a declaration of health certified by an Inspector of the Colony from which they came that such sheep are clean, and that Scab has not existed there for the preceding twelve months.

22. That imported breeding sheep from any of the Australasian Colonies, before they are allowed to go at large in any other Australasian Colony, be placed in quarantine until they have been once dipped in a tobacco and sulphur or lime and sulphur dressing.

23. That the temperature of the dip be not less than 100, nor more than 110 degrees Fahrenheit.

24. That the sheep swim and be completely immersed while in the bath, and the bath to last from one to two minutes, according to its temperature, and as the case may require.

25. That no fodder, straw, litter, or excreta with or about imported sheep be landed; and that all fittings, cases, or cages brought with such sheep and landed be cleansed and disinfected, as the Chief Inspector shall direct, or be re-shipped.

26. That it be not necessary to dip fat sheep imported from any clean Australasian Colony to another Australasian Colony solely for the purpose of slaughter; provided that such sheep be slaughtered in accordance with the regulations of the Colony into which they are imported.

27. That stock, unless from Western Australia, which are allowed by law to travel in the Australasian Colony in which they have been bred, or into which they have been introduced, in accordance with the law there in force, be allowed to enter any neighbouring Colony by land at any lawful place of entrance without further obstacle, unless it be found, on examination by an Inspector of the Colony into which it is proposed to introduce such stock, that they are infected with some disease which is held to be contagious or infectious by the law of such Colony, or unless such Inspector has reason for suspecting the presence of contagious or infectious disease in such stock; and the fact that stock are held to be free from disease in any Colony, and so allowed to go at large, be *primâ facie* evidence of their freedom from contagious or infectious disease.

28. That where an outbreak of disease occurs in any Colony the neighbouring Colonies may, pending the expense and risk of the outbreak being definitely ascertained, at once issue a prohibition against the introduction of stock from such Colony; and that the duration of the prohibition depend upon the amount of risk arising from such outbreak.

29. That the Conference desires to express its strong opinion, in view of the prospect of the assimilation of the stock regulations of the different Colonies, and the great desirability for the freest interchange of stock, that it is undesirable that any duty be charged upon stock going from one Colony to another.

4. *Introduction of Foreign Animals.*

30. That the time has arrived when the prohibition on the importation of cattle and sheep from the United Kingdom may, under proper restrictions, be safely removed, and that the Governments of Australasia be requested to give effect to this resolution.

31. That the importation of Goats and Deer be prohibited, except for Zoological Gardens.

32. That the importation of Pigs be prohibited, as Swine Fever is prevalent in England.

33. That Foreign Dogs landed in any Australasian Colony be detained in quarantine at a special place set apart for the purpose by the Government of each Colony for a period of six months from date of arrival.

34. That Camels be inspected on arrival by an Inspector of Stock and a Veterinary Surgeon, and if they are not infected with disease they be permitted to land, and be quarantined for the same period as cattle, namely, 120 days; that if they are infected with Foot-and-mouth disease or Rinderpest they be destroyed; and that all Camels suffering from any skin disease be treated in such manner as the Chief Inspector shall direct, and under his control.

35. That the following be included among the regulations under which foreign stock are admitted into any Australasian Colony:—

- (a.) That foreign stock leaving for exportation to any of the Australasian Colonies be accompanied by a declaration from the owner or breeder that they are not infected.
- (b.) That all foreign cattle and sheep be taken direct from the place from which they start to the port of shipment; and if they do not travel on foot they be conveyed in a goods waggon, and not put into any conveyance, stable, or other place where animals liable to the same diseases have been within the next preceding 60 days.
- (c.) That all animals, except horses, exported to Australasia be shipped from the port of London.
- (d.) That the Agents-General for the several Colonies be asked to appoint one (*i.e.*, the same) registered Veterinary Surgeon to examine all stock intended to be exported to any of the Colonies; such Veterinary Surgeon to give a certificate of health to accompany the animals.
- (e.) That the skins of all animals which may have died or been slaughtered on board any foreign vessel during the voyage, and not destroyed or thrown overboard, be salted and securely packed in cases or casks, and not landed.
- (f.) That foreign animals be only admitted at such port or ports as shall be declared quarantine ports for such animals.
- (g.) That a declaration be obtained from the captain of the vessel as to the health of foreign stock on board on arrival in port.
- (h.) That the introduction by sea or land of any animal or thing infected or suspected of being infected be prohibited.
- (i.) That if foreign animals are infected they be destroyed or disposed of, as the Minister directs.
- (j.) That if any foreign animals are brought to a port or place in an Australasian Colony, but are not intended to be landed, they be examined by an Inspector or Veterinary Surgeon, and if found free from infectious or contagious disease removed to quarantine, and there kept until the sailing of the vessel, the expense of their detention in quarantine being defrayed by the owner. If their owner refuse to send the animals to quarantine they be forthwith destroyed on board.
- (k.) That foreign horses be admitted without quarantine if found, on inspection by a properly qualified Veterinary Surgeon and Inspector of Stock, to be free from disease.
- (l.) That foreign animals intended to be landed in the Colonies be examined by a Veterinary Surgeon and an Inspector of Stock, who shall report to the Chief Inspector of Stock whether or not such or any other animals on board such vessel are infected.

(m.)

- (m.) That if foreign animals other than horses are not prohibited, and are reported free from infection, and if the Chief Inspector be satisfied that they are not infected, they may, after being washed and disinfected, as he shall direct, be landed for quarantine on sufficient bond and guarantee.
- (n.) That all foreign animals be conveyed by water, at the owner's risk and expense, to quarantine, and remain for the terms respectively prescribed for the different kinds of animals, at their owner's risk and expense, and that they be washed, dipped, and disinfected, as the Chief Inspector of Stock shall direct.
- (o.) That the period of quarantine for cattle be 120 days.
- (p.) That all foreign sheep landed in any Australasian Colony remain in quarantine for a period of not less than 90 days.
- (q.) That all foreign sheep landed in the Colonies forthwith receive two or more dressings with tobacco and sulphur, or with lime and sulphur, at intervals of from ten to fifteen days between each dressing, with the medicaments of the strength, at the temperature, and for the duration prescribed in regard to imported Australasian sheep.
- (r.) That on the expiry of the term of quarantine prescribed for foreign animals they be examined by a duly qualified Veterinary Surgeon and an Inspector of Stock, and released on the order of the Chief Inspector.

5. *Publication of Information re Diseases.*

36. That the several Governments be invited to collect, publish, and exchange all original useful information with respect to diseases in animals, and their prevention and cure.

6. *Regulations re Travelling and Movement of Animals.*

37. That regulations in regard to the travelling, movement, or conveyance of animals be left to be dealt with by each Colony within its own boundaries.

7. *Destruction of Noxious Animals.*

38. That, as the skins of marsupials have become so valuable, the several Governments of the Colonies in which marsupials exist instruct the Vermin Boards, or others who have the administration of the law, not to levy assessment for the coming year, or for such further period as may be deemed advisable.

39. That the means at present available for the destruction of rabbits are most costly, and are not radical cures, and that until some discovery shall have been made more searching and fatal in its effects upon rabbits than anything at present known their absolute eradication cannot be accomplished. The Conference therefore recommends that a bonus be offered by the Australasian Colonies collectively for the purpose of bringing about such a desirable object; such bonus to be granted under such regulations as to success as the Colonies may consider desirable.

8. *Destruction of Noxious Plants.*

40. That the Governments of the several Colonies, where they have not already done so, take power to make the destruction of noxious plants compulsory, such as Prickly Pear, Californian Thistle, Bathurst Burr, Noogoora Burr, and other plants injurious to wool, stock, or pastures.

41. That collections be made of all plants suspected of being poisonous to stock, with the view to their true character being ascertained by analysis, feeding of stock, and otherwise, and to the necessary steps being taken to prevent, as far as possible, losses to stock by such plants as are found to be poisonous.

9. *The Branding and Marking of Animals.*

42. That only such ear-marks as are authorized by the Governor-in-Council and registered with the Inspector for the district be used for sheep; that the "tip" mark be prohibited; and that all ear-marks be made with pliers.

43. That any stockowner owning runs in different Colonies, with the sanction of the Registrars of Brands, be permitted to register in each Colony the brand in use by him and registered in his name in either Colony; and that it be a recommendation of the Conference that such Colonies as have legislation on the subject so amend their Brands Acts as to give effect to this resolution.

44. That the dew-lap mark be reserved in all Colonies having legislation upon the branding and marking of stock as a distinctive mark for spayed cows.

45. That the distinctive mark in use in Queensland—taking the tip off the off (*i.e.*, the right) ear—be used throughout the Colonies as the sign of inoculation.

10. *Additional.*

46. That all drafts of laws or regulations dealing with the diseases of animals be, as far as practicable, submitted by the Government framing them to the Governments of the other Colonies for remark before they become law.

47. That it is desirable that regulations be framed on the resolutions passed by the Conference so that the regulations and relative certificates in each Colony may, as far as practicable, be the same in all the Colonies.

48. That the Conference recommends to the Queensland, South Australian, and Western Australian Governments the desirability of exercising the greatest possible vigilance with respect to their northern ports to prevent the introduction of diseases from Eastern, Indian, or Chinese ports.

49. That the Conference, taking into consideration the importance of the subjects that have come before them for discussion and decision, are of opinion that an Australasian Stock Conference should be held triennially at the chief city of one of the Colonies, and they respectfully offer this recommendation to the several Governments.

ALEX. BRUCE,
Chairman.

MINUTES of Proceedings of the Australasian Stock Conference, held in Denham Chambers, Sydney, September and October, 1886.

Denham's Chambers, Sydney, Monday, the 27th September, 1886.

THE UNDERMENTIONED gentlemen were present:—The Honorable JAMES FLETCHER, Minister for Mines; Mr. HARRIE WOOD, Under Secretary for Mines; and the following representatives of the several Australasian Colonies.

<i>New South Wales</i>	{ Mr. A. BRUCE, Chief Inspector of Stock. Mr. E. STANLEY, F.R.C.V.S., Government Veterinarian.
<i>Victoria</i>	Mr. E. M. CURR, Chief Inspector of Stock.
<i>Queensland</i>	{ Mr. P. R. GORDON, Chief Inspector of Stock. The Hon. H. C. WOOD, M.L.C., Stock Breeder.
<i>South Australia</i> ..	{ Mr. C. J. VALENTINE, Chief Inspector of Stock. Mr. J. BAGOT, M.P., Stock Breeder.
<i>Tasmania</i>	{ Mr. T. A. TABART, Chief Inspector of Stock. Mr. A. PARK, M.R.C.V.S., Government Veterinarian. Mr. J. MEREDITH, Stock Breeder.
<i>New Zealand</i>	{ The Hon. W. S. PETER, M.L.C., Stock Breeder. Mr. J. D. LANCE, M.H.R., Stock Breeder. Mr. G. S. COOPER, Under Secretary, Wellington.

Western Australia was unable to send a delegate.

The Hon. James Fletcher took the chair for the purpose of formally opening the meeting.

Mr. FLETCHER said that so far back as February last some steps were taken to bring about a conference from the various Colonies of the Chief Stock Inspectors; but, for some reason or other—he supposed from no Government being allowed to keep office long—the matter was allowed to lie over until the present Government came into office. His attention was called to the matter by Mr. Bruce, Chief Inspector of Stock for this Colony, and he immediately took steps to give effect to the request then made. They were present in consequence of that request. The importance of the questions to come under their notice could not be over-estimated; and since he had been in office—a few months—he had found a great deal of difficulty, in consequence of the difference in the regulations of the various colonies, of dealing with these matters. It occurred to him that if the gentlemen connected with stock in the various colonies met and deliberated, it would be possible to more nearly assimilate the regulations so as to offer greater facilities for the interchange of stock, and yet guard against the importation of disease into any of the colonies. He had had a statement prepared which warranted him in taking the initiative in asking them to meet that day. He found from this carefully prepared statement that the value of horses, cattle, and sheep in the various colonies was estimated at £78,994,871 6s. It would be needless for him to give the estimated value of the stock in each colony. He simply contented himself with giving the gross amounts. The gross income, on the same basis, was estimated at £33,669,973. Taking the capital value of the land with improvements and plant and the capital value of stock, the figures furnished him represented a total of £359,000,000. With such an enormous capital it surely behoved everyone in authority to do everything possible to offer all possible facilities for the interchange of stock with, as he had said, proper precautions against the introduction of disease. He had very great hopes with the experience that they had gained that the result of their deliberations would be that the regulations would be more in harmony than they were at present, that proper precautions in their administration would be maintained, and that altogether the stock-breeding interest would be largely benefited by their assembling. It was his desire to give effect, as far as possible, to their recommendations, and to have them carried out. The colonies were not equally represented—some had two representatives, some three, and one had only one. He would therefore recommend that while they allowed all the representatives to take part in the debate, they should simply vote as colonies. For instance, it would be clearly unfair for New South Wales to have three votes while Victoria had only one or Queensland only two. In declaring the Conference open he could assure them that he hoped it would be for the good of all the colonies, that in future they would not have so much friction in carrying out the regulations as in the past, but that everything would be done to offer the greatest facilities to stock-breeders with a due regard for the protection of stock against disease. He hoped their deliberations would have that result, and that the time was not far distant when every stock-owner in the colonies would be thankful for this Conference sitting to-day.

The following is the Tabulated Statement referred to by the Minister for Mines :—

STATEMENT of the Number and Approximate Estimate of the value of the Horses, Cattle, and Sheep in New South Wales, Victoria, Queensland, South Australia, Western Australia, Tasmania, and New Zealand, 1885.

Colony.	Horses.			Cattle.			Sheep.			Total Value of Horses, Cattle, and Sheep in each Colony.
	Number.	Average Rate Per Head.	Value.	Number.	Average Rate Per Head.	Value.	Number.	Average Rate Per Head.	Value.	
New South Wales	344,697	£ s. d. 10 0 0	£ s. d. 3,446,970 0 0	1,317,315	£ s. d. 4 10 0	£ s. d. 5,927,917 10 0	37,320,903	£ s. d. 0 7 0	£ s. d. 13,237,317 2 0	£ s. d. 22,612,204 12 0
Victoria	320,933	10 0 0	3,009,030 0 0	1,300,093	4 10 0	5,850,000 0 0	11,709,000	0 7 0	4,095,000 0 0	12,954,000 0 0
Queensland	269,707	10 0 0	2,602,070 0 0	4,162,632	4 10 0	18,731,934 0 0	5,994,322	0 7 0	3,148,012 14 0	24,482,016 14 0
South Australia	172,009	10 0 0	1,720,090 0 0	450,000	4 10 0	2,025,000 0 0	7,336,046	0 7 0	2,578,116 2 0	6,323,116 2 0
Western Australia	31,392	10 0 0	343,923 0 0	70,403	4 10 0	285,833 0 0	1,702,719	0 7 0	595,951 12 0	1,259,707 12 0
Tasmania	23,610	10 0 0	239,103 0 0	138,642	4 10 0	623,883 0 0	1,648,627	0 7 0	577,019 8 0	1,437,003 8 0
New Zealand	151,733	10 0 0	1,017,333 0 0	698,637	4 10 0	3,143,866 10 0	14,624,547	0 7 0	5,118,591 8 0	9,879,817 18 0
Total	1,302,542	.....	13,025,420 0 0	8,137,654	.....	36,619,443 0 0	83,857,167	.....	29,350,008 0 0	78,994,871 6 0

APPROXIMATE ESTIMATE of the Annual Return from the Horses, Cattle, and Sheep, in the Colonies of New South Wales, Victoria, Queensland, South Australia, Western Australia, Tasmania, and New Zealand.

Colony.	Horses.			Cattle.			Sheep.			Wool.			Total Value of the Annual Return from Stock in each Colony.
	Annual Cast.	Rate per Head.	Value.	Annual Cast.	Rate per Head.	Value.	Annual Cast.	Rate per Head.	Value.	Clip.	Rate per lb.	Value.	
New South Wales	43,089	£ s. d. 15 0 0	£ 646,200	219,550	£ s. d. 7 10 0	£ 1,646,625	7,564,181	£ s. d. 0 10 0	£ 3,782,000	lbs. 168,151,659	£ s. d. 0 0 9	£ 6,305,637	£ 12,380,602
Victoria	37,603	15 0 0	564,030	216,030	7 10 0	1,624,995	2,340,000	0 10 0	1,170,000	52,650,000	0 0 9	1,974,375	5,333,370
Queensland	32,500	15 0 0	487,500	698,773	5 10 0	3,815,762	1,798,864	0 10 0	899,432	40,474,449	0 0 9	1,517,791	6,720,485
South Australia	21,500	15 0 0	322,500	75,000	7 10 0	562,500	1,473,200	0 10 0	736,604	33,147,207	0 0 9	1,243,020	2,864,624
Western Australia	4,309	15 0 0	64,500	11,733	7 10 0	83,012	340,543	0 10 0	170,272	7,336,556	0 0 9	271,370	594,154
Tasmania	3,575	15 0 0	53,625	23,100	7 10 0	173,250	323,725	0 10 0	164,862	7,418,821	0 0 9	278,205	669,942
New Zealand	20,210	15 0 0	303,150	116,440	7 10 0	873,330	2,924,900	0 10 0	1,462,454	65,810,460	0 0 9	2,467,892	5,109,796
Total	.....	.....	2,441,475	.....	.....	8,784,444	.....	.....	8,385,714	.....	.....	14,058,340	33,669,973

Approximate Capital Value of Land, Improvements, Plant..... £280,000,000

Capital Value of Stock 79,000,000

£359,000,000

The Minister and Mr. Harrie Wood then withdrew.

Mr. WOOD moved, and Mr. TABART seconded, that Mr. Alexander Bruce be the permanent Chairman of the Conference.

The motion was agreed to, and Mr. Bruce took the chair.

The following papers having reference to the appointment of the Conference were laid before the meeting, together with copies of the "Stock and Pastures Bill for New South Wales":—

Circular letter from Colonial Secretary, New South Wales, to Governments of other Colonies.

Sir, Colonial Secretary's Office, Sydney, 8 February, 1886.

I have the honor, at the instance of my colleague the Secretary of Mines, to transmit herewith, for the consideration of your Government, a copy of a recommendation of the Metropolitan Board of Sheep Directors, regarding the quarantining and dressing of sheep brought to New South Wales by sea from any of the other clean Australian Colonies, together with a statement showing how the regulations affecting such sheep differ, and to draw attention to the advisability of assimilating the regulations in force in all the Colonies relating to sea-borne sheep.

I have the honor to be,
Sir,

Your most obedient servant,

Sir, Board of Sheep Directors, Sydney, 7 January, 1886.

With reference to the correspondence submitted to this Board respecting the stringency of the regulations at present in force in regard to the introduction into this Colony of sea-borne sheep from other Australian Colonies, and as to the advisability of assimilating the laws in this respect in each of the Colonies, I have the honor to state that the subject was very fully considered at meetings of the Board held on the 10th and 19th November last, when the following resolution was unanimously adopted:—Proposed by Mr. E. Vickery, seconded by Mr. D. M'Master—"That this Board having carefully considered the correspondence, minutes, and petition submitted by the Minister for our consideration, resolved that this Board recommend that the regulations of 10th April, 1885, be modified so as to provide that the certificate of the Chief Inspector of Stock be deemed sufficient, that the quarantine be reduced from eighteen to twelve days, and that the term of two years, in clause 5, be reduced to twelve months."

"That in all other respects the regulations be adhered to."

I have, &c.,
R. G. HIGGINS,
Chairman.

The Under-Secretary for Mines.

STATEMENT

STATEMENT as to the Regulations under the Diseases in Sheep Acts as in force in each of the under-mentioned Colonies, with regard to the Quarantine and Dressing of Sheep introduced into each.

Colony.	Quarantine.			Dressings.			
	Length.	From what Colony.	Remarks.	No.	Remarks.	Ingredients.	
New South Wales.	*Eighteen days.	Clean Colonies..	Prior to dipping	1	Tobacco and sulphur.	Sheep from infected Colonies prohibited
Queensland.	Twenty-one days.	Any Colony.....	.....	3	At ten days' interval.	As Chief Inspector directs
Victoria ...	Twenty-four hours.	.....	.....	1	Or more, as Chief Inspector directs. (Practice is two dippings in twenty-four hours.)	Lime and sulphur.
South Australia	Six days ...	Clean Colonies..	As Chief Inspector directs ...	1	Sulphur and lime, or sulphur and tobacco.	Sheep from New Zealand and Western Australia prohibited
	Not less than fourteen and likely thirty days	New Zealand, Western Australia.	Infected Colonies	3	According to circumstances	Sulphur and lime, or sulphur and tobacco.	
Tasmania ...	Nil	Allowed to travel inland when dipped.	.....	1	According as Chief Inspector directs.	As Chief Inspector directs
New Zealand.	Ten days ...	Any Colony.....	Allowed to land if accompanied by Inspector's certificate at port at which they were shipped, and that the vessel has not been in any outside port for the previous six months.	2	In ten days ...	.....
Western Australia.	On inspection.	Any Colony.....	Ninety days' quarantine if unaccompanied by Inspector's certificate at port where shipped from.	.....	.....	.....

* Now twelve days.

Sir,

Colonial Secretary's Office, Sydney, 30 July, 1886.

Referring to my letter of the 8th February last, in which attention was invited to the desirability of assimilating the Regulations in force in all the Colonies relating to sea-borne sheep, I have now the honor, at the instance of my colleague the Secretary for Mines, to enclose, for the consideration of your Government, a copy of a Minute by the Chief Inspector of Stock for this Colony, with reference to the holding of a Conference in Sydney for the purpose above mentioned, and to suggest that each Colony be represented at such Conference by its Chief Inspector of Stock and two gentlemen connected with stock-breeding.

I have, &c.,

Minute Paper.—Conference in Sydney of Chief Inspectors of Stock.

Department of Mines, Stock Branch, Sydney, 19 May, 1886.

It having been decided by the Hon. the Minister, on the suggestion of Mr. Chief Inspector Tabart, of Tasmania, to invite the Chief Inspectors of Stock and Government Veterinarians for the several Australian Colonies (including New Zealand) to meet in Sydney in the month of September next, with the view to the assimilation of the Regulations in force in these Colonies for the prevention of diseases in stock, the Colonial Secretary might perhaps be moved to transmit copies of this Minute to the Governments of these Colonies, and invite them to take part in the proposed Conference.

If this invitation be accepted, it would, I think, be well that the subjects to be discussed should, in the interval, as far as possible, be settled, so that the members on coming to the Conference may be fully prepared to take part in the discussions as they arise, and to vote under the direction of their respective Ministers.

With that view, therefore, and with the view also of furthering the proceedings, I would suggest a list of subjects for discussion, on the understanding that it is only tentative, which any member may amend; but any amendment should be communicated to the other members one month at least prior to the date when the Conference meets.

The following are the subjects which I would suggest for discussion, namely:—

1. Regulations with respect to the introduction of "Foreign" animals, *i.e.*, animals from places outside the Australian Colonies.
2. Regulations relating to the introduction of "Australian" animals.

(I.) By sea.

(II.) By land.

113—B

3.

Programme.

3. Regulations with respect to Diseases, such as—
- | | |
|---------------|---|
| (1.) Scab. | (6.) Anthrax. |
| (2.) Catarrh. | (7.) Pleuro Pneumonia. |
| (3.) Fluke. | (8.) Tuberculosis. |
| (4.) Worms. | (9.) Foreign Diseases, <i>i.e.</i> , diseases not known in the Australian Colonies. |
| (5.) Footrot. | |
4. Regulations in regard to the travelling, movement, or conveyance of animals.
 5. Regulations for the prevention of cruelty to animals.
 6. The collection and publication of information with respect to diseases in animals.
 7. The carrying out, reporting, and comparing experiments made, with the view of ascertaining the nature, cause, prevention, and cure of diseases in animals.
 8. The destruction of noxious animals.
 9. The destruction of weeds and noxious plants.
 10. The branding and marking of animals.
 11. Any other subject which may be suggested and agreed to by the members of the Conference, connected with the object for which it is convened.

ALEX. BRUCE,
Chief Inspector of Stock.

SUBJECTS TO BE DISCUSSED, AND ORDER OF DISCUSSION.

The CHAIRMAN said that the first thing that would have to be done by the Conference would be to settle the programme of business. He suggested that they should take as a basis the statement attached to his minute paper of 19th May, 1886, in which certain subjects were set forth.

This was agreed to.

The CHAIRMAN then suggested that they should now consider what diseases should be dealt with.

Mr. VALENTINE suggested that Nos. 3, 2, and 1 be taken as 1, 2, and 3.

Mr. WOOD agreed that the proposed order would be the best.

Mr. CURR pointed out that there were some matters besides diseases which ought to be taken notice of. For instance, there were ticks in sheep, which was not a disease, yet in Victoria the sheep-owners were very desirous of treating ticks as they did scab and getting rid of them altogether. In veterinary works ticks were not spoken of as a disease. They came more under the head of management. Other diseases, such as parasites, might be introduced here, and it might be desirous to deal with such matters. He had always thought that the Ministers of the different Colonies should have the power to deal with as diseases anything that appeared in that way. It was for the meeting to consider what they would do in reference to this matter. He thought that the various Colonies should take some action, either together or individually.

Mr. LANCE said they had suffered very much in New Zealand from lice; but they introduced legislation on the subject, and it proved effectual.

Mr. VALENTINE thought that ticks might be included under the head of No. 3—ticks and other parasites.

The CHAIRMAN said that ticks or other ailments might be included in the list to be considered.

Mr. LANCE did not think that the Conference should be asked to go into the subject of all diseases, for if that were done they might sit for ever.

Mr. COOPER asked what they intended by "regulations in respect to disease"; whether it meant regulations in the direction of prescribing a method of eradication and enforcing it, or whether it was for the prevention of the introduction of disease from one colony into another?

The CHAIRMAN said that it was intended to include the whole. He thought that they might take the different diseases mentioned in the circular letter, and any others they thought worthy of consideration.

Mr. CURR said it had long been his view on the subject that they should only deal with each other's regulations where there was a general interest at stake; where there was no such interest, he thought, they should not hamper other Colonies, or have too many regulations. If they could agree upon a dozen lines in the way of legislation they would do very well. The less legislation they had the better.

Mr. LANCE said if there was one subject on which unanimity might be expected it was the question of scab, yet it appeared that even on that there were differences of opinion. Therefore, if they debated every subject connected with stock their sittings would never terminate.

Mr. VALENTINE thought they had better leave the diseases affecting foreign animals until they had dealt with those affecting their own.

Mr. CURR thought that the foreign policy they would recommend to the several Governments would be by far the most important. When they had made up their minds on that they would have clear sailing with regard to their own animals, but they could not know what to do in intercolonial matters until they had considered the shipping business altogether.

Mr. VALENTINE thought they should first consider their own regulations apart from others entirely. The regulations connected with the outside would not be in any way connected with their own. In one case they were dealing with the health of their animals, and in the other with animals that might introduce disease.

Mr. VALENTINE suggested, and it was agreed, that Nos. 3, 2, and 1 of the statement attached to the minute of 19th May, 1886, stand as Nos. 1, 2, and 3.

Mr. STANLEY moved, that No. 6 stand as No. 4; Mr. BAGOT seconded the motion, which was agreed to.

Mr. STANLEY moved—"That No. 4 stand as No. 5; Mr. PARK seconded the motion, which was agreed to."

Mr. CURR moved—"That No. 7 be struck out; Mr. COOPER seconded the motion."

Mr. MEREDITH said he did not understand the idea of a motion to strike this out.

Mr. CURR: The number of people who might be of any use to make these experiments might be counted on the fingers. As far as he was aware this Conference was not sitting for the purpose of thrusting upon their Governments things that would be shelved. He considered that it would be 100
to

to 1 if they got a man to perform the necessary experiments, and if they did he would be some celebrated Programme man whose services they would not be able to obtain.

Mr. STANLEY said it did not need a celebrated man to collect poisonous plants and feed animals on them; such information might be easily obtained in any colony, and would be reliable for the others. That was the sort of experiments he thought this question referred to. It had recently been proposed by the South Australian Government that they should have permission to introduce a disease from Germany, and were they to be in a position to say anything on this matter? It was important to know what diseases they proposed to introduce and what experiments they would carry on. It was important that there should be a feeling of reciprocity in this matter.

Mr. BAGOT explained that the disease referred to was one which affected only rabbits and cats, and was absolutely fatal to rabbits. It was proposed, on the suggestion of Professor Watson, Professor of Anatomy at the Adelaide University, that it should be used for the purpose of destroying rabbits. Professor Watson went Home on his own business, on leave, but a sum of £100 was contributed towards his expenses. He went to Germany, where he was well known and had passed his student's days, to make investigations with regard to this disease and bring it out. He was a passenger in one of the Messageries boats, but there was such a fearful dislike to the animals which he was bringing out that he believed they were killed, at all events none reached South Australia alive. Professor Watson was so convinced that it was going to be an absolute means of eradicating the rabbits that he urged the use of it very strongly, and he (Mr. Bagot) thought he was qualified to speak on the subject when he said it could not be contracted by any other animal but the domestic cat. It would not affect stockholders injuriously, but, on the contrary, would be a benefit to them.

Mr. STANLEY: Might I ask the name of the disease?

Mr. BAGOT: *Sarcoptes Cuniculi*.

Mr. PARK: Sarcoptic scabies. He had been promised some rabbits infected with the disease by the Hon. W. A. B. Gellibrand, but the season having been dry none could be found. As a general rule every wet season the rabbits became infected, and, if they caught one, it could almost be snapped in two like a carrot from the effects of the disease. Notwithstanding this, they continued to breed.

Mr. COOPER thought they should make only practical suggestions such as their Governments would be likely to lay before the Legislatures. They should not overweight them by introducing matters which would make their suggestions too heavy. He begged to second Mr. Curr's amendment.

Mr. LANCE said that if he thought for one moment that in striking out the item they would prevent the introduction of poison into rabbits he would not do it, for he believed that was the only way of dealing with the pest; but No. 8 would do that. He would ask them to look at the vast nature of this subject. They could number diseases by the thousand.

Mr. GORDON: I shall support it formally.

The CHAIRMAN said they were beginning to do what was being done in other parts of the world; and although some experiments might be very difficult to carry out, there were simple experiments which they might make. There was no reason why they should not be carried out here as well as in the old country. No Government was obliged to take the matter up unless it chose to do so. If they thought anything was worth recommending, why should they not recommend it?

The motion was struck out.

Mr. STANLEY moved, and Mr. BAGOT seconded, That No. 4 stand as No. 5.

Mr. CURR moved an amendment, that No. 4 be struck out. He held that they should not interfere with the doings of other colonies more than they could help: what suited one colony might not suit another. In Victoria they would not submit to registration of brands and giving travelling notices, as was done in Queensland. For instance, a man near Warrnambool had 100 sheep, and wanted to sell them. He got notice on Friday from his agent in town that sheep would fetch a good price, say on Monday. He required to send off the sheep at once by train; but if he had to have them passed by the Inspector, he would lose his sale. The Victorian Legislature consequently would not pass such a regulation. We should only propose such regulations as would affect beneficially the whole of the colonies. Many which would suit Victoria would not suit Queensland, and *vice versa*. This Conference had to deal principally, if not entirely, with disease. The question before us has nothing to do with disease. The stock-owners of New South Wales are quite competent to make such regulations as they required.

Mr. PETER seconded the amendment.

Mr. MEREDITH said he was not present to interfere with the regulations of the other Colonies, but he had come to protect the interests of the Colony which he represented. This was an important matter as far as Tasmania was concerned. Subject 4 provided for the regulation of the travelling, movement, or conveyance of animals. There was no disease of any kind in the herds of Tasmania. The stock-breeders were desirous of improving their herds, and fully understood their business. They imported bulls from Victoria, and the animals were taken by train to the port of shipment. Unless there were certain regulations to prevent clean stock becoming diseased by travelling in trains in which infected stock might have been previously conveyed, what security had the breeders in Tasmania that pleuro or some other disease was not introduced into the herds and flocks of Tasmania. In Victoria there was no precaution with regard to the prevention of contagious diseases by disinfecting the trucks. Unless some such regulations were adopted, Victoria and the other Colonies would be shut out from Tasmania, and for that reason alone it would be necessary to frame some such resolutions. He would like to know whether there was any fear of stock or land being infected from the droppings, &c., from trucks while conveying sheep or cattle infected with Cumberland disease, or of sheep or cattle becoming infected if carried in the same truck afterwards. Was it possible to effectually disinfect trucks having had in them stock infected with Cumberland disease.

Mr. CURR pointed out that whatever the Conference might do there was nothing to prevent Tasmania from making such regulations for the safety of its stock as the Colony might think fit. They were present to recommend, as far as possible, the adoption of universal regulations. As the Minister had said, they had assembled to try and get over certain difficulties, and endeavour to adopt a general system as far as was practicable; but they had not met to discuss what the Tasmanian people would do with regard to their Colony. In Victoria every herd had had pleuro, and there was nothing to prevent Tasmania receiving bulls from there only under fixed conditions. Victoria might also say "we will not receive your rams except under certain conditions," but that was not a question for the Conference to deal with.

Programme. with. They were simply present to recommend certain general courses of action which could be adopted by the whole of the Colonies. About details it would be impossible to agree.

Mr. MEREDITH thought they had met to help in facilitating the interchange of stock among the Colonies, while preventing contagious disease. It appeared, however, from the last speaker that that was not the object of Victoria. All that was desired was that certain regulations should be enforced with regard to the conveyance of stock from any Colony to another. There should be universal regulations for the movement of stock by train, and there should be precautions taken to prevent stock going from one Colony to another becoming infected in the train, and taking that infection with it. Without some such regulations there was no security.

Mr. CURR: You think, as our cattle have pleuro, that our trains, which are thus constantly carrying diseased animals, should be disinfected after every mob of cattle that occupies them.

The CHAIRMAN understood Mr. Meredith to mean that cattle leaving one Colony for another should be accompanied by a certificate, which would be accepted, stating that they had not been carried in any conveyance in which they were likely to become infected. At present a declaration now accompanied stock from one Colony to another, and also a certificate of cleanness from an Inspector.

It was resolved that the motion be retained.

Mr. STANLEY moved, and Mr. BAGOT seconded, that No. 8 stand as No. 6.

Mr. CURR moved an amendment that No. 8 be struck out.

Mr. CURR said that it was an important subject, but it would have to be dealt with according to the requirements of each Colony. In one Colony a noxious animal might be got rid of by one means, and in a second by another.

Mr. LANCE thought they might discuss the question, and see whether it would be wise to recommend the Governments to go into the matter. Rabbits would never be eradicated unless some disease was introduced among them. Many people thought they should invoke the aid of science, and there was great hopes that something would be discovered which would destroy the rabbit without proving hurtful to the sheep.

Mr. GORDON was strongly of opinion that the subject ought to be considered. Two Governments, Queensland and New South Wales, had already taken it up. He had to destroy kangaroos and wallabies in Queensland, and why should not the other Colonies deal in a similar manner with other noxious animals.

The CHAIRMAN: We are paying over £100,000 a year for the destruction of marsupials.

Mr. GORDON: We have paid £70,000.

Mr. LANCE: Rabbits cost New Zealand half a million sterling a year.

The amendment was negatived.

Mr. STANLEY moved, and Mr. TABART seconded, that No. 9 stand as No. 7.

Mr. CURR moved, and Mr. PETER seconded, an amendment, that it be struck out.

Mr. TABART said that in Tasmania they had great difficulty in dealing with these noxious weeds. One weed which caused great trouble was the Californian thistle. By discussion some useful plan might be arrived at for dealing with these weeds.

Mr. LANCE: It has just been introduced into New Zealand.

Mr. TABART: In Southern Tasmania it has taken possession of our agricultural lands.

Mr. CURR: It is because I do not think that anything can be found to get rid of it that I moved that it be struck out.

Mr. TABART said that when the subject came on for discussion he would give some information with respect to it.

The amendment was negatived.

Mr. MEREDITH moved, and Mr. STANLEY seconded, that No. 10 stand as No. 8.

Mr. CURR moved, and Mr. PETER seconded, that the section be struck out.

Mr. BAGOT thought it would be a great pity if it were struck out. As the representative of stockholders in South Australia he could say so. Many stockholders had runs intersected by the boundary-lines of the Colonies, the partition being only an imaginary line. The brand of Queensland was two letters and a numeral, and that of South Australia one letter and two numerals, or a sign and two numerals. Run-holders in the position he had described were obliged to act with respect to brands as though they owned a run in each Colony. It would be a great advantage to run-holders so situated if the Governments of the various Colonies would consent to amend their Brands Acts to such an extent that they might work their single herd as one, instead of being compelled to work it as two, as they were whenever it was moved across the boundary-line from one Colony into another. Under such circumstances these run-holders should be allowed to use the brand of one Colony in another. The Conference might fairly make a recommendation in that direction.

Mr. CURR: That would be forcing a Brands Act on Victoria. We have none at present.

Mr. BAGOT: That is not forcing the Act upon Victoria.

Mr. CURR: What do you propose that Victoria should do?

Mr. BAGOT: Take the Mundi-Mundi Run, in the neighbourhood of Silverton, for instance. The owners have a block of land in South Australia which they work together with that in New South Wales. There is nothing but the boundary-line of the Colonies dividing the property. Those stock-holders were obliged to regulate their brands according to the Acts of each Colony. This was also the case with the Glengyle and Innamincka Runs. Any such regulation as he suggested should only apply to runs situated as he had stated. Under the circumstances the Chief Inspectors should be empowered to register in each Colony the brands used by a stock-holder in either.

Mr. GORDON stated that in Queensland the brand was *prima facie* evidence of ownership; and recently, when a mob of twenty-three infected cattle had been shot and left unburied they were clearly able to trace the owner and punish him for the offence.

The CHAIRMAN: We have a law, and I think a very good one, by which no man is allowed to crop the ear of a sheep. I do not suppose there is a cropped ear in the whole of the Colony. When sheep come here from another Colony with their ears cropped our endeavours to keep down sheep-stealing are frustrated, and we lose the effect of our work. I think it is a subject that ought to be discussed.

The amendment was negatived.

It was resolved that No. 11 stand as No. 9.

Mr.

Mr. VALENTINE moved, and Mr. CURR seconded, that No. 5 be struck out.
The motion was agreed to.

Programme.

The subjects as revised then stood in the following order:—

- I. Treatment of the different diseases in animals.
- II. Regulations relating to the introduction of Australasian animals (I.) by sea; (II.) by land.
- III. Regulations with respect to the introduction of "foreign" animals, *i.e.*, from places outside of the Australasian Colonies.
- IV. The collection and publication of information with respect to diseases in animals.
- V. Regulations in regard to the travelling, movement, or conveyance of animals.
- VI. The destruction of noxious animals.
- VII. The destruction of weeds and noxious plants.
- VIII. The branding and marking of animals.
- IX. Any other subject which may be suggested and agreed to by the members of the Conference connected with the object for which it is convened.

DISEASES TO BE DEALT WITH.

The CHAIRMAN said there was a list of diseases in Schedule VIII of the Draft Bill prepared in his department, and this list might be gone over by the Conference with the view to decide what diseases should be dealt with. The list was laid upon the Table.

SCHEDULE VIII.

Classification of diseases and periods of isolation.

Disease.	Classification.		Period of isolation and quarantine during which animals land and articles shall be deemed to be infected.	Disease.	Classification.		Period of isolation and quarantine during which animals land and articles shall be deemed to be infected.
	Curable.	Incurable.			Curable.	Incurable.	
<i>In Horses—</i>				<i>In Sheep—</i>			
Anthrax .....	.....	Incurable	21 days.	Foot-rot	Curable...	.....	21 days.
Farcy .....	.....	do	20 "	Hydatids .....	.....	Incurable	42 "
Glanders .....	.....	do	90 "	Rabies .....	.....	do	180 "
Influenza	Curable...	.....	21 "	Rinderpest .....	.....	do	90 "
Mange	do	.....	30 "	Scab .....	.....	do	90 "
Rabies .....	.....	Incurable	180 "	Sheep-pox .....	.....	do	90 "
Strangles	Curable..	.....	30 "	Ticks	Curable ..	.....	42 "
<i>In Cattle—</i>				<i>In Dogs—</i>			
Anthrax .....	.....	Incurable	21 "	Distemper	do	.....	21 "
Cancer .....	.....	do	42 "	Entozoa	do	.....	42 "
Foot and mouth disease .....	.....	do	42 "	Mange	do	.....	30 "
Hoose	Curable...	.....	42 "	Rabies .....	.....	Incurable	180 "
Hydatids .....	.....	Incurable	42 "	<i>In Pigs—</i>			
Mange	Curable...	.....	30 "	Anthrax .....	.....	do	21 "
Pleuro-pneumonia .....	.....	Incurable	90 "	Foot and mouth disease .....	.....	do	42 "
Rabies .....	.....	do	180 "	Hog cholera .....	.....	do	90 "
Rinderpest .....	.....	do	90 "	Rinderpest .....	.....	do	90 "
Scrofula .....	.....	do	42 "	Trichinosis .....	.....	do	90 "
Tuberculosis .....	.....	do	42 "	Measles .....	.....	do	90 "
<i>In Sheep—</i>				<i>In Goats—</i>			
Anthrax .....	.....	do	21 "	Anthrax .....	.....	do	21 "
Catarrh .....	.....	do	90 "	Foot and mouth disease .....	.....	do	42 "
Entozoa	Curable...	.....	42 "	Entozoa	Curable...	.....	42 "
Foot and mouth disease .....	.....	Incurable	42 "	Rinderpest .....	.....	Incurable	90 "

It was agreed to take the list of diseases as a basis of discussion.

DISEASES IN HORSES.

Anthrax, farcy, and glanders.

Mr. STANLEY drew attention to the list of diseases submitted, and proposed that anthrax be dealt with.

The CHAIRMAN said that in New South Wales cattle infected with Cumberland disease (one of the forms of anthrax) could be driven along any road without being stopped.

Mr. CURR said they could be stopped in Victoria and slaughtered.

Mr. VALENTINE moved that the Conference deal with anthrax, farcy, and glanders; Mr. CURR seconded the motion.

The motion was agreed to.

Influenza.

Mr. LANCE moved that influenza be struck out; Mr. TABART seconded the motion.

The motion was agreed to.

Mange.

Mr. CURR moved that mange in horses be struck out; Mr. LANCE seconded the motion.

The motion was agreed to.

Rabies.

It was decided to postpone the subject of rabies until the question of diseases in dogs came on.

Strangles.

Mr. LANCE moved that strangles be struck out; Mr. WOOD seconded the motion.

The motion was agreed to.

DISEASES

Programme:

DISEASES IN CATTLE.

Cancer, scrofula, and tuberculosis.

Mr. STANLEY moved that cancer, scrofula, and tuberculosis be dealt with; Mr. VALENTINE seconded the motion.

The motion was agreed to.

Foot and mouth disease and rinderpest.

Mr. CURR moved that foot and mouth disease be dealt with; Mr. WOOD seconded the motion. The motion was agreed to.

Hoose in Cattle.

Mr. CURR moved, and Mr. VALENTINE seconded, that it be struck out.

Mr. COOPER moved, as an amendment, that it be considered.

Mr. MEREDITH seconded the amendment. He asked would it be wise to send cattle infected with such a complaint into a Colony such as Tasmania, where there was no disease whatever. He was present to represent the breeders of that Colony, and to see that every precaution was taken against disease of every nature being imported there. As far as Tasmania was concerned, those who were interested in stock were particularly cautious in guarding against the introduction of any disease.

Mr. CURR always saw that questions of this sort would come up. It had been said by himself already, and he thought by other gentlemen, that it was of no use to make laws which they could not enforce, hence they had struck out one or two of the regulations proposed for discussion, as they could not be enforced. The amount of stock in Tasmania was very limited, and there might not be lung-worm there. It was perfectly easy to control the introduction of stock into a Colony. They might make regulations to put an end to mange, and yet not be able to accomplish their purpose. They could not do it, but they could prevent mangy dogs being introduced here from New Zealand and Tasmania, or any other Colony, and the same with hoose and other things. It would have been better to have agreed with Mr. Bruce's proposal, but the Conference seems to think otherwise. We may in some cases have to agree as to the only reasonable course to take—that certain diseases that did not exist in some colonies, and could be excluded therefrom, should be excluded, and that power should be taken to exclude them, but that at the same time they should not attempt to deal with them in colonies where they could not be prevented. Mr. Meredith had spoken very reasonably if they were proposing steps which would result in lung disease going to Tasmania. The Conference should confine itself to general principles and not meddle with details.

The CHAIRMAN: It is only a question whether we will deal with it at all.

Mr. CURR withdrew his motion, and the amendment was carried.

Hydatids.

Mr. STANLEY said that hydatids meant cystic or bladder worms, the cystic form of tape-worm found in animals.

Mr. CURR was afraid that nothing could be done in this matter. How could they tell an animal had hydatids? He moved, and Mr. WOOD seconded, that hydatids be struck out of the list.

The motion was agreed to.

Mange in cattle.

Mr. LANCE moved, and Mr. COOPER seconded, that mange in cattle be struck out. The motion was agreed to.

Pleuro-pneumonia.

Mr. WOOD moved, and Mr. TABART seconded, that pleuro-pneumonia be retained. The motion was agreed to.

DISEASES IN SHEEP.

Catarrh.

Mr. CURR moved that catarrh be struck out.

Mr. GORDON was astonished at such a proposal. It had cost his Government £5,000 in two years to stamp it out. It was highly contagious, and he had met with a number of cases of it. It was called catarrhal fever.

Mr. GORDON moved an amendment, seconded by Mr. WOOD, that catarrh be retained.

The amendment was carried.

Entozoa.

Mr. STANLEY thought that lung-worm might be considered at the same time.

Mr. CURR: What other worms have we in Australia?

Mr. STANLEY: Tape-worm, stomach-worm, and fluke. They would have to pass regulations to prevent a man driving diseased stock about.

Mr. STANLEY moved, and Mr. CURR seconded, that entozoa, worms, and other parasites be considered.

The motion was agreed to.

Foot-rot.

Mr. VALENTINE did not think that anything was to be gained by discussing foot-rot.

Mr. LANCE said that, if he thought anything could be done, he would be prepared to sit there for a month.

Mr. VALENTINE moved, and Mr. TABART seconded, that foot-rot be struck out.

Mr. CURR had no doubt it was contagious. It existed to such different extents that if they began to propose legislation they must consider the matter of degree. Were they going to stop 20,000 sheep at the punt

punt because one of them was lame with foot-rot. If not, would they stop them if 100 were suffering; Programme. and, if not, what number would they stop them for? No Bench in Victoria would give a verdict against the owners, as they would get lots of men to say that the affected sheep were not in excess.

Mr. STANLEY: Cannot you make it an illegal offence to travel with diseased stock?

Mr. CURR: Yes, Parliament might enact such a law, and no Bench would convict.

Mr. GORDON moved, and Mr. WOOD seconded, an amendment, that foot-rot be retained.

Mr. VALENTINE withdrew the motion, and the amendment was agreed to.

Scab and ticks.

Mr. VALENTINE moved and Mr. STANLEY seconded,—“That scab, sheep-pox, and ticks be retained.” The motion was agreed to.

DISEASES IN DOGS.

Distemper.

Mr. STANLEY said that this was similar to influenza in horses, and was certainly not more controllable.

Mr. BAGOT moved,—“That entozoa and rabies be considered, and distemper and mange struck out. As far as the importation of dogs from foreign parts was concerned they had quarantine, and if any disease broke out they could be retained longer.

Mr. STANLEY said it was a disgrace to the Colony that mange existed here to the extent it did, and that no one tried to exterminate it. If the Stock Inspectors were to put their foot down they would go far to stamping out this disgrace to the Colony.

The CHAIRMAN said it did not exist to a great extent in the country, but it was a disgrace in the city.

Mr. STANLEY moved, and Mr. PARK seconded,—“That mange be retained.”

Mr. BAGOT thought it was a paltry matter for them to consider, and yet it was very difficult to get rid of. Under the circumstances, as Mr. Stanley thought it should be retained, he would withdraw that portion of his motion relating to mange.

The CHAIRMAN said that, with a view to the prevention of cruelty to animals, it should be retained. It was a disgrace to any man to leave animals covered with mange, as they saw hundreds of dogs in town, and subjected to the torture they suffered, when it could be easily put down by making this disease the subject of a regulation.

Mr. CURR had seen as much as 10 and 20 guineas spent in endeavouring to cure valuable greyhounds entered for stakes, but without success. They were proposing to enforce a regulation on all the colonies in a matter which each might deal with for itself.

The motion as amended by Mr. Bagot was agreed to.

DISEASES IN PIGS.

Hog cholera (better known as swine fever).

Mr. STANLEY moved, and Mr. CURR seconded, that hog cholera be considered.

The motion was agreed to.

Trichinosis.

Mr. STANLEY said that this disease was due to the presence of trichinice in the flesh; measles was another disease in the pig caused by a parasite in the flesh.

Mr. VALENTINE moved, and Mr. BAGOT seconded, that trichinosis and measles be considered.

The motion was agreed to.

Lice in sheep.

The CHAIRMAN asked if there were any other diseases, ailments, or parasites which might be added to this list for regulations. Someone had mentioned lice in sheep. He had seen it once or twice here.

Mr. VALENTINE said that lice were bad in New Zealand.

Mr. LANCE said that an Act had been passed to deal with this pest. It was amended last year, and was not of a vexatious nature. All the small farmers had fallen in with it.

Mr. VALENTINE thought that lice might be considered with ticks.

Mr. LANCE said that lice were 10,000 times more important than ticks.

Mr. VALENTINE moved, and Mr. CURR seconded, that lice in sheep be considered with ticks.

The motion was agreed to.

The subjects contained in Mr. Bruce's circular letter were then considered.

The Conference then adjourned until 10:30 a.m. on the following day.

TUESDAY, 28 SEPTEMBER.

SECOND MEETING.

Present :—Mr. ALEX. BRUCE, Chairman, and the full Conference.

The minutes of the previous meeting were read and confirmed.

VOTING AND REPORTING.

The CHAIRMAN thought that the suggestion of the Minister as to voting by Colonies should be carried out. He said it had been proposed originally that there should be two stockowners present from each Colony; but an objection to that number was taken by one of the Colonies (Victoria), and the number, by way of compromise, was altered by Mr. Fletcher to one breeder and the Chief Inspector. An intimation

Programme. intimation was made accordingly to the other Colonies, but in several instances too late to admit of effect being given to the alteration; and, as two were present from some Colonies, it would be a matter for the Conference to decide how the voting should proceed.

Discussion ensued.

Copies of the telegrams passing between the various Colonies with regard to the voting basis were read by the Chairman.

Mr. COOPER moved and Mr. LANCE seconded, that each Colony have one vote.

Mr. WOOD moved an amendment, seconded by Mr. CURR, that each Colony have two votes.

Mr. HIGGINS moved and Mr. MEREDITH seconded a further amendment, that each Colony have three votes.

Mr. HIGGINS' amendment was carried.

Mr. BAGOT moved, That the Chairman have a deliberative as well as a casting vote.

The motion was agreed to.

Mr. MEREDITH: There is another difficulty. The Colonies that have three members and Victoria with only one will agree very well among themselves, but what will be done by the Colonies that have two? I think it would be advisable to decide which of the two members should have the plural vote.

The CHAIRMAN: They will decide that among themselves.

Mr. COOPER: There are only two such Colonies.

Mr. CURR desired to point out to the meeting that a great part of the good they might hope to effect would be by educating the public mind as to the reasons for doing what they did, otherwise people would say "there is no reason for doing such things." If their meetings were reported so that the public could be informed from day to day of the various arguments put forward by each individual they stood a chance of educating the public mind. They should be prepared to educate the people to some extent by giving out the result of the long practice they had had in the matter of stock. If, however, it was simply reported that they had done so and so that would be of no use, as it would convey no information of the reasons for their action. The members of the Conference could give weighty reasons for whatever they did. Perhaps Mr. Bruce could arrange for due publicity being given to the doings of the Conference. What the public should know was what the Conference was doing from day to day and the reasons the members put forward for their votes. Otherwise the public might say that such and such a member did not move himself at all.

The CHAIRMAN: I do not think that anything further can be done than intimate to the Press that they may attend. Our proceedings will be published in detail when the business is all concluded.

Mr. BAGOT: The shorthand report of our proceedings will be embodied in a blue book, which may be obtained in all the Colonies.

Mr. CURR: If our proceedings are only published in blue-book form that is equivalent to their never reaching the public at all.

Mr. HIGGINS: Was it intimated to the Press that this Conference would sit? I am quite in sympathy with Mr. Curr in his remarks relating to our proceedings, and I think it will be a most important matter if the different Governments act upon our suggestions with regard to stock and its diseases.

I.—TREATMENT OF THE DIFFERENT DISEASES IN ANIMALS.

1. ANTHRAX.

Anthrax.

The CHAIRMAN: The next thing will be the consideration of the treatment of diseases. We have fixed upon a programme, and we should now deal with the diseases in that programme. The first on the list is anthrax.

MR. STANLEY then read the following paper on this disease:—

Cumberland disease is identical with the diseases known as splenic apoplexy, anthrax fever, and black-leg. This disease is known all over the world; but it is doubtful whether any country suffers greater losses from this one disease than Australia.

In New South Wales the annual mortality is certainly not less than 100,000 sheep, hence its great importance to everyone interested in stock.

Investigations into the nature and cause of this disease have been rigorously carried on during the last few years in France and Germany; England has been critically observing, now refuting, now confirming by experiments, their painstaking inquiries, which have concentrated themselves in observations on the history, development, and effects of very minute microscopic organisms termed bacilli, which are proved beyond doubt to cause the disease, and are absolutely necessary to its existence. The cause is the bacillus anthracis.

Symptoms.—These are not well marked, and are of little consequence for diagnosis, the disease being extremely fatal and very rapid. *Post mortem* examinations show extremely dark blood, which clots imperfectly, with congestions and blood extravasations in almost every organ; the spleen is usually enlarged, sometimes even to bursting; finally and most important, anthrax bacilli are found in the blood. To see them, the thinnest possible layer is spread on a clean glass slide, add a drop of violet aniline dye, after a minute draw off the dye with blotting-paper, add a little water, then examine under a powerful microscope, and the bacilli will be seen in great numbers as small rods.

Susceptibility varies even in animals of the same species, and it is to be noted that probably no herbivora are proof against this disease, and carnivora are only less susceptible (not exempt, as many people think). The human subject is fortunately the least susceptible; but many instances of disastrous effects from inoculation are on record.

Frogs and cold-blooded creatures, also birds possessing a *high* temperature, have proved refractory to inoculation. Bacilli anthracis are able to exist, and probably thrive, outside an animal's body in ordinary temperatures; in suitable nutritive materials they must feed or they cease to increase; they propagate by the formation of spores; these spores are practically indestructible, and retain their vitality and virulence for an indefinite period under almost every natural adverse condition. Infected animals contaminate the soil and herbage, and this is the source of infection so prolific in these colonies.

Treatment is not available, because the symptoms are ambiguous and the illness very short and fatal, hence protection has become imperative, and this is done by inoculation.

But so great is the virulence of even a drop of anthrax blood (which contains myriads of bacilli) that it has been found necessary to cultivate bacilli artificially in a medium or soil unfavourable to their growth

growth and so obtain a weakened growth of bacilli, which being used as the virus is found to produce a weak or mild form of disease from which an animal will recover, and that inoculated animal is found to resist a repetition of the inoculation of a virus at the same strength of culture, and to be able to endure inoculation with a second or stronger virus sufficiently potent to kill an animal not previously protected. After this second inoculation the subject is protected from the most virulent virus that can be obtained. In fact he is protected from infection. This protection gives immunity for a period of from nine to twelve months in the case of sheep. This would ensure comparative safety to a flock and carry them on infected land during the fatal season; and if persevered in year after year it is possible to exhaust the bacilli or starve them out of the land, a process which is greatly assisted by nature, the prolonged drought and hot sun deterring their development.

Cultivation of attenuated virus.—Agencies which have this influence are heat, light, oxygen, chemicals, and cultivation in the bodies of particular species of animals. Several methods are employed by individual scientists, all aiming at the production of a virus that may be reliable as a protective and the least fatal as a remedy. Pasteur leads the van, and his results prove the task no easy one. He prepares a virus which gives a high degree of immunity against spontaneous or inoculated anthrax; but there is no known method of attenuation which will give a virus of actual uniform strength.

It is not possible to obtain a virus equally applicable to different species of the domestic animals, or even to different breeds of the same species. Even in the most capable hands there is a liability to accidents entailing serious results in the preparation of the virus, or in its employment, the *quantity* of a known strength being used carelessly would be either ineffectual or fatal. Pasteur has succeeded in making it so nearly uniform as to be generally serviceable for use over the whole of France. Pasteur has inoculated 13,000 sheep and 3,500 cattle without an accident. Chauveau, by a simple and ingenious apparatus, cultivates the virus by heat, and sufficient to at once inoculate 4,000 sheep. With such a preventive remedy available it is our duty to take this subject up warmly; and with the view of gaining practical information a circular letter was sent on from the Hon. the Minister for Mines enclosing a list of questions (appended, marked A), I had prepared, to the Governments of Europe and America, and the replies which are now being received are of very great interest, and I believe I am not premature in saying that the outcome will be protective inoculation; for the prevention of anthrax is one of the successful discoveries of modern times, and means the saving of many thousands of lives, and consequently increase of the national wealth of these Colonies.

The cultivation of the virus will have to be carried out here, and it is for us to urge the authorities to commence this important manufactory.

Having thus briefly introduced the subject, the following points are suggested for discussion:—

1. Is there sufficient evidence to prove that Cumberland disease is anthrax?
2. What extent of country is known to be infected?
3. What is the estimated annual loss?
4. Is there sufficient evidence to support the value of protective inoculation?
5. Are we warranted in advocating the establishment of a laboratory for the cultivation of the virus for inoculation?
6. Is it advisable to have regulations to prevent the spread of this disease?

The following memorandum accompanied the paper, being a copy of the circular sent by the Government of this Colony to the various European Powers:—

A.

Department of Mines, Stock Branch, Sydney, 28 January, 1886.

SPLENIC APOPLEXY IN SHEEP.

Memo.—With the object of obtaining information from other countries, as suggested in your letter No. 9,353, 29/12/85, I have the honor of submitting a slight description of the leading features of the disease in sheep commonly known in this Colony as Cumberland disease, and the points on which information is sought are added in the form of questions.

The disease is characterized by the formation of viscid gelatinous infiltrations and effusions of a dark dull red even to a blackish colour, into parts of organs or tissues, the enlargement and softening of the spleen and lymphatic glands, patchy dark red stains or mucous and serous membranes, the tar-like consistency and hue of the blood, which rarely coagulates, and the microscope reveals myriads of bacilli in the blood.

Symptoms of illness are ambiguous—a short illness, and a rapidly fatal termination.

Information is sought on the following points:—

1. Has the cause of the form of anthrax known as splenic apoplexy been satisfactorily determined in _____?
2. Have any remedial measures, either medicinal, sanitary, or prophylactic been attended with success in its treatment or in arresting its prevalence?
3. Has Pasteur's method of inoculation with attenuated virus been tried, and if so—
4. With what practical results?
5. Has the cultivation of the virus been attempted in England, and with what results?
6. Is the virus of splenic apoplexy protective against all forms of anthracoid diseases?
7. Is the same virus suitable for sheep, cattle, and horses?
8. Is it possible there would be any danger of introducing to this Colony a European form of anthrax by importing the attenuated virus of Pasteur?
9. Are the practical results of the cultivation of the virus such as to encourage its manufacture in this Colony?
10. What is the system of culture carried on in England?
11. What methods of inoculation are practised?
12. For what period (after successful inoculation) is the animal protected from disease?

EDWARD STANLEY, F.R.C.V.S., Eng.,

Hon. Government Veterinarian,

Inspector of Stock.

Mr.

Anthrax.

Mr. BAGOT: Have any replies been received to the circular letter addressed by the Government of New South Wales to the Governments mentioned in Europe and America?

Mr. STANLEY: Yes; from America, England, and Belgium.

Mr. BAGOT: It would be extremely interesting if we could see the answers to these questions.

The CHAIRMAN: Mr. Stanley can say what the answers amount to.

Mr. STANLEY said that the answers would be placed on the table; the gist of the reply from England being that the disease was not prevalent to a large extent. As a matter of fact, it was more prevalent than was generally admitted. It was found in many places, but the British Veterinary Surgeons were engaged so much in other matters that they did not take up the subject so warmly as it had been in France. In consequence of this the few experiments that had been made were by specialists, notably by Klein, one of the leading pathologists of the present day. He had cultivated the virus and refuted Pasteur to some extent. Both Klein and Koch had been working the subject out. Professor Robertson, who was at the head of the Veterinary profession in England, was of opinion, from his own personal experience, that the study of the subject would lead to valuable results; but he had not gone into it far enough to arrive at any decisive opinion. The outcome of the matter had been that the Royal Agricultural Society of England had decided to send Professor Robertson to study under Pasteur, and give the result of his own observations. His (Mr. Stauley's) motive in submitting this paper was this—He had seen nothing in print explaining satisfactorily how Pasteur prepared his virus; and, without knowing what his difficulties were, it was impossible to proceed with the cultivation of the bacilli. From America the reply was to the effect that there was no large amount of anthrax in the country, and that so far they had not practically taken the subject up. Belgium gave the most particulars. Their reply was to the effect that they had been using the virus as prepared by Pasteur, and were satisfied as to its value. They were commencing the culture of it in their own country. It was the opinion of authorities that a virus would have to be cultivated in this country. There were a good many difficulties in the way of carrying on the necessary operations; although the virus might suit one animal in one country, it might not suit it in another; it might be too strong. There were also climatic influences which affected the virus, so that possibly if we did introduce Pasteur's virus here it might be inert, and it could only be used experimentally; therefore we shall have to study the cultivation of the virus. It was a matter that required serious consideration; but, at the same time, if they were satisfied that the disease existed here to the extent which he believed it did, then it was a very important matter, and one which ought to be taken up by all the Governments. As they were all probably aware, anthrax—*i.e.*, Cumberland disease—might exhibit itself in different forms. When present as splenic apoplexy animals in robust health and fat died suddenly, and the spleen was found to be engorged with blood. The animals fell and died suddenly. In other cases, as in those he saw at Dubbo, the disease was more local. It attacked different parts of the body, and was then called black-leg or anthrax fever. That form of the disease was found more in cattle than in sheep. Horses, again, often suffered from anthrax, the parts attacked being principally the head and neck. It was well known in India under the name of Loudianna fever. Loudianna fever, so named from the fatal outbreak amongst the Government horses which took place in that district some years ago. All the varieties of anthrax were not produced by the same germ. There were different anthrax bacilli, which produced the different forms of the disease. A collection of microscopic specimens of the various pathological bacilli was exhibited and explained to the members. The one which he suggested should be cultivated for treatment was the bacillus anthracis, which produced the disease called Cumberland, that was so fatal to sheep, and was known to exist in certain localities. France had far more anthrax than England, which might be due to its climate or soil, or some particular breed of sheep. The losses of stock had been so enormous in Europe that the stock-owners there had been induced to take the matter up, and now use extensively the cultivated virus for protective inoculation.

Mr. LANCE: Some sheep in New Zealand were supposed to have had black-leg, but there was no one there who could say positively whether it was black-leg or not. I tried to investigate it, but nothing satisfactory was ascertained. I was at Loudianna when the outbreak referred to by Mr. Stanley took place. It killed the cavalry horses in a wonderful way. There were 10,000 men there, and in three months we had not enough left to relieve pickets. The station was abandoned, and had been abandoned ever since. It was a curious incident that a malignant fever broke out among the men at the same time that the disease did among the horses.

Mr. HIGGINS: Have you any in South Australia?

Mr. VALENTINE: I heard of black-leg amongst some calves ten or twelve years ago, but I never saw anything of it; we have never had anthrax.

Mr. GORDON: It was very prevalent in 1868 in the Darling Downs, about Maranoa, and several men lost their lives through skinning the sheep that died of it. Since then it has not been so prevalent. We have black-leg every year among the cattle. It is always in the same class of soil—a rich, black soil.

Mr. TABART: We have lately had a disease with a similar effect; but it has not been officially reported upon as to whether it was Cumberland or not. When I return I will have a veterinary examination made to ascertain whether it is anthrax or not. It is among the sheep. The soil is a rich, red loam in the western districts. It was only a fortnight or three weeks before I left for here that I received intimation to make an examination as to the nature of the disease, so that I had not time to make a veterinary examination.

Mr. WOOD: Very little is known of the disease in cattle. I have seen a good deal of black-leg. It always broke out at the top of the season when the cattle were in their best condition. I have seen cattle alive and well in the morning and dead in the afternoon.

Mr. CURR: We have Cumberland occasionally in sheep and pigs, but it does not exist to any great extent. In occasional years we have had a few cases about Melbourne and the more populous districts, principally among pigs. I never saw or heard of it among horses. We have had a few cases among cattle.

Mr. HIGGINS said he had had some experience in Cumberland which might be interesting to relate. As I understand the term "Cumberland" is not the scientific name for the disease. It was so called, as he was informed, because it broke out many years ago in the county of Cumberland, and ever since had been known by that name throughout New South Wales. If any one were to speak of anthrax, even to some educated persons, as denoting Cumberland, they would not recognize it. They lost large numbers of sheep yearly through this disease. Its principal time for appearing was, in his experience, during the months of

December,

December, January, and February; or, as Mr. Wood had said, at the top of the season, during the period of the year when the heat was greatest and the feed best. Hitherto, until the past season, he had always considered that Cumberland would not show itself unless there was plenty of feed, but during the last drought it showed itself unmistakably in rich country, where, however, no feed had grown owing to the drought. It had previously shown itself in such districts when feed was abundant. The indications of it were something of this nature:—The sheep are going along to all appearance in perfect health, when suddenly one or two will drop behind. There will be a convulsive action through the animal, and it drops. You raise it, and it goes on for a little. Then it drops again, and in a very short time death takes place. There is a very great tension of the skin; the parts of it which you can see, where there is no wool, between the thigh and the flank, become black, and after a short time there is a small discharge of very black blood from the nostrils or anus, and sometimes both. If the animal is skinned (and of late years I and almost all stockowners have sternly prohibited our people from skinning any dead animals, owing to the danger ensuing to the men) it is found that the skin is very much discoloured, the blood beneath being black and clotted. Decomposition sets in very rapidly indeed, and the smallest portion of the virus from the animal getting on to a cut on the person skinning or handling the animal would, he was positive, cause death; and blood-poisoning, he believed, might be absorbed through the pores of the skin into the blood. He had never positively known such a case to occur, but he believed that blood-poisoning would ensue, and that the person affected would thereby lose a limb, or even his life, unless medical remedies were instantly resorted to. He had known blood-poisoning from Cumberland remain in the system of an individual for a long time. Perhaps the gentlemen from Tasmania might remember the case of Mr. Cox, a gentleman who came down from the Mudgee District, and was suffering from blood-poisoning. He simply handled the hide of a beast which had been taken off in order to salt it, and after a lapse of more than a year he died from blood-poisoning. In many parts of the Colony where the sheep were on rich pastures, the disease was of frequent occurrence. In the year 1855 or 1856 it swept the Castlereagh River from top to bottom, but since then it had not appeared in the district. It also appeared then in the Liverpool Plains on many stations, and destroyed many sheep, but of late years it had not shown itself in such a virulent form. In 1859–60 it appeared on one station, where they were losing at the rate of about 600 sheep a week, and the station had not above 20,000 sheep. For a long time the disease was known in the Liverpool Plains District, and various remedies were suggested. They used to give salt and all that kind of thing when it showed. During the shepherding days, when they used to put two flocks at the one station and divide them by yards, one flock would be dying from Cumberland and the other adjoining it would not. Of course they ran upon different pastures. His own idea was that it had been largely due to the rich pastures, the sheep eating some fungoid growth or something of the kind that would produce it. He tried to gain as much information as he could about the disease, as he had suffered a good deal from it. He asked several scientific men, some of whom accompanied H.M.S. "Challenger," if they could tell him what function the spleen performed, but they could not. People do not know what function the spleen performed in the animal; they might say this or that, but it would be pure speculation. He would like to know from experiments carefully carried out what functions the spleen performed, as it was really a disease of the spleen they had to deal with. If they made a *post mortem* of any animal dying from Cumberland they would find the spleen diseased. He thought Mr. Stanley's paper bore that out. The most effective remedy of all, and he had great pleasure in naming it, was to change the pastures of the sheep. If they were on good pastures move them if possible to the hills. He had known of twenty, thirty, forty, and even fifty sheep dying in a night out of 1,500 to 2,000, but by moving the flocks to the hills the deaths gradually ceased, and in the course of a fortnight perhaps ceased altogether. He had formerly been under the impression that Cumberland could only exist on rich pastures. On one occasion, however, he went to the poorer pastures in the west, at Mudgee, and bought some of their choice sheep from stock-holders there. All at once Cumberland disease showed itself. He made inquiries and found that the disease was in the sheep there. He decided to watch the progress of the disease, and travelled with the sheep for about six weeks. They had to go on one of his stations, and he remained with man in charge of them. He carefully noticed all the symptoms, and found that they were just the same in the poor countries as they were in the rich. The disease had been a great scourge to the country from time to time. During the drought he had letters from friends telling him that sheep were dying from Cumberland, notwithstanding the fact that there was hardly a blade of grass growing, and they were feeding the stock on cut boughs of trees. They were dying even so fed. In those parts they were accustomed to die, not in large numbers, but perhaps 10 or a dozen to 30 and 50 in a week, in a paddock containing 4,000, 5,000, or 6,000 sheep; 50 would be a large number to lose in a week. No one knew when it would break out again in a virulent form, and he thought it was a very important thing that they should be able to obtain some cure or some preventive agent. As he had stated, the only preventive he knew of was to change the pastures. Of course it could not be so readily adopted now as in the old days, when they had simply to order the shepherd off to the hills. Now, through the country being fenced in on all sides, people require to have special places set apart for such stock. That, of course, would not pay, and they were obliged to continue on, and take the risk of their stock dying. Fortunately, it had not shown itself in a virulent form for some time, and he was in hopes that it would not. His observations were to the effect that since the drought and the fresh crops of grass the disease had shown in a very mild form. Perhaps three or four sheep would die in a paddock in the course of two or three weeks, but nothing very alarming would occur. Such was the Cumberland disease, and that was how it had been cutting down the flocks. In the Murrumbidgee districts he understood that the disease had shown itself to a very considerable extent—so he had been informed. In the Upper Murrumbidgee district (he carefully avoided mentioning the names of any stations, as it would be improper for him to do so) the disease had shown itself in fair grazing country. It was not what they would call first-class fattening country, but, in one word, the disease had shown itself upon the very richest as well as on the poorest pasturages. If there was anything in those replies which Mr. Stanley had obtained from Europe to help them, it would be a very good thing; but the great difficulty he foresaw was in the practical part, in applying the cure or treatment in these Colonies. Our systems were so different. We dealt with large numbers, and they dealt with small numbers. Then again there was the question—would it pay? He alluded in connection with this particularly to sheep. Stock were so much more valuable at Home than here. We could save our stud flocks if inoculation established a perfect preventive, and it would be a great boon to have them saved.

Anthrax.

Anthrax.

saved. Of course to inoculate the millions of sheep all over the Colonies would be hardly practicable. It might be done, and might yet be considered worth doing; but so long as Cumberland existed only in a mild form and only broke out in odd spots, he doubted if such an immense work as general inoculation would involve would be followed up. At the same time it would be well to know that there was a preventive, and that it would be a safeguard for valuable stock. As regards horses, he had seen them dying of Cumberland. He had seen cattle dying of Cumberland, and Mr. Curr would tell them of pigs dying of that disease. Whether it be that Cumberland was produced from the causes which Mr. Stanley had spoken of or not was a matter he would like to be certain of. He was not prepared to say whether it was or was not. He had only stated his own experience, and had not gone into the matter scientifically. He understood that New Zealand, South Australia, and Tasmania were free from this disease.

Mr. GORDON: My observations go to show that the disease is rife in April and June.

Mr. HIGGINS believed that it showed more markedly in the months he had mentioned, but it showed in other months as well. He had had sheep die of it in April. If sheep were attacked with Cumberland the owners should avoid yarding them if possible, or disturbing them. He had known an instance in connection with his own sheep when they were infected. They yarded up the fat ewes, and all at once they began to drop dead. The overseer got so frightened that he let the sheep go out, and they travelled on to the pastures. They were not interfered with; the hurdles were thrown down, and after they got a little distance from the yard they ceased dying. In 1878—or the year of the drought—he met a lot of sheep travelling along almost perished for want of food. They came to a flat where there had been a thunderstorm, and a rapid growth of grass had sprung up. The sheep went into that to the number of 4,000, and in half an hour 100 of them were dead with all the symptoms of Cumberland. He told the man that his best plan was to get the sheep away instantly from the flat. He did so, and they ceased dying.

Mr. TABART: Suppose other sheep crossed over that pasture, would it cause infection?

Mr. HIGGINS: I never knew it have the slightest effect on other sheep passing over the same pasture.

Mr. STANLEY: I shall be very happy to answer any questions that may occur to any of you. Perhaps it will be better if I reply to Mr. Curr first; he says the disease is only seen in swine.

Mr. CURR: I said principally among swine.

Mr. STANLEY: I wish to explain that pigs are less susceptible to this disease than any other animal, so that it was doubtful whether the disease to which Mr. Higgins had referred was identical with that mentioned by Mr. Curr as affecting swine in Victoria.

Mr. CURR: The veterinarians pronounced it to be Cumberland.

Mr. STANLEY: Several scientific observers say it is impossible to give this disease to swine, and I know some persons actually feed pigs with the dead bodies of animals that have died of it. Flesh affected with anthrax has poisoned various animals, including pigs, and the men who skinned them.

Mr. HIGGINS: I have seen blacks eat the bodies of animals that died from Cumberland and the blacks did not die.

Mr. STANLEY said that when anthrax affected the spleen that organ was usually enlarged. Animals might however have Cumberland without the spleen showing any signs of the disease. That it was generally affected was shown by the use of the term splenic apoplexy being given to it by several writers. Although the functions of the spleen were not perhaps fully understood, yet it was known to elaborate the formation of blood cells. The spleen was also a reservoir for holding blood during the process of digestion. That might account for animals dying and their spleens being affected. The process by which the bacillus anthrax was cultivated is as follows:—Take a small drop of the infected blood on a glass rod or wire which had previously been heated red hot to kill any germs upon it. The drop of blood was dipped into nourishing fluid which had been sterilized by heating in an oven to a temperature double that of boiling water. These inoculated fluids were cooled and kept enclosed so as to prevent any contamination from outside germs. The cultivated bacillus developed in the fluids, and were watched as they grew from day to day, their vigor or attenuation being controlled by temperature, and this was the cultivation of the virus. Suppose that one fluid was inoculated. The germs were allowed to develop for say a week, and the virus is then ready for preventive inoculation of animals. From this cultivated virus the inoculation of fresh media could be carried on through any period of years by successive cultivation day after day, week after week, month after month. It is recorded that in four years time the scientists took a small portion of the artificially cultivated material and inoculated a sheep with a fatal quantity of it, then found that it died of anthrax, and that the germs in the dead body were just the same as those with which they commenced the original cultivation, so they might safely assume that they had been cultivating the bacilli anthracis outside the body all the time. There was no doubt that infected animals contaminated the soil, and it was known that the spores would lie on the ground for many months. If sound sheep were put on that ground so surely would they die of anthrax, having become the proper medium for the propagation of those germs.

Mr. HIGGINS: I quite bear out what you say by my own experience. If stock is taken from a locality where anthrax is rife, and afterwards put back on to it, then the disease will show itself.

The CHAIRMAN: It depends a great deal on the weather. Unless the weather was such as favoured the growth of vegetation and of bacilli stock would not run the risk of infection.

Mr. HIGGINS: Whenever there was a small shower of rain and the slightest shoot of grass sprang up Cumberland would show itself much quicker.

The Secretary then read the replies received from America, England, and Belgium, to the questions contained in the memorandum received from Mr. Stanley, dated 28th January, 1886. They are as follows:—

The Commissioner of Agriculture to The Hon. James D. Porter, Assistant Secretary of State.

America, Department of Agriculture, Bureau of Animal Industry,

Sir,

Washington, D.C., 29 April, 1886.

I am in receipt of your communication of the 28th inst., enclosing a despatch from the Consul at Sydney, and a letter from the Colonial Secretary of New South Wales in regard to splenic apoplexy of sheep. In reply to these inquiries I have the honor to state that splenic apoplexy of sheep does not appear to be a very common disease in the United States of America, and that when it does exist it is usually confined to a single flock or to a very small area of territory. It is very seldom

seldom that it occurs continuously or with any regularity as to seasons in any part of the country from which we have Anthrax information. For this reason no experiments with nor investigations of this disease have been undertaken by this Government, and very few have been made by veterinarians. Pasteur's method of inoculation is not practised, and has not been attempted, nor have any cultivations of the virus of this disease been made from animals affected with this disease in this country, so far as our information goes. Trusting that this information will be satisfactory,

I am, &c.,

NORMAN J. COLMAN,
Commissioner of Agriculture.

Sir,

Belgium, Brussels, State Veterinary College, 19 June, 1886.

I have the honor to return the papers which you have sent me with memorandum 54-441, and to reply to the various questions concerning the disease called "Cumberland disease." The symptoms of said disease are evidently of the nature of bacteridian anthrax. The existence of myriads of bacillae confirms this opinion.

My replies to the various questions are:—

1. The cause of the form of anthrax known as splenic apoplexy is evidently the "bacteridie," whether it acts directly or indirectly by means of its products, as many think. The preservation and multiplication of "bacteridie," and in consequence the circumstances favourable to such preservation or multiplication are conducive to the development of anthrax. Some kinds of soil seem to be favourable to the development of anthrax.
2. This disease is generally so rapid in its course that every measure, except preventive treatment, is inadequate. The latter consists of preventive inoculation by Pasteur's method, and production of causes detrimental to the preservation and multiplication of "bacteridie," and bacteridian germs irrigation of marshy country.
3. Inoculation by Pasteur's method has been tried against bacteridian anthrax, and has been found so satisfactory that our Government supplies the vaccine gratis, although it be expensive.
4. Good practical result.
5. In practice it is preferable with us to receive the vaccine direct from Paris, although this is rather expensive.
6. No; bacterian anthrax is too different from bacteridian anthrax, and both differ too much from rouget to allow of the supposition that the virus of splenic apoplexy is protective against all forms of anthralvid diseases.
7. Yes; as long as bacteridian anthrax is to be dealt with. It becomes only a question of dose or attenuation.
8. Impossible to say. Such question should be tested. But if, as it is probable, colonial anthrax is the same as ours, it would present but small differences in animals of the same species.
9. What is done in Paris for the artificial cultivation of virus could I think be applied elsewhere if proper dispositions are taken to that effect.
10. We have no special method because we are too near the place of production of the vaccine, which presents to us a quite reliable character. We are studying the mode of cultivation of vaccine.
11. We use Pravaz syringe and conform ourselves to the recommendations of Dr. Pasteur.
12. This question has not been solved mathematically.

I have, &c.,

O. WEHENKEL,
-The Director.

Mr. CURE said that they had been considering for several hours the experience of Pasteur and several gentlemen in this country of what was known as anthrax—Cumberland disease; but seeing that their mission was to recommend courses of a practical description, he failed to see that they were fulfilling their mission by going into minute scientific details of diseases of this sort. There was not the slightest probability that they would be able to profit by them even if everything connected with these diseases were known. There were several sorts of anthrax, and even Pasteur and others who had devoted a lifetime to the subject did not seem to know exactly how to deal with them. In Belgium every animal had a stable, and was worth £25 to £30, and even there they could not get rid of pleuro. He had watched the course of pleuro in the Low Countries and found that even yet they killed infected animals there, and those which had been in the same stable. Notwithstanding that they had not got rid of pleuro as late as last month. It seemed to him that little could come of the discussion, although he was sure they were all thankful to Mr. Stanley. No one could listen to the information they had received without being interested, yet it seemed to him that if they went on talking for a month they would not be prepared to make any great advance towards what they would have to recommend their Governments to do. The great aim of this Conference should be to bring about something practical. As for cultivating the virus of anthrax, the man who could accomplish satisfactory and practical results would be one in 100,000. It would be quite time for them to go into the subject when a remedy for anthrax had been discovered. Pasteur had told them that in this and every climate the mode of cultivation would differ. How then could they be in a position to recommend any fixed process, say to Queensland, where the climate differed so much from Tasmania and Victoria? As far as his experience went, the only practical step they could take was when an animal was suffering to destroy it; the balance of the flock or herd to be put into quarantine until deaths ceased. What would be the use of telling a man there was anthrax in his stock, and that it might take him four years to get the proper strength of virus? When they had an ordinary remedy, and the public were possessed of the facts, then it would be time for the Governments to legislate on the subject. At present the utmost that the Colonial Governments, especially Queensland and South Australia, could do under favourable circumstances was to insist upon the destruction of infected animals, the remainder to be quarantined in their own paddocks until deaths ceased among them. Such a proposal would, he believed, be given effect to. He begged to move that legislative power should be taken to compel the destruction of all animals which have died of or are suffering from anthrax, and all other animals which have been in contact with the diseased animals be, where practicable, placed in quarantine until certified clean.

Mr. HIGGINS said that they were all indebted to Mr. Stanley for the able paper they had just heard. Seeing that only two colonies were subject to anthrax, he thought that the matter might be dropped altogether. As to taking Mr. CURR's idea of killing the animal infected, he could only say that the animal saved them that trouble, as it died. What they wanted was prevention, not the cure. How were they to know when an animal had become infected?

Mr. PARK: The bacteria still live after the death of the animal.

Mr. HIGGINS: Although it lives, who can tell what animal has the disease in its system, and how are we to know which beast to kill? I have had as much experience of Cumberland as any one in the room, and I could not tell. I am altogether opposed to what Mr. CURR suggests, as it is impracticable.

Mr. CURR: You have only taken one side of the case.

Mr. HIGGINS: If you saw a flock of sheep travelling to market, could you or any one else say whether any particular sheep had become infected with Cumberland?

Mr. BAGOT: You could if you saw the sheep dropping. The whole lot should then be quarantined.

Mr. HIGGINS: We would interfere to too great an extent with trade.

Mr. PETER: Would you not burn the body?

Mr.

Anthrax.

Mr. HIGGINS: There is a law in this Colony by which a drover would become liable to a severe penalty for not burning the bodies of such sheep as had died.

Mr. COOPER: It does not affect us. Our Diseased Cattle Act has a schedule, and we can put into that schedule any disease and so deal with it. If Cumberland disease did appear we could put it in the schedule and make whatever regulations for dealing with it that we liked.

Mr. BAGOT seconded Mr. Curr's motion. He said he thought that the vivid picture which Mr. Higgins had drawn of the terrible nature of this disease, and its known effect in cattle and swine, was sufficient to justify the Conference in passing the resolution proposed by Mr. Curr. If their Governments chose to adopt preventive measures they would be for the benefit of stockowners throughout the Colonies. He remembered an outbreak occurring at Bacchus Marsh, in Victoria. It was approaching the eastern border of South Australia, where they had land exactly similar in character, and where stock would meet with exactly the same conditions of soil and climate. He thought that in all probability the Government would at once act upon a recommendation from the Board on this subject in the event of new regulations being framed. Unfortunately in South Australia they had not power to make the necessary regulations.

Mr. MEREDITH: This shows the importance of prohibiting the moving of stock suffering from this dreadful disease. It is quite right to locate disease. It appears to me that it does not affect an extensive area, and that only two Colonies suffer from it. Is it not better to confine it to those areas and stamp it out? If any laxity is shown there is no saying how soon it may go through the length and breadth of the land. I shall support the motion, and I think we should recommend to the different Legislatures the advisability of preventing stock travelling which has run the risk of infection until the Inspector has seen them.

Mr. HIGGINS said it was utterly impossible to apply any hard and fast rule. This disease was so mysterious, and its appearances so easily mistaken, that the most expert men in the Colony might take some other disease to be Cumberland. Whom had they here capable of determining it to a certainty? He ventured to say with regard to the Inspectors that perhaps not one in ten would be able to do so. Mr. Bruce would bear him out from what occurred before the examining Board as to how many could describe anthrax accurately. If they understood what anthrax was then they should deal with it, and if not they should let it alone.

Mr. VALENTINE: It is dealt with in European countries by inoculation. If anthrax broke out in South Australia the Government would have to take the matter into their own hands, and exceed their powers.

Mr. HIGGINS: What would you do?

Mr. VALENTINE: Destroy the stock, get the land clear, and compensate the owners.

Mr. LANCE: Putting the stock into quarantine is not practicable. The best means of getting rid of the disease is to move the sheep to fresh pastures. Here you propose to keep them on one pasture, and that means killing them.

Mr. CURR: If you do not do that you kill the stock of the neighbours.

Mr. PETER: Suppose that a thousand head of cattle are travelling and they are far from home—how are you going to put them into quarantine?

Mr. HIGGINS: I never knew of a flock getting disease by passing over country which had been travelled by a flock infected with Cumberland.

Mr. GORDON: I can correct that. In 1868 sheep travelling through infected runs in the Maranoa and Darling Downs became diseased. Since then the run has been burnt off for three seasons, and the disease has not shown again.

The CHAIRMAN: If the disease was first noticed in the county of Cumberland and is now found in other parts of the colony, it is surely reasonable to infer that it is infectious, especially as it is year by year found further and further from the starting-point. Some of our station-owners dare not at certain seasons of the year put stock on some parts of their runs, because if they did the stock would begin to die in ten days or a fortnight from Cumberland. If we can obtain any information regarding this disease we should certainly get it; and it was with that object we have been making these inquiries with regard to inoculation for anthrax. It is a most serious matter, and one affecting the whole of the Colonies.

Mr. MEREDITH: Is there any fear of stock or land being infected from the droppings, &c., from trucks while conveying sheep or cattle infected with Cumberland, or of sheep or cattle becoming infected if carried in the same trucks afterwards? Is it possible to effectually disinfect trucks having had in them stock infected with Cumberland disease?

Mr. STANLEY: There is no doubt that animals infected with Cumberland would also infect the ground over which they passed, and it is possible for the bacilli to be conveyed from one place to another by dust, and not necessarily on herbage. The disease known as wool-sorters disease is caused by the bacillus of anthrax being conveyed from one country to another in wool. Where it is possible to disinfect the trucks I believe that such a plan might be practised. The stock trains in England are constantly disinfected with steam and chemicals, but it cannot be done by the ordinary plan of sweeping and washing out.

Mr. PARK: From my own experience I am able to endorse Mr. Stanley's remarks.

Mr. HIGGINS moved and Mr. LANCE seconded the previous question.

Mr. CURR said that when a mob was infected, according to the judgment of a Veterinary Surgeon, the owners should be compelled to burn and bury the bodies, and not allow them to remove the others until the deaths had ceased.

Mr. HIGGINS: At what recompense?

Mr. CURR: No recompense.

Mr. HIGGINS: Would you condemn a man to tremendous loss because his stock were in beautiful pasture, and because some action—perhaps merely atmospheric—occurred, over which he had no control?

Mr. CURR: If a man is 500 miles from his station, and it is found that his herd is infected, is he to be allowed to send it back and infect all the stock on the way? The animals should be destroyed.

Mr. LANCE: After listening to these arguments, I fancy that this disease might be compared with foot-rot. I have been asked to bring in a bill to deal with foot-rot, and I have refused, for two reasons, as there is not sufficient information about it, and I think that it is also influenced by climatic surroundings. In the wet season I defy anyone to stop foot-rot. The same argument applies to Cumberland;

land; and if we recommend seriously to the Governments to legislate about this matter it might prove anthrax and tuberculosis exceedingly vexatious in those parts of the country where the disease exists. It would be better to allow such districts to arrange matters for themselves. If they find that it is a serious evil, if they find that their property is jeopardised by infected animals passing through it, they will use strong measures to put a stop to it.

Mr. HIGGINS: Stock-owners would have done so long ago if it had been feasible.

Mr. Higgins' motion was then put and negatived by twelve votes to five.

Mr. Curr's motion was declared to be carried.

2. CANCER, TUBERCULOSIS, AND SCROFULA.

Mr. STANLEY read the following paper on tuberculosis:—

As this disease is communicable from animals to mankind, and *vice versa*, its importance demands our attention.

Nature.—It is hereditary and contagious to an extent exceeding all other panzootic maladies; it is conveyed to human beings through contaminated flesh and milk.

Cause.—The germs of contagion are bacilli tuberculosis; they may enter the body with the food or in the air in immediate proximity of an affected animal, and establish themselves in various parts of the body. No organ is free from their attack; they increase at the expense of the surrounding tissues, which gradually undergo retrogressive changes, ending in disintegration and death. The disease is subtle and insidious, but nevertheless slow and sure, and it is incurable. The abattoirs revealed the disease in cattle slaughtered for food, although they may be well nourished, if the disease is in the early stages.

Symptoms.—Cattle are seen wasted by the disease—in fact, consumptive; they have been unhealthy bad thrivers for a long time—suffer from diarrhoea if the bowels are affected; panting, breathing, and cough if the lungs are the chosen seat of disease. In advanced cases the glandular system becomes diseased, as seen in lumpy throat, swollen jaw, and diseased mammary glands; if a constitutionally diseased animal receive an injury, in place of healing, tubercular growths spring up instead. That cattle live and get fat with tuberculosis is explained by their inactive life. We see the contrary illustrated in the external manifestation of the disease, so frequently seen in working bullocks, and again amongst dairy cattle; the drain on their systems accelerate the progress of disease, and from them it is communicated to their fellows by cohabitation, grazing and feeding on tainted pastures, and drinking from tanks and water-vessels contaminated by their expectorations and discharges from tubercular ulcerations or abscesses.

Treatment.—None is available.

The following points are suggested for discussion:—

1. What is the extent of its prevalence?
2. What preventive measures are advisable?
3. Is it advisable to compensate owners for the destruction of diseased animals?
4. Should the sale and traffic in tuberculous cattle be prohibited by law?

Mr. LANCE said that, so far as he was aware, they had no tuberculosis in cattle in New Zealand.

Mr. GORDON: In August, 1885, a lot of cattle came from New Zealand to our Exhibition. One of these animals was found to be diseased, and was not allowed to enter the yards. It has since died of tuberculosis.

Mr. TABART: In Tasmania we have tuberculosis to a small extent. It was only lately that three bullocks went into the abattoirs—whether to be sold for human consumption or not he was unable to say. They were condemned and destroyed, and there is no doubt they were suffering from tuberculosis. We have the disease in our stock only to a very small extent.

Mr. WOOD: I have known it in Queensland for twenty or twenty-five years, and we have not been able to do much with it. The best cure is to give the cattle plenty of salt. We have salt-sheds erected, and the salt, with unslacked lime mixed with it, has done a great deal of good. The best course is to destroy the infected animal, and thus prevent the infection spreading. With regard to the third question in Mr. Stanley's paper, "Is it advisable to compensate owners for the destruction of diseased animals," I think such a course would be impossible in Queensland. Years ago I was interested in a Shorthorn herd, and found that a great many Shorthorn cattle were infected. About fifteen years ago we changed the breed for Herefords, and, under the same conditions and treatment, they are not so subject to tubercule as Shorthorns.

Mr. STANLEY said they would all agree that this disease was hereditary and transmissible. The question was, would they use their influence to discontinue breeding from sires known to be effected with the disease, no matter how good they were. It was a well-known fact that the Shorthorn herds have been so in-and in bred, and their stamina so reduced, that they had become the special prey of tubercule. Where the disease existed diseased animals should, as far as practicable, be destroyed, and should not be bred from. As far as compensation was concerned, he had no doubt that that would be impossible. As progress was being made in science, and in tracing this disease, it was shown that it was being conveyed to invalids and children in the milk of cattle infected with tuberculosis. Hence the law would have to seize and condemn tuberculous animals at the expense of the owners. It would be an important matter to discuss, and to try and prevent the traffic in diseased meat and milk. Any hardship caused the affected animals to give external signs of the disease. If they received knocks or blows they showed it. When they had abscesses in the lungs and chronic cough the infection was spread about on the reserves over which they passed, owing to the expectorations, and thus healthy animals in turn were infected. It appeared to him that the Government should make regulations to prevent diseased animals occupying public reserves or travelling on public roads. That would go far towards arresting the spread of the disease. In inoculating animals for pleuro he was certain he stated the truth when he said that the inoculating matter, instead of being taken from a pleuro lung, had been taken in many cases from animals affected with tubercule, and the disease thus spread; hence it was important that tuberculosis should be fully recognized and put down with a strong hand.

Mr. LANCE was quite sure that this was a disease which should be recognized. He was not sure that it should be put down with a strong hand, as had been suggested, as it might prove to be one of the most

Tuberculosis. most valuable diseases ever brought into the Colonies. During the last Session of the Victorian Parliament a question was put by Mr. Buchanan, I believe, as to whether the disease which had broken out among the rabbits was tuberculosis. The reply of the Colonial Secretary was to the effect that he knew nothing about it. There was no doubt that the rabbits had a disease which appeared to be a bastard form of tuberculosis.

Mr. STANLEY: There are two forms, but the difference is only slight.

Mr. LANCE: At present they had only the mild form, and they desired to intensify it. This was one of the largest questions that the Conference would have to deal with. It was not like introducing a new disease. There were a great many people in this Colony who were strongly opposed to the introduction of any disease to inoculate rabbits, while others thought that it was the most efficacious means of getting rid of the pest. If this disease was found, after careful examination, to be a successful means of dealing with the pest, then the argument could not be maintained that they were introducing a new disease, as they had evidence on all hands to show that it had been running rampant through the lands among the cattle. At present he was strongly in favour of spreading tuberculosis among rabbits, in order to ensure their destruction.

Mr. STANLEY: If this disease is rampant through the country, how is it that the rabbits exist? There is no doubt that the rabbits are susceptible to this disease, but it acts so slowly in killing them that they have time to breed. The disease is not virulent enough to terminate the existence of the rabbits with sufficient rapidity, or to retard their breeding. Owing to that, tuberculosis will never be of any use it getting rid of the rabbits.

Mr. PARK said that two or three years ago Mr. Willows, Government Veterinarian, was sent to Tasmania to investigate the existence of tuberculosis in rabbits in Tasmania. He followed Mr. Willows to Ellenthorpe, near Campbelltown, and they found that about 75 per cent. of the rabbits they killed were affected with tuberculosis. He told Mr. Willows he was prepared to travel for 100 miles straight away, and to find tuberculosis wherever there were rabbits. He found tuberculosis to the extent of 80 per cent. where it was never supposed to exist. Mr. Mandeville, who manages the Denisbon Estate, was eager to have the disease communicated to the rabbits on this run. He told Mr. Mandeville to rest assured that he had it, and six weeks afterwards he found on his estate a larger percentage of affected rabbits than in any other place. He also found *strongylus contortus* in rabbits existing in large numbers. The form of scabies which Professor Watson had endeavoured to introduce to South Australia was also to be found amongst the rabbits in Tasmania. It had cleared them off one or two estates, viz.: Wellwood and Schawfield, but they had come back again.

Mr. HIGGINS said that in connection with tuberculosis in cattle they might direct attention to question No. 4 in Mr. Stanley's paper. After hearing what they had with regard to eating tuberculous meat there could be no doubt that it was a most dangerous thing to do.

Mr. PARK: The cooking renders the meat innocuous to a certain extent. The danger is in the milk.

Mr. HIGGINS thought that legislation should be effected in the direction of prohibiting the sale of cattle suffering from tuberculosis. Any person found taking tuberculous cattle to market, or any butcher killing diseased animals should be fined heavily. The selling or offering for sale or slaughtering affected cattle should be punished severely, and that would be one of the most efficient means for stopping the spread of tuberculosis. He believed that there was no cure for this disease (he spoke under correction), and therefore there was nothing left but to destroy the animal, which should be compulsory.

Mr. CURR said that a Royal Commission, consisting of several doctors and other professional men, sat for three months in Melbourne to inquire into this matter. They took evidence, had the appearances photographed, and produced a long report. The result was that they recommended the Government to act just as in case of pleuro—simply kill the animal where practicable. They found that an immense danger was run, especially by infants, and that tuberculous milk produced consumption. Any reasonable man would do as he had done years ago when he met with a disease he did not understand, namely, put a bullet into the beast which had it. The result was that for twenty years he had less disease in his sheep and cattle than any of his neighbours.

Mr. MEREDITH said he would support a proposal to prevent trading in cattle or other stock affected with tuberculosis. He would suggest to the mover that he went a little further and recommended to the various Governments to pass legislation to the effect that all milch cows found to be infected should be absolutely destroyed, because they had it on reliable authority that the consumption of such milk was liable to convey tuberculosis to consumers. There were thousands of persons in the colony who from ignorance of the danger and the disease would possibly, by using milk from diseased animals, bring about the most terrible results to themselves and their families. The Legislatures should interfere to prevent such diseases spreading.

Mr. HIGGINS: Do you think it would be beneficial to prevent infected animals being used in teams of working bullocks.

Mr. VALENTINE: Cancer is tuberculosis. If, for instance, an animal has a cancer in the jaw, that would not make the meat of the body unfit for consumption. People do not care about eating meat diseased with pleuro. If we confine the proposed destruction of carcasses to bad cases we can prevent the consumption of infected meat, but we should not destroy the meat in every case that occurs.

Mr. HIGGINS: Would it not be well to destroy infected animals in order to get rid of tuberculosis?

Mr. VALENTINE: A few years ago 20 per cent. of the animals coming to South Australia and on the border had cancer or tubercle in the jaw. I do not think that it did a great deal of harm.

Mr. WOOD: I have seen scores of them sent into the Brisbane market.

Mr. HIGGINS: If it be the case that it is dangerous to eat tuberculous meat it is necessary to prevent the sale of such animals in the interests of the public. The only way we do it is by adopting the recommendation of stringent measures. If we deal with it in a half-and-half manner offenders will escape the penalties imposed upon them. The only way to deal with it is as a whole and thoroughly. We all know what tuberculosis is. The animal affected with it is a useless beast. I know the theory of the disease, but I cannot say what its effects are on the human being. I propose to deal with it thoroughly.

Mr. STANLEY: Allow me to explain that, although cancer is often called tuberculosis, the two diseases are distinct. Cancer is often simply a local affection, although at times under certain circumstances it might be constitutional.

Mr. HIGGINS: I have also heard that these animals are slaughtered to give to pigs. That also ought

ought to be prohibited, for if an animal is dangerous to eat in one shape it is dangerous to eat in another. Tuberculosis. I beg to move, "That all stock affected with the disease known as tuberculosis be destroyed under a heavy penalty." Mr. PETER seconded the motion.

Mr. CURR moved as an amendment—"That all animals suffering from tuberculosis and not fit for human food be destroyed." He said there was not an instance on record of any one being affected by eating tuberculous meat. It was a well-known fact that in some parts savages eat the bodies of anyone dying amongst them. It was only after they had cut an animal's throat that they could tell if it was diseased, when the disease was in a mild form.

The motion and the amendment were withdrawn.

Mr. HIGGINS moved—"That the travelling, selling, or offering for sale, or slaughtering for food, of any animal affected with the disease known as tuberculosis, or the using of cows affected with tuberculosis for dairy purposes be punishable by law." Mr. WOOD seconded the motion.

Mr. CURR moved an amendment—"That when an animal is so affected with tuberculosis as to be too poor for human food such animal shall be destroyed."

The amendment was not seconded.

Mr. TABART: Are we not going out of our province in dealing with the traffic in dairy cows? I think we will be interfering with the Health Boards in meddling with such a matter.

Mr. WOOD: I have seen beasts sold that were not badly diseased in Queensland. It would be a good thing for a regulation to be passed to prevent such a practice.

Mr. STANLEY: We want to prevent traffic in the live animal. That is where our legislation is at fault.

Mr. CURR: We are not aware that animals with only a small degree of tuberculosis ever caused an injury to any person, but still we are to recommend that their throats be cut. There would be an enormous waste from this course which can only be carried out partially.

The motion was carried on the following voting:—For: Queensland, 3; New Zealand, 2; South Australia, 1; Tasmania, 3; New South Wales, 3. Total, 12. Against: Victoria, 3; New Zealand, 1; South Australia, 1.

Mr. COOPER moved, and Mr. HIGGINS seconded,—“That this Conference meet every week-day except Saturday; that it adjourn for luncheon from 12.45 p.m. to 2.15 p.m., and that it adjourn for the day at 4.30 p.m.; that there be no meeting on Saturday; that eight members form a quorum for the transaction of business; that all questions be decided by a majority of votes, and that the Chairman have a casting vote in consequence of equality in addition to his deliberative vote as a member of the Conference.”

The motion was agreed to.

The Conference then rose and adjourned until half-past 10 o'clock on the following day.”

WEDNESDAY, 29 SEPTEMBER.

THIRD MEETING.

Present:—Mr. Alexander Bruce, Chairman, and the full Conference.

The minutes of the previous meeting were read and confirmed.

Mr. MEREDITH: There are some subjects which members evidently take more notice of than others, and it is desirable that before the close of each sitting notice should be given of the subjects to be considered at the next meeting.

Mr. HIGGINS: The order of procedure has been laid down.

Mr. MEREDITH: It has not been followed. I see that Nos. 3, 2, and 1 have been taken as 1, 2, and 3.

Mr. HIGGINS: I believe they have been taken in the altered order I see that under No. 1 are most of the diseases sheep are principally affected with. I think we should adhere to the order of procedure as laid down, and if any gentleman wishes to bring forward a special motion he should be at liberty to give notice of it, or with the permission of the Conference, and then it could be dealt with on the following day. If a notice were given this afternoon it could be dealt with by the time of the adjournment for lunch on the following day. If we keep to the programme I think there will be no fault found.

The CHAIRMAN: I think it well to state the order in which we will take the different items. Glanders and farcy will come next, and I would suggest that we consider the other diseases not known in the colonies after glanders and farcy.

3. GLANDERS AND FARCY.

Mr. STANLEY then read his paper on glanders and farcy, but it was decided on the motion of Mr. CURR that the further consideration of these diseases should be postponed for discussion with foreign diseases. (*See under head of Treatment of Foreign Diseases.*)

Mr. BAGOT: No. 3 in the programme deals only with the introduction of foreign animals, and Mr. Stanley recommends that Inspectors should have power to confine animals which had disease to some particular locality. We should also have regulations for the internal management of the disease. So long as there is no objection to our discussing the mode of dealing with the disease, if it be in this country, when we are discussing foreign animals, then we can let it remain.

Mr. VALENTINE: All the diseases should be placed in a Schedule to the Act.

Mr. LANCE: We have one in our Act. The Governor has power from time to time, on the recommendation of the Minister, to add any disease to the Schedule.

4. HOOSE.

The CHAIRMAN: The next question is hoose. I suggest that it be held over until we deal with entozoa. This was agreed to.

5. PLEURO-PNEUMONIA.

The CHAIRMAN: The next question is the treatment of pleuro-pneumonia.

Mr. COOPER: It is not known in New Zealand.

Mr. TABART: It is not known in Tasmania.

The CHAIRMAN suggested that in order to facilitate the business of the Conference the resolutions passed at the Stock Conference held in November, 1874, should be taken as subjects for discussion at this, and in the order in which they were then passed. With that view he proposed, and Mr. GORDON seconded, that resolution No. 1 passed by the previous Conference in regard to pleuro-pneumonia be passed by this Conference. These resolutions were to the following effect:—

No. 2.—Pleuro-pneumonia. Legislation suggested.

1. That every mob of cattle which has become infected be inoculated when the virus can be obtained in the mob or in any cattle within a practicable distance.
2. That owners give notice of every outbreak of the disease to their neighbours, to Inspectors, and to the public.
3. That no inoculators but those authorized by the Government be allowed to inoculate for others.
4. That properly inoculated cattle depasturing on a run, on the expiry of six weeks from the last case of disease, be allowed to leave the run and to pass over infected ground without being deemed infected.
5. That all travelling cattle actually affected with or suffering from pleuro-pneumonia be killed immediately they are found to be so.
6. That if the travelling cattle in which any animal is thus found to be actually affected be fat stock, they be taken by day to their destination by the roads least likely in the opinion of an Inspector to spread the disease, and timely notice be given by their drovers to all owners of horned stock on or near the road that the mob is infected.
7. That where the travelling cattle in which any animal is thus found to be actually affected with pleuro-pneumonia are store stock, they be stopped and inoculated as soon as practicable, and afterwards taken to their destination, as provided for in the next preceding regulation; but such cattle be not required to travel more than 6 miles a day for the first thirty days after being inoculated.
8. That in Colonies in which pleuro-pneumonia exists, the owner of travelling cattle give notice of his intention to cross or pass along runs where stock of the same description are kept, if the road be not separated from the run by a sufficient fence.
9. That drovers do not abandon any travelling stock, nor leave the carcasses of any stock which may die, undestroyed.

Mr. MEREDITH considered that tuberculosis might be spread by means of inoculation.

Mr. HIGGINS pointed out that the third resolution says, that inoculation shall only be performed by persons authorized by the Government.

Mr. CURR thought it would be well to decide whether the policy laid down in this paragraph should be the policy of the Conference. He objected to it entirely. If the Conference were asked to adopt this in a general way subject to amendment, it might be accepted with such a condition. The course pursued in Victoria was a good common sense one. If an animal was found to be actually diseased it was destroyed and the others with which it had come into contact were watched; that was to ascertain whether it was an accidental case. If however four or five animals were found to be diseased the whole of those with which they had come into contact were put into quarantine. If the Conference desired to hear his objections to this plan of inoculation, he would be happy to state them.

Mr. LANCE: The plan might be suitable to small lots but not to large ones, or to a very large extent of country.

Mr. CURR: By quarantining, I mean keeping the stock on the station or in their paddocks.

The CHAIRMAN: I think it would be better to consider the resolutions one by one. The first questions we should discuss are:—Have we sufficient evidence to say that inoculation is effective and ought we to make it compulsory?

Mr. CURR moved as an amendment,—“That this Conference decide that the subject of pleuro be not discussed as under heading (No. 2.) in blue book containing report of the previous Conference.”

Mr. VALENTINE seconded the motion. He considered that the matter would be simplified if it were dealt with in a general way.

Mr. HIGGINS: The question is whether we should deal with pleuro in this form or not.

The CHAIRMAN: We have decided to deal with pleuro, and the form suggested is the simplest and best.

Mr. CURR's motion was then put to the vote and negatived by 10 votes to 8. The following was the voting: Against,—New South Wales, 3; Queensland, 3; New Zealand, 1; Tasmania, 3. For,—South Australia, 3; Victoria, 3; New Zealand, 2.

The CHAIRMAN moved the adoption of resolution No. 1, which had been altered to read as follows,—“That in every mob of cattle in which infection exists, those actually diseased be destroyed, and those infected but not showing symptoms of the disease be inoculated, when the virus can be obtained in the mob or in any cattle within a practicable distance.”

Mr. VALENTINE considered that if they adopted the list of regulations laid before them by the Chairman they would be making inoculation compulsory.

The CHAIRMAN: Yes.

Mr. BAGOT: The Legislature of South Australia would never for one moment entertain the idea of enforcing universal inoculation. The most the Conference should do should be to prevent drovers leaving the bodies of diseased animals unburied or travelling infected animals upon reserves. As far as our Colony is concerned the result of this Conference recommending compulsory inoculation would be null and void.

Mr. STANLEY said that the great object of inoculation was to prevent the spread of pleuro in the localities through which the stock was travelling. The matter must be dealt with from an intercolonial standpoint. If infected animals were inoculated the disease would be prevented from spreading. It seemed

seemed to him a very important matter not only to inoculate the mob in which disease appeared but also the adjoining mobs. If a stockowner knew that any diseased stock was approaching he should as a measure of precaution inoculate his own to prevent contagion. Mr. Curr had admitted that there was scarcely a mob of cattle in Victoria that was not infected with pleuro.

Mr. CURR: I spoke not only of Victoria but of all the Colonies. I beg to move, as an amendment, that inoculation for pleuro-pneumonia be not made compulsory.

Mr. WOOD seconded the amendment.

Mr. CURR said that, with all the advantages they possessed in the Low Countries, and the fact that animals were not allowed to mix with one another, they had failed to get rid of pleuro there. He would ask them to contrast the difference between animals in the Low Countries, where they were tied up and kept in stalls, and those in Queensland. Of course the advantages for the system of inoculation were infinitely in favour of the Low Countries. They could do it there, but we could not do it, especially in the larger Colonies. No Government would make it compulsory, even if the Conference did recommend it. Some years ago he had a discussion with Mr. Bruce in the papers, and he received a number of letters from squatters in New South Wales, agreeing with him entirely. They said that industries became emasculated from the constant interference of Government. Why not let everyone look to his own? Some of the letters he received went to show that since inoculation had been introduced a general weakening had taken place in the constitution of the herds, that the bulls never came to maturity thoroughly, and that if the country were polled from one end to the other there would be found to be a large majority of stockowners against the system recommended by Mr. Bruce. If by inoculation we could get rid of pleuro he would be ready to agree with him. He had heard of twenty undiseased animals being killed and paid for in Belgium on account of one outbreak. He apprehended that none of the Colonial Governments would take such a task upon themselves, or go to the expense of employing the necessary staff. He would ask, how could they muster half the cattle of Queensland? Many of the wild ones would be injured if they were pressed into yards. He had been told by men who had been connected with stock for twenty or thirty years, that it was only necessary to travel any herd in Australia 500 miles and they would begin to die of pleuro.

Mr. WOOD said it was a most tyrannical proposal to make inoculation compulsory, and it would never be adopted in Queensland. The loss by inoculation was considerable. He thought that the owners of cattle should be compelled to inoculate their stock before moving them from the stations, and the Government inoculators should see this carried out. It would be very hard on cattle owners to make them inoculate the whole of their stock whenever the disease broke out. There was pleuro in many of the herds without the owners being aware of it.

Mr. STANLEY said, that at a Congress of Veterinarians in Brussels, the subject of pleuro was gone into, and their proceedings published. The result of their investigations were to the effect that they advocated inoculation as a preventive of pleuro. The English authorities were formerly much against it. Now, the most recent information was that the majority of veterinarians of the highest standing in Europe were of opinion that inoculation was the best remedy to arrest the spread of pleuro in cattle where stamping out by slaughter could not be carried out. Sometimes mistakes were made by using the wrong virus, but if the virus were taken only from animals suffering from pleuro, inoculation would certainly be found to be a preventive, and certainly one of the most valuable introduced into cattle practice in this decade.

Mr. HIGGINS said, that one of the objects of this Conference, as he understood it, was to produce something which would assist the various Governments in dealing with the diseases to which the stock of the Colonies were liable, and also prevent the introduction of diseases into the country. Among the diseases which had been introduced into the country was pleuro. To his mind the best way to deal with it was to stamp it out just as they did with scab. If scab were to make its appearance it would be stamped out at once. Mr. Stanley had said that pleuro had not been dealt with successfully at home, and that therefore it could not be dealt with here. They could not get rid of scab at home and yet we had stamped it out here. The question was, would it be possible by any means to stamp out pleuro. He confessed that he saw one grave difficulty in the way, and that was with regard to compulsory inoculation. He considered that regulation No. 1 meant that diseased beasts must be destroyed.

The CHAIRMAN pointed out that the word "mob" and not herd was used in that regulation.

Mr. HIGGINS said when once pleuro shows on a run it extends throughout the herd, therefore you must not make exceptions, otherwise some trouble will certainly occur. We had better say whether inoculation should be compulsory or not.

The CHAIRMAN: If this were made law people would be careful to stamp out the disease for their own sakes. They would make a certainty of bringing in all the cattle likely to be exposed to the danger of infection. They might miss some the first time, but after that they would certainly muster all that were likely to be infected.

Mr. HIGGINS said they must deal with this question as a whole or not at all. He was ready to vote for compulsory inoculation as a general regulation, because he thought that when disease appeared efficacious steps should be taken to stamp it out. If that were done they would be going far towards stamping it out throughout the Colony. He believed that it was the only known remedy they had, and it was their duty to adopt such measures as would protect, not only one, but the whole of the Colonies.

Mr. GORDON said it was agreed that inoculation was a preventive, and it would be a foolish thing to offer any objection to it. He remembered how mobs were dealt with on the Hunter. The same cattle met in camp day after day, and a mob was called a camp. The camps were inoculated and the disease never spread. He would not propose to inoculate every mob of wild cattle, but if they saw that inoculation was a preventive of pleuro they would be very foolish to offer any objection to it.

Mr. VALENTINE believed that inoculation had done a great deal of good, and it was constantly resorted to in South Australia. Nearly all their cattle owners and farmers inoculated their cattle, but if the Conference went so far as to recommend that it be made compulsory he was afraid that it would be found a very difficult matter to carry out. The cattle owners would certainly put up their backs against any proposal to make inoculation compulsory.

The CHAIRMAN: Stock owners objected in the same way when we were engaged in stamping out scab.

Mr. VALENTINE: Scab is a very different thing. If you inoculate an animal the disease may remain latent in it, even with the inoculation, and then if the animal is moved, it will be the means of spreading disease.

Mr.

Pleuro-
pneumonia.

Mr. STANLEY: You cannot infect an animal which is inoculated.

Mr. VALENTINE: It is useless to recommend a law which will not be carried out.

Mr. CURR said there was no doubt that in Victoria and South Australia inoculation is carried out to a large extent. In Victoria, compulsory inoculation throughout the Colony could not be carried out without employing at least one hundred inspectors. At present there were only seven, and he did not think that the Government would care about increasing the number. He contended that they could not get rid of pleuro by any such measures as were now projected.

The CHAIRMAN said that he took the same view of the question as Mr. Gordon. What they had to decide was whether the treatment was a success. He thought that had been settled beyond all doubt. Were they then to do such a foolish thing as allow infected herds to travel through the length and breadth of New South Wales and Victoria, because there were some few immaterial objections to the proposal to make inoculation compulsory. He was astonished to hear the South Australian representatives object to the proposal; for as certainly as cattle started from Northern Queensland, so certainly did they, unless they were inoculated, get infected before they reached South Australia. There was no place where inoculation could be carried on so easily as upon the station, and owners should therefore be compelled to inoculate when the disease appeared. It would be somewhat inconvenient to do it on the road. But that, too, could be managed. A man might just as well put a fire-brand to a run as take a herd infected with pleuro upon it. For these reasons, he would recommend that regulation No. 1 stand as it appeared in the record of the previous Conference.

Mr. PARK said that his experience of travelling stock from Victoria to South Australia was, that every mob of cattle introduced pleuro. Had those cattle been inoculated many thousands of pounds worth of stock might have been saved. Had they been quarantined before being offered for sale, the infected ones could have been got rid of, and the infected mob inoculated and not allowed to mix with the farmers' herds. Therefore, if inoculation was a preventive against the disease spreading, then by all means they should adopt it.

Mr. WOOD said he had no objection to a regulation being passed providing for the inoculation of cattle before they started from the runs on any journey, but he was decidedly opposed to the compulsory inoculation of every mob at home.

The amendment was then put and carried by eleven votes to seven, the voting being as follows:—For,—Victoria, 3; Queensland, 2; South Australia, 3; New Zealand, 3. Against,—New South Wales, 3; Queensland, 1; Tasmania, 3.

The CHAIRMAN moved, and Mr. GORDON seconded, the second regulation,—“That owners give notice of every outbreak of the disease to their neighbours, to inspectors, and to the public.”

Mr. BAGOT: Nothing would suit me better, if I owned 50 miles square of land with stock on it, and desired to act dishonestly, than to put up a notice, “Pleuro on this run,” so as to keep everyone else off it.

The CHAIRMAN: The inspector would put the run into quarantine.

Mr. BAGOT: All these resolutions *re* pleuro might be decided by putting this resolution to the vote. I intend to move a resolution providing that diseased animals be destroyed, that penalties be provided for leaving the bodies of diseased animals undestroyed, and that notice be given to the inspectors of any outbreak of disease.

Mr. GORDON: What would be the use of that in the northern territory?

Mr. BAGOT said that the disease was not so virulent in the dry countries. There had been two outbreaks in his cattle, but he had managed to stamp them out. In one instance he lost heavily, but in the other only a few animals died. The inoculation of travelling cattle was practically impossible. There must be some place in which to perform the inoculation. They could not stop a diseased mob on another man's run.

Mr. GORDON said, that on the Warrego, at Wilcannia, and elsewhere, cattle were inoculated on the way, and the owners were very glad to do it.

Mr. HIGGINS: I was under the impression that, notwithstanding the loss of the first regulation, the others would be considered *seriatim*, and that, as they were being considered, any amendment that members of the Conference thought fit might be proposed.

Mr. BAGOT: The question of compulsory inoculation having been settled, there is nothing before the Conference now. Before we pass the regulation stating that stockowners shall give notice of an outbreak of disease, we must state what legislative power must be taken to stamp out the disease or how it shall be treated.

Mr. BAGOT moved,—“That this Conference recommends that power be given to destroy animals actually diseased with pleuro-pneumonia, and that penalties be enforced for leaving diseased animals or dead bodies undestroyed, and that stockowners be compelled to give notice in writing of every outbreak of the disease to the Chief Inspector of Stock and to the nearest Inspector of Stock.” Practically, he embodied in his motion the regulation which Mr. Bruce had brought forward.

The CHAIRMAN: I take the same view as Mr. Higgins, that the order should be according to this list. The motion decidedly was that these subjects should be considered in the order in which they stand. I rule Mr. Bagot's motion out of order.

The motion was then put and negatived by 12 votes to 6, the voting being as follows:—Against,—New Zealand, 3; Victoria, 3; Tasmania, 3; South Australia, 3. For,—Queensland, 3; New South Wales, 3.

Regulations Nos. 3 to 9 of previous Conference were then withdrawn.

Mr. BAGOT then moved his resolution again in the same shape. He said that pleuro had existed to a great extent throughout the herds of the Colony, but he believed they were now quite free from the disease. He thought that compulsory notification would be a disadvantage to conscientious men, as they would at once notify the presence of pleuro in their stock, whereas dishonest men would not do so until it was found out.

Mr. HIGGINS: What will be the benefit arising from carrying this motion?

Mr. BAGOT: You can destroy diseased cattle.

Mr. HIGGINS: But you cannot inflict a penalty for travelling diseased cattle.

Mr.

Mr. BAGOT: If you talk of inflicting a penalty for travelling diseased cattle, that would be the best trade protection South Australia could have, as very few cattle could then come in from Queensland, New South Wales, or Victoria. Hardly an individual mob of cattle reaches the northern railway stations in South Australia, coming from Queensland, without disease being present in it.

Mr. GORDON: It was by making scab public that it was banished from the Colony.

Mr. HIGGINS suggested that the words "in writing" be added after the word "notice."

The suggestion was agreed to, and the motion altered accordingly.

The motion was then put and carried unanimously.

Inoculation Mark.

Mr. BAGOT moved,—“That the distinctive mark in use in Queensland, viz., the tip off the ear, be used universally through the Colonies as the sign of inoculation.” Mr. HIGGINS seconded the motion, which was carried unanimously.

The motion appears in the report in the following revised form—“That the distinctive mark in use in Queensland, viz., the tip off the off (*i.e.* the right) ear, be used universally through the Colonies as the sign of inoculation.”

ADMISSION OF PUBLIC.

Mr. HIGGINS moved and Mr. WOOD seconded,—“That the public be admitted to the meetings of the Conference.”

The motion was negatived by 12 votes to 6, the voting being as follows:—Against,—New Zealand, 3; Tasmania, 3; South Australia, 3; Victoria, 3. For,—New South Wales, 3; Queensland, 3.

It was agreed that this exclusion should not affect the press.

Efficacy of Inoculation.

Mr. HIGGINS said it had been suggested to him by a member of the Conference that there ought to be a motion, contingent on the motion that compulsory inoculation is not desirable, to the effect that they recognized the efficacy of inoculation.

Mr. GORDON: There is nothing in the resolution to show that we believe in it at all. I beg to move that this Conference desires to express its belief in the efficacy of inoculation as a preventive for pleuro-pneumonia.

Mr. VALENTINE seconded the motion. It had been practised in South Australia with good results.

Mr. LANCE said it seemed to him that the first thing they should be careful about was not to stultify their previous action, but they could vote for this resolution without doing so. What they had done was to vote against compulsory inoculation. It would be quite right of them to recommend to their Governments such means as were fitted for stamping out disease, but surely it was not their duty to recommend any measures which would be either vexatious or impracticable. The remarks which he had heard from South Australia, Queensland, and Victoria, were to his mind conclusive arguments that if they insisted upon recommending compulsory inoculation it could not be carried out.

Mr. PETER: Travelling parties should be compelled to inoculate before they started on their journeys.

Mr. HIGGINS: There is nothing to prevent anyone bringing forward such a resolution.

The motion was then put and carried unanimously.

Reference to Pasteur.—Cultivation of Virus.

Mr. GORDON moved,—“That it is desirable to recommend to the Government of the Colonies represented at this Conference, that communication be opened with M. Pasteur, with a view to ascertain whether the virus or contagium of pleuro-pneumonia has been, or can be, cultivated apart from the living subject, and if so to state the mode of cultivation.” He said it had been satisfactorily proved that this disease owed its vitality to a specific micro germ, and there was no doubt that it could be cultivated. The present system of inoculation was satisfactory and the loss slight. The difficulty, however, was in preserving virus for use. If it could be cultivated in the way suggested, a quantity might be kept available for any emergency.

Mr. CURR: Although we know what the virus is, we shall be all the better for any information that Mons. Pasteur may favour us with.

The CHAIRMAN: Many people would use it, if they had it, as a safeguard for their stock.

The motion was carried.

The motion appears in the report in the following form:—“That communication be opened with M. Pasteur, with a view to ascertain whether the virus or contagium of pleuro-pneumonia has been, or can be, cultivated apart from the living subject, and if so to state the mode of cultivation; and also the best methods of preparing and preserving virus for inoculation.”

THE RABBIT NUISANCE.

This subject was then introduced.

Mr. HIGGINS: If it is not intended to deal with the rabbit nuisance, it is no use bringing it forward.

Mr. PETER: We do so under subject for discussion No. 6.

The Secretary then read a letter from Mr. Oscar Stub, which with the discussion upon it will be found in the proceedings, page 85, under the head of Rabbit Nuisance.

PROTEST BY QUEENSLAND BREEDERS AGAINST WITHDRAWAL OF PROHIBITION.

At this stage a protest was presented by Mr. R. B. Wilkinson (Messrs. Wilkinson and Lavender) by certain Queensland Breeders against the withdrawal of prohibition. It will be found under the head of “Introduction of Foreign Stock,” page 86.

Catarrh.
Entozoa.

CATARRH.

The CHAIRMAN said the next question to be discussed is the treatment of catarrh in Sheep.

Mr. HIGGINS moved,—“That this Conference recommend that all sheep infected with catarrh be destroyed, that the owners be recompensed to two-thirds the value of the sound sheep at the date of destruction, and that the run or place in which such sheep were depasturing shall be strictly quarantined for six months.”

Mr. GORDON seconded the resolution. He said that in the old days if a man wanted to get a piece of country he sent his catarrhed sheep on to it, and very soon he had it without opposition.

Mr. CURR said that in 1839 a friend of his had catarrh among his sheep and a neighbour was in the habit of allowing his sheep to encroach. His friend said, “your sheep will get this disease, and I strongly recommend you to order your shepherd to take them away.” He did not do so; the catarrh appeared amongst the lambs and they commenced to die. The neighbour went to his friend and said, “my sheep have got the catarrh; do you know anything that would be of any use to try as a cure?” His friend said “I have heard of a remedy and you might try it. It is to plough the land where they camp at night.” He did so, and averred that it cured his own stock and succeeded in two or three other cases.

Mr. PETER: I remember some years ago, whenever the sheep commenced to die in the yards, they were travelled away, and by that means they got rid of the disease.

Mr. HIGGINS: It is a most deadly and dangerous disease, and I hope we will be able to keep it down. The motion was carried unanimously.

ENTOZOA.

Mr. CURR said that if they drained swampy ground and gave plenty of salt to the sheep they would prevent fluke appearing, but they could do nothing with it after it had obtained a hold on stock.

Mr. PETER: Sheep fatten when they get fluke. In some countries they put sheep on marshy lands and then sell them as soon as they get fat.

Mr. HIGGINS: Some one said there is no cure for fluke.

Mr. CURR: I said so.

Mr. HIGGINS: We have had flukey sheep from the New England district, and put them into salt bush country, and very soon the fluke has disappeared. Limestone country does the same.

Mr. VALENTINE: I have known ironstone country cure it. That is, reduce it so much as to make it harmless.

Mr. HIGGINS: When the lower jaw towards the throat is “bottled,” as the shepherds call it, there is very little hope for the animal. The prevention consists in using plenty of Liverpool salt, given in troughs, and keeping the sheep from water. There should be salt-houses in the paddocks, so that the sheep can get to the salt whenever they want. By that means you will save your flocks to a very large extent.

Mr. VALENTINE: Salt and sulphate of iron has been found to be very successful in South Australia.

Mr. HIGGINS: The sulphate of iron may be mixed with salt to a slight extent, but in my experience when they eat the salt alone they were just as well off as if they had the sulphate of iron with it. They will not take the salt so readily when the sulphate is mixed with it. I have known Stockholm tar used on stations and mixed with salt, but it never had the effect of salt alone.

Mr. VALENTINE: We find that in our ironstone country flukey sheep recovered, which showed that iron was an agent in the cure. Liverpool salt is also used, under cover, in troughs. It is better than rock salt, and the use of it has been most beneficial. That is the only way in which the disease can be dealt with after it has appeared.

The CHAIRMAN: What we have to consider is whether fluke is infectious or contagious, and to look at it from a public point of view. If you take flukey sheep through country which does not grow salt bush, when it has plenty of moisture and a fair amount of grass, you will leave the seeds of fluke there.

Mr. MEREDITH said he could speak positively that it was so. In Tasmania for many years fluke was never known to exist where he was. Unhappily he purchased some flukey sheep with the idea of improving his flocks, having no suspicion that there was fluke in the Colony. Unfortunately it proved to be otherwise. The flukey sheep rested for one night on one of his stations, and ever since that the run had been flukey. They were removed from there to another portion of the run and that became flukey. When he found the fluke in his sheep he prevented them from going on to other parts of the run. Out of this flock of 1,800 ewes, with 90 per cent. lambs, in eighteen months he had not 50 left. He remembered one run which was esteemed to be the most valuable for lambing purposes, and they were all aware that when a run had that name it was considered to be very superior indeed. Until three years ago fluke was never known in the neighbourhood, but now it was so bad that sheep could not be put upon it. In another, fluke spread all over it in consequence of some flukey sheep being put upon it. He would recommend that flukey sheep should not be allowed to travel, nor should they be permitted to cross over country through which roads passed, unless the roads were fenced off. Generally in Tasmania there was more or less herbage along the sides of the roads, and flukey sheep nibbling it were apt to deposit fluke, and then clean sheep travelling after them were apt to pick up the fluke and become diseased. Persons had told him that there were some stations on which fluke was found only on patches of two or three acres, and any sheep going upon them became infected. One of these patches was only half an acre in size. It was a small swampy place, amongst steep ironstone gravelly hills, and it had to be fenced off. In cases of doubt, stockowners should prevent their sheep crossing such localities. That fluke would contaminate soil he had unfortunately had too much experience.

Mr. TABART said he could endorse every word that Mr. Higgins had stated with regard to fluke. About twenty years ago fluke first made its first appearance in Tasmania. On his own property he had never before had any flukey sheep. He bought a small flock of ewes which had fluke. They were placed on one portion of the run and then removed to another. The result was that he lost 4,500 sheep, and ever since that the property which had been occupied for thirty-five years and had never shown fluke had been infected with it. This season, fluke had been very fatal in Tasmania. On one run 4,000 sheep died, the summer having been very wet. It was the season in Tasmania that caused the fatal result in very many cases. Some of the runs in the midland districts were very dry this season, and the stock was removed to the

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the Lake country, where they got the germs of disease, and so it was disseminated through the country ^{Entozoa.} by travelling. He thought that sheep suffering from fluke should be prevented from entering sale-yards or travelling along public roads.

Mr. MEREDITH said it had been a very dry season, and the gentleman who owned the sheep which he purchased was compelled to remove them to a marshy country. He was obliged to do so by the shortness of feed on his own run, and they contracted fluke. They brought it back, and as they looked so well he (Mr. Meredith) bought them, never thinking that they had fluke. He then took them across his summer run, and in consequence of their infecting that run he had been obliged to abandon it for sheep. He moved,—“That, except with the permission of the Inspector of Stock, sheep affected with fluke shall not be removed from the owner's land, and that they shall not be permitted to travel along any public or bye road, or to graze on any lands not properly fenced off from such roads.”

Mr. TABART seconded the motion.

Mr. PETER asked Mr. Meredith if there had never been fluke in his run before?

Mr. MEREDITH: No. It never existed there before.

Mr. HIGGINS: Our experience is that any marshy country will generate fluke.

Mr. MEREDITH: For twenty years we ran our sheep upon this land, and they never had fluke until these flukey sheep were brought on to the run.

Mr. PARK said that the life history of fluke was so well known that no one would dream of accepting the theory of spontaneous generation. Suppose that there were twenty fluke in one sheep. They did not grow or multiply. They remained the same while in the animal, but when the ova passed out of the body they performed the circle of life, so well known to Helminthologists.

Mr. HIGGINS: I will take sheep from salt bush country, put them in granite country, and then the sheep will have fluke.

Mr. MEREDITH said he had known thousands of sheep to die of fluke on a run in South Australia, the soil very dry and undulating; the only water obtainable in the summer was from native wells. Water would accumulate in the winter time, and there would be a pool perhaps as big as the room they were in, perhaps larger. The kangaroo grass grew so rank that if 1,000 sheep were to go amongst it not one of them could be seen. There were she-oaks and saplings growing over the country, with stringy bark and prickly hop, limestone ranges running through it. There was a plentiful rainfall and a heavy dew, and the grass was only dry for a few hours. On that ground the fluke was. There were no swamps there whatever. The sheep were flukey when he got them, and the fluke continued to infest that place.

Mr. HIGGINS said that the timber was generally a guide to the state of a locality. If there were stringy bark or black butt and a granite country, it was flukey, but where the white box grew the country was clean. If they took flukey stock into salt bush country it disappeared, and therefore they were not in the least afraid to receive sheep from the flukey district of New England so long as they had good frames. Given the frames, they did not care whether there was fluke to a small extent in the sheep.

Mr. LANCE said that this was a matter of degree. In New Zealand, the farmers sons when out shooting at the beginning of the season, would cut open the livers of the hares, and if fluke were present, it was an indication to them how to deal with their sheep. It certainly fattened stock very rapidly, and he was not aware that any harm had ensued to the consumers from its presence.

Mr. VALENTINE: Flukey sheep are destroyed in England by the Board of Health.

Mr. CURR said there was no cure for fluke as there was scab. He thought Mr. Meredith should inform the Conference more minutely what he desired to have done. With regard to the prevention of flukey sheep travelling, it would be necessary in many cases to kill the sheep to see if they were diseased. Out of the 9,000,000 of sheep in Victoria, 1,000,000 would be shut up by such a regulation as prevented their travelling. If it was not to touch mild outbreaks, but only virulent ones, where were they to draw the line. Who was to prove which were very bad and which were only affected in a mild form?

Mr. MEREDITH's motion was then put, and negatived by fourteen votes to four. The following was the voting,—Against,—New South Wales, 3; Victoria, 3; Queensland, 3; South Australia, 3; New Zealand, 2 (Mr. Lance and Mr. Cooper). For,—Tasmania, 3; New Zealand, 1 (Mr. Peter).

Mr. CURR moved, that as the conditions in each Colony are so different, this Conference recommends that on the subjects of fluke, worms, and foot-rot, each Colony should legislate for itself, where practicable.

Mr. LANCE seconded the resolution.

Mr. GORDON said, that at the last Conference, he read a paper on the worms which were decimating the flocks in Queensland. Since then they had had a Board to enquire into diseases in animals and noxious plants, and Sir Joshua Peter Bell gave them two sheep for experiments. Dr. Bancroft, who was on the Board, said that the disease was due to overstocking and starvation. They killed one sheep and found it full of stomach worms. They fed the other liberally, and killed it in three months time, and it was as fat as any sheep in Queensland. Another experiment was carried out, although not by the Board, with similar results.

Mr. VALENTINE: We have had some experience of these worms in sheep, on rich country, during the wet season, and on land which was hardly ever dry, even in summer.

Mr. GORDON; I should have mentioned that.

Mr. VALENTINE: The best treatment is feeding the young sheep well. In several instances this has been most successful. As weaners they were fed on good old feed, and in one case on hay. One lot when weaned were turned into turnips, and that reduced the worms. Fumigation was tried and was said to be successful, and it was also tried in the western districts of Victoria. Carbolic spray had also been tried, but he could not say with what success. He did not think that there was much necessity for legislation on the subject.

Mr. HIGGINS said that he had known sheep to die of worms when they were up to their belly in feed. In the wet season, on the table-land, if the summer has been much broken, there will be numbers of worms in the sour country. He had seen both sheep and lambs failing when there was plenty of feed. If they changed the stock from sour feed, which was in an unfit condition to enter the stomach of an animal, and thereby generated worms, to turnips and such feed, they took away the cause of the disease. That, however, could not be done on a very large scale. Where the grasses were sour, and there was plenty of moisture on the grass, they might as well try to prevent the grass growing as prevent worms and fluke from appearing amongst the sheep.

Mr. LANCE seconded Mr. Curr's motion, which was agreed to.

The

Entozoa.
Scab.

The following paper, by Mr. Chalwin, M.R.C.V.S., of South Australia, on worms in sheep, was tabled by Mr. Valentine, and ordered to be printed as part of the proceedings:—

Sir,

Adelaide, 9 May, 1884.

I have the honor to state, for the information of the Honorable Commissioner of Crown Lands, that I accompanied you on Tuesday, 22 April last, to the south-eastern district of the province, to jointly investigate the nature of an ailment which was affecting the flocks in that locality

Five (5) stations were visited, and at those where a *post-mortem* examination was made the results were almost identical, with this exception, that at two (2) stations there were present in the lungs of the animal destroyed a species of ascaris, known as *Filaria bronchialis*.

The appearance of the animals was emaciated in the extreme. On parting the wool, the skin had a peculiar white appearance, which extended externally to all parts of the body, and from the lower jaw appended a considerable enlargement, which, upon being opened, there issued therefrom a white viscid fluid of a glutinous character, tinged with blood. This swelling was only found at the lower jaws, and was termed a "bottle."

The blood which flowed from the animal, upon being killed in the usual manner, was preserved in a dish, and after standing a short time exposed to the air it partly coagulated, but a large quantity of serous fluid escaped from it. After being placed in a closely-fitting glass-stoppered bottle, and allowed to remain in a quiescent state for some hours, it assumed the look of water, which, upon being analysed, disclosed the results as furnished by A. Thomas, Esq., F.C.S. Upon opening the abdominal viscera, the same white appearance presented itself as was exhibited externally. All the intestines (peritoneal coat) were exceedingly pale in colour, and had an unusual feel to the fingers. The liver, gall-bladder, and kidneys were in a normal condition. On separating the small intestines from the rest of the viscera, and emptying them of their contents, a quantity of badly-digested food escaped, and upon pressure being given along the whole course of these intestines, tapeworms (*tenia*) were dislodged. The food which had been emptied from the small intestines and left exposed during an examination of the *tenia* was now looked over, and upon its surface were hundreds of worms (*strongylus refuscens*), some white and some red in colour, varying from $\frac{1}{2}$ inch to an inch in length. Upon opening the stomach (*abomaseum*), its contents were found insufficiently digested, and upon the mucous membrane there were thousands of the above small worms spreading all over its surface, and issuing from the undigested contents.

The thoracic viscera was next examined. The heart was found to be of a pale colour, and its walls were considerably weakened.

The lungs were of a light-pinkish colour (abnormal), and, with the exception of the presence of filaria, were in a healthy state.

Throughout our examination none but weaners were found affected; the older animals, seemingly, had power to combat the effects of the parasites.

There was not the slightest indication in any of the animals destroyed or otherwise examined of an infectious or contagious disease, the intestinal parasites alone being amply sufficient to account for the structural derangement of the body, both externally and internally.

Worms cannot be regarded as a disease; but are occasioned by morbid conditions, such as morbid secretions of mucus and debility of the digestive organs, which occasion constitutional disturbance, during which the parasites multiply to excess, when they appropriate to themselves the nutriment intended for the supply of the animal.

Death was caused by the absence in the blood of the mineral constituents which should be found in the food which the animals partook of, thus preventing the stomachs and intestines from receiving that nourishment which is conducive to animal life.

The treatment is a somewhat difficult matter to contend with, considering the number of sheep affected; and the grasses, owing to unusually wet seasons which have visited the south-eastern district, are so void of nutritious properties, that only by a free distribution of generous food (almost impracticable on so large a scale), combined with chloride of sodium (common salt) and iron (ferri sulph), can a good result be anticipated.

As a matter of course, in isolated cases there would be no difficulty in introducing this treatment with almost immediate beneficial effects, without having recourse to other medicinal agents; but it appears to my experience this morbid condition will not be eradicated until the soils yield a stronger and more nutritious herbage, and a favourable change of season will rapidly tend to bring about this most desirable improvement.

I have, &c.,

THOMAS CHALWIN, M.R.C.V.S., Eng., Govt. Veter. Surg., S.A.

C. J. Valentine, Esq., J.P., Chief Inspector of Sheep, South Australia.

SCAB IN SHEEP.

The CHAIRMAN: The next question is scab in sheep.

The CHAIRMAN laid before the meeting the various reasons—four in number—as set forth in the Report of the Conference of 1874, which induced that Conference to pass a resolution for the destruction of scabby sheep, as well as the flocks in which they were found running. They are as follows:—

- (1.) The existence of scab in any of the Colonies is a source of real danger to the flocks in the other Colonies.
- (2.) It entails very great expense on some of the Colonies, and a considerable amount on them all, in the protection of their sheep from infection.
- (3.) It puts a stoppage to free trade in sheep in Australia, and thus causes very heavy losses to all the other Colonies, not only through preventing the trade in store and breeding sheep, but also in the impediments it throws in the way of the introduction of improved stud sheep from one Colony to another.
- (4.) The immense losses that are sustained by all the other Colonies through the existence of scab in Victoria and Tasmania, in various ways, even when the disease is not allowed to spread beyond these Colonies.

The CHAIRMAN moved the adoption of Regulation No. 1.

It was elicited that no scab existed in New South Wales, Victoria, Queensland, South Australia, or Tasmania.

Scab

Scab in Sheep in New Zealand.

Mr. LANCE said that they were in hopes that scab would soon be stamped out of New Zealand; Scab. and when it was a clean country they intended to come here and request the New South Wales authorities to open their ports for New Zealand sheep. In the year 1878 there was a Consolidated Sheep Act passed. Previous to that, each province had its own Sheep Act. The provinces were abolished in 1876, but there was not then any general Act in force for the whole Colony. When the Act of 1878 was passed, there was strong pressure brought to bear on Parliament and the Government of the day, by a section of the House, to allow a certain portion of the South Island to be exempted from the operation of the Act, which was a very severe one. It was said that if the Act were brought into force at once it would mean almost absolute ruin to the flockmasters of the province of Marlborough. The concession was asked that it should not come into force in that province for two years, and the concession asked for was made. It was doubtful if the Act would have been passed only for that. Those who were opposed to the concession said that it ought not be granted, and that at the end of the two years the Marlborough flockmasters would not be in any better position than at the commencement. However, the two years passed, and exactly what was predicted came to pass. With only one exception but few steps had been taken to eradicate scab; but further pressure was brought to bear on Parliament, and another year's grace was granted. Thus for three years the Department had no power to put the Act into force, and it was in that province that the scab was so bad. Further time was again sought, but Parliament put down its foot, and the Department commenced to eradicate scab. What happened was this. The Inspectors summoned the sheep owners, and fines were inflicted in the resident magistrates' courts; but in more than one case the sheep-owner went to Wellington, button-holed the Minister, and got the fine remitted. The effect of this was to paralyse the energies of the Inspectors, and that state of things continued until 1884. Then a joint committee of the two Houses sat to investigate the whole matter. They took the most exhaustive evidence, and brought up what was considered to be a most severe report. The result was that it was decided to carry out the Act in its integrity under any circumstances, that no fines should be remitted, and that any Inspector who was not successful in cleaning his district in two years should be dispensed with. The effect was wonderful. In twelve months the area to which the scab had extended had been considerably reduced, brought down in fact to a minimum. They then thought that the best way of stamping it out would be to get the House to grant a sum of money to effect the destruction of all or the majority of the sheep infected and to pay the owners compensation. The House voted the grant and the Department at once set to work. The vote was passed in October. In a great many cases the owners received permission to muster their sheep up to the 1st of January, and any sheep they brought in they had to destroy, receiving half a crown a head compensation, and the skin. The Department then took possession of the run for 12 months, and engaged an efficient staff of men, who were armed with rifles. The country was mountainous and heavily timbered. A large staff of men, with efficient superintendents have been going over this country since January this year, and the result has been that at last they have not been able to find any sheep at all. Still they did not say that the country was clean, as they knew what a serious disease they had to contend with. The snow was off the top of the mountains by this time (end of September), and the inspectors in charge of the districts had ordered the owners of those runs to muster their sheep and they would assist in the work with a large number of men who had been employed up to that time in killing the sheep that had gone wild. It was presumed that there would be a fair muster. Directly they were mustered the Department intended to have every sheep dipped in the wool, whether they were infected or not, and that to his mind was the essence of the plan for cleaning them of scab. After that they would be turned back onto the ranges again, and would be mustered once more about the end of November. It was fair to presume if there were any wild sheep left out on the first occasion that they would come in on the second.

Mr. MEREDITH: And they will scab the clean sheep again.

Mr. LANCE: After being dipped in lime and sulphur there is no fear of the disease spreading. They will then undergo two dippings and be again turned out into the same country. That is the only way in which the mountainous country can be cleaned?

The CHAIRMAN: How many are infected at present.

Mr. LANCE: About 30,000. I do not suppose that there are more.

Mr. COOPER: Between 30,000 and 50,000.

Mr. LANCE: That shows that every step possible has been taken to clear the country. The infected sheep are now confined to a very small piece of country.

Mr. VALENTINE: Are these the only infected ones?

Mr. COOPER: Yes. The North Island is clean. The infection is confined to Marlborough, in the Middle Island.

Mr. LANCE: In the infected country there were two large tracts of forest; one was Rai Valley, which consisted of open bush. The sheep got into the dense scrub and became wild. They were known to be there, and it was fair to presume that there was scab among them. There were 2,000 sheep killed in those forests and yet not one was found to be scabby. That was the position of the infected flocks in New Zealand. What he wished to show the Conference was this, that the New Zealand Government had been perfectly frank in explaining the condition of their flocks. They had never concealed anything and never intended to do so, and when they assured the various Governments of Australia that there was no danger to be feared from scab, and that the country was absolutely clean, then the Australian ports might with perfect safety be opened to the New Zealand sheep.

Mr. HIGGINS: Would it not be a good thing if the 30,000 or 50,000 infected sheep were killed and the owners compensated, or the sheep put into paddocks instead of turning them back into the mountains.

Mr. LANCE said that in a great many cases the sheep were killed, but there were great difficulties in the way of mustering the sheep, and there was really not a sign of scab among them. Unless there were large mobs of sheep to drive over the mountains, and go into every nook and corner so as to fetch in the wild sheep, and those left behind, the mountains would never be cleared of the infection.

The CHAIRMAN: They were so recently dipped that they would not take the scab.

Mr. LANCE: Certainly not. They are only out six weeks before they are mustered a second time.

Mr. HIGGINS: They are used as coachers?

Mr. LANCE: Exactly so.

Scab.

Mr. TABART: If they are scabby why not destroy the skins.

Mr. LANCE: We take every precaution. There is a fellmongery close to where these sheep were killed. The skins go straight to the fellmongery, and we get a count from there.

Mr. TABART: I think it is a mistake to allow the owners to have contaminated skins.

Mr. CURR: We made a number of experiments in Victoria twenty-five years ago, and found that the scab acarus will not live more than thirty hours on a dead skin.

Mr. HIGGINS: We have had them alive for three months.

Mr. MEREDITH said he had known a scab insect live for three weeks off a piece of wool kept in a vial. When taken out the insect was as lively as when it had been put in. He had been shown the insect by Mr. Frank Pitt, of the Rakia River. He found a scabby sheep on the run, killed it, and had the skin dressed with cold tobacco water made extremely strong. The skin remained immersed for some hours, after which it was taken out and hung over a rail to dry. He could then see the acari running about upon it. He then took tobacco water at a heat of 110 degrees, and after that dressing never found an insect left alive.

Mr. TABART said he had been inspector for fifteen years under the Hon. J. White, and in an inspection which he made on the east coast he came across a scabby sheep which had been detained for his inspection. It was the only sheep he saw of that description. The scab insects were on the outside of the wool as if they had been dropped upon it all over, and that was the danger of dealing in the skins of scabby sheep or the sheep.

Mr. GORDON moved,—That the Conference having heard from Mr. Lance, one of the New Zealand delegates, the steps taken by the Government of that Colony to eradicate scab are satisfied that the stringent measures which are being adopted will result in the speedy eradication of the disease there. Mr. BAGOT seconded the motion, which was agreed to.

Scab in Western Australia.

The CHAIRMAN: There is scab in Western Australia. We do not know what communication there is between that Colony and South Australia in the matter of stock. We should certainly take into consideration the presence of scab in Western Australia, and try to induce the Government there to get rid of it as rapidly as possible.

Mr. VALENTINE: From the last reports I received there is only a very small number of sheep under license there, and they are taking all precautions to get rid of it. Western Australian sheep never come this way, and the disease lies in the north and north-west.

Mr. HIGGINS said that the Western Australian authorities might think them impertinent in recommending them to follow any particular line of action, but it certainly was the business of the other Colonies, and they would be perfectly justified in making a recommendation to Western Australia to clean or destroy their scabby sheep. Steamers trading from one port to another might convey the infection. He moved the adoption of the first reason given under the heading of "Scab in Australasia," page 8 of Report of Conference of 1874. It is as follows:—"The existence of scab in any of the Colonies is a source of real danger to the flocks in the other Colonies." They had heard from Mr. Lance what had been done in New Zealand, and he was sure that it would give the other Colonies confidence. He hoped the time was not far distant when New Zealand would be able to write to every Colony, and say that scab had been eradicated.

Mr. PETER seconded the motion, which was allowed to stand over to the following day.

Mr. HIGGINS moved,—“That the Government of Western Australia be urged by the Governments of the various Colonies represented at this Conference to take all possible steps for the speedy eradication of scab.”

Mr. PETER seconded the motion, which was agreed to.

The Conference then, at half-past 4 o'clock, adjourned until half-past 10 a.m. on the following day.

THURSDAY, 30 SEPTEMBER.

FOURTH MEETING.

Present:—Mr. Alexander Bruce, Chairman, and the full Conference.

SCAB.

The subject of scab was continued.

Mr. BAGOT: We should deal with scab as we have dealt with foreign diseases. I propose that we defer the item scab until we come to the intercolonial regulations.

Mr. HIGGINS said that this subject of scab would have a double bearing—what we would do if scab appeared among our own sheep, and what we would do if it appeared among imported sheep. With the latter phase they could not deal just now, as it would dovetail into the question of the importation of foreign stock.

Mr. LANCE moved—“That each Colony be allowed to make its own regulations for dealing with scab.” He said that surely they were the best judges of what they wanted.

The CHAIRMAN: We wish to see how far we can act together. With regard to scabby sheep, the best thing is to destroy them, if the law will allow that course to be taken, and the number comparatively few.

Mr. LANCE: If you pass a law to destroy sheep in mountainous country you destroy the best elements of getting rid of the infected sheep. Mr. CURR seconded the motion.

Mr. HIGGINS said that, without taking the matter formally, they might deal with the question of an outbreak other than from outside causes. The question of the importation of stock from the other Colonies would come on. The question of scab would be connected with it, and he did not wish to trench upon it. He was about to propose that infected sheep be destroyed, and the owners compensated. He did not, however, wish to force this upon the Conference, and he was sure they wished to act in unison.

Mr. MEREDITH said that he concurred with the opinions of those gentlemen who were in favour of each Colony making its own regulations. That was the only plan which could be adopted. If the Conference recommended anything it can only be that a sufficient staff of inspectors be maintained to prevent the introduction of disease from without. The Scab Acts in New South Wales, Victoria, Queensland, South Australia, and Tasmania had had the effect of eradicating scab, and it was rapidly diminishing in

New

New Zealand and Western Australia. The only fear was that in some of the Colonies, from a desire to economise, they might lessen the efficient staff of protection; and, therefore, it would be well for the Conference to express the opinion that an efficient staff of inspectors should be kept up in each Colony proclaimed clean, in order to prevent it being introduced from abroad, and to deal with it should any outbreak occur.

Mr. HIGGINS said that the people of New South Wales and Queensland were more deeply interested in this matter than those of Tasmania, and they received importations of Tasmanian stud flocks. Therefore it was very necessary that not the slightest possibility of the introduction of scab should exist. If they found that there was any fear they would make such regulations as probably might interfere seriously with the business of the Tasmanian stockholders, in order to protect these Colonies.

Mr. CURR said that with regard to making regulations, or laws designed to meet all circumstances, he thought it very undesirable. As an instance, he would cite the Scab Act of Victoria, still in force, which was passed when there were 5,000,000 of scabby sheep in that Colony. Under it, should a flock of sheep, little or large, be found scabby to-morrow it will be thought that their destruction might be ordered. This, however, could not legally be done, for it is specially provided in our Act that an owner may dip his sheep, nor can he be legally compelled to complete such dipping before the lapse of fourteen days after the discovery of scab. If the first dipping be found in time not to have effected a cure, a second may be given, so that in effect on the owner paying certain fees to dip, he may retain his scabby sheep for some months, after which an inspector may enter and dip, or if twelve months have elapsed, destroy the sheep. These provisions were suitable perhaps at the time at which they were made, but all will agree that an insignificant number of scabby sheep should not now be treated in this way, but be destroyed at once. On the other hand, he could not advocate a hard and fast rule making destruction compulsory in every case, for it might happen that a flock infected with scab was allowed to leave quarantine and to come into contact, direct or indirect, with (say) a million of sheep, a large portion of which might have contracted the disease whilst the rest might have escaped it. Who, in such a case, would recommend the destruction of the million sheep, or who would decide which flocks had escaped infection? And what Minister would enforce destruction in such a case? What seemed to him necessary and desirable was, that our laws on this subject of disease should be confined to determining general principles and leave us free to make and rescind regulations, as the needs of the hour may render desirable.

Mr. TABART: With regard to the remarks of Mr. Higgins that New South Wales is more interested than we are, I beg to differ from him. In 1885 Tasmania imported 65,339 sheep, 59,700 being from Victoria and 5,118 from New South Wales, so that we are deeply interested in the question.

Mr. HIGGINS: I said with regard to stud sheep.

Mr. TABART: What is the difference.

Mr. HIGGINS: The stud sheep are very valuable animals, whereas flock sheep are only from 5s. to 8s. a head.

Mr. TABART: Greater care would be taken of stud stock than of store stock.

Mr. HIGGINS hoped that the Tasmanian representatives would not be aggrieved at his remarks. They were simply made for the purpose of showing that in dealing with scab they should be unanimous, and the only unanimity could be a determination to eradicate scab so that there could be free intercourse in sheep between all the Colonies.

Mr. LANCE understood that Mr. Curr had said that according to the Victorian Act there were no means of insuring the efficient dipping. If that was so it was a very grave error. After very careful consideration of the different materials in which sheep should be dipped, it had resolved itself into this—that the sheep be dipped to the satisfaction of the inspector. The Tasmanian Act was similar to the Victorian, but in Tasmania they had sub-inspectors.

Mr. HIGGINS said he could sympathise with Mr. Curr in his desire to have the Act altered. From his description of the law, as it existed in Victoria, he saw the greater reason why they should deal with this question very determinedly and positively. He was sure it was not Mr. Curr's fault that there was the smallest loop-hole, but he did not make the law, he simply administered it. If they gave him their moral support it would help him a great deal towards gaining a victory. Anything that they did towards putting down scab would be a good work.

Mr. LANCE's motion was withdrawn.

Mr. HIGGINS moved—"That the Conference advise that the several Governments should obtain power, in the event of an outbreak of scab, to destroy the sheep infected and those that were in direct or indirect contact with them at their discretion, and to take every other means for the absolute and immediate eradication of scab."

The CHAIRMAN said that there was no scab in New South Wales, Victoria, Tasmania, or South Australia, and comparatively little in Western Australia. The opinion of stock owners, when it came to a test, was that the cheapest way to deal with an outbreak of scab was to destroy the infected sheep and not treat them for the disease. That course, however, was only applicable in case of a few sheep. He did not think that the motion went so far as to say that any Colony would be compelled to take the course proposed where a large number of sheep were infected.

Mr. LANCE said that that did not appear in the motion.

Mr. COOPER: In New Zealand the result would be that we would not take any notice of this if you passed it.

Mr. LANCE: We should resent it very much.

The CHAIRMAN: If there were an outbreak here would you not say "kill the infected sheep."

Mr. HIGGINS said that the motion for opening the outports would come on by and by, and then it would be for them to say, in case they decided upon opening the ports, whether, in conjunction with that, they would pass a resolution to the effect that if any diseased animal arrived from foreign or even inter-colonial ports it should be at once destroyed.

The CHAIRMAN: As our law stands at present we cannot kill infected imported sheep.

Mr. VALENTINE said that in South Australia they were not able to kill scabby sheep unless they took exceptional power, but they were able to fine the owners 5s. a head. Then, if the owner wished to keep them, he had to get a license for three or six months. There was not the slightest doubt that if scab broke out in any part of South Australia the Government would take steps to have the whole flock killed.

Mr. BAGOT: That is nearly equal to the absolute destruction of all infected sheep.

Mr.

Scab, &c.
Forage
Diseases.

Mr. CURR said that a bull suffering from foot and mouth disease was landed in Victoria. Four veterinary surgeons pronounced the complaint to be foot and mouth disease. He saw the animal, went back to town and met a large number of stock-owners next morning, and also saw the Minister on the subject. The Minister asked him what he required, and he said a credit in the Bank of £100 and power to destroy all the animals which had become infected or run the risk of infection. Next morning they were all shot, and he had had the carcasses buried. That was a power which should exist in all the Colonies.

The CHAIRMAN: There were some imported sheep destroyed here by the Government, and the owner brought an action for £20,000, because the Government had not taken power to destroy infected sheep.

Mr. HIGGINS: It has doubled the contributions upon us.

Mr. LANCE: In our Act they must be destroyed within twenty-four hours.

Mr. VALENTINE: We should suggest that the Government take power to destroy sheep when an outbreak of scab occurs.

Mr. HIGGINS moved,—“That power be obtained by the several Governments to destroy at their discretion scabby sheep whenever an outbreak occurred.”

Mr. GORDON seconded the motion, which was carried unanimously.

THE NECESSITY FOR A SUFFICIENT STAFF OF INSPECTORS.

Mr. MEREDITH said that the Government of Tasmania would pay very careful consideration to whatever was arrived at by the Conference with respect to scab. There were some political candidates who had been courting the popular vote and saying that the inspectors should be done away with and the work carried out by the police. He was glad, however, to find that the people had sufficient sense to set them aside.

Mr. TABART said that in Tasmania there were a chief and three inspectors who had to administer the Scab Act and supervise the destruction of rabbits. There were three other inspectors who simply had to look after the sheep landing. They were stationed at Hobart, Launceston, and Torquay.

Mr. MEREDITH moved,—“That it is desirable that an efficient and competent staff of inspectors of stock be maintained in each Colony to prevent the introduction of and to arrest the spread of scab or any other contagious disease.”

Mr. BAGOT seconded the motion, which was carried.

TICKS AND LICE.

Mr. CURR moved,—“That it is recommended that steps be taken by the several Australian Colonies, Tasmania and New Zealand, to eradicate thoroughly ticks and lice in sheep.”

Mr. PETER seconded the motion.

Mr. LANCE said there was a very stringent act in New Zealand dealing with lice, and according to that Act all sheep had to be dipped to get rid of the pest. An alteration was made in it last year in favour of butchers sheep, so that they need not be dipped if they were to be slaughtered within fourteen days after landing.

The motion was agreed to.

TREATMENT OF FOREIGN DISEASES.

Glanders and Farcy.

Mr. STANLEY read the following paper on these diseases:—

GLANDERS and Farcy is the most malignant disease of the equine species; it is known in almost every country, and it is extraordinary that it has not been imported into these Colonies. This disease is highly infectious and contagious, usually incurable and fatal. It has been frequently conveyed to mankind, cats, dogs, rabbits, sheep, and it has been remarked that cattle, goats and swine are refractory to inoculation.

The disease is characterised by the formation of miliary nodules of a soft grey or yellowish white in the lungs and mucous membranes of the air passages, and also on the skin. These nodules undergo degenerative changes, breaking into ulcers, from which a peculiar viscid discharge escapes. The lymphatic glands become swollen (hence the name glanders), and the lymphatic ducts connecting them are distended with fluid, giving the peculiar corded and nodular appearance on the skin of the thighs, leg, or neck, and which is termed farcy, being only a symptom of the true disease; this has been proved many times by inoculation.

Although this disease frequently runs a rapidly fatal course, it too often assumes a sub-acute or chronic form. The sufferer appears able to resist the progress of the malady, even for several months, but at the same time is a medium of conveying the dreadful infection to his fellows, and it is in this form liable to be conveyed into these Colonies.

This disease has been long thought to originate spontaneously in ill-kept, badly ventilated stables. Now, however, credence is being given to its micro-parasitic origin, and the discovery of its special bacilli leaves little room for doubt, and completely dispel the theory of spontaneous generation.

We know this disease prevails in America, India, Africa, China, as well as in Europe, and it would in all probability have been introduced from Egypt had the Contingent horses returned to this country.

Our ports being open, it is, I think, a subject well worth discussion at this Conference. For this purpose the following points are submitted:—

1. Are these Colonies protected from the introduction of glanders?
2. Is it advisable to frame regulations with that object?

Mr. STANLEY said there should be regulations in force to empower the inspectors of stock to isolate any locality where glanders and farcy were supposed to exist, until they were satisfied one way or another that it did exist. Then they should have the sanction of the Minister to destroy all animals infected with that dreadful disease. The Colonies had been protected hitherto from outside infection by the length of time that it took to bring horses here and by the fact that superior animals received most care and attention. Now, however, there was cheaper and more rapid transit, and people were inclined to bring horses here from India. The disease might be brought here in the chronic form and so it might be spread through the Colonies.

Swine

Mr. STANLEY then read the following paper on this disease :—

SWINE Fever is a highly contagious and infectious disease peculiar to pigs, and has become so firmly established in Great Britain as to threaten the extermination of the porcine species. It also prevails in the United States of America and Europe. It was for some time attributed to bad sanitation and impure diet, but now it is known to originate only from infection, the cause of the disease being due to the presence of a specific bacillus.

Symptoms.

These will depend on the seat of activity of the bacillus. The bowels, lungs, or brain being attacked leads to great variety in symptoms. Those generally observed are fever, prostration, patchy discolorations of the skin, drooping ears, flaccid tail with diarrhoea, in some cases vomiting, in others fits.

The disease varies in intensity,—in some outbreaks 50 per cent. recover, but usually it is so fatal that few survive.

Post-mortem examination shows extravasation of blood, with effusion of serous fluid and lymph, into intra-muscular tissue, and petechia on the spleen, liver and other organs, also coagulated lymph causing adhesions of serous surfaces.

Patchy congestions and consolidation of lobules in the lungs.

The large bowels have a blue discoloration interspersed with petechia, and the ulcerated mucous membrane is typical of this disease.

There is some danger of this disease being introduced to these Colonies. Although the incubative stage is limited to ten or twelve days, swine may have had the disease, and recovered, on board ship; other cases assume a chronic form which may last for weeks, and the virus will retain its vitality for many weeks in dirt, litter, and suitable media. Hence it is a very important matter to absolutely prohibit the importation, or landing for slaughter, any swine, or anything connected in any way with them, if the vessel had touched at a port in an infected country during the voyage.

Subject for Discussion.

Are the present regulations sufficient to prevent all possibility of the introduction of this plague?

A paper on the subject by Professor T. Walley, of Edinburgh, was also laid on the table by Mr. Valentine.

Synonyms.—Hog Cholera, Typhoid Fever and Enteric Fever of Pig, Blue Disease, Red Soldier, Measles, Pig Distemper, Contagious Pneumo-Enteritis (Klein).

As in the case of other diseases, so in this, many synonyms have been employed to designate it, some of them referring to some characteristic external symptom, as the colour of the skin or the character of the skin eruptions; and others to some fancied resemblance in its external lesions to those of well-known forms of disease. Unquestionably the present official synonym, "Swine Fever," or, better, "Swine Plague," is the most simple and the most useful for all practical purposes.

Definition.—A specific eruptive fever, peculiar to the pig.

Nature and Characteristics.—Many years ago, when I first became familiar with this malady, I looked upon it as a sporadic or enzootic affection, due to an altered condition of the blood, as the result of purely local causes *e.g.*, bad hygiene and improper or impure dieting; I was of opinion, in other words, that, like purpura hæmorrhagica, it was simply a blood lesion, and in my earliest lectures on the subject described it as such, and drew parallels between its lesions and those of purpura. Nor did I stand alone in this estimate of its character. In America it was also mainly attributed to bad hygiene and bad dieting; but, earlier in the United States than here, it was gradually recognized as a zymotic disease, and of a contagious character.

In the United States of America it was thought to be of the nature of cholera, and this is not to be wondered at when we consider its fatality, its rapid spread, the enteric conditions with which it is associated, and the state of collapse into which its victims are sometimes thrown.

Subsequently an idea prevailed that the disease was allied to the typhoid fever of man, and that, too, mainly from the fact that necrotic enteric changes were common; but as early as 1876 or 1877, Klein showed that a great mistake had been made, pointing out that the lesions of human typhoid, were confined mainly to the small intestines, and were localised in the lymph follicles thereof; and further, that the necrosed tissues on desiccation leave behind pit-like depressions, and not unfrequently result in perforation; whereas in swine plague the ulcerative lesions are confined mainly to the large intestines (often grouped around the ileo-caecal valve), seldom extend to the small intestines, and are still less often found in the stomach. (I have only seen two well-marked cases of ulceration of the stomach, one specimen of which, sent to me by Mr. Kettle, I exhibit.) The lesions are not localised in the lymph follicles, do not as a rule extend deeper than the superficial mucosa, and rarely produce perforation. About 1878 Klein suggested that the disease ought to be designated Contagious Pneumo-Enteritis, and he did this on the assumption that pneumonia was a constant lesion; in this, however, he was certainly mistaken, as I have seen numbers of in which lung lesions were conspicuous by their absence.

In 1887 Klein drew attention to the presence constantly, in the local lesions of the disorder, of colonies of micrococci, and to these he was evidently inclined to attribute specific properties.

At a much earlier period than this I had drawn the attention of the members of my class to the presence of micrococci in the blood and tissues of pigs which became the victims of the disease in the neighbourhood of Edinburgh.

In 1878 Klein drew attention to the fact that there existed in the peritoneal effusions and elsewhere a *bacterium* which, in its morphological characters, bears a close resemblance to the bacillus of hay infusion (*B. subtilis*), and in some respects to the *Bacillus anthracis*; the important differences being that the bacillus of swine fever is finer than either of the others, and although multiplying by spores, it is motile and somewhat rounder at its end. Recently Pasteur has described a dumb-bell shaped microbium. Klein looks upon these as foreign to swine fever.

Not only by Klein, but by Professor Laws and others, has the virus of swine fever been cultivated and attenuated, and with the modified virus animals have been inoculated, and, according to Laws, protected;

Swine Fever. protected; but Klein's experiments in this direction show that even after several inoculations the virus is still capable of producing specific symptoms, though the mortality is materially reduced. Not only has the pig been successfully experimented upon; rabbits and mice are shown to be susceptible to the action of the virus, while Pasteur has also stated (though this is contradicted by Klein), that pigeons are also affected by it.

Swine fever is no respecter of persons amongst the pig tribe. It attacks the young, the old, the fat, the lean, the well and the ill-bred, the male and the female alike; but in my experience pigs varying from six or eight weeks to several months old ("shots," as they are called in Scotland) are most susceptible, and in them the mortality is greatest, while large pigs, as sows, frequently escape it, or if attacked, recover. Young pigs in utero often die and are aborted, or if they survive through the normal period of parturition, are puny and short-lived; while sucklings not unfrequently pine away one by one, until the whole litter is exterminated, even before the mother gives any evidence of being herself affected with the disease. Frequently, too, the mother will pass through the nursing stage apparently in good health, but after the offspring have been weaned or have died out, she will gradually emaciate, and ultimately succumb to enteric, hæmal, or pulmonary disease. There are those who attribute the death of the fœtus in utero to the fact of its being supplied with impure blood, or to histological changes in the placenta, and not to the direct action of the virus of the disease. Such a statement has been made in reference to anthrax, and even some of our best authorities declare that anthrax lesions are never found in the fœtus (or its blood) in utero, the placenta acting as a filter, and effectually preventing the passage of the bacilli. To this statement I give a flat denial. I have found extravasations and effusions into the tissues of the unborn lamb, and I have found bacilli in these products and in the blood when I have failed to find them in the blood or tissues of the mother. In swine fever, as in other zymotic affections, abortion is often the salvation of the pregnant female.

Swine fever may assume either an enzootic or an epizootic character. Probably never within the memory of the present generation of veterinary surgeons, in this or in any other country, has it spread so rapidly or so widely as in the prevailing epizootic. What the determining cause of this wide-spread outbreak may be, it would be difficult to say; but I am satisfied of one thing (and do not hesitate to make the assertion here), and that is, that the disease has in the past been practically left to wander as it listed; that it has existed in certain districts (and that not always owing to the fault of the authorities) for weeks or months before it has been detected or recognised; while during the whole of that time animals from the infected areas have been sent into the surrounding districts, and have thus scattered the disease far and wide. Moreover, a remarkable amount of ignorance as to its diagnosis has been exhibited, even by veterinary surgeons, and it was on this account mainly that I suggested to the Provisional Committee of the British National Veterinary Medical Association that the subject of swine fever would be an appropriate one for discussion at the Birmingham meeting.

Swine fever, perhaps more than any other similar malady, presents itself under a variety of aspects; in other words, its visible manifestations and the localisation of its lesions in different outbreaks assume very different characters. In its clinical character it is hydra-headed, and this fact alone is sufficient to explain the apparent anomaly that scientific men have not always been able to recognise it when the malady has been for the first time brought under their immediate notice. Not only so, but even in one and the same outbreak it often passes through different phases ere it runs its course; thus, the few first animals attacked may show no external manifestations of the disease; they may pine and waste gradually away, perhaps coughing or purging to some extent, but showing no symptom sufficiently pronounced to raise even a suspicion in the mind of the owner or the attendant as to the nature of the malady which is gradually but surely emptying the pig-styes of their occupants. At another time a number of animals are attacked with symptoms of narcotic poisoning—staggering about their styes, boring their heads against the wall, passing into a state of convulsions, foaming at the mouth, and champing the jaws or gnashing the teeth, as the pig is wont to do when under the influence of a cerebro-spinal excitant. Again, the animals appear to be suffering from rheumatic cramp, and when called upon to move, not unfrequently do so with their forelegs spasmodically flexed, the motive power being supplied entirely by the hind legs. But after a time, in each of these cases, characteristic enteric, cutaneous, or pulmonary lesions are developed, and the matter is set at rest. In other outbreaks the lungs are most largely the seat of organic changes, while the existence of bowel lesions is the exception that only proves the rule; and lastly, there are cases in which the skin and enteric lesions are so pathognomonic as to leave no doubt in the mind of the veterinary surgeon as to the nature of the malady with which he has to deal, and there are others in which no sign (external or internal) exists to show what the disease actually is.

Swine fever is in every sense both infectious and contagious. It is disseminated (to limited distances) through the medium of the air; by means of such fomites in water, food, litter, urine, fæces, and dung; by other animals, and above all by ducks, poultry, and rats; by contaminated conveyances, such as railway trucks, floats, carts, and vessels; by the dirty boots and clothes of attendants; by the actual cohabitation of healthy with diseased animals, and by direct inoculation. I was at one time inclined to think that in those outbreaks in which lung lesions were most pronounced the disease had been contracted by inhalation, while in those where bowel lesions were most prominent it had been contracted by ingestion, just as I believe is often the case in anthrax; but on considering the matter more closely in the light of our present knowledge of the fact that, as a rule, in most of these maladies the virus must gain access to the blood before it can produce its characteristic effects, I have been led to modify my opinion in this respect certainly. The manner in which the lesions of some of the granulomata—*e.g.*, tuberculosis, actino-mycosis, and gregarinosis (?)—are locally developed according to the manner by which the fungus is introduced into the system, seem to support the view mentioned, but we must of course remember that the starting point of at least two of the maladies referred to is at some exposed part, as the nostril or the mouth.

In a recent number of the *Journal of Veterinary Science* in India, the details of a very instructive experiment carried out by Mr. Fred. Smith, with the view of determining the method by which the virus of anthrax is introduced into the system are given; and in this case the striking fact is demonstrated that while the anthrax virus was carefully administered to a horse in the form of ball, the resulting lesions were manifested mainly in the lungs, and but very slightly in the bowels.

Swine fever does not necessarily attack all animals exposed to the influence of the virus—a very large percentage escape—nor is it in every outbreak equally fatal. In years gone by I used to treat this malady with great success, and certainly saved 50 per cent. of the animals treated; and even now I feel quite

quite satisfied that numbers of pigs pass through the disease without manifesting any recognisable external symptoms, no matter how carefully they may be watched, and recover. Swine Fever.

Does one attack of the disease protect against future attacks?—According to the evidence afforded by Dr. Klein's experiment on the protective value of swine fever virus, the question should be answered in the negative; but in the past few months I have had the opportunity of watching several animals that during a previous epizootic were attacked by the malady and recovered, and which during the present outbreak have successfully resisted its influence.

Swine fever, so far as I know, has never been transmitted to any other of our domestic animals, nor, except experimentally, to any other creature; and while mice may be successfully inoculated with the cultivated or natural virus, the rats seem to enjoy perfect immunity from its effects—at least so I conclude from the fact that these animals cohabit with pigs (in all stages of the disease), and live with them on the most intimate terms, without showing any signs that they are in the least degree affected by the virus of the disease. Swine fever is as pre-eminently a pig disease as in cattle plague a bovine disease.

The extent of vitality possessed by the virus of swine fever has as yet to be determined; but of one thing I am quite assured from experience and observation, and that is, that it may retain its vitality for several weeks, if not for months, in dirt or other suitable pabula.

Its incubative stage has been shown experimentally to be confined to about four or five days, but naturally it is about ten or twelve days.

Its duration is somewhat indefinite. As in the case of pleuro-pneumonia, so here; an animal may be labouring under the influence of the virus for many days without attracting the attention of those persons who have charge of it. On the contrary, it may be well, and dead in the course of several hours, or two or three days: while in not a few instances it runs a sub-acute or chronic course, which may extend over several weeks, or a month or two.

Symptoms and Course.

The invasion of swine fever is sometimes very pronounced; at others its actual existence is evidence by indeterminate symptoms, its special characteristics being slowly and insidiously developed.

Constitutional Symptoms.

In the earlier stages there is always more or less fever, the temperature being elevated two or three degrees, the pulse increased in rapidity, the bowels constipated or relaxed, occasionally there is vomiting, and sometimes a husky bronchitic cough. The animals show a marked tendency to isolate themselves, and in cold weather seek warmth by burying under litter or huddling close to their companions; they frequently refuse to rise when recumbent, and at all times rise unwillingly and stiffly, and when made to move, do so with a stiff gait, and soon show signs of exhaustion if submitted to exertion. The ears are frequently lopped, and not unfrequently present a congested appearance. The conjunctiva is injected, and there is sometimes lachrymation or discharge of a small quantity of agglutinous mucus from the inner canthus of the eyelids.

In the most advanced stages the above symptoms become aggravated and more pronounced, but their character will depend largely on the seat of the lesions. The temperature rises to 105–6–7° F, the pulse becomes more rapid, the breathing hurried and occasionally jerky, the urine scanty and highly coloured at times, normal in character at others, but frequently evolving a peculiar characteristic odour. Wasting of the muscles proceeds apace, weakness increases, the movements become more unsteady, and often the hind legs are plaited one over the other. Food is refused, or only taken in small quantities, but there is frequently great thirst. The irregularity of the bowels is more marked, and the fæces become of a dark colour, pasty, and of a very unpleasant but characteristic odour. In the case of pregnant sows, abortion sometimes takes place as the disease advances, many of the young pigs being dead, some decomposed. Occasionally a little blood is discharged from the conjunctivæ or the nostrils.

If the bowels are inflamed or ulcerated, diarrhoea replaces constipation, the discharges being of a dirty chocolate colour or of a yellow-ochry hue, and in any case they have an abominable odour, and are sometimes passed with a jerk, and, as the end approaches, involuntarily. At other times the ægesta is retained, accumulates in the large intestines, undergoes decomposition, liberates sulphuretted hydrogen, producing tympany, which gives the animal a rotund appearance, and thus deceives the careless observer—it being taken for granted by such that the patient is eating well, and consequently that there cannot be much the matter.

If the lungs are markedly affected, the breathing becomes laboured as well as hurried, the cough (especially if animal excited) distressing; there may be catarrhal discharge from the nose and eyes, that from the latter causing dirt to adhere to the eyelids, thus giving the animal a very peculiar appearance. There is often a short, painful, hollow grunt, and on physical examination of the chest signs of consolidation are readily detected. The skin of the ears and abdomen is often cyanotic, and the extremities cold, and not infrequently foam (sometimes bloody) oozes from the nostrils, and when this takes place the breathing becomes gasping and oral.

If the brain or the cerebral meninges is involved, the animal presents a stupid appearance, wanders aimlessly and mopeishly about, staggers like a drunken man, and often falls helplessly over, or, if excited, is thrown into a state of convulsions, on the passing off of which it is left lying helplessly on its side. At other times the head is bored against a wall, or thrust into a corner, or the nose is buried in the litter, producing nasal stertor; the pupils of the eye may be contracted or dilated, and the retina may be markedly injected.

If the spinal cord or its meninges is affected there is marked muscular twitching, clonic spasm, and partial, followed by total, paralysis.

The Local External Lesions are to be found in the skin. They consist of (a.) Discolorations; (b.) Vessication; (c.) Pustulation; (d.) Papulation; (e.) Sloughs; (f.) Desquamation.

(a.) The discolorations vary from a pale blue or light red to a dark livid blue, purple, or black. At times a scarcely perceptible erythematous black is to be discerned on the skin of the abdomen, the vulva, the docks, the ears, the throat, or the inside of the thighs; or it may be a little cyanosis (blueness) of the ears. In some cases this discoloration is diffuse, at others in discrete patches; when faint and undecided the animal should be excited a little, and the entrance of air to the lungs excluded for a short time; the discoloration

Swine Fever. discoloration of the ears is rendered more distinct by taking the pig up by the hind legs. In many instances the undecided erythema during life becomes very pronounced, and, chameleon-like, passes rapidly through various hues after the animal is stunned by a blow on the head.

In the course of a few days—hours in some cases—the discolorations become more pronounced and more permanent. At first, being due only to capillary congestion, they may pass off, but as venous congestion sets in, followed as it usually is by extravasation, the colour becomes deepened, and the cutaneous structures positively stained, and if the pig recovers it subsequently passes through the changes seen in ecchymoses from other causes, desquamation of the cuticle taking place as it passes off; on the contrary, the interference with the circulation is so great as to lead to necrosis, usually arterial, and consequently dry and sloughing. The latter condition is well seen in Figs. 1 and 2 (not shown in this report), and the further fact that the lesions are usually localised at the outset in parts which have been previously injured is also shown. The skin from which the sketch was taken was removed from the carcase of a young sow, and the injuries had been caused by the worrying of a boar to whom she had been put about a fortnight previously. The dark central parts are those injured by the boar.

In very many cases no pathognomonic discoloration exists, but even here it will be observed that the dorsum over the lateral and inferior aspects of the body contracts a peculiar yellowish brown hue.

Cyanosis is often the result of imperfect oxidation from the existence of extensive lung lesions.

(b.) Vessication is rarely a primary lesion, and still more rarely is it a solitary lesion, being usually seen during the course of the disease, the vesicles forming in the patches of healthy skin, and being usually followed by desiccation and desquamation. The bullæ, associated with sphacelus, may be mistaken for vesicles.

(c.) Pustulation, like vessication, is rarely primary or solitary, nor is it seen except in the most virulent cases. In some instances there is a distinct collection of pus under the epidermis, in other instances the apparent pustulation partakes more of the character of a circumscribed pemphigus, being marked by circular patches of a very dark red colour, followed by the effusion of sanguineous serum and a little pus, the fluids drying and the superficial parts of the skin becoming necrosed, giving to the patches an appearance similar to that produced by the action of a powerful escharotic, such as nitrate of silver, or in some instances like the lesions seen in a virulent septicæmia.

(d.) Papulation may be primary or secondary, it may be solitary or associated with other lesions. Very frequently, especially in old sows, the formation of papulæ is the first cutaneous lesion observed, and more, it is often the only skin lesion seen throughout the course of the disease. The papulæ vary in size from a hemp seed to a pea; they are not usually of a very high colour, are hard and unyielding, formed about the abdomen and thighs at first, and may appear in successive crops; as a rule, they fade away without going on to vessication or pustulation.

(e.) Sloughs, as already indicated, are the result either of absolute capillary or of hæmorrhagic lesions. Sloughing is most largely seen in the ears, occasionally in the haunches and in the back; the tail is often lost by sphacelus, especially in very young pigs.

(f.) Desquamation of the Cuticle is not peculiar to the disease, it is a common result of all forms of fever. Icterus (jaundice) is not so frequently seen as it is in many other specific diseases. This may probably be due to the fact that jaundice is not often seen in the pig under any circumstances.

Diagnosis.

The importance of a correct diagnosis in such diseases as the one under consideration cannot be too strongly insisted upon. If a false diagnosis is made, much injustice is done to the owner of the animals, much anxiety and often loss is caused, and the practitioner oft-times brings down upon his head severe rebuke.

The conditions most likely to be confounded with those characteristics of Swine Fever are—(a.) Pneumonia with Cyanosis; (b.) Purpura Hæmorrhagica; (c.) Urticaria; (d.) Measles; (e.) Variola; (f.) Anthrax.

(a.) Pneumonia is most likely to be taken for Swine Fever when it attacks a number of animals simultaneously; when, as a result of bad hygienic surroundings or improper feeding, it is accompanied by diarrhœa; and when, from the involvement of a large lung surface, cyanosis is marked.

(b.) In Purpura Hæmorrhagica.—The discolorations of the skin, the congestions and extravasations, with the fatal character of the affection, are very likely to mislead. Purpura, however, is not accompanied by such a high degree of fever, is traceable to some local cause, as the ingestion of putrid or diseased flesh, bad drainage, or dirty styes, and is not contagious.

(c.) Urticaria (Nettle Rash).—In urticaria there is a tolerably high degree of fever, derangement of the bowels, refusal to feed, isolation, tendency to seek warmth; there is frequently patchy erythema, and even discrete ecchymoses, with occasionally superficial pustulation, and sometimes a little hæmorrhage from the conjunctiva and the nose, with conjunctival petechiæ, and in the sow vaginal petechiæ.

The affection is sporadic and non-contagious; is traceable to ingestion of large quantities of cabbage, or to some other form of improper feeding; is not fatal, and passes off in a period varying from forty-eight to sixty hours, though occasionally, owing to a renewal or prolongation of the existence of the determining cause, relapses occur.

(d.) The term measles in the pig is usually associated with hydatid (*Cysticerci cellulosæ*) disease. I do not refer to this. I am of opinion that the pig suffers from an eruptive affection in some respects similar to measles of the human subject. It is not fatal; the attack is local, and there are some of the pathognomonic lesions of swine fever found in *post mortem* examinations. Measles often, however, attack a number of young pigs; is accompanied by a moderately high degree of fever; by some is believed to be contagious, and if the animals affected by it are neglected or exposed to inclement weather or damp and cold they are very apt to suffer from broncho-pneumonic disease.

(e.) Variola Suillus is not often seen in this country, and so far as I know, never occurs as an epizootic. It always runs a definite course, and the skin lesions are evolved in regular order. The characteristic intestinal lesions of swine fever are not developed, though there may be patches of congestion, or even of muco-enteritis, discovered after death, with systemic effusion and extravasation. As in swine fever, and as in foot and mouth disease, the young frequently die while sucking their dams, without the latter giving any external evidence of the existence of such a disease in their system.

(f.)

(f) Anthrax.—As before remarked, there seems to be an impression in the minds of some pathologists that, because the pig resists experimentally the action of the anthrax virus, he is not susceptible to anthrax. This is a great mistake, and is not in accordance with clinical experience. Pigs frequently die from anthrax after the ingestion of the offal, the blood, or the flesh of cattle which have succumbed to the disease. The fatality of anthrax, the rapidity of its course, its contagious nature (unsuspectedly by ingestion), the marked blood lesions seen in *post mortem*, and the hæmorrhagic condition of the lymphatic glands, all combine to lead the unwary practitioner astray. Anthrax is probably never seen on a farm as a primary affection of the pig, this animal almost invariably suffering secondarily by cattle; and the very fact that the disease has made its appearance in cattle first, or that the affected animals have been fed on offal or refuse from a slaughter-house, or have gained access to manure contaminated with the refuse from an abattoir, is sufficient to enable an ordinarily intelligent practitioner to determine the nature of the malady without much difficulty. In any case where doubt exists, inoculation with a little of the blood of the dead animal—of some small animal—or microscopic examination of a drop of the blood for the characteristic bacillus, will soon set the matter at rest.

Finally, it may be said that whenever a large number of pigs are found to be dying simultaneously (and especially if the fatality extends over a large area, with symptoms of bowel or pulmonary derangement, and in some cases skin eruptions), it may safely be assumed that the disease from which they are suffering is swine fever. Practically, pigs in this country are not subject to any other fatal malady of an epizootic type.

Pathological Anatomy.

In dealing with this part of the subject, I shall direct attention (firstly) to the general conditions of the tissues of the body and the blood; (secondly) to the pulmonary lesions; (thirdly) to the gastrointestinal lesions; (fourthly) to the lymphatic lesions.

At the outset I may remark that many of the lesions of swine fever are not peculiar to the disease; they are only concomitants of it, and are common to other affections in which the blood has undergone important physical and vital changes.

The first thing to be thought of in making a *post mortem* examination is to carefully look over the skin, not only in undressed, but in dressed carcasses also, and it must be borne in mind that the cutaneous lesions will be materially modified by three circumstances:—(a) The fact as to whether the animal has died a natural death; (b) As to whether blood has or has not been abstracted at the time of or prior to death; (c) As to whether the carcass has or has not been properly dressed and the skin scalded and scraped. It must be patent to all ordinary observers that if an animal has been allowed to die a natural death, with all the blood in its veins, or if it has been killed without the abstraction of blood, the skin lesions must be more pronounced than where opposite conditions exist. It must be equally plain that the removal of the bristles and epidermis, and with this the dirt from the skin, brings the skin lesions more prominently to view than is the case when the carcass is allowed to lie in the usual filthy surroundings of the porcine species. I do not, however, wish any person to accept these statements hypothetically. I assert that, after making hundreds of *post mortem* examinations under every variety of conditions, and after having investigated the matter experimentally, the propositions laid down are substantially and essentially correct. Frequently, indeed, skin lesions are rendered prominent by dressing that could never have been detected during life.

In the general condition of the carcass much aid is not afforded to the inquirer. If the pig has been fairly well fed, if the disease has not been too long in existence, and if the carcass has been properly dressed and hung in a cool dry atmosphere after dressing, even the experienced inspector can gain nothing by its physical examination. The fat may be as well set and as white, and the muscular tissue as dry and as firm, and of as good colour and consistence, as the carcass of a healthy pig, and even after hanging for several days these conditions may be preserved; if, however, the animal has been labouring for some time under the disease, if emaciation has set in, and if bowel or lung lesions are at all extensive, then the carcass will be pale, flabby, and moist, and suspicion will be aroused at once.

The blood in the early stages, and even in the advanced stages sometimes, does not present any important physical alterations. It may clot with tolerable rapidity and firmness, and may be of its normal colour; on the contrary, and in spite of the assertions of one or two of our best pathologists, it may present some very important physical changes. It may be dark in colour and thick in consistence, or it may have a tarry appearance, or, and more important than either, it may resemble a mechanical mixture of red brick-dust with some colloid solution. The last mentioned condition I look upon as very pathognomonic in its character, and I have frequently found such blood in the heart when I have failed to find sufficiently convincing evidence of the existence of the disease in any other organ or tissue of the body. *Ante mortem* cardiac clots are sometimes found.

The systemic lesions are extravasations of blood and effusion of serum and of lymph. The skin extravasations may be superficial or deep; they may extend into the sub-cutaneous tissue or even into the subjacent muscles; they may be very dark or red in colour, and usually become of a brighter hue after exposure to the atmosphere. They may be confounded with the lesions produced by bruising, and the strokes of whips or sticks; the latter are superficial, and the extravasation is confined to the immediate seat of the injury. Along the back of the neck and on the back they may be confounded with the redness produced by the animal rubbing itself shortly before death against a rail or spar; in this case the redness is diffuse; in swine fever it presents the defined characters of an eruption.

In the muscular tissue itself, the extravasations are rarely pronounced, but in the intermuscular connective tissue they are common, and very frequently, when doubts exist as to the nature of the malady, the detection of intramuscular extravasation, especially in the sub-scapular region, dispels the doubt.

Serous or sub-serous extravasation is common into or under the peritoneum, into the pericardium, into or under the endocardium, particularly of the left ventricle, under or within the renal capsule, or the serous tunic of the liver or spleen, into or within the cerebral meninges. In form the petechia may be punctiform, ramiform, or diffuse; in colour, bright red or modena.

The mesentery and omentum are more often the seat of congestion than of extravasation.

Parenchymatous extravasation is sometimes very extensive, at other times absent, though visceral congestion, especially in the case of the liver, the kidneys, and the spleen, can generally be distinguished if carefully sought after.

Swine Fever.

I have seen the kidneys presenting an appearance such as could scarcely be credited without ocular demonstration; the malpighian bodies as distinct as if they had been painted, the intratubular tissue mapped out to a nicety with effused blood, and the organ rendered more like a kidney into which blood had been injected with superhuman force than anything else to which I can compare it. Usually the lesions are punctiform.

Effusion of serum is found in the deep inter-muscular connective tissue and into cavities, as the peritoneal, pleural, pericardial, and arachnoid; while layers of coagulated lymph are frequently found deposited in the serous surfaces of organs, causing adhesion of visceral to parietal reflections.

Pulmonary lesions are by no means constant or necessary. They may, however, be primary, and may exist independently of intestinal or of any other lesions—frequently I have discovered (and confirmed my diagnosis thereby) pulmonary when the systemic and enteric lesions have been entirely absent. In the early stages the lesions, like those of pleuro-pneumonia, are of an effusive or exudative type. On careful examination, patches of lung will be found in which the lobules have a more solid appearance and feel than have the surrounding lung tissue, and in which the interlobular tissue is distinctly infiltrated with colourless serum, or more usually serum having a slightly sanguineous hue; and if a transverse section of the involved lung-structure is made, and pressure applied, serum oozes out in large quantities, and as it passes from the small bronchi it is seen to be mixed largely with air bubbles (frothy), showing that the effusion has been in existence during the life of the animal. In other cases small patches at the borders of the lungs are found presenting the characteristic appearance of small patches of consolidation from collapse.

As time goes on, the involved part of the lung assumes a condition very similar to that with which we are familiar in pleuro-pneumonia in the ox. The inflammation is circumscribed by effused lymph, the surface of the involved area is raised distinctly above the surrounding level, the pleuræ becomes opaque and thickened, and masses of lymph are found deposited on its external surface, not infrequently producing adhesion of the pulmonary to the costal pleura, while in very asthenic cases I have seen suppuration.

On section the affected lung is found to be solid and friable, charged with serum, red, black, or grey in colour (red, black, or grey hepatisation), increased in density and in specific gravity, decreased in resilience, and, as in pleuro-pneumonia, separated from the surrounding lung structure by a distinct segregating band.

The bronchial tubes, and often the trachea, are filled with serum or occluded with coagulated lymph.

Gastro-Intestinal Lesions.

In making a *post mortem* examination of a pig supposed to have died of swine fever, the best plan to adopt is to carefully remove the whole of the intestines and stomach, and lay them aside until the carcass itself has been examined.

In most cases, lesions in the small intestines are readily detected by visual examination; the coats being semi-transparent, any thickening or discoloration is readily seen from without as they are run over the fingers.

Adhesions of the bowels to each other, or to the mesentery or omentum, should also be noted, as such adhesions, when circumscribed, invariably mark the site of grave structural lesions in the walls of the bowels. Discoloration, ecchymoses, roughening and opacity of the peritoneum, are useful guides, as they are also in the localization of lesions. In the large bowels a peculiar blue discoloration, interspersed with petechiæ, usually capilliform, is often seen.

The large bowels are best examined by making an incision immediately over the junction of the ileum with the cæcum and colon, and continuing the incision along these bowels, noticing first the character of the egesta they contain, and subsequently washing them, when any lesions which may be in existence are at once rendered prominent.

Gastro-intestinal lesions, for convenience of description, may be arranged in two groups:—(1st.) Those in which there are no marked necrotic changes. (2nd.) Those in which such changes predominate.

In the first group the prominent lesion is diffuse mucositis, extending frequently from the cardiac orifice of the stomach to the ileo-cæcal junction, and in some cases along the colon and cæcum.

The inflammatory action may be very slight, and extend no deeper than the superficial mucosa; on the contrary, it may be very pronounced, and involve the deeper structures of the membrane, which may become very thick, soft in consistence, and oftentimes of a gelatinous character. The epithelium in the worst cases is dry and roughened, and there may be superficial erosions. Extravasations into the structure of the bowels are often seen, and not unfrequently the contents are of a sanguineous hue. As a rule the fæces are either semi-solid or of a very liquid consistence, and give off a very unpleasant but characteristic odour, which lingers on the skin of the hands for a considerable time.

In the second group very definite structural changes are observed; these are superficial necrosis in patches having an appearance similar to that which is produced by the application of a cautery, and characteristic ulceration.

Before describing the typical ulcers of Swine Fever, I wish to direct attention to an anatomical glandular peculiarity which exists around the base of the ileo-cæcal valve of the pig. If the surface of the mucous membrane is closely scanned a number of pit-like depressions or *cul-de-sacs* will be seen; these are probably the mouths of glands closely assimilated in character to the solitary glands. In the vast majority of cases the typical lesions of the disease are to be found associated with these pouches, *i.e.*, if there are any intestinal lesions in existence. The mouths of the sacs seem to be enlarged, and extruding therefrom there are masses of a yellowish brown-looking material, not unlike dried yellow putty; on the application of a little pressure these plugs may be enucleated intact, leaving behind a distinct alveolus with jagged surfaces and edges, and often of a yellow ochre hue. In the more advanced stages distinct molecular death has gone on, the ulcers have increased their boundaries by peripheral extension, and very frequently they have become confluent, and form large irregular patches round the base of the valve. Personally, I attach much importance to these changes, and even where there seems to be an absence of bowel lesions I never fail to examine the part indicated.

The typical ulcers of swine fever can scarcely be confounded with the lesions of any other malady. They are preceded by small nodular formations in the mucosa, these producing rounded elevations on its surface, and, on passing the fingers over the part, they can be distinctly felt. They resemble in size and general character the miliary nodes of glanders, and are probably the result either of plugging of the small capillaries (embolism) by bacteria, or of circumscribed inflammatory changes, leading to the throwing out of an exudate.

In

In any case they are of greyish colour, and at first are discrete and tolerably resistant to the touch. *Swine Fever.* After a time, central softening is observed to have taken place, followed by irruption and the formation of distinct small circular ulcers with jagged edges, and of a greyish-yellow or black colour. Many of these ulcers remain discrete throughout the course of the subsequent changes, others run together, and may produce extensive necrotic patches of a very irregular shape. Long ridges of necrotic tissue are sometimes arranged in parallel rows, giving the part the appearance of a crow's foot, as exemplified by preserved specimens in my possession. Whenever these extensive necrotic changes go on, the coats of the bowel in the involved parts become very thick and hard and dark (either black or dark red) in colour, and the patch stands prominently out from the surrounding bowel. In very severe cases there is a tendency to perforation—a result, however, rarely seen, as it is prevented by adhesion of the investing peritoneum to that of an adjacent bowel, or to the mesentery or omentum. This condition is also well shown in specimens in my possession.

The small ulcers already noticed tend to increase their bounds by peripheral extension, layer after layer of epithelium proliferating and degenerating, until ultimately ulcers as large as a sixpenny piece or a shilling are formed, which, on close inspection, are seen to be made up of circumferential layers of necrosed tissue and cells, as seen in preserved specimens. In the course of time the necrosed tissues are cast off; but, in the process of exfoliation, the mass is sometimes seen to separate circumferentially after the manner of a variolous lesion, the central parts clinging to the subjacent structures with great tenacity.

The necrosed structure is of various hues, but there is no doubt that the dark colour so often seen is due to the dyeing effects of coal and coal-dust, a material ingested in large quantities, whenever opportunity offers, by the pig. The discoloration here and over the surface of the bowel is undoubtedly due in some cases, as in cattle plague, to the fact that the iron in the extravasated or stagnated blood has become converted into sulphide by the action of the hydrosulphuric acid so largely found in the intestines by the decomposition of the *egesta*.

As already indicated, gastric ulceration is rare, and the ulcers do not partake of the specific characters seen in those of the intestines.

The contents of the large bowels present remarkable characteristics. Sometimes they are simply fluid or semi-fluid, dark in colour, and of a sickly but peculiar odour; but more largely they will be found (*a*) in the form of small concrete masses, which adhere tenaciously to the mucous membrane, and when detached therefrom leave behind a roughened and sometimes an inflamed surface, (*b*) in the form of large masses of a very dark colour, of firm consistence, very cohesive, and coated with a layer of mucus, or mucus mixed with blood.

A very marked condition often associated with intestinal lesions is enormous engorgement of the mesenteric capillaries, and sometimes pronounced mesenteric extravasations.

Glandular Lesions—Lymphatic and Mesenteric.

There are perhaps no organs in the whole body which become so soon altered in their character as the lymphatic glands. Even when other evidence of the existence of Swine Fever is not forthcoming, it can be obtained in these bodies. The mesenteric, bronchial, and hepatic groups are certainly the most frequently found to present the characteristic lesions; but even when all the viscera have been removed there are still left for inspection the prepectoral, the sublumbar, the inguinal, and the laryngo-pharyngeal groups; and, unless an animal has been slaughtered in the very earliest stages, they usually furnish us with indubitable evidence of the prior existence of the disease.

The glands on section will be found enlarged and charged with serum, the cut surface being moist and glistening; the small vessels in the reticulæ of the lymph channels are found at the outset distinctly injected; but if the disease has been at all advanced, the injection gives place to extravasation, which, like the former condition, is confined at first to the lymph spaces; the parenchyma remaining intact, and of its normal colour (white), gives to the cut surface a mottled appearance—not at all unlike a section of the "Queen" strawberry. After a time all structural characteristics are lost in the gland, it becomes universally infiltrated with blood, very large, very dark in colour, and very friable. The conditions above described are characteristic of Swine Fever; they are not, however, exclusively so; they are found in anthrax and in septicæmia, but, notwithstanding this fact, they afford us a very reliable piece of confirmatory evidence in all cases.

The changes in the mesenteric glands are, on the whole, allied to those described in the lymphatics.

Treatment.

In view of the fact that treatment is not, except for experimental purposes, permitted by the Privy Council, it is unnecessary to make any extended observations in reference thereto.

I may, however, remark that many years ago (over twenty) I used to treat cases of Swine Fever wherever and whenever they came under my observation; and notwithstanding the fact that therapeutics were not so far advanced then as now, I had a very gratifying amount of success in my treatment of the malady.

The plan adopted was to clear out the alimentary canal by a purgative, following this up by the administration of sulphur and by potash salts; with ammon. carb. whenever there was great depression, or lung symptoms were urgent. Good, easily digested food, with plenty of milk, was allowed.

At the present day I should administer sodium sulphite and potassium chlorate; and if the *feces* were very *fœtid*, sulpho-carbolate of soda—alternating these agents with hydrargyrum *cretæ*, and preceding their use by the administration of a purgative.

Prevention and Suppression.

I suppose the various legislative measures which have been put in force by the Privy Council are familiar to all those who are interested in the matter, and local authorities have large powers placed in their hands to enable them to cope with this porcine plague.

Of the Privy Council measures the "Circles Order" is perhaps one of the best; and next in importance to this are the Orders connected with the holding of fairs and markets. But, unfortunately, these measures are not, in most instances, put into force until the disease has made extensive ravages—until, in fact, the legend *Ichabod* may be appropriately written against them. This fault, however, does not always lie at the door of the powers that be. In reference to compensation and slaughter, it may be said that the measures now in force are only half measures. There is too much of the voluntary element about

Swine Fever. about them to render them of any great practical value; and, as in the case of pleuro-pneumonia, there is no uniformity of action observed amongst different and adjoining districts.

Foot and mouth.

Whenever slaughtering is not decided upon, the first care of the Inspector is to persuade the owner of the pigs to slaughter all animals of whose carcasses anything can be made, and which are not of great value for breeding purposes. If proper precautions are observed, and perfect isolation and disinfection insisted upon, there is no necessity to slaughter the brood animals. The necessity for the immediate slaughter of affected or even of suspicious animals need not be insisted upon.

In addition to these measures, the piggeries (every part of them) should be thoroughly cleansed and disinfected, and painted over with fresh hot lime-wash mixed with a large percentage of phenol. I prefer myself gas-tar to white-wash, especially when dealing with wooden erections. The flows of the styes should be put into thorough repair and rendered impervious to moisture. The feeding-troughs, if of wood, should be burnt; if of iron, cleansed, disinfected, and painted, and so arranged as to preclude the possibility of contamination by the feet of the pigs. Rats should be destroyed as speedily as possible, and if very numerous, liquefied gas-tar should be forced into their holes and burrows, and a watch kept at the various outlets for the half-stupefied rats as they make their escape therefrom.

Aërial disinfection by means of sulphurous acid gas and chlorine should also be had recourse to; and medicinal disinfectants—hyposulphite of soda and potassium chlorate—administered to the healthy animals in their food.

By the energetic adoption of the methods above recommended the mortality may be considerably reduced, and the disease effectually suppressed; but while this is so, I do not hesitate to say that such measures are only temporising measures, and that the most effectual method of suppression is the slaughter of all diseased animals, and of those which have been exposed to the infection, with imperial and full compensation.

Mr. GORDON thought that this subject should be dealt with to prevent the introduction of disease in ships' stores.

Mr. PARK: Mr. CURR has said that swine suffered from anthrax. Might it not be swine fever. Has any official inquiry been made into the nature of the disease there as to whether it was really anthrax or swine fever.

Mr. CURR: I said it had been reported upon by the veterinary surgeon as being anthrax. I think it has occurred two or three times.

Mr. STANLEY: Can you give any of the *post-mortem* appearances. They would be interesting, as swine are believed to be refractory to the inoculation of anthrax. I have known swine suffer from diphtheria.

Mr. CURR: The veterinarians were of opinion that it was anthrax.

The CHAIRMAN: They were not imported pigs?

Mr. CURR: No. They were at a place 4 or 5 miles from the port of Williamstown.

Mr. PARK suggested that steps might be taken by Mr. CURR to ascertain beyond doubt what was the nature of the disease.

Mr. CURR: If the Conference wishes for further information I shall be glad to look it up. At the same time it seems to me that I have given a plain straightforward statement, and I do not know what further information is wanted. However, I am in the hands of the Conference, and will do whatever they wish.

Mr. PARK moved,—“That Mr. CURR be requested to ascertain definitely if the disease which appeared in swine in Victoria some years ago was anthrax.”

Mr. CURR: The principal facts, I find on reference to my Correspondence Book, were as follows:—On 29/1/78 a cow on a farm at Kororoit, near Williamstown, was reported to have died of Cumberland. Mr. C. Marson, V.S., made a *post-mortem* of the animal and reported it to be a case of splenic apoplexy, and cautioned the owner not to allow the flesh to be eaten by his pigs. Whilst making the *post-mortem* Mr. Marson cut his hand, which accident laid him up and nearly cost him his life. However, the flesh was eaten by the pigs and numbers of them died, and the cause of their deaths was pronounced to be anthrax by Mr. M'Guire, V.S. I made a further inspection of the pigs with the late Mr. Vincent, V.S., who found them to have died of anthrax, on which I quarantined the two farms.

Foot and Mouth Disease.

Mr. PARK read the following paper on foot and mouth disease:—

Eczema epizootica or foot and mouth disease is one of the most infectious and contagious diseases that has affected the herds and flocks of Europe, Asia, America, and Great Britain for centuries past—the latter country for nearly half a century since the introduction of the disease by importation, which is now and has been declared stamped out of Great Britain for nearly one year. On several occasions reports have been made that foot and mouth has again broken out, but on an investigation have proved this to be groundless.

Nature.—Contagious and infectious, attacking all cattle, sheep, pigs, goats, horses, and men—the human subject—the latter through the medium of milk, and mostly affecting young children.

Cause.—Are due to a specific virus producing the disease only; the period of incubation varying from twenty-four hours to ten or twelve days.

The symptoms are characterised by a vesicular eruption on the tongue and lips, extending occasionally to the mammary gland. The feet participate in this vesicular eruption, producing lameness, sloughing of the hoofs, giving the animal the most intense pain in aggravated cases.

Importation.—All animals should be inspected by a duly qualified Inspector of Stock or Veterinary Surgeon on board ship before being allowed to land. A period of quarantine of ninety days with periodical inspection during that period, together with disinfections if necessary.

The risk of introducing any contagious or infectious disease is almost impossible if proper precautions are taken. England only prohibits importation from infected countries.

Treatment is preventive and curative; the former is already dealt with. Curative treatment is very rarely required; it consists of hygienic measures being adopted—good nourishing food; simple dressing to affected parts.

Mortality.—The mortality is very slight; thousands may be affected without sustaining a single death. The greatest loss occurs amongst sucking young animals.

ARCHIBALD PARK, M.R.C.V.S.

Mr.

Mr. HIGGINS: Have you seen a case of foot and mouth disease in horses?

Mr. PARK: Yes, I have; there is also a disease—a species of catarrh—which resembles it, except with regard to the characteristic vesicles. Rinderpest might also be mistaken for it. For the last twelve months England has been free from it. One case was investigated, but it proved not to be foot and mouth disease. Foreign Diseases. Australasian Regulations.

Mr. STANLEY: The disease is so rare among horses that it is supposed that they cannot be inoculated with it.

Mr. COOPER: We get from the Agent-General a weekly return of diseases compiled by the British Agricultural Department, and for the last two or three months foot and mouth disease has disappeared.

Mr. WOOD: How long has it been in England?

Mr. PARK: Since 1839. It might have been stamped out long ago if it had been well known and unanimous action taken.

Mr. STANLEY: British agriculturalists attach very little importance to it. They will buy in a fair where it is present. The practice is to put the cattle they buy at a fair in quarantine for ten days. If they go fourteen days they are satisfied, and will turn those animals among their own breeding herds. With a quarantine of ninety days there is very little fear of it getting amongst our stock here.

Mr. PARK: Pigs have been known to leave Ireland quite healthy and to be diseased by the time they get to Glasgow, within twenty-four hours from time of shipment.

DESTRUCTION OF ANIMALS INFECTED WITH FOREIGN DISEASES.

Mr. HIGGINS moved—"That this Conference recommends that any animals found to be infected with Glanders, Farcy, Foot-and-mouth Disease, Rinderpest, Sheep-pox, Swine-fever, Rabies, Trichinosis, or any other infectious or contagious disease not existing within the Colonies, be at once destroyed.

Mr. GORDON seconded the motion, which was agreed to.

II.—REGULATIONS RELATING TO THE INTRODUCTION OF AUSTRALASIAN ANIMALS BY SEA.

Mr. COOPER moved that, "The term Australasian Colonies be used instead of Australian Colonies and that it comprise the colonies on the continent of Australia, Tasmania, and New Zealand."

Mr. HIGGINS seconded the motion.

The motion was agreed to.

Mr. TABART read a paper on the regulations relating to the introduction of Australasian animals by sea. The paper is as follows:—

"At the present time the regulations in force throughout the Colonies are so at variance it is with difficulty that exporters and importers can ascertain the particulars as to how they should forward stock. I recommend that a regulation be framed, to be submitted for the approval of the several Governments, dealing with the interchange of Australasian animals; but in doing so I anticipate considerable difficulty will be experienced in arriving at such a code of laws as will be acceptable to all the colonies, there being such a peculiar difference in the circumstances of each country, inasmuch as South Australia, Victoria, New South Wales, and Queensland form part of the mainland, while New Zealand and Tasmania are islands. It would necessitate arrangements being entered into as to the difference to be observed in the case of clean and unclean colonies, and the risk of re-infection that would likely be caused by the introduction of stock from unclean colonies. *Cattle*: The position of Tasmania in reference to this description of stock is singular, as at the present time there is absolute immunity from cattle disease, which is not so in the adjoining colonies. I consider we are subject to greater risk of cattle disease being introduced into the herds of Tasmania by the importation of stud animals from Victoria, New South Wales, South Australia, and Queensland than is the case from direct importation of foreign animals—that is, stock from England, &c.—this on account of the frequent outbreaks of pleuro-pneumonia, also Cumberland disease, which latter plague is reported as being most alarming in New South Wales. This fact is significant, as shown by Mr. Stanley, Veterinary Surgeon for the New South Wales Government, who reported in August last upon the fatality of this disease when it attacked Mr. Leithbridge's cattle, near Dubbo, when 161 head died. The short distance that stock have to be conveyed, with the few hours' length of sea trip from the abovenamed colonies, is most dangerous to the future of Tasmania, and the risk is far more alarming when compared with the length of sea voyage that foreign stock are obliged to undergo, with the greater chance of the development of disease before being landed. It behoves this colony to act with great caution to prevent a repetition of the dire calamity that resulted to this great interest in Australia in 1858 by the importation from England of a cow belonging to Mr. Boadle that was infected with pleuro-pneumonia, hence this disease has established itself throughout the length and breadth of the continent. I feel strongly upon this subject, and assert that measures should be devised to protect our colony from these diseases, particularly when the Australian Colonies, as also Tasmania and New Zealand, absolutely prohibit the introduction of cattle from places and countries outside the colonies. The regulations now in force in Tasmania require a Veterinary Surgeon's certificate, and also a certificate from an Inspector, to be produced before stock can be landed into quarantine, which extends to six months. I should propose in all cases of shipment of cattle that the Inspector's certificate be abolished, and a breeder's substituted, certifying that the herd from which the animal was drafted never had suffered from any contagious or infectious disease, nor had any diseased cattle depastured upon the estate from which the animal came within the next preceding 24 months, and that the vendor should be held responsible for the safe delivery of the animal, free from all contagious or infectious diseases on shipboard. Upon arrival in Tasmania, the stock should be inspected by the Government veterinary surgeon, and if passed as free from disease be sent to quarantine, and there remain for a period of six months at least. In interchange between Victoria, New South Wales, South Australia, Queensland, and New Zealand there is no quarantine upon cattle, but an inspection is required,

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required, and if diseased are forthwith destroyed. *Sheep*: To this description of stock I wish to draw the particular attention of members of the Conference, on account of the great difference in the regulations in each of the Colonies, and the unnecessary inconvenience to which breeders and shippers are subjected. It is an authenticated fact that the admixture of fresh blood is beneficial and absolutely necessary, as also profitable, into any stud flock or herd, if it can be effected without introducing any disease. I feel satisfied that the decision likely to be arrived at by this meeting is, that sheep from clean colonies should be admitted into any other clean colony under less restrictive and arbitrary regulations than those at present in force. I trust that a law will be made allowing sheep to be interchanged, as named above, with one dipping and no quarantine. I intend to review the regulations in force in each of the colonies, so that the inequalities may become apparent to any member of the Conference. Victoria allows sheep from either clean or unclean colonies to be introduced under the same regulations, provided they are furnished with a statutory declaration made by the owner or person in charge that the stock are free from disease. The Chief Inspector shall then detain the sheep until they have been dipped once or oftener as he may direct, and until he shall by writing, under his hand, authorize their removal. This I consider inconsistent, particularly when by admitting sheep from an unclean colony the contact with an attendant's clothes might cause scab to be introduced, when from a clean colony such a risk is impossible. I respectfully beg to intimate to the members of the Conference that when the two last seasons' shipments of stud sheep from Tasmania were forwarded to the annual stud sales held in Melbourne two dippings were enforced, when in previous years only one dipping was considered quite sufficient to ensure safety from the introduction of scab. Upon making inquiry I was informed that this change was consequent from the outbreak of scab in New South Wales, which unfortunate circumstance was the result of an importation of Vermont stud sheep from America, an unclean country. South Australia wisely distinguishes the difference between clean and unclean countries, as signified by their regulations, viz.:—All sheep entering South Australia must produce a certificate from an Inspector of Stock or a qualified Veterinary Surgeon that the sheep were free from disease. If from the clean colonies of Victoria, New South Wales, Queensland, or Tasmania they undergo a quarantine of six days and are dipped, as directed, by an Inspector of Stock; but sheep entering from the unproclaimed clean colonies of New Zealand and Western Australia are necessitated to undergo a quarantine of fourteen days, and dipped as directed by the Inspector of Stock. This Act seems to me to be administered upon more equitable grounds than the law now in force in Victoria. Queensland: All sea-borne sheep from any of the Australian Colonies must undergo a quarantine of twenty-one days, and absolutely three dressings. This law almost amounts to prohibition. Breeders do not care to risk losing a high-priced stud ram from the frequent dippings, which are considered excessive. This law has the effect of excluding the best stud sheep being introduced for the improvement of the Queensland flock. New Zealand requires all sheep landing at their ports to be accompanied with a certificate from an Inspector of the Colony from which the stock are exported, also a Veterinary Surgeon's certificate as to their being free from disease. Upon arrival the sheep are dipped once, and allowed to travel. Under this law I do not consider any hardship is caused to the exporters of sheep, and no practical sheep-farmer could object to this precautionary one dipping being enforced. New South Wales: This colony requires that sheep landed from other colonies shall be inspected one by one by the Chief Inspector of the place from whence they are shipped. The vessel carrying the stock has to be thoroughly disinfected and cleansed before the sheep are taken on board. These portions of the regulations being complied with, upon arrival in New South Wales the sheep have to undergo the examination of two Inspectors, who handle every animal along the back and sides to ascertain if the acari is then upon the sheep. If it is not discovered (which is not likely if there is no outward and visible signs) the sheep are allowed to be taken to a proclaimed quarantine, and there remain for twelve days before being once dipped; but if the sheep are not accompanied by the certificate above-mentioned they have to be dipped three times. Sheep landing in Victoria and travelled overland, in addition to holding the certificate from the Chief Inspector of Tasmania, must also have a certificate from the Chief Inspector of Victoria, certifying that the sheep intended to be travelled have undergone the two dippings enforced by Victoria upon sea-borne sheep. They then enter New South Wales without further dippings or quarantine. The cages or crates which are used for carrying the sheep to the stud sales in Sydney are not allowed to be landed without being disinfected, notwithstanding that the sheep which are enclosed in the crates or cages are landed. The attendants also land without being subject to a disinfecting process. It is the last-mentioned fact that proves the inconsistency of this law. Breeders from all the Colonies attend these sales, and as a matter of fact examine all the sheep exposed for public auction, leave the proclaimed quarantine station, and afterwards travel the length and breadth of the land without any precautionary disinfecting. This colony prohibited the introduction of sheep from New Zealand and Western Australia on account of being unclean. Tasmania admits sheep from all proclaimed clean colonies with one dipping enforced before sheep travel outside the town boundary, and a certificate is required from an inspector that they have always been free from contagious or infectious diseases, and were bred in one of the following colonies:—Victoria, New South Wales, Queensland, and South Australia, or had undergone in the colony from whence they were imported the necessary dippings and quarantine in accordance with the regulations in force in such colony, and that the pens wherein the sheep are confined on shipboard were such as could not possibly have at any time contained diseased sheep. Sheep from New Zealand and Western Australia are prohibited from landing. All returned Tasmanian stud rams are dipped upon arrival in the island before being allowed to travel. *Dogs*.—New South Wales must have a declaration made by the owner before a Magistrate, and certified to by the inspector, that the animal is the produce of the Australian Colonies. Upon the production of this there is no quarantine enforced. New Zealand: A certificate is required from an Inspector setting forth from whence the animal came, and that it is free from disease, and is the produce of the colonies, or that the animal had performed a quarantine of six months, thereby causing the same to be classed as an Australian-bred animal; with this certificate no quarantine is necessary. Victoria: The inspector has to give his authority in writing for a dog to be landed; if Australian-bred, no quarantine. Tasmania and South Australia: Free interchange when colonial-bred. The law for this particular class of stock could without difficulty be assimilated, and required when moving from one colony to another to carry a declaration by the owner, made before a Magistrate, and certified to by an Inspector, that the animal mentioned is Australian-bred, or had performed the necessary quarantine, thereby making the animal equal to and allowed all the privileges of a colonial-bred dog. *Horses*.—This stock upon production of certificate can land in any of the colonies without a quarantine being performed. I consider before horses are exported from any of the

the colonies an examination should be made by a duly qualified Veterinary Surgeon, who shall grant a certificate of health, the production of which at any port of the Colony to be proof of the non-existence of disease. I have only, in conclusion, to say that certain alterations of the existing laws in the interchange of stock would be a mutual benefit throughout the colonies. The high figure given by breeders for good constitution, sound, and suitable animals shows conclusively the great desire there is in the colonies to improve the herds and flocks, thereby adding materially to the wealth of the colonies.

HARBOUR EXCURSION.

The Chairman read the following letter from the Under Secretary for Mines :—

Gentlemen,

I am desired by the Minister for Mines to inform you that he will have very great pleasure in placing one of the Government launches at your disposal with a view to enable you to visit some points of interest in and around the Harbour on Saturday next. If you do him the honor to accept, the Minister will be glad to know at what hour you wish to start.

30 September, 1886.

I am gentlemen, yours faithfully,

HARRIE WOOD.

The Chairman and Members of the Stock Conference, Sydney.

Mr. PETER moved,—That the proposal be accepted, and that a vote of thanks be accorded to the Minister.

Mr. MEREDITH seconded the motion, which was agreed to.

Mr. MEREDITH moved,—That the members meet on Saturday at 10 30 a.m., at Princes Stairs.

The motion was agreed to.

Mr. TABART—with respect to Intercolonial Regulations—said he wished to mention that Tasmania had been free from scab for seven years, and had been proclaimed clean for five and a half years. To ensure safety and prevent its introduction they took every possible precaution. They absolutely prohibited the landing of sheep from New Zealand and Western Australia. It lately came to his knowledge that an endeavour was to be made to introduce carcasses of mutton from New Zealand into Hobart. The sheep were to be put alive on to a vessel at New Zealand, and slaughter them a day before they reached Hobart. They had no regulations in Tasmania to meet such a case, so he at once wrote to the Chief Secretary, and a regulation was framed, which was now in force, prohibiting the introduction of sheepskins, or any part of the skins, from New Zealand into Tasmania. Further, to provide against the possibility of the introduction of scab, all the Tasmanian stud sheep returned unsold from the sales in the other Colonies or purchased by Tasmanian breeders, were dipped before they travelled inland.

Mr. VALENTINE: Are they dipped in Melbourne before they leave.

Mr. TABART replied that they were not, nor in New South Wales. All imported sheep from Victoria or New South Wales were dipped before they went outside the town boundary, and if any of the imported Tasmanian sheep mixed with other sheep during the time they were within the town boundary they had to be dipped before they were taken out. The members of the Conference would see from this that every effort was made to prevent the re-introduction of scab. There were only three landing ports—Launceston, Hobart, and Torquay—and there was an Inspector at each port to supervise the landing of sheep, and to see that they were dipped if they were landed on the north coast at Torquay; they were dipped before being travelled inland. If they were landed at Launceston and trucked to Hobart they were dipped at Launceston.

Mr. HIGGINS: Are your Inspectors practically acquainted with scab.

Mr. TABART replied that they were. He did not think they could find more practical men in the Colonies. To show how important a matter this was to Tasmania, and to the whole of the Australian Colonies, he would state, in 1885, Tasmania exported to Victoria 1,484 stud sheep of the value of £24,310; to New South Wales during the same year they exported 1,244 stud sheep, valued at £29,200; to New Zealand 277, with a value of £1,238; to Queensland 145, with a value of £2,581; and to South Australia 46, with a value of £776. The total number of stud sheep thus exported in that year, 1885, was 3,249, with a value of £58,105. This was sufficient to show the importance of the question. In asking for a relaxation of the present regulations, he might also say that in the same year Tasmania imported 59,744 sheep, with a value of £49,205, from Victoria; 5,118, with a value of £3,837, from New South Wales; 477 carcasses of mutton, with a value of £400, from New Zealand. The grand total of imported stock in 1885 was 65,139, with a value of £53,450.

The CHAIRMAN laid on the table the New South Wales regulations relating to sea-bound Australian sheep. They are as follows :—

AUSTRALIAN STUD SHEEP.

Sheep to be only landed at Sydney.

1. No stud sheep from any other Australian Colony shall be landed at any port or place in this Colony except at the port of Sydney.

What is to be deemed a clean Colony.

2. No Colony shall be deemed to be a clean Colony in which scab or catarrh or any other infectious or contagious disease exists, or is suspected to exist, nor any Colony in which scab shall have existed within the next preceding one year, and no sheep shall be imported except from a clean Australian Colony.

What is to be deemed a clean vessel.

3. No stud sheep shall be imported except by vessels that have not traded to any but a clean Australian Colony within the next preceding twelve months, nor by any vessel which shall within the period hereinbefore mentioned have had any sheep on board from any Colony other than a clean Australian Colony.

Vessel to carry sheep must be cleansed and disinfected.

4. Every vessel on which it is intended to carry any such stud sheep shall be thoroughly cleansed and disinfected before the sheep have been shipped.

Sheep

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importations.

Sheep must be accompanied by certificate from Chief Inspector of exporting Colony.

5. All such stud sheep shall be accompanied by a certificate and declaration to the effect of Form 1 hereto, that they have been examined one by one by the Chief Inspector for the Colony from which they are exported certifying that they have been so examined, and that they are free from any infectious or contagious disease, and that scab has not existed in such Colony for the next preceding two years.

Sheep on arrival to be examined by an Inspector and Veterinary Surgeon.

6. No sheep from any clean Australian Colony shall be landed in this Colony until they shall have been examined and a certificate to the effect of Form 2 hereto, granted by an Inspector of Stock and a duly qualified Veterinary Surgeon, that all the requirements of the abovenamed Acts and of these Regulations with respect to such sheep have been duly complied with, and that they are not infected.

Infected sheep to be destroyed or disposed of by Minister's order.

7. If any such stud sheep brought by sea into a port or place in this Colony be found to be infected they may be forthwith destroyed or otherwise disposed of, as the Minister may direct.

Quarantine and Dressing of Australian Imported Sheep.

8. Stud sheep from any clean Australian Colony may, if found on inspection to be not infected, be landed and taken by a conveyance to the quarantine for such sheep, where they shall be quarantined and dipped under the supervision and direction of the Inspector, and the length of such quarantine, the medicaments to be used in dipping, the temperature and duration of the bath, the number of dippings, and the fees to be charged for the keeping and dipping of the sheep, shall be as follows, viz. :—

Quarantine.

- (1.) The quarantine shall extend to at least twelve days prior to dipping

Medicaments.

- (2.) The medicaments to be used in dipping shall be good sound tobacco, or tobacco leaves and flowers of sulphur, at the rate of 1lb. of each to every 5 gallons of water, the tobacco to be put into boiling water and infused for five hours at least, and the sulphur to be added to the infusion in the dip.

Temperature.

- (3.) The temperature shall not be less than 100 nor more than 110 degrees Fahrenheit.

Bath and Duration.

- (4.) The sheep shall swim and be completely immersed while in the bath, and the bath shall last from one to two minutes, according to its temperature, and as the case may require.

Number of dippings.

- (5.) The sheep shall receive one dipping.

Charges.

- (6.) The rates to be charged for the keeping and dressing of sheep in quarantine shall be as follows, viz. :—

	s.	d.
Sustenance and attendance per day or part of a day per sheep	0	6
Dipping each sheep	1	0

Declaration by persons dipping, dressing, or disinfecting.

9. Every Inspector or other person who shall have superintended any dipping, dressing, or disinfecting, shall make and transmit with due dispatch to the Chief Inspector a declaration to the effect of Form 3 hereto.

How sheep are to be released from quarantine.

10. No sheep shall be released from quarantine until they shall have been examined by the Chief Inspector and a duly qualified Veterinary Surgeon in consultation and a certificate granted by them to the effect of Form 4 that such sheep have been duly quarantined and dressed, as prescribed by these Regulations, and are free from infection.

How imported Australian sheep are to be admitted overland from other Colonies.

11. Sheep imported from any clean Australian Colony into any other clean Colony, and intended to be introduced overland into this Colony, may be admitted if their owner produce the certificates prescribed by Regulations 5, 6, and 10 of 1st July last (1886) under the abovenamed Acts for such sheep, and if they are found on examination by the Inspector for this Colony at the border to be not infected; or such sheep may be admitted at the border on inspection as aforesaid if their owner produce to such Inspector a certificate under the hand of the Chief Inspector for the Colony from which they are intended to be introduced that when such sheep were introduced into that Colony they were accompanied

accompanied by a certificate as prescribed by number 5 of the abovementioned Regulations, and that such sheep have been twice dipped with proper preparations of tobacco and sulphur, or of sulphur and lime, in a bath given at the temperature and of the duration and in the manner prescribed by number 8 of the abovementioned Regulations. But all such sheep, unless they shall have been imported, inspected, quarantined, and dressed as prescribed in this and the abovementioned Regulations, shall, on crossing the border, be placed in quarantine, and kept and dipped in the same manner in every respect as prescribed with regard to Australian imported sheep landed at Sydney.

Intercolonial
Traffic, &c.

How Australian imported sheep which have not complied with all the Regulations are to be admitted.

12. Should any Australian sheep be imported into this Colony by a vessel which shall not have been cleansed and disinfected, as provided by these Regulations, or should any such sheep not have been examined in the Colony from which they were exported, as prescribed by these Regulations, then such sheep may, with the sanction of the Minister, be admitted to and shall remain in quarantine for twenty-one days, and shall in every such case receive three dippings at intervals of not less than ten nor more than fifteen days.

Stud sheep from inland or overland from other Colonies to be treated as "imported" if in or near Sydney at same time.

13. Stud and show sheep brought from any of the inland districts of this Colony or introduced overland from any adjoining clean Colony which shall be in Sydney or in any of the suburbs during the time that any imported sheep shall remain in Sydney or the suburbs, shall, prior to their leaving the coast district, be dipped the same as if they were imported Australian sheep.

Owners of special quarantines to pay for attendant.

14. In any case where a special quarantine has been granted for Australian imported sheep an attendant may, where necessary, be placed by the Chief Inspector of Stock in charge of the sheep in such quarantine; and the person to whom such quarantine has been granted shall pay the expense of such attendant.

No fodder to be landed, and no cages without disinfecting.

15. No fodder-straw or litter which shall have been used for, with, or about imported sheep, nor any fittings on board any vessel for such sheep shall be landed; and all cases or cages brought with such sheep shall be cleansed and disinfected as the Chief Inspector shall direct.

Mr. MEREDITH said it was most important that they should have any proposed motions in hand before they came on for discussion. They should be laid on the table each night and printed, so that they might be able to see at a glance what matters were to be brought forward. That would save a great amount of time. The members could then take the resolutions home and talk them over together so that many differences of opinion might be got over. That was why he proposed on a former occasion that notice should be given at each sitting of the motions for the following day. Take for instance the subject which Mr. CURR had referred to. It ought to be in the hands of members beforehand.

Mr. PETER: It is a subject we are so well up in that it would be a waste of time to deal with it as Mr. Meredith proposes.

Mr. CURR laid on the table the following resolutions:—

1. No sheep brought from any Australasian Colonies in which scab exists shall be introduced into any of the Australasian Colonies.
2. All sheep bred in the Australasian Colonies which have been on board of any ship, steamer, or other vessel, before they are allowed to go at large in any of such colonies, be placed in quarantine until they have been twice dipped for scab in lime and sulphur dressing at intervals of not less than forty-eight hours nor more than seven days.
3. Stock which is allowed by law to travel in the Australasian colony in which it has been bred or into which it has been introduced in accordance with the law there in force, shall be allowed to enter any neighbouring colony by land at any gazetted place of entrance without further obstacle, unless it shall be found on examination by an inspector of the colony into which it is proposed to introduce such stock to be suffering from some disease which is treated as infectious by the law of such colony, or unless such inspector has reason for suspecting the presence of contagious disease in such stock; and the fact that any stock is held to be free from disease in any colony and so allowed to go at large shall be *prima facie* evidence of its freedom from contagious disease.
4. That the lime and sulphur dip shall be adopted as the only dip for scab in the Australasian Colonies, by which last term is meant the several Australasian Colonies, Tasmania and New Zealand.
5. That it is desirable that all drafts of laws or regulations dealing with the diseases of animals, &c., should be submitted by the Government which institutes them to the other Governments of the Australasian Colonies for remark before they become law.

Mr. CURR moved—"That they be discussed."

Mr. LANCE: They all deal with subjects with which we are conversant. We are as well acquainted with them now as we would be if they were held over for six months. On the first there will be little or no difference of opinion. With the 2nd I do not at all agree as to the proposed quarantine restrictions.

Mr. CURR: In Victoria quarantine means that the sheep are taken to a store and the owner was asked whether he would have them dipped on that day or the following. He was then told that he could have the second dipping carried out after the lapse of forty-eight hours, so that as a matter of fact the sheep could be released forty-eight hours after they were landed.

Mr. LANCE: It is practically useless to have the second dipping within such a short period as forty-eight hours.

Intercolonial
Traffic, &c

Mr. CURR: It is not useless. One thorough dipping in lime and sulphur is a cure for scab. You cannot dispute the fact.

Mr. LANCE: I do dispute it.

Mr. CURR said that although the cure for scab was practically effected with one dipping, yet the stuff might not be at the proper heat, or the animal might not be kept in it the proper time. Hence it seemed to him that where they were dealing with seventy millions of sheep it was well to take all possible precautions. It might be said that the period between the dips was too short, but he was of opinion that as soon as the sheep were dry there was nothing further necessary for the destruction of the scab.

Mr. LANCE asked how the two dippings within forty-eight hours would work when the eggs of the scab insect were laid under the skin. The New Zealand Act was based on the theory laid down by Professor Wallz. That theory had been restated recently. He did not think that anyone in England had had the experience of Mr. Bruce or Mr. Gordon with regard to scab. They had dealt with it for the last twenty years. If the theory was true that the scab insect laid its eggs under the skin of the sheep, and the eggs were not germinated for nine or ten days, it would be impossible to destroy the acari of the scab with one dip, notwithstanding that Mr. Curr said he had cured scab in one dipping hundreds of times.

Mr. TABART: I have done it hundreds of times with the scabbiest sheep I have ever seen.

Mr. MEREDITH: I have cured thousands with one dip. I remember one sheep which was scabby from the end of its nose to its feet. He dipped the sheep in sulphur and lime and immersed it the proper time. The sheep did not require another dipping.

Mr. HIGGINS: What was the length of time of the dip?

Mr. MEREDITH: Two minutes.

Mr. HIGGINS: What was the temperature?

Mr. MEREDITH: 110 degrees.

Mr. LANCE: If one dip is enough why should we have two?

Mr. VALENTINE: We have not proposed two.

Mr. MEREDITH said that Dr. Rowe gave him the recipe for the lime and sulphur dressing. At that time scab existed to a considerable extent in Tasmania. He selected for a test ten of the worst sheep that could be found. The insects could be seen upon them with the naked eye. He dipped the sheep according to Dr. Rowe's instructions, immersing the sheep for two minutes. They were then put into a small paddock by themselves, and allowed to remain there for ten days. They were examined daily for a month, and not a single insect appeared on them afterwards. The principle adopted in Tasmania was that they never thought of taking the sheep back to the same run for six weeks or two months. They were always put on clean runs, and every sheep was removed from the infected run.

Mr. CURR said he was glad to be able to add the testimony of his own experience to that of Mr. Meredith. There had been hundreds of thousands of sheep cleaned in Victoria under his guidance, when they had been diseased to the last degree, with bales of wool lying against the hurdles. The sheep were dipped twice for scab in those yards, and no scab ever appeared on them again. The reason of this appeared to him was, that the materials used for dressing, lime and sulphur or tobacco, was so obnoxious to the scab insects that they would not go on the sheep, and if they did they would not live. It was usual to give a second dipping, but it was generally the case that the sheep, even with the bales of wool lying about the hurdles and the branches of the trees covered with the acari of the scab, remained free from disease, as the insects would not go upon them, and they would not live if they did.

Mr. COOPER: If you are sure the Colony is clean, why do you dip for scab?

Mr. CURR said that the only sheep dipped were those which arrived in the Colony by sea, of the condition of which it was impossible to be sure. That much as he objected to interference with traffic in this case it was necessary. That occasionally a scabby sheep was found on board an English vessel in Hobson's Bay. That such a sheep might be transhipped on board a Colonial craft, by which means scab might be introduced. He was not aware of any method, except dipping, by which a catastrophe of the sort could be prevented. He was aware that this did not give the Tasmanian's as good a chance with their stud sheep as he could desire, but he maintained that the 70,000,000 of sheep in these Colonies should not be put to the most infinitesimal danger of getting scab among them. If such a thing occurred it would ruin a great number of people. These Victorian regulations were a little more stringent than those he had in force at a certain time when a deputation waited on the Chief Secretary. The members of the deputation did not know the Victorian regulations. They thought there was some laxity by which scabby sheep might get into the Colony. They insisted upon a few additional precautions to guard against such a possibility. The ones adopted were that the sheep should be kept in stores at the west end of the town. There they were locked up at night and the keys were taken away, so that they could not be removed at night, except by burglary. The dipping only costs a penny a head. In all cases where the sheep were quarantined the Government take upon themselves all the expenses of looking after them. He considered that the ideas of the Tasmanian representatives were somewhat sentimental. As a matter of fact, sheep which were quarantined in Victoria could be taken away forty-eight hours after they landed.

Mr. HIGGINS said he did not see the importance of these resolutions so forcibly when Mr. Meredith raised his objections as he did now. These resolutions were almost as important as any business they had on the paper. They dealt with the question of introducing sheep into one Colony from another. At present each Colony had its own regulations, and now Mr. Curr was bringing forward a set of resolutions introducing regulations which would differ from ours to a considerable extent. He confessed that he was not at present able to grasp where the difference lay. If the different resolutions were to be brought forward they should be before them in order that they might see to what extent they could be dovetailed into one another. There was so much in Nos. 2 and 4 that he would like to study and compare them before any attempt was made to discuss them.

Mr. MEREDITH moved as an amendment,—“That the resolutions be printed and laid on the table.”

Mr. HIGGINS seconded the amendment, which was carried by sixteen votes to two.

The following was the voting on the amendment:—For,—New South Wales, Victoria, Queensland, South Australia, and Tasmania, all; New Zealand, 1. Against,—New Zealand, 2.

(The further discussion of intercolonial regulations was deferred until the notices of motion should be printed.)

IV.—COLLECTION AND PUBLICATION OF INFORMATION WITH RESPECT TO
DISEASES IN ANIMALS.

Noxious
Animals.

Mr. GORDON moved,—“That it be a recommendation of the Conference that the various Governments be invited to collect and publish all original useful information with respect to diseases in animals and their prevention and cure, and that they interchange them with the various Colonies.” Mr. WOOD seconded the motion.

Mr. MEREDITH supported the motion, which was agreed to.

V.—TRAVELLING MOVEMENT AND CONVEYANCE OF ANIMALS.

Mr. CURR moved,—“That the subject now numbered 5 in their programme—the travelling movement and conveyance of animals—be left to be dealt with by each Colony within its own boundary.” Mr. COOPER seconded the motion.

Mr. MEREDITH said he objected to it when it was under discussion a day or two ago. Mr. CURR, the Victorian representative, had said that there were no precautions taken to prevent stock travelling in infected districts. He (Mr. Meredith) asked, in the case of Tasmania importing stud animals from Victoria if there was any possibility of the animals being infected where they were shipped, and Mr. CURR had replied that there was none. The question of keeping both their sheep and cattle clear of infection was not a small one to the breeders of Tasmania. In 1886 their cattle numbered 138,642, which was quite sufficient to create a desire to guard against infection. They also wished to improve their stock as much as possible, and they wished to have ample security in case they dealt with New South Wales, Victoria, South Australia, New Zealand, or other Colonies. They wished to see such regulations in those Colonies as would prevent their stock being infected during the time they were travelling between the run and the port of shipment. The representatives of Victoria, Queensland, and New South Wales had informed them that Cumberland and pleuro existed in those Colonies to a large extent, and therefore the stock-owners of Tasmania should be cautious, and ask their neighbours to take such precautions as would prevent infection spreading to the Tasmanian animals. From the explanation given by the gentleman representing Victoria, it would appear that clean stock leaving the breeding station might return infected if they travelled by rail or even by road.

Mr. CURR assured Mr. Meredith that he was by no means careless as to whether Tasmanian stock became diseased or not. If they wanted to make sure that the cattle which came from Victoria to Tasmania were free from disease they would have to undertake an enormous business. All that had been suggested to meet the difficulty was not worth six-pence. If they decided in Victoria to disinfect stock-trucks—which they could do, but which no Ministry in Victoria would undertake to do—what would it be worth? To carry out effectually a plan in detail to know exactly the movements of all suspected animals, it would be necessary to cut the Colony up into small divisions, and the inspectors in each would require to be intimately acquainted with the movements of stock. No Colonial Government would dream of initiating such a scheme. It had been tried in England, and the representatives of the agricultural department had said that it was not satisfactory. Just take the case of Queensland. How could anyone say with certainty where a beast had been the day before. No inspector could actually certify to that. If he held the position in Tasmania which he did in Victoria, he should endeavour to persuade his countrymen not to admit a beast from the Australian Continent any more than from England. The most eminent Veterinarian Surgeon in England—Mr. Flemming—said that a country could not continue to import animals without importing their diseases. That authority had said that it was only a matter of time to bring into Australia, diseases incidental to the stock imported. However, he believed that on such points, if they consulted a dozen of the most successful Veterinarians in the world, they would probably have fifteen different opinions.

The motion was agreed to.

VI.—DESTRUCTION OF NOXIOUS ANIMALS.

(1.) *In Queensland.*

Mr. GORDON said he was not in favour of native dogs being included in the list, because they were not grass eating animals. The Queensland Government had spent £70,000 on the destruction of marsupials up to the end of 1884. Up to the end of last year no less than 6,000,000 of kangaroos and wallabies had been destroyed according to the number of scalps brought in.

(2.) *In Tasmania.*

Mr. TABART laid on the table his report on the working of “The Rabbits Destruction Act of 1882,” for the year ending 30 June, 1886, which, as it deals exclusively with rabbits, will be found under the sub-head of Rabbit Nuisance, page 77.

(3.) *In New South Wales.*

The CHAIRMAN read the following extract from his last Annual Report, with respect to noxious animals, other than rabbits, in New South Wales:—

1. *The Districts in which the Pastures and Stock Protection Act is in force.*

The Act has been brought into operation in all the districts, fifty-nine in number.

2. *Receipts and Expenditure under the Act.*

The amount of assessment paid by stock-owners during the year 1884 was £49,212 13s. 1d., and the amount expended, £67,485 10s. 4d. The amount of assessment raised by stock-owners in 1885 was £61,754 15s. 4d., and the amount expended was £67,432 1s. 8d., the difference being accounted for by the subsidy granted by the Government to the Boards which raised full rates. Three districts are reported to be in debt to the amount of £414 5s. 4d.

In forty-one districts full rates were levied, in two districts half rates, and in eleven districts various rates, while in four districts no rates whatever were levied.

During the year the bonuses paid by the Boards for scalps ranged as follows:—For kangaroos, from 3d. to 1s. 6d.; wallaby, from 1d. to 1s.; wallaroo, 6d.; paddymellon, from 3d. to 1s.; wombats, from 2s. 6d. to 5s.; hares, from 6d. to 2s. 6d.; eagle hawks, 10s.; native dogs, from 10s. to 60s.; pups, 2s. 6d. to 10s.; and wild pigs, 2s.

**Noxious
Animals.****3. Estimated Number of Noxious Animals.**

The aggregate of the returns by Inspectors of the estimated numbers of noxious animals in their districts, shows that there are supposed to be 2,500,000 kangaroos, 2,300,000 wallabies, and 20,000 native dogs in the Colony.

4. Increase and Decrease.

The decrease of noxious animals during the past year has in twenty districts been reported as considerable; in thirty-five districts it is slight to fair; in four districts they are reported as increasing.

5. Number destroyed.

The number of kangaroos destroyed during the past year was 855,676; of wallabies, 506,372; of wild pigs, 922; of hares, 5,878; of native dogs, 8,474; and of eagle hawks, 55.

6. Steps taken for their Destruction.

In the majority of the districts, hunting with dogs, drives, shooting, and trapping, have been adopted with satisfactory results. In several of the districts poison has been used with fair to best results, and only from two districts has it been reported as unsuccessful.

7. Amendments suggested in the Act.

It is suggested that the Government should administer the Act, that uniform rates be levied, that all assessments be paid to a general fund at the Treasury, that the rates of bonuses be the same throughout the Colony, that all owners make returns of their stock on a particular day, and that all owners should contribute irrespective of the number of stock.

8. Losses from Tame and Native Dogs.

The losses in stock for the past year from the ravages of native dogs are estimated at 63,117 sheep, valued at £25,068, and from tame dogs, 69,745 sheep, valued at £29,658, making the loss from tame and native dogs together, £54,726.

Special Inspections.

The Forbes Board, at the suggestion of its Chairman, had a special inspection made during the year of the runs in the district as regards the prevalence of noxious animals, and where required has called the attention of the owners to the necessity for more effective work. This course might be followed with advantage by other Boards.

(4.) In South Australia.

Mr. BAGOT said there was no doubt that an enormous amount of money had been spent in the destruction of marsupials and rabbits. In South Australia the cost was defrayed by an assessment levied on the landholders and stock-holders in each particular district. The management was in the hands of the ratepayers in those districts. The rates varied considerably, but the maximum rates had been levied by most of the boards and cheerfully paid. The result was that marsupials were becoming extremely scarce. He had seen the large blue skins sold as high as 80s. to 84s. per dozen, as they were very valuable for tanning purposes. Although the system of paying scalp-money had ceased, men were still employed on their own account killing kangaroos for their skins, and making good wages. With regard to rabbits, the Government had cut away the scalp-money system, and the work of extermination was now performed by the land and stock-holders, who were compelled to destroy the vermin. If the inspector went on to any land and found that rabbits existed there he served a notice on the holder to commence the destruction of rabbits within 14 days. If by the end of that period, or on his next visit, he was not satisfied that the landholder was doing his best he placed a Government party on the land. An ordinary party consisted of five men, with dogs, bi-sulphide of carbon, &c., and the cost of this party was charged to the landholder. In the event of non-payment, the cost could be recovered by summary proceeding. The Government were at present considering a Local Government Bill, and the whole question of the extermination of vermin was somewhat undecided in the meantime. It was believed that the present system of dealing with vermin did not work satisfactorily. It would not, however, be amended until the question of local government was settled, as it was anticipated in that scheme to throw all the burdens of local government, including that of rabbit destruction, on to the shires. The central government would then have nothing to do with it. In the meantime, however, they had no reason to be afraid of the marsupial.

Mr. HIGGINS thought that as the skins were so valuable the stock-owners should cease paying an assessment. The persons who were engaged in the destruction of the animals were paid well, not only by the sale of the skins, but by the enforced payments on the part of the pastoral occupants. He begged to move,—“That as the skins of kangaroos and wallabies have become so valuable, this Conference recommends to the Governments of the Australasian Colonies in which the kangaroos and wallabies exist, that they instruct the various boards or others who have the administration of the Acts not to levy any assessment for the coming year, or for such future period as may be deemed desirable.”

Mr. WOOD seconded the motion.

The motion was agreed to.

It being half-past four o'clock, the Conference then adjourned until 10.30 a.m. on the following day.

FRIDAY, 1 OCTOBER.**FIFTH MEETING.**

Present:—Mr. ALEX. BRUCE, Chairman, and the full Conference.

The CHAIRMAN: The business to-day will be a continuation of the discussion of the Intercolonial Regulations under subject No. 2 on the programme—Introduction of Australasian Animals I. by Sea.

PAPERS.

Mr. COOPER laid on the table a copy of the Annual Report of the Superintending Inspector of Sheep and Rabbits in New Zealand; copies of the proceedings of the joint committee of the two Houses on the Rabbit and Sheep Acts, which sat in 1884 and 1886; also copies of Sheep Act 1878; Act to amend Sheep Act of 1878; Rabbit Nuisance Act 1882; Brands and Branding Act 1880; Diseased Cattle

Cattle Act 1884; Act to amend Dog Registration Act of 1880; Annual Sheep Returns for the year ending May, 1885. Intercolonial
Traffic

II.—REGULATIONS *RE* INTRODUCTION OF AUSTRALASIAN ANIMALS BY SEA—*contd.*

Mr. CURR's motions, of which he had given notice on the previous day, and which were now printed, were then considered.

Mr. HIGGINS said that, referring to these motions, he was not aware until that morning that one of the chief causes which had promoted them was the fact that exception was taken by some of the Colonies to our regulations. He would put it to them whether it would not be desirable to go through our regulations before coming to any formal decision on Mr. Curr's motions. By coming to a formal decision on these motions, they might bind themselves to something contrary to the spirit of the regulations, which he was sure no representative present wished to do. Unfortunately, New Zealand was in an awkward position in this matter.

Mr. CURR: If you go through the New South Wales regulations you will have to go through those of all the Colonies. Our desire is to put the least possible inconvenience in the way of the stock-owners.

The CHAIRMAN: There are several matters which will have to be discussed which are not touched upon in these resolutions.

Mr. CURR: They take a general view of the whole business.

Mr. HIGGINS said that the New South Wales regulations were more in detail. They were thoroughly in detail. If, however, they could dovetail the two things—the regulations and the motions—no one would be more pleased than himself. He would like, if it were possible, to see one code adopted for the whole of the Colonies, but that was not practicable just now. He would give an instance of how Mr. Curr's motion and the New South Wales regulations would clash. Mr. Curr, according to his fourth resolution, stipulated that the dressing should be composed of sulphur and lime alone. In New South Wales they used tobacco and sulphur from which they got good results, whereas according to this resolution they would be compelled to adopt a dressing which they were not in the habit of using. He was not saying anything against the efficacy of the lime and sulphur dip, but they were at issue as whether it should be compulsory to use only one dip.

Mr. VALETINE: We can easily meet that difficulty as we are not compelled to use any particular dipping.

Mr. HIGGINS: I am only using this as an illustration. If we pass Mr. Curr's resolutions we will be stultifying ourselves.

Mr. MEREDITH said that if the gentleman who had just spoken would move that the New South Wales regulations be considered as a basis for discussion he would second the motion. He thought that Mr. Curr's resolutions should have every consideration. If they contained any improvement on the New South Wales regulations the improvement should certainly be adopted. If the resolutions were not applicable to the Colony the majority of the Conference would decide accordingly. He repeated that Mr. Curr's resolutions should have full consideration, and if they adopted the New South Wales regulations as a basis, they should at the same time give Mr. Curr's resolutions every consideration they were entitled to.

Mr. CURR: If you come to the conclusion that you cannot accept my resolutions strike them out and let us begin to make detailed regulations. These regulations are only proposed as a general policy.

The CHAIRMAN: The greatest complaint is with respect to a matter which is not touched upon by Mr. Curr's motions, namely, the certificate to be granted by the Chief Inspector of Stock in the neighbouring Colonies. We are pretty well agreed in general, but there are small things which cause friction.

Mr. CURR: I shall go on with these resolutions, first, because they tend to settle our general policy and hardly go into detail, and secondly, because they originate discussion.

The CHAIRMAN: There are some other resolutions on the paper preceding Mr. Curr's.

Mr. CURR: That is very unfair.

Mr. BAGOT submitted, in connection with the Chairman's ruling, that Mr. Curr's were motions of which notice had been given. They were distinct motions, and printed to be considered first thing that morning. He thought that Mr. Curr would be hardly used if any precedence was given to a motion of which notice had not been given.

The CHAIRMAN: This matter of assimilating the regulations was first proposed here, and you will find a statement before you showing the regulations in the different Colonies. A beginning was made by complaints being made by the other Colonies with respect to our regulations. These are the regulations which contain the ground of complaint, and I thought that the only way was to start at the beginning. At my instance Mr. Higgins brought the matter up to-day. But so far as I am concerned, I will not press my view for one moment.

Mr. COOPER: We should not discuss the regulations of any Colony, unless the Minister officially transmits them to us to show where they are faulty. If we begin with the New South Wales regulations, we will have to go all round the Colonies.

Mr. CURR then moved the adoption of the first resolution standing in his name. Mr. GORDON seconded the motion.

The motion was agreed to.

Mr. CURR moved the adoption of the second resolution. He said he did not know that he was called upon to say much about this resolution. There was a certain risk from sheep on board a vessel, unless they were dipped after landing. What he meant by quarantining, was, that the sheep should be taken from a vessel in trucks, or vehicles, and dipped, before they had any communication with any other animals. In Victoria, the owner could have his sheep dipped for the last time within forty-eight hours after landing, and then set at liberty.

Mr. COOPER: Sheep intended for butchers use should not be allowed to go at large in the Colonies after being landed, unless they are dipped.

Mr. LANCE: It would be most vexatious to insist upon fat sheep being dipped.

The CHAIRMAN: We might confine ourselves to stud sheep for the present.

Mr. LANCE: Do you mean to apply this regulation to all sheep.

Mr.

Intercolonial
Traffic.

MR. CURR: If you simply want to put sheep in the yard and slaughter them, I have no objection to such a plan being allowed.

THE CHAIRMAN: I suggest that, in the first place, we consider the regulations as only applying to stud sheep, and afterwards as applying to fat sheep.

MR. VALENTINE: A proviso might be drawn up, making an exception in the case of sheep intended for slaughter.

MR. COOPER moved that the following words be added to the resolution, "Provided that this suggestion shall apply to fat sheep imported solely for purposes of slaughter, on the condition that such sheep are slaughtered within five days of their arrival in the Colony. Mr. BAGOT seconded the motion for the addition, which was accepted by Mr. CURR, and incorporated in his resolution.

MR. TABART: Would it not be better to confine ourselves first to stud sheep, and then deal with fat sheep. We would require special regulations, as we are large importers.

MR. HIGGINS: I intend to move that the word "breeding" be inserted in Mr. CURR's resolution, at the commencement, in place of the word "all," that the dipping may be either with sulphur and lime or tobacco and sulphur, that the quarantine be of greater length, and that there be only one dipping.

MR. LANCE: "Twice" should be struck out and "once" substituted, and all the words after dressing should be struck out. The only possibility of a vessel becoming infected between clean ports, was that mentioned by Mr. CURR, where a sheep might be sent off to a vessel as a present to the captain from a friend, and proving to be infected. Some sheep were taken away from a harbour in New Zealand, and a vessel was infected in that way. The vessel was the City of Brisbane which was trading here from Fiji and Brisbane. It turned out, that while lying in dock, a store sheep from New Zealand was put into the vessel. The disease was detected, and the sheep destroyed at Brisbane.

THE CHAIRMAN: It will expedite business to deal with stud sheep first and fat sheep afterwards.

MR. HIGGINS moved that the word "breeding" be substituted for "all" at the commencement of the resolution.

MR. GORDON seconded the motion, which was agreed to.

MR. CURR said that a decided success had been achieved in Australia with the lime and sulphur dressing. Mr. TABART would say the same.

MR. COOPER: And with us too.

MR. CURR said that the adoption of the lime and sulphur dressing was especially valuable as there was no difficulty in using it, and it did not do more harm than other dressings.

MR. MEREDITH: Not so much.

MR. CURR said there was once an officer sent down to see the Tasmanian sheep which were going across to New South Wales by land from Victoria. He offered no objection to what that officer proposed, and said to him "take the matter into your hands; there is the dip; I shall be here in the morning with the local Inspector to see how things are going." He returned in the morning, took some of the tobacco water, looked at it, and said, "if you will put a little milk and sugar in that I will drink a pint of it." The officer said he had been up since 4 o'clock in the morning, and had been boiling it ever since. He said to the officer, "of course, and now all the essential oil has been evaporated from the mixture and it is useless." He added that the use of that dressing could not count as a dressing. That could not occur with lime and sulphur dressing. All that was required was to weigh the ingredients, and boil them for a certain time. That would turn out to be a cure for anything in the shape of scab in twenty minutes. If the sheep were kept in it the prescribed time, and at the proper temperature one dressing would be a cure. He had used only one dressing, but the Minister, seeing that one had failed in New South Wales, thought that it was not right to expose the stock of this continent to such a danger. He once knew a careful sheep-owner who wished to get rid of scab in his sheep. He went to see him, and asked to see the dip, which he was shown. He found a magnificent dip, worthy of being sent to the exhibition, heated with steam, with circular yards, and everything in first-class order. It was a dip in which 10,000 sheep could be dipped daily. The fences were perfect, and the logs away from the fences. He was somewhat puzzled to account for the presence of the disease, and how it was that the sheep could not be cleaned. The stock-owner then showed him the tobacco which he used, and he said to the stock-owner "That is not tobacco; it was once, but it has been badly cured, and has perished altogether. It would be better to use gum leaves, for they have been effectual." At that time the lime and sulphur treatment was not known. His friend asked him to order him some good tobacco, and he did so, and the sheep were soon cleaned. Of course, the people who held stocks of tobacco knew all about its quality, and they would not say that any they had for sale had perished. Therefore he would say why not have a dressing which had been proved to be perfectly effectual, and with regard to the ingredients of which there would be no temptation to effect any cheapening. The recipe for the lime and sulphur dressing was published in one of the medical journals of Belgium, which Dr. Rowe subscribed to, and he suggested that it might be used for sheep itch. The result of his suggestion they were all acquainted with. Those were his reasons for suggesting, as they desired to assimilate the regulations, that the whole of the Colonies should use this one dip.

MR. MEREDITH endorsed what Mr. CURR had said. It was proposed to substitute lime and sulphur for tobacco and sulphur. Sulphur could not be dissolved without lime. Lime was the solvent and sulphur the curer. The application of tobacco and sulphur was not to be relied on. If they wished to make the sulphur a curative it must be associated with lime and properly dissolved, and then it was an effectual cure, but the sulphur was not a certain cure when associated with tobacco. He had effected cures with tobacco alone with one hand dressing, and he had failed afterwards with tobacco in three cases. In one of these cases the tobacco was strong, but in the others it was spurious stuff and of no use. The use of sulphur with tobacco, without the sulphur being dissolved in lime, was not to be relied on. If sheep were dipped in sulphur and lime he would guarantee one dipping to be effectual; he strongly objected to stud sheep being subjected to two dippings. It was not only suggested that there should be two dippings, but that they should take place in not less than 48 hours. Imagine the effect of two dippings in 48 hours on stud sheep, in heavy wool, having undergone a voyage and possibly been knocked about by bad weather. Quarantine in all cases was absolutely necessary, and for that reason alone it should be optional with any person importing valuable stock to say whether he would allow them to be dipped on arrival, or, if he apprehended serious consequences to defer it until such time as he thought fit. When the sheep had been dipped they should be no longer subjected to any quarantine.

Mr.

Mr. HIGGINS: I go with you in that.

Mr. MEREDITH said it was absolutely necessary to have quarantine. There were instances of stud sheep being brought into the Colonies for sale. It would be most destructive, as far as prices were concerned, to have these sheep dipped before they were offered for sale. Hence they required a quarantine ground, where these sheep might be kept until they had been sold; but after the dipping quarantine should cease.

Mr. CURR: I suggest that we deal with the resolution as far as tobacco and sulphur is concerned.

Mr. HIGGINS: We had an outbreak of scab, which was cured with tobacco and sulphur, long before the Victorian sheep were cured. I say take your choice. We are satisfied with your dipping with lime and sulphur. We do not doubt its efficacy.

Mr. CURR: We cured four and three quarter millions of sheep with tobacco and sulphur, but after many failures; with lime and sulphur there were none, and the cost was enormously less.

Mr. HIGGINS said they had found tobacco and sulphur so efficacious that they intended to adhere to it. He agreed with what Mr. Meredith had said as to the treatment of sheep. It had grieved him to see those poor creatures treated as the law compelled them to be treated. But for the surrounding circumstances he would be willing to allow them to be brought in without dipping, or with only a slight quarantine. The object in making the quarantine twelve days was this:—The best authorities on scab had laid it down, that from the time of first contact or attack by the insect until it again appeared on the surface of the skin was about sixteen days. That being so, they calculated that sheep would take four days to arrive here from Tasmania, and the twelve days quarantine would make sixteen days, the time allowed for the appearance of the insect. The period of quarantine had been shortened from twenty-one days. With regard to the use of lime in dressings, he desired to point out that if it were exposed to a storm it would be destroyed, and would not be efficacious then.

Mr. MEREDITH: Do you know that, in order to dissolve the sulphur, you must have unslaked lime?

Mr. HIGGINS: There are some inspectors who are mere machines, and they would simply mix the ingredients without noticing their condition.

Mr. MEREDITH: In Tasmania we have all practical men, who know how to mix the dressings, and are able to see that it is done properly before being used.

The CHAIRMAN: As far as the dippings are concerned they would require to be under proper supervision. We would see that the tobacco and the lime were in good condition. Mistakes might happen as easily with one as with another.

Mr. LANCE moved,—That 'twice' be struck out, and 'once' inserted in its place, in the resolution." Mr. VALENTINE seconded the motion, which was carried by 15 votes to 3, the Victorian representative dissenting.

Mr. HIGGINS moved,—“That the dressings be optional, either of tobacco and sulphur or lime and sulphur.” The motion was carried by fifteen votes to three, the Victorian representative dissenting.

Mr. HIGGINS moved,—“That all the words after 'dressings' be struck out.” The motion was agreed to.

Period of Quarantine.

Mr. HIGGINS moved,—“That the period of detention in quarantine be not less than ten days.” Mr. STANLEY seconded the motion.

The CHAIRMAN: If we dispense with the second dressing we should stipulate that the sheep should be under our care for a certain time; and they should be examined daily, in case there might be anything wrong. I do not think we would inflict much, if any, hardship on the Tasmanian and South Australian owners by fixing the quarantine at the time proposed, as it would take nearly the whole of that time for the buyers to examine the sheep before the sales.

Mr. CURR said that heretofore they had kept apparently clean sheep in quarantine. They were put into quarantine for ten days, and if they were not found to be scabby, they were dipped and allowed to go at large. If the sheep were not scabby they did not require dipping. He thought that, instead of keeping sheep in quarantine and dipping them, as was suggested, at the end, the dipping might as well take place on the first day.

Mr. LANCE: The stud rams which come to New Zealand from Tasmania are not dipped until they are sold. If they were dipped beforehand their value would be seriously lessened.

Mr. CURR did not object to sheep being kept until after a sale without being dipped. In the plan which he suggested there was no detention whatever, except that which was asked for by the owner himself. He had no desire to see Tasmanian sheep kept for an unnecessary time in quarantine. If sheep ran any risk at all it was utterly impossible to say as a matter of certainty that they were free from scab. It must be discovered by examining the wool, which was impossible when the sheep had been on board a vessel, and perhaps trodden on, and the wool pulled out. In such cases the disease would not be discovered unless the scab insects were very thick and very noticeable.

Mr. HIGGINS said that the whole object of quarantine was to prevent infection being brought into the flocks of this Colony. He had explained why they had twelve days' quarantine—because the authorities had laid down that the insects did not appear on the wool until sixteen days had elapsed, and the time of the voyage from Tasmania, and the twelve days' quarantine, made up that period. During the twelve days that the sheep were here in quarantine, probably seven or eight days were consumed by buyers looking at the sheep. If we insisted upon the sheep being dipped as soon as they arrived here, what benefit would that be to Tasmania?

Mr. MEREDITH: We propose that the time when the dipping takes place should be optional with the owners. This is a matter of compromise, and it has been put forward by Mr. Higgins and Mr. Curr in that spirit. The position we are in is this:—There are six Colonies represented here, and of these three are in favour of no quarantine whatever. There are two Colonies in favour of twelve days, and I do not know what is the feeling of the Queensland representatives with regard to the period during which sheep should be maintained.

Mr. GORDON: We will accept ten days as the period.

Mr. MEREDITH: There are two Colonies in favour of twelve days, one of ten days, and three of none at all. Suppose we halve it and take six days.

Mr.

Intercolonial
Traffic.

Mr. CURR: Do you want your sheep detained six days for that is what you propose.

Mr. MEREDITH: I say they should not be kept six days.

Mr. CURR: I do not want to keep them a minute.

Mr. TABART moved as an amendment on Mr. Higgins' motion,—“That there be no quarantine beyond the time required for inspection and dipping.”

Mr. VALENTINE seconded the amendment.

The amendment was carried by twelve votes to six, the New South Wales and Queensland representatives voting against it.

Mr. COOPER moved as an addition to Mr. Curr's second resolution,—“Provided that this suggestion shall not apply to fat sheep imported solely for purposes of slaughter, on the condition that such sheep are slaughtered within five days of their arrival in this Colony.”

Mr. LANCE seconded the amendment, which was however withdrawn temporarily, until the discussion with respect to Australasian Breeding Sheep was concluded.

What is to be deemed a clean Colony.

Regulation No. 2 appearing in the *Government Gazette* of New South Wales, 1 July, 1886, was considered. It is as follows:—

“No Colony shall be deemed to be a clean Colony in which scab or catarrh or any other infectious or contagious disease exists or is suspected to exist, nor any Colony in which scab shall have existed within the next preceding two years; and no sheep shall be imported except from a clean Australian Colony.”

Mr. HIGGINS moved,—“That no Colony shall be deemed to be a clean Colony in which scab exists or has existed within the next preceding twelve months.” He said they had already decided that sheep should only be admitted from clean Colonies. If the sheep of a Colony were affected with catarrh, the Colony could not be said to be clean. Therefore the importation of sheep from New South Wales to South Australia would have to cease. Directly such a disease as catarrh appeared in a Colony it was no longer clean. Mr. STANLEY seconded the motion.

Mr. TABART: There is a telegram in this morning's paper stating that sheep are dying of anthrax at Dubbo.

Mr. MEREDITH thought that the period stated in the motion should be fixed at two years. In New Zealand there were many mountainous places to which sheep had excess. If it were fixed at a shorter period it might be the means of doing an immense amount of injury. For two or three years, owing to the applications of interested persons, a portion of New Zealand, which was affected with scab, was not put under the directions or control of the inspectors. He presumed that these difficulties still existed; and, with all the efforts made, it might still be possible for a few sheep to remain out for six or eight months after the country had been pronounced to be clean. He moved, as an amendment,—“That twelve months be struck out and two years inserted.”

Mr. TABART seconded the amendment. He said that it was not likely that sheep would be imported into New South Wales from New Zealand; but Tasmania would be receivers of New Zealand sheep; and if infected sheep were introduced, the interests of the Tasmanian stock-owners would be destroyed.

Mr. LANCE: At the earliest, there will be an interval of eighteen months from the end of the last license.

The amendment was put, and negatived by 15 votes to 3. The following was the voting:—For,—Tasmania, 3. Against,—Queensland, 3; South Australia, 3; New Zealand, 3; New South Wales, 3; and Victoria, 3. The motion was then put and carried.

What is to be deemed a clean vessel.

Regulation No. 3 of the same Gazette. It is as follows:—

“No stud sheep shall be imported, except by vessels that have not traded to any but a clean Australian Colony within the next preceding twelve months, nor by any vessel which shall have within the period hereinbefore mentioned have had any sheep on board from any Colony other than a clean Australian Colony.”

Mr. HIGGINS moved,—“That no breeding sheep shall be imported, except by vessels that have not traded to any but a clean Australasian Colony within the next preceding six months, nor by any vessel which shall within the period hereinbefore mentioned have had any sheep on board from any Colony other than a clean Australasian Colony.” Mr. STANLEY seconded the resolution.

Mr. CURR moved as an amendment,—“That the period be reduced to one month.” Mr. LANCE seconded the amendment.

Mr. HIGGINS said that a scab insect might live on board any vessel notwithstanding the fact of being washed and disinfected. In that way sheep coming to a clean colony might be infected and bring the infection with it. Therefore they should be very guarded and very careful not to make any mistake.

Mr. MEREDITH said he had found in a very able prize essay, written by Mr. Curr in 1870, the author stated that under the most favourable circumstances the insect would live for forty days, that is on moist wool and with warm weather. Now Mr. Curr said that it would die almost immediately after the animal died on which it had been living.

Mr. BAGOT: What I understood Mr. Curr to say was that it would not live on the dry skin beyond a certain short period.

Mr. CURR said that certain experiments were tried in Victoria with the scab acari. He wrote an essay on the subject, and some old Victorian stock-owners in Mexico and Monte Video asked him to republish it for the benefit of the Spanish people, so that experienced people thought that it was a fairly good essay. It had been ascertained, as set out in that essay, that if the insect were placed in a corked bottle amongst greasy wool it would live for several days. If, however, it were placed on cold skins his opinion was that it would only live for a few hours. It was the opinion of many people that one night's frost would completely cleanse ground from scab. With regard to the possibility of scab being caught

in a vessel after the lapse of a month, it was not worth troubling stock-owners about, when they remembered that the sheep would be dipped as soon as they landed. What vessel would wait for six months for a consignment of sheep. Intercolonial traffic.

The CHAIRMAN: Sheep are put on board ships and steamers which go all over the world, and the pens are not so clean as to be any guarantee against infection.

Mr. TABART: How do the people of New Zealand remove their sheep from one coast port to another? Are they removed from one port to another in an infected district?

Mr. LANCE: Never. The only ships I know trading on the coast go from Gisborne to Auckland. Auckland is supplied from both coasts. The sheep are put on board from a punt, and the Inspector sees them and lands them.

The amendment was then put, and the voting on it being 9 to 9, the Chairman gave his casting vote against it.

The following was the voting:—Against,—New South Wales, 3; Queensland, 3; Tasmania, 3. For,—Victoria, 3; South Australia, 3; New Zealand, 3.

Vessel to carry sheep must be cleansed and disinfected.

Mr. HIGGINS moved,—“Every vessel, on which it is intended to carry any such stud sheep, be thoroughly cleansed and disinfected before the sheep have been dipped.” Mr. STANLEY seconded the motion.

The motion was withdrawn.

Clean certificate.

Mr. VALENTINE moved,—“That all such breeding sheep shall be accompanied by a certificate of an Inspector of Sheep or a declaration of health by the owner, certified by an Inspector of the Colony, that such sheep are clean and scab has not existed for the preceding twelve months in the Colony from which they come.”

The motion was agreed to.

Temperature of Dip.

Mr. HIGGINS moved,—“That the temperature shall not be less than 100 nor more than 110 degrees.” Mr. STANLEY seconded the motion.

Mr. GORDON thought the temperature should be 110 degrees. He had known insects survive when the temperature was 80 degrees. He had frequently dipped sheep in 120 degrees Fah.

Mr. CURR moved, as an amendment,—“That the temperature be not less than 105 nor more than 110 degrees.” Mr. LANCE seconded the amendment.

The amendment was negatived and the motion was agreed to.

Bath and Duration.

Mr. HIGGINS moved,—“That the sheep shall swim and be completely immersed while in the bath, and the bath shall last from one to two minutes according to its temperature, and as the case may require.” Mr. GORDON seconded the motion.

The motion was agreed to.

Stud sheep from inland or overland from other colonies to be treated as “imported” if near imported sheep.

Mr. HIGGINS moved,—“That stud and show sheep brought from inland, or introduced overland from any adjoining clean colony, which shall be near or in contact with any imported sheep shall, prior to their leaving the coast district, be dipped the same as if they were Australian imported sheep.” Mr. STANLEY seconded the motion.

Mr. CURR: Sheep are dipped as soon as they come into the colony. There is no more danger of infection from a sheep on the coast than from one in the interior.

The CHAIRMAN: A person examines sheep which come by sea and then stands over the sheep from inland. The result might be to spread infection to clean sheep. If it is necessary to dip the sea-borne sheep so it is to dip those from inland.

Mr. LANCE moved as an amendment,—“That the resolution be struck out.” Mr. CURR seconded the amendment.

Mr. MEREDITH: All this dipping is perfectly unnecessary. If it is necessary to dip sheep because they are infected, how does it happen that people were allowed to examine infected sheep and then go away to examine others.

The amendment was then put and carried by 12 votes to 6.

The following was the voting on the amendment:—For—Victoria, 3; Queensland, 3; South Australia, 3; New Zealand, 3. Against—New South Wales, 3; Tasmania, 3.

No fodder to be landed and no cages without disinfection.

Mr. HIGGINS moved,—“That no straw, litter, or excreta with or about imported sheep shall be landed, and all fittings, cases, or cages brought with such sheep and landed shall before being landed be cleansed and disinfected as the chief inspector shall direct, or be re-shipped.” Mr. STANLEY seconded the motion.

Mr. TABART said with reference to the cages and crates that it was not possible that they could be infected when the sheep enclosed in them were clean. No objection was taken to the attendants landing, and yet the crates for the sheep were tabooed. This caused a loss to the sheepowners and inconvenienced them to a great extent; vessels were detained at the wharf for two and a half days, and the stud sheep were dragged out of the cages one by one to be inspected, and the result was that their appearance was destroyed.

Mr. TABART suggested that the words “before being landed” in the latter portion of the motion be taken out.

The suggestion was accepted.

Fat imported
sheep, &c.

Mr. MEREDITH said that large numbers of breeders had drawn his attention particularly to this point, that they had to send fodder on before their stud sheep in anticipation of their coming, as they were not allowed to land any fodder they had on board.

The motion was then put and agreed to.

NEXT SESSION.

The question was considered as to whether the Conference should sit on Monday (October 4th), Eight Hours Anniversary Day.

Mr. CURR moved,—“That the Conference sit on Monday.” Mr. BAGOT seconded the motion.

The motion was agreed to.

FAT SHEEP EXEMPT FROM DIPPING.

Mr. COOPER moved,—“That it be not necessary to dip fat sheep imported from any clean Australasian colony to another Australasian colony solely for the purpose of slaughter, provided that such sheep are slaughtered within five days of arrival.”

Mr. HIGGINS suggested the following amendment:—“That the words ‘are slaughtered within five days of arrival’ be struck out, and the words ‘be slaughtered in accordance with the regulations of any such Colony for the slaughtering of such sheep.’” The alteration was accepted.

The motion, as amended, reads,—“That it be not necessary to dip fat sheep imported from any clean Australasian Colony to another Australasian Colony solely for the purpose of slaughter; provided that such sheep be slaughtered in accordance with the regulations of any such Colony for the slaughtering of such sheep.”

The motion was put and carried.

III.—REGULATIONS *RE* AUSTRALASIAN STOCK ADMITTED OVERLAND.

Mr. CURR moved,—“That stock (unless it come from Western Australia) which is allowed by law to travel in the Australasian Colony in which it has been bred, or into which it has been introduced in accordance with the law there in force, shall be allowed to enter any neighbouring Colony by land at any lawful place of entrance without further obstacle, unless it shall be found on examination by an Inspector of the Colony into which it is proposed to introduce such stock to be suffering from some disease which is treated as infectious by the law of such Colony, or unless such Inspector has reason for suspecting the presence of contagious disease in such stock; and the fact that any stock is held to be free from disease in any Colony and so allowed to go at large, shall be *prima facie* evidence of its freedom from contagious disease.

The CHAIRMAN read Regulation 1,—Sheep introduced overland, under the “Diseases in Sheep Act of 1886” and “Diseases in Sheep Acts Amendment Act of 1878 and 1882,”—“The owner of sheep other than imported sheep which it is proposed to bring overland into this colony shall give the Inspector for the crossing-place at which they are intended to be introduced not less than forty-eight nor more than ninety-six hours’ notice in writing, stating the day and hour when it is intended to cross such sheep, to the effect of Form A hereto, and shall produce to such Inspector a certificate from the Inspector for the district in which the sheep were depasturing at the time they commenced to travel to the crossing-place, that such sheep are not infected with any infectious or contagious disease, and that they have not within the next preceding six months been in direct or indirect contact with sheep so infected.” He also read the following regulation under the “Imported Stock Act of 1871” and the “Imported Stock Act Amendment Act of 1884,” to stand in lieu of Regulation 2 of 1st July, 1886, cancelled.

How Imported Australian Sheep are to be admitted overland from other Colonies.

Sheep imported from any clean Australian Colony into any other clean colony, and intended to be introduced overland into this Colony, may be admitted if their owner produce the certificates prescribed by Regulations 5, 6, and 10, of 1st July last (1886), under the above-named Acts for such sheep, and if they are found on examination by the Inspector for this colony at the border to be not infected; or such sheep may be admitted at the border on inspection as aforesaid if their owner produce to such Inspector a certificate under the hand of the Chief Inspector for the colony from which they are intended to be introduced that when such sheep were introduced into that colony they were accompanied by a certificate as prescribed by number 5 of the above-mentioned Regulations, and that such sheep have been twice dipped with proper preparations of tobacco and sulphur, or of sulphur and lime, in a bath given at the temperature and of the duration and in the manner prescribed by number 8 of the above-mentioned Regulations. But all such sheep, unless they shall have been imported, inspected, quarantined, and dressed as prescribed in this and the above-mentioned Regulations, shall, on crossing the border, be placed in quarantine, and kept and dipped in the same manner in every respect as prescribed with regard to Australian imported sheep landed at Sydney.

The CHAIRMAN said that the certificate was unnecessary except as regards sheep.

Mr. CURR: I object to certificates; they are unnecessary and perfectly useless.

Mr. CURR’s motion was then put and carried.

Mr. CURR moved,—“That it is desirable that all drafts of laws or regulations dealing with the diseases of animals, &c., should be as far as practicable submitted by the Government which institutes them to the other Governments of the Australasian colonies before they become law.” Mr. LANCE seconded the motion, which was carried unanimously.

It being half-past 4 o’clock the Conference then adjourned until half-past 10 o’clock on Monday morning, 4th October.

MONDAY,

MONDAY, 4 OCTOBER.

SIXTH MEETING.

Present :—Mr. Alexander Bruce, Chairman, and the full Conference.

New Member.

The CHAIRMAN stated that another breeder, Mr. M'Kenzie, M.H.R., had arrived from New Zealand, with a letter from the Colonial Secretary there, asking our Premier to allow Mr. M'Kenzie to take part in the proceedings, in addition to the delegates already present from that colony. He read the letter, which is as follows :—

New Zealand, Colonial Secretary's Office,
Wellington, 16 September, 1886.

Sir,

In continuation of the correspondence which has taken place upon the subject of the approaching Conference on matters relating to stock, I have the honor to inform you that as there are in this colony two classes of persons interested in stock—the large runholders and the agricultural farmers—the Government have come to the conclusion that both should be represented at the Conference, and as Messrs. Peter and Lance represent the former class, Mr. John M'Kenzie, a Member of the House of Representatives, has been asked, and has consented, to attend the Conference as representing the agricultural interest. May I venture to ask that Mr. M'Kenzie may be allowed to take part in the Conference along with the gentlemen originally selected to represent New Zealand.

I have, &c.,
P. A. BUCKLEY.

The Honorable the Premier, Sydney.

Mr. PETER: I represent all classes.

Mr. LANCE: We might let Mr. M'Kenzie take part in the proceedings without voting. If you consent to that it will satisfy us, and it will really make very little difference. I beg to move,—“That Mr. M'Kenzie be allowed to take part in the discussions, but not to vote.”

Mr. PETER: I think that will be satisfactory.

Mr. HIGGINS thought that as Mr. M'Kenzie had come so far, and the New Zealand Government was anxious to have an extra representative on the Conference, they might allow Mr. M'Kenzie to take his seat. Mr. Peter had properly corrected one remark appearing in the letter which had just been read, and had said that he was present as a representative of New Zealand, not of any particular class. They might all say the same—that they represented the whole of the Colonies; but as Mr. M'Kenzie had come so far it would be only a proper and courteous act to admit him. The Conference had decided that each Colony should have not more than three votes. If that resolution was rescinded the Conference could agree to give each Colony four votes; but as the New Zealand representatives seemed satisfied that Mr. M'Kenzie should be present and not take part in the discussion, he did not think it would be necessary to rescind the resolution. It would of course be only courteous to New Zealand to allow Mr. M'Kenzie to take part in the discussion, but if that gentleman did take part in the discussion he ought to be allowed to vote.

Mr. WOOD: My colleague and myself agree that there can be no harm in Mr. M'Kenzie taking part in the discussion, but we do not think that he should vote. We decidedly object to his doing so.

Mr. MEREDITH: I agree with the remarks which have fallen from Mr. Woods. I think it would be very awkward if any other person were entitled to vote at the Conference. It would clash with the votes already given.

Mr. BAGOT: It would be very irregular to admit any fresh votes.

Mr. HIGGINS seconded Mr. Lance's motion.

The motion was agreed to.

Mr. LANCE then introduced Mr. M'Kenzie.

The CHAIRMAN informed him of the result arrived at by the Conference, namely, that he be allowed to take part in the discussions, but not to vote.

Mr. M'KENZIE thanked the Conference for the consideration shown him. He was sure that the arrangement come to by the Conference would be satisfactory.

The CHAIRMAN said he wished to mention that the Minister thought they were doing altogether wrong to work on a holiday, and that they should take advantage of the day to enjoy themselves. Unless they were very anxious to proceed he would move that the Conference adjourn until the following day. They might then to-day visit the sheep quarantine at Randwick.

Mr. BAGOT said that the South Australian Parliament was now in session. He represented an exacting constituency, interested in the Consolidating Land Bill—consolidating thirteen Land Acts. The Estimates were under discussion, and many of the items affected his constituents. On that account he was anxious to get back as soon as possible, and he deplored anything that would delay their deliberations for an hour. It had been considered desirable that the Colony of South Australia should be represented by a Member of Parliament notwithstanding that Parliament was in session. The object of the Commissioner of Crown Lands in making that arrangement, and urging him to come here, in spite of his protest that his constituents might be neglected, was that when any subsequent legislation the outcome of this Conference came before the House there would be some one besides himself who would be familiar with the details, and in all probability know a great deal more about them than the Commissioner. He would point out that on Friday they carried a resolution unanimously, with no dissentient, in favour of deliberating that day (Monday), and, unless there was some special reason to alter their decision, he for one must say that he preferred to go on with their work.

Mr. LANCE: I am strongly of opinion that we ought to go on with the work. We are not artisans, and do not represent artisans, so the best thing we can do is to get on with the work.

Mr. BAGOT moved,—“That the sittings be continued.”

The motion was agreed to.

ADMISSION OF FOREIGN CATTLE.

Mr. MEREDITH's paper on the admission of foreign cattle was laid on the table printed. It will be found under the same head at page 92.

III.—

III.—REGULATIONS *RE* AUSTRALASIAN STOCK OVERLAND—*continued.*

Intercolonial
trade.
Inspection
fees.

Mr. HIGGINS moved the following regulation, No. 12, relating to the conduct of the intercolonial stock trade, appearing on page 7 of Report of Stock Conference of 1874:—"That where an outbreak of disease occurs in any Colony the neighbouring Colonies may, pending the extent and risk of the outbreak being definitely ascertained, at once issue a prohibition against the introduction of stock from such Colony, and the duration of such prohibition shall depend upon the amount of risk arising from such outbreak." He thought that some such resolution should be passed if they intended to have an intercolonial stock trade.

Mr. BAGOT: He thought they had this power. It is contained in the Importation of Diseased Cattle Act of 1861, "To enable the Governor to prevent the importation of cattle into South Australia under certain circumstances and for other purposes." The preamble says:—"Whereas certain fatal and contagious diseases sometimes prevail amongst cattle, and it is desirable to prevent the spread of such diseases amongst the cattle in the Province of South Australia, and for that purpose to prevent the importation of cattle into the said province from any place where any such contagious or fatal diseases prevail, and to make the provisions hereinafter contained."

Mr. HIGGINS: We have that power now.

The CHAIRMAN: If Mr. Curr's motion relating to the introduction of stock from one colony to another were taken by itself it would be going too far. A colony which is clean should have the power when an outbreak takes place in another colony to stop the introduction of stock until the extent of the outbreak had been ascertained.

The CHAIRMAN here laid on the table, at the request of Mr. Curr, a copy of the Report of the Secretary of Agriculture, Victoria, 1884, containing a report by Mr. Curr, on the dangers attending the importation of foreign stock.

It was resolved that it be printed. It will be found at page 87.

Mr. HIGGINS' motion was seconded by Mr. CURR, and agreed to.

INSPECTION FEES ON STOCK.

Mr. HIGGINS moved,—“That it is undesirable that any inspection fee be charged by one colony on the stock introduced from another colony, inasmuch as such a charge would tend to prevent the initiation of uniform legislation and combined action by the different colonies for the eradication of disease.”

Mr. GORDON seconded the motion.

Mr. CURR said he was not present to discuss any such proposal, nor did his Minister anticipate that anything of the sort would be dealt with by the Conference. He did not think if it were passed that it would have the least effect as far as his colony was concerned. It was a matter for Parliament to decide, and the Conference would do no good to meddle with it.

Mr. VALENTINE said he must endorse what Mr. Curr said. In South Australia a stock fee was charged under the Customs Act, and he did not think he had been sent here to say what the Government should do in regard to fiscal matters. He would not think it right to vote on such a question. The stock fee in his colony was charged by a large majority in the last session.

Mr. COOPER: We have no fee in our colony except a small fee to cover the absolute cost of inspection. That, however, was not imposed in the shape of duty.

Mr. HIGGINS: This is not a duty fee; it is only an inspection fee.

Mr. TABART: We have an inspection fee of one halfpenny a head on sheep.

Mr. BAGOT said that by a very large majority protective duties had been imposed in South Australia during the present parliamentary session. He was sorry to say that unfortunately protective duties were the order of the day in South Australia. A fee of 2s. 6d. had been imposed on cattle, and 1d. a head on sheep imported into South Australia, not as the result of a desire to establish an inspection fee, but a protective duty. It was opposed by himself and other squatters, but they stood almost alone. He believed that any resolution on the subject, even if carried by the Conference unanimously, would not have any weight.

Mr. HIGGINS said there was a slight misunderstanding with regard to this motion. It did not in any way touch the question of a stock tax; it was simply an inspection fee charged on stock entering the Colony where such a fee was in existence, but it had nothing to do with any fiscal matter. It was a great hardship to some colonies that it should be imposed; New South Wales felt it keenly.

Mr. BAGOT: Where is it imposed?

Mr. HIGGINS: In Victoria. It has nothing to do with regard to the Customs duty, but simply a matter that came within the Stock Department and is dealt with entirely by that Department in Victoria and the other colonies where it is so charged.

Mr. CURR said that this was a vote of Parliament. In Victoria they had a fee on stock which was probably about one-tenth of what was now charged as the Customs duty; that fee on stock was collected by the inspector, and had been done away with. Sir Graham (then Mr.) Berry introduced the stock tax on stock coming into Victoria from the various colonies. There were no fees; if anyone called the tax a fee, he miscalled it. Almost every officer he had on the border was a Customs officer, and they might perhaps have called the tax a fee, but improperly so.

Mr. TABART said there was a fee of $\frac{1}{2}$ d. a head on all imported sheep entering Tasmania. The Government had, however, to provide an inspector at each of the three ports of entry, and to provide an inspector to visit each ship to see that they carried the necessary certificates and were perfectly clean. The fee was charged to cover the costs in connection with these inspections.

Mr. HIGGINS said he had been under the impression that this fee existed in every colony. He now found that it was only charged in two colonies, Tasmania and New Zealand. Supposing that it were not charged in the other four colonies, he thought it was highly desirable that they recommended Tasmania and New Zealand not to insist upon the charge of this fee. It was simply a departmental matter which could be dealt with by the Government, and therefore he thought it was a very proper thing to bring forward and ask the Conference for an expression of opinion upon.

Mr. STANLEY: Our horses going from Sydney to New Zealand require a veterinary certificate. Is that certificate charged in New Zealand as well as here?

Mr. COOPER: No. Only when the Veterinary Surgeon is called upon to visit any horses does he charge a fee.

Mr.

Mr. STANLEY: Then if an exporter to New Zealand from this colony gets a certificate here he need not get one in New Zealand.

Mr. COOPER: No.

Mr. STANLEY: And he gets it gratuitously from us and makes us do the work you would charge him for.

Mr. COOPER: The Veterinary Surgeon's fee in New Zealand is not charged unless he is called in by the Inspector, which hardly ever occurs.

Mr. MEREDITH: The question we have to consider is this: The members of the Conference representing Tasmania are in a difficulty, as they cannot take upon themselves the responsibility of touching anything affecting the finances of the colony. None of the representatives from Tasmania were Members of Parliament, and they have no authority to pledge their Government to any particular line of action which might affect the revenue of the colony. It is a matter I do not think it is competent for me to vote upon.

Mr. HIGGINS: In speaking on the question of removing this fee, what are we doing? We are dealing with the Acts of Parliament through the whole course of our conference.

Mr. MEREDITH: We are not dealing with financial questions. It has been urged at this conference and the previous one that there is more risk of introducing disease in stock by sea than in stock travelling overland. Hence it is that we disregard the certificate of New South Wales and Victoria. It is all sufficient if there is no fear of any intermediate infection.

Mr. HIGGINS: My motion is simply as to whether an inspection fee should be charged.

Mr. MEREDITH considered that it was a distinction without a difference, as the mere dipping and providing a regulation was of no use unless they had an inspector to see the whole thing carried out. With regard to the fee in Tasmania it was only charged on the imported sheep at those particular places provided for the convenience of stock-owners in the other colonies. Only for that the inspection—and consequently the fee—would not be required. It was provided simply to facilitate trade, and to see that trade was carried on in accordance with the regulations. The $\frac{1}{4}$ d. per head was levied on the sheep, subject to an inspection and dipping, towards defraying the cost. As a matter of fact it did not defray the cost. There was another aspect of the case to be considered. If, for instance, Tasmania had any scabby sheep, and South Australia were free from it, she would be very cautious about allowing our sheep to come in.

The CHAIRMAN: In New Zealand the certificates bear a stamp which must mean that an inspection fee is charged on stock going out as well as coming in.

Mr. COOPER: There is no fee in New Zealand on stock going out.

The motion was then put and negatived by 12 votes to 6.

The following was the voting: Against—Victoria, 3; South Australia, 3; Tasmania, 3; New Zealand, 3. For—New South Wales, 3; Queensland, 3.

STOCK DUTY.

Mr. MEREDITH moved—"That it is undesirable that any duty be charged on stock introduced from any Australasian colony."

Mr. LANCE seconded the motion.

Mr. BAGOT: The question of free trade and protection is too big for us to enter upon here. If it is brought forward we shall not discuss it.

Mr. HIGGINS: Where any disability exists in the proper intercourse for stock between the colonies we should suggest all we possibly can to the different colonies for the removal of these disabilities.

Mr. CURR: The letter of the Minister calling us together says we are to meet with the view of "assimilating the regulations for the prevention of disease." Therefore we are not here to review the question of fees or taxes.

Mr. VALENTINE: I shall decline to vote on the motion.

Mr. COOPER, Mr. BAGOT, and Mr. CURR expressed themselves to the same effect.

Mr. LANCE: I am not quite sure that we are doing right in suggesting to our Governments what we should do in respect to fiscal matters, but we have already done so much in this direction that I do not think we shall be doing harm if we deal with the present motion.

The motion was withdrawn in favour of the following:—

Mr. HIGGINS moved,—“That this Conference desires to express its strong opinion in view of the prospect of the assimilation of the stock regulations of the different colonies, and the great desirability for the freest interchange of stock that it is undesirable that any duty be charged upon stock going from one colony to another.” He said that the Conference had met with the object of assimilating, as far as possible, all the different regulations for the interchange of stock that existed throughout the Australasian Colonies. If their suggestions were accepted and embodied in regulations, then it was, undoubtedly, a most important question what those regulations should be. If it was intended that there should be the freest interchange of stock between the colonies, then it would be an anomaly in the highest degree that any one colony or other should labour under any disability in respect to that interchange. If it were not intended that the colonies should have that free interchange then keep it on. As regarded the fiscal question, they were not dealing with it, but were simply placing before the different Governments the result of their deliberations and the desirability of adopting them. He took it that as far as New South Wales was concerned it was a very great disability that the stockholders laboured under at present. He felt that if he did not assist in bringing this forward he would not be doing his duty as a representative of New South Wales, and he desired it to go forth that he, as one of their representatives, had endeavoured to assist Mr. Meredith in bringing forward this resolution. Even the Victorian people themselves saw the desirability of it. If the different Governments did not see where the difficulty was there was an end to the matter.

Mr. MEREDITH said he would be sorry to act against the opinion of the majority of the Conference, but it was desirable that they did not exceed their functions.

The motion was carried by 6 votes to nil. The following was the voting:—For—New South Wales, Mr. Higgins; Queensland, 3; New Zealand, Mr. Peter and Mr. Lance. The following members abstained from voting:—New Zealand, Mr. Cooper; South Australia, 3; Victoria, 3; Tasmania, 3; New South Wales, Mr. Bruce and Mr. Stanley.

DISPOSAL

DISPOSAL OF WOOL FROM SHEEP LIABLE TO INSPECTION.

Noxious
plants.

Mr. TABART asked if sheep sent from one colony to another were shorn, how would the wool be disposed of? In Tasmania, whenever sheep were shorn after being returned to the colony from another the wool was not allowed to be sent inland without being dipped.

Mr. LANCE said that in New Zealand the sheep were brought into a large store in Christchurch, and were there examined and sold. Then the sheep were shorn, and the sheep itself went to be dipped. The wool went straight off to England, and a great deal was sent to the intercolonial exhibitions.

Mr. TABART: The wool is not dipped in any way?

Mr. LANCE: No; not in any way.

Mr. CURR: The same thing happens in Victoria.

Mr. VALENTINE: Until this year I have always had the wool dipped.

Mr. CURR: Perhaps when the sheep are shorn the wool is sold by the wool-brokers not 500 yards away.

Mr. VALENTINE: Not necessarily. The wool may be sent inland.

The CHAIRMAN: The rule in New South Wales is to treat the wool as if from infected sheep, and see that it is securely packed in bags or bales. See Diseases in Sheep Act 1866, section 65.

VII.—DESTRUCTION OF NOXIOUS PLANTS AND WEEDS.

I. PLANTS AND WEEDS INJURIOUS TO PASTURES AND CROPS.

Mr. HIGGINS moved that this Conference is of opinion that the Governments of the several colonies should, where they have not already done so, take power to make the destruction of noxious plants, such as prickly-pear, Californian thistle, Bathurst burr, Noogoora burr, and other plants injurious to wool, stock, or pastures compulsory. He said that the existence of Bathurst burr in the wool caused a great loss. It was not compulsory in this Colony to destroy Bathurst burr.

Mr. BAGOT: We have an Act to deal with it.

Mr. HIGGINS said that one station might become infested from another, or the burr might be brought from a station higher up a stream. Again, with regard to reserves. We had not the power to clear them of the burr because there was no money to do the work. He should like to see the destruction of burr made compulsory, not only on the pastoralists, but on the Government. With regard to travelling stock reserves, until it was compulsory on both, the colony would never be clear of burr. He was not speaking of clover burr, as the clover was one of the best fattening herbs in the Colony. Therefore they need not legislate on that. There was another burr, the Noogoora burr, which was not very well known.

Mr. GORDON here exhibited a specimen of the burr.

Mr. HIGGINS said there was an Act here for the destruction of prickly-pear which had been recently passed into law. In some parts of the colony (in the valley of the Hunter especially) it had shown itself to a very serious extent, and would cost in some instances £10 an acre to clear. To prevent our lands being destroyed our Legislature had passed a law for the destruction of the prickly-pear.

Mr. TABART said that the Californian thistle was the most objectionable weed they had, although at present time the Colony was likely to suffer by the introduction of sheep from the mainland, and the consequent introduction of Bathurst burr. It had appeared on the north-west coast, and also on the line of road along which the sheep imported from Victoria were driven. It had also been found on the south Esk River, where the skins of imported sheep were fellmongered, the seeds having been washed down the river. The Bathurst burr is also to be found at the abattoirs which clearly indicated that it had been introduced from the other colonies. In inspecting a milk farm at Newtown the other day he found that 16 acres of the property were overrun with Bathurst burr. He had recommended the Colonial Secretary to introduce an Act to deal with noxious weeds such as Californian thistle, Cape weed, and burrs. The Californian thistle had taken possession of some of the best lands in the Clarence district and New Norfolk. There were now in Tasmania 1,800 acres of land covered with Californian thistles. It was similar to the Scotch thistle. The centre root went down to a depth of 8 or 10 feet, and laterals were thrown out. Then in ploughing, if a small particle of this thistle was moved by the plough another plant sprang up. They considered that it depreciated the value of land 75 per cent. It could, however, be got rid of, and the plan for this was constant cultivation. Thus, if anyone had an acre of Californian thistle he should upon its first appearance in the early spring start hoeing at one corner on a Monday morning; and finish at the other on Saturday night. So by preventing the leaf from appearing above ground (which is the lung of the plant) it will be soon destroyed. He would recommend Mr. Lance to take the most energetic measures to destroy this most abominable pest. This thistle was introduced in seed oats from America, and there were now 300 acres of Californian thistles on the property where those oats were sown. There was now a law in Tasmania compelling all owners or occupiers of land to prevent it from blossoming. Failing that, the owners were liable to be prosecuted, there being a penalty attached to the extent of £20. Unfortunately the Inspectors had not been assisted as they should have been by the different Benches of Magistrates throughout the colonies, and the result was that thistles were extending and were being allowed to blossom. On many properties it would cost £20, £30, or £40 to prevent the thistles blossoming, whereas the owners were fined 5s. and the costs remitted. The result was that they found it better to pay one, two, or three fines than go to the cost of cutting the thistles, and consequently the thistles were extending through Tasmania. Until last year the Thistle Act was worked under the police, but not in a satisfactory manner, as prosecutions did not take place as they should have done. Now the Act had fallen upon himself to administer. He was afraid that he did not occupy a very enviable position among agriculturists, as he had tried to prevent the owners allowing the thistles to blossom in growing crops, if then cut down for hay, the seed would be carried into various districts. From hay of this description thistles could be traced along the track of the wood-carter to where he fed his horses. There was no way of eradicating thistles except by constant cutting.

Mr. LANCE said he was extremely obliged to Mr. Tabart for what had fallen from him with regard to this weed. He never heard of it until the last session of the New Zealand Parliament. Then it was brought forward by a leading member of the House, who did so at the request of Mr. John Greig, who wrote to him (Mr. Lance) saying that it had appeared on his land. It was brought forward towards the end

end of the Session, but the Government was busy in winding up business. Not a member had heard of this weed, and, like other matters, it was shelved and dropped. Next Session he would bring the matter before the Government seriously, as he considered that it was a very important matter. In the Provincial Council years ago they had an Act for the destruction of thistles. The Act, however, proved to be unworkable, and was dropped, as the farmers found that the thistles did not do them any harm. With regard to Bathurst burr, Mr. Higgins had told them that it occupied vast tracts of country. The question was, could they suggest anything that was practicable.

Mr. HIGGINS said he could. The burr was an annual. Prickly-pear existed largely in the Hunter district, and they had legislation to deal with it. If it was thought advisable similar legislation might be recommended for the thistle. There was no doubt that the Bathurst burr could be dealt with, but it was being allowed to spread through neglect of proprietors. It did not matter to the cattle-holders, but to the wool-growers it had been and would be a great nuisance and a cause of loss, because, as they knew, it got into the wool and depreciated the wool in some instances 3d. per lb., and in some cases more. The burr got on to a fleece which was sometimes double its true weight in badly burred country. It was necessary that steps should be taken to compel our neighbours to carry out their part as well as we did our own. There were many stock-owners who kept their runs clear, which was very creditable to them.

Mr. TABART handed in his report on the working of the Californian Thistle Act, dated 1st July, 1886. It is as follows:—

CALIFORNIAN THISTLE ACT.—*Report by Chief Inspector.*

Sir,

Office of Inspector of Sheep, Hobart, 1 July, 1886.

I have the honor to submit the following report upon the working of "The Californian Thistle Act" during the past year.

From the representations made in my last report upon the prevalence of this weed in Southern Tasmania, and its alarmingly rapid extension over our most valuable agricultural lands, I considered it desirable to apply for further inspecting power, which was granted, to perform duties under the Act, and to see that its provisions were properly enforced.

One of the most serious difficulties this Department has to contend against is the action taken by one of the municipalities with reference to fees. I have communicated with the authorities in that district, pointing out the inconvenience to the inspector by being compelled to pay fees out of his private purse for costs of informations laid under the Act, and have intimated that great facilities would result to the working of the Act if the fees were allowed to stand over until the cases are heard. I further stated that this Department would be responsible for any liability so incurred. The authorities did not accede to the request. In view of these facts, I have to suggest that an amendment be made in "The Californian Thistle Act, 1883," 47 Vic. No. 17, with a clause inserted equivalent to section 41st of "The Education Act, 1885," 49 Vic. No. 15, so that the difficulty may be overcome.

I would suggest that a minimum penalty of £2 be fixed by law when a second offence under this Act is committed and verdict given for the plaintiff, and £3 for the third offence. I feel satisfied from past experience that no permanent good will result as the Act at present stands; occupiers of land having Californian thistles upon their properties maintaining that it is far more to their pecuniary advantage to pay one, two, or even three such fines as are at present inflicted at the different Police Courts than to cut their thistles to prevent them blossoming.

Property owners must be, and are, blind to their own interests in demanding such exorbitant rents for infested agricultural land. It is unreasonable and impossible to expect that a property so leased will have justice done to it. Patches of Californian thistles are ploughed through yearly, allowed to bloom, seed, and eventually to take complete possession of the cultivated portion of the estate, as is the case in the Clarence District; little or no care is taken by the tenant, who must pay rent, and cannot afford, nor does he attempt, to eradicate the thistles so long as he keeps out of the Police Court and within the reading of the Act. I should recommend owners of agricultural properties to assist the tenant by giving him a bonus in the shape of reduced rent for all patches of thistles destroyed, and thus encourage him to improve and enhance the value of the estate.

It only required a repetition of the energy and perseverance displayed by Mr. Joseph Barwick, of the Tea Tree, who has eradicated upwards of 9 acres, and Mr. Charles Mathews, who has destroyed thirty-four patches of thistles in five years. Mr. Earle has also exterminated about 5 acres of Californian thistles. He informs me that he purchased the ground he now occupies, containing about 7 acres, four years since, which at that time was literally one mass of thistles, and has now the satisfaction of knowing he has exterminated this weed by constantly keeping the ground moving. He made the work reproductive, for during the operation the land produced vegetables and strawberries in abundance during the season. The ground is now planted out as an orchard. This work has been accomplished in three years. Mr. Earle tells me the work of extermination cost him £7 per acre, but now, with his increased experience, he thinks he could undertake to destroy these thistles from any land for half that sum. By advertisement he offered to place the knowledge he has gained by long experience and his services at the disposal of those holders of Californian thistle land who are desirous of being rid of this weed, and undertakes the work of extermination at a price per acre to be agreed upon—the terms being, "No cure, no pay."

Mr. Tasman Morrisby entered into an arrangement with Mr. Earle to destroy 62 rods of thistles, with the pleasing result that after two seasons' work the few thistles that remained were small, but, with one more season's work, these few stragglers totally disappeared. Last season the ground was cropped; not one thistle made its appearance. After this practical and satisfactory test, Mr. Morrisby laid himself out to eradicate a large area he had in a paddock of 6 acres, and by constant attention, and working the land thoroughly and systematically, he had the satisfaction of seeing the land cleared in two seasons. One paddock of Mr. Morrisby's that has been laid down in grass for thirteen years still has these thistles growing, but they are spindly, showing that grassing the land weakens the thistle, but will not eradicate it. A few other practical gentlemen have eradicated large areas. These gentlemen assert, without fear of contradiction, that what they have done others can do by persistently hoeing the infested land once a week, thus destroying the lungs of the plant. This method will, in most cases, destroy the weed in one, and certainly in two, seasons.

I

**Californian
thistle.**

I am also of opinion that in the districts of Green Ponds, Spring Bay, Oatlands, Glamorgan, Hamilton, Bothwell, and in all districts in the north of the island where the Californian thistle has not obtained complete possession, the Government should insist on the extirpation of this objectionable plant, by compelling owners upon whose property it exists to start with systematically hoeing the thistle patches once a week during the season, commencing when the thistle first appears in the spring. The owner should be allowed two seasons to destroy the pest on all land in the above-mentioned districts; and if after that period these thistles are still found to exist the owner shall be liable to proceedings being instituted against him, and failing to prove to the satisfaction of the Justices that he has taken proper means to eradicate the thistle, a penalty, to be mentioned in the Act, shall be inflicted. A license shall then be issued, upon application and payment of a certain fee, to extend the time for eradication for another season.

Another very important matter is the selection of grain for seed, and careful inspection of hay before purchasing. The carelessness with which seed grain was formerly purchased from thistle-infested land has been the primary cause of the rapid extension of the pest. It is also a known fact that grain is cut for hay during the time thistles are in bloom and in seed, and has in the past been sold without restriction in the Hobart market. The destructive effect of this is now evident in the Huon district by following the timber-splitter's track to the stump where his horse and cattle have been fed—you will see the Californian thistle now growing most luxuriantly. If agriculturists and consumers were more particular in purchasing their grain for seed and hay for horse feed, and not invest in produce grown upon farms whereon Californian thistles are known to exist, it would have the effect, in a great measure, of decreasing the pest, and compel farmers in districts such as Glenorchy, Clarence, and Brighton to cut all thistles out of growing crops.

In consequence of the large area of thistles now known in the Huon District, I must ask for another inspector to be appointed. Up to the present this locality was considered fairly free from the pest, but, from the isolated position of this district, an inspector is required solely to enforce the carrying out of the law in that portion of the island.

The remuneration now provided is not adequate to the work performed. It is impossible for an inspector to travel and do the work required unless he is paid in proportion. I therefore recommend that the rate of salary be increased by 3s. per diem. The rate now sanctioned, viz., 12s. per diem working days, is not sufficient to meet the inspector's outlay. The duties frequently compel their absence from home at nights; they also have to provide their own horses, shoeing, and forage.

I have to express my entire satisfaction at the able way the present gentlemen have carried out their extremely unpleasant and difficult duties connected with this Act. There has been considerable agitation as to the way in which the inspectors appointed to carry out the law have performed their duties, and complaints have been made. These I have required to be reduced to writing, with the view of enabling the inspector to furnish their remarks to the charge preferred against them. The explanations made in all cases satisfactorily explain their actions, and prove they have not exceeded their duties, as has been fully borne out by the verdicts recorded at the various Police Courts.

I have the honor to draw your attention to the convictions and fines under "The Californian Thistle Act" for the years 1884 and 1885. The particulars I have curtailed, only furnishing the number of convictions with the total amount of fines inflicted, but giving a full summary for 1885-6:—

Convictions.		1883-4.		Fines inflicted.	
				£ s. d.	
46	...	...	...	24	0 0
36	...	...	...	16	0 0
		1885-6.			
		s. d.			
2	convictions carrying fines at	1	0	0	2 0
1	"	2	6	0	2 6
31	"	5	0	7	15 0
24	"	10	0	12	0 0
23	"	20	0	23	0 0
1	"	25	0	1	5 0
6	"	40	0	12	0 0
5	"	60	0	15	0 0
Total	93	...	...	£71	4 6

I herewith beg to furnish as accurate a list as is possible of the number of properties infested with thistles, with the number of known patches, and the extent of area in each district:—

District.	Properties.	Patches.	Area.	District.	Properties.	Patches.	Area.
Oatlands	8	14	10 acres.	Green Ponds	16	48	22 acres.
Glamorgan	2	3	A few rods.	Bothwell	5	10	5 "
Spring Bay	3	6	1 acre.	Hamilton	2	...	...
Sorell	31	91	12 acres.	Deloraine	1	...	10 rods.
New Norfolk	34	116	115 "	Port Sorell	2	11	5 acres.
Brighton	94	689	341 "	Huon	43	75	65 "
Clarence	57	296	835 "	Selby	1	2	20 rods.
Glenorchy	56	167	350 "	Kingborough	8	13	2 acres.
New Town and Queenborough.	64	121	6 "	Total	482	1,842	1,809 acres 30 rods
Richmond	55	180	45 "				

It is certain that other properties are infested, but unknown to Inspectors, the gentlemen now acting having only been in office since November last. Besides the thistles known to exist on private land, there are thistles on the Crown estate, Main Road, and upon the railway lines. I

I desire to draw your attention to the serious injury that is likely to accrue to Tasmania by the extension of the Cape weed (*Cryptus temma-calendulaceum*), Bathurst burr (*Zanthium spinosum*), gorse, and briar. These noxious weeds are spreading slowly but surely, and in a few years' time will be as great a curse to the Colony as the Californian thistle. Noxious plants.

No doubt the Cape weed has been introduced from Victoria in the fodder provided for the circus horses and imported cattle, also in ships' ballast.

The Bathurst burr is chiefly confined to the North Coast and along the roads travelled by imported Victorian sheep. This plant is also to be found upon the milk farm at New Town. The introduction of the weed in this instance is clearly to be traced to the removal of manure from the slaughter-house, where the seed must have been deposited by imported stock. The briar is increasing to an alarming extent in Tasmania, and will shortly be beyond control. To successfully cope with this growing pest, I am of opinion that a Noxious Weeds Act should be made law to prevent these objectionable plants spreading throughout the length and breadth of Tasmania.

In New South Wales the Chief Inspector's Report for 1884 shows the necessity of keeping in check, as also the cost that will have to be incurred, to destroy noxious weeds in that Colony, viz.—the Bathurst burr, trefoil burr, variegated thistle, and black thistle. The following report of expenditure clearly shows that action should be taken before the imported weeds referred to by me establish themselves throughout the Colony. The cost of clearing the commons of noxious weeds is estimated at £18,085; the temporary commons, £8,720; the police paddocks, £5,697; the travelling stock reserves, £43,355; and the droving roads throughout the Colony, at £32,205; making a lump sum for clearing the whole, of £108,012.

An Act is now in course of preparation in New South Wales to provide against the spreading of the prickly pear, which is becoming such a pest, and so increasing that legislation is now absolutely necessary to control its extension.

I have, &c.,

THOMAS A. TABART,
Chief Inspector.

Mr. WOOD seconded Mr. Higgins' motion.

Mr. BAGOT said that in South Australia they had an Act, known as the Thistle Act. It had been introduced for the eradication of the variegated thistle which spread over the country and grew to a height of 10 feet in rich gullies. It took possession of the country, and the Act was passed for its destruction. There was a very valuable clause in the Act which he would recommend to the consideration of the Conference. The clause in question gave the Governor in Council power to include, by proclamation, in the provisions of the Act any other noxious weed which might be introduced. Under this Act they had dealt with Bathurst burr, Star thistle, and Darling pea. A well grown Bathurst burr plant would produce 2,000 or 3,000 seeds, and they were not destroyed by fire under ordinary circumstances; unless the plant was first hoed out, it seemed impossible to destroy it. Generally the Act was fairly administered. They were not troubled with the Californian thistle. He thought the Cape weed which infected South Australia was different from that met with in Tasmania. The plant they had in South Australia was the true *Calendula*—and is a very valuable fodder plant. It came up with the first drop of moisture that fell. It formed a very valuable pasturage for lambing. If left alone it grew up and covered the whole face of the country. When it flowered, the plains of Adelaide for miles around were one blaze of yellow. The dairy people said that it gave a great quantity of milk, and they looked upon it as a valuable plant. It had a little seed surrounded by purple fluff. He had collected the seeds, put them into a mortar, and they crushed into oilcake. He had seen the cattle apparently licking up the dust of the roads, and on examining it found that it was thickly covered with the seed, so that the cattle were really eating nutritious food. There was prickly pear in South Australia, but the seed did not ripen. The crows and other birds eat the fruit and thus spread the seeds, but he had never seen any part of South Australia where it had been a nuisance. He hoped power would be taken to include in all existing Acts in the different Colonies any noxious weeds, for the destruction of which no provision had yet been made.

Mr. WOOD said that in Queensland noxious weeds were dealt with by the divisional boards. If the chairman heard of the appearance of noxious weeds he had power to make an order for their destruction. He thought it was a matter in which the chairman and the Government should work altogether. So far as the district in which he lived was concerned the plan worked very well. He thought that the nuisance was being greatly reduced on the Darling Downs.

Mr. HIGGINS said that in New South Wales the plan adopted was to allow the Bathurst Burr to grow to a certain stage. It must be allowed to grow until the seed was just beginning to show, then it must be attacked at once. Of course if it were cut down after the seed had ripened they would simply do more injury than good. The seed of the burr had wonderful vitality; it had been known to germinate after being in the ground for three or four years. Last season he saw the burr growing on the hills and among the rocks where it would not be thought of during the drought, it was really the only vegetation to be seen. While it was young they could force stock to eat it, and when it existed in broad patches and was tender, he had destroyed it by keeping wethers upon it.

The CHAIRMAN said with reference to the difficulty alluded to by Mr. Tabart of enforcing the law relating to the destruction of noxious plants and weeds, and the inadequacy of the penalties inflicted by magistrates, he thought it would be an improvement to put the owner of infested land under license until the land was cleared. Thus the owner, on his land being declared infested, would receive a license for such a reasonable term as the Board considered would be sufficient to enable him to eradicate the weeds, without any charge; but if on the expiry of the term the weed still existed the owner should be obliged to renew the license for say three months, and to pay such a fee per acre as should be fixed by regulation for the renewal, and so on at the end of every three months until the land was cleared. This got over the difficulty arising from taking cases before the local benches and fighting for a conviction. If an owner did not clear his infested land he was obliged to renew his license, and to pay; and he would soon get tired of that and complete the eradication.

Mr. TABART said that licenses with reference to the Californian thistles should be issued during the season in which they blossomed, as in the winter months they were not to be seen. The first frost cut down the thistle. It was possible to go on to land and not see a thistle, and then during the spring and summer months it would appear. The tenants who rented the land would be continually hampered

Noxious and hampered by being obliged to cut them down. He thought that when the Californian thistle appeared on land it should be placed under license, and the owner compelled to take steps for its clearance. Unfortunately in Tasmania the tenant had to do everything to destroy the thistles, and to pay all the fines. The owner if he were not also the tenant, did nothing. He coincided with what had been said as to the advisability of issuing licenses for land infested with noxious weeds.

Mr. MEREDITH said that in Tasmania various public meetings were held throughout the Colony to deal with nuisances affecting stock and pastures. The meetings were to consider what steps should be taken for the destruction of rabbits. With that question was associated that of the eradication of noxious weeds. From these public meetings delegates were appointed to attend a meeting to be held in Hobart for the purpose of representing the views of the Colony in general. He attended that meeting and a committee was formed to draft the necessary legislative measures. He was appointed chairman of the committee, and they drew up certain resolutions, proposing to deal with existing Acts and amend them. One recommendation they made was, that the question of the noxious weeds should be separated entirely from those of the destruction of rabbits, and the inspection of stock. They came to the conviction that the first should be under separate management, which he believed to be a sound and proper recommendation. He agreed with the remarks of those delegates who spoke in favour of the issue of licenses for land infested with noxious weeds. A similar recommendation should be made with regard to the destruction of this abominable weed—the Californian thistle—as had been arrived at already in the Colonies with regard to the destruction of rabbits. Where the owners did not take proper precautions to prevent the plant blooming and seeding, the Government should have the power to enter upon the land and do the necessary work at the owner's expense, otherwise, it would be useless to do anything. The same thing would be done over and over again. He knew of one instance in which several magistrates of a municipality were defendants, and the Bench which tried the case was formed of several members of the council which was summoned. Each member was fined in turn, and then went on to the Bench to deal with the others, and so it went round.

Mr. BAGOT: Were their names allowed to remain on the list of Justices of the Peace?

Mr. MEREDITH went on to say that they would never deal with the Californian thistle nuisance successfully until they had such regulations for the destruction of the plant as would permit the Governments to enter upon infested lands and destroy the thistles at the owner's expense.

Mr. CURR said there were many noxious weeds in the Colonies. He believed that the plant which was doing most injury in New South Wales and Victoria was the pine scrub, which was increasing enormously, and already occupied a large area of the Murray country. If the Conference intended to deal with the question of noxious plants they should recommend the introduction of a bill for the eradication of these plants. They could do nothing by recommending the destruction of any particular plant, whether Californian thistle, Bathurst burr, or anything else; they must leave those details to the Government or municipality interested. He understood that an attempt would be made to destroy the scrub by drawing rollers provided with knives through it.

Mr. MEREDITH presumed that Mr. Curr was referring to the pine scrub which grew about the Murray. It was known in Tasmania as the Oyster Bay pine. It grew as thick as in New South Wales or Victoria on many sheep runs. He could always destroy the plants in three years. The land should be unstocked, the grass allowed to grow, and fire put to it. That plan never failed.

Mr. CURR: No grass grows amongst these plants, and they seem to kill everything. There are localities where formerly 25,000 sheep were kept, and now there are only 2,000; that is owing to the spread of the pine.

Mr. M'KENZIE said there was no Act in New Zealand to compel the destruction of noxious weeds. There had been an Act against the common thistle, but it proved to be inoperative, as the farmers and other stock-owners found that it benefited the country. In three years time the thistles died out. The first season they grew up so thickly that a man could hardly ride through them. Now the same country was perfectly smooth without any attempt being made to eradicate the thistles. He presumed, if he was right, from what had been said by the Chairman with regard to the licensing system, that the occupiers of infested lands must take out a license to hold them, and that the owners of private land, or land leased from the Crown, would be responsible for cutting the weeds. If he were the owner of the property he was responsible, and if he did not do so the inspector would not renew his license unless he were able to show good cause why he had not cut the thistles. That should prove to be a very good system.

Mr. HIGGINS said that with regard to pine scrub the New South Wales Land Act of 1884 provided that holders of certain pastoral lands might obtain licenses to hold lands conditionally on the destruction of pines, and that if they carried out this work they were to get a twenty-one years' lease.

The motion was then agreed to.

Mr. BAGOT said that the thistles had been used successfully in silos in conjunction with grass and barley. If they were passed over a fire and the prickles thereby made limp by the action of the flame they might be at once fed to stock.

2. PLANTS AND WEEDS POISONOUS OR SUSPECTED POISONOUS TO STOCK.

Poisonous Plants of Queensland.

Mr. GORDON read the following paper on the "Suspected Poison Plants in Queensland":—

"For over ten years I have laid myself out for the collection of plants poisonous, or suspected of being poisonous, to stock. I lay no claim to a knowledge of botany. As the suspected plants are sent to me by stock-owners or drovers, I submit them to our Colonial Botanist, Mr. F. M. Bailey, F.L.S., who supplies the names, and they are then placed in a book prepared for the purpose, and kept in my office, open for inspection by visitors, and in this way they are readily recognized by stock-owners. The number of poison or suspected poison plants sent to me or to the Colonial botanist, from all districts of the Colony, is forty-two. Thirty-four of those are common to Queensland and New South Wales, many of them also to Victoria. So far as I know, eight of them are peculiar to Queensland only and to the Northern Territory of South Australia. It should, however, be stated that several of the plants submitted to me as being poisonous to stock have been forwarded at various times to the botanist as good fodder plants. A pamphlet on the subject, illustrated by lithographed drawings, is now in preparation for the Press, under the

the joint authorship of the Colonial Botanist and myself. In this short paper I shall only touch upon **Poison plants**. those plants known to be poisonous and those which have been found by analysis or experiment to possess some poisonous qualities. In this list the *Gastrolobium grandiflorum*, the 'Wallflower,' 'Australian' or 'Desert-poison bush,' is first deserving of notice. About the poisonous nature of this plant there is no differences of opinion. There are belts of this plant through which it is impossible to travel bullocks and sheep without constantly watching them and yarding them at night. Before the line of railway was constructed through the belt on the Great Northern Line from Townsville to Hughenden, parties travelling in charge of valuable stud sheep had to muzzle the sheep during the day and carry hay for the purpose of feeding them in bush yards during the night. Strange to say, Mr. Staiger, the analytical chemist, failed to find any irritant poison in an analysis of dried specimens of this plant, but he is of opinion that a volatile irritant poison will be found on analysing fresh specimens. The plant, fortunately, is not widely distributed; and it is worthy of notice, that stock bred on the areas on which it grows are seldom affected by it. The next in order is the *Swainsonia galigifolia*, the dark red flowered indigo bush, with its variations *Coronillefolia* (the rosy flower) and the *Albiflora* (the white flower). This plant is generally recognized under the name of 'Indigo' and the 'Darling Pea.' It is not an irritant poison, but when sheep once eat it it is difficult to break them of the habit. They become what the shepherds term 'cranky,' separate themselves from the flock, and are for all practical purposes useless to their owner. Mr. Staiger, then Government Analyst for Queensland, experimented with an extract from the plant, and found it to be a powerful diaphoretic when applied to frogs, rats and mice under confinement; the animals literally sweat to death. A sheep-owner on Darling Downs selected a lamb that had taken to eating the plant, placed it in a small paddock near the homestead, and notwithstanding that grass was plentiful, the lamb (although not a pet one) followed its owner all round the paddock, eating from a bundle of *swainsonia* which he carried in his hand. When grass is plentiful the percentage of 'indigo-eaters' in a flock is not large. Of the *Euphorbias*, the *E. drummondii* and the *E. eremophila* are the only two that have been brought under my notice as poisonous. Of the latter I cannot speak from experience. Of the former (called by the stock-owners the caustic creeper) I have had considerable experience. Its effects on sheep are curious. The head swells to such an enormous extent that the sheep has frequently to drag it along the ground, and there is frequently suppuration of the ears. Like the *gastrolobium*, analysts would seem to have a difficulty in detecting poison except in green specimens, and drovers state that it is only poisonous when eaten before being dried by the sun. The *Solanum nigrum* (small black nightshade) was some years ago reported as having poisoned large numbers of stock in the metropolitan districts of Victoria. The fruit is decidedly poisonous to children, but I have had no experience as to its effect on stock in Queensland. The *Datura stramonium* (thorn or mad-apple) and the *D. leichhardtii* (native thorn apple) are both poisonous to cattle, but are rarely eaten except by quiet milkers, or during seasons of drought, when feed is very scarce. The *Nicotiana suaveolens* (native tobacco) and the *Bulbine bulbosa* (the native leek or onion) both grow in abundance in the western or saltbush districts, and cause numerous deaths amongst travelling sheep, but they appear to have little or no effect on the sheep bred on the runs on which the plants grow. The only other plant on which experiments have been made is the *Xanthium strumarium* (Noogoora burr), a plant introduced into Queensland with cotton seed, from the Southern States of America. When young and succulent this plant is readily eaten by cattle, and many deaths have been the result. From experiments made by Dr. Bancroft, of Brisbane, this plant is decidedly poisonous. His results are embodied in the transactions of the Queensland Philosophical Society. It may not be generally known to members of the Conference that a plant of the same family, the *Xanthium spinosum* (the Bathurst burr) is also of a poisonous nature, but fortunately it is rarely eaten by stock. With most of the abovenamed plants, however, losses in stock are as a rule confined to travelling sheep and cattle. Rarely do sheep bred on the runs on which they are prevalent, eat them, or if they do, fatal results rarely occur."

Mr. GORDON moved, that the Conference recommends that collections be made of all plants suspected of being poisonous to stock, with the view to their true character being ascertained by analysis, feeding of stock and otherwise, and to necessary steps being taken to prevent so far as possible losses to stock when the plant is poisonous.

Mr. HIGGINS seconded the motion.

Mr. LANCE said that in New Zealand there was a plant called the *Tutu*, which was excellent food for stock accustomed to it, and eat it on a full stomach in the ordinary way. If however, freshly landed stock, or stock with empty stomachs, eat it, they were seized with vertigo, and died.

Mr. M'KENZIE: A berry comes on it, which is very dangerous.

Mr. VALENTINE said that in South Australia they had had a good many losses from sheep eating the *Lotus Australis* the year before last in the south-eastern districts. The *Swainsonia Procumbens* was also to be found over an area of country covering about 60 or 70 miles, and horses and cattle had died in great numbers from eating it. Stock that eat it became affected with the staggers, and generally became useless. They had also the *Euphorbia Drummondii*, which came down the river; and two or three seasons ago a number of sheep died from eating it. One settler put some sheep in to feed on that plant and nothing else, and they got fat upon it.

Mr. PARK: I have not heard of poisonous plants doing any damage.

Mr. STANLEY said that when he was in the Riverina district he had a number of sheep penned up. He collected a quantity of *Euphorbia Drummondii*, and fed the sheep upon it, but they did not die. Having done that, he sent through Mr. Duff to Baron von Müller, and asked him for his authority for stating that *E. Drummondii* was a poison plant. The reply from Baron von Müller was as follows:—

John Duff, Esq., Inspector of Forests, New South Wales.

Melbourne, 22/9/86.

Dear Sir,

In reply to your letter of the 20th instant, I beg to observe that all species of the large genus *Euphorbia* are characterized by being pervaded by an acrid milky sap, the induration of which from some North African species yielding the highly irritant and blistering gum *Euphorbii*. Many other species are recorded from various parts of the globe as possessed of burning acidity, and not one instance is known of any congener having proved really harmless, even the *Euphorbia pilulifera* can be used only cautiously, and in small doses against asthma; indeed, so corroding is the sap of many species, as to be occasionally applied as a caustic. Though therefore not likely any of the *Euphorbias* are inert, it may be that some contain only a slight quantity of milky sap, and that of less burning property, so this may account for the deleterious qualities of *Euphorbia Drummondii* not being readily apparent, should the latter plant be consumed only in small quantity, and at particular seasons when least of the sap is developed.

Branding and marking.

I have the plant nowhere accessible near Melbourne, and have neither the means of subjecting it to chemical analysis, though toxic experiments could easily be carried out wherever the plant is copiously available. I cannot think that the numerous correspondents who through many years successively sent me specimens of *Euphorbia Drummondii* as poisonous to their pastoral stock could all have been in error when attributing the mischief to this plant. Indeed the *Euphorbia Chamaesyce* of the countries around the Mediterranean Sea, a plant from which hardly our *Euphorbia Drummondii* can be distinguished, has been used there since antiquity, for removing by its milky sap, obscuring patches from the cornea, and for corroding away any warts. A good test for the acidity of our plant would be to apply a few drops of the sap to the eye of a lamb, dog, small calf, rabbit, or some other animal for seeing whether such an application will produce inflammation or not. I presume that against any possibility of using some other habitually similar plants for the experiments instituted in New South Wales, has been effectually guarded.

I am, &c.,

FERD. VON MÜELLER.

Mr. STANLEY said that the Government Analyst had stated that the plant contained a slight bitter, but nothing of a poisonous character.

Mr. GORDON remarked that the *Solanum Nigrum* was poisonous to children, when growing in deep rich soil, yet people used it in pies without injurious effect.

Mr. STANLEY drew attention to the injurious effects resulting from the presence of mould and fungus on ensilage. Horses and valuable sheep had been destroyed by eating it. The fodder had been flooded, and put away wet, the result being that fungoid growths were encouraged on the ensilage, with fatal effects to the stock.

The motion was then agreed to.

VIII.—THE BRANDING AND MARKING OF ANIMALS.

Sheep—Ear-marks.

The chairman said it was very desirable to prevent the use of such ear-marks as the "crop," which would cut off or out other ear-marks. He moved the following resolutions:—

"That only such ear-marks as are authorized by the Governor-in-Council, and registered with the Inspector for the district, shall be used for sheep."

"That the crop or tip-mark be prohibited."

"That all ear-marks be made with pliers."

Mr. BAGOT said that these marks would interfere with the inoculation marks.

Mr. CURR said that in civilized countries people had done away with these ear-marks. In Spanish South America the system was used for some time. That was one of the strictest laws in force in the country. In the case of branding, a horse could be pretty well identified. After they finished branding the animal on one side, they could turn him round and begin branding on the other. He had learnt from a gentleman who had lately come from South America that the whole system was falling into disuse. In Victoria they did very little branding, and that was of the most ridiculous description. He had registered, he supposed, fifty owners who used A for a brand, and the only thing they could do was to prevent any neighbour using that brand so as to enable him to steal sheep.

The resolutions as moved by the chairman were agreed to. They appear in the following form in the report:—

"That only such ear-marks as are authorized by the Governor-in-Council, and registered with the Inspector for the district, be used for sheep."

"That the tip-mark be prohibited."

"And that all ear-marks be made with pliers."

CATTLE—EAR AND OTHER MARKS.

Mr. MEREDITH believed that considerable difficulty would arise if the Conference retained the resolutions which had been passed relating to ear-marking. He remembered a case where a man was charged with perjury for swearing that a cow was marked on the near ear; and he justified himself by stating that the near ear of a bullock was opposite to that of a milking cow—that the near ear of a bullock was the left, and of a cow the right, because it was nearest in milking. The man was acquitted.

Mark for Inoculation.

Mr. STANLEY moved,—“That the mark for inoculation be on the off ear for cattle.”

Mr. BAGOT seconded the motion.

The motion was agreed to.

The motion appears in the following form in the report:—“That the distinctive mark in use in Queensland—taking the tip off the off (*i.e.*, the right) ear—be used throughout the Colonies as the sign of inoculation.”

Mark for Spayed Cows.

Mr. BAGOT moved,—“That, in the opinion of this Conference, the dewlap mark be reserved in all Colonies having legislation upon the branding of stock, as a distinctive mark for spayed cows.”

Mr. WOOD seconded the motion, which was carried.

RUNS ON INTERCOLONIAL BOUNDARY LINES.

Mr. BAGOT moved,—“That any stock-holder owning runs in different Colonies which are only separated by the boundary line between such Colonies should be permitted to register in each Colony the brand in use by him, and registered in his name in either Colony, and that it be a recommendation of this Conference that such Colonies as have legislation on the subject should be requested to amend their Brands Acts, so as to give effect to this resolution.” He said that there were runs which were only separated by intercolonial boundary lines. They were absolutely identical, and were worked as one run. In Queensland it was compulsory on stock-owners to register one numeral and two letters, and in South Australia one letter and two numerals. On one side of the line the stock-owner had to use one brand, and

and on the other side the other. It only required a recommendation to the different Governments to Rabbits, N.Z. have the substance of his motion carried into effect. He had looked at the matter from all points, and he was of opinion that no injury could come of it to any Colony.

Mr. GORDON seconded the motion.

The motion was agreed to.

The motion appears in the Report in the following form :—“That any stock-owner owning runs in different Colonies, with the sanction of the Registrars of Brands, be permitted to register in each Colony the brand in use by him, and registered in his name, in either Colony; and that it be a recommendation of the Conference that such Colonies as have legislation on the subject so amend their Brands Acts as to give effect to this resolution.”

ORDER OF BUSINESS FOR THE FOLLOWING DAY.

The following business was then decided upon for the following day :—

1. The rabbit question.
 2. The introduction of stock from places outside the Australasian Colonies.
- The Conference then, on rising, adjourned until 10.30 a.m. on the following day.

TUESDAY, 5 OCTOBER.

SEVENTH MEETING.

Present :—Mr. A. BRUCE, Chairman, and the full Conference.

Suppression of Scab in New Zealand.

Mr. LANCE read the following telegram, which had been received by Mr. COOPER from Mr. Buckley, Colonial Secretary of New Zealand :—“Wellington. First muster Clarence Run shows no disease.—P. A. BUCKLEY.” He said that that was the country which had been infested for the last twenty-two years.

VI.—DESTRUCTION OF NOXIOUS ANIMALS—*continued.*

1. THE RABBIT PEST.

The Chairman, with the view to elicit information on the subject, handed the following list of questions to each of the delegates :—

- (1.) Does the rabbit pest exist in your Colony?
- (2.) If so, to what extent have the rabbits spread?
- (3.) At what do you estimate the annual loss through rabbits to your Colony, and the total loss to date?
- (4.) Have you legislation for the pest? If so, state its features.
- (5.) How is the destruction of the rabbits carried out?

(1.) *Rabbits in New Zealand.*

The CHAIRMAN : The question to be dealt with now is the rabbit pest.

Mr. LANCE said, that with regard to this question he had come to the conclusion since his arrival in Sydney that no further information could be obtained. He was aware that they had had two exhaustive Conferences, of which he was not aware until he arrived here. He had read the result, and found that so late as last June they had fifty-four delegates present from all parts of the Colony, and the question was debated carefully. They came to certain conclusions, and drew up a report. At the same moment we were doing the same thing in the Parliament of New Zealand. There was a joint committee of both Houses, which sat for certainly over two months, and examined an enormous number of witnesses. The Report was now lying on the table. In noticing what took place in New Zealand and what took place here, he saw that they came to practically the same results, and in New Zealand legislation immediately followed. A Bill was passed in the few last days of the Session. They did not say it was perfect, but it was a step in the right direction. They might have gone further and arrive at the conclusion agreed to by the Sydney Conference—that certain localities should be under the local administration of Rabbit Boards. The Sydney Conference came to the conclusion that those local districts should elect among themselves a Central Board, the business of which would be to advise the Government as to the action to be taken in connection with the rabbit pest. This was a mode which the New Zealand Government would probably adopt in future legislation. Both came to this conclusion—that fencing was one of the great elements of success, but in New Zealand fencing was an exceedingly difficult matter. There was a mountainous backbone all through the infested island, and parts of it were so precipitous and rocky that they could not get a pack-horse into hundreds of thousands of acres, so that poisoned grain could not be carried there. Therefore they could see that on these mountainous regions it was not possible to carry out fencing to any extent. There were spots, however, where it could be done. In the south and north they had rabbits, and a large tract of valuable country was not infested. To the north it was possible to construct a fence which would be a very efficient one, and that was what they proposed to do. To the south the fencing would be more difficult, but they hoped to be able to find fairly good country over which to carry it. If they did so they would save that country from being overrun with rabbits. The Queensland people bore in mind the fact that the New South Wales people were doing the proper thing, that they were going to fight the enemy on another man's ground, and that was what they wanted to do in New Zealand with the centre of the Middle Island. They thought that if they erected a fence, and allowed the great wave of rabbits to come against it without any opposition, that it would never keep them back. Therefore they proposed to build huts at certain intervals along that fence,

Rabbits, N.Z. fence, at distances varying according to the nature of the country. Sometimes there were an enormous number of water-courses within a short distance, extending over 10 or 12 miles. They proposed to have two men in each hut, and those men were to breed ferrets as largely as they could and turn them out. The men would not be allowed to possess dogs; and the Government did not intend to allow the destruction of the natural enemies of the rabbit, or fumigation, or anything of that kind. The men would be provided with guns, but the main thing would be keeping the men at the fence turning out ferrets to meet the army of rabbits coming towards it, driven on by the ferrets in the rear. The rabbits would thus be between two lines of ferrets, and the Government believed that on the infested side a large area would be kept practically free from rabbits. That was how they proposed to work in New Zealand. The Sydney Conference recommended the preservation and propagation of the natural enemies of the rabbit—so they did in New Zealand. It should be borne in mind that blood-sucking animals required an enormous amount of water. Ferrets would not live without a plentiful supply. They had had a sad experience of that in New Zealand. There was a long-dry season, and in one part of the country where ferrets were turned out it happened to be rolling country, but without permanent watercourses. The ferrets were absolutely exterminated in a very few months. Therefore it would be for the Australian representatives to judge whether ferrets would answer here. Almost every witness they examined, he thought, without a single exception, both *viva voce* and by writing, were in favour of the introduction of stoats and weasels. The joint committee was, of course, bound to frame its report on the evidence; and it therefore recommended the Government to import those animals largely. On looking over the matter calmly and quietly afterwards, he came to this conclusion—that stoats were dangerous animals, and he was not in favour of weasels. When he came to analyse the evidence he found that the whole of the witnesses, or most of them, were sheep farmers, or connected with the pastoral industry. There were no agricultural farmers amongst them, as they did not understand the question. He found that the agricultural farmers were almost to a man against the introduction of stoats and weasels, as they thought those animals would be destructive to their poultry. It was of no use to tell them that they might protect their chickens with a little wire-fencing. For himself, he would be very chary about advising any Government to introduce stoats and weasels. Cats were most useful in keeping down the rabbits; and with ferrets, fencing, and poisoning, there should be sufficient power brought to bear to keep down the rabbits. Poisoning was not even mentioned at the Sydney Conference. He did not know why, as it had been found by us to be most valuable in keeping the rabbits in check. With regard to poisoning, they had only one means which was efficacious, and that was the use of phosphorised oats. They could, however, only be used in winter, as the heat of summer evaporated the phosphorus so rapidly. In winter it would stand snow and rain for three weeks, and then be perfectly good. There was, however, the danger of the phosphorus setting fire to the grass during the summer months. There had not been a stone left unturned to find out better means for the destruction of rabbits. They had an excellent Agricultural College in Canterbury—The Lincoln Agricultural College,—and the Government had put the machinery of it in motion to try if a poison could be discovered, which the rabbits would prefer to grass, in summer. He did not know why the subject of poisoning was omitted from the discussions of the Sydney Conference. With regard to rabbiters, he might give them some information. Mr. Bullen, a resident of the Marlborough district, determined to clear his lands of the rabbits, and he began to use phosphorised oats and also to breed ferrets very largely. He had been breeding them for a year or two, and one morning, while walking near his house on the borders of a lake, he heard on the other side a tremendous noise, the sound being carried a considerable distance across the water. He concealed himself until the noise was over, and the parties had time to go away. He then went around to where the noise had occurred, and found a fine dog ferret which had just been killed by his rabbiters. He walked quietly home, and after thinking what course he should adopt, he resolved on a plan and acted upon it. He sent for every one of his rabbiters, gave them their cheques, and sent them about their business. Mr. Bullen assured the committee before whom he gave evidence that in three months after that there was an evident decline in the number of rabbits. That occurred eighteen years ago, and he never employed a rabbitier since. They had come to the conclusion in New Zealand that the rabbitiers encouraged rabbits in every way, and the joint committee recommended the Government to prohibit men from being employed in that way. There was another question brought up, and about which Mr. Gordon had asked him. That was as to the bonus system for eradicating rabbits. The joint committee went exhaustively into that matter, and came to the conclusion that it was not advisable to recommend the system. They thought it would encourage rabbit farming, and the bonus system was also an expensive one. The bonus proposed was 1d. per skin, but it was found that each skin cost 2d. or 3d. As he had said, the proposed bonus was 1d. per skin, but what would the Conference think that came to. If they took eight and a-half million skins as the average number of skins exported, at 1d. per skin that came to £37,000 per annum. What did that expenditure do? Practically nothing. Therefore they came to the conclusion not to recommend the system of bonuses in any way, and he strongly advised them to follow the same course. With regard to the cost, the Conference could easily understand when the Government was about to introduce the Bill into Parliament, how valuable it would be, and how it would strengthen the Bill, if they could have approached anything like an idea of what the rabbits had cost New Zealand. He did his utmost to ascertain it, and he found that the public expense was nothing compared with that incurred by private individuals in striving to get rid of the pest. He found that it was impossible to arrive at the actual cost, but he averaged it in this way. He succeeded in getting what the rabbits actually cost in annual expenditure on three stations, and he knew that that was perfectly reliable information. Then he took the area of these stations, compared them with the area of the infested country, and thus got a rough idea of the total cost. By that means he calculated that a quarter of a million sterling had been annually expended in the destruction of rabbits, without reckoning the loss of grass, and the falling off in the condition of the sheep, and the amount of wool. Many of the runs which used to carry 20,000 sheep now only carried 2,000. Allow for the losses in sheep and wool, he thought that another quarter of a million sterling might be added, which would make the total annual cost half a million sterling, despite which fact the rabbits were increasing. There was one point that should not be overlooked, and that was that whatever means were taken to attack the rabbits, whether by poisoning or by means of natural enemies, or by rabbitiers, all had the effect of spreading the rabbits. Although their actual numbers were not, perhaps, greater now than formerly, yet they were being found over a larger area, and therefore it was believed that

that nothing but fencing would check them. That was why they advocated fencing so strongly in New Rabbits, N.Z. Zealand.

Mr. HIGGINS: Do ferrets kill the lambs?

Mr. LANCE said that the very gentleman to whom he had referred (Mr. Bullen) was asked before the joint committee, how many ferrets there were on his land, and he replied that he would not be surprised to find that there were ten thousand, as he had been breeding and turning them out for the last eighteen years. He grazed forty thousand sheep on his land, and he was asked whether the ferrets were dangerous to lambs. He replied that he never knew a case of a lamb being killed by a ferret. More than that, he had done his utmost to find if such a thing had ever occurred, and when his ewes were lambing, his shepherds had orders to examine as many camping places as possible, as they knew if the lambs were found killed anywhere, it would be there, but they had been unable to find one. It had been also said that ferrets were dangerous to human life. They had been making the Government road through the district in which Mr. Bullen lived, and they had camps of men there for eighteen months. Every night the ferrets came into the men's tents, crawled over them, and yet there was not a single case recorded, of a man being bitten by a ferret. For those reasons, the committee came to the conclusion that ferrets were not dangerous, either to human or animal life.

Mr. STANLEY: Do they keep the rabbits down?

Mr. LANCE: They do in a wonderful manner, but they cause them to spread.

Mr. TABART: Have the rabbits been killed or driven off?

Mr. LANCE: They have been killed by hundreds of thousands, by millions. That country used at one time to be black with rabbits.

Mr. TABART: Does Mr. Bullen use phosphorised grain?

Mr. LANCE: Yes, every year. The best plan is to poison the country first, to bring the number down to a reasonable extent with phosphorised grain, and then turn out the ferrets.

Mr. MEREDITH: What method do you use for phosphorising your oats? What guarantee have you that they are properly prepared before being spread on the ground in the infested districts?

Mr. LANCE: The people who use them have machines for preparing the oats. They consist of large iron drums.

Mr. MEREDITH: You said there was some danger to the grass. If the oats are properly prepared the phosphorus will not ignite the grass.

Mr. WOOD: Do the stoats kill lambs?

Mr. LANCE: We have not had any experience on that point. The stoat is a large animal, and it was thought it would increase in size here, and become a larger and more vigorous animal. There was a case known, where a stoat had killed lambs, and he thought they should be chary in introducing any animal into these Colonies which might hereafter prove to be a great curse. With all these means—poisoning, the use of ferrets, and other natural enemies, and fencing—they consider that they would never be sufficient to eradicate the pests. Therefore they thought that science ought to be invited to discover some means that would actually exterminate the rabbit. Until that was done, the Colonies would never have any rest.

Mr. HIGGINS: With regard to the administration of your Act. How is it carried out?

Mr. LANCE said that the Act had been altered this Session. There had been very great difficulty in administering it, especially in the northern parts, which were infected with scab. The Sheep Inspectors and Inspectors under the Rabbit Act, found great difficulties in dealing with the rabbits. They found it was practically impossible to deal with scab and rabbits on any one run at the same time. The inspectors contented themselves with making those people who had rabbits, breed ferrets and turn some out every year. The eradication of the rabbits had not been conducted so efficiently as it would have been if scab had not been present. Now, however, the Act was being carried out thoroughly, and vigorous steps taken to get rid of the rabbits.

Mr. MEREDITH: At whose expense?

Mr. LANCE: At the expense of the owners of the lands infested. Wherever there were Government reserves they were cleared by contract, the charge being set against the Consolidated Revenue. It had been decided in New Zealand to strike an optional local rate with a maximum of 1d. per sheep. The rate would be a differential one, according to the proximity of the rabbits. All sums so raised the Government would subsidise at the rate of £ for £ for erecting fences, and so forth. That Act was passed last Session. The Government had to bear all the departmental expenses for working the Act, and in this way, with the subsidy, the rabbits cost the Government about £40,000 a year. He moved—"That the Conference recognises that the means at present available for the destruction of rabbits are most costly, and are not radical cures, and that, until some discovery shall have been made, more searching and fatal in its effects upon rabbits than anything at present known, their absolute eradication cannot be accomplished. The Conference therefore recommends that a bonus be offered by the Australasian Colonies collectively, for the purpose of bringing about such a desirable object, such bonus to be granted under such regulations as to success, as the Colonies may consider desirable."

Mr. PETERS seconded the motion.

Mr. M'KENZIE said that his experience of the rabbit question was different from that of his colleagues for the reason that he came in personal contact with them himself. Mr. Lance had just told them that during the last Session of Parliament in New Zealand there was a Joint Committee of both Houses sitting, and it went into the subject exhaustively. The conclusions of that committee, of the New Zealand Parliament, and of the Conference which sat in Sydney, brought out the same facts. They had come to the conclusion that the rabbit nuisance was more serious than many people gave credit for. If they expected to occupy the country successfully they must use every effort to destroy the rabbits. In Otago, fifteen years ago, the rabbits were only found on an area of 20,000 acres in the extreme south of the Island. He resided about 200 miles north from that place in North Otago, and they scouted the idea of rabbits reaching so far. They could have easily fenced off the rabbits then, and driven them into the sea. Unfortunately they did not really know what the evil was, and the rabbits gradually spread. About ten years ago the first of the rabbits made their appearance in the district in which he resided. A few people took immediate action to keep them down, but their efforts were useless, as there was no law for their eradication, and the Government reserves were left lying without anything being done to them. Some owners gave as much as 6d. per head for the destruction of the rabbits. For

Rabbits, N.Z. four or five years they did not do much harm, but they were noticed to be increasing. About five years ago they came upon the district in millions, taking almost every person by surprise, causing very serious losses indeed. The result so far, whether on pastoral country owned by the Government and leased to the runholders, or on private property, was this:—The carrying capacity of the land had been reduced by one-third, and the weight of the fleeces had decreased on an average from 1 lb. to 1½ lb. per fleece. The lambing percentage had decreased 30 or 40 per cent., and the death-rate had increased from 3, 4, 5, and 6 per cent. to 10, 11, 12, and 13 per cent. He then referred to the following evidence given before the Joint Committee on the Rabbit and Sheep Acts:—

Mr. Brydone examined:—

Chairman.] Have you had much experience in the matter of rabbits? Yes.

In what part of the Colony? In the Waitaki district.

Not all in one block? No; we have got runs and freeholds extending over most of Otago.

What quantity of freehold and what quantity of leasehold? I superintend something like 200,000 acres of leasehold, and about 150,000 acres of freehold.

And you have rabbits over all? No; on some of the freeholds there are no rabbits.

Would you speak more particularly about the properties on which you have rabbits? We have a freehold property in Southland, which now extends to about 50,000 acres, on which we have had the rabbits for the last eight or ten years.

And have you rabbits on the whole of the leaseholds? Yes.

Are the rabbits very bad in any part of it? There are three places where they are very bad—one, in the Queenstown district, of about a 100,000 acres.

Is that along the bank of the lake? It is opposite to Cromwell. We have another one between Shag Valley and the Taieri River of about 44,000 acres, on which there are rabbits; and one on the Waitaki of about 40,000 acres.

Is that high up? No. It is a place called Kowrow, just at the extremity of the railway.

The rabbits are a great nuisance on all these places? Yes. On the Queenstown run during the last two years we have spent about £7,000; and we collected skins there the year before last to the number of 244,000, and this year to 283,000.

Then the rabbits have increased? I would not like to say they have increased; but we got some new country there very rabbitly, and we did not get them thoroughly killed the first year. I think it was because we were more successful last year than the previous one; and we have been killing all last summer, which has been adding to the number. The rabbits trapped and shot are all got, whereas of those poisoned in the winter probably not more than a half or a third are got. That has increased the number of skins. It does not exactly indicate that the rabbits have increased.

What system of killing do you adopt? Poisoning with phosphorized oats in winter, and last summer we practised trapping and shooting. We have some fifty or sixty men on that run, and we think we have got the rabbits very much under hand just now; but it has cost us a great deal of money to do so. The skins we get in the summer are perfectly valueless.

What proportion of the expense do you think the skins would return, taking the year all round? Now I do not expect we get half of what the skins cost us, particularly with so many summer skins coming in.

Less than 50 per cent? Yes, at present prices. The price has come down very much.

Do you poison at all in summer? No; it has been tried, but found to be no use.

Do you turn out any natural enemies? We have turned out ferrets on nearly all our places.

In what quantities? We have turned out probably a 150 on that particular run at Queenstown.

Have you seen any results? Yes; we believe they are increasing and doing some good. Of course they require to be in larger numbers on a big tract of country to see very decided results.

Have your sheep diminished on account of the pest? Slightly, but not to any great extent. Of course our increase has diminished very considerably. From an average increase of about 70 per cent. on the Kawarau run we now average about 45.

And in regard to wool? We clip about 1½ lb. less wool per sheep than we did formerly, and it is not of as good quality.

Mr. Fulton.] And how about deaths? The death-rate formerly averaged 3½, and since the rabbits came it has become 10½. There is another run we have—Deepdell—where the death-rate formerly was 6 per cent., and for the last few years it has averaged 13½; while the increase was formerly 67, and is now 45.

We considered that Mr. Brydone's evidence was a fair sample of the experience of Otago runholders.

Mr. M'KENZIE also referred to the following evidence given by Mr. J. Roberts, Station Agent of Dunedin:—

Chairman.] Have you had large experience in connection with rabbits? I have had experience to this extent; that one season we killed 50,000 skins off 35,000 acres.

What method of killing have you adopted? We have adopted the usual methods. With regard to fumigation, I only tried bisulphide of carbon four or five years ago, when the remedy was first started; but we found it was difficult to apply, and the results were not equal to the expenditure.

I suppose it could only be carried out in certain parts of the country? Where there are burrows.

Have you tried ferrets? I have turned out a great many ferrets; and in one place of 5,000 acres in Southland we found that in trapping we caught almost as many ferrets as rabbits, so we gave it up.

Have rabbits diminished in your neighbourhood? My own experience is that they have diminished. In the year ending June, 1884, we killed about 50,000 on 35,000 acres, the net result being a profit on the value of the skins of £191 9s. 5d.

During the shearing previous to that (in November, 1883) I found that the clip fell 1 lb. per fleece as compared with that of the previous year; but since the rabbits have been kept down the wool has recovered its weight, and the country is carrying now quite as many sheep as it ever did. During the year ending June, 1885, the net charge for rabbits was £402, crediting the value of the skins.

That was a loss? Yes; and I expect the loss this year will be about £500.

And that is the result of your exertions to kill rabbits? Yes.

In the other parts of the district have they succeeded as well as yourself? No; on the adjoining run I think their wool has fallen off a good deal, and their stock too.

Is that through neglect, or other cause? I think it is through neglect.

And you think rabbits can be kept down? I am quite satisfied if proper care is taken they can be kept down to such an extent that they will not affect the wool nor carrying-capacity, though they may affect the lambing. The shorter and finer grasses are taken by the rabbits, and the ewes do not get the same amount of milk in the early spring that they otherwise would.

Mr. M'KENZIE said that Mr. Roberts' evidence went to show that the weight of the wool was decreased to the extent of 1 lb. per fleece, and that notwithstanding the fact that he had been spending a very large sum of money in keeping the rabbits down, they had been increasing.

Mr. M'KENZIE also referred to the following evidence given by Mr. H. S. Valentine, of Waimea South:—

Chairman.] What experience have you had in matters connected with the rabbit pest? I have had great experience. We cover a large tract of country, about 300,000 acres, of which perhaps about 100,000 is leasehold country, and that is the worst rabbit-country.

You suffer very much from it? Very much.

In what way do they affect you? They eat the grass, and reduce the carrying-capacity of the country.

I suppose you have taken means to kill the rabbits? If we had not done so, and that very extensively, we should soon have no country. We have taken every possible means of destroying them—poisoning and shooting them, and so on. For the last five years, after allowing for the value of the rabbit-skins, we must have spent nearly £20,000 in this way.

And have you succeeded in reducing the number? To a very great extent. The country is better now than it has been since they became a nuisance. We are carrying more sheep now by 10,000 than we were three years ago.

Which means have you found the most effectual? The poisoning was the most effectual.

Have you tried natural enemies? Ferrets—not many.

What

What do you suggest that the Government should give during the summer months as a bonus for the skins? A bonus would certainly have the effect of stimulating the small settlers—and particularly the small men—to kill rabbits coming down on their farms. Rabbits, N.Z.

It would also act as an inducement, I imagine, to the owners of the land to proceed with killing, as they do at other times of the year? Yes; anything in that way will undoubtedly stimulate them to carry on the work they are doing. Of course, large owners must carry on the work for their own protection. Although they get their leasehold lands at a nominal rent, the rent becomes a serious matter when they have to add to it the cost of keeping down the rabbits. Although the land may be got for 3d. an acre, the cost of the destruction of the rabbits brings it up to 9d.

Mr. HIGGINS: How is the decrease with regard to the wool and lambs brought about.

Mr. M'KENZIE said that the carrying capacity of the land was reduced, and the feed eaten down by the rabbits. From one of Mr. Brydone's runs he took 244,000 skins in 1884. In 1885, after the expenditure of £7,000, he took 283,000 skins off it, making an increase of 40,000 skins in one year, after an expenditure of £7,000. Through there being no grass in the spring, the ewes had no milk and the lambs died. From the want of feed the fleeces were lightened and were therefore less valuable. That result might be considered rather singular when they remembered the last sheep report of New Zealand. It would be seen on looking through it that there had been an increase in the number of sheep last year by half a million. The colonists had however been largely improving the country, ploughing and sowing turnips, feeding them off and laying the ground down in grass. By that means the carrying capacity of the ground was improved by one or two sheep to the acre. That however did not affect the facts, although the returns of the whole Colony showed an increase in the numbers of stock. During the last two years in New Zealand, the prices of grain had been so low that a large number of agriculturists had given up grain cultivation and taken to sheep farming, which would largely increase the number of sheep in the returns. If, however, there were no rabbits in the Colony, the increase in the number of sheep would have been three or four millions, instead of half a million. The small farmers suffered very largely from the rabbits, and where the settlers had extended their holdings on to the Crown Lands, they were very much troubled with rabbits. In some cases they eat one-third or one-fourth of the crop, and he knew one case last year—a man had 100 acres of very good wheat, the part of which was not touched by the rabbits, yielding 40 bushels to the acre; out of that 100 acres, 10 acres were completely cut by the rabbits, and 30 or 40 acres more were quite destroyed. That would give an idea of the enormous losses which the farmers were suffering. He could vouch for that, as he saw the land being measured. He might say that that was the experience of all the settlers who were now going on to Crown Lands in the different settlements. Then they had to consider the enormous yearly cost of keeping the rabbits down. They had had various estimates of the cost of keeping the rabbits down. They had had the evidence of Mr. Brydone, Mr. Valentine, Manager of the New Zealand Agricultural Company, and Mr. Roberts, and it had been ascertained that the cost varied according to the nature of the country. They had it in evidence that in some cases where the land was rented at 3d. per acre, it cost 6d. per acre to keep the rabbits down, thus trebling the original rent. Then there was a large area of abandoned country in Otago, owing to the rabbits having taken hold of it. He could speak of that from his own knowledge. Many applications were also made to the Land Boards by tenants to be allowed to surrender their lands. They had tried in all sorts of ways, but without success, to get this land taken up. The Land Act had been amended so as to allow an extended time for the leases; and the policy of the department in grouping a number of small runs into one had prevented the abandonment of the back country altogether. Instead of ten years tenure the Government were giving twenty-one years tenure. The small runs which had been grouped had been offered at low prices, and in some cases they had been taken up, and in some they had not. An area of 120,000 acres had been offered for a period of twenty-one years at a nominal rental of £5, and no one would take it. At one time that land yielded a large revenue to the country; so they could understand the loss that ensued to the State. In his opinion Mr. Lance's estimate was under the real cost. Of course it was impossible for anyone to say what it actually was. He thought that Mr. Lance was within the amount when he said half a million. While he agreed with the efforts now being made to keep down the rabbits he quite agreed that every effort should be made in the way of fencing to prevent them spreading, and also to assist in their destruction and use every possible means known at the present time. He did not think that anything had yet been discovered that was a radical cure. His own opinion was that they should not give up, but should endeavour in every possible way to get some further assistance from scientific men. Until scientists said they were defeated he could not believe but that a more effectual remedy would yet be discovered. If they had to fight this pest year by year it would interfere with the progress of the Colonies seriously. People had been ruined by the rabbits already, and he was afraid they had not seen the last of it. He therefore heartily supported the motion as moved by Mr. Lance, and he was sure that the Government of New Zealand would co-operate in the matter, and would be only too glad to act with the other Colonies. He would like to correct a statement of Mr. Lance, who had stated that farmers objected to the introduction of the natural enemies of the rabbit. That was quite true so far as the localities were concerned where there were no rabbits; but where there were rabbits they would be very ready to bring in any mortal enemy of the rabbit. Mr. Meredith had asked some questions about phosphorised grain. All the remedies tried proved to be ineffectual until they got phosphorised oats. Until then they could make no headway. The phosphorised oats had been the greatest friends of the New Zealand stock owners. The plan used was to take 100 lb. of oats or wheat and put it into a boiler. They had an excellent boiler, which had been patented by a blacksmith in Otago, and which was a great saving in many ways. Before that description of boiler was brought into use they had to put the grain into a common boiler, heat the water and melt the phosphorus. It was difficult to dissolve the phosphorus. The plan adopted was to put the water into the boiler, boil the water, then put in the phosphorus, and when dissolved well, the oats, and the moment the oats were put in the fire was drawn away. There was a handle attached to the boiler which turned a number of scrapers so that the phosphorus was distributed through the oats. 50 lb. of grain prepared in this way were equal to 70 lb. or 80 lb. prepared in the old way. If it was properly prepared every grain of it would kill. Mr. Meredith had said something about the danger of laying down phosphorised grain in grass. This was where people made a mistake. It was a mistake to lay the grain in grass, as then they could not prevent stock from eating it. The first time that he poisoned his land, he had the misfortune to have 300 ewes poisoned in one week. He engaged a man who said he had great experience in the business, with the result he had stated. What they did now was this: In every little place where there was no grass growing,

Rabbits, N.Z. growing, they laid a little of the poisoned grain. First it was laid with a teaspoon, but the sheep eat the little heaps, and now they spread it as if they were sowing. One grain was strong enough to kill a rabbit. One difficulty they had to contend with was this,—there was no law to enable the inspector of rabbits to force every person to commence poisoning at the same time. The result was that in large properties it might take the gang of men a month or two to reach from one end to the other, so that when one end was cleared a fresh inroad took place from the neighbouring runs. Now, if the inspector had power to order all to commence poisoning on the same day it would be more satisfactory. Poisoning was generally done now by an overseer. They had tried various methods. At one time they used to let contracts, and a man received so much money to do so much work. That was found to be a very bad system, and the grain was sometimes merely buried. That system had been done away with, and those who were most successful in dealing with the nuisance had the management of eradicating it themselves. The Government did it by contract under the supervision of an inspector or agents. There were an inspector and agents, the agents being under the inspector. There might be four or five agents under one inspector to see that the work was done.

Mr. TABART: What distance would that cultivated field of which you spoke be from the nearest warren?

Mr. M'KENZIE: Perhaps nine or ten chains.

Mr. TABART: How far will rabbits travel for their food backward and forward in a night?

Mr. M'KENZIE: Three or four miles. With regard to ferrets, he said that he bred them himself, and he found out that where he turned out a few ferrets he did not want rabbiters. The ferrets were easily bred, but required the attention of a person who knew their habits. They should be fed once a day on porridge and milk, and once on rabbit. They required to be kept clean, and should be bathed once a week.

Mr. BAGOT: They suffer from distemper. They are very delicate in some ways, and cannot stand a bruise. If the young are touched before they are four or five weeks old, the doe immediately kills them.

Mr. HIGGINS: How do you feed them?

Mr. M'KENZIE replied that there were two compartments in the cage, one for sleeping and one for eating. They never took their food into the sleeping compartment. The reason why so many died was that they were not kept clean. One gentleman he knew lost 200 ferrets last year from distemper. He believed that his own success was due to keeping them clean, and he bathed them once a week in soda, soap and water. After the bath they were put into a big box filled with straw, and they dried themselves in the straw. While they were being bathed their houses were cleaned out. They were trained to kill rabbits, and were then turned out anywhere. His own method was to carry them out in a little box, and give them milk and porridge for the first four or five days. They at first came back at night, but in three or four weeks they disappeared altogether.

Mr. TABART: What effect have ferrets had on the acclimatised game?

Mr. M'KENZIE: They killed it clean out.

Mr. TABART: In fact they will attack feathers before fur.

Mr. M'KENZIE said that before he turned out ferrets he lost all his game by poisoned grain, so that the thing was as broad as it was long. There were also a large number of wild pigs which were killed by eating the poisoned rabbits. Now there was hardly a pig to be seen.

Mr. HIGGINS: I suppose that is a great relief.

Mr. M'KENZIE: Oh, yes.

2. Rabbits in Tasmania.

Mr. TABART said that this question was one of the most important that there was to be dealt with in the Australian Colonies. He said so from the little experience they had had in Tasmania of that abominable pest. For the last six years their sheep had decreased in number by 250,000, and the weight of wool they were exporting by 323,000 lb. From this it would be seen that Tasmania also was suffering from the same plague which affected New Zealand and New South Wales. In Tasmania the rabbits had spread over the midland and south-western districts. These were the great breeding places for lambs, but now instead of getting 70, 75, or 80 per cent. they only got 50 or 60 per cent. consequent upon the rabbits taking all the milk producing portion of the feed.

Mr. LANCE: To what do you attribute the fact that the rabbits are not all over the island?

Mr. TABART: They have not extended sufficiently.

The CHAIRMAN: Have they extended over one-half?

Mr. TABART: Oh, yes, fully one-half. Up to the present time the Tasmanian Rabbit Act had been most imperfect, and the Government were now trying to pass a new Bill through Parliament giving additional powers and making the use of poisoned grain compulsory and simultaneous. It also provided that great power should be given to the inspectors in this way,—that where the owner did not carry out the destruction of rabbits, a Government party could be placed on the land to destroy them. A provision was made that if, after the Government party had been on the land fourteen days, he evinced a desire to use energetic measures, the Government party might be withdrawn upon the owners paying the expenses of the party for the fourteen days. The use of phosphorised grain throughout Tasmania had been most successful. One run in particular now carried 900 sheep whereas formerly in only carried 300, and during the time it only carried the smaller number the owner had two trappers employed on 1,200 acres of land. They were making a profit to the injury of the owner of the land. Since he had taken to using phosphorised grain the rabbits had greatly decreased. With reference to trapping, he thought it was most objectionable to have men employed in this work. They did not care what became of the owner as long as they made a large profit in the winter time. They could go away in the spring and summer and allow the rabbits to breed again so as to be a source of profit for the next winter. He thought that employing lads as rabbiters had a most demoralising effect on the rising generation. After lads of 10, 14, and 15 years of age had been trapping for two seasons they would do no other work. Their earnings were spent in the public-house, and the result was in all probability that they found their way to prison. Fencing in the runs had been found to be very successful, but the rabbit proof fencing was not made of wire netting, as had been proposed for use in New South Wales, but consisted of palings. It was an expensive process, and would not suit New South Wales on that account and the large expense attendant on getting the timber. They had boundary riders who had to attend to the fence and fill up the holes made by the rabbits. After they had been filled up for fourteen days or three weeks the rabbits did not attempt to burrow, but simply ran up and down the fence. That was their experience in Tasmania. He thought that the mode of destruction

tion would have to be regulated according to the means and requirements of the different Colonies. The same plan could not be used in all Colonies. In the fenced in lands numbers of owners in sandy lands were digging out the burrows, which had been found to be successful. He maintained that to narrow the rabbits in, and so limit the area over which they had spread, that fencing must be resorted to. Whatever was done to destroy the rabbits would simply cause them to be driven on to new lands, and thus spread them. Therefore, to effectually deal with the pest they would have to fence and also to use poison. With regard to ferrets, he had no experience.

Mr. LANCE: There is an absolute necessity for legislation with regard to people having live rabbits in their possession. We have found that scoundrelly rabbiters would actually trap a dozen rabbits and take them away to a new place.

Mr. TABART: By our new law we have a penalty on persons keeping rabbits or letting them loose.

Mr. TABART said that with reference to ferrets his experience was very limited. He had been an inspector since 1870. About four years ago he was riding on one of his rounds and heard a great commotion at the hut of a rabbitier. Thinking, perhaps, that the hut was on fire he galloped up, and on going to the door found an animal attacking a child. He killed it, and found it to be a large dog ferret, which would have killed the child had it been by itself.

Mr. LANCE: Rats have been known to do the same.

Mr. TABART said that with reference to legislation on the rabbit question, every country would have to adopt itself to its own circumstances. In Tasmania the Government were now asking for an increase upon the tax on sheep to be increased by one-fourth the amount so raised for the destruction of rabbits on Crown Lands. It was useless for private people to do anything while the Crown took no steps to clear its own land. On two of their properties in Tasmania some years ago, one in the south and one in the western portion of the island, the rabbits died off in a mysterious manner, and for some years not a rabbit appeared on the properties; but now they were as badly infested as ever.

Mr. TABART's Report for the year ending 30th June, 1886, on the working of the Rabbit Act in Tasmania (which had been laid on the Table on Thursday, the 30th ultimo), is to the following effect:—

THE RABBITS DESTRUCTION ACT.—*Report by Chief Inspector.*

Sir,

Office of Inspector of Sheep, Hobart, 1 July, 1886.

I have the honor herewith to furnish you with a report of "The Rabbit Destruction Act of 1882," for the year ending 30th June, 1886.

The outlook upon the serious question of rabbits' destruction is not encouraging to the Australian Colonies; it requires considerable and prompt attention, and the passing by Parliament of such stringent measures as shall compel the destruction and eradication of the pest.

I may remark that when the eradication of scab from Tasmania was enunciated by the late Hon. James White, he was looked upon as a theorist, but the successful issue proved beyond a doubt that he understood the task he proposed to accomplish, though it was deemed by many sceptical persons to be an impossibility; and so it might have been, had not the Scab Act of 1870 been repeatedly amended, with more stringent clauses inserted and enforced. These remarks, I maintain, are applicable to the present working of "The Rabbits Destruction Act;" the time has arrived for the enactment of more stringent measures with an increased staff of inspectors.

With the meagre staff at present employed in Tasmania no possible good will or can be effected, particularly when we see the want of co-operation on the part of large property holders with the Department, and when they, instead of assisting the Inspectors, place impediments and obstructions in the way of rabbits' destruction. This, in a measure, may be accounted for by the diversity of opinion expressed by holders of infested land, who are divided as to the best and most destructive methods that should be adopted. The general opinion of those who have had considerable experience, and who have watched closely the operation of the Act, in connection with the obstructive action taken by some owners of rabbit-infested land, and the want of combined action, is that the pest increases daily; this I admit.

The information to hand, taken from "The Report by occupiers" furnished up to date, clearly indicates that to effect any permanent and satisfactory results, compulsory and simultaneous poisoning, with the use of bisulphide of carbon and digging out burrows, must be the recognized modes of destruction. Many argue that with the use of phosphorised grain they cannot find the carcasses of rabbits poisoned, and at once condemn the method, asserting that if the rabbits were killed they would be found. The test is, are the traces disappearing?—if so, the number of rabbits must be reduced. Much capital is made out of the injurious and destructive effect poisoned grain has upon our native magpie, and is taken up as an argument against the use of poison, by those who do not care for this system of destruction to rabbits, and cannot be sincere in their belief, asserting that the bird is the farmer's friend, and destroys worms, grubs, and other insects,—and there is no disputing this point; but yet these gentlemen maintain the magpie is a grain-eater, consequently a destructive bird to the farmer, unless his discrimination is so great that he would rather commit suicide than eat the grain the farmer sows for seed.

Upon referring to "The Handbook of the Birds of Australia," by John Gould, Esq., F.R.S., whose authority cannot be denied upon this subject, he says:—"The magpie's food consists of grasshoppers and other insects, to which berries and fruit are added when procurable."

The use of bisulphide of carbon as a destroying agent for rabbits has been fully tested by a few practical men last season, who are much gratified with its destructive powers. In one instance twenty-five rabbits and rats were taken dead out of the burrow; snakes have also been destroyed by the deadly fumes of the carbon. Those who have used carbon are much impressed with the desirability of using it in the breeding season. The labourers employed for this method should be careful and reliable men.

Trapping, as a means of extermination is, I contend, most objectionable; the more I see and hear of this practice the more convinced I am that the system is bad. At the present time trappers will not work at the rate now offered, from 1s. to 1s. 3d. per dozen for skins, but will allow rabbits to increase unless owners or occupiers engage them to trap at so much per week. In my Report of 1885 I asserted trapping was taken as an occupation by those who wished to be under no control, and only trap so long as the work is reproductive, as has been proved this season; who will liberate young rabbits as unprofitable on account of the lesser money value on their skins; who do not care for the interests of the owner

of

Rabbits,
Tasmania.

of the estate upon which they are working (being rovers for this employment); who will only reduce rabbits to a certain limit, taking care to leave numbers to propagate, making these estates a source of profit for the following season. Another most objectionable feature is that trapping drives rabbits into country not previously occupied, also into the unoccupied Crown Lands; hence the Government are blamed for having lands, warrens, and feeders for the surrounding private holdings,—which I assert is not the case. Trapping has a most seriously demoralizing influence upon the rising youth of Tasmania, who naturally embrace an employment that enables him to go or come at will or, in other words, to be his own master.

The natural enemy of the rabbits I look upon as a thing of the past, but trust the Government in Tasmania will pause before they adopt the course of action New Zealand has, I think, injudiciously followed for rabbits' destruction, viz., the introduction of ferrets, weasels, stotes, and polecats. Granted they will destroy numbers of rabbits, it yet has to be proved whether these animals will not turn their attention to sheep and lambs; we know their appreciation for hen-roosts and all feathers, which I maintain they will attack before fur.

I am very strong in my belief that eventually, to cope with this increasing pest, rabbit-proof fencing will have to be erected. In the case of small holdings it might be constructed by a combination of owners in groups, so as to embrace areas of from 6 to 15 square miles; fencing of this description has been erected by some of the midland proprietors with good effect. When constructed the property so embraced is safe from the inroad of rabbits, and the operation of extermination can be carried on with greater chance of success within the limited extent so protected. Care must then be taken to prevent rabbits from burrowing into these enclosures. In the case of large estates each owner could completely isolate his property. This process would entirely do away with the ill-feeling that now exists as to who are the rabbit breeders.

In consequence of the rabbit pest being such a serious evil and loss to the Colony, I trust that the Government will see fit to admit wire netting for rabbit-proof fencing, phosphorus, phosphorising machines, and bisulphide of carbon into Tasmania free of duty. I believe many holders of land would avail themselves of the concession, and erect netting fence as a block against rabbits.

I must again suggest that section 6 of "The Rabbits Destruction Act, 1882" be repealed, and an Amended Act passed with a clause making the use of poisoned grain and bisulphide of carbon compulsory and simultaneous (from a date to be named), to be continued with other means such as the Department recommends to be followed.

More power must be conferred upon inspectors under the Act; provision must be made compelling negligent owners or occupiers to destroy rabbits. When an inspector finds that an owner or occupier is not using sufficient means to cope with the pest, he shall at once serve a notice insisting that more active means be taken to destroy rabbits; if the occupier or owner fails within seven days to carry this into effect, an inspector shall have power to employ men and destroy rabbits on the property mentioned in the notice, at the cost and risk of the owner or occupier.

The insertion of a clause equivalent to the 14th section of "The Education Act, 1885," (49 Vict. No. 15), to provide against objectionable action being taken when inspectors are laying informations, as has been the case within certain municipalities, is absolutely necessary to facilitate the working of the Department.

Under these circumstances I consider I am justified in asking that compulsory and simultaneous poisoning, with the use of bisulphide of carbon and digging out burrows, shall become law for rabbits' destruction throughout Tasmania. This method, with an increased staff of inspectors, is absolutely necessary to secure that the work is well and truly done.

The additional inspectors required, with the rate of salaries, I will embody in my Report under the "Scab Act," as inspectors under the "Rabbit Destruction Act" are inspectors under the "Scab Act," which I propose to have renamed the "Sheep and Stock Act."

I have, &c.,

THOMAS A. TABART,
Chief Inspector.

The Hon. J. W. Agnew, Chief Inspector.

NUMBER of Occupiers adopting the various modes of destruction specified, during the six months ending 31st December, 1885.

	Total number of Occupiers.	Hunting, shooting, trapping.	Digging out.	Poison.	Fumigating.	Bisulphide of Carbon.	Men working.	Rabbits destroyed as shown by Returns.
Northern District.....	532	783	403	227	3	...	807	380,379
Southern District.....	140	195	63	47	43	...	286	107,263
Midland District.....	203	558	17	93	4	...	672	370,973
	875	1,536	483	367	50	...	1,765	858,615

NUMBER of Occupiers adopting the various modes of destruction specified, during the six months ending 30th June, 1885.

Total number of Occupiers.	Hunting, shooting, trapping.	Digging out.	Poison.	Fumigating.	Bisulphide of Carbon.	Men employed.	Rabbits destroyed as shown by Returns.
678	392	120	309	7	22	1,725	2,841,911

No reliable data is given to show how much time of the men employed was given to rabbits' destruction.
The

The Custom House Report shows the number and value of rabbit skins exported as under:—

	Rabbit skins exported.	Value.
1883...	1,735,857	£20,367
1884...	1,730,626	14,537
1885...	2,872,896	22,572

Rabbits,
Tasmania.

I herewith beg to furnish a Report of the number of prosecutions that have been instituted under the "Rabbits Destruction Act" during the past twelve months, from 30th June, 1885, up to 30th June, 1886, showing the fines inflicted in each district, with the amount:—

MIDLAND DISTRICT.

Cases tried.	Fines inflicted in each case.	Total amount.
	£ s. d.	£ s. d.
3	0 1 0	0 3 0
9	0 5 0	2 5 0
1	1 0 0	1 0 0
1	3 0 0	3 0 0
1	5 0 0	5 0 0
4 cases dismissed.	.....	.....
19	.....	11 8 0

One case was heard in this district for using insulting language to the Inspector, under "The Police Act." Delinquent fined £1 and costs.

SOUTHERN DISTRICT.

Cases tried.	Fines inflicted in each case.	Total amount.
	£ s. d.	£ s. d.
1	0 10 0	0 10 0
1	10 0 0	10 0 0
2	.....	10 10 0

NORTHERN DISTRICT.

Cases tried.	Fines inflicted in each case.	Total amount.
	£ s. d.	£ s. d.
3	0 1 0	0 3 0
4	0 5 0	1 0 0
1	0 10 0	0 10 0
1	1 0 0	1 0 0
1	2 0 0	2 0 0
1	20 0 0	20 0 0
11	.....	24 13 0

The following Table contains information furnished by Messrs. A. G. Webster & Son and Mr. C. E. Pitt, of Campbelltown:—

	Year.	Phosphorised Grain.	Bisulphide of Carbon.	Phosphorus.	Phosphorising Machines.
Messrs. A. G. Webster & Son.....	1884-5	bushels. 260	lb.	lb. 800	8
Do do	1885-6	58½	170	740	.....
Do do	1886-7	80	165	960	5
Mr. C. F. Pitt	1884	81½	196	.....	.....
	1885	72½	672	62	.....
	1886	98½	464	140½	.....

It will be seen from the above Table the large increase in the quantity of phosphorus used, which method will, I feel certain, shortly become the recognised mode of rabbits' destruction.

Mr. MEREDITH said it was very necessary that phosphorised grain should be properly prepared, otherwise it would not be effective to the extent it ought to be in the destruction of rabbits, and would be dangerous in many places. He was the first person to use phosphorised grain in Tasmania. He was led to do so by the experiments of a gentleman in New Zealand. He followed out that gentleman's plan, which was to make up the phosphorus in an open pot. With all the pains he took to dissolve the phosphorus he found that it was impossible to do it. A large quantity of the phosphorus would always fall to the bottom and precipitate in a cake. Some portions of it would ignite. He obtained his phosphoriser from Victoria. It was perfectly air and water tight. He always prepared the phosphorised oats himself. He found from experience that the proportions given by Raymond were not the best, the proportions

Rabbits,
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proportions advised by him being 6 gallons of water and 100 lb. of grain. That was half a gallon of water too much. The correct proportions were $5\frac{1}{2}$ gallons of water, 100 lb. of grain and 12 oz. avoirdupois of phosphorus. He also mixed in about 4 lb. of brown sugar with beneficial results. The water should be boiled and the phosphorus introduced, revolving the phosphoriser for ten minutes. Mr. Raymond advised two or three minutes. The sugar was then introduced, and the mixture revolved for a minute. The oats were then introduced as quickly as possible, and a little fire was kept under the boiler after the introduction of the oats. The phosphoriser should then be slowly revolved for three quarters of an hour. Then in a couple of hours the mass should be given a few more revolutions. Last of all it should receive a few revolutions two or three times during next day. The mass should be allowed to remain for forty-eight hours, and it was then ready for use. Two or three grains would then destroy a rabbit, and it was utterly impossible to ignite the driest grass with it on the hottest day. He had found that unless the phosphorus was properly mixed it was dangerous to put it near a fence or anything inflammable. If the oats were properly prepared and kept without being exposed to the air it was just as efficacious after a lapse of four months as after a lapse of a week. It might be exposed for three or four weeks and if a person put a grain in his mouth he might fancy that there was no phosphorus in it, but if he were to take the husk off he would at once notice the taste of the phosphorus which had penetrated the grain. With reference to rabbits not taking it when there was abundance of green feed, his experience was different. He had used it when there was abundance of green feed and found that it was taken largely. He had also strewn it in a growing crop of rape, and poisoned numbers of rabbits in that way. There were, he believed, no rabbits in Queensland. A discussion took place at a meeting of gentlemen in Tasmania on the best means of dealing with the pest, and some were of opinion that if rabbits were taken to a district where their natural enemies existed they could not spread. Mr. Robert Jones, a large breeder of stock, had told him of an instance of a station belonging to himself or a friend on the banks of the Ouse. The rabbits were on one side of the river and not on the other. The station was broken up and the shepherd and his wife coming to that place brought a pair of rabbits with them which were a present to the children. They did not like to kill the pets when going away and let them go to take their chance. Within fifteen years after that the rabbits were there in immense numbers. There were the Tasmanian "devil," the tiger cat, the native cat, and the tiger in that part of the country. From that small commencement the evil had extended and had become a perfect curse there. He had made a note of what happened in the Rabbit Conference, Sydney, and he saw it had been suggested that they should form an opinion as to the advisability of the Colonies using wire netting for fencing as one remedy against the pest. He thought it advisable that they should consider what was the best rabbit-proof wire netting as regards height, size of mesh, and gauge of wire. At the time that he was using phosphorus he always put it on their feeding grounds; also near to, but not on the mounds they make and frequent—about a teaspoonful—scattered thinly. When he found the feeding ground, which any man could detect, he sowed it like grain, but never put it in dabs. He might say that he had used it more sparingly than any person who had the same extent of land, and had poisoned the same number of rabbits. It struck him that he could invent a fumigator cheaper than any he had seen. Accordingly he got a large pistol, and by firing it into the burrows destroyed everything in them. In some of the burrows they found snakes, iguanas, the native cat, and the domestic cat. He must, however, caution them that if they resorted to fumigation they destroyed not only the rabbits but the natural enemies of the rabbits in the burrows. Whenever his dogs ran a rabbit into a burrow he gathered a handful of fern, grass, or twigs. He then put about two charges of powder into the pistol, rammed it down with paper, thrust his arm as far as he could up the burrow and discharged the pistol, after which he crammed the fern into the mouth of the burrow, and closed it firmly with the earth or sand which had been scratched out. He would then go on and do others in the same way, and never were those burrows opened from inside or out. Sometimes there were double or treble burrows, and where they existed he did the same at each opening, and never did a single animal come out or go in again. In Tasmania they objected to fumigation because it destroyed not only the rabbits but their natural enemies as well. He was advised to try trapping. He got four or five dozen traps, got the necessary information from old trappers, and attended to them every day. He caught more domestic cats gone wild than he did rabbits, so he abandoned trapping and fumigating. He adhered to poisoning, the result being that he cleared the place so thoroughly that, whereas once a person could get a bag of rabbits in a couple of hours within a quarter of a mile of his cultivation paddock recently, some friends went out for the whole of the afternoon with six good dogs over favourable ground. They turned up two rabbits and got one of them. Trapping and fumigating were both injurious systems to pursue, but phosphorised grain was efficacious and adapted for every place. He would suggest to those interested that in a warm climate greater precaution was required in preparing phosphorised grain. He had known phosphorised grain to be prepared in the same kind of machine as he used. It was sent for by a neighbour of his. The grain was put in a garden which had just been formed where the fowls had scratched up all his seeds. The fowls eat the grain and got fat on it, and that grain was advertised for sale as having been prepared on the Raymond system, and it was sold for the purpose of exterminating rabbits.

Mr. HIGGINS: Have you found the domestic cat destructive to the young rabbit.

Mr. MEREDITH replied that the tame cat was destructive to old and young rabbits alike. He had seen a cat hunting a rabbit like a dog. The cat chased it for fully 150 yards until it took to cover again. Generally, however, the cats laid in wait and sprang upon the rabbits. Cats would bring home a rabbit or two now and again, and it was a common thing for a cat to bring home a rabbit bigger than itself; so convinced was he of the great advantage resulting from using domestic cats that he would give another instance in point. His house was situated on the banks of a river. On the opposite side he had a neighbour, and there was a considerable amount of river growth, scrub, and other matter between their two houses where it was impossible to lay grain, from the fact that the domestic pigs and the poultry sometimes running about. It was a favourite sport of his to practice across the river, with a rifle, on the rabbits in his neighbour's garden. The rabbits used to come up to the house, and when he commenced poisoning around for a distance of a quarter of a mile he found that there were rabbits about. There was not the slightest doubt that cats had destroyed them, as now there was not one to be seen where they formally existed in hundreds. Where they existed in the cover and could not be poisoned the cats were constantly to be seen carrying rabbits about in their mouths. He had turned out a number, and they were often to be seen sunning themselves in front of the burrows. The destruction of the native enemies of rabbits was a mistake, and trapping and fumigating were unnecessary. Mr.

Mr. PARK said that tuberculosis would not kill the rabbits off quick enough. In Tasmania over 80 per cent. of the rabbits were affected with tuberculosis, and, strange to say, full-grown rabbits were sometimes found which had suffered from tuberculosis and had recovered. The marks could be seen where the tubercles had existed and had healed, the liver having become perfectly healthy. Certain parasites were supposed to have destroyed them at Shawfield and at Lewis' Neck, Cambridge, and Wellwood. The Hon. W. A. B. Gellibrand promised to get him some of the rabbits so affected, but he had been unable to do so. Mr. Cecil Parsons, a squatter in New South Wales, had told him that the rabbits in his district had exhibited signs of a skin disease, beginning at the nose and extending over the body. The rabbits actually became so brittle with the disease that they would almost snap in two like a carrot. The disease destroyed the rabbits in that district. Mr. Gellibrand had told him that it occurred mostly in the wet season. He wanted to ascertain whether the parasite was *strongylus contortus*, which was sometimes to be found in the stomach of sheep and rabbits. At Lewis' Neck there had been 1,800 sheep last year, and now they were reduced to 1,200, the remainder having died from worms in the stomach. He had the sheep drenched with turps, and no more deaths occurred. He never saw the rabbits so much infected with parasites as at Dennison, near Bothwell. Something might be done with the aid of science to exterminate the rabbits, but he had very much doubt if tuberculosis would do anything more than affect the young.

Rabbits—
Tasmania,
Victoria,
and South
Australia.

3. Rabbits in Victoria.

Mr. CURR: I have no special knowledge of what has been done with regard to rabbits in Victoria. It is not in my department.

Mr. GORDON: What is the total loss in New Zealand from rabbits?

Mr. LANCE: It costs us now half a million a year.

Mr. M'KENZIE: It has cost New Zealand 5 millions up to the present time. Teschmacker, estimated it at 10 millions.

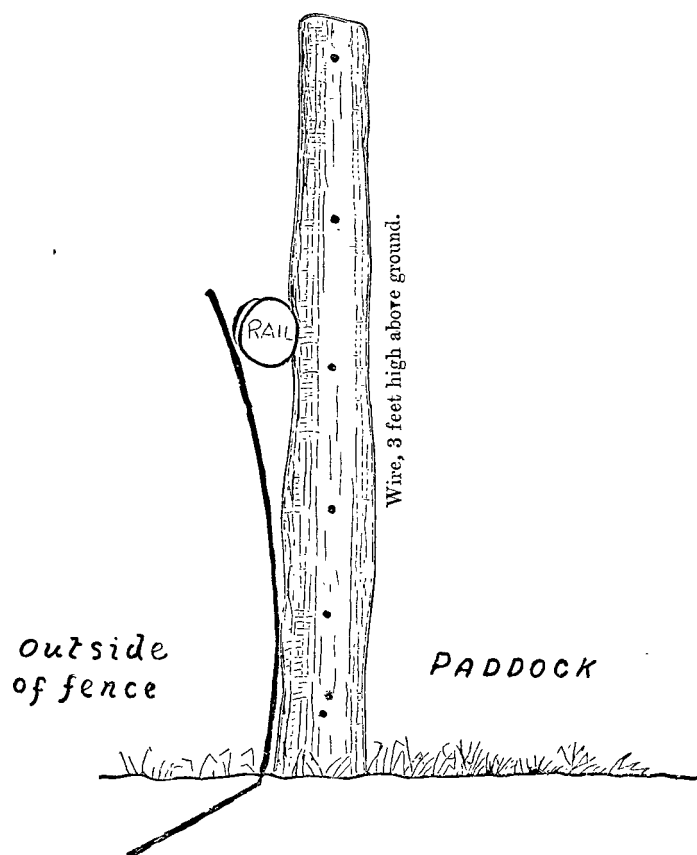
Mr. LANCE: It may be safely set down at 5 millions.

4. Rabbits in South Australia.

Mr. BAGOT said he would take the Chairman's questions as they were put. He might say, to commence, that personally he had never come into direct contact with the rabbit plague. Still, many of his friends, run owners and stockholders, were fully impressed with the terrible nature of the pest, and had felt its baneful effect on their purses. The rabbit pest formerly existed almost entirely on the best and richest lands of the Colony, but they had been eradicated almost without exception from the lands worth anything. This was effected chiefly by digging out burrows and by the destruction of the rabbits in the ways already mentioned. At the same time, he agreed with what was said by Mr. Lance and others, that the means adopted for the eradication of the rabbit had been the cause of their spreading all over the country. He believed that if South Australia had gone in for a definite system when the Colony first commenced to realise the magnitude of the evil, and the Parliament and the country had worked as industriously as individuals the evil might have been stamped out. Resolute landholders in getting the rabbits off their lands, hunted, trapped, and shot them until they spread into the worst country—into the scrub and hills—where the land was of little value. The first question was, "Are there any rabbits?" and to that he had given his answer. The second was, "To what extent have they spread?" The reply to that was, that they occupied the greater portion of the south-eastern districts, but they had been driven out of the richer portion. They had spread over the Mallee country, much of which was similar to the Wimmera district, and had spread along the Murray through the pastoral districts to the north-east to about 31 or 30 south latitude, spreading across the whole country. Probably 30,000 square miles of South Australia was infested with this rabbit pest. The third question was, "What do you estimate the annual loss to your Colony from rabbits, and the total loss?" He could not hazard a guess. He had not prepared any such information, nor did he think it would be possible for any one in South Australia to give it. The Government had not given the question any serious consideration until within the last few years. The fourth question was, "Have you legislation for the pest, and if so state its features." There had been two or three Acts passed, but they had been passed either wholly or in part as new experience came, and the main principle of the present legislation was the wholesale destruction of rabbits by landholders and stock-owners. The Government undertook to clear all lands within their control, and the other occupiers of land, whether as leaseholders or freeholders, had to destroy all the rabbits on their land. There was a department known as the Vermin Destruction Department. There was a chief inspector, and Sub-inspectors, who were pretty numerous. They were spread about the country in the different districts and it was their duty to see that the Act was rigidly carried out. They served notices on the owners in case of continued neglect. Within a certain time the owners were required to institute measures for the destruction of the rabbits, and if they continued to neglect the notice, there was a system of compulsion brought into action by which Government rabbit parties were placed on their lands, and not taken off until the rabbits were destroyed. The whole expense was charged to the landholder and was recoverable in Court in the most simple and summary way. The Government tried the system of paying scalp money, and had a fearful experience of it. Numerous instances were recorded of rabbits having been trapped, carried by persons to various distances and turned adrift in places where they could not be noticed until they had increased to such an extent as to become a positive evil. The aborigines had made pets of them and carried them about in their blankets, and it was reported when the question was under discussion, that they carried them about from camp to camp and turned them adrift. In this respect the Act was insufficient, as it only provided a penalty of £100 for turning a rabbit adrift; but such regulations always broke down, as it appeared that the act of turning the animal adrift must be proved to be wilful. In the New Zealand Act it was a penalty to possess a live rabbit, except for scientific purposes. If it were made absolutely penal to be in possession of a live rabbit except under the condition he had named, it would go far towards putting a stop to the rascally practice of turning rabbits adrift in order that they might propagate and increase in new places. The fourth question was, "How is the work of destruction done?" Every known means had been tried. The country over which the rabbits had now spread—the saltbush country—was so large that it was difficult to enforce such stringent regulations.

However,

Rabbits, S.A. However, people are beginning to realise the fact that fencing must precede all attempts to effect the actual eradication of the pest. Fencing was being largely resorted to by individuals, but there was no compulsion in the matter. The Government had done what they could in that direction by abolishing the duty on wire netting and allowing it to be carried on Government railways at a cost below that of ordinary merchandise. That was a matter which should be fairly considered by the other Governments if they had not done so already. In South Australia there had been a duty of 30s. a ton on wire netting, which was abolished. Bisulphide of carbon was largely used, and they had a factory for preparing phosphorised oats. Arsenised water was also used. The only safe way to use it was to remove the sheep from the paddocks in which it was placed, or to fence off a corner and have men and dogs near where the sheep were collected. Hunting with dogs and shooting had been discouraged, on the ground that the use of such means spread the rabbits over a larger area. Under the same Act which dealt with rabbits eagle-hawks were once destroyed, a fee of half-a-crown a head being paid by the Government, while the vermin boards in some cases increased the fee very much. The funds of the vermin destruction boards were raised by rates levied on the sheep and cattle, the maximum on sheep being £2 per thousand. That had made a large fund available in each district, and a great deal of it had been absorbed in the destruction of rabbits. They had also a good deal to do with dingoes and marsupials of all kinds, and the marsupials had been very much thinned down. The eagle-hawk was at one time destroyed under the Act. The ban had recently been removed from the eagle-hawk, it being found that though it might take an occasional lamb it destroyed an immense number of rabbits. He had seen their nests in tall trees, the ground around which was covered with rabbit bones. Wire netting was largely resorted to, as he had said. Some gentleman had asked for information as to the size of the mesh, the gauge of the wire, and the height of the netting. Formerly the first persons who used wire netting were satisfied with a height of 3 feet, 6 inches being buried in the ground. It was found that the rabbit invariably got under the wire when it was put straight down in the ground, and the consequence was that the wire was now turned out at an angle of 45 degrees on the infested side, according to the appended cut :—



Their experience was that the rabbit started to burrow a few inches back from the wire and stopped on reaching the netting. It had been found that galvanized wire netting did not stand in the earth, and in consequence they had to import wire netting in strips 6 inches in width. These strips were put down in separate pieces, and could then be replaced as it rotted away. The netting used was $1\frac{1}{2}$ -inch mesh, but the strength or gauge of the wire depended entirely on the fancy of the person who bought it. 2-inch mesh had been used, but it was found that small rabbits got through it. Two and a half feet out of the ground had been found to be insufficient. A friend of his who was interested in the matter tried an experiment to ascertain whether such netting was high enough. He had a number of rabbits put into a barn and a piece of two and a half feet netting placed across the centre with staples to secure it, so that there was no possible way of the rabbits getting from one side to the other except by climbing over. Among the rabbits were a number of yellow and black ones which were on one side and greys on the other. He put abundance of feed on one side of the netting to ascertain whether the temptation would bring them over, and he found that the yellow and black rabbits were sometimes on one side of the netting and sometimes on the other. The consequence was that all the wire netting which was now being bought was 3 feet high, and in addition to that the stockholders who had made a study of the subject put a rail on the outside of the post so as to give the wire netting an outward trend on the top. One landowner had completely surrounded his property with 3 feet 6 inch wire netting, 6 inches of it

it being in the ground, turned out a little at the top by being fixed to a rail. He was satisfied that it was absolutely effectual. The wire netting cost about £30 a mile, and the erection of it cost very little extra on a fence already constructed. The seventh question, as to how in his opinion the work of destruction ought to be carried on, he had no further suggestion to make. He would be very happy if he could, for every encouragement ought to be given to get persons of ingenious minds to invent an effectual process. The primary object should be to discover a means of destroying the rabbits when the grass was growing and was plentiful; it was easy to use poison when the feed was scarce, but the difficulty was to induce them to take the poison when they could get green feed. He thought that the value of wire netting had been proved by what had been done in South Australia, and every reasonable facility should be given to encourage people on Crown Lands to protect their holdings by the use of netting, by the Government contributing part of the cost. The last question was—"Have you any general suggestions to offer?" He could only express a hope that inventive geniuses should be stimulated by the offer of a large bonus for the discovery of some disease or something which would destroy the rabbits in its own course. He thought also that experiments, such as they had proposed in South Australia, should be encouraged as much as possible—of course under all proper precautions. He meant that they should try to introduce some infectious disease fatal to the rabbit, and not to stock or domestic animals. In Melbourne, questions were asked in the House whether steps had been taken to introduce any such disease. It was proposed to do it in South Australia under the supervision of scientific men of high attainments. It was proposed that the experiments should be carried out on an island which was situated close to Adelaide, and separated by an arm of the sea from the main land. The experiments never took place, and he thought it was a pity that circumstances interfered with the carrying out of them. The opposition of public opinion which was raised to it in New South Wales and Victoria was sufficient to deter the Ministry of South Australia from taking any further action in the matter. When the Government was urged to go on with the subject they said, "You see what a storm it has raised in Victoria and New South Wales." It was very hard to get squatters into Parliament, and only slightly interested persons had the handling of the subject. The attempted eradication of rabbits had been carried on under harsh laws, which were not effectual, and which, he was satisfied, had spread the plague. For instance, in the case of his own Colony, they could see how the newspaper correspondents kicked up a row about the introduction of this disease, and yet here was the opinion of all the delegates of the Colonies saying that the only effectual way to deal with this plague was to introduce some such disease. He thought that the Colonies should join in offering a large bonus to scientific men to produce something which would destroy this pest. The engineers, while making the Victorian border railway-line, found the rabbits a great nuisance. The rabbits burrowed into the earthworks, and interfered seriously with the work. The result was that the contractors and others interested in that part of the country urged the Government to make one side of the fence rabbit-proof, which they should have done. Then there would be one fence, from the river Murray to the neighbourhood of Border Town, from which stockholders could run their fences. They were now, in conjunction with Victoria, fencing the boundary between the two Colonies. There was no fence to the north.

The CHAIRMAN: What did the owners do after they had enclosed their runs and found rabbits inside?

Mr. BAGOT: They cleared their lands of rabbits.

The CHAIRMAN: What means did they adopt?

Mr. BAGOT: They used every means. The first thing was to root out the burrows and kill the rabbits.

5. Rabbits in New South Wales.

Mr. HIGGINS said he might state, on rising, that he was one of those who had no practical acquaintance with the rabbit. That is to say, the rabbit had not reached his part of the country, and they were very desirous of preventing it coming there. As they were aware a Conference sat in Sydney some time ago. He was present at the first Conference as a member, and was also present at the second Conference. The first idea mooted was to prevent the spread of the pest, and they desired to do everything possible in that direction. The next step suggested was to destroy it. They were of course aware that there was a Rabbit Act in this Colony. The members who attended the last Conference were unanimous with regard to the utter uselessness of that Act. If he remembered rightly, the term used towards it was "unmitigated failure," and they all cordially and thoroughly indorsed that expression. Some gentlemen were of opinion that there should be a clause in the Act making it penal for anyone to have a rabbit in his possession. He might point to the 36th section of the Act, in which it was made penal for anyone to have a rabbit in his possession in the Colony. He only stated that, as it appeared that some gentlemen present were not aware that such a clause was in our Act. Our Victorian friends (he did not know whether they were aware that that clause existed), sent dead rabbits over here, and they were hawked about Sydney as late as June, although there were bonuses on the skins, in some places as high as 5s. and 10s. It was an easy way of making money to send the rabbits over here and the skins to the interior. A newspaper found fault with him for bringing the matter under the attention of the Conference, although this clause was in force. He wrote a letter to the editor pointing out that if he knew anything of the subject he would not have written the paragraph. The outcome of it was that the Minister here some little time afterwards published an advertisement in the Gazette, but he did not know whether anything appeared in it offering rewards, or pointing out the penal clause in our Act. Since then he did not know if they brought rabbits over from Victoria. At all events, it was done through laxity in the administration of our Act. If Victoria had known the great damage that would have been done to the continent of Australia, her authorities would have taken care long ago to have the rabbits destroyed. The Conference assembled, and the leading feature was the question how to deal with this pest. They could only arrive at this conclusion after hearing the various evidence given of how the rabbit had been dealt with by the different colonies, and how the Act was administered, that our Act was administered in a very loose way. For the first year the amount of money spent in the extermination of the pest was estimated at from £70,000 to £80,000, inclusive of the taxation levied on the stockholders towards the fund for the extermination of the rabbit. Our Government subsidised the fund to a large extent. He thought that the assessment for the Rabbit Act on the pastoral people

Rabbits,
N.S.W.

was something like £40,000. The second year the expenditure was something like £104,000. The third year the expenditure was about £120,000, and it was increasing from year to year. That of course was irrespective of the private expenditure of various owners of land and lessees of runs. Therefore they would see what a terrible pest the Colony still had to cope with. The rabbit was not diminishing—rather the contrary, it was increasing; and without some miraculous thing being discovered it was not likely that its numbers would diminish. At both Conferences that had been held the members were very desirous of obtaining every possible information from outside sources. One of his own suggestions was, that the Minister should write to the Government of New Zealand, where they had larger experience than in the other colonies, and ascertain their opinion as to what should be done. The Minister, however, did not see fit to do so, and thus this Colony lost some very valuable information. If they had the valuable information given to that Conference that had been given that day this Conference would be in a different position. He took this opportunity personally, and on behalf of the pastoralists of New South Wales, of offering his best thanks to the various gentlemen from the different colonies who had given such very valuable information with regard to dealing with the pest. Mr. Holmes, son of Mr. Matthew Holmes, volunteered to give them some information, and it was placed on record in their proceedings. It was valuable, but not in any way comparable with what had been given to the present Conference. The second Conference was called together without anything being done by the Government other than the proposition to carry out one of the leading recommendations of the first Conference, namely, fencing. In the interval the matter of fencing was not gone on with. Our politics interfered with our progress to a large extent. The former Minister was a strong advocate of fencing, and did all in his power to get rid of the pest. The present Minister coincided with him on these points, and was heart and soul in favour of the destruction of rabbits. A letter was read at the previous Conference from Mr. M'Lellan, who bred ferrets largely, and that gentleman strongly recommended the introduction of them, but the only suggestion which had come to anything was the fencing. An able paper was read by Mr. Hebden, a pastoralist, residing on the Murrumbidgee, who gave it as his experience that the natural enemies of the rabbit, such as the iguana, the native cat, the tame cat turned wild, were great destroyers of rabbits, especially of the young. He had listened with great interest to the information given by Mr. Lance and Mr. M'Kenzie with regard to ferrets, and he must say that they were very lucid in their descriptions, and he thought that from what they had stated our people now possessed information which they did not possess before, and which would be very valuable. He was sorry to hear that ferrets would not live in waterless countries. Unfortunately our country was waterless in the interior, and that was where the difficulty would ensue with regard to turning out ferrets. When the second Conference met tenders were about to be decided for the rabbit-proof fencing between Bourke and Narramine. Several gentlemen thought it would be better to bring the fencing towards the Forbes district, away from the proposed original line, to between Nyngan and Narramine, and a resolution was carried to that effect. He considered that no time should be lost, and he proposed a resolution, which was carried, for a deputation to wait on the Minister to urge him to do this. Next day, however, on the Conference thinking the matter over, they came to the conclusion that it would be better not to push the matter, but to see what the wisdom of the Conference would be with regard to the subject, and he therefore withdrew the motion. Now the line of fencing was actually going where it was originally intended, and in his opinion very properly so too, as he believed that the rabbits would be outside the proposed line. Now, however, they would be within it, and he hoped that the Government would see their way to call for tenders not only for the fence from Narramine to Dubbo, but to extend it down to the Murray.

The CHAIRMAN: The Minister intends to call for tenders for this part of the line of fence, but at present he was not empowered to do so. He cannot make use of the existing fences without fresh legislation. About one-half of the Colony is now infested with rabbits, and what makes matters worse, is that they are getting into the great pine scrubs between the Lachlan and the Darling.

Mr. HIGGINS said that they occupied an area as large as the whole of New Zealand. The second Conference also recommended local boards. Several members of the Conference felt that under a squatter administration local boards would be a perpetration of the evils of the present Act. The Conference thought it would be best to have a central board to become the directing head of the local boards under the Minister, as it was felt that if the local boards had not some central control that they would act entirely for themselves. The Conference decided that the Colony should be divided into eastern and western divisions—that was the infested and non-infested districts—and run a fence between the two. They decided to continue the taxation upon themselves and out of the money so raised to pay £5,000 a year to the men in the western division to help them and get rid of the rabbits, they being subsidised by the Government and levying taxes upon themselves. The landholders would also help to maintain the barrier fence between the two divisions. That, after a good deal of discussion, was accepted, and that was how the matter stood as regards the barrier fence. One of the things proposed at the Conference was, that there should be fences within the infested district—that two or three runs should join and have a cordon of fences. He made a proposition which was not carried, that they should go further. The view he took was this: that the people who owned private lands within the infested districts should at their own cost destroy the rabbits on their lands, and that the State being a large landholder should, if they did not accept the onus altogether of destroying the rabbits, at least do so to a large extent, and also help those men in their holdings, either by the loan of money at a small interest, or else make them a great concession with regard to their leases. It was found best not to press anything of that kind. The groups of runs were decided upon. If they looked at the result of the Conference they would find that that matter was decided upon, but, with the exception, as he had said before, of this barrier fence, nothing had been done that was recommended by the last Conference. Our position was this—the rabbits were still increasing and were more numerous than ever. He was in hopes that some gentleman would have been present from the Rabbit Department who would have given valuable information of what had been done. The difficulty they saw with regard to the leases was that they would have to go back on the Land Act if they desired to do anything, and alter portion of a measure which had taken twelve or thirteen months to pass. How the Government intended to deal with the evil he did not know, but there it was, and it was increasing. Reference was made to the matter of fencing by some of the gentlemen now present in connection with the size of the wire netting. The mesh should be 1½ inch in diameter, and the wire sixteen or seventeen gauge, as the

case

case might be. The conference of delegates carried a resolution that our fences should be from 3 feet 6 inches to 4 feet high, and of this 6 inches at least should be in the ground; that was provided for the barrier fence between Dubbo and Narromine. They desired to ascertain if the rabbits climbed up the wire netting, and Mr. Walter Lamb gave them information on that point. He said he had seen the rabbits climb up the wire. If hares were hard pushed by dogs they would go right over the fence. It was desirable that the Australian Governments should offer a reward for some means, rapid in its operation, for the destruction of the pest. The reward should not be given until the thing was proved to be a success beyond all doubt.

Mr. CURR did not agree with the proposal to have the Act administered by boards. He said so, having had a good deal to do with boards. They were intelligent men, but you could not get outside men who knew as much as those who had studied a subject. With regard to scab in Victoria, until the boards got sick of it and gave it up very little progress was made towards its eradication.

Mr. MEREDITH: When we had rabbit boards in Tasmania the pest increased, because the board relied on dealing with it by bounties on the scalps and skins.

Mr. CURR: Owing to the prosecutions which took place complaints were made, "Oh! here is the inspector pursuing this man."

Mr. HIGGINS: We find that Acts are better carried where there are boards than where there are not. Nothing can be better worked than the stock and pastures boards, and the result was that large numbers of kangaroos were destroyed, and the animals were becoming scarce. It is impossible for those people who administer Acts to do impossibilities.

Mr. M'KENZIE: The people in New Zealand think they can manage themselves and their own affairs better by means of boards than from Wellington.

Mr. GORDON said that all they had done in the way of coping with the rabbit pest in Queensland was to put a fence on the border. At first it was proposed that there should be parallel fences. Now they had a single line of fencing. At the public crossings there were paddocks a mile square for the purpose of catching those rabbits which might pass the barrier. The netting was sunk 6 inches into the ground perpendicular. With regard to the destruction of marsupials, he believed that it was he who made a feature of the bonus system, and now he was disgusted with it. While the marsupials were plentiful it worked well, but not so when their numbers were thin. The only thing to do was to repeal the Act allowing persons to keep rabbits.

The CHAIRMAN said ours is almost a copy of the New Zealand Act, and the leading provision of that Act is that the owner of the land shall be compelled to clear it of rabbits. He went on to say that while the New South Wales Government paid from the Consolidated Revenue a considerable portion of the money expended in the destruction of rabbits, the principle first acted on was this, that the landholders should be treated liberally, but that if they were not at first inclined to kill the rabbits off with reasonable dispatch the continued expense to which they were put would be sufficient to compel them in the long run to do good work. It was, however, found that, without fencing, when they cleared their lands fresh supplies of rabbits came from other lands, and that principle was abandoned for the bonus system. Under that system, although not a good one, they had killed a great many rabbits, and through the liberality of the Government in giving bonuses there were comparatively few in the infested country, but they had now spread over a large area. With fencing and other effective work, however, they hoped to overcome the pest, especially as the delegates from the Eastern Division at the recent Rabbit Conference had made such a liberal offer of assistance. They offered that, if the Government put up a barrier line between the infested and the uninfested country, they would double it by enclosing the runs along the barrier line with rabbit-proof fences, and they guaranteed that no rabbits would be allowed to exist on the eastern side. They had, therefore, fair hopes, if effect was given to the resolutions of the Rabbit Conference, of arresting the spread of the pest, and ultimately getting rid of it in New South Wales.

The CHAIRMAN laid on the table a copy of a Bill, framed by the Minister for Mines, to induce the discovery of new methods for the destruction of rabbits, and to protect all patent rights in connection with the same. The Bill is as follows:—

"WHEREAS it is expedient to induce the discoverers of new methods for the destruction or extermination of rabbits and other noxious animals to make such methods known and to provide for the protection of such methods for the benefit of the discoverers Be it therefore enacted by the Queen's Most Excellent Majesty by and with the advice and consent of the Legislative Council and Legislative Assembly of New South Wales in Parliament assembled and by the authority of the same as follows:—

"1. Notwithstanding anything to the contrary contained in any Act relating to patents or patent rights any person who has discovered any new method or process for the destruction or extermination of rabbits or other noxious animals may deposit in the Department of Mines Sydney a written description or specification with or without illustrative models plans or drawings and such description or specification shall forthwith be registered in the said department in the order of receipt and thereupon the method or process referred to in such description or specification shall be deemed the exclusive property of the person or persons depositing the same hereinafter termed the owner and any person who shall infringe pirate or use such method or process without the sanction and consent of the owner shall be liable to a penalty not exceeding _____ pounds for infringing or pirating such method or process and not exceeding _____ pounds for using such method or process without the sanction and consent of the owner.

"2. The owner of any method or process registered as aforesaid shall be at liberty to sell or transfer his property in such method or process and to have the name of the transferrer registered in the Department of Mines."

Mr. LANCE's motion was agreed to.

Gas for the Destruction of Rabbits.

The SECRETARY read the following letter from Mr. Oscar Stub, 22, Grey-street, East Melbourne, under date 27th September:—

SIR,—Enclosed I forward to you a report on my partner's invention for destroying the rabbit pest, and the *phylloxera vastatrix*, which appeared in the *Argus* of the 23rd inst. We can likewise produce a liquid which will destroy noxious plants in a wonderfully short time at a very small outlay. Any further information will be gladly given by your obedient servant,

OSCAR STUB,
The Secretary of the Stock Conference, Sydney.
The

Rabbits, &c.

The following paragraph from the *Argus* was appended to the letter:—

A new invention for the destruction of rabbits was tested yesterday afternoon in an enclosure off Grey-street, East Melbourne. The destroying agent in this system is a species of gas, the constituents of which are kept secret, but which are said to be so inexpensive that a shilling's worth of gas will kill 150 rabbits. The meter, in which this gas is self-generated, is equally economical, its construction costing only 4s. The meter, with the materials for the formation of the gas within it, is placed at the mouth of a rabbit burrow, and when the gas is generated a small pipe of India-rubber, about 2 feet in length, conveys it into the burrow. The gas gradually fills all parts of the burrow, with the result that every rabbit breathing it is asphyxiated. At yesterday's experiment several live rabbits were placed in boxes connected by a pipe with a meter, the tops of the boxes being covered in with glass to enable the spectators to observe the effect of the gas. In about six minutes the gas forced its way into the nearest box. The rabbits on first inhaling it became exceedingly vivacious, but in a few seconds they ceased jumping, and died almost simultaneously. A few minutes later the gas arrived at the second box of rabbits, and produced precisely similar results. To demonstrate that the gas was innocuous in the open air, the inventor, M. Le Blanc, removed the glass covering from one of the boxes, and held a live rabbit over the escaping gas for some time, with no perceptible effects on the animal; but as soon as he placed the rabbit inside the box and covered it in with the piece of glass the animal expired. The invention is claimed to be applicable also to the destruction of the *phylloxera* in vineyards. Its promoters are now in correspondence with the Government of New South Wales on the subject of utilising the invention for the destruction of the rabbits in that colony.

MR. LANCE: Anything of that kind will not do for New Zealand. We use ferrets, and what kills rabbits kills ferrets; so we prohibit the use of any noxious gas.

MR. TABART: I think that this mode would be ineffective in this country.

MR. TABART moved, and Mr. PETER seconded,—“That the letter be acknowledged with thanks.” The motion was agreed to.

3.—INTRODUCTION OF FOREIGN ANIMALS.

MR. MEREDITH moved,—“That the consideration of the introduction of foreign animals take precedence on the meeting of the Conference to-morrow.” Mr. BAGOT seconded the motion. The motion was agreed to.

MR. TABART laid on the table a paper containing his answers to the questions prepared by the Chairman *re* the rabbit pest.

It being half-past 4 o'clock, the Conference adjourned until 10:30 a.m. on the following day.

WEDNESDAY, 6 OCTOBER.

EIGHTH MEETING.

IX. INTRODUCTION OF FOREIGN STOCK.

1. PROTEST BY QUEENSLAND OWNERS AGAINST WITHDRAWAL OF PROHIBITION.

The following is the letter from Mr. Wilkinson, to the Chairman, on Wednesday, the 29th ultimo, forwarding protest by certain breeders in Queensland against the withdrawal of the prohibition:—

Mr. Robert Wilkinson to A. Bruce, Esq., Chairman, Australasian Stock Conference, Sydney.

Sir,

12, Spring-street, Sydney, 29 September, 1886.

I have the honor to inform you that I am in receipt of a telegram from Brisbane, instructing me, on behalf of Hon. S. Smythe, M.L.C., Hon. W. Forrest, M.L.C., Messrs. J. M'Whannell, M.L.A., J. Nelson, M.L.A., J. Stevenson, M.L.A., F. Murphy, M.L.A., Lumley Hill, M.L.A., D. Wallace, M.L.A., J. Lalor, M.L.A., E. Wemholt, and James Tyson, for themselves and other Queensland stock-owners, to signify to your Conference, and place on record their most emphatic protest against the removal, under any conditions, of the prohibition against imported stock, as they consider the benefit problematical and risk undoubted, seeing that foot and mouth disease was introduced into Victoria some time ago, and scab into New South Wales more recently. I have, therefore, the honor to request that you will be good enough to read this letter to the Conference.

I have, &c.,

ROBERT WILKINSON.

MR. VALENTINE moved, and Mr. BAGOT seconded,—“That the letter be received and the receipt of it acknowledged.”

MR. CURR moved,—“That the introduction into Australasia of all bovine, ovine, equine, porcine, caprid, feline, and canine animals from places outside of Australasia shall be prohibited, except for the purpose of introduction into Zoological Gardens,” and in doing so said that anything they had yet considered was of secondary importance to the question of the importation of foreign stock. Anything they had done with regard to diseases, rabbits, &c., were all matters to be met with in the colonies, but now they came to dealing with diseases which had not yet reached the colonies. After recalling his many years of practical experience, and the many researches he had made into the best authors of modern times, he could come to no other conclusion as to the matter of breeding. The subject was dwelt on by Darwin and other writers who were only known to the few, and many might think that his own conclusions were far fetched—that is, if they had not gone into the matter in a theoretical as well as a practical manner. One thing that seemed to be traditional in the minds of men was that England possessed all excellence in stock. There was no doubt that England did possess a great deal of excellence in stock, but how did England come to be possessed of it? In the time of the fathers of gentlemen then sitting around the table the excellence of England began in pigs, pigeons, sheep, draft horses, and all other stock except race-horses. How was it that she became so celebrated in stock that her race-horses beat the Arabs and other famous importations? How was it that this excellence with regard to horses was obtained? It could not be by importation, because the imported horses could not do a mile or a mile and a quarter in the time it was done now in England? It arose simply in this way: The breeders of horses, urged by desire of gain and aided by experience, found that the old system of selection was the best—that is to breed from horses which were winners. They found by experience that they must work on that system, and by degrees they acquired the amount of experience which they now possess. Admiral Rous, the famous racing authority, had pointed out that there was no horse in the world which could vie with the English horses in the matter of speed. Who made the short-horn cattle? That was of course only a name for them. They had gradually acquired certain qualities and the square shape by which they became recognised. Then the head and feet were small, as those were the parts which afforded least meat and naturally were wanted small. The breeders of sheep took these things into consideration, and

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in one life-time brought the Leicester cross-bred and Southdown sheep to their present perfection. Since then there had been no improvement to any great extent. He had noticed the result of the theory in many places—on the Murrumbidgee for instance in the old days. He had seen a mob of 20 or 30 horses which had developed great carrying powers, and he had asked the owner how this came about. The reply he got was that they had never been crossed with any imported horses. In the matter of work a donkey would kill a thoroughbred. The argument he was using might well be taken up with any other animal. He took horses because he understood them better than he did some other animals. The merino sheep originally came from Spain. Towards the end of the last Century they were introduced into Germany, England, America, Australia, and France. The most remarkable thing about these sheep from the point they were looking at was that they were now all different from the Spanish merino. The latter, from the climate and other causes, developed certain fine qualities of wool. No one would now introduce the Spanish merino sheep here to improve his sheep. Anyone who was well up in sheep could put his hand on a merino and say what country it came from. They now came to the point, "What is the Australian sheep?" It had developed a type of its own. No other country produced the same wool we produced, and if we began to import German, or French, or Spanish merinos and give them fair play, in five generations they would be exactly the type of sheep we have here. If that be so, what was the use of importing sheep which were different from our own, the progeny of which would become the same as ours. It might be said that stockowners would derive a temporary advantage from these importations. Suppose they did for the moment. They might gain a certain profit, but there was a certain risk. There had been an outcry now and then to open the ports, but when they were opened what occurred. When they were opened they were opened for a couple of years. Mr. M'Culloch, of Melbourne, introduced a little herd, but no second man did so. Of the principal breeders of cattle in Victoria three introduced two bulls apiece. They were of very secondary quality, nothing like what they had in their own herds. They were simply introduced by the owners so that they might say, "Oh! we have imported bulls as well as Mr. M'Culloch." In the old days of Kirk's bazaar an imported bull would fetch twice as much as a colonial bull which was a better animal.

Importation
of Foreign
Stock.

The SECRETARY, at the request of Mr. CURR, read the report by that gentleman on the dangers attending the importation of foreign stock, incorporated in a report of the Secretary of the Department of Agriculture of Victoria, 1884.

The Report is as follows:—

In dealing with this question I will begin by referring briefly to the evils we have already suffered from the importation of foreign stock into the Colonies and the risks which are inseparable from the practice.

For many years after the first introduction of the domestic animals into New South Wales they enjoyed immunity from all the contagious diseases, except sheep scab and fluke, which were brought by very early comers. How much these diseases have cost Australia cannot, of course, be ascertained. That the sum has been an enormous one there can be no doubt, and experienced persons who have thought the matter out have questioned whether, if we had back the money lost in this way, it would not pay for all the railroads we have heretofore constructed in this continent.

Subsequently, Cumberland (anthrax) gained a footing in New South Wales, committed considerable ravages, and continues to this day yearly to exact its victims in one part or other of this continent. Somewhat over twenty years ago pleuro-pneumonia was added by importation to the list of our diseases, and it is probable that the losses which the Colonies have suffered from it cannot, from first to last, be set down at less than two per cent. per annum of our horned cattle. Nor is this the only, or perhaps the greatest, evil we have experienced from that malady, for it is complained that either the disease itself, or inoculation (the remedy used) has injured the constitution and reduced the stamina of the whole of our horned stock generally.

Finally, at a later date, it is thought, tuberculosis made its appearance, and besides the gradual wastings and deaths which flow from this disease, it is a moot point amongst veterinarians whether both the flesh and milk of animals suffering from it do, or do not, give birth to consumption in the human subject. That the milk of tuberculous cows has this effect some authorities do not hesitate to assert. It is also to be remembered that there is no reason to hope that either anthrax, pleuro, or tuberculosis will be got rid of to the end of time, so that we have already reaped the consequences of importation by establishing throughout Australia three lasting and malignant preventible diseases.

Whether indeed tuberculosis is yet found in the other Colonies, I am not aware; but that it will be eventually there can be no doubt, for experience has shown that any infectious disease admitted into one Colony *cannot be prevented from spreading to the rest.*

It must further be remembered that the live stock of Europe and America has, since steam communication rendered the conveyance of animals by sea easy, suffered enormous losses from diseases which as yet do not exist in this continent. Russia alone is reported to have lost one million head of cattle during the last four years from foot-and-mouth disease, without speaking of other maladies. Other facts of the same sort might be adduced, so that it seems probable that many countries in Europe, in spite of restrictive measures and lavish expenditure by their respective Governments, must annually reckon their losses from infectious diseases by millions sterling. What would be the losses in Australia were foot-and-mouth disease, for instance, or variola in sheep to acquire a footing amongst us it is impossible to estimate.

Heretofore, to obviate the risk consequent on the introduction from time to time of a few stud animals from countries which we know are never free from diseases which have not yet obtained a footing in Australia, inspection, veterinary examination, and quarantine have been had recourse to, and in Mr. Bruce's memorandum it is proposed to continue this system (the details of which in New South Wales emanated, I believe, from himself) under regulations of additional stringency. Hence we have the fact that measures which that officer formerly held to be sufficient he now believes to be insufficient, and consequently that for the years they were in force the door was open to disease.

In Mr. Bruce's new regulations, however, I find myself bound to acknowledge that I place no more trust than in the old ones, neither do I agree with their policy, on the grounds—

- 1st. That, even if admitted to be perfect, their administration cannot be depended upon.
- 2nd. That the importation of the primest sheep or cattle from Great Britain, Germany, or other countries *in which the conditions of nature differ widely from those of Australia* is injurious instead of beneficial to our stock, and *per se* an evil.

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In support of the first of these objections it need hardly be said that what is required is positive security against the introduction of any infectious disease, and that neither inspection nor veterinary examination, before or after quarantine, can give this security, an assertion which requires no other support than the acknowledged fact that all who deal with diseases constantly differ fundamentally in their diagnoses. This unreliability of opinions, even when several experts concur in a conclusion, is well exemplified in the late outbreak of scab in Sydney, on which occasion the sheep were examined by the Chief Inspector and the Government Veterinarian in consultation, on their arrival in harbour, and frequently afterwards by one or both of these officers, during the currency of a five months' quarantine, and were on each occasion pronounced free from scab, and finally dismissed as clean, whereas we now know that they were suffering from that disease during the whole period. Further, we learn from the report of the Royal Commission which investigated the case that it recommended in future that the appointments of Chief Inspector of Stock and Government Veterinarian should be held by persons "possessed of a practical knowledge of scab; and that these officers should also inspect the sheep in consultation previous to releasing them from quarantine; and that the release of the sheep only be allowed on a certificate signed by both."

To this recommendation the Minister replied in his minute as follows:—"I quite agree with the Commissioners in the recommendation that all sheep, previous to their being admitted to quarantine, shall be examined by the Chief Inspector of sheep and a Government Veterinarian; and for the future this course will be adopted, and the Chief Inspector must be relieved of some of the duties now devolving upon him, in order that he may efficiently perform this service. I regret that I cannot agree with the recommendation that both of these officers should be men possessed of a practical knowledge of scab. Of course, such a qualification if possible would be most desirable, and would add to the efficiency of the officers in question; but as, with the exception of the late outbreak, there has been no scab in any of the colonies for many years, and it is to be hoped that we may be kept free from this infliction, it is evident that the selection of officers would be restricted to persons advanced in years, or who had visited Europe or America; unless, indeed, a depôt were formed for the maintenance of scab, in order that our youths might obtain a practical knowledge of the insect scourge; which would be very like introducing small-pox in order that medical men might, by study of symptoms, become more assured and unanimous in their opinion. These officers must also in future inspect sheep in quarantine in consultation previous to releasing them, and the clean certificate must be signed by both. A regulation to this effect should be prepared at once."

Now, what does this amount to? That sheep in New South Wales are still to be inspected, or liable to be inspected, by an officer who does not know scab, but under a new regulation; nor assuming that importation is to be persevered in, could a Minister, except from a want of knowledge, make any other reply. But I would ask, are the qualifications of these officers really to begin and end with scab? Is not the same practical knowledge of other diseases necessary? If the Minister has found it impossible, as he remarks, to find persons possessed of the requisite knowledge of scab, is he likely to be more successful when the requirements are infinitely enlarged?

Another point which strikes me as very deserving of notice in the Sydney outbreak is that very sufficient regulations for dealing with scab existed at the time. These required, amongst other things, that imported sheep should be properly and efficiently dipped, and a certificate of their freedom from scab be given. But the evidence shows that neither one nor the other of these regulations was thoroughly enforced; that the catastrophe occurred not for want of regulations, but of their enforcement. These are but a few of the facts which have convinced me that no reliance can be placed on regulations. Hence it is clear that the quarantine system is not only one of risks, and has absolutely broken down, but is one which, in the nature of things, cannot ensure freedom from risk. Now, my contention is that no preventable risks should be allowed in connection with our live stock—the great source of Australian wealth. In other words, that prohibition should take the place of importation under restrictions.

My second objection to importation is that, under our circumstances, *it is a proceeding at variance with the laws of breeding*. In this you will notice that I entirely disagree with Mr. Bruce, who sets out in his memo. that the quality of our animals has been, and must continue to be, kept up by means of imported sires. In my remarks on this point, I shall (the fundamental laws of breeding extending to all animals, and the conditions of nature in Australia being favourable alike to sheep, cattle, and horses) illustrate what I have to say by reference to the merino sheep, on the ground that we may, through the wool of this animal, test the results of Australian breeding *by reference to the London market*, which annually marks by its sales the success or failure of the steps taken by breeders with an authority which the person most inclined to dispute facts will hardly venture to call in question. I will begin by referring you to the first lines of Mr. Bruce's memorandum, in which he argues that, though there is no theoretical obstacle in the way, practically the improvements needed in our stock cannot be made in these Colonies; that our breeders of stock have not developed the capacity for establishing new and improved families of stock, and that, therefore, their success in breeding is attributable to the frequent introduction of foreign blood; that the experience of the old countries has shown that the talent in question is an exceedingly rare one.

As regards these statements, their incorrectness may be shown by calling attention to the fact that several flocks, with new and excellent characteristics, have already grown up in Australia. I will instance the Canowie flock, and Mr. Pitt's sheep on the Levels. These flocks show that breeders in Australia have both the means and knowledge necessary to produce new types when required, for none such exist elsewhere. The creation of Mr. Currie's *Lustre flock* is another instance of the same thing—of a new type of sheep of great value, brought into being without the aid of importations from abroad.

Passing to another and more important of Mr. Bruce's statements, that the quality of our stock, and hence of our wool, has been solely kept up by means of importation, it will only be necessary in disproof to call attention to the facts that the flocks of Australia at large are not the progeny of imported sires, and that yet we find by the *fiat* of London sales that the average Australian fleece has not only kept up its qualities, but has constantly been rising in the wool market of the world, in which it now holds, perhaps, the premier position. It hardly needs arguing that the mass of Australian wool-growers are, and have been for perhaps half a century, beyond the reach of importation, and that if all the foreign breeders of our national sheep, the merino, were, putting cost out of the question, yearly to ship the whole of their prime rams to our shores, they would fail to supply a tithe of our wants, and that this impossibility is daily becoming greater. Exactly the same may be said in connection with bulls. It will be argued, however, that no vast importation

importation of the sort was ever contemplated, but that what is needed is the periodical introduction from abroad of a few first-class animals into the flocks of our stud-breeders, as through their descendants their excellencies and good qualities will become disseminated through our flocks at large. My answer to this argument is a short, and I think conclusive one. It is this: If imported sheep do not transmit their excellencies through many generations, they are useless to stock-owners at large; if they do transmit their qualities, they are not wanted, as we possess already, as the result of former importations, large numbers of merinos of the purest blood and best quality. Hence it seems that the importation of merinos means the risk of disease, an enormous evil, without any adequate object.

There are other facts connected with the past of the Australian sheep, and the innate fitness of this continent for sheep-breeding and wool-growing, which should not be lost sight of.

Thus, prior to 1840, very large numbers of merino sheep of high quality, chiefly Germans, were imported into the colonies, the Circular Head Company of Tasmania alone expending £30,000 in this undertaking; but after that date, importations, then unobstructed by law, dwindled away to a number quite inappreciable, when the numbers of sheep then in Australasia are taken into consideration. But it is also since that date that the wools of our stud-flocks, and the common wools of the continent, have steadily gone on rising in the London market. Since the introduction of foreign blood into our flocks ceased, our wools have improved in quality. Nor do I look on these facts as unconnected, but in the relation of cause and effect, as the following goes to show:—

In the interval between the years 1763 and 1801 the merino, which was the product of Spain heretofore and existed in that country, alone, was introduced into Germany, England, Australia, and America. It reached Germany just thirty years before it found its way to Australia. Very shortly after this dissemination of the hitherto jealously guarded Spanish sheep, differences of type began to manifest themselves amongst its descendants, so that there quickly came to be a German merino, a French merino, and an Australian merino; their wools being held by the manufacturers as distinct articles. Some years, however, before the merino reached Australia, a number of sheep were introduced into New South Wales from Bengal. As a part of what Youatt, a leading authority on stock, says concerning them is exceedingly important in connexion with the subject of which I write, I shall take the liberty of quoting it. It is as follows:—"They had," says he, "large heads, Roman noses, and slouch ears; they were extremely narrow in the chest; they had plain and narrow shoulders, very high curved backs, a coarse hairy fleece, and tremendous long legs. This was an accumulation of bad qualities—yet such were the primitive New Holland sheep, more, according to Mr. Atkinson, resembling goats than sheep, and from such emanated all the improved flocks now in the Colony. *The climate worked wonders upon them; New South Wales seemed to be an exception to the fundamental principle of the paramount influence of blood, and the more subsidiary one of soil and climate. In the first two or three years these sheep were in a manner changed; the hair was comparatively gone, and a fleece of wool, although of no great fineness, succeeded.*"

Reading this, we are not surprised to find that our merino soon came to differ from others, nor that the merits of his descendants, pure and crossbred, should go on improving, and be spoken of by the same writer in the following terms:—"Those who are best capable of judging, and could have no temptation to deceive—the woolstaplers and manufacturers, shall here speak for themselves." Then succeed a number of extracts from evidence taken before the House of Lords, of which I quote the following:—"The qualities of the wool were originally very bad, but they all possess an extraordinary softness, which the manufacturers here so much admire, and they are sought for more than any other description of wools." Again—"There is no other wool which spins so well as the Australian; the finer description of stuff which is now manufactured is made of this wool. Whether from the climate or herbage, or both, the wool has improved in softness, and in staple too; and I have no doubt we shall shortly derive the whole of our supplies of foreign wool from that part of the globe." Again—"The Australian wools have much improved; they are decidedly preferable to the apparently slender description of German wools. They have comparatively very peculiar qualities. They have a softness and silkiness about them which, when worked into cloth, shows itself more distinctly than in the raw material of the same description." These quotations have reference to the descendants of our early Bengal sheep, crossed by the merino, the wools of which we find already *challenging those of Spain and Germany in the London market*. What Youatt extracts from the evidence before the House of Lords concerning the wool of our early merinos is as follows:—"The wool of Mr. M'Arthur has made some of the finest cloth that has ever been seen in the country." Youatt adds, of his own knowledge, "One bag of Mr. M'Arthur's wool, weighing 1 cwt., and properly sorted, sold at the unprecedented price of 10s. per lb." He had already remarked that the improvements in our wools of all sorts were the effects of climate.

Of the advantages which Australian-bred sires have over imported ones, I will give a single instance, one in which we see imported blood struggling for mastery with climate, and climate gaining the day. In Mr. George A. Brown's excellent work entitled *Sheep-breeding in Australia*, we read (p. 137) that in the celebrated Waganella stud flock, French, German, and American rams were used. That writer says, "The French, German, and American rams were used for six years, after which rams bred in the flock were used; and found to answer better. Messrs. Peppin found that their prize-takers were invariably drawn from those sheep which had the largest amount of acclimatised blood in them." And let me ask what is the explanation of this? I take it to be that when natural conditions, climate, &c., favour the production of any class of animals, the introduction of blood the product of dissimilar conditions disturbs the homogeneity which nature is striving to bring about. That such an introduction of blood is, in spite of a common pedigree a *mild cross*. The disadvantages of such crosses may be realized by remembering the fact that flocks, herd, studs, &c., which enjoy a lasting celebrity, are to a great extent inbred. Hence I look upon the importation to Australasia of European or American sheep and cattle as a backward step, as well as a dangerous practice. As regards coarse woolled sheep and animals with peculiarities which may require specialities of climate to keep up perfection, there exists as far as we can judge within the bounds of Australasia, from the perpetual snow line of New Zealand to the burning plains of central Australia, all those natural conditions which are necessary to preserve original qualities.

Before closing my report, it seems to me essential to add to what I have already advanced, a few remarks on the statement made by Mr. Bruce, to the effect that men fitted to carry on breeding in its highest form have been exceedingly rare in Europe, and quite wanting in Australia. Whilst acknowledging the merit, due to original thinking and investigation in the case of Bakewell of Dishley, and others of the same stamp,

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it seems to me that what was a rare knowledge in their day would be comparatively a common one now, having at present to guide us many excellent writers on breeding, Darwin amongst others, whom they had not. That since Bakewell's time knowledge of the laws of breeding has advanced as much as knowledge in other sciences. Hence I not only do not share Mr. Bruce's low estimate of our breeders, but I fail to understand how any one acquainted with the sheep shows of Melbourne can endorse his opinion. Neither does it seem to me probable when I see rams bought and sold at £50, £100, £1,000, up to £3,500 per head, that both buyers and sellers are not well acquainted with the science of breeding, so far at all events as concerns sheep. Again, I would ask is there any foreign rams which would compete in price with our own if submitted to auction in Melbourne? Has Germany any rams which would hold their own in our market with those of the Messrs. Gibson, of Tasmania?

Still it must not be overlooked that the pastoral wealth of a country cannot mainly rest on the efforts of a few eminent breeders, however useful and indeed necessary they may be, but must always principally depend on the use made by the ordinary breeder of the advantages at hand. In other words, natural conditions being allowed for, national success in stock rearing must always depend at last on the average knowledge which prevails on the laws of breeding. If, in conclusion, I may be permitted to offer a suggestion as to how this matter should be dealt with, I would recommend, as I have already recommended on many occasions, that as foreign importation is at present an obstacle instead of a help to good breeding in Australasia, that steps should be taken *whilst there is yet time* to avert the dangers of introducing fresh diseases by prohibiting the entrance into our harbours of vessels with foreign stock on board. In my opinion, no step short of this will confer absolute security.

So ends my original memorandum on this subject, which I have altered a good deal textually, as already said. At the time it was written it might have been thought open to argument whether quarantine was an effectual safeguard against the introduction of disease or not, but it is not so now, for it has been tried in *New South Wales, and failed, and no argument can avail against a fact.* That quarantine failed whilst carried out by an officer who may be said to have championed the system, under regulations framed by himself, and in connection with scab (a disease more easily provided against than any other) does not fundamentally alter the case, though it renders the rude refutation his argument has met with more conspicuous.

Mr. CURR went on to say that where animals were allowed into a colony in quarantine under certain restrictions every one must rely on the restrictions. Persons might say that it was easy to form such regulations as would prevent the introduction of disease. Some of these diseases took two years to incubate. There was the matter of carrying out the regulations, and to say that the officers should go through an examination, the Board, as far as his experience went, considered any advice an impertinence. When he looked back upon the past history of his own Department he saw that perhaps fifty individuals had been in the Stock Department during the last twenty years. Of these two had been sent to prison; one hanged himself; and three or four (one of whom had been a Minister of the Crown) died of drinking. These men were selected just as the Minister liked, and they had the power of saying whether stock was or was not fit to be imported into the Colony. What man would give such a power in that haphazard manner where his own interests were concerned? He did not see how the difficulty relating to importation could be got over. He had drawn up a good many regulations, and the Minister accepted them, but they all dribbled away in spite of anything he could do. A difficulty ensued about the regulations regarding the importation of dogs. The owners were informed—"There is the quarantine; you can pay £15 and have the dog quarantined for six months; any unexpended balance to be returned to you." However, one or two persons managed to evade the law, and they were summoned. In the first four cases, what did the magistrates do? The cases were heard at Port Melbourne, and the defendants were fined 1s. apiece. The fifth was, if he remembered rightly, fined £1. So that, instead of a person having to expend from £2 to £6, he paid 1s. and took his dog home. Another regulation with regard to stock was that all sheep, pigs, or cattle in a vessel which came alongside the wharves should be killed within twenty-four hours. The captains did not like this, especially with regard to their milch cows. What was the use of trying to keep disease out if cattle were to be kept so near the land? It was found also that they smuggled boars ashore. A deputation of captains waited on the Minister, and it was pointed out to him what an objection they had to their stock being killed. He informed the Minister that the stockowners of the Colony should run no risk; but the Minister decided that the beasts should be allowed to live, so the risk continued. There was an old axiom—that you cannot import stock and keep out its diseases. The Conference now had the opportunity of bringing itself before the world by announcing that the Colonies intended to protect themselves against the importation of disease. If they did take the step of keeping out foreign stock people in high stations would say that they had taken a very wise step, and that they could not breed stock to perfection if they crossed their own productions with those of other countries. Where is the perfection of English stock? They could not breed a decent beast in England unless it was housed, whereas here a beast had only to be turned out and given proper pasture and it would flourish. The Colonies did not want free trade in disease, and that must follow in the importation of stock from abroad.

Mr. BAGOT seconded the motion. He considered that the arguments put forward by Mr. CURR were practically unanswerable.

3. Mr. Wood's Amendment.

Mr. WOOD moved as an amendment—"That this Conference is of opinion that the time has arrived when the prohibition on the importation of cattle and sheep from the United Kingdom under proper restrictions may be safely removed. 2. That the Governments of Australasia be requested to give effect to the foregoing resolution."

He then read the following paper on the subject of Prohibition:—

THE subject of the Prohibition of the Importation from the United Kingdom has lately become a prominent question amongst the stock-owners in the Colony which I have the honor to represent at this Conference, and I take it to be part of my duty to present to the Conference my views on this momentous question—views which, I may observe in passing, are identical with those held by a large number of stock-breeders in Queensland.

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As this is no ordinary and every-day question that we have to attempt to decide upon I have thought it more respectful to the members of this Conference and to the public generally to put forth my ideas in the form of a paper. Importation
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And let me say first that no one is more sensible than myself of the diversity of opinion existing about this Prohibition, not only in my own Colony, but probably in all the Colonies represented at this table, and no one can be more prepared than I am to give great weight to any opinion contrary to the conclusions that myself and many others have arrived at.

I desire to express an earnest hope that out of the conflict of opinion a correct and safe decision may happily be arrived at. I think it may be taken for granted that all of us are pretty well acquainted with the history of the past twelve years as regards the closing of the Australian ports. Shortly stated, they may be said (New Zealand excepted) to have been closed for ten years and open for two years.

In 1874, the subject was carefully considered at the Stock Conference held in this city, and the outcome was a recommendation to all the Governments to the effect that importation should be altogether discontinued, and that recommendation was unanimously adopted. The recommendation was made because at that time disease was rampant amongst the herds of Great Britain, and, beyond all doubt, the imposition of the Prohibition in 1874 was a wise precautionary measure. In 1878 a better state of things having come about in Great Britain the ports (Tasmania excepted) removed the Prohibition, and importations went on until 1880. In that year, an outbreak of foot and mouth disease happening in Great Britain, Prohibition was again resorted to, and has continued in force ever since.

I have said that New Zealand did not associate herself in the Prohibition of 1874, and it is only within the last three years that New Zealand (under the threat of an embargo being placed upon her stock by the other Colonies) came into the general Prohibition then and now existing. In the years intervening between 1874 and 1883 New Zealand made considerable importations of Shorthorn, Hereford, and dairy cattle, and it is to be hoped she earned a rich harvest through her enterprise. Now, the point to be noted here is, that we have never heard of any ill consequences or outbreak of imported disease consequent upon the New Zealand importations which extended over a number of years. If that be so, why should we hesitate, now that Great Britain is entirely free from foot and mouth disease, to open our ports and allow breeders of cattle in all the Colonies an opportunity of refreshing their strains of blood and improving their herds where improvement is required.

And not only to improve and to strengthen existing herds but also to permit the introduction of valuable breeds of cattle which have never yet reached their shores.

In speaking of the question of importations from the United Kingdom it is impossible not to refer to the position taken up by American breeders. In America we are confronted with the pregnant fact that the introduction of all breeds of cattle into that country from England and Scotland has been carried on for six years past on a scale of extraordinary magnitude.

It is no exaggeration to say that cattle have been sent to America from England in thousands, and I am not aware that any untoward result has happened.

It is reasonable to suppose that considering the enormous interests involved and wrapped up in the cattle industry of the United States—interests to which our interests in Australia, so far as cattle are concerned, may be called insignificant—that the Americans would take special and peculiar precautions against the introduction and dissemination of disease by importation of stock. But it is quite clear that beyond the ordinary and usual quarantine the United States Government has not found it necessary to resort to any vexatious and prohibitory measures. The result has been a marked improvement of their immense cattle property, now amounting to about twenty-two millions of cattle, and a stimulation of their export trade in beef, which makes them the most formidable competitor that the Australasian Colonies have to contend with. And it is not America only that has been making good use of her opportunity; Canada, Mexico, and the South American States have all been making selections from the best herds of Great Britain, while Australasia has been unable to do anything. In answer to all this it may be said, and indeed it is very frequently advanced, that the cattle of Australasia are equal to any in the world. I should be the last person to say a word of depreciation of Australasian cattle. I am fully sensible of their merits, nay, in many cases of their super-excellence; but I hold that first-class herds are few in number, and that mediocrity is the general rule. I think it is the first and paramount duty of breeders of thoroughbred and grade bulls to take every conceivable care that no sire shall be sold for the purposes of commercial cattle without being quite sure that the animal he sells goes forth to do good and not harm, to beget sound and robust stock endowed with quality and early maturity, and fitted to cope with the many vicissitudes inseparably connected with the pursuit of grazing in Australia. But without the privilege of changing his blood, and introducing fresh strains when necessary, the breeder has set before him a difficult and well nigh impossible task.

As with beef stock so it is and in a greater degree with dairy stock. If there is one industry more than another in Queensland which needs development, and which, combined with agriculture round the centres of population would become extremely profitable, it is that of dairying in an intelligent way. In Queensland the dairy stock as a rule are not good; the product is extravagantly dear, and at times hardly procurable. Importations of dairy stock from England, Scotland, the Channel Islands, and the Continent of Europe will greatly stimulate and encourage this important pursuit. I am not one of those who hold too lightly the possible risks and dangers of foreign importation, and I recognize and accept the responsibility attaching to the advocacy of this cause. That there is a certain amount of risk attending every human undertaking I think we all must agree to, but to my mind the accruing benefits of doing away with this restraint are so numerous and so valuable to Australia as a pastoral country, that it is worth the risk. And I am strongly of opinion that the risk may, by proper precautionary measures, be brought into a very small compass, if not extinguished altogether.

Mr. WOOD went on to say that the Queensland breeders objected to prohibition for two reasons: the first was that they desired to import stock, and the second was that they considered that the present disability had no business to exist at all. To show their faith in the introduction of fresh strains into their herds stock-owners had gone to the herds of Victoria, South Australia, and to New Zealand, where stock had been most recently imported from England. Stock that came from New Zealand was eagerly sought for at sales, and at once sold at a high price. He took it that New Zealand went on with its importation from England because the stock-owners of that colony desired to get imported blood to as large an extent as possible. In the interests of a herd of 120 pure-bred pedigree cows he was eager to

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get fresh imported stock, and he went to New Zealand, and got the offspring of the celebrated "Lord Wilton." By that means he obtained for the Colony a strain of the best Hereford blood in the world. He would have preferred to have secured the celebrated bull "Chippendale," but was unable to do so. He desired as shortly as he could to review what importation had done for the colonies in the past. In Victoria it has built up the valuable and splendid herds of Messrs. Moreton, C. B. Fisher, M'Culloch, Neil Black, M'Dougall, and Horwood. It has created in New South Wales the famous herds of Dr. Jenkins, the Messrs. Dangar, Woodhouse, White Bros., Nowlan, Loder, Reynolds, and Wyndham; while in Queensland it had been the nucleus of the herds of Messrs. Archer, the M'Connells, Marshall and Slade, and Macaush. He could see no reason, if this prohibition were removed, why fresh and valuable herds should not spring into existence. With regard to the remarks that fell from Mr. Curr, concerning the importation of sheep and the formation of a distinct type in Australia, he agreed with a great deal of what was said, but a proper stock was required to begin with. It would be a very tedious proceeding to build up from the present stock. There were one or two valuable breeds of cattle in England to which he would specially refer. Take, for instance, the Norfolk polls. He did not think there were any in Australia, yet they were one of the best beef producing class in England. Then there were the Angus polls. There were very few of them here, and there was only one herd in the whole of Australia. With regard to Herefords, he might say that they had made a great impression on breeders as being good beef producers, but, unfortunately, it was difficult to obtain any fresh Hereford blood. The Messrs. Robertson in Victoria had a herd, but it was sold, and the animals dispersed. There were two or three herds in New South Wales, and to show how eager the stock-owners of this Colony were to refresh their strains of blood, they took advantage of the lapse of the prohibition here by effluxion of time, to introduce two or three imported bulls from England. They made arrangements so that the bulls came in before the renewal of the prohibition. He was aware that a number of people denied the efficacy of fresh importation. Some said that the cattle of Queensland were equal to any in England, and some said they were better. He dissented altogether from those opinions. There were others who said that the risk of disease was so great that importation should not be thought of. The question could be put into a very small compass, whether sheep, cattle, and swine could be imported from the United Kingdom with little or no risk of disease being imported also. If so, then by all means let them come. Should they continue to oppress the great pastoral industries of the Colonies by continuing this vexatious prohibition, or do away with it, and thus advance the industries, the welfare of which had been in some measure committed to their care.

MR. MEREDITH seconded the amendment, and in doing so, read the following paper:—

"The question of permitting Foreign cattle to be introduced is entirely a question that should be determined by the breeders of the Australasian Colonies.

The carefully prepared paper laid before this Conference by the Honorable the Minister of Mines, shows that the value of horses, cattle, and sheep in the various Colonies, is estimated at £78,994,871.

That the gross income on the same basis is estimated at £33,669,973, and the capital value of land with improvements and plant, and the capital value of stock represent £359,000,000.

All this 'enormous capital' belongs to the breeders and others dealing in stock, and it cannot, for one moment, be doubted that they are anxious to further increase the value of the same, neither can it be disputed that fresh blood is necessary to improve our herds and flocks, both in quality and constitution. Momentous as this question is at the present time, it is rapidly becoming more so; every year the area occupied for pastoral purposes increases, as also do the numbers of breeders and owners.

It is not only for the improvement of *merino* sheep and *short horn* or *Durham* cattle that the introduction of Foreign animals is required; but also to fully develop the new and important industries, if I may so call them, of exporting frozen meat, and the manufacture of butter and cheese, to which no doubt will soon be added that of preserved milk.

The great varieties of climate, pasture, soil, &c., should not be lost sight of in considering this question, because as the climate, pasture, &c., varies, so it stands to reason that different breeds or grades of animals will be required so as to stock parts of the Colonies with that particular class of animal best adapted for the purposes required and surrounding circumstances. I will allude to one instance in confirmation of this. A cargo of frozen mutton sent to England from either Victoria or New Zealand, composed partly of long-wooled and partly of merino sheep, upon being sold, it was found that the merinos realized much less per pound than the long-wools. Have we in the Colonies the best kind of long-wooled sheep for exporting in a frozen state?—I mean that will prove the most profitable? I am advised not. Then again we must be prepared in the future for a keen competition in the butter and cheese exportation trade. America is rapidly developing a variety of breeds of dairy cattle, as most suitable to the different States. For developing an extensive dairying business in these Colonies it will be necessary to build up herds of various kinds or grades, and we have not the material to begin with.

The objections that have hitherto been raised against the introduction of foreign animals (from England, at all events), viz., the fear of introducing foot and mouth disease, &c., ought no longer to be persisted in, because foot and mouth disease no longer exist there. It has been stamped out, and it has been, I submit, most conclusively proved that, with regulations and quarantine for six months, there will not be any risk in importing animals from England. Have not cattle and sheep for over twenty years been introduced from England successfully, with the exception of one cow, which introduced Pleuropneumonia, and a bull, "Achmet," by which Foot and mouth was introduced; and if there had been proper quarantine regulations at the time, these diseases would have been detected in quarantine, and the animals destroyed.

I know the stock breeders of Tasmania were unanimous at a meeting held by them when this subject was considered, and it must be borne in mind that there is no disease amongst the herds or flocks in Tasmania, except fluke. The very great care that has hitherto been taken by allowing only fat cattle to be landed in Hobart slaughter-yards, where they are killed, and stud animals under stringent quarantine regulations on an island in the Tamar, has been effectual in keeping out pleuro and Cumberland disease from the Australian Continent, which is only a few hours steaming distance from Tasmania, and from which we have within the last few years imported thousands of cattle and sheep during the existence of these diseases amongst the herds and flocks therein.

In the face of the evidence which has come before the Conference, with respect to the controlment of infectious disease by proper quarantine regulations, and having regard to the fact that the importation of stock

stock from this Continent to Tasmania has been going on for years without any bad results following, in spite of the existence of Pleuro-pneumonia and Cumberland diseases in Australia, I think we may be justified in assuming that the great length of the voyage, and the jealous care with which stud animals are guarded in England, ought to be a sufficient guarantee that the introduction of foreign diseases from England need not cause any very serious apprehension."

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Mr. PARK said that Foot and mouth disease had been stamped out of England since the beginning of the year. Its period of incubation was from one to eight days, and the period of quarantine thirty days. Rinder-pest incubated in from two to eight days, and it had not existed in England for fourteen or fifteen years. Rabies incubated from three to fourteen days according to Pasteur; but you all gave it, up to thirty years. Swine fever incubated in from seven to eight days; sheep scab fourteen to sixteen days. These infectious diseases could not be introduced, now that we know how to deal with them.

Mr. CURR: How about the outbreak of scab here.

Mr. PARK: Was it scab.

The CHAIRMAN: Yes, the acarus was found.

Mr. STANLEY said that when a disease broke out in England the area was quarantined. The period of quarantine for foot and mouth disease was thirty days. The retention of the prohibition must seem an extraordinary thing to the English people. He had known a bull to be seized with foot and mouth disease in a yard surrounded by dairy animals. The animal went through all the stages of the diseases surrounded by the stock, and none of the other animals took it. The bull was simply isolated in a pen. This showed that foot and mouth disease could be very easily controlled by proper regulations.

Mr. VALENTINE said he looked at this from an official point. From what had been already said by the Conference, it was evident that they should not allow the importation of stock from any country where disease had existed during the previous twelve months. They had already passed a resolution that no sheep from New Zealand should be admitted, until it had been clean of scab, for a period of twelve months. Yet, now it was proposed to admit sheep from England, where scab was rife, and where they had not been free from foot and mouth disease for twelve months. It was utterly inconsistent with their treatment of the different Colonies to open their ports at once to importation from Great Britain. If the stock of Great Britain had had no diseases for twelve months, then there could be no objection to opening our ports, as we would only run a moderate risk, and the stock would also be quarantined on arrival here. With regard to swine fever, he might state that it caused an immense loss to the farmers of England. It was a very dangerous disease, and it would be a most improper thing to admit swine from the old country. So far as foot and mouth disease was concerned, he did not look upon it as a difficult disease to cope with, but it would spread very easily if it once obtained a hold here, and we should have great difficulty in stamping it out, and that would not be done without serious loss. They should pause before they admitted stock from Great Britain, until that country had been free from disease for a certain time. So far as merino sheep was concerned, he did not think that the Colonies required their admittance from England. He had seen some of the primest sheep in France, and he certainly would not admit them to our stud flocks, as he did not consider that the French sheep were worthy of a place amongst ours. Whatever action might be taken, the Conference certainly should not recommend the admission of stock from Great Britain until the whole country had been clean for a period of twelve months if it were necessary to prohibit them from New Zealand for that period.

Mr. TABART said he took this question to be purely a stock-owners question, and if it was determined that the prohibition now existing upon foreign stock should be removed, it was then a matter for the chief inspectors of stock of the Australasian Colonies to frame such stringent quarantine regulations as would absolutely prevent the possibility of other diseases than those we now had, from being introduced, and he had come to vote on behalf of Tasmania without being hampered in any way, and he intended to record his vote in the direction which was most calculated to benefit his own Colony, and accorded with the expressed views of the stock-owners. He would vote that the existing prohibition now imposed upon the introduction of foreign stock be removed. One reason for recording his vote in the way he indicated, was, the knowledge that the introduction of new blood had been beneficial to the Colony, and he could instance the introduction of the Vermont ram into Mr. M'Farland's flock, which resulted in producing the first prize ram at the late Melbourne Agricultural Exhibition; also by the introduction into Tasmania of a Vermont ram by Messrs. W. Gibson and Son, the progeny of one of which was sold at the last annual stud sale held in Melbourne, for £500. Tasmanian blood had been introduced into New Zealand, New South Wales, Victoria and Queensland, with astounding results. The result being the production of first prize animals at the principal shows held in those Colonies, thus clearly indicating the advisability of adopting the amendment proposed by Mr. Wood, which he certainly intended to vote for.

Mr. M'KENZIE said he could not agree with the conclusions at which Mr. Curr had arrived. It was true that breeding could be improved by natural selection, but to improve the herds in that way might take a century, and even then a man might not be able to bring his flocks or herds to perfection. He did not see why they should wait for such a time when they could get the article ready-made in a short time. He thought they would be very foolish not to take advantage of the experience gained, and the perfection arrived at by their forefathers. It was impossible for any climatic influences or the nature of feed to introduce new blood into stock. New Zealand, as they had been told, had kept their ports open to the importations from the old country for a longer time than the other Australian Colonies, and they had consequently been able to improve their herds to a greater extent than the other Colonies. New Zealand could never have done so if she had not been able to fall back on the mother country for fresh stud stock. The advantages the Colony had thereby received were well known. The stock-owners could send their stock here, and sell their animals at high prices. With regard to disease New Zealand had first to import stock from Australian Colonies, and in doing so Pleuro was carried into Otago. It existed for two or three years, but by careful regulations and inoculation, they had been able to stamp it out. There was not a case of that disease now in New Zealand. The introduction of disease resulted from the introduction of stock for slaughtering. In introducing stock from Great Britain they had never introduced one case of disease. Owners of stud stock kept their animals very free from disease, and therefore there was not nearly so much risk of disease from those animals as from stock for slaughtering.

Mr. GORDON said that with regard to the question of the necessity for fresh importation, he had nothing to say, but in his official position he came into contact with all the stock-owners of his Colony, and if Great Britain were free from disease, there would not be a dozen Queensland stock-owners found

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to be in favour of prohibition. In connection with the question of disease he was prepared to accept the responsibility of dealing with it.

Mr. COOPER: If Mr. Curr's motion is carried it will exclude horses, goats, dogs, and cats.

Mr. MEREDITH: When I seconded Mr. Wood's motion I failed to hear some of the words which it contained. I was not aware that swine were included in it.

If Mr. Wood would consent to confine his resolution to cattle and sheep it would leave members more free to act.

Mr. WOOD withdrew the word "swine" from his amendment.

Mr. HIGGINS said he desired to express his regret that his friend Mr. Curr had included in his paper that which was to a certain extent personal to Mr. Bruce. He was sorry to say, having the knowledge he had of the matter, as at the time of that unfortunate calamity he (Mr. Higgins) was Chairman of the Sydney Board. Mr. Bruce had an officer who had been appointed with the thorough conviction in the minds of those who appointed him that he was a first-class man with a certificate as Veterinary Surgeon from the Royal College of Veterinary Surgeons, and that he understood animal diseases, inclusive of scab. It therefore followed that those who had the appointment, made it with the feeling that they had selected a competent man who would be able to deal with any emergency that might arise. That was the position of the late Mr. Willows. With him was associated as assistant inspector a gentleman who had had the misfortune to get all his sheep scabbed, and had to go through the difficulty of getting them cleaned. That being so, Mr. Bruce being hampered with the administration of matters relating to water-supply and the Rabbit Act, it was impossible for him to give that attention to the matter he otherwise would have given. It must also be pointed out that Mr. Bruce placed the utmost confidence in the ability of his officer to detect scab, and thus it had happened that Mr. Bruce got into the position of being brought to book for scab having been introduced into the Colony, he being chief inspector. He was sure that it was without the slightest intention of jarring upon Mr. Bruce that this matter had been introduced, but it might have been well left out.

Mr. VALENTINE: I do not consider it as personal.

Mr. CURR denied any intention of being personal. He asked how could it be said that his remarks were personal when it had been reported in the papers, referred to in Parliament, and a Commission appointed to inquire into it. If the reference he had made came into conflict with anything which his duty called upon him to say with respect to public matters, he must be held to be exonerated from any wish to say anything disagreeable to Mr. Bruce.

Mr. HIGGINS: I think it is simply an unfortunate reference and might have been done without.

Mr. CURR went on to say that they could never get over the fact that quarantine had been found to be insufficient. He had said that Mr. Bruce was a most competent officer. If it had not been necessary for his argument to refer to the matter he would not have done so, but he wished to show that even with such an officer they had been unable with quarantine to guard against the introduction of disease. Those who knew himself were aware that he was not a rancorous man, but even if it were his own brother he would have pointed out, that notwithstanding all his zeal and competency, scab had been allowed to come into the Colony.

Mr. BAGOT: That is the only view I take of it.

Mr. CURR: I say you will not get a more competent or zealous man than Mr. Bruce, and if I had been in his place, and had been actuated with an urgent desire to keep out disease, I should have utterly failed.

Mr. HIGGINS: Mr. Curr says in his paper (and I think he will admit that I am not in any way questioning his ability), that new flocks have grown up in Australia. He uses that as an argument against the introduction of stock from foreign countries. By what means did the owners produce these types? Was it not from the introduction of imported stock?

Mr. CURR: No; it was not.

Mr. HIGGINS maintained that it was. None of our flocks obtained any excellence they now possessed except by the importation of stock from home. He would now refer to the Mudgee sheep. At all events the New South Wales breeders would admit they were an excellent type. One of the things that had raised them to their present standard was the introduction of Silesian rams about 1862. The Mudgee breeders would tell them that that was the case, and Mr. George Henry Cox had said that the flocks had been stamped by that introduction. He contended that without the importation of stock we could not stamp our flocks as they ought to be. He would now refer to that part of Mr. Curr's paper in which he said that the sheep from Bengal of an inferior type improved here, and produced wool instead of hair. If our climate worked wonders on stock, would they not admit, when remembering the improvement in such a class of animals as the Bengal sheep, that they could work wonders with the excellent stock of Great Britain. Then, again, Mr. Curr, in referring to Tasmanian stock, had asked whether Germany had any rams which would hold their own in our market with those of Messrs. Gibson of Tasmania. What was it that gave such excellence to those flocks but the importation of the Steiger rams? Young Mr. Gibson had told him that that was so. Given the conditions which Mr. Curr laid down—a good, suitable climate and lovely pastures—and we could not do better than procure the best animals possible and bring them here. Mr. Curr had stated that quarantine failed while administered by capable officers, and he had given his reasons for the great danger which there was of quarantine failing. There was no doubt that it did fail, and would fail again, under certain conditions; but could not the conditions be made such that there could be no possibility of failure. Could they not have the inspectors, veterinary surgeons, and a board of breeders acting together, who would examine stock, so that it should not be let out of quarantine until it was clean. He was quite ready to admit that there were diseases existing at home which, if they threw open their ports, might be brought here with stock. Whilst he did not go with either resolution in its entirety, he did desire to see something done. About the early part of this year, when the question of opening the ports was brought forward, the Sydney Boards desired that a deputation should wait on the Minister, with the intention of suggesting that something should be done towards the removal of the prohibition. It was thought at the meeting of the Sydney Stock Board that it would be better to send out circulars to all the boards, asking for opinions with regard to the removal of the prohibition. The circular was drawn up, signed by himself, and sent out. The Sydney Board conceived that by doing that, they would be taking the best possible means of obtaining the opinions of the stock-holders of New South Wales. There were altogether fifty-nine Stock and

and Pastures Boards in the Colony. The substance of the circular was—"Shall the prohibition be removed or not?" Out of these, fifty-two boards replied direct; one board sent in a reply which was not an answer to the question, and six boards did not reply at all. Of those which replied, twenty-eight were against the removal of the prohibition, and twenty-four were in favour of it. The numbers were, therefore, as it might be seen, very close; but he admitted that the majority were of opinion that the prohibition should not be taken off. They could not ignore that, and he, as Chairman of the Sydney Board, would not ignore it. The opinions of the Boards would influence his vote, and he intended to vote according to the opinions of the majority of the Boards. At the same time, he had also the greatest respect for the opinions of the minority.

Mr. WOOD: Were the opinions expressed by the Board, in connection with cattle or with sheep?

The CHAIRMAN: The two were submitted and answered together.

Mr. HIGGINS said that if he voted in accordance with his personal wishes and personal interests he would vote for the opening of the ports, because he believed he could do much better with his stock if he could import fresh blood from home. Although he had some excellent stock he desired to import some more, but when he looked at the result of the circular to the various boards and saw the result of their careful opinions, he felt he must bow to the majority and vote accordingly. He said this in order to justify his vote. He also took into account the fact that the twenty-four boards had men on them who must be considered, and they had spoken in favour of an intermediate course, which might be followed if some such resolution as the following were agreed to, which he moved as a further amendment:—

4. Mr. Higgins's Amendment.

This Conference is of opinion that if in eighteen months from the present time it be satisfactorily ascertained that neither foot and mouth disease nor scab has existed in England for twelve months previously, then the prohibition against the importation of cattle and sheep from that country can be removed, but with the strictest regulation.

The CHAIRMAN said that Mr. Curr had stated that he (Mr. Bruce) said there was no breeder in the Colony who had established a distinct type of sheep. Mr. Curr had misquoted him in that. He had allowed that there were breeders, such as Mr. N. Bayly, Mr. King Cox, and others in New South Wales, Mr. Currie, Messrs. Learmonth, Mr. Canning, and others in Victoria, and the Messrs. Gibson, Mr. Taylor, and others in Tasmania, who had been successful breeders, and to some extent formed distinct types. He had not made such a sweeping assertion as Mr. Curr inferred he did. All that he had done was to point out that such cases were extremely rare, and only partially successful. With respect to the improvement of Mr. M'Arthur's sheep, if Mr. M'Arthur had followed the principles laid down by Mr. Curr, and confined his endeavours to improving the long-eared Indian sheep without introducing fresh strains, the Colonies could never have been in the position they are to-day with regard to sheep and wool. It would have taken a good few centuries more to make our sheep what they are (if ever they could have been so improved in that way) had no importations of fresh blood been introduced; in fact it is absurd to suppose they could have been improved in any other way. Mr. Curr, in quoting Mr. M'Arthur's action, had therefore cut the ground from under his own feet. With respect to his motion that all animals, except for zoological purposes, should be prohibited, the exception also upset his arguments, as the animals imported for zoological purposes might introduce the infection; and we know it could easily be communicated to other animals, over a fence, as it had been on several occasions at home. With respect to tuberculosis and anthrax he believed they were brought here with the stock in early days, and so far as his reading went no part of the world was free from them. If, again, Mr. Curr's theory was sound, why do breeders go, as they constantly do, to their neighbours for fresh blood. Victorian breeders are continually buying Tasmanian rams. On the question of the withdrawal of the prohibition and the introduction of foreign animals, he said that he was, like his friend Mr. Higgins, bound by the opinions of the majority of the Boards.

Mr. CURR: Then vote for my resolution.

The CHAIRMAN: I will; but it is not because I think it is right. Because we once made a mistake here, it does not follow that we will make it again. I believe we can frame such regulations as will absolutely prevent it occurring again. I am not my own master with regard to the question at present. As the circular letter emanated from my own office, and as the opinions of the majority are to guide me, I cannot now vote against them.

Mr. MEREDITH strongly maintained that the question as to whether foreign animals should be introduced should be decided solely by the breeders. The breeders were shown in the paper laid before them by the Minister, to represent property worth £359,099,000. Did that belong to the Inspectors of Stock or to the veterinarians? The majority of the stockowners still further desired to improve their property, the value of which was rapidly increasing. In 1874 there were in the Colonies of New South Wales, Victoria, Queensland, South Australia, and Tasmania, irrespective of New Zealand and Western Australia, 723,877 horses. In 1885 there were, 1,106,444. The number of cattle in 1874 was, 5,203,352, and in 1885, 6,367,967. The number of sheep in 1874 was, 45,086,718, and in 1885, 67,529,901. This marvellous increase had taken place in eleven years, and if that were so, what might they not hope for in the future? In the seven Colonies there are 1,302,542 horses, 8,137,054 cattle, and 83,857,167 sheep. The question under discussion was therefore a most momentous one, affecting not only the present generation, but all who were to follow hereafter. The question was—"are we to plod along with this vast number of stock such as they were, or are we to open our ports to improve them, as we did in the past?" New Zealand had had a considerable advantage over the other Colonies, as it kept its ports open longer than the other Colonies. New Zealand now possessed stud stock that would take years before the other Colonies could compete with. He maintained that the breeders of all the Colonies were not represented. Victoria was only represented by her chief inspector, and the opinion of the breeders in that Colony was in favour of the removal of the prohibition. Mr. Youatt, who had been quoted by Mr. Curr, was an antiquated authority. With regard to Zoological Gardens, Mr. Curr would allow animals to come in and infect the whole Colonies, but would not allow those to enter which would be for the general benefit of the Colony. On the 12th of August, 1886, there was a meeting of stock-owners of Victoria held at the "Victoria Hotel," Bourke-street, to consider the question of the admission of foreign stock and other matters. Mr.

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A. Patterson, of Cranbourne, was voted to the chair. Mr. Graham Mitchell, who had called the meeting, explained the present stock regulations, and pointed out that the recommendations of the Select Committee, which sat a few years ago, and the recommendations of the Tuberculosis Board had received no notice from the Legislature. The existing prohibition regulations were no real protection against the introduction of disease, such as an effective quarantine system would supply. England was now free from the foot and mouth disease, and there was no longer necessity to prohibit breeders from importing cattle from the home country. Mr. H. Beattie contended that cattle and sheep could be imported to great advantage. Importation by breeders direct should be permitted under effective quarantine regulations. He moved "That this meeting considers the continuance of the prohibition of the importation of live stock from England unnecessary, as that country is now declared free from foot and mouth disease, and that a proper system of quarantine and inspection should be adopted by all the Australian Colonies." Mr. J. BELL seconded the motion, and it was carried unanimously.

Mr. MEREDITH then referred to the existence in the Colony of pleuro-pneumonia, and suggested that an effort should be made to secure Parliamentary action in the direction of compensation being given for animals slaughtered, or of rendering enoculation compulsory. He considered that the present arrangements tended to prevent the disease being imported. No action was taken in the matter by the meeting. This was the only report of a meeting of stock-breeders that he had seen, and they were in favour of the admission of stock. It seemed extraordinary, that a Colony which could send representatives here with such convenience, was not represented except by an inspector, who was dealing with things outside his province. It had been stated also by Mr. Curr that there could be no advantage from bringing in stock from abroad. How did that agree with the fact that Mr. Fisher gave Mr. Gardiner £4,000 for a bull a few years ago? He had referred already to the fact that only two diseases were known to have been imported into Victoria in the past—pleuro-pneumonia and foot and mouth disease,—and during that time he was under the impression that there were no proper quarantine regulations. At present did we not import people suffering from all sorts of diseases, and go so far as to pass a Contagious Diseases Bill, yet none of the arrivals were examined. It was a most extraordinary thing to put the beast before the human being. It was a great pity that publicity was not given long ago to this question of importation, throughout the length and breadth of the Colonies, and the breeders allowed the opportunity of meeting independently to consider it.

Mr. HIGGINS: We did that.

Mr. MEREDITH did not think they had done so. The board might be like Parliaments, and yet not be representative. Mr. Curr had also spoken of the impossibility of improving animals by fresh importations. What had America done? She had availed herself of the opportunity of importing stock, and now possessed stock superior to anything known here. Why should not that be done here? Take Queensland. That Colony always required fresh supplies of rams. They wanted a characteristic animal—one with plenty of grease in the wool, as the wool rapidly deteriorated in quality in that climate. That showed that it was absolutely necessary to build up and establish different herds and flocks for different climates and pastures. In Tasmania, at the present moment, they were most desirous of introducing polled Angus stock and other breeds to improve their dairy cattle. A member of the Conference (Mr. Valentine) said some twelve months ago—"The most important question which arises in connection with the special inquiries into the diseases of stock is the probability of the introduction of diseases by the removal of the prohibition. The question has now become a national one, and can only be dealt with by the Colonies as a whole, since the introduction of disease into any one Colony is of vital importance to all. I have carefully considered the state of disease in Great Britain, and the probabilities of foot and mouth disease being introduced by importation. As regards stud herds themselves, but little, if any danger exists. Owners of stud herds in Great Britain do not expose their valuable animals to danger any more than do our own breeders. The danger lies in the movement of such animals from the owner's property to the ship, and this is difficult to estimate. At the present time it is not great, on account of the disease being restricted to a very few centres. Precautions could be taken and the chances of infection reduced to a minimum. With no other stock on board the vessel, and the fodder being carefully selected, after undergoing the voyage, and a quarantine of ninety days on their arrival here, I believe there would be little or no risk of introducing disease.

Mr. VALENTINE: I did not advocate the removal of the prohibition. I simply said there was little or no danger after the voyage and quarantine.

Mr. VALENTINE said that in his remarks, as quoted by Mr. Meredith, he was only expressing his personal opinion. That there was a risk must always be admitted, and the question arose—was it of sufficient importance to our owners that they should seek fresh blood out of the Colonies. During his visit he had seen very valuable and beautiful animals, some of which, in his opinion, would improve our herds; but at the same time he believed there were as good animals and equal in point of breeding in Australia. Was it then desirable, with even then the slight risk of introducing such a calamitous disease, to allow the importation of stock? He considered that this important question should be decided by stock-owners themselves. If they were desirous of removing the prohibition, and did not fear the introduction of foot and mouth disease, it might be withdrawn.

Mr. HIGGINS said he wished to point out again and again that we could only take this as the expression of the stock-holders opinion. They believed that they fairly represented the opinions of the majority of the stock-holders, but it was his idea that to settle this matter a circular should be sent throughout the Colonies, to the stock-holders, containing the question, "do you vote for free importation, or do you not?" That, however, was not done. He felt that if he proposed such a course here it would put the matter aside, and defer the settlement of it. He proposed an intermediate course to meet both parties, and in this way a settlement might be effected.

Mr. COOPER: I intend to move a further amendment, that equine, bovine, ovine, feline, canine be omitted from the resolution, so that only pigs and goats be left. I am entirely unfettered by any instructions.

Mr. CURR in reply, said Mr. Higgins had stated that the stock-owners were in favour of the ports being open, but he had put forward nothing but assertion in support of that claim. He (Mr. Curr) claimed to represent the stock-holders, who had really affirmed the principle of his resolution. The meeting of stock-holders in Melbourne, which had been alluded to by Meredith, was a hole and corner affair, at which only ten or a dozen persons were present. With regard to stock in England, it had arrived at its perfection by natural selection, except in the case of horses.

Mr.

Mr. WOOD remarked that Herefords came from the Ukraine.

Mr. CURR said if that were the case, he would say "in the majority of cases" With regard to what Mr. Park had said as to there being little or no danger of foot or mouth disease being introduced by stud stock, he would ask how it was that the bull Achmet showed the disease after being imported out here. Importation
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Mr. WOOD's amendment was then put and carried by 10 votes to 8,—the voting being :—For,—New South Wales, Mr. Stanley; Queensland, all; Tasmania, all; New Zealand, all. Against:—New South Wales, Mr. Bruce and Mr. Higgins; Victoria, all; South Australia, all.

Mr. HIGGINS' further amendment was put and negatived by 12 votes to 6,—the voting being :—Against,—Victoria, Queensland, Tasmania, and New Zealand, all. For,—New South Wales and South Australia.

4. *Importation of Dogs.*

Mr. HIGGINS moved,—“That the importation of dogs be prohibited”; Mr. BAGOT seconded the motion. The motion was lost by 10 votes to 7, the voting being :—Against,—Queensland, Victoria, New Zealand, all; South Australia, 1. For,—Queensland, all; South Australia, 1; Tasmania, all; New Zealand, all.

5. *Importation of Pigs.*

Mr. HIGGINS moved,—“That the importation of pigs be prohibited.”

The motion was carried by 15 votes to 3, the voting being :—For,—New South Wales, Victoria, Queensland, South Australia, Tasmania, all. Against,—New Zealand, all.

6. *Importation of Goats and Deer.*

Mr. STANLEY moved,—“That the importation of goats and deer be prohibited, except for Zoological Gardens.” Mr. HIGGINS seconded the motion.

The motion was carried by 12 votes to 6, the voting being :—For,—New South Wales, Victoria, Queensland, Tasmania, all. Against,—South Australia, New Zealand, all.

PREPARATION OF REPORT.

Mr. LANCE moved,—“That Messrs. Cooper, Curr, Tabart, Gordon, Valentine, and Bruce, be a sub-committee to prepare the Report of this Conference, in accordance with the minutes of the proceedings.”

The motion was agreed to. The Conference then rose, on the understanding that the Committee would meet at 10 a.m. on the following day, for the preparation of the Report, and the full Conference at 2 p.m., for the transaction of other business.

THURSDAY, 7 OCTOBER.

NINTH MEETING.

Present :—Mr. A. Bruce and the full Conference.

FAT SHEEP.

Mr. COOPER's motion,—“That it shall not be necessary to dip fat sheep imported from any clean Australasian Colony to another Australasian Colony solely for the purpose of slaughter, provided that such sheep be slaughtered in accordance with the regulations of any such Colony for the slaughtering of such description of sheep,” was altered, by consent, by the words “the slaughtering of” being struck out.

Mr. COOPER, Chairman of the sub-committee, informed the Conference that the sub-committee desired to insert in Mr. Curr's third resolution the words “infectious and contagious,” so that both expressions shall be used when speaking of disease.

The recommendation was accepted.

Mr. COOPER also reported that the sub-committee desired that a resolution arrived at by them defining the term foreign, as indicating every place outside Australasia.

This recommendation was accepted.

REGULATION FOR IMPORTATION OF FOREIGN ANIMALS.

The regulations for the importation of foreign animals was then considered.

Mr. STANLEY moved,—“That all animals, except horses, to be shipped to Australasia shall be shipped from the port of London. Mr. MEREDITH seconded the motion.

Examination of Stock.

Mr. STANLEY moved,—“That the Agents-General for the several Colonies be asked to appoint one, *i.e.*, the same registered veterinary surgeon, to examine all stock intended to be exported to any of these Colonies, the veterinary surgeon to give a certificate of health to accompany the animals.” Mr. WOOD seconded the motion.

The motion was agreed to.

Ports of Admission.

Mr. WOOD moved,—“That foreign animals be only admitted at such port or ports as shall be declared quarantine ports for such animals. Mr. PETER seconded the motion.

The motion was agreed to.

Prohibition

Prohibition of infected Animals.

Importation
of Foreign
Stock.

Mr. WOOD moved,—“That the introduction by sea or land of any animals or thing infected or suspected of being infected shall be prohibited until further decision.” Mr. PETER seconded the motion. The motion was agreed to.

Admission of Horses.

Mr. WOOD moved,—“That foreign horses shall be admitted without detention, if found on inspection by a properly qualified veterinary surgeon and inspector of stock, to be free from disease.” Mr. PETER seconded the motion.

Foreign Dogs.

Mr. WOOD moved,—“That foreign dogs landed in any Australasian Colony shall be detained in quarantine, at a special place set apart for the purpose by the Government of each Colony, for a period of six months from date of arrival.” Mr. CURR seconded the motion.

Mr. PETER moved an amendment,—“That the period be three months from the date of arrival.” Mr. COOPER seconded the amendment.

The amendment was negatived by 15 votes to 3, the voting being :—Against,—New South Wales, Victoria, Queensland, South Australia, and Tasmania, all. For,—New Zealand, all. The motion was declared to be carried.

Freedom from Disease.

Mr. WOOD moved,—“That all foreign cattle and sheep intended to be introduced into any Colony shall be accompanied by the breeders' or owners' declaration as to their freedom from disease, and of their not having been in contact with infection. Mr. GORDON seconded the motion, and agreed to.

Mr. CURR moved,—“That if any foreign animals are brought to a port or place in any Australasian Colony, but are not intended to be landed, they shall be examined on arrival by an inspector and veterinary surgeon, and if found free from infectious or contagious diseases, they shall be removed to quarantine and there kept until the sailing of the vessel, or be destroyed forthwith on board; and the expense of their detention in quarantine shall be defrayed before removal from such vessel by the owner.”

Motion agreed to.

Skins of Animals.

Mr. WOODS moved,—“That the skins of all animals which may have died or been slaughtered on board any foreign vessel during the voyage and not destroyed or thrown overboard, shall be salted and securely packed in cases or casks, and shall not be landed in the Colony.” Mr. GORDON seconded the motion.

The motion was agreed to.

Declaration of Captain.

Mr. WOOD moved,—“That a declaration be obtained from the captain of the vessel as to the health of stock on board on arrival in port.” Mr. GORDON seconded the motion.

The motion was agreed to.

Destruction of Infected Animals.

Mr. WOOD moved,—“That if foreign animals are infected they shall be disposed of as the Minister directs.”

Mr. COOPER moved an amendment,—“That they be forthwith destroyed by the Chief Inspector without compensation to the owner.”

The amendment was lost by 15 votes to 3, the voting being :—Against,—New South Wales, Victoria, Queensland, South Australia, Tasmania, all. For,—New Zealand, all.

The following resolutions with respect to Foreign Stock were also agreed to :—

Foreign Cattle and Sheep, intended to be introduced into any of the Australasian Colonies, shall be taken direct from the place from which they start to the port of shipment, and if they do not travel on foot they shall be conveyed in a goods waggon and not put into any conveyance, stable, or other place where animals liable to the same diseases have been within the next preceding sixty days.

If foreign animals are intended to be landed in any of the Colonies, they shall be examined by a duly qualified Veterinary Surgeon, and by an Inspector of Stock, who shall report whether or not such or any animals on board the vessel are infected.

If foreign animals other than horses are not prohibited, and are reported to be free from infection, and if the Chief Inspector is satisfied that they are not infected, they may, after being washed and disinfected as he may direct, be landed for quarantine, on sufficient bond and guarantee.

All foreign animals found on inspection to be free from infection, shall be conveyed by water at the owner's risk and expense, and remain in quarantine for the terms respectively prescribed for the different kinds of such animals, during which they shall be kept at their owner's risk and expense, and shall be washed, dipped, and disinfected, as the Chief Inspector of Stock shall direct.

On the expiry of the term of quarantine hereinafter prescribed for such animals, they shall be examined by a duly qualified veterinary surgeon and an Inspector of Stock, on the order of the Chief Inspector.

Period of Quarantine.

Mr. WOOD moved,—“That all foreign cattle and sheep landed in any Australasian Colony shall remain in quarantine for a period of not less than ninety days.”

Mr. GORDON seconded the motion.

Mr. MEREDITH moved an amendment,—“That the period for cattle be 120 days.” Mr.

Mr. TABART seconded the amendment.

Mr. PETER moved,—“That the period be six months.”

Mr. CURR seconded the amendment.

Mr. PETER's amendment was lost by 11 votes to 7, the following being the voting:—Against,—New South Wales, Queensland, Tasmania, all; South Australia, 1; New Zealand, 1. For,—Victoria, all; South Australia, 2; New Zealand, 2.

Mr. MEREDITH's amendment was carried by 9 votes to 6, the voting being:—For,—New South Wales; Queensland, Tasmania, all. Against,—South Australia, New Zealand, all.

The motion as relating to sheep was then agreed to.

Dressings and Bath for Foreign Sheep.

Mr. WOOD moved,—“That all foreign sheep landed in the Colony shall forthwith receive three dressings with tobacco and sulphur, or with lime and sulphur, at intervals of from ten to fifteen days between each dressing; and the medicaments shall be of the strength and the bath at the temperature and for the duration prescribed in regard to imported Australian sheep.

Mr. VALENTINE moved as an amendment,—“That the number of dressings be two or more if necessary.”

The amendment was accepted by Mr. Wood, and the resolution carried, with the amendment embodied in it.

IMPORTATION OF CAMELS.

Mr. VALENTINE stated that camels were largely imported into South Australia, and they were subject to foot and mouth disease and to scab and lice, which frequently cause their death. Camels should only be landed under inspection, and those infected with foot and mouth disease should be destroyed. He moved,—“That all camels arriving by any vessel shall be inspected by an Inspector of Stock or duly appointed veterinary surgeon, and if free from disease shall be permitted to land. All camels suffering from foot and mouth disease shall be destroyed, and all camels suffering from any skin disease shall be treated in such manner as the Chief Inspector shall direct, and under his control.

Mr. BAGOT seconded the motion.

INFECTION FROM EASTERN, INDIAN, OR CHINESE PORTS.

Mr. TABART moved,—“That this Conference recommends to the Queensland, South Australian, and Western Australian Governments the desirability of exercising the greatest possible vigilance with respect to their Northern ports, to prevent the introduction of disease from Eastern, Indian, or Chinese ports.”

Mr. STANLEY seconded the motion.

The motion was agreed to.

The Conference then adjourned to the following day, the sub-committee to meet at 10 a.m., and the full Conference at noon.

FRIDAY, 8 OCTOBER.

TENTH MEETING.

Present:—Mr. ALEX. BRUCE, Chairman, and the full Conference.

Introduction of Camels.

The CHAIRMAN stated that the camels which were imported into these Colonies came from countries where disease was prevalent, and it was possible that unless precautions were taken that they would be the means of introducing disease here.

QUARANTINE FOR CAMELS.

Mr. HIGGINS moved,—“That the quarantine for camels be the same as for cattle—120 days.”

Mr. BAGOT moved an amendment,—“That the period of quarantine be thirty days.” He said that if the proposal to quarantine them for 120 days were carried it would be the means of stopping their introduction. In South Australia there were from 1,000 to 1,500 camels. Every bush police station was provided with two, and nearly all the outlying squatters had a team of from fourteen upwards. The occupants of the territory in Western Queensland used them, and in dry season the Birdsville traffic was carried on by means of those animals.

Mr. LANCE seconded the amendment.

Mr. CURR seconded the motion. He said the question was not whether camels were necessary for South Australia, but whether they were likely to import disease. As far as he knew, the period of incubation of diseases common to the ox tribe, or to camels, was the same. They had fixed the period of detention at 120 days for cattle. They were either making it too long for cattle, or too short for the camel.

Mr. HIGGINS: I would like to know whether the foot and mouth disease to which camels are said to be liable is the same foot and mouth disease as that which affects cattle. If it be so, I do not think we can safely make any difference.

Mr. STANLEY: The camel is liable to all the diseases of ruminants.

Mr. MEREDITH said that they had agreed to a certain period of quarantine, not on account of the animals, but on account of the diseases in respect to certain animals. The camels were animals which were employed in distant places, and if disease did break out through them it might be very widely spread before steps could be taken to deal with it.

The motion was carried by 11 votes to 7, the following being the voting:—For,—New South Wales, Victoria, Queensland, all; Tasmania, 2. Against,—South Australia, all; Tasmania, 1; New Zealand, all.

PERIOD OF QUARANTINE FOR CATTLE.

Mr. LANCE moved,—“That the resolution fixing the period of quarantine for cattle at 120 days be rescinded.

Mr. BAGOT seconded the motion.

The motion was negatived by 11 votes to 7, the following being the voting:—Against,—New South Wales, 2; Victoria, Queensland, Tasmania, all. For,—New South Wales, 1; South Australia, New Zealand, all.

INTRODUCTION OF FOREIGN STOCK.

The sub-committee recommended that Mr. Stanley's motion, *re* the introduction of foreign stock,—“That all animals to be shipped to Australasia shall be shipped from the port of London, be amended by the insertion of the words ‘except horses,’ after the word ‘stock.’”

The recommendation was accepted.

The motion appears in the report in the following form:—“That all animals, except horses, exported to Australasia, be shipped from the port of London.”

RUNS ON BOUNDARY LINES.

Mr. BAGOT's resolution, having reference to runs situated on the boundary lines of Colonies was altered by consent, to read as follows:—“That any stock-holder owning runs in different Colonies may, with the sanction of the Registrar of Brands, be permitted to register in each Colony the brand in use by him and registered in his name in either Colony, and that it be a recommendation of this Conference that such Colonies as have legislation on the subject should so amend the Brands Act as to give effect to this resolution.”

ASSIMILATION OF REGULATIONS.

Mr. MEREDITH moved,—“That it is desirable that regulations should be framed from the resolutions passed by this Conference, so that the regulations in each Colony may be assimilated as far as practicable, and that the necessary certificates in the interchange of Australasian stock shall be the same.”

The motion was agreed to.

DRAFT REPORT.

Mr. COOPER laid on the table the draft report of the sub-committee, and moved that it be adopted and signed by the Chairman.

The motion was agreed to.

ACKNOWLEDGMENT OF SERVICES OF CHAIRMAN AND SECRETARY.

Mr. CURR moved,—“That the Conference desires to express to the Hon. Mr. Fletcher, Minister for Mines, its appreciation of the services of the Chairman, Mr. A. Bruce, and the ability and urbanity with which the Secretary, Mr. R. Brannon, has recorded the proceedings.” Mr. Cooper seconded the motion.

The motion was agreed to.

REVISION OF REPORT.

Mr. CURR moved,—“That the Chairman and Secretary be jointly authorized to revise the report of the proceedings of the Conference, in order to correct any verbal errors in the same.” Mr. VALENTINE seconded the motion.

The motion was agreed to.

VOTES OF THANKS TO THE MINISTER FOR MINES AND MINISTER FOR WORKS.

Mr. MEREDITH moved,—“That a vote of thanks be accorded to the Minister for Mines and the Minister for Works for the kind way in which the members of the Conference coming from the various Colonies have been received.” Mr. COOPER seconded the motion.

The motion was agreed to.

Mr. MEREDITH moved,—“That a vote of thanks be accorded the Press for giving publicity to the matters coming before the Conference.” Mr. LANCE seconded the motion.

The motion was agreed to.

TRIENNIAL CONFERENCE.

Mr. WOOD moved,—“That this Conference, taking into consideration the importance of the subjects that have come before them for discussion and decision, are of opinion that an Australasian Stock Conference should be held triennially at the chief city of one of the Colonies, and they respectfully offer this recommendation to the Governments of Australasia.” Mr. LANCE seconded the motion.

The motion was agreed to.

VOTE OF THANKS TO THE VETERINARY SURGEONS.

Mr. WOOD moved,—“That this Conference accords a cordial vote of thanks to the Veterinary Surgeons who have favoured this Conference with so much varied and valuable information.”

The motion was agreed to.

Mr. COOPER moved,—“That a vote of thanks be accorded to the Chairman.” Mr. BAGOT seconded the motion.

The motion was agreed to.

The CHAIRMAN and SECRETARY having expressed thanks for the recognition of their services, the Conference terminated.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

SCAB INSPECTORS.

(INFORMATION RESPECTING.)

Ordered by the Legislative Assembly to be printed, 9 June, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 1st June, 1887, That there be laid upon the Table of this House,—

“A Return showing the number of Scab Inspectors in the Government Service, together with their names, the amount received by each, and the date of their appointments; also, the names of such officers (if any) who have shown by examination that they are capable of distinguishing a scabby sheep when they see one.”

(Mr. Wall.)

SCAB INSPECTORS.

			Rate of Salary per annum.	Date of appointment.
			£	
1	Albury	G. E. Mackay	385	7/3/84
2	Armidale	*C. J. Vyner	285	23/12/85
3	Balranald	J. M'Leod	385	18/4/67
4	Bathurst	*G. S. Smith	285	27/2/85
5	Bombala and Eden... ..	*R. W. Dawson	285	20/11/85
6	Bourke	J. Mallon... ..	285	2/5/83
7	Braidwood, Broulee, and Kiama	H. L. Mater	285	12/1/83
8	Brewarrina and Walgett	J. R. Doyle	335	29/10/80
9	Carcoar	*P. L. Smith	285	21/4/85
10	Cobar	J. Cotton... ..	310	20/3/82
11	Condoblin	R. D. Jones	360	31/8/80
12	Cooma	C. Hudson	285	14/7/82
13	Coonabarabran	A. Mackie	285	14/7/80
14	Coonamble	*T. W. Medley	285	27/5/85
15	Corowa	R. Lowes... ..	385	1/12/76
16	Deniliquin	A. M'Cullough	385	1/11/74
17	Dubbo and Cannonbar	R. G. Dulhunty	285	14/1/79
18	Forbes	*W. G. Dowling	285	6/5/86
19	Glen Innes and Tenterfield	M. J. St. Clair	285	14/12/80
20	Goulburn and Berrima	F. M. Charteris	285	7/5/67
21	Grafton and Casino	T. Bawden	125	11/12/80
22	Gundagai	D. L. Mackenzie	285	20/2/80
23	Hay and Booligal	J. A. Kieghran	385	1/11/74

*These Inspectors passed the necessary examination, as prescribed by the Sydney Stock Board of Examiners, and obtained certificates certifying to their knowledge of the various diseases, particularly that of scab in sheep.

The other Inspectors have not passed the above examination, but there is no reason to doubt their ability to detect scab if the opportunity presented itself. The reason that these Inspectors have not passed the examination referred to is that they were appointed prior to the issue of the regulation calling for examination.

RETURN—*continued.*

			Rate of Salary per annum.	Date of appointment.
			£	
24	Hume	G. Bruce	385	22/3/67
25	Ivanhoe	*J. Yeo	285	26/5/85
26	Maitland and Port Stephens	*S. Durham	285	1/7/84
27	Menindie	*J. C. W. Crommelin	335	9/7/72
28	Merrilwa	J. Roper	285	6/4/68
29	Molong	*E. G. Finch	285	1/5/85
30	Mudgee	H. Single	285	8/9/74
31	Murrurundi... ..	J. W. Brodie	185	26/2/84
32	Narandera	W. J. Elworthy	310	1/10/83
33	Narrabri and Pilliga	A. W. P. Copeman	285	25/8/76
34	Port Macquarie	J. Ducat	185	8/6/69
35	Singleton	E. Alford	285	9/4/67
36	Sydney	*E. Stanley	455	19/3/85
37	Tamworth	W. D. Dowe	285	30/4/75
38	Urana	P. R. Brett	310	10/2/82
39	Wagga Wagga	*Chas. Lyne	285	1/5/87
40	Warialda and Morce	F. W. Ridley	335	18/4/67
41	Wentworth	D. A. Morgan	385	1/11/83
42	Wilcannia	*M. J. C. Tully	285	11/4/85
43	Windsor and Picton	G. A. Cleeve	285	14/2/68
44	Yass and Queanbeyan	J. F. Turner	285	17/5/80
45	Young	C. C. Wildash	285	28/4/67
46	Moama	*Theo. Watson (assistant)	160	18/4/87
47	Sydney	*A. Welman (assistant) ...	300	2/12/86

*These Inspectors passed the necessary examination, as prescribed by the Sydney Stock Board of Examiners, and obtained certificates certifying to their knowledge of the various diseases, particularly that of scab in sheep.

The other Inspectors have not passed the above examination, but there is no reason to doubt their ability to detect scab if the opportunity presented itself. The reason that these Inspectors have not passed the examination referred to is that they were appointed prior to the issue of the regulation calling for examination.

1887.

(SECOND SESSION.)

NEW SOUTH WALES.

PASTURES AND STOCK PROTECTION ACT, 1880, AND PASTURES
AND STOCK PROTECTION AMENDMENT ACT, 1881.

(REGULATION UNDER.)

Presented to Parliament, pursuant to Act 44 Vic. No. 11, sec. 30.

Department of Mines, Stock Branch, Sydney, 22 December, 1886.

PASTURES AND STOCK PROTECTION ACT, 1880, AND PASTURES AND STOCK PROTECTION AMENDMENT
Act, 1881.

HIS Excellency the Governor, with the advice of the Executive Council, has been pleased to approve of
the following Regulation under the abovenamed Acts, which is hereby published for general information.

JAMES FLETCHER.

ANY person sending a hare out of the District in which it has been killed, shall split the near ear thereof,
from the root to the tip, under a penalty not exceeding £10.

1887.

(SECOND SESSION.)

NEW SOUTH WALES.

PASTURES AND STOCK PROTECTION ACT, 1880, AND PASTURES AND STOCK PROTECTION ACT AMENDMENT ACT, 1881.

(REGULATION No. 40.)

Presented to Parliament pursuant to Act 44 Vic., No. 11, sec. 30.

Department of Mines,
Stock Branch,
Sydney, 2nd November, 1886.

PASTURES AND STOCK PROTECTION ACT, 1880,
AND PASTURES AND STOCK PROTECTION ACT
AMENDMENT ACT, 1881.

His Excellency the Governor, with the advice of the Executive Council, has been pleased to approve of the cancellation of Regulation No. 40, of 13th January, 1882, under the "Pastures and Stock Protection Acts," together with Schedule 12 thereunder, and to substitute the following Regulation and Schedule in lieu thereof.

JAMES FLETCHER.

REGULATION 40.

Every owner of horses, cattle, or sheep, whatever the number may be, shall, between the first and thirty-first days of December in each year, make and deliver personally, or transmit by registered letter through the Post to the Inspector of Stock for the district, a return in the form of Schedule 12 hereto of the horses, cattle, or sheep owned or kept by him at the date of making such return.

SCHEDULE 12.

PASTURES AND STOCK PROTECTION ACT, 1880.

Return by owner of number of stock to Inspector.

RETURN of all Horses, Cattle, and Sheep owned or kept by in the Sheep District of and Colony of New South Wales, made this day of 188 , to the Inspector of Stock for the said District.

Name of Run.	Name and Address of Owner and of Superintendent or person in charge	Description of Stock.	Number of each description.	Brands or Marks.	*Acreage.
		Horses ...			
		Cattle ...			
		Sheep....			
		Hogs			

NOTE.—It is particularly requested that the correct Address (including Post Town) of the person making this Return may be given.
* The acreage of the entire holding, including "Freehold," "Leasehold," and "Crown Lands," must be stated.

I, , do hereby solemnly declare that the several matters and things contained in the above Return are true, to the best of my knowledge and belief.

Declared at , this day of , 188 .
Owner (or Superintendent).

N.B.—All owners are cautioned that they will render themselves liable to a penalty of £20 if they do not make their returns between the 1st and 31st days of December in each year, and that the Inspectors have been instructed to recover this penalty in every case in which it is incurred.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

PROTECTION OF STOCK AND PASTURES.

(PETITION FROM CERTAIN GRAZIERS.)

Received by the Legislative Assembly, 7 June, 1887.

To the Honorable the Speaker and the other Members of the Legislative Assembly of the Colony of New South Wales, in Parliament assembled.

The humble Petition of the undersigned graziers of the Colony of New South Wales,—

SHOWETH :—

That this Conference, representing the stock-owners of this Colony, owning ten head of cattle and one hundred sheep and upwards, has unanimously agreed on certain principles which they think should be embodied in an Act of Parliament, the principles agreed on being,—

That rates necessary for the protection of stock and pastures of the Colony should be raised by bodies locally elected by the people who are to pay assessment, and that the expenditure of the rates so raised should be made by the same locally elected bodies or boards.

That the administration of all laws relating to stock and pastures should also be by the same locally elected bodies or boards.

That the only attempt at local administration in reference to stock and pastures which has yet been made (the Stock and Pastures Protection Act now in force) has been eminently successful in every part of the Colony.

That the principle of centralization adopted in many other Acts relating to stock and pastures has been one of the chief causes of their failure.

For these reasons your Petitioners urge as strongly as possible that your Honorable House should take into consideration, and pass into law with as little delay as may be, a Bill embodying the above-named principles, and consolidating and amending the many Acts and many principles now in force relating to stock and pastures and other matters in which stock-owners are materially interested, which consolidating and amending Bill has been drawn up by this Conference, and will in due course be presented to the Minister under whose charge the stock and pastures of the Colony of New South Wales are now placed.

Your Petitioners therefore pray that your Honorable House will be pleased to take into consideration the above premises.

And your Petitioners, as in duty bound, will ever pray.

[Here follow 43 signatures.]

1887.
(SECOND SESSION.)

NEW SOUTH WALES.

IMPORTED STOCK ACT 1871, AND IMPORTED STOCK
ACT AMENDMENT ACT 1884.
(REGULATION UNDER.)

Presented to Parliament, pursuant to Acts.

Department of Mines, Stock Branch,
Sydney, 17th June, 1887.

IMPORTED STOCK ACT OF 1871, AND THE IMPORTED STOCK ACT AMENDMENT ACT OF 1884.

His Excellency the Governor, with the advice of the Executive Council, has been pleased to cancel so much of No. 8 of the Regulation of 1st July, 1886, issued under the abovenamed Act, as refers to the quarantine of Stud Sheep imported from any clean Australian Colony, and to substitute the following Regulation in lieu thereof:—

QUARANTINE OF AUSTRALIAN IMPORTED SHEEP.

The quarantine for such sheep shall only extend to such time as will admit of their being once dipped.

FRANCIS ABIGAIL.

1887.

(SECOND SESSION.)

NEW SOUTH WALES.

PUBLIC WATERING PLACES ACT OF 1884.
(AMENDED REGULATIONS.)

Presented to Parliament, pursuant to Act 14 Vic. No. 16, sec. 14.

Department of Mines, Public Watering Places, Sydney, 6 May, 1887.

PUBLIC WATERING PLACES ACT, 1884.

His Excellency the Governor, with the advice of the Executive Council, has been pleased to cancel Nos. 3, 9, and 49 of the Regulations of the 1st December, 1885, issued under the above-named Act, and to substitute the following in lieu thereof:—

3. All stock upon prepayment of the following watering charges shall be supplied with water, all persons in charge of travelling stock being required to show their travelling statements or permits. Tenants may water and depasture within their lease not more than 35 head of large stock or 200 sheep where both sheep and large stock are kept; five head of the former shall be reckoned as the equivalent of one head of the latter.

9. The charges for water which the tenant or caretaker shall collect are as follows:—

	s.	d.
Horses, per head	0	2
Cattle, per head	0	1
Sheep, per hundred or portion of hundred	1	0
Goats and pigs, per head	0	0 $\frac{1}{4}$

When water is required for domestic purposes or in bulk, the same shall be supplied at the rate of one shilling per 100 gallons.

Any other animals according to agreement between tenant or caretaker and the owner or drover.

Water Trusts.

49. Any public watering place may be placed under Trustees, subject to these Regulations and the following conditions:—

1. The number of Trustees may be three or five, as the Minister shall decide.
2. The Trustees must engage, and may discharge, a caretaker, who will be under their immediate control and direction, but his remuneration will be fixed and paid by the Government.
3. The Trustees shall see that the works, appliances, and appurtenances are kept in a thoroughly efficient state, and will, as the necessity arises, make requisition to the Minister for repairs.
4. The following charges will be made for water supplied:—

	s.	d.
Horses, per head	0	0 $\frac{1}{2}$
Cattle, goats, and pigs, per head	0	0 $\frac{1}{4}$
Sheep, per hundred and portion of hundred	0	6
Water for domestic purposes or in bulk per 100 gallons	1	0
Any other animals according to agreement with Trustees.		

5. All travellers, teamsters, and drovers entitled to obtain water at a Public Watering Place shall, on prepayment of the charges prescribed by Regulation No. 9, be equally entitled at Public Watering Places under Trustees.
6. All watering charges collected at Public Watering Places under the control of Trustees shall be paid into the Consolidated Revenue Fund.

FRANCIS ABIGAIL.



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1887.

(SECOND SESSION.)

NEW SOUTH WALES.

PRICKLY PEAR DESTRUCTION ACT OF 1886.

(ADDITIONAL REGULATION UNDER.)

Presented to Parliament pursuant to Act, 50 Vict. No. 2, sec. 23.

Department of Mines, Forest Branch, Sydney, 22 February, 1887.

WHEREAS by the Prickly Pear Destruction Act of 1886, power was given to the Governor to make Regulations for declaring how and in what manner Prickly-pear may or shall be destroyed otherwise than as provided for in the said Act, and it is expedient that such Regulations should be made: Therefore, His Excellency the Governor, with the advice of the Executive Council, has been pleased to make the following Regulation.

FRANCIS ABIGAIL.

DESTRUCTION OF PRICKLY-PEAR.

4. As an alternative to burning or burying the prickly-pear, it may be stacked in large heaps upon ground out of reach of flood or storm water, such heaps not to exceed 25 feet in width, and to be enclosed with a close paling or closely-laid log fence at least 1 foot higher than the heaped prickly-pear, but not exceeding 6 feet in height, each post to be supported with a stay outside the enclosure, the heap of prickly-pear to be closely covered with bark, palings, slabs, branches, or stones, upon which a covering of not less than 1 foot of earth is to be placed and firmly stamped down, the fence and covering on top to be made close so as to exclude light and air, openings in the sides or top through shrinkage to be made good, and any growth of prickly-pear through the sides or top of such heap to be destroyed. The covering may be opened and prickly-pear added to the heap from time to time, provided the conditions herein specified are observed. If the stack is erected upon sloping ground, a channel to be cut around the upper sides sufficiently large to carry off storm water. The whole to be kept in good order to the satisfaction of the Minister until the mass of prickly-pear is thoroughly destroyed, or until the remains of any such heap is burned or buried as provided for by the "Prickly-pear Destruction Act of 1886."

1887.

(SECOND SESSION.)

NEW SOUTH WALES.

PRICKLY-PEAR DESTRUCTION ACT OF 1886.

(REGULATION IN LIEU OF REGULATION No. 4.)

Presented to Parliament, pursuant to Act 50 Vic. No. 2.

Department of Mines, Forest Branch,
Sydney, 1st July, 1887.

WHEREAS by the Prickly-pear Destruction Act of 1886, power was given to the Governor to make Regulations for declaring how and in what manner prickly-pear may or shall be destroyed, otherwise than as provided for in the said Act; and such Regulation No. 4 was made on the 22nd February, 1887, and it is expedient that a new Regulation should be substituted: Therefore, His Excellency the Governor, with the advice of the Executive Council, has been pleased to cancel Regulation No. 4 of 22nd February, 1887, and to make the following Regulation in lieu thereof.

FRANCIS ABIGAIL.

DESTRUCTION OF PRICKLY-PEAR.

No. 4. As an alternative to burning or burying prickly-pear, it may be stacked in large heaps, not to exceed 24 feet in width, built so that all portions of the plant bearing fruit are turned inwards and covered, to prevent birds or animals from obtaining access to and disseminating the seed, and so as not to be liable to be washed away by flood or storm water. Two such heaps or stacks shall not be built within 300 feet of each other on land belonging to the same owner or occupier without permission of the Minister. Heaps or stacks may remain on the ground and be added to from time to time, as the work of clearing progresses, until the land is cleared of prickly-pear, after which they shall be burned: Provided that the Minister may at any time direct that a heap or stack shall be burned within two months from date of notice, and until every part of the prickly-pear in any such heap or stack is completely burned, the owner or occupier of the land shall be liable at common law for any damage caused to other owners if any of the prickly-pear fruit or seed is carried away by flood or storm water. And if any prickly-pear on the top or sides of the said heaps or stacks is allowed to bear fruit, the owner or occupier shall be deemed guilty of a breach of the Act 50 Vic. No. 2.

[F. 87-5,718]

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RABBIT PROOF FENCING.

(NARRAMINE TO BOURKE—TENDERS.)

Ordered by the Legislative Assembly to be printed, 22 March, 1887.

Memo. from Mr. Henry C. Taylor to The Minister for Mines.

In considering the contracts for the supply of wire netting, it will be seen that the tender of the Victoria Galvanized Iron and Wire Company is the lowest, the sum stated being £9,652 15s., and if from this is deducted the *ad valorem* duty the cost to the State would be reduced by about £1,100; but in response to enquiries the Company state that they cannot comply with the conditions unless the time occupied in dealing with the tenders is allowed for, and they hint that in the event of accidents at sea they would also expect consideration.

Next comes the tender of T. Dunn & Co., amounting to £9,743 11s. This firm state that they are prepared to deliver within the time specified, and they neither ask nor do they require an extension of time.

The last tender to be considered is that of John Lysaght, Limited, the amount being £9,881 17s. 6d., the wire to be supplied in the time named, and in all respects in accordance with the conditions. An offer is made to reduce the price by about £500 if the time is extended by three months.

In view of these facts it is submitted that the Minister be asked to decide which tender is to be accepted.

HENRY C. TAYLOR, 16/6/86.

Submitted.—H.W., 16/6/86.

I hereby accept the tender of John Lysaght, Limited, for the supply of wire netting, according to specification, for the sum of £9,881 17s. 6d., and the tenders of Job Coles for erection of the fence according to specification from Narramine to Nyngan for £1,767 1s. 1d.; from Nyngan to Byrock, £1,860 7s.; and from Byrock to Bourke for £1,064 17s. 6d.—JAMES FLETCHER, 11/8/86.

Messrs. Lysaght and Coles so informed, 11/8/86.

The specification and general conditions, together with the tenders which have been accepted, may now be forwarded to the Crown Solicitor, with a request that he will prepare the necessary bonds.—H.T., 12/8/86. Forwarded as directed, 12/8/86.

Minute Paper.

Subject:—Tenders for rabbit proof fencing, Narramine to Bourke.

Department of Mines, Rabbit Branch, Sydney, 2 June, 1886.

From an inspection of these tenders it will be seen that one firm (T. Dunn & Co.) have offered to supply the whole of the netting, and erect the same in terms of the specification for the sum of £15,138 8s.; but although it would be an advantage to have but one firm to deal with in carrying out the work, it can be done cheaper by accepting other contracts.

Under the head of contract B will be seen particulars of the various tenders for the supply of the whole of the wire netting, the colonial manufacturers being able, owing to the *ad valorem* duty and other causes, to supply in accordance with the specification at a much lower rate than the representatives of the British manufacturers, who also in the majority of cases are unable to supply the article within the time specified.

The following are amongst the lowest offers:—

The Victoria Galvanized Iron and Wire Company	...	...	£9,652	15	0
Thomas Dunn & Co.	...	...	9,743	11	0
J, Lysaght, Limited	...	...	9,881	17	6

The last firm offer to reduce the price by £2 10s. per mile if the time for delivery is extended by three months.

In

In contract C, for the erection of the whole of the netting, fencing, &c., the following are the most reasonable offers:—

William Sharp	...	...	...	...	...	...	...	...	...	£5,353	11	0
T. Dunn & Co.	...	...	...	...	...	...	...	...	...	5,394	17	0
J. Fox & Co.	...	...	...	...	...	...	...	...	...	5,615	10	0

but by accepting the tenders of Job Coles (See Contracts E, 1, 2, and 3), who has offered to carry out the work of erection in three sections, as follow:—

Narramine to Nyngan	...	...	...	...	...	...	...	...	...	£1,767	1	1
Nyngan to Byrock...	...	...	...	...	...	...	...	...	...	1,860	7	0½
Byrock to Bourke	...	...	...	...	...	...	...	...	...	1,064	17	6

The work can be done for £4,692 5 7½

and this tender we desire to recommend for acceptance.

In the Schedule of Contracts E it will be seen that D. C. J. Donnelly's tender is less than that of Cole's for the same section, but to effect a saving of £5 13s. 6d. it would not be judicious to divide the work.

GERARD E. HERRING,
HARRY A. GILLIATT,
HENRY C. TAYLOR.

CONTRACT A.

For the supply of the whole of the Netting, Fencing, and all necessary material, and the erection of such Netting, Fencing, &c., from Narramine to Bourke.

Name of Tenderer.	Amount.
	£ s. d.
Thomas Dunn & Co.	15,138 8 0
Ryan, Hammond & Donkin	20,461 10 0

CONTRACT B.

For the supply of the whole of the Netting, as per Specification.

Name of Tenderer.	Amount.	Remarks.
	£ s. d.	
The Victoria Galvanized Iron and Wire Co.	9,652 15 0	
Thomas Dunn & Co.	9,743 11 0	
J. Lysaght & Co. (Limited)	9,881 17 6	Offer to reduce the price by £2 10s. per mile if time extended for three months.
John Macdonald	9,197 10 6	Cannot supply within the time specified; the price is calculated exclusive of duty, which at the present tariff would increase it to about £10,298 10s. 6d.
R. L. Scrutton & Co.	10,198 0 0	Cannot complete until 30 November.
Schmedes, Erbsloh & Co.	10,289 15 0	Cannot supply in time.
Andrew Rowan & Co.	10,778 7 6	Cannot supply in time.
Dalgetty & Co.	11,413 0 0	Cannot complete under twelve months; tender late, and without deposit.
Gibbs, Bright & Co.	11,572 14 11	Cannot complete until January.
M'Lean Brothers, Rigg & Co.	11,816 0 0	Could complete order on 1 December for £9,983.

CONTRACT C.

For the erection of the Netting and Fencing, and the supply of all materials (other than netting) and labour required, as per Specification.

Name of Tenderer.	Amount.
	£ s. d.
William Sharp	5,353 11 0
Thomas Dunn & Co.	5,394 17 0
James Fox & Co.	5,615 10 0
D. C. J. Donnelly	6,239 19 10
M. Kinshela & T. Bellwood	6,496 16 0
P. J. D'Arcy	9,542 5 0

CONTRACT D.

For the supply of Netting for any of the Sections, as per Specification.

Name of Tenderer.										Amount.		
										£	s.	d.
<i>Section 1—Narramine to Nyngan.</i>												
Schmedes, Erbsloh & Co.	...	...	...	...	...	...	...	...	...	3,987	13	0
Ross Brothers	...	...	...	...	...	...	...	...	...	5,366	6	9
<i>Section 2—Nyngan to Byrock.</i>												
Schmedes, Erbsloh & Co.	...	...	...	...	...	...	...	...	...	3,890	3	7
Ross Brothers	...	...	...	...	...	...	...	...	...	5,263	3	6
<i>Section 3—Byrock to Bourke.</i>												
Schmedes, Erbsloh & Co.	...	...	...	...	...	...	...	...	...	2,209	10	10
Andrew Rowan & Co.	...	...	...	...	...	...	...	...	...	2,314	5	6

CONTRACT E.

For the erection of the Netting and Fencing, and the supply of all materials (other than netting) and labour required, as per Specification, for any of the sections.

Name of Tenderer.										Amount.		
										£	s.	d.
<i>Section 1—Narramine to Nyngan.</i>												
Job Coles...	...	...	...	...	...	...	...	...	...	1,767	1	1
William Sharp	...	...	...	...	...	...	...	...	...	2,034	3	3
Conlon Brothers...	...	...	...	...	...	...	...	...	...	2,748	3	9
Ross Brothers	...	...	...	...	...	...	...	...	...	3,948	6	3
P. J. Glasheen	...	...	...	...	...	...	...	...	...	7,699	0	0
<i>Section 2—Nyngan to Byrock.</i>												
Job Coles...	...	...	...	...	...	...	...	...	...	1,860	7	0½
William Sharp	...	...	...	...	...	...	...	...	...	2,003	18	9
Conlon Brothers...	...	...	...	...	...	...	...	...	...	3,724	0	0
Ross Brothers	...	...	...	...	...	...	...	...	...	4,063	5	0
<i>Section 3—Byrock to Bourke.</i>												
D. C. J. Donnelly	...	...	...	...	...	...	...	...	...	1,059	4	0
Job Coles...	...	...	...	...	...	...	...	...	...	1,064	17	6
William Sharp	...	...	...	...	...	...	...	...	...	1,191	7	1
John Melliday	...	...	...	...	...	...	...	...	...	2,266	18	9

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

THE RABBIT PEST.

(PETITION FROM REPRESENTATIVES OF THE STOCK AND PASTURES BOARDS OF THE COLONY.)

Received by the Legislative Assembly, 3 June, 1887.

To the Honorable the Speaker and the other Members of the Legislative Assembly of the Colony of New South Wales, in Parliament assembled.

The humble Petition of the undersigned representatives of the Stock and Pastures Boards of the various Sheep Districts of the Colony of New South Wales met in Conference,—

SHOWETH :—

That whilst an ever increasing area of the Western pastoral country is already so seriously affected by the rabbit pest that extensive assistance in some form has become an absolute necessity, the pastoral and agricultural interests extending over the whole area of the Colony are threatened with an indefinite loss from the same cause.

This grave national evil has been considered by past Rabbit Conferences, and following their careful deliberations they proposed and suggested a fair foundation for legislation, which has once more been adopted by this Conference, and by it urged with strong reasons for its adoption, and in the hope that your Honorable House may see your way to grant to your Petitioners such a measure of relief as may be just to them and conducive to the general interest.

Your Petitioners therefore pray that your Honorable House will be pleased to take into consideration the above premises.

And your Petitioners, as in duty bound, will ever pray.

[*Here follow 35 signatures.*]

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

SIR JOHN FOWLER.

(EMPLOYMENT OF, AS CONSULTING ENGINEER TO THE GOVERNMENT, IN ENGLAND.)

Ordered by the Legislative Assembly to be printed, 15 June, 1887.

RETURN to an *Order* of the Legislative Assembly, dated 21st April, 1887, That there be laid upon the Table of this House,—

“ A Return showing the various amounts paid to Sir John Fowler every year since his appointment; also, copies of all letters, minutes, and other documents having reference to the appointment of the above-named gentleman, showing who recommended his appointment, and any correspondence from any persons offering to carry out the duties performed by him on different terms from those at present in force.”

(*Mr. Cameron.*)

Memo. by The Chief Clerk.

THE records of the Department have been diligently searched, but no paper anterior to 22nd September, 1863, can be found bearing upon Sir John Fowler's connection with the inspecting business of the Department, although it is clear from the search made in the books of the Accountant's office that payments to him on this account were made as far back as 1862.

The following letter from the Commissioner for Railways to the Representative Agent in England, dated 22nd September, 1863, refers to an arrangement with Sir John Fowler, which was then in existence. In that letter reference is made to instructions issued to the previous Inspecting Engineer, Captain Galton, R.E., but no copy of such instructions can be found in the records.

D.C.M'L., 13/6/87.

No. 1.

Extract from letter to E. Hamilton, Esq., Representative Agent, dated 22 Sept., 1863.

Inspection of Railway Materials.

THE arrangements made with Mr. Fowler appear to me satisfactory; but to prevent any misunderstanding on this head, I enclose a copy of the instructions to Captain Galton, R.E., and the late agents, which, as far as possible, should still be adhered to. I may add it is particularly desirable that all tenders accepted should be previously approved by you, using such discretion, however, under the advice of Mr. Fowler, as the circumstances may seem to you to render necessary, where you are unable to rely upon your own judgment. As a rule, however, you should, I think, act independently; but I offer this merely as a suggestion; and not in any way to fetter you in the mode of carrying out your very onerous and difficult duties.

JOHN RAE,
Commissioner for Railways.

No. 2.

335—A

[842 copies—Approximate Cost of Printing (labour and material), £19 16s. 4d.]

No. 2.

The Secretary for Public Works to E. Hamilton, Esq., London.

Sir,

Department of Public Works, Sydney, 22 October, 1864.

In consequence of recent investigations of the invoices for railway iron shipped from England on account of this Colony from the beginning of 1859 to this time, it appears to the Government that the charges for rails and chairs have been greatly and improperly in excess of prices current at the times of purchase and shipment. Under these circumstances they are of opinion that a most rigid inquiry should be instituted in England, and as a preliminary step I have to request that Mr. John Fowler's services as Inspector of railway iron, plant, and rolling stock may be dispensed with at once.

As to any orders for railway materials which may be transmitted by this mail, I have to request that they may be executed under the superintendence and inspection of a leading London broker in the iron trade.

As to orders for railway materials which have already been transmitted to you, I have to request that so far as practicable the execution of contracts for such materials should be stopped until further orders.

In respect of orders already transmitted, the execution of which cannot be fully stopped or suspended till next advices from this, I have to request that you will do nothing without consultation with a leading London broker as abovementioned.

If the advice and opinion of an Engineer should be required in reference to orders still outstanding, you will be pleased to employ an experienced gentleman in lieu of Mr. Fowler.

The Government are about to institute inquiries into the supposed overcharges above referred to, and I purpose forwarding by next mail full information and instructions for your guidance, or the guidance of your successor, should the Government be in a position to appoint such successor in the meantime.

I have, &c.,

ARTHUR T. HOLROYD.

No. 3.

The Under Secretary for Public Works to The Agent for New South Wales.

Sir,

Department of Public Works, Sydney, 21 November, 1864.

Referring to the notification in the *Government Gazette* of the 10th instant, of your appointment as Agent for the Colony of New South Wales, resident in London, I am directed by the Secretary for Public Works to request that, as there is reason to believe that for a considerable period this Government has been defrauded of large sums of money in the prices paid for railway iron, you will on your arrival in England investigate into, and report upon, all the circumstances connected with these purchases and the actual value of the rails and chairs so purchased.

2nd. I am to inclose herein a return of invoices of rails and chairs purchased by the Government Agents in England; and for the purpose of further accrediting you in this matter, I am instructed specially to authorize you to take all proper and necessary steps for the elucidation of all the circumstances connected with the alleged overcharges.

I have, &c.,

JOHN RAE.

No. 4.

The Representative Agent of New South Wales to The Secretary for Public Works.

196, Gresham House, Old Broad-street, London,

24 January, 1865.

Sir,

In reference to an instruction contained in your letter of 22nd October, 1864, that a leading London broker be engaged to inspect any railway materials now under contract, I beg to call your attention to the terms of the contract, a copy of which has been furnished to you, that the money is to be paid one month after the production of the bills of lading, accompanied by Mr. Fowler's certificate. Any delay in payment through a second inspection may be resisted as being at variance with the terms of the contract, and will probably create trouble. I therefore suggest that Captain Mayne be authorised to carry out all existing contracts without alteration in the conditions, and that the new regulations, whatever they may be, be limited to future engagements.

I have, &c.,

EDWD. HAMILTON,

Representative Agent of New South Wales.

No. 5.

The Representative Agent for New South Wales to The Secretary for Public Works.

196, Gresham House, Old Broad-street, London, E.C.,

26 January, 1865.

Sir,

I have the honor to acknowledge the receipt, on the 19th instant, of your letter dated 22nd October, 1864, conveying certain instructions for my guidance, based apparently on an assumption "that the charges for rails and chairs supplied during the last few years to the Colonial Government have been greatly and improperly in excess of prices current at the times of purchase and shipment."

I have handed over this letter to my successor, Captain Mayne, who will enter upon the duties of the agency on the 1st proximo, and he will, I make no doubt, inform you of the course he intends to adopt in reference thereto. The only point which calls for remark from me is the order to suspend, *so far as practicable*, all existing contracts for railway material, and I beg to say that they must proceed to completion, and that any attempt to interfere with them would expose the Colonial Government to consequences which the words *underscored* lead me to believe that you did not contemplate or desire.

The only contracts for railway material in hand are:—

(1.) For locomotive engines, of which there are fifteen not yet ready for delivery, and 2nd for miscellaneous stores ordered in your letters dated respectively the 22nd September and 22nd October, 1864, of which part has already been shipped; and it will be obvious to you that it is not practicable to break, suspend, or alter the engagements entered into.

The foregoing is, perhaps, the only answer which, on the eve of my retirement from the agency, it is my duty to give to your letter now under reply, but as it is in my power to afford information which will help to remove the unfounded suspicions which exists in some quarters as to the management of contracts for permanent-way material, I do not feel justified in withholding it, and I offer it as entitled to credit, inasmuch as no contract of the kind has been executed by me, or on my responsibility, since I have filled the office of Representative Agent to the Colony.

The only order for rails, fish-plates, &c., received in London since the 1st of January, 1863, when my duties commenced, is that dated 20th March, 1863, and, in conformity with my instructions, it was placed in Captain Galton's hands, and was executed by him and Mr. Fowler. I was on one occasion present for the consideration of tenders which had been sent in to, and opened by Captain Galton, but the responsibility of decision rested with him and not with me. I mention this only as a fact, and not with a view of suggesting that the interests of the Colony were not on that and on all previous occasions fully and entirely protected. There was, however, one small order for rails not executed on Captain Galton's responsibility, that, namely, for the replacement of rails lost in the "Everton," but in that case I was expressly instructed to employ Messrs. Beale and Co., who had furnished the original lot. I am particular in stating these facts in order that it may be clearly understood that I am not affected in any way by the imputations that are distinctly referred to in your letter, and in the hope that the information I offer may be received as that of an impartial person. I will further add that I am not responsible for the appointment of Mr. Fowler as inspecting engineer, or for the rate at which his commission was fixed.

When the supervision of railway contracts passed into my hands (in compliance with the Commissioner's letter, dated 22nd September, 1863), I took over the business, subject to all existing arrangements and appointments, and having obtained a copy of the authority by which Mr. Fowler's commission was fixed, I allowed matters to remain as I found them.

The way in which the business was conducted by Captain Galton was, I believe, thus:—On receipt of an order for rails (and I confine my remarks to the subject matter of the imputations, viz., permanent-way materials), Mr. Fowler was instructed to advise upon the quality which, in his judgment, was most suitable for colonial traffic, keeping in view the heavy addition to prime cost on account of freight, insurance, &c.; and after general approval by Captain Galton, to draw up specifications, setting out in detail the conditions to be complied with by the manufacturers. As soon as the specifications were settled and in print, Captain Galton (probably after consultation with Mr. Fowler) determined what parties should be invited to tender (*vide* Mr. Fowler's letter herewith on the question of inviting tenders by public advertisement), the specifications were sent to the parties so selected, and the tenders were addressed to Captain Galton, opened and abstracted by him, and the selection was made by him in the presence of Mr. Fowler and the Commercial Agent. After this, the superintendence of the execution of the order virtually devolved upon the inspecting engineer; it was his duty to see, at the proper stage of the work, that each specification was complied with, and to follow the goods till, in compliance with the contract, they were delivered into the Agent's charge for shipment; and I will hazard this assertion, that if disposed to prove the fidelity with which his inspection was performed, Mr. Fowler could, by reference to the diaries of his Inspectors, state the day on which every order has been inspected at the different stages of its progress.

As to the number of tenders invited in each case and the names of the parties, I beg to refer you to the list furnished to me by Mr. Fowler, and forwarded to the Commissioner for Railways by last mail.

It is not within my knowledge whether abstracts of tenders were sent to the Colony while the contracts were in Captain Galton's charge, but they have been forwarded in every instance since I became agent, whether the order was executed on my responsibility or not.

If they were not forwarded by Captain Galton, the reason, probably, is that they were not asked for.

Such were the arrangements, for the superintendence of the railway contracts, while it was intrusted to Captain Galton, and I am confident that no better could be devised for the protection of the public interests.

Under these arrangements all the permanent railway material sent out since 1859 has been inspected by a civil engineer of the highest eminence, most punctual in attention to his business, and shrinking from no trouble or expense incident to the discharge of his duties; and that engineer has been controlled by an officer whose impartiality, integrity, and knowledge of every branch of railway business are universally recognized.

It is, therefore, to me a matter of surprise as well as regret, that a suspicion should be entertained that the Colony has not received full value for the money expended, and before concluding this letter I beg to address myself to the specific allegation which has been made, viz.: "That the charges for rails and chairs shipped from England to the Colony from the beginning of 1859 have been greatly and improperly in excess of prices current at the times of purchase and shipment." The ground on which this charge is made appears to be that the contract prices are higher than those quoted in the lists published by the *Economist*. The fact is so; the quoted prices are materially lower; but the discrepancy admits of easy explanation, and the information I have obtained will, I trust, have the effect of allaying the feeling of dissatisfaction which has so unfortunately arisen.

As soon as my attention was called to the subject in an unofficial way by the Commissioner for Railways, I wrote to Mr. Fowler about it, and received in reply the explanation contained in his letter herewith forwarded.

I also sought an interview with the Secretary of the London and North Western Railway Company, with whom I had no previous acquaintance, and requested him to be good enough to furnish me with the price paid by that Company for rails of good quality, in June, 1863, 75 lb. to the yard, 50 per cent. 24 feet long, and the remainder carrying from 20 to 15 feet.

I enclose his written reply, which, though marked private, contains nothing which he would care to withhold from publication. In the course of conversation he observed that the information would be of no use to me unless I could tell him whether the rails were made of Welsh, Staffordshire, or Yorkshire iron, and what were the specifications with which the manufacturers had to comply. My reason for applying to the Secretary of this Company was that Mr. Fowler has no connection with it, and the requirements of their extensive line bring them continually into the market.

I have also seen a statement prepared by the Lancashire and Yorkshire Railway Company to show the durability of rails of various prices ranging from £8 as high as £16 per ton, the result of their experience being that a rail of low quality is the most expensive that can be laid down. It must be known to you that the experience of all the large Railway Companies in this country points in the same direction. In fact the evidence on this question is so conclusive, that the London and North Western Company are beginning to lay down solid steel rails (Bessemer) at all points of heavy traffic, and it is understood that the substitution of them for iron rails throughout their system is only a question of time. The engineer of the Great Western Railway Company mentioned in my presence, only two days ago, that in order to test the durability of Bessemer steel rails, the London and North Western Company had laid down, in the throat of their London terminus where the traffic is greatest, a Bessemer rail on one side and an iron rail of first quality on the other, and that the iron rail had been replaced over and over again, while the Bessemer showed no signs of wear or deterioration, and he said that if Bessemer could be laid down at a cost not exceeding £15 a ton, iron rails would cease to be used.

Again I forward for your information the specification of rails for one of the Grimsby lines, prepared by Mr. Fowler. The contract was taken about the same time as the last colonial contract of 1863, and as there is no material difference of quality, though there is some slight variation of detail in the specification, the comparison goes to establish two points.

- 1st. That the price paid for the colonial rail was not excessive if the Grimsby price was not so; and
- 2nd. That Mr. Fowler does not fail to consider the special conditions in each case that he has to deal with.

The foregoing explanation amounts to this: that the prices named in the printed lists refer to rails just merchantable but not made under specification and subject to no test; that such rails are rarely if ever used in this country; that the price of rails varies in proportion to quality, the range being from £5 as high as £16 per ton; that it was Mr. Fowler's special duty to decide on the quality of rail which was best suited to colonial traffic, and most consistent with an economical application of the funds appropriated to the construction of colonial railways, and that there is absolutely no evidence whatever that the quality of the rails supplied is not up to the price paid for them.

In conclusion I beg to hand in copy of a statement sent to me by Mr. Fowler, giving the names of makers of rails of best quality on his list, selected, because the execution of previous orders had given satisfaction, but subject to be struck out if the character of their manufacture was not maintained. As Captain Mayne wishes to see the original tenders referred to in Mr. Fowler's letter of the 25th inst., I shall not forward them to the Colony.

I have, &c.,

EDWARD HAMILTON,
Rep. Agent of New South Wales.

No. 6.

J. Fowler, Esq., to E. Hamilton, Esq.

Dear Sir,

2 Queen's-square Place, Westminster, 24 December, 1864.

In reply to your letter of the 22nd I enclose you a list of the rails which have been sent out to New South Wales under indent since I have acted on behalf of the Government as Inspecting Engineer.

I also enclose a list of all indents during the same period.

As regards the difference in price between the published price current of rails and the price in the accepted tenders, it is very easily explained.

The price in the price current is what is called "Merchantable iron," manufactured in the cheapest possible manner without specification or supervision, or test or guarantee.

Such rails are never used in England, India, Russia, or other great markets for English manufacture. At one time they were largely used in America, and are sometimes used in foreign countries—when, from omission, a Government or Company have neglected to require the supply of rails to be furnished under a proper specification and supervision.

An instance occurred lately in the Riga and Dimsburg Railway, constructed under my friend Mr. Hawkshaw, when tenders were sent in for £6 5s. per ton without specification, but when they were required to be of proper quality under a specification the price was increased to £8 5s. on a quantity of 32,000 tons, and the rails were supplied at that price.

The rails supplied to New South Wales under my specification and superintendence were quite as cheap at the price, in the accepted tenders, as the price in the price current for the rails then referred to; and it would have been a most serious mistake of judgment to have adopted rails of inferior quality when carriage is so important an element.

The

The quantity of iron of superior quality in the rails sent to New South Wales under my specification at the top and bottom, where the wear takes place, is exactly four times the quantity usually put into the rails referred to, in the price current, besides other precautions in the manufacture which greatly affect the quality of the rails.

As regards the best principle of tendering, I believe you get the best competition by selecting a sufficient number of makers or contractors of character and give the contract to the lowest tenderer, and this is the principle almost universally adopted in England at the present time.

If you throw tenders open to everybody you are obliged to say you will not be bound to accept the lowest tender, and then conditions frequently prevent the most eligible parties tendering.

I shall be most happy at all times to furnish the fullest information and explanation to you with respect to every contract entered into on behalf of the Government of New South Wales.

I can say with confidence that from the prompt payments and attention with which the financial business of New South Wales has always been conducted in this country, I have been able to obtain the most favourable possible terms from makers of all kinds, in the tenders they send in.

Yours, &c.,
JOHN FOWLER.

Minute by Minister for Public Works.

Acknowledge with thanks for the valuable information conveyed herein, with the expression of my regret at the early termination of Mr. Hamilton's services.—W.M.A., 22/3/65.

No. 7.

The Agent for New South Wales to The Secretary for Public Works.

Sir,

New South Wales Agency, 36, Cannon-street, London, 13 February, 1865.

Having reference to the letter of the 22nd October last, from the Honorable the Secretary for Public Works to my predecessor, intrusting him at once to dispense with Mr. John Fowler's services as Inspector for Railway Stock; to have any orders for railway materials transmitted by the same mail executed under the superintendence and inspection of a leading London broker in the iron trade; as regarded orders for railway materials previously transmitted to stop, so far as practicable, the execution of contracts for such until further orders; in case of such as could not be stopped doing nothing without consultation with a leading London broker as before mentioned; and if the advice and opinion of an engineer should be required in reference to orders still outstanding to employ an experienced gentleman in lieu of Mr. Fowler, I have the honor to state for your information that it is not, in the case of any of the orders for railway materials, practicable to stop the execution of the contracts, and that the terms of these, involving as they do, payment under Mr. Fowler's certificate, preclude till the completion of those contracts dispensing with Mr. Fowler's services.

2. Regarding the instruction touching superintendence and inspection by a leading London broker in the iron trade, I have to state that the services indicated are, I am informed, entirely beside those of a broker, and that all the inquiries I have made lead me to the conclusion that to employ the services of a broker in the carrying out of contracts for permanent-way material and rolling stock, would merely include the additional charge of a brokerage commission without any one safeguard or advantage whatever.

3. As regards the instruction for the employment of another engineer in lieu of Mr. Fowler, in cases in which the advice and opinion of one should be required in reference to orders still outstanding, I have—referring you to what I have stated in paragraph 1, as to the impossibility of setting aside Mr. Fowler, so far as existing contracts are concerned—to point out that compliance with that instruction would involve expense to an amount which cannot, I am confident, have been foreseen, and this without any commensurate advantage; as I have already explained, the existing contracts render imperative payment under Mr. Fowler's certificate, and such payment the contractors would demand and enforce, whatever might be the report made by any other engineer after inspection and trial of the material or stock.

Such inspection and trial could, it is obvious, be made only after delivery by the contractors; that delivery in terms of the contracts is to be "alongside" the ship—now observe what this in case of the engines (twelve in number) now in course of construction and delivery, would after delivery "alongside" involve,—

- 1st. The removal from the wharf (not without risk) of cases of such weight and dimensions, as are those containing locomotives packed for a voyage to Australia.
- 2nd. The several processes of unpacking, taking to pieces (indispensable for inspection of any value) putting together again, after this actual testing on rails (only to be effected on a railway line, or in a contractor's workshop or yard) then repacking and final removal back to the wharf.

The expense of all this, added to the charge by the engineer employed, for his time and professional services, in making detailed inspection, would be so very serious that having regard to all that fulfilment of the instruction would and might involve. I feel it to be my duty, in the exercise of the discretion with which, at such a distance, an agent must be invested, to suspend acting on the instruction in question, until I receive further orders on the subject

I have, &c.,
W. C. MAYNE,
Agent for the Colony of New South Wales.

No. 8.

The Agent for New South Wales to The Under Secretary for Public Works.

Sir, New South Wales Agency, 36, Cannon-street, London, 22 February, 1865.
 Having reference to your letter of the 21st November last, conveying to me the instructions of the Hon. the Secretary for Public Works, on my arrival in England to investigate and report upon the purchases of permanent-way material for the Government of New South Wales, I have the honor to inform you that, though I have used every exertion to carry out those instructions, the steps I have taken to that end have not yet placed me in a position to arrive at a definite conclusion, and to make my report on the subject for the information of the Secretary.

2nd. It must be borne in mind that those to whom I have to address my inquiries, and from whom I have to seek information on the subject are for the most part gentlemen weighted with their own pressing and important business, to whose leisure and convenience I am obliged entirely to defer.

3rd. I have already had to make one journey into Staffordshire to obtain a personal interview with one of those gentlemen, and I expect to have to report it to procure further information from him.

4th. By the March mail, however, I have every hope that I shall be able to report the result of my investigation for the information of the Honorable the Secretary for Public Works.

5th. Before closing an inquiry intrusted to me, I have always guarded myself from forming a conclusive judgment, or committing myself to positive expression of opinion, and I do so now; but in the special circumstances of this case, I consider it open to me, and right to state that the result of all my inquiries hitherto tends towards establishing the *bona fides* with which the purchases of the permanent-way material for the Government have been made.

6th. In these circumstances referring you to Mr. Hamilton's recent communications respecting Mr. Fowler, and to my letter of the 13th instant, I would submit for the consideration of the Hon. the Secretary for Public Works the expediency of so far modifying the instructions conveyed to my predecessor in Mr. Secretary Holroyd's letter of the 22nd October last, as to make the dispensing with Mr. Fowler's services as Inspector of Railway Iron Plant and Rolling Stock dependent on the result of the inquiry, in which I am now engaged, and on the final decision of the Executive.

On this point it is very desirable that I shall be favoured with a reply by the mail to be despatched from Sydney on the 22nd of April.

I have, &c.,

W. C. MAYNE,

Agent for the Colony of New South Wales.

As the mail had left Sydney before this letter was received, the only means of complying with Captain Mayne's request was by means of the telegraph. The Minister for Works accordingly requested the Chief Secretary to forward the accompanying telegram to the Chief Secretary at Melbourne for transmission to Captain Mayne, and a telegram has been received that the letter has been sent to Captain Mayne.—J.R., 24/4/65.

No. 9.

Telegram from The Colonial Secretary, Sydney, to The Chief Secretary, Melbourne.

24 April, 1865.

Will you have the kindness to send the following communication in a letter by your outgoing mail:—

Sir,

Department of Public Works, Sydney, 24 April, 1865.

Your letter of the 22nd February, 1865, is just received. I concur in the proposal contained in your sixth paragraph, and you may consider the instructions there referred to as modified accordingly.

W. M. ARNOLD.

To Captain W. C. Mayne, Esq.,
 36, Cannon-street, E.C., London.

No. 10.

The Agent for New South Wales to The Under Secretary for Public Works.

Sir, 36, Cannon-street, London, E.C., 22 March, 1865.

Referring to my letter of the 22nd ult. I have the honor to state for the information of the Hon. the Secretary for Public Works that it is with very great regret I find myself compelled to forego the hope which I had confidently entertained that by this mail I should have been in a position to dispatch my report on the purchases of the permanent-way material for the Government of New South Wales.

2. Until this day I had every reason to believe that I should in sufficient time have been placed in possession of information which alone is wanting to enable me to conclude my investigation; but I now learn from the Civil Engineer, through whom I have sought it, that occupation of time during the last few months with Parliamentary business before the committees has rendered it impossible to make the necessary references back, and go into the details requisite to afford that information. I am, therefore, obliged to keep the inquiry open till I have received it.

3. By the April mail I shall, I have no doubt, be able to forward my report; and I may state that, while I still hold final judgment in abeyance, and guard myself from positive expression of opinion, nothing whatever has arisen since my letter of the 22nd ultimo was written to cause me to withdraw or modify what I conveyed in paragraph 5 of that letter.

I have, &c.,

W. C. MAYNE,

Agent for the Colony of New South Wales.

No. 11.

No. 11.

Précis.

PRESENT arrangements for procuring Railway Material from England.

1. The present arrangement for procuring supplies of railway materials from England is contained in Mr. Holroyd's letter to Mr. Hamilton of date 22 October, 1864, herewith. In that letter the Minister requests that Mr. John Fowler's services as Inspector of Railway Iron Plant and Rolling Stock be dispensed with at once; that any orders that may be transmitted by the October mail may be executed under the superintendence and inspection of a leading London broker in the iron trade; that as far as practicable the execution of contracts for materials already ordered should be stopped till further orders; that in respect of those that cannot be stopped or suspended till next advices from Sydney, Mr. Hamilton should do nothing without consultation with a leading London broker; and that if the advice of an engineer should be required in reference to orders still outstanding, he will employ an experienced gentleman in lieu of Mr. Fowler.

2. On 21st November, 1864, the Under Secretary, by order of Mr. Secretary Wilson, acting Minister for Works, requests Captain Mayne, successor to Mr. Hamilton, to investigate into and report upon all the circumstances connected with the purchase of railway iron, and the actual value of the rails and chairs so purchased, and forward for his guidance a return of invoices of rails and chairs purchased by the Government Agent in England, showing the prices per ton in London and the prices current as quoted in the *Economist*.

3. In his letter to the Minister for Works, dated 24th January, 1865, Mr. Hamilton with reference to the instructions of 22nd October, 1864, as to the employment of a leading London broker to inspect materials now under contract, calls attention to the terms of the contract, any deviation from which might be resisted, and would probably create trouble; and suggests that Captain Mayne be authorised to carry out all existing contracts without alteration in the conditions, and that the new regulations may be limited to future engagements.

4th. On the 24th of the same month Mr. Hamilton informs the Minister for Works that he has handed over the instructions of 22nd October, 1864 to Captain Mayne, who would enter upon the duties of the agency on the 1st February, 1865; but with reference to the order to suspend as far as practicable all existing contracts, he says that they must proceed to completion, and that any attempt to interfere with them would expose the Colonial Government to consequences which the words underscored led him to believe that the Minister did not contemplate or desire. Mr. Hamilton adds that it must be obvious that it is not practicable to break or suspend the arrangements entered into for the contracts now on hand.

5th. It will be seen that the instructions to the English agent have reference merely to an investigation of past contracts, and the execution of contracts now on hand, but make no allusion to orders for materials hereafter required from England. And as Mr. Secretary Wilson on 24th January last approved of the accompanying indent for permanent-way materials, for which no tenders could be obtained in the colony, being sent to England for execution, I submit that instructions should be sent for the guidance of the English Agent.

6th. On the appointment of Captain Galton, the instructions,* of which a copy is appended were forwarded for his guidance. A copy of the same instructions was subsequently sent to Mr. Hamilton. They have hitherto been acted upon by the English Agent; and, no doubt, Captain Mayne will adopt them for the future, unless they are now modified or amended.

*A copy of the instructions cannot be found among the papers in this office.

7th. The present indent is the largest that has ever been sent to England. It consists of the following quantity of rails with the corresponding amount of chairs, fish-plates and bolts, &c. :—

Southern Line	...	...	...	...	...	...	...	...	...	Tons.
Western Line	...	...	...	...	...	...	...	...	...	7,906
Northern Line	...	...	...	...	...	...	...	...	...	4,130
										2,124
										14,160

And the appointment of a new Agent for the Colony seems a proper occasion for modifying the arrangements hitherto in existence for procuring railway materials from England, if the Government consider that any alteration is necessary.

8th. In connection with the subject of the English agency, I would venture to suggest that it would be a graceful act on the part of the colonial Government to acknowledge by some substantial mark their recognition of the valuable gratuitous services rendered to the colony by Captain Galton during the period of his connection with this Department.—J.R., 30/3/65.

No. 12.

The Agent for New South Wales to The Under Secretary for Public Works.

Sir,

36, Cannon-street, London, 24 April, 1865.

Having reference to your letter of the 21st November 1864, I have the honor to enclose for the information of the honorable the Secretary for Public Works, my report on the purchases of railway iron for the Government of New South Wales.

I have, &c.,

W. C. MAYNE,

Agent for the Colony of New South Wales.

[Enclosure.]

[Enclosure.]

Agent-General's Report.

IN pursuance of the instructions of the Honorable the Secretary for Public Works, under date the 21st of November last, "on my arrival in England to investigate into and report upon all the circumstances connected with the purchases of railway iron, and the actual value of the rails and chairs so purchased" I lost no time after reaching London, in addressing myself to the inquiry directed.

2nd. Mr. Hamilton having in his letter of the 26th of January last placed the Government in possession of full and detailed information respecting the mode of obtaining and dealing with tenders for railway iron, has rendered it unnecessary for me, as regards that, to do more than, referring the Secretary for Public Works to that communication, to state, in addition, that I have examined the specifications, the tenders, and Captain Galton's abstract of these, with the accepted tenders noted; and that, following the acceptance, I have seen and examined the reports made from time to time by Mr. Fowler's assistants, detailing their supervision and inspection of the work in progress at the factories, the tests they applied and the results, all these leaving no room to doubt that watchful supervision was exercised, and stringent means adopted to secure the material being in each case in strict accordance with the specification.

Mr. Hamilton has also, in his letter of the 26th January last, so fully disposed of the question of the difference between the prices quoted in the *Economist* and those charged in New South Wales, that it is unnecessary for me to encumber this report by repeating, as substantially I could but do what he has written on the subject. I have only to say that all my information entirely bears out what he has stated on the general question of difference between quoted prices and those for material under stringent conditions.

3rd. Proceeding to the question of prices paid for and actual value of the railway iron supplied, I sought and obtained introductions to gentlemen largely connected with railways here, competent to afford me the information I desired, and thoroughly reliable from positive experience and absolute disinterestedness, as regarded the matters and persons involved.

The first of those to whom I applied for information (having been introduced to him by a relative of mine) was Mr. Henry Woodhouse, resident engineer of the southern division of the London and North Western Railway Company.

Mr. Woodhouse has charge of some six hundred miles of rail over which passes a traffic certainly greater than that over any other six hundred miles in the world. His practical experience of all that is connected with permanent way material is consequently wide and ample. His intelligence and capacity are vouched by his having for years, and to the entire satisfaction of the great Company he serves, held the important office he fills.

Proceeding to Staffordshire for the purpose, I had an interview with Mr. Woodhouse; and having placed in his hands the specifications, several of the tenders, the quantities of and prices paid for permanent-way material supplied to the Government of New South Wales during the years 1859, 1860, 1861, 1862, and 1863; having also handed to him the official report as to the quality of the materials (read to the Assembly by Mr. Secretary Holroyd), together with his (Mr. Holroyd's) reported testimony as to the state of the rails after five or six years' wear, with a request that he would, after having gone through and considered the whole matter, favour me with his opinion as to the prices charged and paid; and having in subsequent interviews with Mr. Woodhouse, after he had read and carefully considered the papers, discussed the matter in detail and at considerable length, he gave it to me as his distinct opinion, having regard to the specifications requiring an exceptional make of rail, to the tests being very severe, to the quality of the material as proved by those tests, and by actual wear, and to all the circumstances, that, with the exception of one lot of 94 tons, the prices charged and paid were not in excess of the current rates of the periods for material of the quality supplied, or more than sufficient to give that reasonable and fair profit which the iron and every other trade properly and prudently conducted has a right to claim and to secure.

4th. The following were, I have satisfied myself, the circumstances in which the 94 tons referred to in the preceding paragraph were obtained:—

Captain Galton mentioned in a communication to Mr. Fowler, that Lord Dudley's works were making very good iron, and finding that no tender had been sent in from those works, resorted to subject in a second communication to Mr. Fowler.

Lord Dudley's manager then tendered "as a sample to supply 100 tons at £9 per ton, and the tender was accepted for 94 tons, by Captain Galton, doubtless for the purpose of testing the quality that had been mentioned to him as very good. The result of the experiment I have no means of tracing, but I conclude the Railway Department can furnish it.

5th. Considering it desirable to have a second entirely impartial, independent, and reliable opinion drawn from comparison of prices paid by railway companies in England with those paid by the Government of New South Wales, I obtained an introduction to Mr. Forbes, the General Manager of the London, Chatham, and Dover Railway, a gentleman standing high in estimation for ability, experience, and intimate practical acquaintance with all connected with railway management, and placed in his hands the whole of the documents which I had submitted to Mr. Woodhouse, with a request that he would have a comparison of the prices made, and would favour me with his opinion on the whole question.

Mr. Forbes very kindly consented to do so, and placed the matter for comparison in the hands of an assistant whom he knew to be perfectly competent to the task.

Having carefully analysed the comparison made between the prices paid at periods the most nearly approaching each other by some of the great railway companies of England, and by the Government of New South Wales, and having considered the documents I had put before him, Mr. Forbes gave it to me as his distinct opinion, that in the cases where the prices charged to New South Wales were higher than those charged to the English companies, the difference was fully and satisfactorily accounted for by the different conditions and circumstances; and, having regard to the generally stringent nature of the specifications, but especially to one particular condition in them, not usual, but decidedly favourable to the Government (a condition to which contractors are extremely averse, as involving possible loss to a considerable amount, and for which they would certainly charge an increased rate), to the severity of the tests, which from Mr. Fowler's known character as to supervision and inspection contractors would regard as certain to be applied to the quality of the material furnished proved by actual wear, to the difference to be taken into calculation on account of delivery at the docks instead of at the railway station (involving certain additional cost, and possible delay and loss to the contractors), and to all the circumstances, that the prices paid by the Government of New South Wales for the materials supplied were not in excess of the current rates of the periods for material of equal quality, and that the Colony had been uprightly and fairly dealt with in the matter.

6th. The special condition in the specifications referred to as unusual and disliked by contractors is to be found where, after stringent provision for supervision and testing at the contractor's works, the specifications go on to say, "but notwithstanding such tests and inspection any rails may be rejected on delivery, which in his (Mr. Fowler's) judgment are defective in any respect; and if labour should be required for turning over and examining the rails at the post of delivery, the manufacturer is to supply it."

This, it will be seen, continues the liability of the contractors to have the rails (under the terms of the specifications without appeal) thrown back upon their hands after having incurred the cost of carriage to the post, and to have either to sell them, thus depreciated by rejection, at any price obtainable, or to incur the further cost of carriage back.

The insertion of such a condition shows, I consider, that Mr. Fowler has sought very carefully to guard the interests of the Colony in the matter, and has not sought to court or conciliate the contractors.

The importance and value of stringent and well considered measures to secure permanent-way material of the kind best suited to the particular traffic, and in a special degree of lasting quality, in a case where freight and labour so materially enhance prime cost are so obvious that they cannot fail to be recognised.

7th. Mr. Fowler, it is right to mention, has the character of carrying out very rigid supervision and inspection, and of applying severe tests, and this is a matter which, I have had conclusive proof afforded me, materially weighs with contractors in making their tenders.

As direct evidence of this, I may mention that I have seen the letter to a railway company from a manufacturer who had agreed to furnish material at a certain price, and who, on finding that it was to be subject to the supervision and tests of a particular engineer (not Mr. Fowler, but one having a like character for strictness) drew back from his agreement; but, and this as a concession in the circumstances, offered to furnish the material subject to the required supervision and tests, at a rate, however, fifteen shillings per ton over the price named before he was aware of who the inspecting engineer was to be,

8th. Every person with whom I have been in communication respecting the matters involved in my inquiry, has, on being told that the tenders had been invited and dealt with by Captain Galton, on the instant said that, such being the case, the colony had the very highest guarantee that universally recognized professional ability, exalted character, and unblemished honor could afford.

9th. Mr. Fowler's high professional standing, his very large and profitable employment, dependent upon upright discharge of duty, his character for strict and watchful supervision, all afford guarantees for a faithful discharge of professional duty; and the stringent nature of his specifications, and the facts, prove that such discharge of it has not been wanting.

10th. Guided then by the concurring opinions I have given, emanating from able, experienced, and practical men after investigation and consideration of the matter submitted to them, and having regard also to all the facts and circumstances, I have to report that I consider it beyond doubt, that, in the purchase of permanent-way material during the periods in question, the Colony was zealously, faithfully, and efficiently served; and was not charged for the material supplied prices in excess of the fair current rates of the periods for material of the quality obtained under the particular specifications in force.

24 April, 1865.

W. C. MAYNE,

Agent for the Colony of New South Wales.

No. 13.

The Colonial Secretary to The Agent-General.

Sir,

Colonial Secretary's Office, Sydney, 6 September, 1871.

I have the honor to inform you that this Government have had under consideration the position and duties of Mr. Fowler, the Inspector in England of Permanent-way Material and Rolling Stock for the Railway Department of the Colony, and that it has been determined to make some other arrangement for the duties now discharged by Mr. Fowler, not less on the ground of economy than because it seems to the Government that that gentleman's numerous other avocations must preclude him from giving such attention as is desirable to the duties required of him on behalf of the Colony.

2. Under these circumstances, I have the honor to request that you will take steps to ascertain on what terms the duties in question can be performed, so as to meet the views of this Government as already stated, and that you will also make any suggestion that may occur to you, not only as to the selection of a gentleman to perform these duties, but as to the nature of such arrangements as are likely to bring about the best results.

3. In conclusion, I have the honor to request that you will deal with the matter under consideration so far as it is entrusted to you by the terms of this letter without delay.

I have, &c.,

JOHN ROBERTSON.

No. 14.

The Agent-General for New South Wales to The Colonial Secretary.

Sir,

London, 3, Westminster Chambers, 3 November, 1871.

I had the honor to receive your letter of the 6th September last, requesting me to ascertain on what terms the duties of inspecting in England the permanent-way material and rolling stock for the Railway Department of the colony can be performed, so as to meet the views of the Government; and requesting me to make any suggestion that may occur to me, not only as to the selection of a gentleman to perform the duties, but as to the matter of such arrangements as are likely to bring about the best results.

The subject is one of such grave importance, that I shall not be able to deal with it in the short period which will elapse before the outgoing mail is closed, but it shall have my immediate and earnest attention.

Mr. Fowler has never spoken to me on the business intrusted to him, nor has he ever been in my office. In fact, I have never seen him except accidentally in the open air. Yesterday I received the first letter bearing his own signature, and I am informed that my predecessor never had one, nor have the clerks ever seen him in the office. His representative, I am in justice bound to say, is an attentive and apparently a well qualified gentleman; but I imagine that our business is of comparatively insignificant consideration to Mr. Fowler.

I have, &c.,

CHARLES COWPER.

Resubmit when report is received from Agent-General.—J.R.

No. 15.

The Agent-General to The Colonial Secretary.

Sir,

London, 3, Westminster Chambers, 30 October, 1873.

I have the honor to refer you to the despatch from Mr. Robertson dated the 6th September, 1871, upon the subject of Mr. Fowler's position as Consulting Engineer for the New South Wales business, in which my attention is called to the question of his remuneration, and to the multiplicity of his extensive engagements; and I was instructed to take such steps as I might consider advisable for the future conduct of the duties of Consulting Engineer. My replies to that communication were dated the 3rd November, 1871, and 10th January, 1872, and to those letters I would also request your reference.

Since those letters were written I have employed Mr. Shields, who was connected with the Sydney railway in its earliest stages. This gentleman has for many years resided in London, and has maintained a reputation for strict integrity and close attention to the business of his profession. I find that Mr. Lowe, the Chancellor of Exchequer, employed him in some of the Government works here, and still employs him occasionally. Since I have consulted him he has been most attentive, and always available when required. He has, in fact, given me entire satisfaction.

The

The enclosed letter states minutely the rate at which he has been paid for the several works he has inspected. When I first employed him, I stipulated that should he be employed in heavier works the remuneration must be considerably reduced; and when the order for the Railway Extension to Wagga Wagga reached me, I agreed with him that he should only be paid half per cent for inspecting the rails.

I found upon inquiry that the Victorian and Queensland Governments pay two or two and a half per cent. upon all their work, including everything, however extensive.

Mr. Shields is to give the most rigid inspection of the work, in strict conformity with Mr. Whitton's specification, throughout the manufacture of the rails.

I have, &c.,

CHARLES COWPER.

No. 16.

The Agent-General for New South Wales to F. W. Shields, Esq.

Sir,

3, Westminster Chambers, 17 September, 1873.

I shall be glad to be informed at your earliest convenience upon what terms you are prepared to act as Inspector for the Indent of Rails for the Railway works projected in New South Wales, as described in the accompanying specification. When I requested you in the early part of last year to undertake to act as inspector of the small indents which I might from time to time place in your hands, I explained that if I should at any future time employ you upon large indents, such as that for which I now have to contract, I should feel it my duty to make them the subject of a special agreement. My impression then was at the time advised that a minute inspection, and indeed any inspection at all, might be dispensed with, the contractor being held responsible for the delivery in New South Wales of rails to the satisfaction of the Engineer-in-Chief there. That view does not appear to have been adopted by the Government, as I judge by the very minute details of the specification which I have now received. On the contrary, by my instructions it appears that while a strict supervision of the rails during the course of manufacture is rigidly insisted on, the charge that was made by the gentleman who was formerly employed as Inspector of Permanent-way Material is objected to as being excessive. That charge was 1 per cent.

When you have carefully read the enclosed specification, I will thank you to state the terms upon which you are willing to undertake the duty which will devolve upon you in the faithful inspection of the rails as required by the New South Wales Government under it.

I have, &c.,

CHARLES COWPER.

No. 17.

F. W. Shields, Esq., to The Agent-General.

New South Wales Railways, &c.

Dear Sir,

3, Delahay-street, Westminster, S.W., 17 September, 1873.

With reference to our conversation yesterday, respecting the remuneration for my services as Inspector in the Contracts for Railway and other Materials exclusive of Rails, upon which you requested me to report fully to you without delay, I beg accordingly to report as follows:—

My duties in these matters consist in advising you personally, and in writing, on the carrying out of the various contracts for railway and other materials for which indents are sent from Sydney, and also in inspecting at the contractor's works wherever situated throughout England and Scotland such materials when completed, in order to ensure their being of proper quality and workmanship.

For the contracts I have inspected hitherto, which were exclusive of rails, I have been paid at the rate of 2 per cent., and the following list shows the nature and amount of each contract, the place where the inspection was made, and the payments I have received in each case.

List referred to.

Material of Contract.	Amount of Contract	Where inspected.	Amount paid to me.
	£ s. d.		£ s. d.
Axles, &c.	417 3 2	Leeds	8 7 0
Telegraphic apparatus ..	3,554 3 4	Birmingham, Darlaston, Dudley, Manchester ..	71 1 8
Carriage materials ..	130 13 0	London	2 12 3
" ..	29 12 8	" ..	0 12 0
" ..	36 11 6	" ..	0 14 6
Machine tools ...	552 0 0	Manchester ..	11 0 10
Cranked axles ...	200 12 0	Leeds ..	4 0 2
Springs ..	87 10 0	Newcastle-on-Tyne ..	1 15 0
" ..	77 4 9	Sheffield ..	1 11 0
Iron plates ..	171 0 7	Tipton ..	3 8 5
Carriage materials ..	44 15 0	London ..	0 18 0
Copper plates ..	204 2 6	Swansea (Wales) ..	4 0 5
" ..	86 9 0	Birmingham ..	1 14 6
Machine tools ..	166 0 0	Manchester ..	3 6 5
Woodcutting machines ..	172 6 0	Glasgow ..	3 8 10
Machine tools ..	524 0 0	Leeds ..	10 10 0
Iron plates ..	3,627 17 10	Newcastle-on-Tyne ..	72 14 3
Crank axles ..	110 0 0	Manchester ..	2 4 0
Telegraph wire ..	1,363 0 0	" ..	27 5 3

When it is considered that even in the smaller contracts more than one inspection is frequently required, and that the larger contracts require repeated and lengthened supervision, extending in cases over several weeks, it will be very evident that my remuneration is not excessive.

I remain, &c.,

F. W. SHIELDS.

No. 18.

No. 18.

F. W. Shields, Esq., to The Agent-General.

3 Delahay-street, Westminster, S.W., 23 September, 1873.

Sir,

New South Wales Rails.

In reply to your letter of 17th instant, requesting me to inform you upon what terms I am prepared to act as inspector for the indent of rails for the railway works projected in New South Wales, as described in the specification accompanying your letter, I beg to say that my terms for inspection thereof, as described in your letter, would be one-half per cent. on their contract price, my inspection including not only the usual superintendence of the rolling and testing of the rails but the retaining of an experienced inspector at the contractor's works during the entire period of manufacture, the inspector himself also being under my regular supervision.

I am, &c.,
F. W. SHIELDS.

No. 19.

Précis.

Employment of Mr. Shields as Inspecting Engineer of Railway Materials imported by the Government.

In a minute signed by the Hon. John Robertson, then Colonial Secretary, and Mr. James Byrnes, Secretary for Works, dated September, 1871, it is stated, "That at the last Cabinet Council, on consideration of the position and duties of Mr. Fowler, the Inspector in England of permanent-way materials and rolling-stock for the Colony, it was determined to communicate with the Agent-General for the Colony by the mail about to be closed for England, and request Mr. Cowper to make some other arrangement for the duty, on the ground that it seems to the Government that Mr. Fowler's numerous other avocations must preclude his giving such attention to the duties required of him for the Colony as is desirable."

Mr. Robertson proceeds to say that, "On consultation with my honorable colleague, the Minister for Works, difficulties appeared to us of a kind not discussed at the Cabinet," viz., as to the propriety of final arrangements being made for the appointment of some one in Mr. Fowler's place without the sanction of the Executive; and also, whether it would be proper for the Agent-General to make the selection of a gentleman for the office and to appoint him without first making reference to the Government here. "Under these circumstances," the Minister goes on to say, "we think the least objectionable course will be to limit the action of the Government at present to writing Mr. Cowper, and informing him of its determination with reference to Mr. Fowler and the duties with which he has been connected—requesting Mr. Cowper to take steps to ascertain under what terms they can be performed so as to meet nearer the views of this Government already stated, and generally for him to make any suggestion that may occur to him, not only as to the selection of a gentleman to perform the duties, but as to the nature of such arrangements as are likely to bring about the best results."

A letter to the above effect was written to Sir Charles Cowper on the 6th September, 1871. He acknowledged the receipt of it on the 3rd November following, stating that the subject was one of such grave importance that he would not be able to deal with it in the short period which would elapse before the outgoing mail was closed, but promising that it should have his immediate and earnest attention. Mr. Cowper added—"Mr. Fowler has never spoken to me on the business entrusted to him, nor has he ever been in my office. In fact I have never seen him, except accidentally in the open air. Yesterday I received the first letter bearing his own signature, and I am informed that my predecessor never had one, nor have the clerks ever seen him in the office. His representative, I am in justice bound to say, is an attentive and apparently a well qualified gentleman; but I imagine our business is of comparatively insignificant consideration to Mr. Fowler."

On the 10th January, 1872, the Agent-General wrote to say that he had been making inquiry as to the course pursued by other Governments in regard to inspection in England. "He finds," he says, "the practice differs, and the opinions of engineers vary; in some cases inspection in England is insisted upon, but not in all," &c. Mr. Cowper adds,—"I wrote on the 8th instant to Mr. Fowler, requesting him to meet me here to-day that I might have some conversation respecting the existing arrangement with him, but Mr. Baldry, his deputy, wrote to me that he was absent in Egypt, where I understand he is likely to be for some months. Mr. Baldry, however, came, and I briefly informed him that a change would probably be made"; and then he says,—"The present seems a favourable time for making a change, as there is not much required by the Colony. Whatever may be found necessary with respect to machinery, I see clearly that inspection of rails here is not thought by engineers to be of any value, though very large sums have been paid by us in past years on that account."

On this letter is a minute by Sir James Martin,—“The Cabinet approve the suggestion of the Agent-General,” 19th March, 1872. On the same date Mr. Robertson directed a letter to be prepared, informing Sir Charles Cowper, which was sent on the 25th March, and on the papers being forwarded to the Works Department, Mr. Byrnes expressed his approval thereon on the 8th April following.

On the 20th March, 1872, Sir Charles Cowper wrote to say that since the date of his letter of 10th January, he had, when he required professional advice, consulted Mr. Shields, C.E., who was many years ago connected with the Sydney Railway Company. "Of his integrity and intelligence"—the Agent-General says—"I entertain a high opinion. Since he left New South Wales he has been in practice in London, thereby having ample opportunity of becoming acquainted with contractors for railway machinery; and his offices being in the immediate neighbourhood of my chambers, every facility for personal conference is afforded. I have not, of course, made any permanent arrangement with Mr. Shields, but the cost of inspection, &c., will be considerably less than 2½ per cent."

The only minute on this paper is one by the Hon. John Robertson,—“May be communicated to the Minister for Works, 8th May, 1872”; and the Commissioner for Railways has marked upon it,—“Seen by Minister, 16/5/72.”

No further steps appear to have been taken, and it was not till Sir Charles Cowper wrote his letter of 31st October, 1873, that the question was again before the Government. Sir Charles, after calling attention to previous correspondence, says:—“Since those letters were written I have employed Mr. Shields, who was connected with the Sydney Railway in its earliest stages. This gentleman has for many years

years resided in London, and has maintained a reputation for strict integrity and close attention to the business of his profession. I found that Mr. Lowe, the Chancellor of Exchequer, employed him in some of the Government works here, and still employs him occasionally. Since I have consulted him he has been most attentive, and always available when required; he has, in fact, given me entire satisfaction. The enclosed letter states minutely the rates which he has been paid for the several works he has inspected. When I first employed him I stipulated that, should he be employed in heavier works, the remuneration must be considerably reduced, and when the order for the Railway extension to Wagga Wagga reached me I agreed with him that he should only be paid half per cent. for inspecting the rails. I found upon inquiry that the Victorian and Queensland Governments pay 2 or 2½ per cent. upon all their work, including everything, however extensive.

From Mr. Shields, 17th Sept., 1875. This letter shows that Mr. Shields had been paid £232, being 2 per cent. upon orders to the value of £11,555.

Mr. Shields is to give the most rigid inspection of the work, in strict conformity with Mr. Whitton's specification, throughout the manufacture of the rails."

Mr. Fowler's charges were:—2½ per cent. on orders for machinery, and 1 per cent. for rails and fastenings, &c. These charges included everything, cost of plans, consultations, &c., &c.

Mr. Shields' charges are:—2 per cent. on orders for machinery and fastenings, &c., and ½ per cent. for rails; extra charges being made for plans, drawings, &c., consultations, attendances at Board for opening tenders, &c., &c.

CH. A. G.
19/11/74.

No. 20.

Minute by The Accountant to The Commissioner for Railways.

I BEG to bring under notice that Mr. Shields is charging 2 per cent. for inspection of steel rails for renewals. The charge for other rails being only ½ (one half per cent.)

The form in which Mr. Shield's accounts for commission are rendered makes it very difficult to check them off. For instance, a number of shipments are added together and the percentage charged on the gross, without mentioning the ships' names, leaving it to us to find them out as best we can, which is rendered impossible when any mistake is made in the figures. Perhaps instructions may be given for the names of the ships to be mentioned in the accounts.—H.A.W., 12/1/75.

The Agent-General should be communicated with, and asked to inquire and report.—CH. A. G., 13/1/75. Approved.—J.S., 14/1/75.

No. 21.

The Secretary for Public Works to The Agent-General.

Sir, Department of Public Works, Railway Branch, Sydney, 13 January, 1875.

I have the honor to bring under your notice that Mr. Shields is charging 2 per cent. for inspecting the steel rails required for renewals, whereas the charge for inspection of other rails is only ½ per cent. I may also state that the mode in which Mr. Shield's accounts are rendered makes it a matter of some difficulty to check them off. As an instance, I may mention a number of shipments are added together and the percentage charged on the gross, without mentioning the names of the ships, thus leaving it to this Department to find them out as best they can, which is rendered almost impossible when any mistake is made in the figures.

In order to remove this difficulty, and at the same time facilitate the checking of these accounts, I have to request that you will be good enough to give instructions to have the names of the ships mentioned in the accounts for the future.

I have, &c.,
JOHN SUTHERLAND,
Secretary for Public Works.

No. 22.

Capt. A. A. Jopp to The Secretary for Public Works.

Sir, London, 3, Westminster Chambers, 6 April, 1875.

In reply to your letter No. 75-49 of the 13th January last, I have the honor to explain, with reference to Mr. Shield's charge for the inspection of the rails in question, that Mr. Shield's fees for inspection generally have been at the rate of 2 per cent., but that when the large extension contracts were entered into a special arrangement was made by which he was to charge only ½ per cent. for rails under those contracts. The quantity of Landore Siemens steel rails, in the instance to which you refer, was only 150 tons, and as special arrangements had to be made for this, as for any other inspection for which 2 per cent. is charged, I think that you will not consider that Mr. Shields could have been limited to ½ per cent., which has hitherto been paid for the large rail contracts only.

I may mention that in the case of the 1,025 tons (800, 200, and 25) of Landore rails, ordered under cover of your letters of the 3rd September last, I pointed out to Mr. Shields that the inspection of so large a quantity appeared to come under the general conditions of the extension contracts, and accordingly only ½ per cent. was paid.

Your instructions as to keeping each shipment distinct, and inserting in each case the name of the ship, in Mr. Shields' accounts, will be carefully attended to.

I have, &c.,
A. A. JOPP, Capt. R.E.
(For Agent General.)

Seen.—J.R., 10/6/75. Mr. Whitton, B.C., 10/6/75. See memo. 75 herewith.—W.H.Q., 11/6/75.

No. 23.

No. 23.

Minute by The Engineer-in-Chief to The Commissioner for Railways.

Engineer-in-Chief's Office, Sydney, 11 June, 1875.

Rate of Commission paid to the Inspecting Engineer in England.

I HAVE up to the present time refrained from making any remarks on the arrangements made with Mr. Shields for the inspection of railway materials supplied from England, nor should I now have considered myself justified in doing so had not the Commissioner asked my opinion with reference to the letter of the Agent-General, dated 6th April, 1875.

The reasons given by the Agent-General for the appointment of Mr. Shields as Inspecting Engineer in preference to Mr. Fowler were, that the work would be done at much less cost, and that Mr. Shields would personally inspect every article, which, it was stated, Mr. Fowler did not.

From the Agent-General's letters, I understood that Mr. Shields was to be paid $\frac{1}{2}$ per cent. for rails and 2 per cent. for fastenings, bridges, and rolling stock.

Mr. Fowler was paid 1 per cent. for rails and fastenings, and $2\frac{1}{2}$ per cent. for bridges and rolling stock; but it must be remembered that for these amounts Mr. Fowler prepared all specifications and drawings of every description and for all kinds of work, and made no extra charge whatever.

I desire to draw the Commissioner's attention to an account which has been supplied by Mr. Shields and which has been paid. It is dated April 9th, 1874, the amount £327 10s. 4d.

Mr. Fowler's charge for similar inspection, including the cost of printing and writing specifications (which, in the case of Mr. Shields, was done in Sydney) would have been £302 1s.; and, therefore, although Mr. Shields was to do this work for less money I find he has been paid in excess of Mr. Fowler's charges £25 9s. 4d.

This may be an exceptional account, but as it is the only one in my possession I have made use of it.

An amount of £75 12s. is charged by Mr. Shields for advising and reporting upon contracts, but no such charge was ever made by Mr. Fowler for similar services.

Probably I may here be permitted to say that, in my opinion, it is utter folly to employ anyone to inspect rails at $\frac{1}{2}$ per cent., as no man can possibly afford to do so, if he be expected to discharge the duties satisfactorily.

I now come to the Agent-General's proposition to pay Mr. Shields 2 per cent. for small orders for rails instead of $\frac{1}{2}$ per cent. previously paid. Without offering any opinion on the above proposal, I may state that the commission paid to Mr. Fowler was 1 per cent. for rails and fastenings on all orders whether large or small.

JOHN WHITTON.

No. 24.

The Under Secretary for Public Works to The Principal Under Secretary.

Sir,

Department of Public Works, Sydney, 4 June, 1875.

I am directed by the Secretary for Public Works to enclose herewith a letter respecting the dispensing with the services of Mr. Shields as Inspecting Engineer for this Government in London, which I am to request you will have the goodness to forward to the Agent-General in London by the outgoing mail.

I have, &c.,

JOHN RAE.

Letter forwarded per mail, 4/6/75.

No. 25.

The Secretary for Public Works to The Agent-General.

Sir,

Department of Public Works, Railway Branch, Sydney, 4 June, 1875.

Referring to my telegram of the 28th ultimo, directing you to dispense with the services of Mr. Shields as Inspecting Engineer, I have now the honor to inform you of the causes which have led to this decision. You are already aware by my predecessor's telegram of the 27th August last, followed by his letter of the same date, that the inspection of the rails imported for the railway extensions was considered to be unsatisfactory, and in your letter of reply, dated the 22nd September last, you furnished a report from Mr. Shields on the subject.

When the first shipment of these rails arrived in the Colony it was apparent from their rough and unfinished appearance that in this respect they were not equal to specification; they were then tested by being laid down in the Newcastle and Sydney yards where the traffic was the heaviest, and it was found that they were out under this test in a few weeks, confirming the Engineer-in-Chief's opinion that they were next to worthless. Upon this result being ascertained, it was decided that a Board, composed of competent men, unconnected with the Department, should be appointed to inspect, test, and report upon the rails with a view—if their report confirmed the opinion of the Engineer-in-Chief—to the Crown Law Officers being asked to advise if any steps could be taken to obtain redress.

The report of the Board was obtained on the 4th ultimo, and as the conclusion they arrived at after a most exhaustive enquiry fully confirmed the verdict of the Engineer-in-Chief, the advice of the Crown Law Officers was at once asked for. A copy of the opinion given by the Honorable the Attorney-General is enclosed. In accordance with his advice the Crown Solicitor has been instructed to communicate at once with the legal agents of the Government in London, instructing them to obtain without delay a copy of all contracts with the Park Gate Iron Company, and other papers from you, and to submit a case to Counsel as to whether an action will lie against the Company for breach of contract.

The Board in their report state that had the specification been strictly adhered to there could have been no possibility of any cause of complaint; it was Mr. Shield's duty to see that the specification was adhered to, and as it was clear that he had failed in this duty, I had no alternative but to direct that his services be dispensed with.

With

With printed copies of the report of the Board on the rails, I forward by book post printed copies of their report on the fastenings, spikes, screws, fish-plates and bolts, and nuts supplied by the Patent Nut and Bolt Company, the Ebbir Vale Iron Company, and the Darlington Iron Company. It will be seen that the Board report that these materials have not been manufactured in strict accordance with the specification for the supply of same, and as they were passed by Mr. Shields it is evident that in this respect also he has failed in his duty.

I have to request that you will have the goodness to furnish the Law Advisers of the Government in London with all papers and information they may require to enable them to take the required action, and that you will employ some person other than Mr. Shields to make the Government inspection of the material to be supplied in satisfaction of the indents now in your hands. I shall be glad to be informed at as early a date as possible of the name of the gentleman so employed temporarily, and the rate of remuneration agreed upon for his services.

I have, &c.,
JOHN LACKEY,
Secretary for Public Works.

No. 26.

Telegram from W. Forster, Esq., to The Colonial Secretary.

16 January, 1876.

LETTER 7th July, from four engineers about dismissal Shields, signed by Woods, then our engineer; this presents confidence in him; shall we return to Fowler?

Received 17th January, 1876. Telegram to Forster to try the suggestion of the Martin Government.

No. 27.

C. H. Gregory, Esq., and others, to F. W. Shields, Esq.

Sir,

Great George-st., Westminster, London, 7 July, 1876.

In accordance with your request we have given our best consideration to the subject of the recent withdrawal of your appointment of Inspecting Engineer for New South Wales Government, as mentioned in the letter of the Agent-General, Sir Charles Cowper, to you of the 3rd ultimo, and in consequence of statements made in the Colony respecting certain rails supplied by the Parkgate Iron Company.

After careful consideration of the documents placed before us, which documents comprise, as you inform us, the whole of the correspondence which has passed between the Agent-General and yourself on this subject; we have arrived at the following conclusions, viz:—

1st. It appears to us from those documents that you have carried out the inspection (which was the only duty intrusted to you) in a careful manner; the returns showing that you had submitted sample rails day by day for testing during the progress of their manufacture, and had applied to them the tests prescribed by the specification sent for your guidance. According to these returns, the rails have borne the tests satisfactorily, with the exception of that test named in clause 16 of the specification, which requires rails of the dimensions specified to support a weight of 30 tons on bearings of $3\frac{1}{2}$ feet—a condition which, according to our experience, is entirely impracticable.

2nd. We have noted the two telegrams communicated to you in the letter of the Agent-General, of 3rd September, and 29th May last, viz.: “Rails tested very inferior, worn out in a month, better inspection required”, and “Regret that rails supplied by Parkgate Iron Company, six thousand five hundred tons condemned utterly useless; make immediate inquiry as to inspection by Shields.”

In the absence of definite information we cannot understand how it can have happened that so large a quantity as 6,500 tons (the entire lot) should have been proved to be utterly useless within so short a period. Such a result, as also that of any rails being worn out by any ordinary traffic in a month, being unprecedented in our experience.

3rd. We are of opinion that the application contained in your letter of the 31st May last, to the Agent-General, viz., that some of the rails in question should be sent back to be tested in England, is a reasonable and proper request, which should in fairness be acceded to by the New South Wales Government.

4th. We have carefully considered the instruction sent to the Agent-General to withdraw your appointment without notice, and without any explanation of the reasons for which you were considered to have failed in your duty, other than an assertion that the rails were condemned as utterly useless.

We find that no opportunity has been afforded you as yet of knowing or refuting the specific charges against you on which it is to be presumed the order to withdraw your appointment has been based.

5th. Under all these circumstances, we think that the instruction given by the Government of New South Wales to the Agent-General to summarily withdraw your appointment must have been sent under some misapprehension of the facts; as it is difficult to conceive that the Government should commit the injustice of withdrawing your appointment without affording you the opportunity and means which you have asked for, of knowing and refuting the specific charges which are presumed to have been made against you.

We are, &c.,
CHARLES HUTTON GREGORY,
W. H. BARLOW,
EDWARD WOODS,
CHARLES MANBY.

15

No. 28.

Telegram.

TELEGRAPH to Forster:—"Unwilling to revert to old system, even with Fowler. We think it best to arrange, if possible, to have railway material approved here by our Engineer-in-Chief; all other ironwork to be approved here by Engineer-in-Charge, as exhibited in specifications.

"Payments to be made on shipment to 66 per cent. of amount, remainder on approval here. None but first-class houses should be invited to tender.

"Understand Deniliquin Railway has arrangement of the kind.

"JOHN ROBERTSON."

Telegram, 31/1/76.

No. 29.

The Agent-General to The Colonial Secretary.

Sir,

London, 3, Westminster Chambers, 18 February, 1876.

With reference to your following telegram dated 1st instant,—“Unwilling to revert to old system, even with Fowler. We think it best to arrange, if possible, to have railway material approved here (by our Engineer-in-Chief; all other ironwork to be approved here by Engineer-in-Charge, as exhibited in specification. Payment to be made on shipment, &c., 66 per cent. of amount, remainder on approval here. None but first-class houses should be invited to tender. Understand Deniliquin Railway has arrangement of the kind,”—I have the honor to enclose for your consideration a minute which I have prepared on the subject of the system of inspection and payment of railway and other materials, together with a report from Captain Jopp on the same subject.

I also enclose a minute on the subject of the appointment held by Mr. Woods, C.E., and a copy of a letter dated 20th ultimo, conveying to him my intention not to refer the inspection of railway materials to him in future. A copy of Mr. Wood's reply is also enclosed.

I have, &c.,
WILLIAM FORSTER.

No. 30.

Minute by The Agent-General to The Secretary for Public Works.

I RECOMMEND for the consideration of the Government the within suggestions of the Secretary, which have been furnished by him at my request. The telegram attached is not imperative, and goes no further than to indicate the desirability of either a discontinuance or considerable modification of the existing system of inspection and approval of railway materials by a skilled and qualified person, upon whom the chief responsibility of obtaining good and suitable articles accordingly rests, and, as has been exemplified in the case of the bad iron supplied by the Parkgate Company, whose approval goes far towards binding, if it does not entirely bind the Government, and conclude them against any expression of disapproval thereafter. The telegram, however, still leaves the question open for further consideration.

The case of the Parkgate Company above alluded to shows, I think, the necessity for some, and perhaps even considerable modification of the system. There appears to be an obvious objection to the nominal employment of an inspector who never personally inspects but appoints some other person, of course inferior in position and capability, to inspect for him, without giving the Government a voice in this second nomination.

I am given to understand that in a great many cases these sub-inspectors are of a class not quite removed from the suspicion of bribery to which they become inevitably exposed, during a process of inspection, which extends over, and involves residence on the spot, for a long time. And it is clear that the very assumption or supposition of an authorized person being always present during the manufacture of materials, renders it the more difficult for the Government afterwards to object to the quality of the materials, and consequently places the Government very much at the mercy of the sub-inspector. This constant inspection moreover seems almost to obviate the necessity of, and to impart a superfluous character to, the application of tests after the material has been completed. And were I to choose between the two methods, I should unquestionably prefer the tests to the inspection.

I cannot hesitate, therefore, strongly to recommend the application of tests at such times as the Government may themselves choose for their application, whether it be before shipment from England or on arrival in New South Wales; and to this, I imagine, no reasonable manufacturer could possibly object. But I am greatly inclined to concur with the Secretary in doubting, as he seems to doubt, the practicability of entirely abolishing inspection in England, and relying altogether in its stead upon subsequent examination and approval in the Colony. If practicable, there can be no doubt that to make the final settlement of the account for payment, postponed to the extent of 40 per cent. until the materials should be finally approved in the Colony, would involve an increase of expense so great as almost to amount to an inseparable difficulty. But suppose this difficulty overcome, or the cost determined to be not in commensurate with the benefit, which no doubt would be considerable, then occurs the possibility suggested by the Secretary, which does not seem to me so extreme as he considers it, namely, that the materials supplied might tend to be of the quality which would be worth, and could be supplied or purchased for the amount payable in England, that is to say 66 or 60 per cent. in round numbers, the manufacturers or sellers of the article being content to take the chance of being paid the remainder, if by any chance the inferiority of the article should fail to be detected.

The change of system proposed or anticipated in the telegram of abolishing inspection in England must, in short, involve practically the purchase of the materials in question from merchants or agents, and not from manufacturers. There may be, and no doubt are, certain advantages to be gained by this, as it were extending the competition and entering a more open market; but in such case we must be prepared to incur additional expense, in order to compensate the sellers for additional risks, arising out of the inevitable competition with firms of doubtful integrity or reputation. We must be prepared also to suffer from the possibility of even worse frauds than have occurred in the case of the Parkgate Company. I trust, therefore, the Government will see the desirability of caution in making this change, some change

change being, in my opinion, inevitable and absolutely necessary. What I am inclined to recommend is that in all cases a guarantee should be obtained from the parties supplying the goods, and that inspection in England should be discontinued as far as to render unnecessary the appointment or employment of a permanent inspector, but that the Agent-General should be empowered in all cases, and should be required in particular cases, to employ a skilled person to test the quality of important or valuable materials, at such times and places as he might consider expedient, or the Government might determine. The inspection in this case would amount to no more than approval or acceptance subject to further trial, and in a number of cases would be obviously unnecessary.

In these views, I gather from a late conversation with Sir Daniel Cooper, that he substantially concurs. W.F., 15/2/76.

No. 31.

Minute by Capt. A. A. Jopp.

MINUTE for the Treasurer, with reference to the Chief Secretary's telegram, dated 1/2/76, received 2/2/76, relative to inspection and payment of railway material.

In compliance with your instructions (on receipt of the above telegram, "Unwilling to revert, &c.") that I should give you my views upon the matter of local inspection of railway materials and similar articles, I beg to submit as follows:—

The telegram, as I understand it, indicates that it would be best to arrange, if possible, that railway materials and other ironwork should be inspected and approved on arrival in the Colony, instead of in England as heretofore; and that the Agent-General should pay only 66 per cent. of the invoice value on shipment here, withholding the remainder (34 per cent.) until the goods had been passed in the Colony. (The proportions of payment intended are probably $66\frac{2}{3}$ and $33\frac{1}{3}$ per cent., or $\frac{2}{3}$ and $\frac{1}{3}$.)

2. It is not quite clear whether it is suggested that we should dispense with the services of an engineer in England altogether, or whether it is only the system of inspection by him which would be discontinued.

3. In considering this question it may be well to detail the duties hitherto performed by our engineer here. They have been as follows:—

A.—On receipt of an indent from Sydney to consider it and recommend the firms from whom tenders should be obtained. This frequently involves the preparation of specifications and drawings, and occasional correspondence with the makers, in order to guard against defects and to stipulate for attention to points of detail in manufacture which suggest themselves to an engineer who is experienced in the actual supervision of the various processes which have to be gone through.

B.—To recommend the acceptance of the most desirable tender.

C.—To supervise and inspect the article during its manufacture.

D.—To inspect the article finally on completion.

4. The charges for these services, A, B, C, and D, have been,—

Mr. Fowler—Rails, 1 per cent.; other articles $2\frac{1}{2}$ per cent.

Mr. Shields:—Rails, $\frac{1}{3}$ per cent.; other articles 2 per cent.

Mr. Woods:—2 per cent. all round, but with the intention that a reduced charge for rails be suggested, in the want of a large order being received.

5. The charge of $2\frac{1}{2}$ per cent. is the one usually made by all our first-class engineers; and the more we cut it down the greater risk we incur of having an inferior class of inspectors.

6. If we had no engineer in England A and B would be done by the Agent-General on his own sole responsibility. C would not be done at all, and D would be done in the Colony.

7. How would this work? With regard to A and B, or making the contract, I think it could be done, and it would become my duty to a greater extent than heretofore to make such inquiries and suggestions as might be of use to the Agent-General, though it is not to be supposed that this professional assistance would be as acceptable to the Government as that of an experienced civil engineer.

8. C, or supervision during manufacture, could not be done satisfactorily, as the limits of time and distance would preclude its being attempted to any great extent, in combination with their other duties, by the Agent-General or the Secretary. The result would be that we should depend entirely on tests at the final inspection (D, in the Colony), which cannot always be relied upon to detect bad material.

To devise tests which shall expose a bad wearing material is most difficult. Wear and tear is the real test, and an article which will wear well is best insured by careful examination of the generality of the materials used, and by strict attention to all the processes of manufacture. I think that it was actual wear, rather than the repetition of the tests in the Colony, which most fully exposed the bad quality of the iron used in the Parkgate rails, and careful inspection during manufacture would have detected this fault with greater certainty than could be expected from the application of tests on completion.

If, therefore, we dispense with inspection during manufacture, we at least lessen the probability of our obtaining good material.

9. The next question which arises is whether a first-class firm, willing to submit to the most rigid inspection here, but accustomed to payment on delivery, would be disposed to tender at all under the conditions proposed; and supposing that it would, then what increased charge would it make, in view of the delay and risk to which the proposed mode of payment would expose it?

10. Putting ourselves in the place of the contractor, let us consider this delay and risk and their consequent effect on his price.

11. In the first place, as he will have to wait probably for about six months for one-third of his money, he will arrange his price to meet this delay. It must be remembered that when the contractor delivers the article, he has laid out, in plant, labour, and materials, its full value, less his own profits, and as he is deprived for six months of one third of the purchase money, which he requires to meet his expenses, he must in the first instance find it in some other way, which will involve him in outlay in some form, and this he will charge to the purchaser, by adding it to his price. It is true that Government will be in receipt of interest on the money it withholds; but this will not be equivalent to the value which it would represent to the contractor were he to receive it, or to the expense to which he might be put for want of it.

12. But this is a small item when compared with the additional price which the contractor would charge to cover the consequences to him of the rejection of the whole, or a portion of his goods, after delivery in the Colony; and this brings before us the most serious aspect of the difficulty.

13. A contractor is willing to submit to the most rigorous inspection at his works, and to correct defects which may be found during manufacture, or on completion, and a good contractor courts such inspection, because it checks faults at their earliest stage; and it is moreover an additional check on his workmen, whose regard for the eventual consequences to their masters will not prevent their slipping in bad material, or slurring over some important process, if they know that they are free from the risk of detection by a vigilant inspector. But if the goods are to be inspected after they have been delivered, at so distant a spot as Sydney, where the contractor cannot be present to protect his own interests, the consequences of rejection assume, in his eyes, a most serious magnitude. Every article rejected is thrown on his hands, and must be replaced. As there will probably be no market for it in the Colony, he must reship it to England (or to the best market he can find), get rid of it at a depreciated value, and ship goods to replace it at his own expense.

The measure of this risk partly depends on the ratio of the weight to the value. Thus, if a batch of rails, say at £8 per ton, were rejected, it would cost him at least 40s. per ton for freight and charges home and out again, or 25 per cent. on the value of the rails; to which must be added their depreciation in value, which would depend on his success in finding a market for them. The contractor will therefore determine in his mind what proportion of rejection it will be provident for him to provide for; he will then make some such calculations as are indicated above, and he will add the result to the price which he would charge if the goods were accepted and paid for on leaving his works. In making these calculations he will naturally feel his disadvantage in not being present at the inspection, and he will dread possible rejections for small faults. It is true that the Government would probably hesitate to condemn an article for some very slight defect, when the result of such condemnation would be so serious to the contractor. This, however, is an argument against the proposed system, for we should certainly not hesitate to make the very smallest blemish a ground for rejection if detected at the works.

14. Moreover, as the consequences of rejection would be so serious, the inclination of the contractor to attempt to secure approval by the offer of percentages, or by other unfair means, would be increased. This would correct itself in time, where its failure had proved the uselessness of the attempt; but it might, in the first instance, be made an element in the calculations of an unscrupulous contractor, ignorant of the position and character of those with whom he would have to deal.

15. Then what is to prevent a very inferior article being shipped, for which the contractor would charge such a sum as that 66 per cent. thereof would satisfy him, taking his chance of getting the remainder? If payment of the balance were refused, and he were called upon to replace the rejected goods, he would simply decline to do so, contenting himself with the 66 per cent. already in his pocket. We should then endeavour to proceed against him for breach of contract, but under the most favourable circumstances, such a course will be attended with difficulty, with the party to be sued against in England, and his goods and our witnesses in the Colony. This is of course an extreme case, and by selecting first-class firms we should render its occurrence very improbable; but the nature of the indent frequently limits very much our choice of firms, and it is occasionally necessary to order goods from a house that we know will require careful supervision, in order to insure its carrying out the order satisfactorily.

16. I am led, by a consideration of the difficulties which I have endeavoured to point out, to the conclusion, that very few first-class firms would be disposed to tender at all under the conditions proposed, and that such firms as might do so would, in view of the delays and risks above indicated, increase their ordinary price, by an amount which cannot be accurately estimated, but which would probably vary from 15 to 33 per cent.

17. I therefore earnestly hope, natural though it be, that the recent instance of grave failure in the existing system should make the Government doubt its efficacy, that the arrangement indicated in the telegram will not be adopted at least before its probable working has been more fully considered. I still venture to think that the employment of a first-class civil engineer, on whom we may depend for a thoroughly careful and efficient system of inspection, and full payment on his certificate, will be found to be the most certain and the most economical method of securing the best materials and the best workmanship. At the same time, I think that it may be arranged (without necessarily informing the contractor of our intention) that the contract may be so framed as to guard against the inspecting engineer's certificate being claimed by the contractor as a final approval from which there can be no appeal under any circumstances. This point was considered by Sir Daniel Cooper, when the replacing of the rails lost in the "Cambridgeshire" was under consideration, and Mr. Mackrell was of opinion that it could be provided for. I therefore wrote to Mr. Woods on the 15th November last a letter, of which a copy is attached. I also attach a copy of Mr. Woods' reply, dated 16th November last, in which he suggests a form of guarantee. You will observe that Mr. Woods is of opinion that even under the restrictions which he suggests, the makers may not consent to undertake the liability, though he supposes that they would do so by putting on a little extra price to cover any possible risk. The clause in its modified form as not as yet been referred to Mr. Mackrell, as Sir Daniel Cooper decided to do nothing further in the matter until you arrive in England, and you have determined to make no changes in the specification in the particular instance in question. For future orders, however, Mr. Mackrell might be asked to draw up a protecting clause framed on the principle above indicated.

18. I may add that the system which we have hitherto followed is the one which has, I believe, been in practice for all our distant colonies, although the system indicated in the telegram has been occasionally suggested, but has on full inquiry been thought to be impracticable.

19. To the supervision exercised by our engineer, we should probably be able in future to add a greater degree of supervision from this office than was possible during Sir Charles Cowper's illness. As far as could be effected by correspondence, every order, whether in the hands of our engineer or not has been throughout under the full control of the Agent-General; but the actual inspection of the railway orders has been intrusted to our engineer, and it has been to the miscellaneous orders that I have given more immediate personal attention. In arranging this, it has latterly been thought desirable only to refer to our engineer, as a rule, the indents from the Public Works Department and the other orders have been inspected

inspected by me when necessary. But in future I think that some of the orders, even when in the hands of our engineer, might if thought desirable, be occasionally inspected, either during manufacture or on completion, by the Agent-General or the Secretary. Such inspection would not profess to be of such value as that of our engineer, and could not efficiently take its place, but it would at least be an additional check.

A. A. JOPP, CAPT., R.E.,
Secretary.

5/2/76.

No. 32.

Capt. Jopp to E. Woods, Esq., C.E.

Dear Sir, 3, Westminster Chambers, Victoria-street, S.W., 15 November. 1875.

With reference to the proposed modifications in the specification for rails, I am desired by Sir Daniel Cooper to inform you that it has been suggested by our solicitors that it might be desirable so to alter paragraph 16 of the specification as to provide, not only that the rails actually tested should stand the tests prescribed, but that all the rails should be guaranteed to stand the tests. By this means, you could as before, test such rails as you might chose to select, and we should have the additional security of being able to maintain that any rails which would not stand the tests, if afterwards applied in the Colony, did not comply with the conditions of the contract.

If you do not see any objection to this, please say in what way you think it would be best to introduce the condition into the specification.

Yours, &c.,
A. A. JOPP, CAPT., R.E.,
Secretary.

No. 33.

E. Woods, Esq., C.E., to The Agent-General.

3, Great George-street, Westminster, London, S.W., 16 December, 1875.

Dear Sir, Rail Specification.

In reply to Captain Jopp's letter of yesterday's date, I see no objection whatever, but rather the contrary, to the introduction of a clause which has been suggested by your solicitors. The only question is whether the makers will consent to undertake the liability. I suppose, however, they would do so, putting on a little extra price to cover any possible risk.

I would suggest that the first line in clause 16 should be struck out, and that in lieu thereof the following words should be inserted:—"All the rails included in this contract shall be guaranteed to stand the following tests, which will be applied from time to time to such individual rails the inspector shall select for testing."

And I would further suggest that the words which I have marked through in pencil in clause 17, should be struck out; and this clause as thus altered would then read as follows:—"If the result of the tests do not show compliance with this arrangement the whole of the batch of rails from which the rails have been taken for testing should be subject to rejection."

I beg to return the specification.

Yours, &c.,
EDWARD WOODS.

No. 34.

Minute by Mr. William Forster.

My attention has been directed to a letter addressed to F. W. Shields, Esq., 6, Delahay-street, Westminster, dated Great George-street, Westminster, London, July 7, 1875, and signed by certain persons who I understand are reputed engineers, and among their names I find that of Mr. Edward Woods, inspecting engineer in London to the Government of New South Wales. I have been in London since December 7th, and as no further communication or explanation has been received from Mr. Woods, I think it my duty to place on record some observations upon the extraordinary position in which Mr. Woods appears to me to have placed himself by signing such a letter.

This letter ostensibly has reference to what the writers term "the recent withdrawal of his, Mr. Shield's, "appointment of Inspecting Engineer for the New South Wales Government." It purports directly, "after careful consideration of the documents placed before the writers by Mr. Shields himself, but also as afterwards admitted," in the absence of definite information "upon certain material points to inquire into and condemn the course taken by the Government of New South Wales by such withdrawal, and to express approval of the manner in which Mr. Shields performed his duty in inspecting certain rails supplied by the Parkgate Company to the Government of New South Wales in pursuance of contract made with that Government.

These rails have been since, by careful inspection, and by actual use, proved to the satisfaction of the said Government, and of other parties not interested in the matter, to be not only quite incapable of standing the tests to which it was agreed by the contractors that the rails should be submitted but utterly worthless for the purposes for which they were intended and for which the contractors knew and must have known they were intended. From this unquestionable fraud, by whomsoever committed, it is clear that Mr. Shields' inspection failed to protect the Government by whom he was employed. The letter, therefore, obviously, though indirectly, prejudges the case which may possibly be, and very probably will be, matter of litigation between the Parkgate Company and the Government of New South Wales, and pronounces an *ex parte* opinion in defence or in extenuation of the fraud charged by the Government of New South Wales against the Parkgate Company, and so far in prejudice of any claim arising out of the transaction, which may be made by the Government of New South Wales upon the Parkgate Company. So far as the other writers of this letter are concerned, doubtless the Government of New South Wales may easily afford to treat their interposition as an impertinence.

The time has not yet come when three or four engineers can be regarded as infallible exponents of the value of evidence, or can undertake to rule public opinion or courts of law, in matters for judicial inquiry, and of possible legal litigation.

The

The gross folly, presumption, and injustice of venturing to pronounce an *ex parte* opinion in such a matter by means which, whether or not intended, yet evidently tend to favour one particular side at the expense of the other is too obvious for comment, and cannot be excused or counteracted by any weight of professional authority. With Mr. Woods, however, the case assumes a different complexion. This letter seems to me to have very much the aspect of a concerted attempt of certain persons, friends of another person deeply interested, virtually to gloss over a fraud, and in the interest of their friend to protect from its legal consequences, not only him as the paid servant of the defrauded parties who have suffered by his failure rightly to perform his duty, but even to shelter the actual parties by whom the fraud was committed, and surely it cannot be regarded as otherwise than an extraordinary fact that another inspecting engineer of the Government of New South Wales should be a party to such a transaction, and should in effect offer himself as evidence for the defence in case of an action by the Government of New South Wales against the defrauding Company.

It appears to me, therefore, that by holding such opinions upon this matter much more by their publication in the form now under consideration, Mr. Woods has rendered it difficult for the Government of New South Wales to have any confidence in him, either as inspecting engineer or as an individual. Of course I have no wish to assume that Mr. Woods has acted otherwise than honestly in the matter, or to impute to him any breach of faith or confidence. But even upon this supposition, what opinion can be formed of Mr. Woods' judgment and general capacity after having allowed himself to be drawn into taking such a step?

Mr. Woods may be an excellent engineer, but upon the most favourable view of his conduct in this matter he must be convicted of an unpardonable error of judgment, as well of deplorable ignorance of the necessities of his position, and the sort of relations which ought to subsist between possible or actual employers and employed.

Communicate to Mr. Woods, and forward a copy to the Government.

W.F., 15/1/76.

In communicating with Mr. Woods, it may be sufficient to inform him of the withdrawal of confidence in him, stating only such reasons as are applicable to himself.—W.F., 17/1/76.

No. 35.

Captain Jopp to E. Woods, Esq., C.E.

Sir,

3, Westminster Chambers, Victoria-street, 20 January, 1876.

The attention of Mr. Forster, Colonial Treasurer, of New South Wales (who is now in England for the purpose of inquiring into the question of the supply of railway iron to the Colony) has been directed to the letter of the 7th July last, addressed to Mr. Shields, and signed by you after your appointment as Mr. Shields' successor, in which you comment on the withdrawal by the Government of Mr. Shields' appointment as inspecting engineer.

Mr. Forster has desired me to inform you that in view of the circumstances under which this letter was written, and of the opinions which you have therein expressed, he finds a difficulty in bestowing upon you that confidence which ought to subsist between the Government and their engineer; and he has, therefore, desired me to intimate that the inspection of railway materials will not be referred to you in future by the Government of New South Wales.

Yours, &c.,

A. A. JOPP, CAPT., R.E.,
(For Agent-General).

No. 36.

E. Wood, Esq., C.E., to Capt. Jopp, R.E.

Sir,

3 Great George-street, Westminster, 27 January, 1876.
New South Wales Government.

I beg to acknowledge the receipt of your letter of the 20th instant, in which you inform me that, in view of the letter of the 7th July last addressed to Mr. Shields, and signed jointly by myself and by some members of our profession, commenting upon the withdrawal of Mr. Shield's appointment as Inspecting Engineer for the New South Wales Government, you had been directed by Mr. Foster, the Colonial Treasurer of New South Wales (who had arrived in England for the purpose of making inquiries into the matter of the contract for the railway iron), to intimate to me that the inspection of railway materials will not be referred to me in future by the Government of New South Wales.

Yours, &c.,

EDWARD WOODS.

No. 37.

Minute by the Superintendent of Railway Stores.

Inspection of Railway Material.

I NOTICE that Mr. Fowler is being paid $2\frac{1}{2}$ per cent. commission instead of 2 per cent., the rate paid to his predecessors Mr. Shields and Mr. Woods—also 1 per cent. for rails instead of $\frac{1}{2}$ per cent.

I presume this is correct.

A.R.

The Secretary, 28/5/77.

The rates now paid to Mr. Fowler are those which were originally fixed. There are no papers in this office showing how Mr. Fowler came to be reappointed, nor the terms on which his services have been obtained. As the rates have been passed by Agent-General, it is presumed they are correct; but it is desirable that the Department most concerned (Public Works) should have some record of the matter.—CH. A. G., 4/6/77.

Principal Under Secretary,—Are there any papers on the subject?—J.R., B.C., 5/6/77. Certain papers forwarded herewith for perusal, B.C., 8/6/77. Commissioner. These papers show only what we already know, viz., that there was some proposition to revert to Mr. Fowler; but that the Government did

did not desire to do so. They do not show how Mr. Fowler was reappointed, nor the rates of remuneration for his services.—CH.A.G., 15/6/77. Principal Under Secretary. If there be no other papers on the subject in the Colonial Secretary's Office, probably the Agent-General might be able to furnish.—J.R., 15/6/77.

No. 38.

The Under Secretary for Public Works to The Principal Under Secretary.

Sir,

Department of Public Works, Sydney, 26 June, 1877.

In returning to you herewith the documents forwarded to this Department by your B.C. of the 8th instant, I am directed by the Secretary for Public Works to state that these papers do not contain evidence of the reappointment of Mr. Fowler as Consulting Engineer on behalf of this colony in England, nor the remuneration allowed; and as there do not appear to be any papers in existence giving the information required, I would suggest that the Agent-General be requested to furnish the particulars of Mr. Fowler's reappointment, and the remuneration received by that gentleman for his services, in order that the same be made a record of this Department.

Letter to Agent-General for approval, 3/7/77. Agent-General, 6th July, 1877.

I have, &c.,
JOHN RAE.

No. 39.

The Principal Under Secretary to The Agent-General for New South Wales.

Sir,

Colonial Secretary's Office, 6 July, 1877.

With reference to the reappointment of Mr. Fowler as Consulting Engineer for this colony in England, I have the honor, by the desire of the Secretary for Public Works, as expressed in the enclosed letter, to request that you will furnish me with the particulars of information required by that Minister as to Mr. Fowler's reappointment, and the remuneration that he receives for his services.

I have, &c.,
HENRY HALLORAN,
(For the Colonial Secretary).

No. 40.

The Principal Under Secretary to The Under Secretary for Public Works.

Sir,

Colonial Secretary's Office, Sydney, 13 December, 1877.

With reference to your letter of the 26th of June last, asking that information might be obtained from the Agent-General in London regarding the position and remuneration of Mr. Fowler as Consulting Engineer for this Government in England, I am directed by the Colonial Secretary to transmit to you, for the information of the Secretary for Public Works, a copy of a report which has now been received from Mr. Forster on that subject.

I have, &c.,
HENRY HALLORAN.

No. 41.

The Agent-General to The Colonial Secretary.

Sir,

London, 3, Westminster Chambers, Victoria-street, S.W., 18 October, 1877.

In reply to your despatch No. 77/5478 of the 6th July last, requesting, at the desire of the Secretary for Public Works, as expressed in his enclosed letter of the 26th June last, that I would furnish you with particulars of information required by that Minister as to the reappointment of Mr. Fowler as Consulting Engineer for the colony in England, and the remuneration that he receives for his services, in order that the same be made a record of the Department of Public Works, I have the honor to remind you that in January, 1876, shortly after my arrival in England, I thought it desirable, for the reasons set forth in my minute of the 15th January, 1876, forwarded to you under cover of my despatch No. 77/5478, of the 18th February, 1876, to discontinue the inspection of railway materials by Mr. Woods, C.E. I telegraphed to you to this effect on the 13th January, 1876, and proposed our returning to Mr. Fowler. Your telegram in reply, dated 1st February, 1876, suggested an alternative system, which was most carefully considered by me; and on the 18th February, 1876, also under cover of my above-quoted despatch No. 77/5478, I enclosed for your consideration a report by Captain Jopp, dated 5th February, 1876, and a minute by myself dated 15th February, 1876, on this subject.

Subsequently, in April 1876, on my receipt of Public Works indents of 9th February, 1876, I referred them to Mr. Fowler, as I had no definite instructions to discontinue inspections; and I considered, acting on the responsibility which necessarily devolved on me with respect to ordering and despatching the articles required, that I could not do so satisfactorily without reference to a first-class Civil Engineer.

Your despatch now under reply is the first communication I have received on the subject since the transmission to you of my above quoted despatch and reports of February, 1876; but during the interval, the occasional mention of Mr. Fowler's name in the instructions accompanying various indents, as well as the absence of any reply objecting to the views taken in the above reports, have led me to infer that the system which I have adopted had met with the approval of the Government.

At the same time, I would suggest that it is not, in my opinion, desirable to recognise or assume that any "appointment" has been conferred, either on Mr. Fowler or any other gentleman of whose services I may avail myself in connection with any matters entrusted to me, for whose proper execution, as far as such can be ensured by all reasonable precautions, I am responsible. At the same time, bear in mind that all such references are subject to your confirmation and approval, both in respect of the references themselves, and of the persons to whom they are made.

In

A copy may be forwarded to the Under Secretary for Public Works in reference to 77/5478. 6/12/77. Agent-General, 18th Feb., 1876. Minute on the subject of inspection and payment of railway and other materials, Park Gate Works 26 April, 1876. Under Secretary for Public Works, 13 Dec., 1877.

In the matter of railway materials, I desire to record my opinion, derived from the information and experience which I have acquired during my tenure of my present office, that the existing system—under which railway materials are ordered under the advice of a first-class Civil Engineer, inspected by him at all necessary stages, and paid for in full on shipment after his approval, subject to the guarantee provided in our existing form of tender, is the most reliable, efficient, and economical system which we can adopt; nor can I view any departure from it as free from the risk of impaired efficiency, as well as of increased cost, eventually if not at first.

Mr. Fowler's remuneration is that of most first-class engineers in this country, and is as charged in the quarterly accounts regularly rendered to the Treasury and to the Department of Public Works, being 1 per cent. on the invoice value of rails, and $2\frac{1}{2}$ per cent. on that of all other articles, for the services detailed in the preamble of his accounts, which runs as follows:—

To professional charges for duties performed on behalf of the Government of New South Wales as follows:—

Receiving instructions from the Agent-General, examining drawings, designs, specifications and engraving, and lithographing same.

Investigating tenders and advising thereon as requested—inspection by self and assistants of materials and work during the progress of manufacture.

Certifying accounts and generally acting professionally in the interests of the Government.

These terms were agreed to when I first referred the railway indents to Mr. Fowler, the arrangement being advisedly left otherwise indefinite, in order that no actual appointment might be assumed. They are now, however, placed on record, by my letter of 11th September 1877 and Mr. Fowler's reply of 22nd September 1877, copies of which are enclosed.

I have, &c.,
WILLIAM FORSTER.

No. 42.

The Agent-General to J. Fowler, Esq., C.E.

Sir, Westminster Chambers, Victoria-street, 11 September, 1877.

Having been directed by my Government to furnish them with particulars as to the remuneration received by you for your services as Consulting Engineer, I shall be obliged by your informing me whether you propose that the services set forth in the preamble of your quarterly accounts should continue to be charged at the percentage rates herein detailed (1 per cent. on the invoice value of rails, and $2\frac{1}{2}$ per cent. on that of all other articles), or whether there are any modifications of these rates which you would be prepared to adopt in any specific cases or otherwise.

I am, &c.,
WILLIAM FORSTER.

No. 43.

J. Fowler, Esq., C.E., to The Agent-General.

Sir, 2, Queen's Square Place, Westminster, 22 September, 1877.

I beg to acknowledge your letter dated September 11, 1877.

The percentage rates charged in the accounts to which you refer are the same as those which have always been charged by me for similar services, and I do not propose to make any departure from them.

Provided that real and thorough inspections are made by trustworthy and competent persons, that detailed specifications and all other necessary communications and correspondence are included, and provided the same percentage rates apply to periods when prices for materials are very low, as well as otherwise, to small as well as large indents, I consider the rates charged are reasonable and could not be reduced without a corresponding reduction in the efficiency of the services performed.

I need hardly say that it would not be desirable to adopt the latter alternative.

In cases of consultations, or in preparing plans and specifications for which no contracts are made, or where no inspections are required, I should make a charge in proportion to the work done in such cases.

Yours, &c.,
JOHN FOWLER.

No. 44.

The Agent-General to J. Fowler, Esq., C.E.

Sir, 3, Westminster Chambers, Victoria-street, 28 September, 1877.

I beg to acknowledge the receipt of your letter of the 22nd inst., intimating the terms which you propose in connection with the professional services rendered by you to the Government of New South Wales.

Yours, &c.,
WILLIAM FORSTER.

No. 45.

Position and Remuneration of Mr. Fowler as Consulting Engineer.

THIS is a matter that concerns exclusively the Department of Public Works. Without some knowledge of the affairs and practices of that Department the papers are only partially intelligible.

The Agent-General herein replies to an inquiry of the Secretary for Public Works, put to him in July last, regarding the reappointment of Mr. Fowler as Consulting Engineer for this Colony in England, and his remuneration, on which points it seemed no information had ever been given. Mr. Forster now explains why such information was not given—namely, because it was not thought expedient that any formal transaction in the nature of an appointment should take place.

In January, 1876, shortly after Mr. Forster's arrival in England, he thought it desirable, for reasons stated at the time, to dispense with the services of Mr. Edward Woods in the inspection of railway

railway materials. The Government, however, objected to any returning to the old system, (which was proposed by Mr. Forster), and no appointment of Consulting Engineer was made. Mr. Forster, however, found it necessary to avail himself of the services of Mr. Fowler without any formal appointment; and in the absence of any reply to his reports or objection to the course taken, inferred that his system was approved.

Mr. Forster thinks it is not desirable to recognize or assume that any "appointment" has been conferred on Mr. Fowler or any other gentleman, of whose services he may avail himself. He believes the existing system to be the most "reliable," efficient, and economical.

Mr. Fowler's remuneration is that of most first-class engineers in England—1 per cent. on the invoice value of rails, and $2\frac{1}{2}$ per cent. on that of other goods. These terms were settled when the railway indents were first referred to Mr. Fowler, "the arrangement being advisedly left otherwise indefinite, in order that no actual appointment might be assumed." Now, however, since the inquiry of the Secretary for Public Works was made, these terms are placed on record in correspondence between Mr. Forster and Mr. Fowler.

7th December, 1877.

No. 46.

Telegram from The Agent-General to The Secretary for Public Works.

London, 19 June, 1881.

ARRANGED with Fowler for considerable reduction his charges, from two and half to two per cent. in machinery, from one per cent. on rails to fixed charge of tenpence per ton, estimate saving on this and shipping business nearly two thousand pounds annually on basis of past and present operations.

Railways, B.C.—J.R., 25/7/1881.

No. 47.

The Agent-General to The Colonial Secretary.

Sir,

5, Westminster Chambers, London, 29 June, 1881.

I have the honor to report that I have given very careful consideration to the system adopted in this Department in making contracts for the supply of railway and other materials, and to the engineer's inspection thereof, with a view of ascertaining whether improvements could be effected and other arrangements made to secure greater economy and faithful examination of our large indents.

I do not see that any preferable system of inspection and of making contracts could be introduced; and, so far as the inspection is concerned, I arrived at the conclusion that it would be in the interest of the Government to continue the existing system and the services of Mr. John Fowler, if they could be secured upon terms advantageous to Government. With this in view, and having regard to the large orders present and prospective, I have on several occasions discussed the matter with Mr. Fowler, and our conversations have led to an arrangement between us, the result of which I hope may be considered satisfactory by the Government.

The nature of the arrangement will be gathered from Mr. J. Fowler's letter to me, of date the 14th instant, a copy of which I send herewith and of my reply.

On the 19th instant I informed you, by telegram, of the arrangement between Mr. Fowler and myself, and although it is impossible accurately to estimate what the annual savings will be, the amount on the whole will be considerable, especially when the reduced cost of shipping is taken into consideration.

By the old arrangement of 1 per cent. for the inspection of rails, and 6d. per ton for shipment, the cost per ton was about 1s. 9d.; this is now reduced to 1s. 1d., viz., 10d. per ton inspection, and 3d. per ton shipping agent's commission, a saving upon outstanding orders which I estimate at nearly £2,000.

I have, &c.,
SAUL SAMUEL.

No. 48.

The Agent-General to J. Fowler, Esq., C.E.

Dear Sir,

5, Westminster Chambers, London, 20 July, 1881.

I am in receipt of your letter of the 14th instant, in which you state the modified terms on which you will advise the New South Wales Government on the railway orders and inspecting engines, rails, &c.

I am willing to assent to the terms you mention respecting orders which may be referred to you; but it must be understood that the Government, or the Agent-General acting for them, shall be at liberty at any time to terminate this agreement should they so desire, and that this arrangement is not for any fixed period.

I am, &c.,
SAUL SAMUEL.

No. 49.

J. Fowler, Esq., C.E., to The Agent-General.

Dear Sir,

2 Queen's Square Place, Westminster, 14 July, 1881.

I have the honor to acknowledge your letter informing me that large orders for railway and other materials are now outstanding, and requesting me to consider whether under such circumstances I am prepared to make any reductions in my charges as Consulting and Inspecting Engineer.

Having had personal interviews with yourself on the subject, I have carefully examined the cost out of pocket to myself for inspections during the last five years, under indents for large and small quantities, and I find that when quantities are small the cost of inspection almost entirely absorbs the remuneration

remuneration received, whereas, when the quantities become large, the remuneration gradually increases. The result during the last five years has been that the net balance left to me annually is a very moderate average amount.

So far as I can judge, however, the quantities for some future years will exceed the average of the past, and I am willing, as agreed between us, to make the following modifications in my remuneration so long as the present large quantities continue:—

Locomotives (in one order) to 2½ per cent. on 4 engines, and 2 per cent. on all above.

Inspection of rails and fish-plates to be paid for at 10d. per ton.

Miscellaneous articles, that is everything except locomotives, and rails, and fish-plates to continue as at present.

It is understood that when the quantity of rails becomes considerably smaller than at present, the arrangement to be subject to reconsideration, so as to be equitably adapted to the altered circumstances.

This new scale of remuneration to commence on the 1st July, 1881.

I am, &c.,
JOHN FOWLER.

Forward to Engineer-in-Chief. Accountant to note first.—CH. A. G., B.C., 24/9/81.

No. 50.

Minute by The Secretary for Public Works.

Inspection of materials, &c.

REPRESENTATIONS have been made to me that it would prove of much advantage to the Department if the inspection of all materials and supplies obtained in England, now carried out in England, was carried out in this Colony on the arrival of the supplies.

I shall be glad to know if there are any insuperable objections to this course.

W.J.L., 21/11/85.

Circular to heads of branches.—J.R. Resubmit with replies.

Copies sent to Commissioner for Railways, Engineer-in-Chief for Railways, Engineer-in-Chief for Harbours and Rivers, Commissioner for Roads, and Acting Colonial Architect.—24/11/85.

No. 51.

The Engineer-in-Chief for Railways to The Secretary for Public Works.

Engineer-in-Chief's Office, Sydney, 16 March, 1886.

Subject:—Imported materials, &c., from England. Proposal to inspect same after arrival in the Colony, instead of before leaving England.

WITH reference to the Minister's minute of the 6th instant, on the subject of materials and supplies for the use of this Department being inspected in the Colony instead of in England, I have to state that I do not consider such an arrangement to be practicable.

I am under the impression that first-class manufacturers would not send goods from England, or elsewhere, if the final payment is to be made after they have been inspected and approved in the Colony.

Should any of the articles be rejected, the manufacturer would have no market for them, and they would consequently be thrown on his hands as worthless, and there would be no chance of obtaining the balance of his account for their supply.

Besides, there would be the risk to the manufacturers of damage during transit, which I do not consider would be a fair risk for which they should be held responsible.

I also think that such an arrangement would greatly increase the cost of all manufactured articles, as the contractors would take care that the advance made in England would be the full value of the articles being rejected in the Colony.

In the case of permanent-way materials, tires, axles, &c.; these should be inspected during manufacture, as there could be no proper inspection afterwards, and few contractors would allow the Government to retain any portion of the contract sum until the articles had been a sufficient time in use to test their wearing qualities.

JOHN WHITTON.

No. 52.

The Engineer-in-Chief of Harbours and Rivers to The Under Secretary for Public Works.

Harbours and Rivers Branch, Sydney, 23 March, 1886.

Re substituting Colonial for English inspection of imported material.

I THINK the effect of substituting inspection in the Colony for English inspection, in all cases, would be undesirable, and would have the effect of limiting the range of selection for Government contracts to Colonial tenderers entirely. No English contractor would tender for work or supplies which might be subject to the risk of being condemned and thrown on his hands in the Colony.

But while I say I do not think it should be done in all cases, I am of opinion that wherever practicable it is desirable to do so, and I have insisted on it in regard to the pipes for the Sydney and suburban water supply.

As regards the pumping machinery, although it is subject to my approval, and will not be taken off the contractor's hands till after satisfactory trials, it is of the utmost advantage to have the work carried out under careful inspection in England. Many things may be just on the border-land between good and bad, not so good as to be quite satisfactory, yet not so bad as to be condemned, which if executed under rigid and careful inspection in England would be quite satisfactory. I think, therefore, on the whole, that the present arrangements as to inspection should be allowed to stand.

E. O. MORIARTY.

No. 53.

No. 53.

The Commissioner for Roads to The Secretary for Public Works.

Re inspection of materials, &c.

THE material for iron bridges means the ironwork of the bridges complete. The inspection is obliged to be in England. I do not think it likely that any manufacturer would send out a bridge complete, without some advance, which necessitates inspection. Provision is made for a reserve of 5 or 10 per cent to cover defects,—*e. g.*, the correspondence now going on about Cochrane's bridges as to paint.

The iron ropes are passed in England, but I do not think they can be got here; we called for tenders over and over again, and could not get them satisfactorily here.

Pellett's process materials, is a simple article of stationery—and is not inspected in England or here, but returned if not good.

Troughing for tanks is inspected in England. Mr. Musson got contracts for inspection here, and failed to carry it out.

W.C.B., 26/11/85.

No. 54.

The Commissioner for Railways to The Secretary for Public Works.

Re inspection of materials, &c.

I AM of opinion that inspection in England should be considered indispensable.

The correspondence with these papers elucidates the question thoroughly; the project of dispensing with inspection and holding a portion of the purchase money till inspection could be made in the Colony was introduced some ten years since, and the reasons given for continuance of inspection in England were considered to be conclusive.

CH.A.G., 11/3/86.

RAILWAY DEPARTMENT.

Amounts paid as commission in each year to Sir John Fowler:—

	£	s.	d.
1862	1,415	2	0
1863	755	4	11
1864	1,167	12	9
1865	1,610	6	3
1866	889	18	1
1867	1,921	3	2
1868	394	9	8
1869	1,020	16	2
1870	1,207	6	3
1871	81	11	4
1872	41	7	2
1876	155	8	11
1877	3,343	17	10
1878	3,391	14	3
1879	3,299	12	2
1880	4,191	2	6
1881	4,658	14	2
1882	4,657	7	1
1883	4,027	15	6
1884	6,668	13	6
1885	6,474	16	6
1886	4,596	10	3
1887	998	0	8
	£56,968	11	2

ROADS AND BRIDGES DEPARTMENT.

Payments to Sir John Fowler as commission for inspection of Materials in England:—

	£	s.	d.
1879	23	3	1
1880	684	18	9
1881	719	9	1
1882	67	1	1
1883	150	18	9
1884	312	11	7
1885	225	6	2
1886	182	1	11
	£2,365	10	5

HARBOURS AND RIVERS DEPARTMENT.

STATEMENT of yearly payments to Sir John Fowler since his appointment :—

	£	s.	d.
1877	14	15	2
1878	43	7	3
1879	424	1	4
1880	27	5	6
1882	27	17	5
1883	1,044	5	5
1884	106	13	4
1885	2,924	18	11
1886	1,202	7	5
	<hr/>		
	£5,815	11	9

No. 55.

Mr. Strickland to The Secretary for Public Works.

Sir,

Sydney, 13 March, 1885.

I have the honor to point out to you that Mr. W. Mason, lately Engineer for Existing Lines, and for some 26 years in the service of the New South Wales Government as one of the Engineers of the Railway Department, is now in England and would be inclined to act as your representative for inspection of bridge-work, rails, and other materials, which inspection requires a practical knowledge of the wants of the department, such as Mr. Mason from his long experience, possesses.

Mr. Mason would undertake the duties (and indeed hardly say would inspect to your satisfaction) either on a stated salary or on a much smaller commission than you have been paying.

Will you please give this matter your consideration.

I have, &c.,

THOS. STRICKLAND.

Memo. by Chief Clerk.—Found in Minister's room when clearing up last week.—D.C.M.L., 12/10/85.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAY EMPLOYÉS.

(WHO RECEIVE NIGHT EXPENSES.)

Ordered by the Legislative Assembly to be printed, 18 March, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 25th March, 1886, That there be laid upon the Table of this House,—

“ A Return showing the number and occupations of the Employés in the
“ Railway Department who receive remuneration in the form of Night
“ Expenses when absent from home.”

(Mr. Olliffe.)

RETURN showing occupation of Employés in the Railway Department who receive remuneration in the form of Night Expenses when absent from home on duty.

HEAD OFFICE.

Pay Clerks.

TRAFFIC BRANCH G. S. W. AND R. RAILWAYS.

Traffic Manager.	Relieving Officers in Charge.
Assistant Traffic Manager.	Do Clerks.
Goods Superintendent.	Do Telegraph Operators.
Coaching do	Telegraph Battery Man.
Traffic Inspectors.	Guards and Assistant Guards.
Telegraph Inspector.	Porters.
Relieving Station Masters.	

TRAFFIC BRANCH NORTH.

Traffic Manager.	Relieving Officers in charge.
Do Inspectors.	Do Clerks.
Telegraph Inspector.	Do Telegraph Operators.
Paymaster.	Guards and Assistant Guards.
Assistant Paymasters.	Porters.
Relieving Station Masters.	

TRAFFIC AUDIT OFFICE.

Traffic Auditor.	Inspectors.
Assistant Traffic Auditor.	

STORES DEPARTMENT.

Superintendent of Stores.	Travelling Storemen.
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100—

[817 copies—Approximate Cost of Printing (labour and material), £1 11s. 8d.]

LOCOMOTIVE DEPARTMENT.

Locomotive Engineer.	Locomotive Foreman.
Assistant do	Running do
Chief Draftsman.	Superintendent of Rolling Stock.
Chief Clerk.	Inspectors.
Locomotive Overseer.	Foremen.
Draftsmen.	Relieving Clerks.
Clerks.	

PERMANENT WAY AND WORKS.

Engineer for Existing Lines.	Surveyors.
Deputy Engineer.	Inspectors.
Chief Clerk.	Sub-Inspectors.
District Engineers.	Cadets (Camp allowance).
Assistant do	Chief Foreman of Shops.
Architect.	Foremen.
Assistant Architect.	Draftsmen.
Resident Engineer.	

ENGINEER-IN-CHIEF'S BRANCH.

All persons employed in this Department are entitled to night allowance for expenses when absent from home on Departmental business.

A correct estimate of the number of employés cannot be given, as they vary each week and month.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAY DEPARTMENT.

(CASES OF EMBEZZLEMENT FOR THREE YEARS ENDED AUGUST, 1886.)

Ordered by the Legislative Assembly to be printed, 18 March, 1887.

[*Laid upon the Table of the House in accordance with promise made by the Honorable the Secretary for Public Works, in answer to Question No. 1 on Votes and Proceedings of 28th September, 1886.*]

1. How many cases of embezzlement in the Railway Department, for three years ending August 1886, have been discovered, the amounts misappropriated, and the names of persons prosecuted, with the result of such prosecution?
 2. Did any, or all of the said defaulters provide a fidelity bond, if so, for what amount?
 3. What amounts, in whose case, and by whom, have been made good to the Commissioner for Railways?
 4. Names of those whose defalcations have not been made good, who is the responsible officer, in each case, and does he intend calling upon such responsible officers to pay up the said deficiency?
-

[34.]

RETURN showing the number of CASES of EMBEZZLEMENT which have been discovered in the Railway Department during the three years ending August, 1866.

QUESTION No 1				QUESTION No 2		QUESTION No 3		QUESTION No 4		Remarks
The number of cases of embezzlement discovered during three years ending August, 1866	The amounts misappropriated	The names of those prosecuted	Result of such prosecutions	Defaulters who provided Fidelity Bonds	The amounts of such Bonds	The amounts which have been made good	By whom made good, &c	Names of those persons whose defalcations have not been made good	Responsible Officer in each case	
Daly, T. G	£ s. d. 57 19 5				£ s. d. 57 19 5	£ s. d. 57 19 5	The Defaulter's Father.		Station-master, Dubbo.	
O'Donnell, B.	20 9 6			...	.	.		O'Donnell, B.	Station-master, Newtown.	The Station-master who was at Newtown at the time of the discovery of the defalcations, is now deceased.
Gamble, E	75 11 8	Gamble, E.	Two years imprisonment	Bond was in course of preparation when Gamble absconded	100 0 0			Gamble, E.	.	Gamble was as usual sent to the Bank with the day's remittance, and brought back to the Station-master a forged receipt. This was not discovered until the document was returned by the Bank to the Cashier marked "unpaid." Gamble in the meantime absconded.
Hicks, E. T.	21 13 4	Hicks, E. T	Six months imprisonment.	Hicks, E T	100 0 0	21 13 4	Mercantile Mutual Insurance Co.			Hicks was in charge of Douglas Park Station. He suddenly disappeared, and an examination of the Books disclosed the deficit named.
Kelly, J.	19 18 10	Kelly, J.	Six months imprisonment.	.				Kelly, J.	Station-master, Mittagong.	The defalcations could not be attributed to laxity on the part of the Station-master, and he was not called upon to make the amount good.
Russell, H.	9 2 1	Russell, H.	Three years imprisonment.			9 2 1	Station-master, Orange.	.	Station-master, Orange.	
Berner, G.	2,012 5 7	Berner, G	Ten years imprisonment	These Officers were not authorized to receive cash on behalf of the Department, and consequently were not called upon to provide a Fidelity Bond.				Berner, G	.	No one can be held responsible, because he took money which he was not authorised to do.
Logan, E.	20 0 0	Logan, E	Two years imprisonment.					Logan, E.	District Engineer, Bathurst.	The officer named was Logan's immediate superior, but the fraud practised was such that he cannot be held accountable for the amounts misappropriated.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAY DEPARTMENT.

(EMPLOYÉS DISMISSED SINCE 24 JANUARY, 1887.)

*Ordered by the Legislative Assembly to be printed, 30 March, 1887.**[Laid upon the Table of the House in accordance with promise made by the Honorable the Secretary for Public Works, in answer to Question No. 5, on Votes and Proceedings of 29th March, 1887.]*

RETURN showing:—

- (1.) The number of employés dismissed from the Railway Department since 24th January, 1887.
- (2.) The character of the occupation pursued by such employés while in the service of the Department.
- (3.) Is it the intention of the Department to further increase the dismissals.

(Mr. Toohey.)

RETURN showing the number of employés dismissed from the Railway Department since 24th January, 1887, and the occupations which they pursued, &c.

Number dismissed.	Occupation in which employed.	Remarks.
10	Labourers ...	One was dismissed for losing time, four through slackness of work, two through completion of special work on which they were engaged, and three through misconduct.
1	Rivet Boy ...	Dismissed for losing time.
1	Apprentice ...	Do do
1	Officer-in-charge ...	Do irregularities.
1	Clerk ...	Do do
12	Porters ...	Ten of these were temporary hands whose services were no longer required, while the other two were dismissed for irregularities.
1	Boilermaker ...	Dismissed for incompetency.
17	Carpenters ...	Discharged through slackness of work.
1	Tinsmith ...	Do do
1	Bricklayer ...	Do do
2	Boys ...	One discharged in consequence of slackness of work, and one on completion of special work on which he was engaged.
3	Carters ...	Two through slackness of work, and one in consequence of special work on which he was engaged being completed.
51		

3. It will be the duty of the Department to dispense with the services of men when it is found that they are not required, they will, however, be taken on again as trade revives and their services are wanted.

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author outlines the various methods used to collect and analyze the data. This includes both primary and secondary sources, as well as the specific techniques employed for data processing and statistical analysis.

The third section provides a detailed overview of the results obtained from the study. It includes a series of tables and graphs that illustrate the key findings and trends observed in the data.

Finally, the document concludes with a summary of the main points and offers some recommendations for future research. It suggests that further exploration of the underlying factors could provide more insights into the observed patterns.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAY PROBATIONERS.

(EMPLOYED ON LINE BETWEEN NEWCASTLE AND MURRURUNDI.)

Ordered by the Legislative Assembly to be printed, 4 July, 1887.

[Laid upon the Table of the House, in accordance with promise made by the Honorable the Secretary for Public Works, in answer to Question No. 2 in Votes and Proceedings, No. 47, of the 16th June, 1887.]

(1.) *Question—*

How many Probationers are employed in the Railway Service between Newcastle and Murrurundi?

Answer—

Ten.

(2.) *Question—*

What salaries do they receive?

Answer—

Two shillings and sixpence per week.

(3.) *Question—*

How long have they been so employed?

Answer—

One since July, 1884; three since August, 1884; one since November, 1884; two since January, 1885; one since February, 1885; one since April, 1885; and one since January, 1887.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAYS.

(CASE OF MRS. BUTTERLY.)

Ordered by the Legislative Assembly to be printed, 8 June, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 18th May, 1887, That there be laid upon the Table of this House,—

“Copies of all papers, petitions, &c., in the case of Mrs. Butterly, whose son was killed on the Railway at Blayney about two years ago.”

(Mr. Schey.)

SCHEDULE.

No.	PAGE.
1. Application for employment from S. Butterly, and minutes thereon. 9 July, 1882	2
2. Letter from Sir G. W. Allen, recommending Stephen Butterly for employment, and minutes thereon appointing Butterly. 1 August, 1882	2
3. Letter from Sir G. W. Allen, asking that Butterly be removed to Sydney, &c. 14 October, 1882.....	2
4. Memorandum from Traffic Manager, that Porter Butterly was crushed between trucks whilst shunting at Blayney and killed. 21 November, 1882	3
5. Minute by Locomotive Engineer <i>re</i> accident to Butterly, and decision of Coroner's jury. 23 November, 1882... ..	3
6. Letter from Under Secretary for Justice, enclosing copy of verdict and rider of jury in inquest on S. Butterly, 27 November, 1882.....	3
7. Letter from Sir G. W. Allen to Secretary for Public Works, asking for sum to be placed on Estimates for Mrs. Butterly, and minutes thereon. 23 December, 1882	3
8. Minute by Secretary for Railways <i>re</i> amount to be paid to Mrs. Butterly, &c. 9 January, 1883	4
9. Minute by Secretary for Railways, recommending that an advance be made to Mrs. Butterly, in anticipation of Parliamentary sanction to a gratuity of £100. 2 February, 1883	4
10. Letter from Mrs. Butterly to Secretary for Public Works, and minutes. 13 March, 1883	5
11. Letter from Mrs. Butterly, accusing Porter Bourke of being the cause of her son's death. 28 March, 1883	5
12. Petition from Mrs. Butterly, asking for more compensation than has been granted to her, and minute thereon, 19 February, 1884	5
13. Letter from Mrs. Butterly <i>re</i> above. 3 May, 1884.....	6
14. Petition signed by a number of Members of Parliament, asking for further assistance. 27 June, 1884.....	6
15. <i>Précis</i> of case to date, and minute thereon. 20 August, 1884.....	7
16. Letter from Mrs. Butterly, asking for an appointment as gate-keeper, with minutes. 28 August, 1884	7
17. Letter from Mrs. Butterly to Secretary for Public Works, asking for assistance. 11 June, 1886	8
18. Letter from T. M. Williamson, M.P., asking for reconsideration of Mrs. Butterly's case, with minutes. 16 November, 1886.....	8
19. Letter from T. M. Williamson, M.P., to Secretary for Public Works <i>re</i> Mrs. Butterly's case, with minutes thereon. 1 December, 1886	8
20. Memorandum from W. Stephen, M.P., to Minister <i>re</i> Mrs. Butterly's case, and minutes thereon. 30 March, 1887.	9

RAILWAYS.

No. 1.

Mr. S. Butterly to The Commissioner for Railways.

Dear Sir, 2 Grigg-street, Glebe, Sydney.
 As I have been out of employment for the last few weeks, my last employer was Mr. Railton, of Bay-street, Glebe (grocer), with whom I stayed for two years and nine months. I have been most of my time in the country up till the last six years, which I have passed in Sydney; wishing to know if you would oblige me by doing anything for me by putting me on the railway such as porter or anything where you may have a vacancy. Hoping you will oblige,

Yours, &c.,
 STEPHEN BUTTERLY.

I can confidently recommend this application to the favourable consideration of the Commissioner; he is a very active, intelligent, steady, young man, who would, I am sure, give every satisfaction.—JOHN ROSEBY.

Traffic Manager, B.C., 10/7/82.—G.B. No vacancy.—W. V. READ, D.K., Commissioner, 11/7/82. Mr. S. Butterly informed no vacancy, 24/7/84.

No. 2.

Sir G. W. Allen to The Commissioner for Railways.

Toxteth Park, 1 August, 1882.
 I BEG to recommend Stephen Butterly for employment in the Railway Department.
 He is the son of well conducted parents, who have lived on the Glebe for a great many years, and I have reason to believe he will do credit to any position for which the head of the Department may consider him qualified.
 Address, No. 2 Grigg-street, Glebe. G. WIGRAM ALLEN.

This young man is twenty years of age, and small of frame. I do not think he would be suitable for a porter but as Sir Wigram Allen strongly recommends him for employment I shall be glad if something can be done for him.—CH. A. G., 2/8/82. Traffic Manager. Write Butterly to call.—W.V.R., 23/8/82.

Sir, The Traffic Manager to Mr. S. Butterly.
Traffic Manager's Office, Redfern Station, Sydney, 24 August, 1882.
 In reference to your application for employment in this Department, you will please call on me at this office at your convenience.
I have, &c.,
 W. V. READ,
 Traffic Manager,
 (per W. H. COLQHOUN.)

Butterly would do for platform man at Blayney; pay 30s. per week.—W.V.R., 25/8/82. Inspector Hornidge. P.S.—He leaves for Blayney, on Monday, 28th. Let me know when he commences duty.—W. V. READ, per D.K., 26/8/82. Please see that Butterly is provided with a rule book, and properly instructed in his duties as platform porter, wages 30s. a week, let me know when he commences.—M. HORNIDGE, 29/8/82. Station-master, Blayney. Butterly commenced duty on 29th August, 1882.—J. GEO. CRENNY. Inspector Hornidge, Bathurst. Traffic Manager.—P.J. (pro HORNIDGE), 8/9/82.

No. 3.

Sir G. W. Allen to The Commissioner for Railways.

My dear Mr. Goodchap, Toxteth Park, 14 October, 1882.
 Some time ago you gave employment on the Railway works, on my recommendation, to a young man named Stephen Butterly. He is carriage or lamp cleaner at Blayney. His mother called on me this morning to beg that he may be removed to Sydney as his father is a very old man, and is very ill, and just able to leave his house.
 I suppose that frequent changes are made, and perhaps at these times you could keep him in similar employment in or near Sydney. His father and mother are mainly dependent upon what this son is able to give them.
Yours truly,
 G. WIGRAM ALLEN.

Traffic Manager, B.C., 18/10/82.—G.B. Can Inspector Richardson arrange for some one to exchange with Butterly.—W. V. READ (per W.H.D.), 27/10/82. Inspector Richardson. A man named Holborow, at Darling Harbour, will exchange, as he wishes to be removed to a country station.—H. RICHARDSON, 27/10/82. Traffic Manager. What sort of a man is Holborow? What is his age, and how long has he been employed? If he is suitable for the Service he must pass the Medical Board.—W. V. READ (per T.L.), 11/11/82. Mr. Paull. From the little I know of the man he appears to be very respectable, and is a very good working man. Medical certificate attached.—CHAS. PAULL, 14/11/82. Traffic Manager. The medical certificate is not satisfactory; can another man be found to exchange with Butterly?—W. V. READ (per W.H.C.), 17/11/82. Mr. Paull, urgent. Porter Frank Goodman will exchange with Butterly, and will be ready to go to Blayney to-morrow (Tuesday) if necessary.—CHAS. PAULL, 20/11/82. Traffic Manager.

No. 4.

Memo. from The Traffic Manager to The Commissioner for Railways.

I REGRET to have to inform the Commissioner that while the No. 33 down goods train was shunting at Blayney yesterday morning, platform porter Stephen Butterly in going between the trucks to couple up, was caught between the buffers, and died immediately. A doctor attended at once.

An inquest will be held on the body.

21/11/82.

W.V.R., Traffic Manager.

Seen.—D.V.

No. 5.

Minute by The Locomotive Engineer.

Fatal accident at Blayney, on 20/11/82.

I REGRET to inform you that an accident happened at Blayney, on the 20th instant, which resulted in the death of porter Stephen Butterly.

It appears that after the arrival of No. 33 down goods (driver, John Fullerton) at Blayney, engine was detached from the train which was left on the main line opposite the station platform.

Fullerton was told by the shunter to go into the goods-shed road, and whilst doing so, he saw some person being carried on to the east end of the platform.

On going to see who it was he found porter Stephen Butterly had been crushed between the buffers of the break-van and the last truck on the train.

It appears the break-van had been detached by the traffic men, and a horse-box shunted into the dock, also by them. They then pushed the brake-van down the line towards the train, which was moving at about one mile an hour up the line, Stephen Butterly getting in between for the purpose of coupling the brake-van on, lost his presence of mind and stepped out with right foot outside the down side rail, and stood facing the brake-van by which he was crushed, as before stated.

An inquest was held and the jury returned the following verdict:—"That the deceased Stephen Butterly, died on the 20th November, 1882, at Blayney, from injuries caused through his being accidentally crushed between the buffers of two railway trucks. The jury add as follows:—"We consider that no blame can be attached to any person connected with the Railway Department."

23/11/82.

W.B.S.,
(per Locomotive Engineer.)

No. 6.

The Under Secretary of Justice to The Under Secretary for Public Works.

Copy of verdict and rider—Inquest on Stephen Butterly.

Sir,

Department of Justice, Sydney, 27 November, 1882.

I am directed by the Minister of Justice to forward for the information of the Secretary for Public Works, the accompanying copy of verdict, and riders of jury, on inquest on Stephen Butterly, held before James Oliver Dodd, Esq., coroner, Carcoar, on the 20th instant, with reference to opinion that no blame can be attached to any person connected with the Railway Department.

I have, &c.,

W. G. PLUNKETT,
Under Secretary.

[Enclosure.]

New South Wales, }
to wit. }

INQUISITION held at the dwelling house of Michael Watson, known as the sign of the "Cosmopolitan Hotel," at Blayney, in the District of Carcoar, in the Colony of New South Wales, this 20th day of November, one thousand eight hundred and eighty-two, before me, James Oliver Dodd, one of the Coroners of our Sovereign Lady the Queen, for the Colony aforesaid, on view of the body of Stephen Butterly, then and there lying dead, upon the oaths of—Henry Oliver, George L. Wardell, William Fitzgibbon, Samuel Dean, George Black, John Marsden, George Marsh, William Whittaker, Frederick Franke, Peter Viper, Louis Viper, good and lawful men of the district aforesaid, who, having been sworn and charged to inquire (on the part of our said Lady the Queen) when, where, how, and by what means the said Samuel Butterly came to his death, do, upon their oaths, say that the deceased Stephen Butterly died on the 20th November, 1882, at Blayney, from injuries caused through his being accidentally crushed between the buffers of two railway trucks.

The jury also add:—"We consider that no blame can be attached to any person connected with the Railway Department."

In witness whereof, as well the said coroner as the jurors aforesaid, have to this inquisition set their hands and seals, this day and year aforesaid.

J. O. DODD, Coroner.
HENRY OLIVER, Foreman.

GEORGE MARSH,
FRED. FRANKÉ,
JOHN MARSDEN,
WILLIAM FITZGIBBON,
SAMUEL DEAN,

LOUIS VIPER,
PETER VIPER,
W. WHITTAKER,
GEO. L. WARDELL,
GEORGE BLACK, } Jurors.

No. 7.

Sir G. W. Allen to The Secretary for Public Works.

My dear Mr. Lackey,

Toxteth Park, 23 December, 1882.

Some time ago a respectable young man, named Stephen Butterly, was appointed to some position on the railway in the country.

He met with a fatal accident while attending to his duties, by being crushed between the buffers of some carriages.

He

He has left a mother, a widow, who was in the main dependent on him for her living.
Can you do anything for her, by placing a sum of money on the Estimates as compensation for her loss? I strongly recommend her to your very favourable consideration.

Yours, &c.,

G. WIGRAM ALLEN.

If you cannot do anything yourself, will you leave a recommendation for your successor?

As the deceased was the support of his mother, the usual sum in such cases will be given.—J.L., 28/12/82. Inform that the Minister has approved of some amount of compensation being placed on the Estimates.—D.V.

The Commissioner for Railways to Sir G. W. Allen.

Sir,

Department of Railways, Sydney, 3 January, 1883.

Referring to your letter of the 23rd ultimo, addressed to the Honorable the Minister for Public Works, in which you recommend that an amount be placed on the Estimates as compensation to Mrs. Butterly, whose son was recently killed by a railway accident at Blayney, I have the honor to inform you that Mr. Secretary Lackey has been pleased to approve of an amount being placed on the Estimates for the purpose named.

I have, &c.,

CH. A. GOODCHAP,

Commissioner for Railways.

No. 8.

Minute by The Secretary for Railways.

Re Stephen Butterly, killed at Blayney, 20 November, 1882.

STEPHEN BUTTERLY was employed as porter at Blayney, and while engaged in the performance of his duty was crushed between the buffers of two trucks and killed.

Butterly was a single man, aged 17 years and 10 months at the time of his death. Gratuities are paid in the case of single men killed in the performance of their duty, when it is shown that relatives were supported by them at the time of their death. Butterly left an aged father and mother and two sisters; the father subsequently died. Previous to joining the railway service, Butterly was employed by Mr. Railton, grocer, of the Glebe. Mr. Railton has called to say that Butterly's earnings went to the support of his family, as he used to pay their bills, &c.

D.V.

Shall £100 or £200 be placed on Estimates?—D.V., 9/1/83. Commissioner.

I would recommend that £100 be placed on the Estimates as a gratuity to the mother of whom the deceased was the chief support.—CH.A.G., 9/1/83. I see that the late Minister approved of this on 28/12/83. Make provision accordingly.—CH.A.G., Accountant, B.C., 15/1/83.—G.B. Amount placed on Estimates.—D.V., 19/1/83.

No. 9.

Minute by The Secretary for Railways.

Mrs. BUTTERLY, the mother of the late porter, Stephen Butterly, who lost his life in the performance of his duty at Blayney recently, has called to ask if some assistance can be afforded her, as she is in very straitened circumstances. Mrs. Butterly is a widow, and has a daughter lying at the point of death: she has sickened since it happened. The case appears to be one of great necessity, and deserving of consideration. The only method by which assistance can be rendered her is by obtaining Ministerial sanction for making an advance, in anticipation of the approval of Parliament, to the amount of £100, submitted, as a gratuity to Mrs. Butterly, on the Estimates for 1883.

D.V., 2/2/83.

Re-submit on Wednesday.—CH.A.G., 5/2/83. Pay Mrs. Butterly £35 on account, pending approval of amount to be voted by Parliament.—CH.A.G., 7/2/83. Mrs. Butterly written to, and voucher herewith.—7/2/83.

The Secretary for Railways to Mrs. C. Butterly.

Madam,

Department of Railways, Sydney, 7 February, 1883.

Referring to your personal interview, when you asked that some assistance might be afforded you in consideration of your son having lost his life while in the performance of his duty in the railway, I have the honor to inform you that the Government have recognized yours as a case in which compensation should be allowed, and have placed the sum of £100 on the Estimates for this year, to be paid to you as a gratuity.

This sum cannot, however, be paid until the amount is passed by Parliament, but in view of the necessities of your case, the Commissioner has been pleased to approve of an advance of £35 being made to you pending the passing of the Appropriation Act.

If, therefore, you will call on the cashier at this office the amount named will be paid to you.

I have, &c.,

D. VERNON,

Secretary of Railways.

The accountant.—D.V., 7/2/83. Urgent. £35 paid from advance.—J.W.B., 8/2/83. Accountant.

No. 10.

Mrs. C. Butterly to The Secretary for Public Works.

Dear Sir,

59, Hugo-street, 13 March, 1883.

I called to see you to-day, but the person whom I saw told me I was to write to you. I wanted to see you about my son Stephen's death, he was killed on the Government Railway at Blayney, on the 20th of November; he was the only support I had; he was caught between the buffers of the carriages and died instantly. I wish to put in for £2,000, it is a poor recompense for the loss of my child. I wish you to bring it before the House as soon as possible, for I am at present in great want and heavily in debt through his father's illness, who has left me too, they both got buried the one week—there was only three days difference.

C. BUTTERLY,

59, Hugo-street, Redfern, Sydney.

Will the Commissioner inform me as to the circumstances of this application.—H.C., 14/3/83. £100 voted; £35 advanced (C. 83-6,070)—see verdict of jury. The Department is in no way answerable for this unfortunate event.—D.V., 17/3/83. Commissioner.

Accidentally crushed between the buffers of two railway trucks. Verdict of jury,—Accidental death, with rider that no blame can be attached to any person connected with the Railway Department.—CH.A.G., 29/3/83.

No. 11.

Mrs. C. Butterly to The Commissioner for Railways.

Dear Sir,

Sydney, 28 March, 1883.

I now take the liberty of writing to you again to inform you that I accuse Porter Bourke for Stephen's death, he being the cause of it. On Sunday night he had taken a drop too much, and on Monday he asked Stephen to shunt as he was going down the line with lamp in his hand. Porter Bourke asked him to give the carriages a shove, so he left down his lamp to obey him; the moment he put his hands to the buffer he was struck by the buffers of the other carriages and as he bumped back Bourke took him in his arms before he fell; he got no warning of the other carriage coming. Bourke was always inclined to put Stephen shunting; when he went first shunting he wrote and asked me to go to Mr. Vernon in Sydney, and when he wrote his next letter he begged of me to go to Mr. Vernon again and beg of him to have him removed to Sydney as soon as possible, for Bourke was like a jealous child; he thought that the people made too much of him. Bourke said at the inquest he could save himself, that he seen the carriage coming and let his arms drop waiting for it; the moment Stephen put his hands to the buffer he was struck by the other, so his hands dropped when he was killed; he was not lazy nor sleepy, but he always had a dread of Bourke, and he did everything he could to oblige him. He said in his letter the only enemy he had in Blayney was Bourke; they all liked him only Bourke; there is not a night but in my dream are Stephen and Bourke walking down the platform together to a certain spot, Stephen's head drops and Bourke looks stupid, when they come to the certain spot they disappear and then I can rest no more.

I remain, &c.,

C. BUTTERLY.

Put by till balance of money voted is available.—CH.A.G., 9/4/83. £100 has been voted on Estimates for 1883.—G.B., 7/5/83. Commissioner. To be paid, make out voucher.—A.S., 21/5/83. Voucher herewith.—D.C.M.L., 23/5/83. Commissioner. Pay.—CH.A.G., 25/5/83. Examiner, B.C. Voucher forwarded.—J.B.F., 25/5/83. Secretary.

No. 12.

Petition.

To the Honorable the Minister for Works.

The humble petition of Catherine Butterly, of Cleveland-street, Darlington, near Sydney, in the Colony of New South Wales, widow,—

HUMBLY SHOWETH:—

1. That, on the twentieth day of November, one thousand eight hundred and eighty-two, her son, Stephen Butterly, was employed by the Government at the Blayney Railway Station as platform porter.

2. That, on the said day, upon the arrival of the 10:40 a.m. train from Bathurst, several of the railway officials were required to detach some waggons from the train, and though it was not the duty of the said Stephen Butterly to assist in shunting, he was ordered to uncouple and shunt some of the trucks attached to the train.

3. That while thus employed in pushing a truck before him an empty truck was sent along the line after him, and in trying to avoid it he was caught between the buffers of the said truck and the one he was pushing, and was crushed to death.

4. That the deceased was the only support of your petitioner, and that he obtained employment on the Government Railways solely that he might be enabled to support her more respectably.

5. That your petitioner has been thus deprived of her only support and is now in great distress.

6. That your petitioner has been allowed the sum of one hundred pounds by the Government, but that this sum is altogether insufficient to enable her to avoid the most distressful poverty.

Your petitioner therefore humbly prayeth that you may be pleased to take into consideration all the circumstances of the case, and to grant her such relief as may be just and reasonable, and your petitioner, as in duty bound, will ever pray.

Dated at Sydney, this twentieth day of February, in the year one thousand eight hundred and eighty-four,—

her
CATHERINE × BUTTERLY.
mark.

SIGNED by the said Catherine Butterly by affixing her mark in the presence of me, and I certify that the above petition was first read over and explained to her, and she appeared to me to understand the nature and effect thereof.—J. GILLESPIE.

No. 13.

Mrs. C. Butterly to The Secretary for Public Works.

Dear Sir,

503, Cleveland-street, 25 March, 1884.

I am Mrs. Butterly, the mother of Stephen Butterly, who was killed—or rather murdered—between the buffers of a Government railway carriage on the 20th day of November, in the year 1882. He was my only support. I am but a widow since the day after he was buried.

I sent in a letter for £2,000 damages—that was a poor recompense for the loss of my son. I am 63 years of age, and am very much troubled with rheumatic pains. I have no means of support. If my son was let live I would never have been any trouble to any one: he always told me that he would keep me respectable while I lived. I trust to your Honor to grant me compensation to do so.

I am, &c.,

CATHERINE BUTTERLY.

I wish your Honor to grant me a reply.

Commissioner for report.—F.A.W., 20/2/84. Traffic Manager for any remarks he may wish to make.—D.V., 5/3/84.

I have really nothing to say. Butterly was only a temporary hand, having been barely three months in the service. The inquest showed that he met with his death accidentally, and that there was no blame attributable to the Department.—N.V.R., 15/3/84. Commissioner.

Can a gate be found for Mrs. Butterly? Where does this woman live;—ascertain what her circumstances are, and what she does for her living.—CH. A. G., 25/3/84. Traffic Manager, B.C.

Mrs. Butterly is 63 years old, and looks about 10 years older. She is too old and infirm for a gate. I have ascertained that she keeps a small fruit and lolly shop, and also takes in sewing, but I do not suppose she makes much of a livelihood. No doubt her loss was a hard one, but I see the Department has already paid her £100, although her son was only a temporary hand, and had not been three months in the service.—W. V. READ (*per* D.K.), 21/4/84. Commissioner.

I cannot recommend anything further.—CH. A. G., 26/4/84. I concur; inform.—F.A.W., 28/4/84. Mrs. Butterly informed, 30/4/84.

The Commissioner for Railways to Mrs. C. Butterly.

Madam,

Department of Railways, Sydney, 30 April, 1884.

I have the honor to acknowledge your letter of the 25th ultimo, addressed to the Secretary for Public Works, claiming to be compensated for the loss of your son, who was accidentally killed on the railway at Blayney, on the 20th November, 1882.

In reply, I am directed by Mr. Secretary Wright to express his regret that he is unable to sanction the payment of any further amount than the gratuity you have already received.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

No. 14.

Mrs. C. Butterly to The Commissioner for Railways.

Sir,

Sydney, 3 May, 1884.

Re your letter of the 30th April, Reg. Nos. 84/8,642 and 84/2,328,—

I beg to state that my son entered the Government employ for the sole purpose of supporting me respectably while I lived, and the compensation I received, after funeral and other expenses were paid; I had very little left. As regards the accident, I can assert that if he got warning, which he did not get, as I was told by the policeman and many others at Blayney, and as the fault was on the Government side, I demand full compensation to support me while I live. I consider that he was murdered by the Government, and I insist on getting what I demand.

If he was let live, I would not trouble about it, as he was my sole and only support.

I remain, &c.,

CATHERINE BUTTERLY.

Petition.

To the Honorable Frederick Augustus Wright, M.L.A., Minister for Public Works, &c., Sydney.

The humble Petition of Catherine Butterly, of Sydney, in the Colony of New South Wales, widow,—
HUMBLY SHEWETH:—

1. That your Petitioner's late son, Stephen Butterly, deceased, was an employee in the New South Wales Government Railways in the year 1882, and was employed at Blayney, on the Great Western Line, in the capacity of Railway Platform Porter.

2. That your Petitioner's said deceased son, by his earnings as such employee, was the only support of your Petitioner and her daughter.

3. That in the exercise of his duties as such employee the said deceased had occasionally to assist at shunting and other Railway work.

4. That on the morning of Monday, the 20th November, 1882, upon the arrival at Blayney, aforesaid, of the daily morning train from Bathurst, the deceased, with several other men at the Blayney Station, were required to detach some waggons or trucks from the said train.

5. That during shunting, and whilst being engaged in coupling one of the waggons, the said deceased, in trying to get out of the way of some approaching trucks, got jammed between the buffers of the waggons he had been endeavouring to couple, and was so seriously injured, that he died almost immediately.

6. That your Petitioner's said deceased son was a young man of steady habits and quiet disposition, and respected by all his fellow employees, zealous in his work, and anxious to acquire the knowledge requisite to enable him to rise in his vocation, the better to enable him to support his mother, your Petitioner. And that the lamentable accident which caused his untimely death and left your Petitioner in almost destitute circumstances, could not in the remotest way be attributable to any want of care, diligence, or forethought on his part.

Your Petitioner therefore humbly prays that the Honorable the Minister for Works will kindly take the foregoing statement into favourable consideration, and be pleased to place a reasonable sum of money at the disposal of your Petitioner, to recompense in some measure the irreparable loss sustained by her through the death of her only son, whilst in the execution of his duty, who was her only support.

And your Petitioner, as in duty bound, will ever pray.

CATHERINE BUTTERLY.

WE beg to recommend the prayer of the foregoing Petition to the favourable consideration of the Honorable the Minister for Public Works.

HUGH TAYLOR, M.P., A. G. TAYLOR,
T. M. SLATTERY, NINIAN MELVILLE,
JOHN SUTHERLAND, GEO. MERRIMAN,
E. O'BRIEN, W. T. POOLE,

And twenty-four others.

No. 15.

Précis.

Case of Stephen Butterly.

In August, 1882, Stephen Butterly was appointed porter at the Blayney Station, at 6s. per diem. In the November following, just as he was about to be removed to Sydney (on the recommendation of Sir G. Wigram Allen, in order that he might be near his parents, whose chief support he was, he met with an accident which resulted in his almost immediate death. He was crushed between the buffers of two waggons which he was coupling up. An inquest was held, and the verdict was one of accidental death, and that no blame attached to any one connected with the Department.

On the recommendation of Sir G. W. Allen, Mr. Secretary Lackey minuted that the sum usual in such cases should be given to the mother, Butterly having died unmarried, and Commissioner gave orders for £100 to be placed on the estimates for the purpose.

On the 8th February, 1883, Mrs. Butterly received £35 on account, and the balance was subsequently paid to her.

In February, 1884, Mrs. Butterly petitioned the Minister for further relief, and Commissioner inquired if a gate could be found for her, and what her circumstances were. Traffic Manager reported that she was 63 years of age and too old and infirm for a gate, and that she kept a fruit and sweet shop, which probably afforded her but a poor livelihood. Commissioner minuted that he could not recommend anything more, and Minister concurred. Mrs. Butterly was so informed and she (or some one for her) wrote a rather intemperate reply.

Subsequently she addressed another petition (without date) to the Minister, and got it endorsed by a number of M.L.A.'s and others, and she also wrote an appeal to Mr. Slattery, M.L.A., who forwarded it to Commissioner.

On the 26th June, Mrs. Butterly addressed a letter to the Colonial Secretary drawing attention to her petition, representing herself to be in great distress, and praying for relief.

On the 15th instant Mr. G. Eagar returned the papers to Acting Secretary, remarking that he would be glad if something more could be done for Mrs. Butterly.

Commissioner.

C.A.B., 20/8/84.

Seen. I can see no reason why more should be paid.—CH.A.G., 21/8/84. Minute of Acting Secretary for Works approved.—G.R.D., 22/8/84. Inform Mrs. Butterly.—G.B.

The Commissioner for Railways to Mrs. C. Butterly.

Department of Public Works, Railway Branch,

Madam,

Sydney, 25 August, 1884.

Referring to your memorial, dated 27th June last, respecting your claim to further compensation on account of the death of your son, Stephen Butterly, who was accidentally killed while in the service of this Department, I have the honor, by the direction of Mr. Secretary Dibbs, to inform you that the matter has been fully considered, but he is unable to approve of any further amount being paid.

I have, &c.,

CH. A. GOODCHAP,
Commissioner for Railways.

(per G.B.)

No. 16.

Mrs. C. Butterly to The Commissioner for Railways.

Sir,

28 August, 1884.

With reference to your letter of the 25th instant respecting my claim for compensation on account of the death of my son, Stephen Butterly, I do myself the honor to make application for appointment as a gate-keeper on the railway line. If you should be good enough to grant this request, my daughter, who is 21 years of age, will accompany me and reside with me at whatever place you may be pleased to send me.

I have, &c.,

CATHERINE BUTTERLY.

Traffic

Traffic Manager.—R.J.S., B.C., 3/9/84. Mrs. Butterly is altogether too old to be employed as gate-keeper; and in any case, there is no vacancy.—W. V. READ (*per D.K.*), 5/9/84. Commissioner. Inform.—G.B., 9/9/84.

The Acting Secretary for Railways to Mrs. C. Butterly.

Madam,

Department of Railways, Sydney, 15 September, 1884.

In reply to your letter of the 28th August, applying for an appointment as gate-keeper on the Government Railways, I have the honor to inform you that inquiries have been made, but there is no vacancy.

I have, &c.,

GEO. BERNER,

Acting Secretary for Railways.

No. 17.

Mrs. C. Butterly to The Secretary for Public Works.

Sir,

Sydney, 11 June, 1886.

I most humbly beg that you will do something for me now, for my last means are gone. I have nothing to depend on, for what little I had I had to spend going backward and forward trying to get my petition signed. I am in sad distress, so I most humbly beg your honor will do something for me as soon as possible.

Yours, &c.,

CATHERINE BUTTERLY.

Thirty-four honorable members have signed my petition.—Mrs. C. BUTTERLY, 503, Cleveland-street, Darlington.

What does this refer to? Please let me have particulars.—W.J.L., 14/6/86. Commissioner. *Précis* of case herewith.—CH.A.G., 17/6/86. Minute of Secretary for Works. Scen.—W.J.L., 19/6/86. Inform.—D.C.M'L., 22/6/86.

The Commissioner for Railways to Mrs. C. Butterly.

Madam,

Department of Railways, Sydney, 23 June, 1886.

With reference to your letter of the 11th instant, addressed to Mr. Secretary Lyne, again appealing for further compensation on account of the death of your son, Stephen Butterly, who was accidentally killed while in the service of this Department, I am directed to inform you that the matter has had the fullest consideration, but the Minister is unable to approve of any further gratuity being paid.

I have, &c.,

CHAS. A. GOODCHAP,

Commissioner for Railways.

No. 18.

T. Williamson, Esq., M.P., to The Commissioner for Railways.

Dear Sir,

Sydney, 16 November, 1886.

During the last Session of Parliament I presented a petition for a Mrs. Butterly, asking for further assistance from the Government in consequence of her son being killed at Blayney.

I may state that Mrs. Butterly is over 60 years of age and has not a friend in the Colony. It appears her husband died a few days after the son was killed. I have made inquiries and find that the old lady is in extreme poverty and is not destined to live very long. Hoping that you will fairly consider her case.

I remain, &c.,

THOS. WILLIAMSON.

I think this is a case for private benevolence. Mrs. Butterly received more than she would have received; had her son been a contributor to the Superannuation Fund, and had been killed (as he was) in the execution of his duty, she could not have received more than six months pay, and she received nearly twelve months.—CH.A.G., 20/11/86.

Butterly was only three months in the Department, but would have received six months gratuity as the minimum. Mr. Williamson called again to see the Commissioner about Mrs. Butterly this morning, and will take an early opportunity of seeing him further.—A.R., 23/11/86. Commissioner.

Inform Mr. Williamson in reply to his letter.—CH.A.G., 25/11/86.

The Commissioner for Railways to T. Williamson, Esq., M.P.

Sir,

Department of Railways, Sydney, 26 November, 1886.

In reply to your letter of the 16th instant, in which you ask that the case of Mrs. Butterly, whose son was killed on the railway while in the discharge of his duty, may be reconsidered with a view to affording her some further pecuniary assistance, I have the honor to inform you that Mrs. Butterly received more than she would have been paid had her son been a contributor to the Superannuation Fund and had been killed (as he was) in the execution of his duty. In the latter case she would not have received more than six months' pay, while she actually received nearly twelve months'. In my opinion this is a case for the exercise of private benevolence.

I have, &c.,

CHAS. A. GOODCHAP,

Commissioner for Railways,
(*per A.R.*)

No. 19.

T. Williamson, Esq., M.P., to The Secretary for Public Works.

Dear Sir,

Sydney, 1 December, 1886.

I wrote a short time back to the Commissioner for Railways in reference to the case of a Mrs. Butterly, and after considering the representations made by me he informs her that the allowance paid cannot be increased.

I may state that the poor creature has no friend, in fact is quite penniless. The money that she previously received was expended in burying her son and her husband, the latter a few days after the son. If a small amount was given to her it would be a valuable assistance.

Hoping you will kindly consider her case.

I remain, &c.,

THOMAS M. WILLIAMSON.
(per G.N.)

Where are the papers?—W.J.L., 6/12/86. Papers herewith.—A.R., 9/12/86. Commissioner's 87/7,278,—For Minister's information. There is really no claim, and to grant an allowance would form an inconvenient precedent. It is a case for private benevolence.—C.H.A.G., 9/12/86. Inform.—W.J.L., 18/12/86.

No. 20.

Memo. from W. Stephen, Esq., M.P., to The Secretary for Public Works.

On the 20th November, 1882, a young man named Stephen Butterly was killed between the buffers at the Railway Station, Blayney.

The deceased's mother (Catherine Butterly, widow) presented a petition to Parliament praying for consideration in her bereaved condition; she states that she is in indigent circumstances.

Has the Government given any relief to the said Catherine Butterly; if so, does the Government intend to grant her any further relief?

Will the Government have any objection to the appointment of a Committee to make further enquiry into the circumstances of the death of the said Stephen Butterly.

Let me know how this matter stands.—J.S., 31/3/87. The matter was brought forward in December, and the Commissioner then submitted that Mrs. Butterly had no claim, and that he considered it a matter for private benevolence. The then Minister concurred, and Mr. Williamson was so informed.—A.R., 7/4/87. Inform Mr. Stephen.—J.S., 14/4/87.

The Commissioner for Railways to W. Stephen, Esq., M.P.

Sir,

Department of Railways, Sydney, 15 April, 1887.

Referring to your memo., urging that further assistance might be given to Mrs. Butterly, whose son was fatally injured at Blayney, I have the honor to inform you that the matter has had further consideration, but Mr. Secretary Sutherland regrets he is unable to make any direction in this matter.

Mrs. Butterly was granted the allowance usually made in such cases, and to depart from the regular practice would establish an inconvenient precedent.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAYS.

(ACTIONS AGAINST COMMISSIONER FOR LOSS BY FIRES.)

Ordered by the Legislative Assembly to be printed, 18 March, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 11th May, 1886, That there be laid upon the Table of this House a Return showing,—

- “(1.) The number of cases for loss by fires, occurring through negligence, which have been brought or threatened against the Commissioner for Railways during the past ten years.
 “(2.) The number of cases which have gone to trial in which the Commissioner has been successful.
 “(3.) The number of cases in which he has been unsuccessful.
 “(4.) The number of cases which have been settled.
 “(5.) The amount paid in damages, and the amount in costs.
 “(6.) The amount in costs which has been recovered by the Commissioner.
 “(7.) The amount paid for settled cases.
 “(8.) The number of cases in which settlements have been offered to the Commissioner and refused, and what were the offers, showing which cases the Commissioner has lost, after an offer of settlement has been refused.”

(Mr. Thompson.)

RETURN relative to claims and actions against the Commissioner for Railways for loss sustained by fire

SUMMARY.

Questions.

No. 1.	2.	3.	4.	No. 5.		6.	7.	8.
				Verdict.	Costs.			
162	98	17	47	£ 5,480 s. 11 d. 3	£ 3,921 s. 5 d. 4	Nil.	£ 1,809 s. 13 d. 1	See cases of the Messrs. Falconer on page 3. See case of John Carroll on page 6.
*162	+98	17	47	5,480 11 3	3,921 5 4	Nil.	1,809 13 1	

* NOTE.—There were 162 cases, but none of them occurred through negligence, every possible precaution having been taken by the Department.

† These claims were successfully resisted by the Commissioner, and did not go into Court. One case, however, is still pending.

RETURN relative to Claims and Actions against the Commissioner for Railways for loss sustained by fire.

(1) The number of cases for loss by fires, occurring through negligence, which have been brought or threatened against the Commissioner for Railways during the past ten years.	(2) The number of cases which have gone to trial in which the Commissioner has been successful.	(3) The number of cases in which he has been unsuccessful.	(4) The number of cases which have been settled.	(5) The amount paid in damages, and the amounts in costs.		(6) The amount in costs which has been recovered by the Commissioner.	(7) The amount paid for settled cases.	(8) The number of cases in which settlements have been offered to the Commissioner and refused, and what were the offers, showing which case the Commissioner has lost, after an offer of settlement has been refused.	Remarks
				Damages.	Costs.				
Hamilton, John	£ s. d.	£ s. d.	£ s. d.	£ s. d.	.....	Claim not entertained.
McCallum, A.	do
Cunningham, Anne	do
Long, Michael	do
Lawless, John, senr.	do
Rev. Mr. Buthorne	do
Mrs Whitmore.	Mrs. Whitmore .....	.....	.....	.....	9 8 0	.....	do
Lee, Wm.	do
White, George	do
Chapman, W. G.	do
Chisholm, Hon. Jas.	Chisholm, Hon. Jas. ....	.....	.....	.....	193 11 3	.....	do
Lee, W., junior	do
Lackey, John	do
Kite, Wm.	do
Crawford, R.	do
Stinson, Wm.	Stinson, Wm. ....	.....	200 0 0	191 11 1	.....	.....	.....	This was a claim for £200 as compensation for damage done to fruit trees, grass, fencing, vines, &c., by fire, alleged to have been caused by sparks emitted from a passing engine. The Department repudiated liability, and a writ was then issued and claim increased to £500. The action was defended, and a verdict obtained for £200.
Messrs. Chisholm and Stuckey.	Messrs. Chisholm and Stuckey. ....	.....	260 0 0	193 1 9	.....	.....	.....	Messrs. Chisholm and Stuckey claimed £400 for loss sustained by them in consequence of the destruction by fire of a quantity of grass and fencing at Breadalbane. The case was referred to the Attorney-General, who recommended that the claim should be resisted, as it could be shown that the engine which caused the fire was fitted with the best known appliances for preventing the emission of sparks. The claimants then brought an action against the Department, and obtained a verdict for £260.
McBurney, N.	McBurney, N. ....	.....	.....	.....	30 0 0	.....	.....
Mizens, Mrs.	Claim not entertained.
Gilbert, John	Gilbert, John .....	.....	.....	.....	10 0 0	.....	.....
Francis, Jabez	Francis, Jabez ...	.....	40 0 0	31 4 8	.....	.....	.....	This was a claim for £50 for grass, fencing, &c., consumed by fire alleged to have been caused by sparks emitted from a passing engine. The Department declined liability on the ground that every reasonable precaution had been adopted to prevent fires occurring. The claimant then took proceedings against the Commissioner for Railways for the recovery of the amount of damage sustained in the manner alleged. He obtained a verdict for £40.
O'Brien, B.	Claim not entertained.
Murphy, Peter	do
Barton, John	do
Glasson, Bros.	do
Hughes, Hugh	Hughes, Hugh .....	.....	.....	.....	5 5 0	.....	.....
Ryan, Edward	Ryan, Edward .....	.....	.....	.....	5 0 0	.....	.....
White, Mrs. Jane	White, Jane .....	.....	.....	.....	5 0 0	.....	.....

Cunningham, Mary J.		Cunningham, Mary J.		12 0 0	40 12 4			
Best, William								
Doyle, A. J.							10 0 0	
Peck, Mr.							5 0 0	
Messrs. R. B. Ronald and Jas. McBain.							30 0 0	
King, Chas.								
Howard, Geo.							25 0 0	
Campbell, A.							40 0 0	
Wilcock, Wm.								
Mooney, Henry								
Collins, Chas.								
Britton, Thos.							14 2 6	
Waddell, M.								
Godfrey, Joseph								
Graham, Chas.								
Schones, Wm.							10 0 0	
Cowley, Frank								
Hansford, John								
Rogers, John								
Kerby, Jas.								
Hurley, Jno.								
Stoddart, Thos.								
Piper, Fredk.								
Chisholm, Jas.								
Dewling, S.								
Meale, Wm. Thos.								
Slaven, Wm.								
De Lauret, A. G.								
Quinlan, P.								
Darlow, F.								
Dillon, John							15 10 0	
Hayes, C.							26 17 6	
Samuel, Sir S.								
Hilly, Felix								
Hurst, Jas.								
Gould, A. J.							60 0 0	
White, Jas.							15 0 0	
Fawcett	Fawcett			1,000 0 0	196 9 1			
Falkner, D.	Falkner, D.			305 18 4	170 14 0			
Falkner, R.	Falkner, R.			203 18 10	172 4 6			
Britton, Thos.							9 17 6	
Carried forward 69	7	19		2,021 17 2	995 17 5		519 11 9	

Mary Jane Cunningham claimed £50 as compensation for destruction by fire of grass, fences, &c., alleged to have been caused by the negligence of the fencers when burning off the grass along the line. The Department repudiated liability. Subsequently an action was brought against the Department for the recovery of the amount named, when a verdict for £12 for plaintiff was recorded.

Claim not entertained.

Claim not entertained.

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On behalf of trustees of Anglican Church, Singleton.

Claimed originally £1,000. The Department disclaimed liability. Subsequently a writ was issued, and the claim increased to £2,000. The action was tried at Maitland, and the Jury brought in a verdict for £1,000 damages against Department.

The original claims in connection with these cases were respectively £220 and £150. Subsequently writs were issued for £500 in each case, and Mr. Gould, M.P., who was acting for the claimants, intimated that he had been instructed to accept without prejudice the sums of £400 and £300 respectively. The offers were declined, and the claimants brought actions against the Commissioner for Railways to recover £500 in each case, with the results shown.

62

RETURN relative to Claims and Actions against the Commissioner for Railways for loss sustained by fire—*continued.*

(1) The number of cases for loss by fires, occurring through negligence, which have been brought or threatened against the Commissioner for Railways during the past ten years.	(2) The number of cases which have gone to trial in which the Commissioner has been successful.	(3) The number of cases in which he has been unsuccessful.	(4) The number of cases which have been settled.	(5) The amount paid in damages, and the amounts in costs		(6) The amount in costs which has been recovered by the Commissioner.	(7) The amount paid for settled cases	(8) The number of cases in which settlements have been offered to the Commissioner and refused, and what were the offers, showing which case the Commissioner has lost, after an offer of settlement has been refused	Remarks.
				Damages.	Costs.				
Brought forward.. 69	7	19	£ s. d. 2,021 17 2	£ s. d. 995 17 5	£ s. d.	£ s. d. 519 11 9	....
Upton, E. & J.	Upton, E. & J.	....	120 0 0	235 1 3	....	....	....	Messrs E & J Upton claimed the sum of £123 as compensation for a quantity of straw, wheat, and barley consumed by fire, alleged to have been ignited by sparks emitted from a passing engine. Claim was not entertained. Subsequently a writ was issued and claim increased to £500. The action was tried at Tamworth, and plaintiffs secured a verdict for £120.
Febay, F. W.	Claim not entertained.
Hayes, Hy.	do
Commins, G. W.	do
Caps, John	do
M'Innes, R. A.	do
Fleming, G. F.	Fleming, G. F.	....	50 0 0	79 4 0	....	....	....	This was a claim for £67 for the destruction of 40 acres of grass and a quantity of timber by fire, alleged to have been caused by the carelessness of fettlers when burning off grass within the railway fences. The reports furnished by the Officers of Department were to the effect that the fire could not have originated in the manner alleged, and that consequently the Department refused to admit liability. An action was then commenced against the Commissioner to recover the amount of damages in question. The case was tried at Albury, and the plaintiff obtained a verdict for £50.
Edgan, Patrick	Claim not entertained.
Fullagar, Wm.	do
Baxter, Wm.	Baxter, Wm.	....	....	....	20 0 0	....	do
Hnes, W. J.	do
Hefferman, Patk.	do
Coull, Wm.	do
Cousins, H. T.	Cousins, H. T.	....	....	....	20 0 0	....	Mr John Sands claimed compensation for destruction by fires of a quantity of grass and fencing, alleged to have been caused by sparks from a passing engine, and carelessness of fettlers when burning off along the line. The Department declined to admit liability. Proceedings were subsequently taken to recover £100 for the damages in question. The action was tried at Goulburn, and the jury returned a verdict for plaintiff for £70.
Sands, John	Sands, John.	....	70 0 0	28 4 4	....	....	....
Cleghorn, W. and G.	Cleghorn, W. and G.	....	....	....	15 0 0	....	Claim not entertained.
Morris, Dennis	do
Paul, Chas.	do
M'Kay, Chas.	do
Balfour, Hon. Jas.	do
Jennings, Wm.	do
Mitchell, Jas.	do
Egan, P.	do
Jeffs, S.	do
Hilley, Felix	do
Taylor, John	do
Fahey, Michael....	do

Bergin, Edwd.								Claim not entertained.
White, Mary Jane								do
M'Lennan, Alex.								do
Baxter, Wm.								do
Burdekin, S., M.P.								do
Roche, D. W.								do
Moad, Arthur								do
Fitzpatrick, M.			Fitzpatrick, M.			20 0 0		
Baxter, J.								do
Messrs. Betts and Carter, on behalf of Trustee of Glebe Lands, Gunning.								do
Redfern, W. L. M.								do
Tabor, Geo.								do
Hay, J. G.								do
De Lauret, A. G.								do
Toomey, M.								do
Best, Mr.								do
Crawford, R.								do
Burns, Edwd.								do
Fraser, A. D.								do
Peck, Hy								do
Coll, Mr.								do
Meale, Wm.			Meale, Wm.			178 0 0		The amount of £178 was paid to Mr. Meale for damage done to his interests as lessee of the farm on which the fire occurred, and the other item of £4 10s. was paid to Messrs. J. and E. Barnes (owners of the farm) in respect of damage done to fencing, &c.
						4 10 0		
Steele, Edwd.			Steele, Edwd.			65 0 0		This was a claim for damage sustained by the same fire as alluded to in the preceding case. Mr. Steele was paid £65 for damage done to his interests as lessee of the holding, while the other item of £19 6s. 3d. was paid to Mr. W. A. Byrne on behalf of a person named Quinlan (owner of farm) for destruction of fencing, &c.
						19 6 3		
Corby, Jas.			Corby, Jas.			40 0 0		This was a claim in respect of damage sustained by the same fire as alluded to in the two preceding cases. Mr. Corby, as lessee of the farm, was paid £40, while the owners, Messrs. J. and E. Barnes, were paid £40 10s. as compensation for damage done to fencing, &c.
						40 10 0		
Pellow, John			Pellow, John			12 0 0		This was another claim in respect of damages sustained by the same fire as referred to in the preceding cases. Mr. Pellow, as lessee of the farm, was paid £12, and the owner, Mr. Robert Little, received £30 as compensation for damage to fences, &c.
						30 0 0		
Quinlan, James.								Claim not entertained.
Bourke, J.								do
Whitton, Joseph			Whitton, Joseph			150 0 0		do
Ingersoll, W.								do
Zerk, Henry			Zerk, Henry			71 0 0		do
Hawkins, H.								do
Donaghy, J.								do
Wright, Heaton & Co.								do
O'Keefe, John			O'Keefe, John			12 10 0		
Cunneen, A.		Cunneen, A.		760 0 6	616 1 9			Mr. Cunneen claimed the sum of £1,000 in respect of and as compensation for loss sustained in consequence of the destruction of about 2,000 acres of grass and many miles of fencing by fire, alleged to have been caused by sparks emitted from a passing engine. Enquiries in the matter were being made, but before the Department had collected sufficient particulars on which to base a reply to the claim advanced, a writ was issued and the claim increased to £2,000. The case was tried at Maitland, and the Jury gave a verdict for £750 (with interest thereon) for plaintiff.
Carried forward	131						1,217 8 0	
		11	30	3,021 17 8	1,954 8 9			

RETURN relative to Claims and Actions against the Commissioner for Railways for loss sustained by fire—*continued.*

(1.) The number of cases for loss by fires, occurring through negligence, which have been brought or threatened against the Commissioner for Railways during the past ten years.	(2) The number of cases which have gone to trial in which the Commissioner has been successful.	(3) The number of cases in which he has been unsuccessful.	(4) The number of cases which have been settled.	(5) The amount paid in damages, and the amounts in costs.		(6) The amount in costs which has been recovered by the Commissioner.	(7) The amount paid for settled cases.	(8) The number of cases in which settlements have been offered to the Commissioner and refused, and what were the offers, showing which case the Commissioner has lost, after an offer of settlement has been refused.	Remarks.
				Damages.	Costs.				
				£ s. d.	£ s. d.	£ s. d.	£ s. d.		
Brought forward..... 131	11	30	3,021 17 8	1,954 8 9	.....	1,217 8 0	.....
Beckes, J. C.....	Beckes, J. C. ....	.....	.....	.....	18 2 6	.....
Jolly, J. H.	Jolly, J. H. ....	.....	.....	.....	35 0 0	.....
Irwin, Alexr.	Irwin, Alexr. ....	.....	.....	.....	15 0 0	.....
Bailey, Hy.	Bailey, Hy. ....	.....	.....	.....	60 0 0	.....
Lanigan and others	Lanigan and others...	.....	.....	.....	30 0 0	.....
							*10 0 0	.....	*Legal expenses incurred by the Crown in connection with the claim.
M'Dougall, W. A.	M'Dougall, W. A. ....	.....	.....	.....	50 0 0	.....
Alcorn, W. H.	Alcorn, W. H. ....	.....	.....	.....	50 0 0	.....
Atkinson, Mrs.	Atkinson, Mrs. ....	.....	.....	.....	115 0 0	.....
Carroll, John.....	Carroll, J. ....	.....	62 3 0	167 13 4	.....	.....	Carroll, John ...	Mr. Carroll claimed the sum of £131 13s. as compensation in respect of damage done to his grass paddock at Uralla, by fire, alleged to have been caused by carelessness of fettlers when burning off grass within the railway fences. Enquiry was made, and it was reported that the amount of damage done was over-estimated, and that £30 would adequately compensate Mr. Carroll for his loss. This amount Mr. Carroll was offered without prejudice, but he refused to accept it; he, however, intimated that he would accept £100, but the offer was not entertained. Subsequently Mr. Carroll increased his claim to £300 and issued a writ to recover that amount. While the case was pending the Commissioner offered to pay £60, but the offer was not entertained. The action was tried at Armidale, and verdict for £62 3s. for plaintiff was entered.
Fitzpatrick, Jno.	Fitzpatrick, John ...	.....	.....	.....	7 0 0	.....	Claim not entertained.
Nivisan, J. A.	do
Jones, Thomas	do
Stack, M.	Stack, M. ....	.....	.....	.....	6 0 0	.....	do
Burden, Margaret.....	Burden, Margaret ...	.....	.....	.....	8 0 0	.....	do
Argland, W. E.	Argland, W. E. ....	.....	.....	.....	5 0 0	.....	do
De Lauret, A. G.	do
Grims, Geo.	do
Stafford, Mr. (on behalf of the Muscledbrook Municipal Council.)	do
Lethbridge, G. L.	Lethbridge, G. L. ...	.....	.....	.....	68 1 7	.....	do
Paton, John	Paton, John .....	.....	.....	.....	9 1 0	.....
Englebrecht, John	Englebrecht, John ...	.....	.....	.....	70 0 0	.....
Zerk, Martin	Zerk, Martin .....	.....	.....	.....	16 0 0	.....
McBurnie, Nicholas.....	McBurnie, N. ....	.....	20 0 0	14 2 6	.....	.....	.....	This was a claim for £37 as compensation for fences and grass consumed by fire alleged to have been caused by the carelessness of fettlers when burning off along the line in January, 1834. The damages were assessed by an officer of the Department, and the Commissioner offered, without prejudice, the sum of £15, which the claimant refused to accept. A writ was then issued by claimant to recover the amount in question. The case was tried in the District Court, and plaintiff obtained a verdict for £20.
Macdonald, Mrs. B.....	Macdonald, Mrs. B...	.....	.....	.....	20 0 0	.....

Chambers, W. R.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Claim not entertained
Aarons, Joseph.....	.....	Aarons, J. ....	.....	190 6 1*	441 16 4	.....	.....	.....	.....	Mr. Joseph Aarons claimed £500 as compensation for damage sustained in consequence of the destruction by fire of a quantity of lucerne, wheat, prairie and other grasses, alleged to have been caused by sparks emitted from a passing engine. The damage was estimated at £10 15s., but as every precaution, calculated to ensure immunity from fires, was adopted, it was decided to resist the claim. Mr. Aarons was so informed on 31/12/84, and on 12/1/85 a writ was issued against Commissioner to recover amount of damage sustained. The action was tried at Dubbo, on 16/10/85, and the jury brought in a verdict for plaintiff, damages £189
Bowman, A. and E .....	.....	Bowman, A. and E.	.....	539 19 8*	412 5 11	.....	.....	.....	.....	Messrs. A. and E. Bowman claimed compensation for destruction by fire of 800 acres of grass and a quantity of fencing. Claimants were informed that Department was not liable, as the best known appliances for arresting the emission of sparks were fitted to the engine in question. A writ was issued to recover £1,000 damages. The action was tried at Maitland, when the jury returned a verdict for plaintiffs, damages £530.
Bowman, William .....	.....	Bowman, William ...	.....	533 17 6*	208 4 1	.....	.....	.....	.....	Mr. William Bowman claimed £1,000 for damages sustained by the same fire as referred to in the preceding case. The action was tried at Maitland, and resulted in the jury returning a verdict for plaintiff, damages £524.
Mackay, D. F. ....	.....	Mackay, D. F. ....	.....	1,112 7 4*	722 14 5	.....	.....	.....	.....	Mr. Mackay claimed £8,000 as compensation for destruction by fires of about 8,500 acres of grass and a large quantity of fencing, alleged to have been caused by sparks emitted from passing engines. On the 8/3/84, and before the Department had time to enquire into and ascertain the particulars of the damage sustained by Mr. Mackay upon which to base a reply to the claim advanced, a writ was received claiming the amount stated. The action was tried at Maitland, and the jury brought in a verdict for plaintiff, damages £1,084 11s. 6d.
Quinn, Celia M. ....	.....	Quinn, C. M. ....	.....	.....	.....	.....	.....	.....	.....	Mrs. Quinn claimed compensation for a quantity of grass and fencing destroyed by fire, alleged to have been caused by sparks emitted from a passing engine. The Department declined to admit liability, and an action was then commenced to recover £300. The case was tried at Goulburn, in October, 1884, when the jury, in opposition to the opinion of the judge, brought in a verdict for £50 for plaintiff. A new trial was applied for and granted, the costs of the case to abide the result of the second trial, which took place at Goulburn, on 19/4/86, and resulted in a verdict for the Commissioner. The costs in this case have been taxed, but no amount has been recovered from Mrs. Quinn.
Mackinnon, C. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Mr. Mackinnon claimed £100 as compensation for destruction by fire of a large quantity of grass and fencing, alleged to have been caused by sparks emitted from an engine which failed to haul a load up a steep gradient. The Department disclaimed liability, and an action was commenced against the Commissioner to recover £200 for the damages in question. The case was tried at Wagga, on 9th October, 1884, and the jury brought in a verdict for plaintiff, damages £120. A rule nisi for a new trial was applied for and granted on 6/11/84, and on 10/8/85 the original verdict was set aside by the full Court. The costs to abide the event of the second trial, which is pending.
Total..... 162	1	17	47	5,480 11 3	3,921 5 4	Nil.	1,809 13 1	.....	.....

* Inclusive of Interest.

[6d.]

Sydney: Charles Potter, Government Printer.—1887.

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

COMMISSIONER FOR RAILWAYS *v.* MURPHY.

(CORRESPONDENCE, MINUTES, &c.)

Ordered by the Legislative Assembly to be printed, 10 May, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 20th April, 1887, That there be laid upon the Table of this House,—

“Copies of all papers and documents connected with the case of the
“Commissioner for Railways *versus* Murphy; and all papers connected
“with the career and character of one Stuart, a witness in the above
“case.”

(*Mr. Thompson.*)

SCHEDULE.

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COMMISSIONER FOR RAILWAYS v. MURPHY.

No. 1.

Memo. from Station-master Collins to Assistant Guard Murphy.

Sydney Station, 17 February, 1887.

You are suspended from duty, and your explanation required why you left your train at Newtown this morning without coming to your destination. J. COLLINS.

Assistant Guard Murphy's reply to above:—

Sir,

I beg to state I plead guilty to the above. My wife being unwell, was anxious to get home, and am very sorry to think have incurred your displeasure, and it shall not happen again. Guard Pratt not to blame. I am, &c.,
E. MURPHY.

No. 2.

Memo. from Station-master Collins to Guard Pratt.

Sydney Station, 18 February, 1887.

You will report at once why you allowed Assistant Guard Murphy to leave his train at Newtown this morning, contrary to orders issued that no one leave their train until arriving at your destination. J. COLLINS.

Guard Pratt's reply:—

Sir,

The reason why I allowed Murphy to leave his train at Newtown this morning. He told me that his wife was very bad when he left home the night before, and as there was no one with her he asked me would I let him get off, and as I did not think Mr. Collins would object in a case like this I let him off. Yours, &c.,
ANTHONY PRATT.

No. 3.

Minute from Station-master Collins to The Traffic Manager.

TRAFFIC MANAGER to see. Certainly I should object; how was he to know what was to take place with his train; also, there are strict orders against leaving trains before going to destination. Please send to Superintendent Richardson. J. COLLINS, 19/2/87.

No. 4.

Report from Porter W. Stuart to Goods Superintendent Harper.

Sir,

According to your instructions I proceeded to Picton by the mail on the 16th instant, and saw the Station-master on following morning, with whom I arranged that I should start work in the shed, where I assisted to load and watch produce and poultry up to the hour of train, viz., No. 10 south, left for Sydney. There were very little lots in all, which consisted six coops of poultry, one pigs, and one magpies.

Everything went on well till we arrived at Burwood, where the train stopped for about 10 minutes. From 3 to 5 minutes before the train left Burwood Assistant Guard Murphy got into cattle waggon 40, in which I was planted, and broke open the coop containing three and a half pairs of magpies. I heard a magpie sing out. I got on to my knees and could see nothing in Murphy's hands. He then knocked the board back in its place with the heel of his boot. Like a flash it came to my mind it would not be well for me to collar this fellow, for if he overpowered me he would think nothing of strangling me and throw me out on to the line, and, knowing something of the man's principles, I watched and allowed him to depart, and the train started off and I saw Murphy get into brake-van. I then found that three magpies were missing from the case. To make sure I was not mistaken in Murphy I called at Redfern and asked the officer-in-charge who it was went out on the 6:40 p.m. train last night, and he told me Guard Pratt and Assistant Guard Murphy; then I was positive it was Murphy who stole the magpies. I am certain, too, that there is not another man in the service who I would have treated so easily as I did Guard Murphy, simply for the reasons I have already stated. I shall, with your leave, set about recovering the magpies missing. I have, &c.,
W. STUART.

P.S.—As Guard Murphy was returning by brake-van the magpies could be heard as he walked along, wherever he may have had them hid about his person.—W.S.

STATEMENT made by Guard Pratt.

ANTHONY PRATT was guard of No. 10 up south train this morning. Left Picton at 12:20 a.m., arrived at Burwood at about 3 a.m. Drew up to platform, and, with assistance of Assistant Guard Murphy and Porter Callaghan, put out ten cases of fruit from a cattle waggon, No. 55, I think, from Camden. Murphy travelled in van with me from Picton to Burwood. I left it first at Burwood and he followed me to the cattle waggon. After putting out the cases the train drew up to the advance signal and we, *i.e.*, Murphy and myself, got into the van as it drew past us. We were nearly opposite to ticket office window. Murphy did not leave me during the time we were at Burwood, and he did not get out of my sight. I have not seen Murphy since he left the train at Newtown this morning. I have been away from home since 11 a.m. this day, having been to the cricket match. My train stood about 10 minutes at the advance signal, and during that time Murphy did not leave the van. Anyone might have interfered with the train during this time without my seeing him. ANTHONY PRATT, 18/2/87.

No. 5.

No. 5.

Memo. from Station-master, Darling Harbour, to The Station-master, Picton.

Darling Harbour Station, 18 February, 1887.

RECEIVED from yours in cattle waggon 40, one case magpies, J. Clark to Inglis and Son; the ticket on the case shows three and a half pairs magpies; please note we only received two pairs of birds, three alive and one dead. Please advise at once.

H.R.,
(pro S.M.)

Station-master's (Picton) reply:—Birds were not counted by Department.—D. SHEPPARD, 21/2/87.

The Station-master, Darling Harbour, to The Goods Superintendent.

Goods Superintendent's information. This is in connection with Guard Murphy's case going into Court on 24th instant. CHAS. PAULL, 22/2/87.

No. 6.

Minute from The Goods Superintendent to The Traffic Manager.

I FORWARD the attached report for your information. As you are aware, complaints are being almost daily made to either the Commissioner or your office, of poultry and other goods being tampered with in transit.

This has really become a serious matter and the subject of gross reflection on the Department, and in order to detect the offenders, Stuart, a smart, active officer, who has been employed for the past twelve or eighteen months in this direction and has convicted several offenders, was detailed. On Thursday last he proceeded to Picton, from which district the complaints have been specially numerous. After watching the loading all day he was secreted in a cattle waggon by the station-master, and proceeded in it by No. 10 goods to Darling Harbour. He reports that on arrival of the train at Burwood, Assistant Guard Murphy entered the truck, examined the contents, and finally selecting a box containing magpies, removed a batten and abstracted three birds. He says he had no difficulty in recognizing Murphy by the light of the hand lamp he carried. He further reports that Murphy returned to his brake-van, but was not in it on arrival at Darling Harbour. Subsequent inquiry proves that Murphy left the train at Newtown.

When Stuart reported the matter to me at 9 a.m., and after consultation with you, the case was placed in the hands of the Detective Department, and an officer was despatched with a search warrant to Murphy's residence at Newtown, where Stuart identified him as the thief.

Although a thorough search was made of the premises no trace of the magpies could be found; the detective officer, however, says Murphy's manner exhibited strong symptoms of guilt.

It appears from Stuart's statement that Pratt saw him at Darling Harbour, and it is of course possible that he may have suspected his mission and warned Murphy before the search was made, as the detective informs me that Murphy passed a remark showing he knew of Stuart's presence at the Harbour when the train arrived.

Pratt, on being questioned by Superintendent Richardson and myself, emphatically denied that Murphy was out of his sight during the time the train stopped at Burwood.

The matter is now in the hands of Detective Clough, who is engaged in obtaining evidence to corroborate Stuart. JNO. HARPER, 19/2/87.

[Enclosure.]

Statement of Porter Wm. M. Stuart:—

New South Wales Railways, Goods Department, Sydney, 18 February, 1887.

WILLIAM MONTGOMERY STUART states:—I am employed by the Railway Department of the New South Wales Government on special duty; on the 16th of February, 1887, I proceeded to Picton on duty; on the 17th (Thursday), I assisted to load a cattle waggon, No. 40, with various goods invoiced to Darling Harbour, Sydney, amongst the consignments being one addressed, "From James Clark, Razor Back, Picton, to William Inglis, three and a half pairs of magpies;" the truck was loaded in the shed at Picton; it was about 5 p.m., when the truck was finished loading; I remained near it until 7:30 p.m., when I left for refreshments; I returned at 8 p.m., and got into the truck and secreted myself underneath the sheet; I took particular notice of all the consignments that were placed in this truck, and they all appeared in good order; I examined the contents of the truck, viz., one coop of pigs, six coops of poultry, and one case of magpies, and rearranging the things, I placed the coop of magpies on the top of one of the coops of fowls; the train left Picton at 12:20 a.m., the 18th inst., and arrived at Burwood Station at 3:15 a.m., and remained for about 5 minutes, the train then started and again pulled; having gone from 80 to 100 yards, and stopped about 5 minutes; during this time Murphy, the assistant guard wearing the uniform of the New South Wales Railway Department, and carrying a lamp in his hand, got into the truck over the door; I saw him force the case containing magpies open; I saw him take some out; afterwards he proceeded to secure the case by striking the battens down with his foot; he then left the truck by the same way as he entered it; as he was passing me I heard a bird cry as of a magpie, the sound coming from the direction Murphy was going; when the train arrived at Darling Harbour I drew the attention of the watchman, Charles Douglas, to the case of magpies; we examined it together and found that there were four magpies in it.

W. M. STUART,
Porter.

No. 7.

Minute from The Goods Superintendent to The Traffic Manager.

ACTING in accordance with your instructions, I arranged for a summons to be issued against Edward Murphy for stealing three magpies, the property of the Commissioner.

As you are aware, this step was taken in order that the various conflicting statements might be made and verified on oath before a Magistrate, and in view of the fact that certain allegations were made as to Stuart's character. The case and evidence was placed in the hands of Mr. Wallace, solicitor, who, with the detective who had it in hand, expressed a conviction that it was strong enough to secure a committal. It came on for hearing yesterday 24th inst., before Mr. Abbott, S.M.

The fact that seven magpies were in the case when delivered at Picton was proved, and Douglas, the watchman at Darling Harbour, deposed that directly the train reached that station, Stuart called his attention to the box, and on counting the contents only four birds were found. Stuart,

Stuart, when called upon, clearly and positively swore to the matters contained in his written statement, and cross-examination by defendant's solicitor (Mr. Thompson) failed to shake his evidence as to the occurrence. He was then examined as to his character whilst in the Police Force, and admitted that he had been charged with smoking whilst on duty, with taking a drink in a public-house whilst in uniform, and further that he had been charged, to use his own words, "with perjury by a number of prostitutes and larrikins, but the case was dismissed, and he was advised by the Bench to take proceedings against his accusers."

He was asked to explain the circumstances of his leaving the Police, and stated that he had been charged by two fellow-officers with receiving £22 as a bribe from a prostitute, and having reported to the Inspector-General that two of his superior officers were parties to a conspiracy against him in this matter, he was offered the opportunity of resigning, which he refused to avail himself of. He was then discharged. He was questioned as to whether, since he has been in the Railway Service, he had not falsely charged a carter named Pugsley with stealing a case of grapes which had never been received. This he positively denied, and I may say that prior to the information being laid I saw and questioned Mr. Paull on this subject, having indirectly heard that it would be made a feature in the case. Mr. Paull denied that such an incident had ever occurred, the whole matter being contained in the paper attached, from which it appears Stuart made a mis-count, and reported thirty-two cases as received instead of thirty-one cases.

For the purpose of proving that an animus existed on Stuart's part against Murphy, he was asked if he had not been called "a damned black mailer" by Murphy.

This he positively denied, swearing most emphatically that he had never spoken to Murphy, or Murphy to him.

The defence was then gone into, Mr. Thompson raising a preliminary objection that "magpies could not form the subject of a charge of larceny," and that there was consequently no case. After this point had been somewhat strongly insisted upon, it was overruled by the Bench and evidence given by Superintendent Richardson and Mr. Collins to the effect that Murphy's character, whilst under their supervision, was very good. The guard of the train, Pratt, was next examined, and swore positively that Murphy was with him in the brake-van during the time Stuart swore he was stealing the magpies. At this stage Mr. Abbott dismissed the case without assigning any reason for so doing. As a certain doubt may have existed as to the weight the technical objection may have had in his decision, I saw him subsequently, and pointed out to him that our object in sending the case for trial was to have the evidence weighed and considered impartially by a Magistrate accustomed to deal with such matters, and that we wished to know on what grounds had he dismissed the information. He was good enough to tell me that it was purely on the evidence, and that Pratt's testimony had decided him. When I pointed out the position the Department was in, as either Stuart was a perjurer, or Murphy a thief, he assured me that he would not say that the former had perjured himself, but that he did not think Murphy was the thief.

These are the facts of the trial, but as there are always certain points which the law of evidence will not permit of being brought under notice, and which do not appear in the foregoing, it will be as well to place them on record.

Pratt, whose evidence decided the case, was not subjected to cross-examination to prove the possibility of collusion, and I think you will remember that the misstatements made by him had much weight with you in deciding to go on with the case. Then, again, we were assured by the detective that although Murphy left the train at Newtown and could not have then known that Stuart was on it, yet when he reached Murphy's house Murphy knew that Stuart had been at Darling Harbour at 4 o'clock a.m. that morning. I do not mean to say that had these facts been known to the Magistrate, his decision would have been a different one, but it must be admitted that to us they had a certain amount of meaning.

JNO. HARPER.

26/2/87.

No. 8.

Statement of Porter W. M. Stuart to The Goods Superintendent.

Sir,

Re the case tried yesterday at the Central Police Office, I wish to state that although the case went against me, that there are three who know which side was in the right, viz., Murphy and myself and the Supreme Being of the world (our Maker), and sooner or later it will come home to the guilty.

I wish also to state, if it should be your desire to again employ me upon any such duty in the future, that I will have the power to arrest, and a second person with me to corroborate whatever may occur in the performance of such duty.

I am satisfied in my own mind that I performed my duty fearlessly and truthfully, and trust I shall ever retain the confidence of yourself and all my other officers under whom I serve. When leaving the Central yesterday I was hooted by fifteen or twenty Railway men. A sad sight indeed, and a hard lot for one to bear who has always strove to do his duty, as I have, fearlessly and impartially, and I am now a marked man amongst a portion of the Railway men.

I have, &c.,

W. M. STUART,
Porter.

No. 9.

Minute from The Assistant Traffic Manager to The Coaching Superintendent.

THIS is an extraordinary and I must say a very unsatisfactory case.

In consequence of repeated complaints of petty pilferages, Porter Stuart, of Darling Harbour, was selected to act as a detective on repeated occasions, but it was not until the morning of the 18th instant that he had occasion to make a report implicating anyone.

In consequence of numerous petty pilferages between Picton and Sydney, he was directed to go to Picton, see a truck loaded there, and accompany it to Sydney. He accordingly went there on the 16th instant, and on the following day assisted to load cattle waggon, No. 40, for Darling Harbour. In this truck

truck was a box containing seven magpies consigned from James Black to William Inglis. This box was put into the truck, according to Stuart, about 5 p.m., and he knows it contained seven magpies, for he counted them. He says he did not leave the vicinity of the truck until 7:30 p.m., when he went to tea. He returned at 8 p.m., got into the truck, arranged the articles in the truck, and placed the box of magpies on the top of a coop of fowls, and then secreted himself under a sheet that was in the truck, where his presence was entirely unknown to anyone on the train. The train left at 12:20 a.m., and nothing of any importance occurred until Burwood was reached.

There, Stuart says (and in that respect his statement is fully borne out), the train stopped at the platform for about 5 minutes, and then drew forward to the starting signal and stood for about 5 minutes there. It was while standing there that Stuart alleges he saw Murphy, the assistant guard, enter the truck with his hand-lamp in his hand (Murphy's action is fully explained in Stuart's written statement to Detective Clough), open the box containing the magpies, remove one or more of the birds, and then nail up the box, after which he left the truck as he entered it; and as he walked away, Stuart says he heard the cry of a bird resembling a magpie from the direction in which he was walking.

Stuart alleges that the moment the train arrived at Darling Harbour he drew the attention of Watchman Charles Douglas to the case, which then only contained four magpies.

The question then arose, what had become of the three missing birds? It was difficult to conceive what Murphy could do with them, and yet they had gone. If he had gone to Darling Harbour with the train it would have been seen at once whether he had them or not, but he jumped off the train at Newtown and went home; so that Burwood was the last stopping-place of the train.

Stuart made such a clear and positive statement (which was not shaken in the slightest degree, although he was closely questioned) that it was deemed advisable to put the matter in the hands of the detectives.

Detective Clough, who inquired into it, was convinced of the accuracy of Stuart's statement; and on the forenoon of the day the magpies disappeared he visited Murphy's house, but failed to discover anything.

In addition to Stuart's statement, it was ascertained that seven magpies had been put into the box by the sender and Stuart. Watchman Douglas, of Darling Harbour, and the consignee were able to swear that it only contained four when it arrived at that station.

It was therefore thought advisable to take out a summons against Murphy, and let the case come before a Magistrate, who would take the statements of the men on oath, as Murphy had stoutly denied having gone near the truck.

The case accordingly came before Mr. Abbott, at the Central Police Court, on the 24th instant, and Mr. Wallace, the solicitor, and Detective Clough seemed to think there was sufficient evidence to secure a committal.

Mr. Thompson, M.P., and Mr. Hillyer defended Murphy, and it seems the former raised and persisted in the technical objection that, as magpies are wild animals within the meaning of the Act of Parliament, they could not form the subject of a charge of larceny. It is but fair to Murphy to say that he informed me that Mr. Thompson attended the Court on behalf of the Railway Association, and that he (Murphy) was entirely unaware that such an objection was going to be raised. It would certainly have left a better impression on my mind if it had not been raised. If Murphy was innocent it would have been better if all such technical objections had been avoided.

However, after Mr. Richardson had been examined, and had given Murphy a good character, and after Pratt, the guard, had sworn that Murphy never left the van after the train drew forward to the starting signal at Burwood, Mr. Abbott dismissed the case without calling upon Mr. Wallace to cross-examine Pratt, or even giving him an opportunity of doing so. Possibly Pratt's cross-examination would not have elicited much, perhaps nothing at all, to Murphy's discredit; still, it could have been shown that in a written statement he made he had not adhered to the truth, for he said that he had allowed Murphy to leave the train at Newtown that morning because his wife was ill, whereas she (an invalid, as I am told) was not worse than usual, and it had been of frequent, if not of daily, occurrence for Murphy to get off at Newtown, notwithstanding repeated written instructions to the contrary.

Pratt, doubtless, made the statement in question to screen himself and Murphy, but the statement, nevertheless, amounts to an untruth, and the impression is made, that if he could knowingly tell an untruth about one thing, he may have consciously or unconsciously told an untruth in stating that Murphy never left his sight after the train left the platform at Burwood. If Murphy did take the birds, and if by any chance he has taken articles on previous occasions, it is hardly likely that he did so entirely on his own account.

Altogether, as I have said, the case is not a satisfactory one. Still, as the Magistrate dismissed the case, principally on Pratt's evidence, and has since expressed himself to the effect that he believed the birds to have been stolen, but that he considered Stuart was wrong in identifying Murphy as the delinquent, I am not prepared to press the case further against Murphy, and, having now been reinstated, his pay during suspension should not be withheld.

D.K., 28/2/87.

No. 10.

Minute from Station-master Collins to The Coaching Superintendent.

Sydney Station, 26 February, 1887.

In reference to Assistant Guard Murphy—as it seems by the evidence he was accused innocent—is he not to be paid for time lost. Reply what is to be done.

J. COLLINS.

To the Traffic Manager,—Although Murphy has been honorably acquitted by the Court in the robbery case, he is guilty of breach of my orders in leaving his train at Newtown, and I recommend he be punished for it.—H. RICHARDSON, 28/2/87.

No. 11.

No. 11.

Minute from The Assistant Traffic Manager.

I THINK a caution both to Murphy and Pratt will meet the case. Having been acquitted by the Magistrate of the graver charge, and reinstated, I would not like to inflict a heavier punishment for the lighter offence. It would look like a determination that Murphy should be punished somehow.

D.K., 7/3/87.

No. 12.

Mr. G. Wallace, Solicitor, to The Commissioner for Railways.

Sir,

Sydney, 129, King-street, 12 March, 1887.

Herewith I send a memo. of fees in the case of Murphy. I cannot understand how the Magistrate dismissed it in the summary manner he did, as it appeared to me that there was a strong *prima-facie* case made out, and he should have committed for trial; but we have no remedy unless you thought the matter of sufficient importance to lay before the Hon. the Attorney-General.

Yours obediently,
GEORGE WALLACE.

Legislative Assembly—Friday, 6th August.

5. *Railway Employé named Stuart*:—Mr. Burke asked the Secretary for Public Works,—

1. Is there a person in the employ of the Railway Department at Darling Harbour by the name of Stuart?
2. Was he an officer of Police in this Colony?
3. Was he discharged from the Police Force, and for what offence?

Answers.

1. Yes; he first joined the Department in August, 1884, as night watchman at West Maitland, but subsequently made an exchange with a porter at Darling Harbour.

2. Yes.

3. The Inspector-General of Police has reported as follows:—"The above-named man was discharged from the Police Force on the 24th June, 1884. His conduct was not satisfactory, but he was a determined, active constable, who had on more than one occasion behaved very well in the discharge of his duty, and strong recommendations were made to me to procure him other employment."

No. 13.

Minute by The Commissioner to Mr. Higgs.

History of Porter Stuart.

W. M. STUART, 30 years of age, is recommended by Mr. Burdekin, M.P., for a position on the Northern extension.

Mr. Higgs has several vacancies, and has submitted names of applicants of long standing to fill them. Stuart, however, is recommended as a peculiarly good man, and Mr. Higgs should make room for him. Stuart's address is 61, Burton-street; Mr. Higgs should send for him when required.

CH.A.G., 12/8/84.

Please send this man for employment. I do not know whether he is in Sydney or elsewhere.—
JOHN HIGGS, 13/8/84. Acting-Secretary.

No. 14.

The Acting-Secretary for Railways to Mr. W. M. Stuart.

Sir,

Department of Railways, 19 August, 1884.

Referring to the application made by Mr. Burdekin, M.P., for employment for you, I have to request that you will be good enough to at once proceed to Newcastle and report yourself to the Traffic Manager there.

I have, &c.,

GEORGE BERNER,
Acting-Secretary of Railways.

No. 15.

Memo. by Mr. Higgs.

STUART starts as night watchman at West Maitland, *vice* Drake, promoted, this day. Pay, 42s. per week.

JOHN HIGGS,

Commissioner.

22/8/84.

No. 16.

S. Burdekin, Esq., M.P., to The Commissioner for Railways.

My dear Sir,

Macquarie-street, Sydney, 13 November, 1884.

I understand that a man named James Stapleton has been suspended from his position as porter at the goods-shed at Elgin-street, West Maitland, for drunkenness.

Mr. Ferris has, I believe, a very high opinion of a man named W. M. Stuart, whom you kindly appointed some little time ago on my personal recommendation.

Stuart

Stuart has been employed as night watchman since his appointment, and has, I understand, earned golden opinions. He is an excellent shunter and has learned the telegraphing to make himself more useful.

Could you give him Stapleton's position if it became vacant? I understand that the Station-master is anxious to have him, and that you have no more promising Railway servant.

Yours faithfully,
S. BURDEKIN.

For report.—CH. A. G., 13/11/84. Mr. Higgs.

Stuart will, I think, make a very good man; at present he has had no experience of shunting, and but little of telegraphing. Should Stapleton be dismissed (and I trust he will be) I will arrange for Stuart to take Stapleton's place.—J. HIGGS, 15/11/84. Commissioner.

No. 17.

Memo. by Mr. Higgs.

At his request Stuart has been exchanged with William Ponsfrett from South and West lines, and leaves West Maitland to-night for Sydney.

JOHN HIGGS, 26/2/85.

Secretary.

Traffic Manager.—D.C.M'L., 2/3/85. Stuart commenced duty at Darling Harbour on 2/3/85, at 7/- a day.—W. V. READ, 10/3/85. Commissioner. Inform Mr. Burdekin.—CH. A. G., 11/3/85.

No. 18.

The Commissioner for Railways to S. Burdekin, Esq., M.P.

Sir,

Department of Railways, 12 March, 1885.
Adverting to your letter of 13th November last, recommending W. M. Stuart, an *employé* under this Department, for promotion, I have the honor to inform you that the matter has received attention, and I have approved of Stuart being transferred from Maitland station to Darling Harbour. His pay will be 7s. per day.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

No. 19.

Minute by The Commissioner for Railways.

WHAT work is Stuart supposed to do at Darling Harbour? I hear that he does little or nothing, but seems to be the associate of Mr. Paull. Traffic Manager will please inquire into this at once. I hope no idlers or gossipers only are employed.
CH. A. G., 9/8/86.

I HAVE made inquiries into this matter, and am satisfied that there are no grounds whatever for the assertions that seem to have been made respecting Stuart, who is an ordinary goods porter, a hard-working fellow, and a man who does not, like many others, content himself with doing no more than he is required to do, but takes a general interest in everything relating to the Department. Mr. Paull tells me that he (Stuart) has completely rid Darling Harbour of the larrikins that used to infest it.

I have been shown a number of written testimonials obtained by Stuart when his connection with the Police Force was severed, and they all speak of him in high terms. The attached letter, extracted from the *Evening News* of the 19th instant, has just been handed to me.

Stuart's duties are those of an ordinary goods porter ordinarily, but being a man of greater intelligence than the majority of goods porters, he is not unfrequently selected to perform duties for which other men would not be well fitted.

Traffic Manager.

D.K., 24/8/86.

[Enclosure.]

EXTRACT from letter in *Evening News* of 19th August, 1886.

CONSTABLE STUART, who struck dismay into the hearts of the larrikin element, and did more to stamp out ruffianism than any man now in the Force, and who openly stated that he would, single-handed, purge Sydney of the crowds of lads, youths, and hobbledoys who had been encouraged to prey upon the citizens, I say when this man was doing his duty bravely, and people who had long suffered, began to enjoy a peaceful regime, certain of the authorities became alarmed at finding their occupation slipping away from them, and Constable Stuart was removed from the force and placed on the Railway, but not as a constable. Since then the larrikins have had the free run of Sydney, and then comes the cry of "more Magistrates wanted."
IN MEDIAS RES.

Minute to The Commissioner by The Traffic Manager.

I AM sure that the Commissioner has been misinformed concerning Stuart. From inquiries I have made I am convinced he is a very good man. Mr. Paull assures me that he performs his duties in a most satisfactory manner, as also does Mr. Kirkcaldie, who has seen him while he has been at Darling Harbour investigating the wool cases.
W.V.R., 29/9/86.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

RAILWAY BRIDGE OVER THE HAWKESBURY RIVER.
(TENDERS, REPORTS, PLANS, &c)

Ordered by the Legislative Assembly to be printed, 27 April, 1887.

RETURN to an *Address* of the Honorable the Legislative Assembly of New South Wales, dated 15th April, 1886, That there be laid upon the Table of this House,—

“Copies of all minutes, letters, reports, tenders, contracts, plans, and
“documents, relating to the Railway Bridge over the Hawkesbury River.”

(*Mr. Abbott.*)

SCHEDULE.

NO	PAGE
1. Letter from Mr Augustus Morris to Secretary for Public Works <i>re</i> a promise made by Mr Lackey when Minister, that the Company he represented would, with the rest of the world, be afforded an opportunity of tendering for construction and erection of proposed Railway Bridge over the Hawkesbury, &c, and minute by Minister thereon 30 May, 1883	3
2. Letter from Mr J S Robertson to Secretary for Public Works <i>re</i> Ironwork for Hawkesbury Bridge, with reply and minutes 23 June, 1883	4
3. Letter from Mr Thomas Wearne to Minister <i>re</i> report current that the manufacture of superstructure for Railway Workshops at Eveleigh, and Bridges over Parramatta and Hawkesbury Rivers was to be confined to England, and argument in opposition thereto, with reply 12 November, 1883	4
4. Minute to Minister by Engineer in Chief, forwarding Specification and Plans for Hawkesbury Bridge, and minutes thereon 16 May, 1884	4
5. Further letter from Mr Augustus Morris <i>re</i> his Company being permitted to tender on their own designs for Hawkesbury Bridge, &c 18 July, 1884	5
6. <i>Precis</i> 23 July, 1884	6
7. Minute by Minister for consideration of Cabinet <i>re</i> proposal to erect bridge over the Hawkesbury, &c, with approval of Cabinet and minutes 10 September, 1884	7
8. Letter from Colonial Secretary to Agent General, transmitting copies of conditions and plans for proposed Hawkesbury Bridge, and requesting him to call or cause tenders to be invited for performance of the work. 24 December, 1884	8
9. Letter from Agent General to Colonial Secretary, acknowledging receipt of letter of 24th December, 1884	9
10. Telegram from Agent General to Secretary for Public Works <i>re</i> hesitation of manufacturers in preparing designs under uncertainty of their tender being accepted, &c, with minutes thereon	9
11. Telegram from Agent General to Secretary for Public Works <i>re</i> action of engineers Evans and Hawkshaw, with minutes 14 May, 1885	9
12. Letter to Under Secretary for Public Works, by Messrs Eldred & Co, in explanation of Mr Evans' refusal to act on Board appointed to examine and report upon designs submitted for Hawkesbury Bridge 19 May, 1885	9
13. Letter from Mr W H Eldred to Minister <i>re</i> previous communications, with Minister's reply. 2 June, 1885	10
14. Telegrams from Agent General to Colonial Secretary <i>re</i> number of designs and tenders received, &c, and minutes thereon	10
15. Letter from Agent General to Colonial Secretary, enclosing summary of tenders for Hawkesbury Bridge, received and opened by him 5 June, 1885	10
16. Telegrams from Agent General to Colonial Secretary stating tenders and designs handed to Bridge Committee, also if report of Board should be submitted to Mr Fowler for separate report, &c, with minutes and Minister's reply	11
17. Letter from Messrs Eldred & Co to Minister <i>re</i> their action in inducing the Phoenix Bridge Co to reduce their original tender by 2½ per cent, with minutes 29 June, 1885	12

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[1,105 copies—Approximate Cost of Printing (labour and material), £48 5- 51]

NO		PAGE.
18	Letter from the Agent General to Colonial Secretary, enclosing report of the Committee of Engineers appointed to examine tenders, &c, for bridge, and tabulated statement therewith 7 August, 1885	12
19	Letter from Agent General to Colonial Secretary, enclosing duplicate report of Board of Engineers 4 September, 1885	18
20	Letter from Agent General to the Colonial Secretary, enclosing three copies of the separate report by Sir John Fowler, and minutes thereon 11 September, 1885	18
21	Engineer in Chief's report on the competitive designs and tenders for erection and construction of the Hawkesbury Bridge	18
22	Letter from Augustus Morris, Esq, to Engineer in Chief for Railways, relative to the Edgemoor Iron Co's tender 22 December, 1885	30
23	Letter from Agent General to Colonial Secretary re applications made by tenderers for the return of their drawings, &c, and minutes thereon 18 September, 1885	30
24	Further letter from Agent General, enclosing bill of lading for one case, shipped per s s "Iberia," containing plans, &c, of bridge, as forwarded to him on 18th September, 1885 2 October, 1885	30
25	Letter from Messrs Eldred & Co to Secretary for Public Works re the Phoenix Bridge Co being willing to reduce amount of their tender by 5 per cent	32
26	Letter from Mr R W Cameron to Commissioner for Railways, introducing Mr Field, one of the Members of the Union Bridge Company, and Commissioner's minute thereon 12 October, 1885	32
27	Letter from Messrs Eldred & Co to Secretary for Public Works re Phoenix Bridge Co's amended tender, &c 20 November, 1885	32
28	Letter from Messrs Eldred & Co to Secretary for Public Works, conveying opinions held by Mr W W Evans, C E, New York, respecting structure, &c, of Hawkesbury Bridge, with Minute thereon by Engineer in Chief 26 November, 1885	33
29	Letter from Messrs Eldred & Co to Minister, offering, on behalf of Phoenix Bridge Co, to construct superstructure of bridge only, with Minute 21 December, 1885	33
30	Letter from Mr W H Eldred to Under Secretary for Public Works, asking interview with Minister, and reply thereto 7 January, 1886	34
31	Letter from Messrs Eldred & Co to Minister, in terms of apology for having unwittingly given offence to Mr Whitton, as contained in their letter of 26 November 11 January, 1886	34
32	Minute by the Engineer in Chief for Railways re Union Bridge Co's design, with Minutes thereon 22 January, 1886	34
33	Letter from Commissioner for Railways to General G S Field, giving conditions upon which the Union Bridge Co's tender would be accepted 27 January, 1886	35
34	Letter from Union Bridge Co to Commissioner for Railways, accepting conditions laid down in his letter of 27th January, with Minute thereon 27 January, 1887	35
35	Letter from Secretary for Public Works to Agent General, notifying acceptance of Union Bridge Co's tender, with amendments, &c 1 February, 1886	36
36	Letter from the Compagnie de Fives Lille to the Minister, asking that they may be made acquainted with the grounds upon which their tender had been discarded, &c, with Minutes and reply	36
37	Minute by Commissioner, recommending Sir John Fowler's suggestion that some tangible recognition should be accorded unsuccessful tenderers for the trouble and expense they incurred, with Minister's approval 6 March, 1886	36
38	Telegram from Agent General to Colonial Secretary re penalties and sureties for due fulfilment of contract, with Minutes and approval of Cabinet	37
39	Letter from Secretary for Public Works to Agent General, confirming acceptance of Union Bridge Co's tender, and Government's decision to present a medal to each unsuccessful competitor, &c 12 May, 1886	37
40	Minute by the Minister to Engineer in Chief re carriage of materials from America for Hawkesbury Bridge, &c, with reply and minutes 19 May, 1886	38
41	Letter from Agent General to Secretary for Public Works, stating that contract had been duly signed by General Field on behalf of Union Bridge Co, &c, and Commissioner's minute thereon 21 May, 1886	38
42	Letter from Agent General to Secretary for Public Works enclosing contract and letter of the Inspecting Engineer re final arrangements in connection with same 28 May, 1886	38
43	Telegram from Agent General to Colonial Secretary re Bank deposit 15 July, 1886	39
44	Telegram from Union Bridge Co to Commissioner for Railways re their proposal to make deposit in London, and minutes thereon 15 July, 1886	39
45	Letter from Commissioner for Railways to Messrs Town & Co, Sydney, re Mr Stoke's inquiry as to security, &c, to be deposited by contractors for Hawkesbury Bridge in connection with their contract, &c 17 July, 1886	40
46	Telegram from Agent General re credit sackage and minutes by Minister and Commissioner thereon	40
47	Letter from Agent General to Colonial Secretary re deposit to be lodged by contractors, &c 23 July, 1886	40
48	Telegram from Agent General notifying lodgment of £10,000 deposit to Government's credit in London and Westminster Bank, with minutes thereon 26 July, 1886	40
49	Minute by Under Secretary to Commissioner for Railways, enclosing deposit receipt for £10,000 deposited in Commercial Bank, Sydney, by Union Bridge Co, to Commissioner's credit as security on their contract 1 October, 1886	41

RAILWAY BRIDGE OVER THE HAWKESBURY RIVER.

No. 1.

Augustus Morris, Esq., to The Secretary for Public Works.

Sir,

24, Bridge-street, Sydney, 30 May, 1883.

Permit me, on behalf of the Edgemoor Iron Company of the U.S.A., whose agent I am, to draw your attention to the promise made by Mr. Lackey, when Secretary for Public Works, that with the rest of the world it should be afforded an opportunity of tendering for the construction and erection of the proposed railway bridge over the River Hawkesbury, and that its own designs for the superstructure would be accepted.

In 1878, Mr. Sutherland, who was at that time Minister for Public Works, gave the Edgemoor Iron Company permission to tender on its own designs for the superstructure of two iron bridges, to be erected respectively over the Shoalhaven and Bundarra Rivers, but although the company was the lowest tenderer in both cases, it only received the contract for the Shoalhaven Bridge. It was, however, expressly stated that if the work was fully approved of the American contractors should have an opportunity of tendering on their own designs for all future great bridges. The Shoalhaven Bridge was completed to the entire satisfaction of the Commissioner for Roads and Bridges, and the Government Engineer appointed to inspect and take over the work reported that it had been submitted to a load six times greater than would in practice pass over it, and that the deflection was a minimum.

Mr. Lackey opened the bridge, and was so much pleased with the beauty and strength of the structure that he publicly stated the Edgemoor Iron Company should have an equal chance with other contractors of tendering for any other bridge. Mr. Lackey further promised me, as representing the company, that it should be allowed to tender for the railway bridge to be erected over the Hawkesbury, and on its own designs.

At one time Mr. Whitton, the Engineer-in-Chief for Railways, was favourable to calling for tenders in England, Belgium, and America, but latterly he receded from that position unless the tenders were in accordance with a design of the bridge to be prepared beforehand. Such a provision will wholly shut out American builders, and doubtless all those of other countries except England. I brought the matter, in a personal interview, before Mr. Lackey, when he admitted his promise and stated that he believed his policy to be the right one, but he left office without further action. I afterwards drew the attention of the late Minister, Mr. Copeland, to the promise made by his predecessor, and he agreed that the subject deserved every consideration, and he has since told me that had he remained in office he would have directed that designs and tenders should be called for in England, Belgium, and the United States.

By carrying out this policy it is certain that the bridge over the Hawkesbury will be constructed for £100,000 to £150,000 less than if tenders are called for on official designs.

The best bridges in America are connected by pins instead of by rivets. Some engineers have objected to connections by pins, fearing that they may slip; but of late years pins have been made so that they cannot move, and so strong that every part of a bridge must go to destruction without their breaking. The best standard books on bridge engineering admit that while the riveting as done in the shops cannot be improved, that done in the field is very often most defective, and that on that account immovable pins are superior. Of course all designs, as well as the tenders, must be submitted to the approval of engineers in the confidence of the Government. The designs should be beautiful, and the strength of the structure should be in accordance with the requirements of the Board of Trade.

May I be allowed to suggest that tenders might be called for the bridge as a whole, or in these parts as follows:—

1. The superstructure and erection thereof.
2. The cylinders for the piers.
3. The sinking and erection of the cylinders.

It has been determined to erect the bridge on iron piers, and it is probable that the local foundries can tender low enough for the cylinders, and it is certain that local contractors can erect the piers cheaper than any out of the Colony.

I am by no means sanguine, on account of the shortness of the spans, that my friends can, if permitted to tender, obtain the contract for the bridge, but I am certain that their competition will save the Colony not less than £100,000.

On this last ground, and because the promise made by Mr. Lackey ought not to be disregarded, I trust that my request may be acceded to.

I have, &c,

AUGUSTUS MORRIS,

Agent for the Edgemoor Iron Co.

I regret that Mr. Lackey should have made the promise Mr. Morris says he did, because I think the promise was a mistake. While I am anxious to give American firms an opportunity of tendering for this and for any other large work of this kind, I cannot approve of their tendering upon their own designs. The Colony possesses an Engineer-in-Chief for Railways, of admitted ability, who has a large staff of engineers and draftsmen under him, and in my opinion all bridges should be designed in his office. Tenders for the Hawkesbury Bridge should, I think, be called for in the Colony, England, and America. As follows:—
1. The cylinders; 2. The sinking and filling of the cylinders; 3. The superstructure and erection thereof.—
F.A.W., 2/7/83.

Forward for information of Mr. Whitton, and send copy of Mr. Wright's minute to Mr. Morris.—
J.R., 3/7/83. A. Morris, Esq.—4/7/83. Railways.—J.R., B.C., 4/7/83. To be returned.

No. 2.

No. 2.

J. S. Robertson, Esq., to The Secretary for Public Works.

Dear Sir,

Sydney, 23 June, 1883.

The writer desires to see you regarding the ironwork for the Hawkesbury Bridge, and would be much obliged if you could give him a few minutes conversation on the subject. Kindly say what time would be most convenient.

Yours, &c.,

J. S. ROBERTSON.

Reply any time to-morrow from 11 to 1 a.m.—F.A.W., 25/6/83. Inform at once.—J.R., 25/6/83.
J. S. Robertson, Esquire.—25/6/83.

LIST of iron bridges (with cast-iron cylinders) to be constructed on the railway from Homebush to Waratah, for which the ironwork has not yet been ordered:—

1	Hawkesbury River Bridge.
	Contract No. 3—
2	Bridges.
	Contract No. 4—
5	Bridges.
<hr/>	
Total...	8
<hr/>	

W.H.Q., for E.-in-C.

WILL Engineer-in-Chief for Railways inform me when plans for bridges on line Homebush to Waratah will be completed, so that tenders may be invited for the works.

F.A.W., 23/8/83.

Mr. Whitton.—J.R., B.C., 24/8/83. J. W. Drewett.—W.H.Q., 23/8/83.

The drawings for the cylinders for the 66-foot plate girder bridges on contracts Nos. 3 and 4 can be ready for calling tenders on the 16th September next, and the detail drawings for the plate girders and remainder of superstructure can be ready for tendering by the 16th October next.—J.W.D., 24/8/83.
Engineer-in-Chief.

E.-in-C., 25/8/83. Advertisement inviting tenders cast-iron cylinders (1,568 tons) herewith.—
W.H.Q., 6/9/83. For the Engineer-in-Chief. Under Secty.—B.C.

No. 3.

Thomas Wearne, Esq., to The Secretary for Public Works.

Sir,

220, Pitt-street, Sydney, 12 November, 1883.

I have the honor to inform you that, it is reported, the plans for the iron-work in roofs and cranes for the Eveleigh workshops and the bridges over the Parramatta and Hawkesbury Rivers, for the Northern Railway extension, are being sent to England for the whole of the works to be carried out there, this appearing to be in direct opposition to your expressed wish to encourage the industries of the Colony as far as possible, I, as one of the many manufacturers and contractors, take the liberty of bringing this matter under your notice. As you are aware there are a number of firms in this Colony who have proved beyond doubt that they are quite capable of carrying out and completing these works equal to anything that can be imported, and as you have kindly caused tenders to be invited here for the cylinders and rails, I am led to hope that you will extend the favour and give us an opportunity of tendering for the above, in the event of which I am confident you will find there are quite enough in the trade to create a healthy competition, and that we have the ability, skilled labour, and appliances to enable us to compete successfully with foreign producers. Trusting you will kindly give these matters your favourable consideration, and pardon the liberty taken.

I have, &c.,

THOMAS WEARNE.

Inform Mr. Wearne that tenders for superstruction of iron bridges for Northern Railway are now being invited.—F.A.W., 14/11/83. Thomas Wearne, Esq.—16/11/83. Railways.—J.R., B.C., 16/11/83

No. 4.

The Engineer-in-Chief to The Secretary for Public Works.

Southern and Northern Junction Railway (Homebush to Waratah).—Hawkesbury River Bridge.

Department of Public Works, Railway Branch, Engineer-in-Chief's Office,

Sydney, 16 May, 1884.

I FORWARD for the consideration of the Minister the detail plans, sections, and specification for the bridge over the Hawkesbury River from Long Island to Mullet Point.

As there will be about 6,400 tons of cast-iron and nearly 6,000 tons of steel in this bridge, I advise that tenders be invited as early as possible in England for the work complete, as stated in the specification, including all cast-ironwork in cylinders, &c., sinking of cylinders, filling with concrete, the whole of the steel superstructure, and all the work described in the specification.

I am satisfied that no portion of the ironwork could be manufactured in the Colonies in a reasonable time, and any attempt to divide the work into separate contracts would not only cause great delay, but would largely increase the cost of the bridge.

The total estimated cost of the iron and steel work in England will be about £142,500.

JOHN WHITTON.

Submitted.—J.R., 17/5/84. Cabinet.—G.R.D., 26/6/84. Returned to-day by the Hon. the Col. Treasurer, with whom it has been since.—17/5/84. J.R., 14/4/85.

Great Northern Railway.—Extension from Homebush.

Department of Public Works, Sydney, 10 July, 1884.

I SHOULD like to be informed :—

1. Whether tenders have been called for the bridge across the Hawkesbury.
2. If punt or bridge has been decided upon.
- 3a. If the rest of the connections, viz., between Homebush and the Hawkesbury, and between Waratah and the Hawkesbury will be completed, at a date prior to the cross water connection being completed.
- b. Generally, what steps have been taken with regard to this bridge, and what has been decided.

G.R.D., 10/7/84.

Mr. Whitton.—J.R., B.C. Urgent, 11/7/84. 1. Tenders have not yet been invited. 2. The Engineer-in-Chief has recommended the building of a bridge. 3a. In the absence of the Engineer-in-Chief I cannot answer this question. b. The plans and specification for the bridge were forwarded for the consideration of the Minister on the 16th May last, and no instructions have yet been received by the Engineer-in-Chief.—W.H.Q., 11th July, 1884. Mr. Whitton will be in the office on Monday next—J.R. Mr. Whitton for report—J.R., B.C., 31/7/84.

1. Tenders have not been invited for the above bridge.
2. Bridge was decided upon and the Minister (Mr. Wright), gave instructions to have the drawings prepared.
3. I believe the whole of the works, Homebush to Waratah, will be completed before the bridge can be erected, and tenders should therefore be immediately invited.

No steps, so far as I know, have been taken, beyond preparing the drawings and specification for this work, and which were forwarded to the Minister on the 16th May last, with a suggestion from me that tenders should be immediately invited in England.

If it be considered advisable to invite tenders in the Colony, the drawings should first be sent to England, and when ascertained on what conditions the English manufacturers would tender, similar conditions could be sent out here, and tenders invited here and at home at the same time, and to be sent in on the same date.

J.W., 2nd August, 1884.

Seen.—F.A.W., 10/8/84.

No. 5.

Augustus Morris, Esq., to The Under Secretary for Public Works.

Sir,

24, Bridge-street, Sydney, 18 July, 1884.

I have the honor to request that you will be good enough again to lay before the Minister for Public Works my application on behalf of the Edgemoor Iron Company, of Delaware, in the United States, to be permitted to tender on their own designs for the railway bridge proposed to be erected over the River Hawkesbury. When the Edgemoor Iron Company tendered on their own designs for the superstructures of the bridge over the Shoalhaven and Bundarra Rivers, they only obtained the contract for the former, although their price for the latter was much the lowest. It was thought by the Department of Roads and Bridges as the American system of pin connections was a novelty in this Colony, that it would be in the public interest to make one trial first. The Minister, the Honorable John Sutherland, who took a great interest in the experiment, promised that if the Nowra Bridge turned out the success he hoped it would be, the Edgemoor Iron Company should have opportunities of tendering upon their own designs for all future important iron bridges. Subsequently when the Honorable John Lackey, when he opened the Nowra Bridge, not only publicly expressed his great satisfaction with its construction, but said that American contractors should be welcome competitors for the Government requirements for the future. Mr. Lackey also assured the writer that his friends should have the opportunity of tendering for the construction and erection of the Hawkesbury Bridge. The Commissioner for Roads and Bridges has expressed his unqualified satisfaction with the bridge at Nowra over the Shoalhaven, and his opinion has been endorsed by every engineer who has visited the structure. Excellent as that bridge is there have been since its erection some most important improvements made by which every other part must be destroyed before the pins can be moved, or in any way effected. So convinced are the most eminent engineers of Europe, of the superiority of pin connections for long spans that the Government of Austria, in calling for competitive designs and tenders for the great bridge, with its spans of 450 feet, to be erected over the Danube, required that the American system should be adhered to. I have already placed in your possession diagrams of the three best designs for that bridge with all particulars. I also gave you a diagram of the long span bridge designed by an American engineer for the Canadian railroad, and manufactured in England.

I may also remark that the Cantalever Bridge, lately thrown across the Niagra Rapids is a pin construction, as will be the bridge over the River Forth with its two spans of 1,700 feet each.

The

The consulting engineer of the Edgemoor Iron Company is the celebrated C. Shaler Smith, who, during the last year designed and erected no less than 131 iron bridges in Canada and the United States, besides carrying out other great aquatic works.

I have I trust stated sufficient to induce the Minister to give a favourable consideration to my request. I desire to be furnished with a diagram of the proposed site of the Hawkesbury Bridge, and so much of its specifications as will enable an independent engineer to produce a design in accordance with the requirements of the railway. If the Minister will grant this, in fulfilment of the promises made by his predecessors, I engage the necessary designs transmitted to him from Mr. Shaler Smith without an hour of unnecessary delay, and the design shall be so complete in its details that exact conclusions can be arrived at in the Colony as to its strength and suitability for the purpose intended. My friends will, on approval of the design or in company with it, furnish a tender. They will, as may be desired, tender for the whole structure including the cylinders and the piers, or they will give a separate price for the manufacture and erection of the superstructure. It will be understood that Mr. Shaler Smith will not be bound by any specified length of spans, but shall be at liberty so to vary the lengths that the lowest price may be offered. The requirements of the Board of Trade as to the strength of the structure, or such as you may prescribe, will be complied with, and full allowance will be made for wind pressure. The spans shall be tested with four or five times the weight which can in use be placed upon them, and these shall not be more than the required deflection with trains so loaded, running at the rate of 45 miles an hour. There is no law or regulation in the United States which limits the minimum of safety of the spans of a bridge, but it is one of the articles of the Edgemoor Iron Company that no railway bridge shall be turned out of their shop unless equal in strength to the requirements of the English Board of Trade, and consequently they never compete for cheap work.

It is well known that the superstructure of a pin bridge can be put up in one-fourth the time required to erect a riveted one, and that the work done in the field is as good as that done in the shop. If the Minister accedes to my proposition he may be sure that many thousands of pounds will be saved to the country.

The Edgemoor Iron Company may not obtain the contract, but their competitors must cut down their prices lower than they would. By such competition, too, the time contemplated for the erection of the bridge can be reduced four or six months.

I may point out that the question I have raised is one of policy, not engineering, and no one is so competent to decide it as the Minister himself.

I have, &c.,

AUGUSTUS MORRIS,

Agent for the Edgemoor Iron Company.

No. 6.

Précis.

Railway Bridge over the Hawkesbury.

On the 6th June, 1883, a deputation of Members of the Protection and Political Reform League and others waited on the Colonial Secretary and the Minister for Public Works to urge the desirableness of calling for tenders in the Colony for some portions of the ironwork required for the railway bridge over the Hawkesbury, and Mr. Wright stated that he would call for tenders both in England and the Colonies, and if the latter were 10 per cent. the dearer he would give them the preference, but if colonial tenders were, say, 25 per cent. in excess he would have to act with the advice of his colleagues.

Per letter of 30th May, 1883, Mr. Augustus Morris, Agent of the Edgemoor Iron Company of Delaware, U.S.A., addressed the Minister of Public Works, stating that Mr. Lackey, when Minister, had promised that his company should have an opportunity of tendering for the Hawkesbury Bridge, and that the company's own designs for the superstructure would be accepted; that Mr. Sutherland, when Minister, gave the company an opportunity of tendering for the Shoalhaven and Bundarra Bridges, and although their tender was the lowest in both cases they received the contract for the Shoalhaven Bridge only, but with the express understanding that if this work were fully approved, the company would be allowed to tender, on their own designs, for all future large bridges; that the bridge gave complete satisfaction, and that Mr. Lackey, who opened it, was so pleased with the strength and beauty of the structure that he gave Mr. Morris the promise before referred to; that he (Mr. Morris) brought the matter, at a personal interview before Mr. Lackey, who admitted his promise and justified his policy, but left office without taking action; that he drew the attention of Mr. Copeland, when Minister, to the promise made by his predecessor; that Mr. Copeland said the matter deserved every consideration, and had since told him that had he remained in office he would have called for designs and tenders in England, Belgium, and America. Mr. Morris goes on to say that if this policy be carried out the Hawkesbury Bridge will cost from £100,000 to £150,000 less than if the tenders were to official designs. He then enters into technical details as to the relative merits of rivets and pins as fastenings for the parts of a bridge, pronouncing in favour of "immovable pins." Mr. Morris suggested that tenders for the bridge should be invited either as a whole or in parts as follows:—

1. Superstructure and erection thereof;
2. Cylinders for the piers;
3. Sinking and erection of cylinders.

Thought local firms could tender low enough for the cylinders, and that local contractors could erect the piers cheaper than any out of the Colony. Tenders and designs should be approved by Government engineers, and the strength of the structure should be in accordance with Board of Trade requirements. Wound up by re-affirming that the competition of the Edgemoor Company would save the Colony at least £100,000. Mr. Secretary Wright minuted that he regretted that Mr. Lackey had made such a promise, that it was a mistake, that he (Minister) was anxious that American firms should have an opportunity of tendering for large works, but could not approve of their doing so to their own designs; that the Colony had an Engineer-in-Chief of admitted ability, with a staff of engineers and draftsmen, and in his office all bridges should be designed. Tenders should be called in Colony, England, and America, for—1. Cylinders; 2. Sinking and filling cylinders; 3. Superstructure and erection.

Under date of the 18th instant Mr. Morris addressed the Commissioner on the same subject, repeating a good deal of the matter contained in his former letter, and stating further that in the designs for the great bridge over the Danube the Austrian Government has insisted upon the adoption of the American system ; that the cantalever bridge over the Niagara rapids and the Forth Bridge, with its spans of 1,700 feet, are both on that principle ; that the consulting engineer of his company, C. Shaler Smith, designed and erected last year no less than 131 bridges in Canada and the United States. Hoped he had stated enough to induce Minister to give favourable consideration to his request in fulfilment of promises made by his predecessors. Desired to be furnished with a diagram of proposed site of bridge, with so much of the specification as would enable an engineer to prepare a plan in accordance with requirements. If this were done Mr. Shaler Smith would forward designs without an hour's delay, and so complete in details that exact conclusions might be arrived at as to strength and durability. The company would tender for the bridge as a whole, or for superstructure and erection only ; but would not be bound by the number of spans provided if contract limited to superstructure ; and stated that it was one of the articles of the Edgemoor Company that no railway bridge should leave their shops, in point of strength equal to the requirements of the Board of Trade, and that a pin bridge could be put up in one-fourth of the time taken to erect a riveted one, and that in that system the work done in the field was as good as that done in the shops, and if his proposals were acceded to Ministers might rest assured many thousands of pounds would be saved to the country, for although his company might not get the contract their competition would compel other tenderers to cut their prices down.

C.A.B., 23/7/84.

No. 7.

Minute by Secretary for Public Works.

Bridge across the Hawkesbury River in connection with the Railway Extension, Homebush to Waratah. I FIND before me a minute from Mr. Whitton, Engineer-in-Chief for Railways, submitting a set of plans for the proposed bridge across the Hawkesbury River, which it is estimated will cost £150,000. In view of this large outlay, and as interest, viz., £30,000 per annum at 4 per cent. upon 3,000 feet of this railway, it is a question for the Cabinet to decide whether the bridge should be constructed as proposed, or whether, as is the practice in some instances in America, a floating steam punt should be provided in lieu thereof. Another important question to be considered is whether tenders should be at once called for the structure upon the plan submitted by Mr. Whitton, or whether it would be advisable to call for tenders throughout the world for a bridge to be designed by the various tenderers. I doubt if the plan hitherto followed in designing and calling for tenders for our railway bridges is the wisest one that could be adopted. I understand that bridge manufacturers all over the world have their own plans and designs for bridges, and machinery for making their specialty. I am unable to say whether the bridge proposed by Mr. Whitton is the cheapest and best form of structure, doubtless it is strong enough for the services required, but there can be little competition on the part of manufacturers if we decide upon the one form, without allowing manufacturers the option of preparing their own plans and sections, subject of course to the standards of strength laid down by the Board of Trade in England.

Taking into consideration the fact that borings for some of the piers of the proposed bridge have reached a depth of 250 feet before a suitable bottom has been found, I think we should endeavour to procure a design of a bridge providing for fewer piers than the plan submitted by Mr. Whitton. There is no difficulty, I imagine, in obtaining a bridge with much wider spans, and this would considerably decrease the cost of construction, as the great depth to which the piers have to be taken must necessarily add very largely to the expenditure.

While asking the Cabinet to decide whether communication across the Hawkesbury shall be by bridge or punt, I would recommend if it be decided to adopt the former, that tenders be invited throughout the world upon plans to be prepared by each tenderer ; tenders to include the cost of putting down piers and the final completion of the work ; the bridge to be subject to the Board of Trade tests ; and the plans and tenders when received in London to be submitted to a Board of three skilful engineers for their report. After obtaining which, the whole of the plans and specifications might be forwarded for the opinion of Mr. Fowler, the consulting Engineer in England, who should be asked to attach his recommendation for the guidance of the Government. I do not think it advisable, in view of Mr. Fowler acting as agent for the Government in the selection and passing of materials, that he should be called upon to form one of the proposed Board. The report of the Board, and the recommendation of the consulting Engineer, to be forwarded to the Colony, to guide the Government in the selection and approval of the most appropriate design of bridge.

F. A. WRIGHT,

10/9/84.

Minute

Minute of Premier.

Approved with reservation of right to reconsider the whole subject of the bridge, or the substitution of a steam punt or floating bridge in the event of the bridge estimates proving too expensive.—A.S., 15/9/84. The Engineer-in-Chief will please make the necessary arrangements to carry out the views of this minute.—F.A.W., 16/9/84. Mr. Whitton.—J.R., B.C., 24/9/84.

I may be permitted to remark that my estimate for this bridge is £600,000 and not £750,000, as stated in this memo.—J.W., 2/12/84. Under Secretary.—B.C.

Proposed Bridge over the River Hawkesbury.

Department of Public Works, Railway Branch, Engineer-in-Chief's Office,
Sydney, 27 November, 1884.

I FORWARD, for the information of the Minister, the conditions upon which tenders and designs are to be invited for the bridge over the River Hawkesbury, on the Southern and Northern Junction Railway, and also explanatory plans and sections, showing the crossing of the river, and borings for depth of foundations.

I suggest, for the consideration of the Minister, that one pound (£1) be charged to each applicant for plans and conditions, so as to prevent persons asking for the information who never intend to make use of it for the purpose for which it has been prepared.

JOHN WHITTON.

In submitting to my honorable colleagues the plans and general conditions for the Railway Bridge over the Hawkesbury, so that tenders for the work may be invited throughout the world, I beg to recommend that fifty copies of attached plans and general conditions be sent to the Agent-General, and that he be instructed to invite tenders for the work in terms of the general conditions and of my minute accompanying these papers. That such tenders be submitted to a Board of Engineers, to consist of the following gentlemen:—Sir John Hawkshaw, C.E.; Colonel Galton, R.E.; and W. W. Evans, Consulting Engineer, New York. Should Mr. Evans decline to act, Mr. T. Harrison, C.E. (North Eastern Railway), to be asked to form one of the Board.

After the members of the Board have considered the tenders, &c., they shall make report upon the same, and recommend the acceptance of one tender. Such report and recommendation to be addressed to the Minister for Public Works in this Colony under cover of the Agent-General.

The tenders then to be submitted to Mr. Fowler for a separate report, which shall also be forwarded with the Board's recommendations, tenders, and all designs to the Minister for Public Works, N.S.W. I would further recommend that in the event of any or all of the gentlemen I have named refusing to act on the Board, that the Agent-General be instructed to submit by cablegram, for the approval of the Government, the name or names of gentlemen of eminence in the profession, who would be willing to act.

F.A.W., 12/12/84.

Cabinet approved.—W.B.D.

Hawkesbury Bridge, *re* Plans and Sections.

Department of Public Works, Sydney, 1st December, 1884. Information with reference to the Hawkesbury Bridge. Is this ready, or when will it be so?—J.R.

Mr. Whitton.—The plans and sections were all printed last week, but were found to be wrong, and had to be relithographed, but I expect the correct ones will be ready by to-morrow. I have had nothing but trouble with this matter, and shall be very glad to be rid of it.—J.W., 1/12/84.

How are the copies to be disposed of when completed?—J.R., 2/12/84.

Minute of Minister.

Mr. Whitton knows how to act and what to do in this matter.—F.A.W., 2/12/84. One pound per set is to be charged for them.—F.A.W. Mr. Whitton.—B.C., 3/12/84.

I forwarded fifty copies of these plans, sections, and conditions to the Minister a few days ago, for the purpose of being sent to the Agent-General in London. If these should not be considered sufficient I have another fifty copies ready. I think it might be advisable to send 100 copies to the Agent-General.—J.W., 4/12/84.

No. 8.

The Colonial Secretary to The Agent-General, London.

Sir,

Colonial Secretary's Office, Sydney, 24 December, 1884.

I have the honor, at the instance of the Secretary for Public Works, to transmit herewith fifty copies of the plans and general conditions for the proposed railway bridge over the River Hawkesbury, and to request that you will be good enough to cause tenders to be invited throughout the world, for the performance of the work, in terms of the general conditions, and that you will cause the tenders received to be submitted to a Board of Engineers consisting of the following gentlemen, viz.:—Sir John Hawkshaw, C.E., Colonel Galton, C.E., and W. H. Evans, Consulting Engineer, New York. Should Mr. Evans decline to act, Mr. T. Harrison, C.E., North-Eastern Railway, to be asked to be a member of the Board.

After

After the members of the Board have considered the tenders received, they are to make a report upon the same, and recommend the acceptance of the one tender; the report and recommendation to be addressed to the Secretary for Public Works, under cover to yourself. The tenders are then to be submitted to Mr. Fowler for a separate report, which is also to be forwarded with the Board's recommendation, tenders, and designs to the Minister for Public Works.

I beg to add that in the event of any or all of the gentlemen named refusing to act on the Board, you will be good enough to submit by cablegram, for the approval of the Government, the name or names of gentlemen of eminence in the profession who will be willing to act.

I have, &c.,
ALEX. STUART,
Colonial Secretary.

No. 9.

The Agent-General, London, to The Colonial Secretary.

F 1,244—Hawkesbury Bridge.

Sir, 5, Westminster Chambers, Westminster, S.W., 6 February, 1885.

I have the honor to acknowledge the receipt of your letter of the 24th December last, on the subject of the proposed bridge over the River Hawkesbury, and to state that the matter has been put in hand and will receive my immediate attention.

I have, &c.,
SAUL SAMUEL

No. 10.

Telegram from The Agent-General, London, to The Secretary for Public Works.

Received 13 March, 1885.

MANUFACTURERS hesitate about preparing designs Hawkesbury Bridge, because uncertainty acceptance any tender. I suggest that substantial premium given three best designs; also, that Government accept alternative tenders for materials only, and make contract for foundations and erecting in Colony, otherwise competition very little.

SAMUEL.

The Under Secretary for Public Works.—B.C., 13/3/85. C. W., Railways.—J.R., B.C., 17/3/85.

Minute by Commissioner.

The only instance I know of in which premium for designs were offered was in the case of the proposed new Houses of Parliament. The premiums were for the first design, prize £1,000, and for the second, £500. The Government will not, probably, dispense with the condition that each design should be accompanied by a tender for the erection of bridges.—CH.A.G., 13/3/85.

Minute of Secretary for Public Works.

No alteration will be made in this matter, our object being to get designs and tenders together.—F.A.W., 24/3/85. Send cablegram.

“Conditions for tendering designs, Hawkesbury Bridge, will be adhered to; no premiums.”—CH.A.G., 25/3/85. Cablegram sent to Public Works for transmission to Agent-General.—28/3/85.

No. 11.

Telegram from The Agent-General, London, to The Secretary for Public Works.

London, 14 May, 1885.

HAWKESBURY Bridge.—Evans and Hawkshaw decline to act. I suggest W. A. Barlow and T. E. Harrison, both past President's Institution.

SAMUEL.

The Under Secretary for Public Works.—C.W., B.C., 15/5/85. Inform Capt. Eldred, by Minister's instructions, that a cablegram received from Agent-General, it appears that Mr. Evans declines to act on Board with reference to Hawkesbury Bridge.—J.R., 16/5/85. Capt. Eldred informed.—18/5/85.

No. 12.

Messrs. Eldred & Co. to The Under Secretary for Public Works.

Sir, Sydney, 19 May, 1885.

I am requested by my partner, Capt. Eldred, to thank you for your courtesy in informing him in your official letter of yesterday's date of the refusal of Mr. W. W. Evans, of New York, to act on the proposed Board with reference to the competition in designs for the railway bridge over the Hawkesbury.

I beg to request that you will inform the Honorable the Minister for Works, that both Capt. Eldred and myself feel assured that our friend Mr. Evans will have been the first to appreciate the high honor it was proposed to confer on him. but, if we may judge from our latest advices from him, we are equally assured his refusal is based on the fact that, in conjunction with the Phenix Bridge Company, who intend to tender, he has interested himself in the designs, &c., to be furnished by them, and would, in consequence to a certain extent, have to sit in judgment on his own work; otherwise, we have no doubt he would too gladly

gladly have given the Agent-General and this Colony the benefit of his long and valuable experience in bridge building or other matters relating to his profession.

I have, &c.,
ALEX. GRAY,
(Eldred & Co.)

Minute by Commissioner :—I presume Minister's approval is to the appointment of A. Barlow, Esq., and T. E. Harrison, Esq., in the place of Messrs. Evans and Hawkshaw, as recommended by the Agent-General ; if so, cablegram will be sent, as time is now short.—C.A.G., 23/5/85.

Minute of Secretary for Works :—Approved.—F.A.W., 27/5/85. Cablegram to Agent-General.—3/6/85.

No. 13.

W. H. Eldred, Esq., to The Secretary for Public Works.

Sir,

Sydney, 2 June, 1885.

Referring to the various communications which have passed between my firm and your Department with regard to the tender for the bridge over the Hawkesbury, for which I am led to understand our friends the Phoenix Bridge Company have prepared designs, plans, and estimates, I make free to express a hope that, as Mr. W. W. Evans, C.E., of New York, has declined to act on the Committee for, apparently, the reason contained in my partner's letter to the Under Secretary of 19th ultimo, you may have felt it advisable to instruct the Agent-General to enlist the services of some other competent American bridge engineer in lieu of Mr. Evans ; so that the Colony may not be without the experience of a class of bridge builders who, however much their principles may differ from those of English engineers, have achieved a large degree of success in many parts of the world.

Trusting I may be pardoned the liberty I am taking.

I am, &c.,
W. H. ELDRED.

Inform that the Board has been appointed.—F.A.W., 4/6/85. W. H. Eldred, Esq.—Informed 5/6/85.

No. 14.

Telegram from The Agent-General, London, to The Colonial Secretary.

London, 2 June, 1885.

FIFTEEN designs and tenders received for Hawkesbury Bridge : Eight English, three American, one French, one Sydney (Royce), one Canadian, one Melbourne, and two for the materials only. Other for the whole price vary from about 351,000 to 700,000 for the work complete. I will hand designs and specifications over to Committee of Engineer. Schedule of Tenders by mail.

SAMUEL.

Minute by Colonial Secretary.

The Secretary for Public Works.—A.S., 3/6/85.

Minute of Minister for Works.

Seen.—F.A.W., 4/6/85.

Telegram from The Agent-General, London, to The Secretary for Public Works.

London, 4 June, 1885.

HAWKESBURY Bridge. Another tender from Melbourne received by mail after despatch my telegram. Harris unable to act on Committee. I suggest George Berkley, vice-President, to associate with Barlow and Galton. Reply.

SAMUEL.

Minute of Secretary for Public Works.

I regret that the gentleman selected should refuse to act, but as time is passing and the final approval rests with the Government, I must approve of the suggestion of Agent-General.—F.A.W., 5/6/85. Under Secretary for Public Works.—C.A.G., 5/6/85. Very urgent. Please say who now constitute the Board.—Chas. A.G. As appears from the cablegram herewith, the names of the gentlemen forming the Board are Messrs. Barlow, Berkley, and Galton.—J.R. Seen.—C.A.G., 13/6/85. Send cablegram through Colonial Secretary :—Berkley's appointment. Approved.—J.R. Done.—6/6/85.

No. 15.

The Agent-General, London, to The Colonial Secretary.

Sir,

5, Westminster Chambers, Westminster, S.W., 5 June, 1885.

In continuation of correspondence on the subject of tenders for the Hawkesbury Bridge, I have now the honor to report that tenders were received here, and opened by me on the 1st instant, and I now enclose, for your information, a summary of them.

My

My telegrams of the 2nd and 4th instant, of which I hereto attach copies, will have acquainted you of the number of tenders received.

I am now waiting your reply to the inquiry in my telegram of the 4th instant, before handing the tenders and designs to the Committee of Engineers for examination and report.

I have, &c.,
SAUL SAMUEL.

HAWKESBURY RIVER.

ABSTRACT of tenders opened by Sir Saul Samuel, Tuesday, 2nd June, 1885 :—

- Munro (Melbourne)—£702,384. Complete according to requirements in three years.
 Fives-Lille (Paris)—£685,000. Complete according to requirements in three years.
 R. Parkinson (London)—£584,898. Complete according to requirements in three years.
 Arrol Brothers (Glasgow)—£586,395 (design No. 1). £439,847 (design No. 2). Complete in four years.
 Tender also for steel superstructure—£18 10s. per ton, F.O.B., Glasgow; £12 10s. per ton, W.I. Cylinders, F.O.B., Glasgow.
 John Dixon (London)—£486,100. Complete according to requirements in two years from commencement of operations.
 Oscar Reichenbach, G. B. Godfrey, and G. A. Innes (London)—(Hawkes, Cranshay make it)—£466,032. Complete according to plans. Time not mentioned.
 Handyside & Co. (Derby)—£456,000, £435,000 (two designs). Complete according to requirements in three years.
 Royce & Co. (Sydney) with Butterley Co., Alfreton, near Derby—£403,367. The whole complete in three years. £158,211. Materials at Sydney.
 Fford & Young (London)—£317,500. Cylinders not carried down. £377,500. Cylinders full depth.
 Westwood, Baillie, & Co., make it (London)—£71,907. Steel superstructure. £30,107. W.I. cylinders, F.O.B. only. In three years.
 Union Bridge Co. (U.S.A.)—£327,000; plan, No. 1. £277,000; plan, No. 2. £306,000; plan, No. 2. No. 1, complete in thirty months. No. 2, shallower depth of piers. No. 2, full depth of No. 1 complete in thirty-six months.
 Edgemoor Iron Co. (U.S.A.) sellers—£105,500, No. 1, superstructure only erected. £265,650, No. 2, whole completed. £296,350, No. 3, whole completed. £119,938, No. 4, superstructure only erected. Superstructure completed in three months. The whole complete in two years.
 Phoenix Bridge Co. (U.S.A.)—£250,800, Phoenix construction, thirteen spans. £256,400, plate and angle construction, thirteen spans. £252,950, Phoenix, eleven spans. £258,940, plate and angle, eleven spans. Each of the above increased £30,000, by telegram. Tender is for wrought-iron superstructure. All materials ready for shipment in four months. Erection, five months from arrival of iron at site.
 Dominion Bridge Co. (Canada)—£85,482*a*. £91,586*b*. £98,857*c*. Tender for superstructure, F.O.B., in Liverpool.
 McLellan (Glasgow)—£92,535. Tender for superstructure only. No cylinders, F.O.B., Glasgow.
 T. R. Bell—Schedule and tender incomplete, quantities not priced, and no total given.

Tender received, 3rd June, from Melbourne.

- Messrs. Millar (Melbourne)—£441,230. No. 1 design, by G. H. Edwards. £344,740. No. 2 design, by Frazer & Chase. Complete in three years from date of contract.

No. 16.

Telegrams from The Agent-General, London, to The Colonial Secretary.

London, 11 June, 1885.

HAVE handed tenders and designs Hawkesbury Bridge to Committee—Mr. Barlow, Mr. Berkley, Colonel Galton.

SAMUEL.

Minute of Colonial Secretary.

The Secretary for Public Works.—A.S., 12/6/87. Railways—J.R., B.C., 12/6/85. Seen.—C.A.G., 18/6/85.

Dated London, 27th July, 1885, received Sydney, 28th July, 1885.

HAVE received Report Board of Engineers on Hawkesbury Bridge Tenders. Am I to submit it to Fowler for separate report, or is Fowler to make is report without seeing it?

The Under Secretary for Public Works.—J.B. (*pro* P.N.S.), B.C., 28/7/85. Railways.—J.R., B.C., 3-4/8/85.

Minute

Minute of Commissioner.

For Minister's decision.—C.A.G., 5/8/85.

Minute of Secretary for Public Works.

Cable Agent-General that Mr. Fowler is to submit a separate and independent report, and that he is not to see report of Board of Engineers. As soon as Mr. Fowler's report is in the hands of the Agent-General he will forward the whole of the papers to the Colony by first mail.—F.A.W., 6/8/85. Cablegram sent.—A.S., 7/8/85.

No. 17.

Messrs. Eldred & Co. to The Secretary for Public Works.

Tenders for Hawkesbury Bridge.

Sir,

Sydney, 29 June, 1885.

We have the honor to inform you that circumstances affecting the cost to our friends—the Phoenix Bridge Company—of the above work, have reduced us to write them by last San Francisco mail, urging them to authorize us, on receipt of our letter, to communicate to you their willingness to reduce their original tender by about 2½ per cent.

We take this opportunity of thus early placing our course of action before you with a view to its being recorded in your Department before the amounts of the respective tenders can possibly be known here, so that no previous acquaintance with the terms, &c. of the various offers can be attributed as the motive for our action.

We have, &c.,

ELDRED & CO.

Minute of Secretary for Public Works.

Acknowledged, and placed with other papers. The whole subject can be considered when tenders arrive here.—F.A.W., 30/6/85. Acknowledged.—30/6/85. Railway.—B.C., 2/7/85. Seen.—C.A.G., 6/7/85. May be forwarded to Engineer-in-Chief.—C.A.G., B.C., 6/7/85. Seen.—J.W. (*pro* W. H. QUODLING), 10/7/85. Railways.—B.C.

No. 18.

The Agent-General, London, to The Colonial Secretary.

Sir,

5, Westminster Chambers, Westminster, S.W., 7 August, 1885.

I have the honor to forward herein for your information the Report of the Committee of Engineers appointed to examine the tenders received for the Hawkesbury Bridge, together with the covering letter accompanying the same from the Committee.

I do not clearly understand from the instructions already conveyed to me in regard to these tenders, whether I am to show this document to Mr. John Fowler, the Inspecting Engineer, or not; and further, whether he is to make a distinct and separate report upon the tenders received. My telegram of the 27th ultimo will have apprised you of this, and I am now waiting a reply thereto, but I send you the Report of the Committee at once.

You will notice from the letter (25/7/85) of the Committee addressed to me that their fees for examining and reporting upon the tenders are 200 guineas each, and the out-of-pocket expenses incurred amount to £50 8s.

I have to-day telegraphed to you, asking whether I should cable to you the recommendation of the Committee of Engineers.

I have, &c.,

SAUL SAMUEL.

P.S.—Since closing the foregoing letter, I have received your coded telegram of this date; I interpret as follows:—"Fowler to send Report without seeing Report of Board; not necessary to telegraph recommendation." I will, therefore, act accordingly.—S.S.

Messrs. Barlow, Berkley, and Galton to The Agent-General, London.

Sir,

2, Old Palace Yard, Westminster, S.W., 25 July, 1885.

In accordance with the instructions which you conveyed to us on behalf of the Government of New South Wales, to consider and report upon the tenders received for the construction and erection of a Bridge over the River Hawkesbury, on the Southern and Northern Junction Railway in New South Wales, we have the honor to forward to you herewith our Report addressed to the Honorable the Secretary for Works.

The necessary calculations, and other expenses out of pocket incurred by us, amount to £50 8s., and we have the honor to inform you that our own fees in the matter are 200 guineas (£210) each.

We have, &c.,

W. H. BARLOW.
GEORGE BERKLEY.
DOUGLAS GALTON.

Hawkesbury

Hawkesbury River Bridge, New South Wales.

Sir,

In compliance with instructions received from the Agent-General for New South Wales we, the undersigned, have considered the tenders for the construction and erection of this bridge, and we have thoroughly examined the designs accompanying the tenders with a view to recommend the acceptance of one tender, and we have the honor to report as follows :—

Twenty-two tenders have been received, consisting of :—

Two designs and tenders from the Phoenix Bridge Company, 40, Walnut-street, Philadelphia, Pa., U.S.A.

Two designs and tenders from the Edgemoor Iron Company, C. Shaler Smith, Consulting Engineer, Wilmington, Delaware, U.S.A.

One design and tender from the Union Bridge Company, 18, Broadway, New York, U.S.A.

Two designs and tenders from Messrs. James Fforde, M.I.C.E., and Edward William Young, M.I.C.E., 8, Victoria Chambers, Westminster, London, S.W.

One design and tender from the Butterley Iron Company, near Alfreton, Derbyshire, and Messrs. Royce & Company, Sydney, Australia, and of 62, Holborn Viaduct, London, E.C.

Two designs and tenders from Messrs. Andrew Handyside & Company, Derby, and 32, Walbrook, London, E.C.

Two designs and tenders from Messrs. Arrol Brothers, Germiston Iron Works, Glasgow.

One design by Oscar Reichenbach, 6, Victoria-street, Westminster, London, S.W., and tender from Messrs. Geo. B. Godfrey & Company, 6, Queen Anne's Gate, Westminster, London, S.W., and George A. Jones, M.I.C.E., Hatherley Court, near Gloucester.

One design and tender from Mr. John Dixon, 1, Laurence Pountney Hill, London, E.C.

One design and tender from Mr. Richard M. Parkinson, Eastern and Midland Railways, Melton Constable, East Dereham.

Two designs and three tenders from the Compagnie de Fives-Lille, 64, Rue Caumartin, Paris, France, Agent, Mr. Sauvée, 22, Parliament-street, Westminster, London, E.C.

One design and tender from David Munroe & Company, 154, Queen-street, Melbourne.

One design from P. and W. M'Lellan, Clutha Iron Works, Glasgow.

Three designs from the Dominion Bridge Company, Montreal, Canada ; Agents—Reynolds, Carter, and Reynolds, 3, Clements-lane, Lombard-street, London, E.C.

These twenty-two designs and twenty-three tenders are shown and described on a statement appended to this report, which statement gives in relation to each design and tender :—

- 1st. An illustration of the general character of the design.
- 2nd. A description of the piers.
- 3rd. Description of the superstructure.
- 4th. The amount of the tender.
- 5th. The time named in the tender for completion.
- 6th. Remarks.

Among these twenty-two designs six do not comply with important conditions.

The Phoenix Bridge Company in its two designs has tendered for a construction made entirely of iron instead of steel.

Messrs. M'Lellan, in the one design which they submit, and the Dominion Bridge Company in its three designs, have tendered only for the delivery of materials for the superstructure of the bridge and not as required by the conditions for its completion.

A divergence from the condition respecting the headway under the bridge is made in the design of Mr. Reichenbach, inasmuch as the specified headway is reduced for a length of 70 feet on each side of the centre line of the piers ; and in the design of the Compagnie de Fives-Lille the rails are laid 2 feet 3 inches above the specified level.

Although these two latter examples of non-compliance with the specified conditions are named, we do not regard them as of sufficient importance to condemn the design, were either of them the most advantageous.

The Edgemoor Company's design No. 2, and Messrs. Fforde and Young's design No. 1, show the piers carried down below the bed of the river by groups of timber piles of about 70 feet long ; this mode of construction is not in our opinion satisfactory, and these two designs are therefore excluded from further consideration.

The designs of the Compagnie de Fives-Lille, and No. 1 design of Messrs. Arrol Brothers, represent exceedingly fine works, and are presented for our consideration in a manner which reflects credit upon these two firms, but unfortunately the structures represented by these designs are necessarily very costly. We regret that their large cost prevents us from recommending either of them for acceptance.

For the reasons above mentioned we have thus set aside eight of the designs.

In the case of all the other designs which have been submitted, we have calculated the strains, and otherwise so examined the details as to enable us to form an opinion respecting the strength, stability, durability, and facility of execution of each of the designs.

We do not propose to trouble you by stating in this report the whole of these elaborate calculations, as it appears to us sufficient, and a compliance with the instructions given to us if we give the effect of these calculations for such of the designs as comply with the conditions, and which it appears probable will secure a thoroughly substantial and suitable structure at a reasonable amount of cost.

With this view, we have directed particular attention to the design No. 1 of the Edgemoor Company, which it will be seen by the appended statement is the lowest tender for any design which has not been excluded from consideration for reasons hereinbefore stated.

This design consists of masonry abutments, and generally complies with the printed conditions. The piers below a point 10 feet above the level of high water to the bottom of the foundations, consist of steel cylinders $\frac{1}{2}$ an inch thick, 20 feet diameter at the bottom, and 15 feet diameter at the top, completely filled with concrete to a height of 10 feet above the bottom, and beyond this height by a ring of concrete 5 feet

thick

thick. At the top of this ring we judge, from the drawings submitted (which in this respect are not very clear), that there will be a thickness of masonry on which a steel trestle will stand and carry the ends of the spans of the superstructure.

The diameter—20 feet at the bottom—is only applicable to the deepest of the piers, and will be reduced in proportion as the piers are shorter.

The superstructure consists of two spans of 134 feet, from the centre of the end pier to the faces of the stone abutments, and nine spans of 292 feet from centre to centre of piers.

The flooring is proposed to be of timber.

The estimated cost of the piers is £190,850, and of the superstructure £105,500, giving a total of £296,350 for the whole of the proposed work completed, including twelve months' maintenance.

The short time of two years is named for the execution and completion of this work. We are of opinion that too much reliance should not be placed on the statement of so short a time as two years, as circumstances almost always arise which cause such an estimate of the time required to be extended.

The proportion between the breadth and the unstayed length of the vertical struts is, in our opinion, too great to bear the strain that will come upon them. The breadth of these struts should, we think, be increased 50 per cent.

We are also of opinion that before this design could be accepted it would be desirable to connect at the top, by deep girders, the steel casing of the two columns which form one pier, which girders should again be connected together by diagonal bracing, or be made of a form which would produce great lateral stiffness; and we also think that the cylinders should be very much strengthened both by thickening some of the plates and by T and L bars rivetted to the plates at the joints, both vertically and horizontally; and that the concrete should be solid for the whole depth and surrounded by 18 inches of good brickwork or cut masonry in cement, well bonded into the concrete immediately within the outer plate of the cylinders, and that the base of the steel trestle resting upon these columns requires horizontal diagonal bracing, which is not shown on the designs accompanying the tender.

The cost of these additions would probably amount to £37,000, which, added to £296,350, will make this tender £333,350, or £115 per foot run of viaduct.

The next lowest tender is that of the Union Bridge Company. The design accompanying the tender complies generally with the conditions stated by the Engineer.

The piers consist, between the level of low water and the foundations, of caissons made of steel plates each 48 feet long by 20 feet wide, with semi-circular ends, which caissons have an outer skin $\frac{3}{8}$ inch thick and have three cylinders 8 feet in diameter, one placed in the centre of the length of the caisson, and the other two in the centre of the semi-circles forming the ends, to which cylinders consisting of $\frac{1}{4}$ inch plate) the outer skin is connected by diagonal bracing.

The bottom lengths of the cylinders (10 feet long) are made of a form which brings the outer skin and the skin of the shaft into communication at the bottom of the caisson, where it forms a cutting edge. In this length these two skins, which are increased in thickness to $\frac{5}{8}$ inch and $\frac{3}{8}$ inch respectively, are strongly braced together.

It is proposed to fill this caisson with "beton made of broken stone, sand, and best Portland cement of such proportions and mixture as will sustain 30 tons per square foot, measured on cubes of 12 inches."

An alternative was suggested, which, were this design adopted, appears to us worthy of consideration, viz., "that the outer skin of the caisson for a length at upper end sufficient to go below the bed of the river may be made of grey cast-iron plates $1\frac{1}{2}$ in. thick, with interior flanges 4 inches wide, and united by $\frac{3}{4}$ inch round bolts 9 inches apart.

The proposed superstructure consists of seven spans of 415 feet. The floor consists of timber. The amount of the tender for the piers is £159,000, and for the superstructure £168,000, making a total of £327,000.

The time named for completing the work is two and a half years.

We consider that the horizontal stiffener extending from the inclined strut at the end of the girder should be extended so as to stiffen two more of the vertical struts at each end, which appear to us to require support.

In the third bay from the end of each span the strain upon the boom or bottom member somewhat exceeds the tensile strain named in the conditions; the area of this part should be therefore increased.

We also consider that the outer skin of the caisson, where it is flat and unsupported for a length of 14 feet between the centres of the cylinders, sunk within it, would require staying to the cylinders, and to an inner plate extending from the centre lines of the cylinders at a distance of about 6 feet from the outer skin.

The thickness of some of the plates forming the caisson should be increased and stiffened by vertical and horizontal T and L bars at the joints.

The beton should be surrounded by an 18-inch ring of good brickwork or cut masonry in cement, well bonded with the beton, immediately within the outer steel skin.

The cost of these additions to the work, as shown in the design submitted, would probably be £30,000, which, added to the amount of this tender, £327,000, will make it £357,000 or £124 per foot run of viaduct.

The design No. 2 of Messrs. Fford and Young complies generally with the conditions.

The piers consist of two cylinders, 10 feet 6 in. diameter, from 4 feet above high water to the bottom of foundations, diminished to 6 feet diameter under the bed-plates. These cylinders are made of wrought-iron plates 9-16ths in. thick, filled with concrete.

The superstructure consists of two end spans, 116 feet 6 in. between the face of abutment and centre of pier, four spans of 221 feet, and five spans of 357 feet, from centre to centre of piers.

The total amount of the tender is £377,500, and the time for completion three years.

The design of the Butterley Company, and Messrs. Royce and Company complies generally with the conditions.

The piers consist of two circular columns, 16 feet in diameter, made of wrought-iron plates $\frac{1}{2}$ inch thick, and filled with concrete.

The superstructure consists of two spans of 167 feet 8 inches, one span of 175 feet 8 inches, and ten spans of 238 feet 6 inches.

The

The amount of the tender is £403,367, and the time named for completion three and a half to four years.

The design No. 1, of Messrs. Handyside and Company, complies generally with the conditions of the Engineer.

The piers consist of two cylinders, 15 feet diameter, from the foundation up to about the bed of the river; this part is made with two skins of iron plates $\frac{3}{8}$ inch thick, connected together by vertical plates. From this level to 4 feet above high water the diameter is reduced to 12 feet, and a single skin of $\frac{3}{8}$ inch thick is used. The whole of the cylinders are filled with concrete. Between the top of the cylinders and the underside of the girders there are steel octagonal pillars 10 feet across at the bottom, and 8 feet at the top.

The superstructure consists of two spans of 138 feet, and ten spans of 262 feet. A buckled plate floor is provided.

The tender for this design is £456,000, and an alternative tender of £435,000, is also submitted for a design with a superstructure of a somewhat different form.

The time named for completion is three years.

An extra payment is required for the removal of boulders or other obstructions to the sinking of the cylinders.

In our opinion the strength and stability of the piers in these three designs are not equal to the strength and stability of the piers proposed in design No. 1 of the Edgemoor Iron Company, or that of the Union Bridge Company. The tenders for these two bridges are from 25 to 50 per cent. less in cost, and after the additions have been made to the designs which we have referred to when reporting on the Edgemoor Iron Company's and the Union Bridge Company's plans, the cost would still be considerably less.

The design No. 2 of Messrs. Arrol Brothers complies generally with the conditions of the Engineer.

The abutments are of masonry. The two end piers are elliptical in form, 55 feet long by 25 feet wide, made of wrought-iron plates, except at the bottom, where steel plates of increased thickness are used. These caissons are filled with concrete.

There are six other piers, consisting of four cylindrical columns 18 feet diameter at the bottom and 13 feet at the top, placed in a rectangular form 40 feet by 28 feet, between centres up to 5 feet above high water, with a steel trestle resting thereon to support the superstructure.

The bottom length of each of the cylinders is made of steel; from the top of these steel lengths to about 8 feet below the bed of the river wrought-iron plates are used in the form of a double cylinder, with diagonal stays between the two cylinders, and from the top of this wrought-iron work to the underside of the trestles cast-iron cylinders are used.

The cylinders from the top to the bottom are filled with concrete.

The superstructure consists of two spans of 153 feet 6 inches, two of 369 feet 6 inches, and five spans of 370 feet.

The amount of the tenders for the piers is £249,462 10s., and for the superstructure £190,385; giving a total tender of £439,847 10s.

Extra payment is claimed if serious obstructions are met with in the execution of the work.

Messrs. Arrol's design No. 2 would be satisfactory, but the cost would amount to £152 per foot run of the viaduct, whilst the design No. 1 of the Edgemoor Company, including the additions which we have suggested as being necessary to its stability and strength, would not cost more than £115 per foot run; and the design of the Union Bridge Company, with the additions necessary to render it satisfactory, would cost about £124 per foot run.

We consider that the foundations proposed by the Union Bridge Company will be superior to those proposed by the Edgemoor Company, provided the caissons be strengthened, and provided the beton with which they are to be filled be surrounded with a ring of brickwork or cut masonry in cement as hereinbefore described; and that, with such additions, the superiority of the foundations of the Union Bridge Company over those in the design No. 1 of the Edgemoor Company, would justify the payment of the higher price for the work.

We consider that £124 per foot run should (unless some extraordinary difficulties present themselves to which our attention has not been directed) be sufficient for the construction, including a year's maintenance, of this viaduct, we therefore feel it to be our duty to recommend that arrangements should be made to strengthen the design of the United Bridge Company, in the manner hereinbefore stated, to the satisfaction of the Engineers, who will have charge of the construction of the work, and that if this can be done without increasing the amount of the tender beyond about £124 per foot run, the contract should be let to that company.

We have not thought it our duty to continue a detailed description of designs which are more costly than No. 2 design of Arrol Brothers.

Although the designs submitted to us have generally been prepared with care, none of them afford the same amount of detailed information as would be given by the working drawings which will have to be made and submitted to the Engineer prior to the execution of the work.

The final settlement of the exact form of joints, the bearing surface, the shearing and transverse strength of pins, the thickness and best form of the plates at the bottom of the caissons, and such like matters of detail must be left for the decision of the engineer in charge of the work.

We have, &c.,

W. H. BARLOW.
GEORGE BERKLEY.
DOUGLAS GALTON.

London, 25 July, 1885.

HAWKESBURY BRIDGE.—STATEMENT OF TENDERS RECEIVED.
The Diagrams referred to will be seen on page .

Name of Firm and nature of Design	Piers.				Superstructure.				Floor.	Amount of tender.			Time.	Remarks.
	No.	Form.	Size.	Material.	Spans.		Girders.			Piers.	Super-structure.	Total.		
					No.	Size—centre to centre.	Depth at ends.	Over all at centre.						
Phoenix Bridge Company— (Design No. 1).	12	Cluster of eight Phoenix columns.	91' × 39' 10" at bottom, 33' × 11' at top.	Wrought-iron columns 24" diameter.	13	ft. in. 223 5	ft. in. 45 0	ft. in. 45 0	.....	£ .....	£ .....	£ 280,800	Construct in four months.	Iron. Phoenix construction.
Phoenix Bridge Company— (Design No. 2).	10	do do ...	do do ...	do do ...	11	250 0	.....	.....	.....	.....	.....	£ 282,950	Erect in five months.	Plate and angle construction.
Edgemoor Iron Company— (Design No. 1).	10	Two columns to 10' above h.w.	15' diameter maximum at top.	Steel, filled with concrete, ring 5' thick, 8' from bottom.	2	134 0	32 0	32 0	Timber..	190,850	105,500	£ 288,940	do ..	do do
		Trestle above	20' diameter maximum at bottom.	.....	9	292 0	45 0	45 0				£ 296,350	2 years.	
Edgemoor Iron Company— (Design No. 2).	10	Two columns from 10' above to 90' below h.w. Foundations are carried on piles about 70' long.	do do ...	Steel, filled with concrete, ring 5' thick, 8' from bottom; And timber piles 10" diameter, or 16" × 16".	2	134 0	32 0	32 0	Timber..	160,150	105,500	£ 265,650	do ...	
					9	292 0	45 0	45 0						
Union Bridge Company.....	6	Up to l.w. rectangular caissons with semi-circular ends. Above l.w. masonry pier, formed of two cylinders of masonry joined by masonry wall.	48' × 20', bottom 10', length widens out 2' all round; ends, 7' radius; wall 6' thick.	Wrought-iron, double skin, filled with concrete masonry.	7	415 0	53 0	53 0	Timber..	159,000	168,000	£ 327,000	2½ years	
Messrs. Fforde and Young— (Design No. 1).	10	Two cylindrical columns	10' 6" diameter, 162' long, extending from 4' above h.w. Above 8' length diminished to 6' diameter, 6' diameter to bed plates; timber pilcs, 13" × 13", are carried down to solid.	Wrought-iron skin filled with concrete.	2	116 6	5 0	52 0	.....	.....	F.o.b. Thames, £71,907	£ 317,500	3 years.	6' too long.
					4	221 0	35 0	52 0						
					5	357 0	18 0	52 0						
Messrs. Fforde and Young— (Design No. 2).	...	Same as last, but piers carried down to solid.	.....	.....	...	.....	.....	.....	.....	.....	do ...	£ 377,500	do ...	do
Butterley Company & Messrs. Royce & Company.	12	Two circular columns 23' centres.	16' diameter	Wrought-iron filled with concrete.	2	167 8	18 0	18 0	.....	Not divided.		£ 403,367/5/3	3½ to 4 years.	Erection three years from first delivery of materials at Sydney.
					1	175 8	18 0	18 0						
					10	238 6	18 0	24 6						
Messrs. Handyside & Company—(Design No. 1).	11	Two circular columns...	15' diameter to bed of river; 12' diameter to 4' above h.w., filled with concrete. Above steel octagonal pillars, 10' at bottom, 8' at top.	Steel casing, concrete filling.	2	138 0	19 6	19 6	Buckle-plate floor.	.....	.....	£ 456,000	3 years.	Extra sum for the removal of boulders or other obstructions if met with.
					10	262 0	34 6	34 6						
Messrs. Handyside & Company—(Design No. 2).	11	do do ...	15' diameter to bed of river, 12' diameter to 4' above h.w., filled with concrete. Above steel octagonal pillars, 10' at bottom, 8' at top.	Steel casing, concrete filling.	2	138 0	2 0	19 6	do ...	.....	.....	£ 435,000	do ...	do do Iron.
					10	262 0	2 0	34 6						

Messrs. Arrol Brothers— (Design No. 1).	2	Elliptical	55' x 25'	Caisson to near l.w., filled with concrete.	2	153 6	25 0	25 0	do ..	373,065	213,330	586,395	4 years.	If boulders, driftwood, or other obstructions be found, the cost of getting past them to be an extra ; and if a pier be found im- possible to complete and another one be necessary, the Government to pay the cost.
	5	do	70' x 33'	Brickwork to h.w. Masonry above, filled with concrete.	2 4	430 6 432 0	25 0 25 0	55 0 55 0	If no flood.	.....	.....	580,000	.....	.....
Messrs. Arrol Brothers— (Design No. 2).	2	do	55' x 25'	As before	2	153 6	25 0	25 0	Buckle plate.	249,462 10	190,385	439,847 10	.....	do do
		Four columns in rect- angle 40' x 28' up to h.w.	Bottom lengths, 18' diameter; top lengths, 13' diameter.	Wrought-iron cylinders filled with concrete.	2	369 6	24 0	48 0	.....	.....	.....	.....	4 years.	.....
		Trestle above .....	.....	Steel	5	370 0	24 0	48 0	.....	.....	.....	.....	.....	.....
Messrs. Reichenbach, Godfrey, and Jones.	8	Rectangular	54' 3" x 22'	Top portion, iron cais- son, sunk by pneuma- tic process. Below ground, frozen and timbered, whole filled with concrete.	1 3 4 1	306 0 311 0 392 0 89 0	27 to 87 5,, 87 85 0 3 0	27 to 45 27,, 45 27,, 45 19 0	.....	.....	.....	466,032	.....	Headway interfered with by cantalever at piers springing from water level.
Mr. John Dixon	9	Four columns in rect- angle, 45' x 25'.	Bottom lengths, 12' diameter; upper lengths, 10' diameter.	Cast-iron, filled with concrete.	10 9	251 0 43 0	21 0 10 8	33 0 10 8	do	.....	.....	486,000	Two years from com- mence- ment of operations	Iron.
Mr. R. Parkinson	8	Circular	40', external diameter 26'.	Steel plates braced every 5 feet, filled with con- crete between skins.	2 7	269 6 338 0	36 0 36 0	36 0 36 0	.....	.....	.....	584,898	4 years.	9 feet too long, contin- uous girder.
Compagnie De Fives-Lille— (Design No. 1).	6	One column to about h.w.	57' 5" diameter at bottom.	.....	2	73 0	6 5	6 5	Timber	.....	.....	685,000	.....	.....
		Four small columns above.	42' 8" diameter at top; 8' 6" diameter.	Iron skin concrete and masonry.	5	550 0	6 5	19 4½	do	.....	.....	.....	.....	Rails raised 2' 3".
Campagne De Fives-Lille— (Design No. 2).	6	One column throughout	57' 5" diameter at bot- tom; 39' 4¼" diameter at top; hollow, 65' from h.w.	do do	5	550 0	6 5	19 4½	do	.....	.....	685,000	.....	.....
Compagnie De Fives-Lille— (amended tender, received 21st July, 1885).	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	515,000	.....	.....
Mr. Munroe	10	Two circular columns 48' apart, centre to centre, to 3 feet above h.w., 28' apart above.	14' diameter from bot- tom to 3 feet above h.w., above vary from 14' diameter to 11' x 3' 6".	Cast-iron, filled with concrete for lowest, 7 feet, above concrete to be 3 feet thick, space filled with sand and broken stone.	2 7	144 8 289 6	2 0 2 0	21 0 42 0	Timber.	.....	.....	702,384	3 years.	Iron.
Messrs. Maclellan	11	.....	.....	.....	1 10	166 0 261 0	25 0 25 0	25 0 25 0	.....	.....	.....	92,535	.....	Superstructure only.
Dominion Bridge Company— (Design No. 1).	11	No particulars (not included in tender).		.....	1 1 10	120 0 120 0 262 0	25 0 28 0 36 0	25 0 28 0 36 0	Timber	.....	.....	85,482	.....	Superstructure only, delivery at Liverpool.
Dominion Bridge Company— (Design No 2).	9	Do	do	.....	1 8	120 0 160 0 328 0	28 0 28 0 38 0	28 0 28 0 38 0	do	.....	.....	91,586	.....	do do
Dominion Bridge Company— (Design No. 3).	8	Do	do	.....	1 8	160 0 343 0	28 0 40 0	28 0 40 0	do	.....	.....	98,857	.....	do do

No. 19.

The Agent-General, London, to The Colonial Secretary.

Sir, 5, Westminster Chambers, Westminster, S.W., London, 4 September, 1885.

Referring to my communication of last month, in which I forwarded to you the Report of the Committee of Engineers appointed to examine the tenders received for the Hawkesbury Bridge, I have now the honor to forward herein a duplicate of that document.

I hope by the next mail to transmit to you the separate report of Sir John Fowler.

I have, &c.,
SAUL SAMUEL.

No. 20.

The Agent-General, London, to The Colonial Secretary.

Hawkesbury Bridge.

Sir, 5, Westminster Chambers, 11 September, 1885.

In continuation of former correspondence on the subject of the tenders for the Hawkesbury Bridge, I have now the honor to forward for your information three copies of the separate Report of Sir John Fowler upon the tenders received.

By the next mail I shall transmit to you the whole of the tenders and drawings in connection with this matter.

I have, &c.,
SAUL SAMUEL.

Get all papers together, as ordered by the Minister. Railways.—B.C., 26/10/85. All papers herewith. See letter of Aldred and Co.—J.R. Repeated inquiries have been made for the plans. No action can be taken till they are received. The Principal Under Secretary is making further inquiry.—C.A.G., 19/11/85. The plans are on board of the "Iberia." She will be in on Monday.—C.A.G., 21/11/85.

Minute of Secretary for Public Works.

For Mr. Whitton's Report upon the whole question.—W.J.L., 21/11/85. Mr. Whitton.—J.R., B.C., 23/11/85.

No. 21.

Sir John Fowler to The Secretary for Public Works.

PROPOSED RAILWAY BRIDGE OVER THE RIVER HAWKESBURY.—REPORT OF SIR JOHN FOWLER.

Sir,

In accordance with instructions, I have carefully examined the designs, calculations, and tenders for the proposed railway bridge over the River Hawkesbury, and have the honor to report as follows:—

Tenders for the construction and erection of the bridge were submitted by twelve firms, at the amounts tabulated below.—

	£
Edgemoor Iron Company, No. 1	265,650
Do do No. 2	296,350
Union Bridge Company, No. 1	277,000
Do do No. 2	306,000
Do do No. 3	327,000
Phoenix Bridge Company, No. 1	280,800
Do do No. 2	282,950
Do do No. 3	286,400
Do do No. 4	288,940
Fforde & Young, No. 1	317,500
Do do No. 2	377,500
Royce & Co. ...	403,367
Handyside & Co., No. 1	435,000
Do do No. 2	456,000
Arrol & Co., No. 1	439,847
Do No. 2	580,000
Reichenbach & Godfrey	466,032
John Dickson	486,100
R. Parkinson	584,898
Fives-Lille, Nos. 1 and 2	685,000
Do Amended tender	515,000
D. Munroe	702,384

The above list is remarkable for the absence of many well known English firms of bridge builders as tenderers for the complete work, and also for the great difference in amount between the lowest and highest tenders.

It is probable that the great depth of the foundations of the piers, the absence of exact information as to local prices, and the impossibility of making a personal inspection of the site, led certain contractors either to refrain from tendering, or to add excessively large amounts for unknown contingencies. Indeed, one firm, upon receipt of further particulars from their agents in the Colony, sent in an amended tender lower by £170,000 than the original one.

Under these circumstances it is impossible to attach much value to the figures in the list as indicative of the correct relative costs of the different designs.

In

In illustration of another of the causes of the great discrepancy in the amount of the tenders, namely, the absence as regards the foundations of the specific directions which were issued in respect of the steel superstructure, I may mention that whilst one American firm is satisfied with piers consisting of a few wrought-iron columns only 2 feet in diameter, a French firm proposes massive masonry piers, nearly 60 feet in diameter. And further, one English firm estimates for piers 70 feet long by 33 feet wide at the base, whilst an American firm estimates for piers 52 feet by 24 feet. As the cost of such piers is practically proportional to the area, it is clear that if the smaller pier is of adequate stability, the size of the larger one and the amount of the tender for its construction might be correspondingly reduced.

Notwithstanding the great differences in the amount of the tenders sent in, there are amongst them tenders of reasonable amount, from parties of reputation, for designs of satisfactory character, so that the Government of New South Wales may safely entertain the acceptance of one of them.

I am disposed to think that the difficulties of the foundations of the Hawkesbury Bridge have been exaggerated by many of the parties tendering. In India, practically, similar work has been frequently and successfully accomplished by native labour under proper engineering supervision; and I see no reason why local contractors might not attain equal success with the piers of the proposed bridge, provided the Government of New South Wales desires to separate the contract for foundations from the superstructure.

In my work of investigation of the drawings, tenders, and calculations which preceded the preparation of this Report, I was much impressed with the amount of labour and expense which the parties tendering for the Hawkesbury Bridge must have incurred, and I would suggest that the New South Wales Government might perhaps be disposed, in communicating their final decision to the contractors, to recognize this fact of careful and laborious work in the preparation of the designs, by the terms of their communication to the parties whose tenders are not accepted.

If this suggestion be thought worthy of consideration, the mode of giving effect to it will be better determined at Sydney than by anything I can propose for the guidance of the Government.

I have had diagrams of the different designs prepared and attached to this Report for more convenient reference.

I will now proceed to consider in detail the different tenders submitted, but I may at once exclude the following four tenders for the reasons set forth in each case:—

Edgemoor Iron Co. (tender No. 1), because the piers are not carried down to solid ground.

Phoenix Bridge Co. (tenders Nos. 1 to 4), because, amongst other reasons, the superstructure is of iron, instead of steel as specified.

Union Bridge Co. (tender No. 1), because the piers are not carried down to the solid ground; and (tender No. 2), because no drawings are submitted.

Fforde & Young (tender No. 1), because the piers are not carried down to solid ground.

In considering the remaining tenders, it will be convenient to commence with the highest and finish with the lowest in amount.

D. MUNROE, Melbourne.

Amount of tender, £702,384. This tender does not include providing or laying permanent way or floor.

Piers.—There are ten piers, each consisting of two cast-iron columns 48 feet apart, centre to centre at the base, and 14 feet diameter from bottom to high-water level, above which they are reduced in size to 11' x 3' 6". Concrete, broken stone, and sand are used as filling.

Superstructure.—There are two spans of 144 ft. 8 in. and seven of 289 ft. 6 in., with girders 2 feet deep at the ends, and 21 feet and 42 feet deep at the centres respectively. (See diagram.) The floor, including rail-bearers, is of timber, and the stresses resulting from compression in the cross girders and main girders exceed those specified. Owing to the great height and small diameter of the cylinders the pressure on the foundation is excessive. The estimated time for completion is three years.

FIVES-LILLE, Paris.

Design No. 1.—Amount of tender, £685,000, subsequently reduced to £515,000, which does not include the supply or laying of the permanent way.

Piers.—There are six massive cylindrical piers 57 ft. 5 in. diameter at the bottom, and 42 ft. 8 in. at high-water level, above which four columns 8 ft. 6 in. diameter are adopted. Concrete and masonry are used as filling.

Superstructure.—There are two spans of 73 feet and five of 550 feet, with girders 6 ft. 5 in. deep at the ends, and 6 ft. 5 in. and 91 ft. 4½ in. deep at the centres respectively. The floor is of timber, and some of the stresses slightly exceed those specified.

The estimated time for completion is four years.

Design No. 2.—The amount of tenders, the details of the superstructure, and of the piers also up to about high-water are the same as in the design already described; but above high-water the piers are carried up as single masonry columns, ranging from 42 ft. 8 in. to 39 ft. 4½ in. in diameter.

R. PARKINSON, East Dereham.

Amount of tender, £584,898, which does not include the supply or laying of the permanent way.

Piers.—There are eight cylindrical, concrete piers 40 feet in diameter. The bottom, 40 feet, is solid, and the remainder of the pier is hollow, with sides 7 feet thick.

Superstructure.—There are two spans of 269 ft. 6 in. and five 338 feet, with continuous girders of a uniform depth of 36 feet. Adjustable hydraulic bearings are proposed to be used, but no details are given. The floor is of timber, and the stresses are excessive in all the principal parts of the structure. The estimated time for completion is four years.

JOHN

JOHN DIXON, London.

Amount of tender, £486,100, which includes the cost of supplying and laying the permanent way.

Piers.—There are nine piers, each consisting of a group of four cast-iron cylinders from 12 feet to 10 feet in diameter, and filled with concrete. The cylinders are arranged in a rectangle 45 × 25 ft.

Superstructure.—There are ten spans of 251. feet between the piers, and nine spans of 43 feet at the piers, with girders varying in depth from 10 ft 8 in. to 33 feet. The stresses in the structure are within the specified limits.

A floor of steel buckle plates is provided.

The estimated time for the completion is two years from the commencement of operations.

REICHENBACH, GODFREY, & JONES, London.

Amount of tender, £466,032, which does not include the supply or laying of the permanent way.

Piers.—There are eight rectangular piers 54 feet long by 22 feet wide at the base. It is proposed to execute the work partly by means of pneumatic caissons, and partly by freezing the ground in advance of the excavations, and so, it is assumed, arresting the flow of water.

Superstructure.—The spans are—one of 89 feet, one of 306 feet, three of 311 feet, and four of 392 feet, with continuous girders 87 feet deep over the piers, and from 45 to 27 feet deep at intermediate points. The lower number of the girder at the piers is but 15 feet above high-water, and the condition requiring “a clear headway of 40 feet under the girders” is thus infringed.

The cross girders are of a peculiar form, and, if taken as independent girders, are deficient in strength.

The floor is of buckled plates. No time is stated for the completion of the bridge.

ARROL & Co., Glasgow.

Design No. 2.—Amount of tender, £580,000, including the laying but not the supply of the permanent way.

Piers.—There are seven elliptical piers, two of which are 50 feet long by 25 feet wide at the bottom, and the five others are 72 ft. × 33 ft. Up to near the level of low-water the piers consist of concrete brickwork or masonry, in a double-skinned iron caisson. Above low-water brickwork and masonry alone are used. The skins of the caisson are well braced together, and the form of structure is preserved by adequate strengthening.

Superstructure.—There are two spans of 153 ft. 6 in., two of 430 ft. 6 in., and four of 432 feet, with girders ranging from 25 feet to 55 feet in depth.

The stresses in all parts are well within the specified limits. A steel buckle-plate floor is provided. The estimated time for completion is four years.

Design No. 1.—Amount of tender, £439,847 10s., including the laying, but not the supply, of the permanent way.

Piers.—There are eight piers, two of which are similar to the small piers described in design No. 2. The six main piers consist of four columns 18 feet diameter at the base, disposed in a rectangle 40 feet and 28 feet between the centres, and braced together. Upon each group of four columns is erected a steel trestle about 33 feet high and 40 ft. × 28 ft. at the base.

Superstructure.—There are two spans of 153 ft. 6 in., similar to those described in design No. 2, two spans of 369 ft. 6 in., and five spans of 370 feet. The girders covering these six spans are of similar construction to the large girders in design No. 2, but of smaller dimensions. With the exception of the rail-bearers and cross-girder, the stresses in all parts are well within the specified limits.

In both tenders there is a provision that if boulders, driftwood, or other obstructions impede or render it impossible to complete a pier, the Government is to bear the cost.

HANDYSIDE & Co., Derby.

Design No. 2.—Amount of tender, £456,000, which does not include the supply or laying of the permanent way, or removal of boulders or other obstructions to the pier-sinking.

Piers.—There are eleven piers, each consisting of two columns 15 feet in diameter at the base. The columns have a shell of $\frac{3}{8}$ inch steel plates, double to the top of the taper piece and single above, filled in with concrete. From the level of 4 feet above high water to the top of the girders the columns are octagonal in form. The foundation of the first pier on the south side is but 15 feet below the bed of the river; and if no support be given by the soil in which it is sunk, an excessive pressure might be brought upon the foundation.

Superstructure.—There are two spans of 138 feet and ten of 262 feet, with girders of 19 ft. 6 in. and 34 ft. 6 in. in depth. The stresses in all parts of the structure are within the specified limits. A steel buckled-plate floor is provided. The estimated time for completion is three years.

Design No. 1.—Amount of tender, £435,000, which does not include the supply and laying of permanent way or removal of boulders, &c.

Piers.—These are of the same character and materials as those described in design No. 2.

Superstructure.—The number and size of the spans are the same as those already described in design No. 2; but the girders, instead of being of uniform depth, are of bowstring form, varying in depth from 19 ft. 6 in. in the centre to 2 feet at the ends, and from 34 ft. 6 in. in the centre to 2 feet at the ends respectively.

ROYCE & Co. and BUTTERLEY & Co., Sydney and Alfreton, Derbyshire.

Amount of tender, £403,367, which includes the sleepers but not rails.

Piers.—There are twelve piers, each consisting of two steel plate columns 16 feet in diameter, spaced 28 feet apart centre to centre, and filled solid with concrete. The

The end piers, when exposed to 56lbs. wind pressure and heavy floods, would have hardly a sufficient margin of stability to resist overturning, if the columns forming them be considered to act independently; and the pressure on the foundations of the longer columns is rather excessive.

Superstructure.—There are two spans of 167 ft. 8 in., one of 175 ft. 8 in., and ten of 238 ft. 6 in., with girders ranging from 18 feet to 24 ft. 6 in. in depth. The stresses in the main girders are within the specified limits, but the upper windbracing and compression members of the cross girders are weak. A timber floor is provided. The estimated date of completion is three years from the first delivery of materials in Sydney.

FFORDE & YOUNG, London.

Design No. 2.—Amount of tender, £377,500, which does not include the supply or laying of permanent way.

Piers.—There are ten piers, each consisting of two wrought-iron columns, 10 feet diameter at the bottom, reduced to 6 feet at the top, and filled with concrete.

The pressure on the ground in this design is excessive, amounting to 18.6 tons per square foot area of cylinders.

Superstructure.—There are two spans of 116 ft. 6 in., four of 221 feet, and five of 357 feet, with girders varying in depth from 52 feet over the piers to 35 and 18 feet elsewhere.

No complete floor is provided, but plates 10 in. by $\frac{1}{4}$ in. are laid longitudinally in the space between the lines of rails.

The time for completion is estimated at three years.

UNION BRIDGE COMPANY, New York.

No. 3.—Amount of tender, £327,000, which includes the supply and laying of the permanent way.

Piers.—There are six piers 52 feet long by 24 feet wide at the base, and 48 feet by 20 feet at low water level, formed by caissons of wrought-iron filled with concrete. Above low water, up to the girder bed-plates, masonry piers will be built, consisting of two cylindrical columns, 14 feet diameter, and 28 feet apart centre to centre, joined by a wall 6 feet thick.

Superstructure.—There are seven spans of 415 feet, with girders of the ordinary American type, 53 feet in depth. There is no complete floor, the rails being carried upon sleepers 8 in. by 9 in., extending across the bridge between the girders, and spaced 8 inches apart. Alternative designs for the horizontal wind-bracing are submitted; one with round rods, as in most American bridges; and the other with lattice girder, struts, and ties. I prefer the latter, on account of its superior rigidity and freedom from vibration under passing trains.

The stresses, with trifling exceptions, are within the specified limits. The estimated time for completion is two years and a half.

EDGEMOOR IRON COMPANY, Delaware.

No. 2.—Amount of tender, £296,350, which includes sleepers, but not the rails.

Piers.—There are ten piers, each consisting of two steel plate columns 20 feet to 15 feet in diameter, partially filled with concrete. Upon these are placed trestles, which carry the superstructure.

Superstructure.—There are two spans of 134 feet, and nine spans of 292 feet, with girders similar in form to those in the last design, and 32 feet deep. The stresses, as a rule, are within the specified limits; but in the case of certain vertical struts the stress is rather excessive. The floor is composed of sleepers 9 in. by 7 in., spaced about 6 inches apart.

The estimated time for completion is two years.

In addition to the above tenders for the construction and erection of the bridge, Messrs. McLellan, of Glasgow, and the Dominion Bridge Company of Montreal have tendered for the supply of the materials only.

RECOMMENDATION.

Several of the preceding designs have high engineering merit, notable that of the Fives-Lille Company, whose bridge would be looked upon as a monumental work in any country, and that of Messrs. Arrol. But owing to the large sums included in the estimates for contingencies, the majority of the tenders are excluded from present consideration.

Indeed, it appears to me that only two of the tenders need be entertained, namely, the Edgemoor Iron Company's No. 2 Tender for £296,350, and the Union Bridge Company's No. 3 Tender for £327,000. These are both for good bridges of the ordinary American type, and the amounts of the tenders represent the fair commercial value of the respective works without any excessive addition for contingencies.

The Union Bridge Company propose six piers, and the Edgemoor Company ten; but as the latter propose two cylinders for each pier, and the former only one, there will be practically twenty separate piers to sink in one case as compared with six in the other. From my own experience, in sinking cylinders and caissons through mud, I am of opinion that the reduced number and larger size of the Union Bridge Company's caissons is a distinct advantage, minimising the risk of accidents and delay when executing the pier work. And further, that the larger spans of the superstructure of the Union Bridge Company have a substantial superiority over the smaller spans of the Edgemoor Company's design.

Certain minor modifications, which it is unnecessary to particularise, might be usefully made in both the preceding designs; but these would not affect the relative cost of the two structures.

My instructions, I understand, are to "recommend the acceptance of one tender," and I beg, therefore—presuming the work to be let as a whole—to recommend the acceptance of the tender of the Union Bridge Company for the sum of 327,000, subject to a proper specification and contract being first arranged, together with a schedule for additions and deductions at prices based upon the lump sum, for any modifications which the engineers of the New South Wales Government may hereafter direct.

I have, &c.,

JOHN FOWLER.

2 Queen Square Place, Westminster, S.W.,
3 September, 1885.

PROPOSED

PROPOSED RAILWAY BRIDGE OVER THE RIVER HAWKESBURY.

Report of the Engineer-in-Chief for Railways to the Honorable the Minister for Public Works.

Department of Public Works, Railway Branch, Engineer-in-Chief's Office,
Sydney, 25 January, 1886.*Minute Paper.*

Hawkesbury River Bridge, Report on Designs, &c.

THE competitive designs and tenders for the construction of a Bridge for a double line of railway over the River Hawkesbury having been forwarded for my consideration, I have the honor to submit the following report :—

DESCRIPTION OF DESIGNS.

EDGEMOOR IRON COMPANY, Delaware.

The Edgemoor Iron Company of Delaware send in four tenders as under, viz. :—

- No. 1. For superstructure only, with spans of 292 feet, £105,500.
 No. 2. For the same superstructure, combined with piers of design A, £265,650.
 No. 3. For the same superstructure, combined with piers of design B, £296,350.
 No. 4. For superstructure only, with spans of 328 feet, £119,338.

The designs Nos. 1 and 4 being for superstructure only, will not be considered. The other designs, Nos. 2 and 3, are for a bridge with nine spans, 222 feet each, and an abutment span at each end of 134 feet.

Piers—Design A.

The upper portion is a framework of steel columns and bracing. The lower portion of piers Nos. 1, 2, and 10, consists of a pair of steel cylinders, 20 feet in diameter, with $\frac{1}{2}$ -inch thickness of metal, and filled with concrete. Piers 3 to 9 consist of two groups of about forty piles, supporting similar cylinders. The piles are cut off 5 feet above the lower edge of the steel shell, the space between being excavated and filled with concrete. It is assumed that, after sinking the steel cylinders to a certain depth, the ground will be of a sufficiently impervious character to allow of the water being pumped out and the piles driven. This design does not conform to the conditions upon which tenders were invited.

Piers—Design B.

The upper portion is a framework of steel columns and bracing. The lower portion consists of a pair of hollow cylinders of concrete, incased in steel $\frac{1}{2}$ -inch thick. They are 15 feet in diameter at the upper end, and increase downwards at the rate of 1 inch in 33, each ring fitting inside the ring below it. The diameter of the base of the deepest pier will thus be 20 feet 6 inches.

The bulk of the concrete to be used is one of cement to three of sand, and five of broken stone, that at the top of the cylinders having a large proportion of cement.

The masonry of the abutments is of the quality specified in American railway specifications as "first-class bridge masonry laid in cement."

Superstructure.

The main girders are of the American type, with pin fastenings. One end of each girder rests on expansion rollers. The depth of the girders is 32 feet.

The upper boom and end post are of trough section, made up of riveted plates and angle irons; the vertical struts are angle bars with lattice bracing, while the bottom boom and diagonal ties consist chiefly of eye bars.

The cross girders have plate webs, and are attached to the lower ends of the vertical struts, and are thus about 24 feet apart. There are six lines of longitudinal plate bearers, across which sleepers at 16-inch centres are placed to form the platform of the bridge, and to carry the rails.

The main girders are braced laterally at the end posts and each vertical strut. Resistance to wind is effected by diagonal bracing at top and bottom between the girders.

Two years are required to complete the whole bridge according to tenders 2 and 3.

UNION BRIDGE COMPANY, New York.

The Union Bridge Company of New York submit three tenders as under, viz.—

No. 1. For a bridge with spans of 415 feet each and piers to depths shown on drawings, and in accordance with the printed conditions :—

Masonry and foundations	...	...	...	...	...	...	£159,000
Superstructure	...	...	...	...	...	...	168,000
Total	...	...	...	...	...	...	£327,000

No. 2. For a bridge with spans of about 250 feet each, with piers carried down to depths averaging 21 feet less than No. 1 :—

Masonry and foundations	...	...	...	...	...	...	£160,000
Superstructure	...	...	...	...	...	...	117,000
Total	...	...	...	...	...	...	£277,000

No. 3. For a bridge with spans of about 250 feet each, with piers carried down to the full depth :—

Masonry and foundations	...	...	...	...	...	...	£189,000
Superstructure	...	...	...	...	...	...	117,000
Total	...	...	...	...	...	...	£306,000

No

No drawings are furnished with tenders 2 and 3, which cannot, therefore, be considered. The following is a description of the design furnished :—

The piers from low water mark downward consist of a mild steel or plate iron casing, with three internal tubes 8 feet in diameter braced to the casing. The size of the piers thus formed is 48 feet by 20 feet, with semicircular ends, but towards the bottom the dimensions are increased to 52 feet and 24 feet. Concrete is to be filled in between the outer shell and the tubes during sinking, and on the completion of the pier the tubes also will be filled in with concrete.

Above low-water the piers will be carried up in masonry according to the specifications of the Government Railways, and as stone, obtained locally, will admit; the same kind of masonry will be used for the abutments.

It is proposed to sink the foundations by open dredging, but the caissons will be so arranged for the application of air-locks if required.

Superstructure.

The main girders are 410 feet 1 inch between end pins, and 51 ft. 3 in. in depth. They are of the American type, with pin fastenings. The upper boom and end post consist of riveted plate and angle iron. The vertical struts are of plate and angle iron with lattice bracing, while the segments of the lower boom and diagonal ties are eye bars.

The cross girders have plate webs, and are secured at each joint of the lower booms to the vertical struts, and there are four lines of longitudinal plate-bearers fixed nearly under the rails. Sleepers are placed about 16 inches apart from centre to centre across the bridge, and guard rails as well as permanent way rails, 70lbs. per yard, are supplied and fixed for each road.

For the wind bracing two designs are furnished, one with pin fastenings, the other with riveted fastenings.

The time required for the completion of the contract is two years and six months.

THE PHOENIX BRIDGE COMPANY, Philadelphia.

The Phoenix Bridge Company of Philadelphia submit four tenders, viz. :—

No. 1. For a bridge of Phoenix construction, with thirteen spans	... ..	\$1,404,000
No. 2. For a bridge of plate and angle construction, with thirteen spans	... ..	\$1,432,000
No. 3. For a bridge of Phoenix construction, with eleven spans...	... ..	\$1,414,750
No. 4. For a bridge of plate and angle construction, with eleven spans...	.. ..	\$1,444,700

The superstructure in all cases is of wrought-iron, and does not therefore comply with the published conditions.

The Phoenix construction consists of the use of columns of circular section, with four, six, or eight segments, according to size. These are used, singly or in combination, in piers, and all members of the superstructure subject to a compressive strain.

Tension members are flat bars or rods with pin fastenings.

The design, with thirteen spans, provides main girders 219 feet in length between end pins.

The cross girders have plate webs, and are suspended from each joint of the main girders. Between these run six lines of longitudinal bearers, upon which the sleepers carrying the rails are fixed.

The piers are each of them composed of eight Phoenix columns, 22 inches inside diameter, and with $\frac{1}{8}$ -inch thickness of metal. These, after sinking, are filled with concrete. All the columns have a batter of 1 in 12 longitudinally, and the outside ones 1 in 6 transversely.

Above the bottom of the river the columns are braced together by adjustable eyebars. The piers are surmounted by heavy transverse and longitudinal plate girders, to distribute the load over the columns.

It is proposed to sink the columns of the piers by means of a central water jet, in connection with others exterior to the columns. It is stated that the Phoenix method of construction allows of considerable deviation from a uniform batter if a boulder or log be met with in sinking.

The ironwork can be ready for shipment within four months from date of order, and can be erected in five months after the arrival at site.

MESSRS. FFORDE & YOUNG, Westminster.

Messrs. Fforde & Young, of Westminster, submit the following designs and tenders, viz. :—

No. 1. The cylinders being sunk to 90 feet below high-water, with timber piles the remainder of the distance : cost, £317,500.

No. 2. The cylinders being sunk to the depth shown on the section furnished by the New South Wales Government : cost, £337,500.

The superstructure in both cases is the same.

They also make an offer to supply the superstructure and ironwork, f.o.b. in the Thames as under :—

Steel superstructure...	... ..	£71,907
Wrought-iron in piers, castings, &c.	... ..	30,107

The designs show alternate spans of 357 feet and 221 feet over the main portion of the river, with a shore span at each end of 116½ feet.

The piers consist of two wrought-iron cylinders in riveted sections, 10 ft. 6 in. diameter and 28 feet from centre to centre, braced together at high-water line and at the top.

In tender No. 1 it is proposed to sink them by pneumatic means to a depth of 90 feet below high-water, and then on the bottom thus formed to sink piles, by pneumatic power or otherwise, to the depth shown on the Government section; the cylinders are afterwards filled up with concrete. It is maintained that the piles alone will carry the load without any allowance for the support of the stratum at the level of the bottom of the cylinders or for the fractional resistance at the sides of the latter, also that piles in such a position are according to experience indestructible.

Tender No. 2 assumes the wrought-iron cylinders to be sunk to the depths shown on the Government section, the excavation being made by dredging or otherwise.

Superstructure.

Superstructure.

The spans of 357 feet consist of two cantilevers of 119 feet each, and a central girder of 119 feet in length, the ends of the latter having expansion joints.

The cantilevers are balanced by a diagonal tie connecting the summit over the piers with a point on the girder of the 221 feet span. Alternate bearings on the piers are on expansion rollers. The depth of the cantilever over the piers is 57 feet, that of the central girder of the 357 feet span is 17 feet, and that of the 221 feet girder is 34 feet. The bracing is of the lattice type, and the joints riveted throughout.

The cross girders are attached to the underside of the main girders at the joints by means of a downward extension of the gusset plates. Longitudinal beams are fixed in four lines, one under each rail.

The bottom wind bracing is attached to the cross girders. The top bracing is carried out where the headway will admit of it.

The abutments are intended to be built of coursed rubble masonry, set in cement mortar.

The time required for the completion of the bridge is three years.

MESSRS. G. H. ROYCE & Co., SYDNEY, AND THE BUTTERLEY IRON WORKS.

Messrs. G. H. Royce & Co., of Sydney and the Butterley Iron Works, Alfreton, Derbyshire, submit the following design and tender, viz. :—

For bridge delivered	£158,211	5	3
Erection, completion, and maintenance	245,156	0	0
Total	403,367	5	3

This bridge consists of ten spans of 238 ft. 6 in. each, one span of 175 ft. 8 in., and one shore span at each end of 168 ft. 8 in.

The piers are formed of wrought-iron cylinders in pairs, 16 feet in diameter and 28 feet from centre to centre, with upper box-girder connecting pieces 5 feet wide and 7 feet deep. Half-inch plates are used for the main piers of the larger spans, and $\frac{1}{4}$ inch plates for the others. They are stiffened by outside straps 6 inches by $\frac{3}{8}$ inch, and internal T irons 6 inches by 3 inches by $\frac{1}{2}$ inch.

When the sinking is complete the cylinders are to be filled with concrete of cement, sand, and blue metal, in the proportions of 1, 2, and 5, respectively.

The abutments will be built of masonry, of the type usually adopted by the Department.

Superstructure.

The main girders of the smaller spans are all similar, and are of the lattice type, with the top and bottom flange straight.

The girders spanning the larger openings are also of lattice construction, but the upper boom is curved, the effective depth in the middle being 23 feet, and at the ends 16 ft. 6 in.

The upper boom is trough-shaped, while the lower one consists of a pair of riveted links formed of plates 2 feet deep and set on edge. The vertical struts are of plate and angle irons, with lattice stiffening. The diagonals consist of flat bars in pairs.

The cross-girders are plate girders, and are suspended from the lower end of the vertical struts by a pair of plates and secured by a pin. Longitudinal bearers are placed under each rail. Longitudinal sleepers are provided 6 inches in thickness, and 4-inch decking over the rest of the bridge.

The upper wind-bracing is fixed to the lateral braces, the lower wind-bracing is attached to the longitudinal bearers and is thus free of the main girders.

The time required for completion is three years after the first delivery of material in Sydney.

MESSRS. HANDYSIDE & Co., Derby.

Messrs. Andrew Handyside & Co., of Derby, submit the following designs and tenders, viz. :—

Tender for bridge with superstructure, according to design A ...	£456,000
Do do do B ...	435,000

Both designs are for the same span, and the piers are the same in both cases.

There are ten spans of 262 feet each, and two shore spans of 138 feet each.

Piers.

These consist each of a pair of steel cylinders, 28 feet from centre to centre. From the bottom of the foundation to the bed of the river there are two concentric rings 15 feet and 12 feet diameter, connected by diaphragms. From the bed of the river to 4 feet above high water the cylinders are continued 12 feet in diameter; from this level upwards the piers consist of octagon pillars, 10 feet across at the base and 8 feet at the top, braced together. The piers are to be filled with concrete to the base of the octagonal pillars. The process proposed for sinking the piers is as follows :—

A pair of pontoons will be provided, upon which the pair of cylinders will be put together; the latter will be sunk between the pontoons, ring after ring added, and sufficient concrete put in the pockets between the rings to keep the cylinders down. It is proposed to excavate by the process adopted at the Goorai Bridge in India, that is to say, by means of a rotary boring machine or plough, the excavated earth being removed by a syphon, which is made to act by pumping water into the cylinders.

Superstructure according to Design A.

The main girders are of lattice construction, with riveted joints, and are non-continuous. The depths are 32 ft. 2 $\frac{1}{4}$ in., and 17 ft. 8 $\frac{1}{4}$ in., for the longer and shorter spans respectively. The upper booms are of trough section; the lower consists of two series of plates on edge, stayed apart at intervals.

The

The diagonal ties are flat bars, the vertical struts the same, but stiffened with angle-iron and lattice bracing.

The cross girders are attached to the underside of the main girders, and are firmly secured by plates to a web at the lower end of the vertical struts. The longitudinal bearers are fixed under the centre line of each rail, and carry the longitudinal sleepers. The floor of the bridge is covered with steel buckle-plates.

Superstructure according to Design B.

The main girders are of the bowstring type, the depths being the same as in Design A. The forms of cross sections of the different members are similar to those in Design A, while the disposition of the cross girders, bearers, &c., correspond entirely.

It is intended to put together a complete span, main girders, cross girders, rail-bearers, and flooring on one pair of pontoons. The pontoons will be floated between a pair of piers, and the ends of the girders deposited on them at high tide. The span will be raised from this into the requisite position by hydraulic rams, the steel columns being built up under it.

The time required for the completion of the bridge is three years.

Messrs. Arrol Brothers, Glasgow.

Messrs. Arrol Bros., of Glasgow, submit two designs and tenders, which will be considered separately, viz. :—

Tender for design No. 1	...	...	...	...	...	...	£586,395
Or, with reduced masonry, shown on drawing No. 1A	...	...	...	...	...	...	580,000

This bridge has four spans of 432 feet, two of 430 ft. 6 in., and two shore spans of 153 ft. 6 in.

The piers consist of double skin wrought-iron caissons filled with concrete, and are of elliptical form ; the larger having bases of 70 feet by 33 feet, the smaller 55 feet by 24 feet, strengthened by three cross walls.

The cutting edges are of steel. Above the bed of the river, and to a point above high-water mark, the piers are carried up in brickwork ; above this again in masonry, with concrete filling. Provision is made for building the abutments in first-class style.

The long-span girders are 55 feet deep at the centre and 25 deep at the ends. They are of the lattice type, with riveted joints. Both booms are of trough section. The diagonal ties are flat bars ; the vertical struts consist of four angle-irons, with lattice bracing. A longitudinal brace runs from end to end of the girder at a length of 25 feet above the lower edge.

Plate cross girders are fixed inside the lower booms at the joints ; longitudinal bearers, with hard-wood capping, carry the rails. At the top of the longitudinal bearers a floor is formed of buckle-plates, flushed up level with asphalt concrete. Lateral and wind bracing is provided. A light lattice screen is fixed on the inside of the main girders, to protect the lower part of passing carriages from the wind.

The bearings of the main girders are ordinary roller and rocker bearings of steel on cast-iron bed plates.

It is proposed to build the lower lengths of the caissons on launching ways, and float them out between twin barges to site. The barges will be steadied in position by legs, as in use at the Tay Bridge, or by cross moorings, as may be convenient.

It is proposed to perform the excavation either by grab dredgers, ladder excavators, or by the method adopted at the Goorai Bridge in India (mentioned also in Messrs. Handyside's tender).

The girders will be built on shore and floated out, either on high level staging or barges, or placed on the masonry at a lower level, and raised by utilising the rise of the tide from time to time, and packing up under each lift.

The girders of the end spans would be erected on timber staging in the usual manner.

The time required for the completion of this bridge is four years.

Messrs. Arrol Bros.' tender for design No. 2 is £439,847 10s.

In this bridge there are five spans of 370 ft., two of 369 ft. 6 in., and two of 153 ft. 6 in. The superstructure is similar in character to that of design No. 1.

The main piers consist each of groups of four columns of wrought-iron, arranged in a rectangle 40 feet by 28 feet. The lower lengths are double-skinned and 18 feet in diameter, with steel edges ; above this they are strengthened with frames, the spaces being filled in with brickwork in cement. Near the level of the bed of the river the diameter is reduced to 13 feet, and they are then continued up to about 5 feet above the water, cast-iron being substituted as a material, and are braced together at the top with wrought-iron. Above this level the pier consists of a steel trestle secured to the concrete in the cylinders by long foundation bolts.

The erection of this bridge will be a modification of that of the other design.

MESSRS. REICHENBACH, GODFREY, & JONES, London.

Messrs. Reichenbach, Godfrey, & Jones submit one design and tender, the amount being £466,032 10s.

This bridge consists of two pairs of continuous girders and one pair of non-continuous girders, the latter of about 90 feet span. The continuous girders cover two spans of 392 feet each and two spans of 311 feet each.

The piers are of Portland cement concrete and masonry, partially provided with a thin iron skin. It is proposed to sink the foundations pneumatically for a certain depth, after which Poetschli's process of freezing the ground around the piers would be adopted, so that excavation could take place in the open. This part of the excavation would be done in sections, and would have to be timbered. The piers, from caisson level to high-water are of masonry, with a core of concrete, and above that of solid masonry.

The tender does not include the abutments.

The superstructure is of steel, and the bracing of the lattice type, with all joints riveted. The main girders are continuous over four spans, and deepened considerably over the piers, the bottom edge coming down below the 40 feet line of headway. They are also deepened in the centre of the spans, so that both top and bottom of the girders present an irregular line.

The top and bottom members are both composed of channel iron, strengthened and stiffened where necessary by plates.

The struts and diagonal ties consist of pairs of channel irons braced together. Lattice cross girders are suspended at the joints of the main girders, and there are four lines of plate girders to carry the rails. The floor is of buckle plates.

No time is mentioned for the completion of the bridge.

MR. JOHN DIXON, London.

Mr. John Dixon, of London, submits a design and tender, the amount being £486,100.

This design gives a bridge with ten spans of 257 feet each, and nine spans of 45 feet. The piers consist each of a group of four cylinders, braced together above high-water. The cylinders are of cast-iron, $1\frac{1}{4}$ inch thick, and are 10 feet in diameter, except for a length at the bottom, where they are 12 feet, and have steel cutting edges. The cylinders are afterwards filled with cement concrete 8 to 1.

Superstructure.

The short spans have lattice girders with parallel flanges. The girders of the main spans are of the lattice riveted type, with a covered upper boom, the depths at centre and ends being 33 feet and 21 feet respectively. The top and bottom booms are of trough section; the vertical struts are plate and angle iron, with lattice bracing. The diagonals consist of pairs of flat bars. Plate cross girders are attached to the inside of the main girders. Longitudinal bearers are placed under each rail; the floor is covered with steel buckle-plates.

Lateral and wind bracing is provided at the top of the main girders, the members consisting for the most part of lattice beams.

It is intended to perform the excavation with mechanical diggers.

The cylinder being complete to high-water level, the superstructure would be floated out and deposited; from this position it would be raised by hydraulic power as the piers are completed.

It is proposed to provide two cylinder sinking stages; these will consist of two large pontoons, through each of which will pass two wrought-iron cylindrical legs, to rest on the mud, and these will be worked by hydraulic power. Some of the mud would be previously dredged away to give a firmer base for the legs. Over the pontoons will be built a strong stage with overhead travelling crane.

The entire stage would be floated to site and moored. The abutments are to be of native stone.

Two years are required for the completion of this work.

MR. R. M. PARKINSON, East Dereham.

Mr. Richard M. Parkinson, of East Dereham, submits a tender, the amount being £584,898.

This design shows continuous girders throughout. There are seven openings of 338 feet and two of 269 ft. 9 in., one at each end.

The girders are to be fixed on one of the central piers; on the other piers and abutments they rest on adjustable hydraulic bearings and rollers.

The piers consist of cylinders 40 feet in diameter, with a central tube of 26 feet diameter, the space between these two rings being filled with concrete. A length of 60 feet of the outer skin at the lower end is of steel. On the completion of the sinking, concrete will also be filled into the middle for a height of 40 feet.

The abutments are rock-faced rubble.

Superstructure.

The main girders are 36 feet deep, with vertical struts and inclined ties. The lower boom is also supported half-way between each pair of attachments of the latter by an additional suspension bar. The upper boom forms an inverted trough in section. The verticals are of box section, while the inclined ties are flat bars; the attachment of the latter and also of the wind bracing is by pins.

The plate cross girders are bolted to the underside of the main girders, while the longitudinal bearers lie on the top of the cross girders and form troughs, in which the longitudinal sleepers and permanent way rails lie.

The floor is of 3-inch planking.

The time required for the completion of the bridge is four years.

FIVES-LILLE COMPANY, Paris.

The Fives-Lille Company submitted a design and a tender—£685,000, and afterwards reduced the latter to £515,000.

The design shows five spans of 550 feet each, and two shore spans of 73 feet each. The two end piers are elliptical in plan, the four principal ones are circular; the part above high-water is, however, the same in all cases. The lower part of the piers is of masonry, with a sheet-iron envelope resting on a wrought-iron caisson. When the sinking is complete the caissons and central shaft are to be filled up with concrete.

The

The principal piers have a diameter at the base of 57 ft. 5 in., and the sides of a batter of 1 in 25. The end piers, which are elliptical, have a base of 57 ft. 5 in. by 26 ft. 10 in.

There are two designs for the upper part of the piers; one being for ashlar masonry, while in the other there are four iron columns, braced together, and filled with concrete.

Superstructure.

The principal openings are spanned by a pair of bow-string girders, the upper members of which consist each of a pair of arched lattice beams jointed at the crown, the main ties consisting of links 24 ft. 7 in. long, with riveted ends and pin fastenings. The rise of the arch is 85 ft. 4 in.

The platform of the bridge is carried by vertical suspension bars, 49 ft. 2 in. apart, from which also the main tie is suspended.

The platform of the bridge consists in the first place of a pair of lattice girders, carried by the vertical suspension bars and placed in the same vertical plane as the main tie. To these girders lattice cross girders are attached at distances of 12 ft. 3½ in., and brackets fixed on to the latter carry the longitudinal bearers; upon the latter, cross sleeps are fixed to carry the rails.

The lateral bracing of the upper members of the main girders consists of lattice beams; the wind bracing is of bar and angle iron. The lower wind bracing is affected by an independent horizontal truss; all the members of this truss are of box form, with lattice webs. The longitudinal members of the truss are carried from end to end of the main girders between the platform girders and the main tie, and are secured to each vertical suspension-bar of the main girder. Each of these attachments is pierced by a pin, from which the main tie is suspended by a couple of links.

The proportion of cement to sand to be used for the work above ground is 674 lb. of cement to 1 cubic yard of sand, and for work under water 842 lb. of cement to 1 cubic yard of sand. For cement concrete the proportion of cement mortar to broken stone is 6 to 8.

It is proposed to excavate the foundations of the end piers by the compressed air method. The other and deeper piers would be sunk by excavating under water, but the compressed-air apparatus would be at hand if required for use at moderate depths.

In order to ease the descent of the caisson should it stick on one side, a pipe will be laid on all round the inside of the cutting edge, from which jets of water under pressure can be made to issue both vertically and laterally. This a patent of the firm.

The time required for the completion of this work is four years.

MR. D. MUNROE, Melbourne.

Mr. D. Munroe, of Melbourne, submits a design and tender, the amount of which is £702,384 3s. 4d.

The design divides the bridge into nine main spans of 289 ft. 6 in. each, and two spans of 144 ft. 8 in. each.

The piers consist of cast-iron cylinders in pairs, which, up to high-water, are 14 feet in diameter, with 1½ inch thickness of metal.

The bottom of the cylinders is to be filled for a depth of 7 feet with concrete; above this level only a shell of concrete 3 feet thick is to be used, the interior being filled up with broken stone and sand. The broken stone used for the concrete is to be called sandstone.

Above high water the cylinders taper upwards, and have a batter inwards, and are carried up to support the end pins of the girders. The cylinders are braced together above low water.

The abutments are ashlar masonry in local sandstone.

The main girders are of the fish-belly lattice type, and are 40 feet in effective depth at the centre. The top and bottom booms have the same section throughout. The top boom is trough shaped; the bottom one is made up of eyebars, and from the joints of these the platform is suspended.

The cross girders have zig zag lattice bracing, and are about 15 ft. 9 in. apart. The rails are carried by timber baulks on the top of the cross-girders. No decking of any sort is provided. Resistance to wind pressure is provided by angle-iron bracing to top boom, and a horizontal truss at the level of the platform.

THE DOMINION BRIDGE COMPANY, Montreal.

The Dominion Bridge Company of Montreal submit three designs and tenders for the superstructure delivered f.o.b. at London or Liverpool, as follows:—

Design A, consisting of one span of 120 feet, ten spans of 262 feet each, and one of 162 feet, £85,482.

Design B, consisting of one span of 120 feet, eight spans of 328 feet each, and one of 160 feet, £91,586.

Design C, consisting of eight spans of 343 feet each, and one span of 160 feet, £98,857.

These designs are for lattice-girder bridges of the American type, with pin fastenings. Details are given of design C only, but the construction would be the same in the other designs. The firm would undertake the erection of the superstructure, but has no facilities for undertaking the sub-structure.

MESSRS. P. & W. M'LELLAN, Glasgow.

Messrs. P. and W. M'Clellan, of Glasgow, submit a design and tender for the superstructure only, the amount being £92,535 6s. 2d.

The design shows one span of 120 feet, ten spans of 261 feet each, and one span of 160 feet.

The main girders are of the lattice type, with riveted fastenings and non-continuous. The girders of the small spans, as well as the large, are 26 ft. 1 in. in height. The top and bottom booms are of trough section; the vertical struts are pairs of plates, with angle-iron and lattice bracing; the ties are similar, but without the lattice bracing.

Plate cross girders are fixed to the vertical struts inside the main girders above the bottom boom. The longitudinal beams are in five pairs across the bridge, and carry a flooring of buckle-plates. Steel kerbs are also provided.

Remarks

Remarks and Recommendations.

Having carefully examined the whole of the designs sent in for this bridge, I will now proceed to deal with those which, in my opinion, appear the most suitable for the purpose intended.

I may, however, exclude the following tenders, for the reason given after each. The letters and numbers refer to those in the first column of the appended table.

- C 1 to 4.—Phoenix Bridge Company. The design of the piers is unsatisfactory, and iron is to be used in the superstructure instead of steel.
 F 1 and 2.—Messrs. A. Handyside & Co.
 G 1 and 2.—Messrs. Arrol Bros.
 H.—do.

These firms (F., G., and H.) decline to be responsible should any obstruction be met with in sinking the foundations for the piers.

- D 1 and 2.—Messrs. Fforde & Young. The piers are considered too weak.
 D 3.—Messrs. Fforde & Young. This tender is for steel and iron work only, without erection.
 E.—Messrs. Royce & Co., and the Butterley Co. The piers are too weak.
 I.—Messrs. Reichenbach, Godfrey, & Jones. I consider that in this case continuous girders are not admissible; no time is mentioned for the completion of the work, and the cost of the abutments is not included in the tender.
 J.—Mr. John Dickson. I consider that the design of the piers is not satisfactory.
 K.—Mr. R. M. Parkinson. In this case continuous girders are not admissible; the cost, £584,898, is too high, and the time required for completion, four years, is too long.
 M.—Mr. D. Munroe. The piers are, in my opinion, too small, and the cost, £702,384 3s. 4d. is too high.
 N.—The Dominion Bridge Co.
 O.—Messrs. P. & W. M'Lellan.
 These firms (N and O) tender for superstructure only.

The designs and tenders of three Companies now remain to be dealt with, viz. :—

- A 1 to 4.—The Edgemoor Iron Co.
 B 1 to 3.—The Union Bridge Co.
 L.—Fives-Lillie Co.

Tender No. 1 of the Edgemoor Co. is for superstructure only.

No. 2 is for the whole work, the piers consisting of 20-foot cylinders, in pairs, supported on piles, which I consider a most objectionable and dangerous form of design for this particular bridge.

No. 3. The piers consist of a pair of cylinders 20 feet in diameter at the base. The superstructure being in all cases the same, with spans of 293 feet; cost £296,350.
 No. 4 is for superstructure only.

Of the above, therefore, No. 3 only is suitable.

Tender No. 1 of the Union Bridge Company is for a bridge having piers 52 feet by 24 feet at base, with semicircular ends.

Tenders Nos. 2 and 3 it is not necessary to consider, as no drawings have been furnished.

The spans of the superstructure of No. 1 tender are 415 feet each, and the cost is £327,000. The piers in this design are better than those of No. 3 of the Edgemoor Co., as having a much larger base, and the spans 415 feet as against 292 feet of the latter Company, present a decided advantage. Therefore, of these two tenders and designs, I consider those of the Union Company preferable.

The superstructure of the Union Co.'s design is, as before stated, of the American type, with link and pin fastenings; and although the eyes are forged out of the solid bar, I do not consider this form of bridge as rigid or satisfactory as the riveted bridges of the English type, which have been constructed on the New South Wales railways. When the eyes are welded to the bars, a few bad welds would make this style of bridge a very dangerous structure, but when the eye bars are forged out of the solid, every care being taken in their manufacture and testing, these bridges may be used with safety.

The design of the Fives-Lille Co. complies with all the conditions issued for the guidance of tenderers, and is, in my opinion, the most perfect of all the designs submitted. The drawings have been prepared with the greatest care, and reflect every credit on the Company; but as the cost is £515,000, and a satisfactory bridge can be erected for £327,000, I should not be justified in recommending the more costly design for adoption.

I therefore recommend the acceptance of the tender No. 1 of the Union Bridge Co., the amount being £327,000, subject to the preparation and approval of full detailed drawings, and a proper specification of the whole of the work connected with this bridge.

The Commission appointed in England recommend the following additions to the design :—

- Extension of the horizontal stiffening bars.
 Strengthening to the third bay of bottom boom, and strengthening of the caisson.

In addition to these, I further advise an increase of depth to the longitudinal rail-bearers, with more perfect bracing between them, and a more definite specification for the concrete filling, for which Kiama bluestone is to be used, instead of sandstone as proposed by the Union Bridge Co.

The designs of Messrs. Arrol Bros. are particularly good, especially No. 1, the cost of which is £586,395. This is in excess of the tender of the Fives-Lille Co.; and as Messrs. Arrol Bros., do not comply with the printed conditions this design could not be taken into consideration.

To avoid delay in dealing with this matter, I have already sent on a memorandum recommending the acceptance of the Union Bridge Co.'s tender, copy of which is annexed.

A table giving the names of the tenderers, the principal features of the designs submitted, and the amounts of the different tenders, is appended to this report.

JOHN WHITTON.

HAWKESBURY

HAWKESBURY RIVER BRIDGE.—Table showing particulars of designs and Tenders received.

Reference.	Name of Tenderers.	Main Features of Design.		Time of Completion.	Amounts of Tenders.			Remarks.
		Piers.	Superstructure.		Piers.	Superstructure.	Totals.	
A 1	Edgemoor Iron Co.				£	£	£	Tender for superstructure only.
2	Do	20 ft. cylinders in pairs supported on piles	American lattice type, pin fastenings, span 292 ft.	2 years ...	160,150	105,500	265,650	
3	Do	Cylinders in pairs, 20 ft. diameter at base..		2 " ...	190,850	105,500	296,350	
4	Do		American lattice type, pin fastenings, span 328 ft. 6 in.			119,338	Tender for superstructure only.	
B 1	Union Bridge Co.	52 ft. x 24 ft. at base, with semicircular ends	American lattice type, pin fastenings, span 415 ft.	2½ years..	159,000	168,000	326,000	No drawings furnished.
2	Do	Design not shown. Depths 20 ft. less than last.	American lattice type, pin fastenings, span about 250 ft.		160,000	117,000	277,000	
3	Do	Design not shown. Piers to full depth ...			189,000	117,000	306,000		do do
C 1	Phoenix Bridge Co.	Trestles of 24-in. columns braced	American lattice type, pin fastenings, 13 spans, Phoenix construction.	Delivery, 4 months. Erection, 9 months.			1,404,000	Superstructure iron.
2	Do	do do	American lattice type, pin fastenings, 13 spans, plate and angle construction.				1,432,000	do
3	Do	do do	American lattice type, pin fastenings, 11 spans, Phoenix construction.				1,414,750	do
4	Do	do do	American lattice type, pin fastenings, 11 spans, plate and angle construction.				1,444,700	do
D 1	Fforde & Young	10 ft. 6 in. cylinders in pairs, supported on piles.	Cantalever lattice type.	3 years ...			317,500	Iron and steel work delivery only.
2	Do	10 ft. 6 in. cylinders in pairs, to full depth		3 " ...			377,530	
3	Do	do do		3 years after arrival of first shipment.	30,107	71,907	403,367/5/3	
E	Royce & Co., & Butterley Co.	16 ft. cylinders in pairs.....	Riveted lattice, curved upper boom, main spans, 238 ft. 6 in.		245,156	158,211/5/3		
F 1	A. Handyside & Co.	15 do do	Riveted lattice, straight top, main spans 262 ft.	3 years ...			456,000	No responsibility as to piers
2	Do	do do	Bowstring, main spans 262 ft.....	3 " ...			435,000	
G 1	Arrol Bros.	Main piers 70 ft. x 33 ft., elliptical.....	Riveted lattice, curved upper boom, main spans 432 ft.	4 " ...	373,065	213,530	586,395	
2	Do	do do with reduced masonry.		4 " ...			580,000	
H	Do	18 ft. cylinders in groups of four	Riveted lattice, curved upper boom, main spans, 370 ft.	4 " ...	249,462/10	190,385	439,847/10	
I	Reichenbach, Godfrey, & Jones..	Rectangular, 54 ft. 3 in. x 22 ft.	Cantalever lattice, continuous, spans 392 ft. and 311 ft. alternately.	No time given			466,032/10	Abutments not included.
J	John Dixon	10 ft. cylinders in groups of four	Riveted lattice, curved upper boom, spans 251 ft.	2 years ...			486,100	
K	R. M. Parkinson.....	Cylinders 40 ft. diameter.....	Riveted lattice, continuous throughout, spans 338 ft.	4 " ...			584,898	
L 1	Fives-Lille Co.	Main piers circular, 57 ft. 5 in. diameter at base.	Bowstring with stiffened arc, spans 550 ft.	4 " ...			685,000	
2	Do	Same design in every respect; tender reduced.					515,000	
M	D. Munroe	14 ft. cylinders in pairs.....	Fish-belly lattice type, spans 289'6 ft.	3 years ..			702,384/3/4	Tender for superstructure only.
N 1	Dominion Bridge Co.....		American lattice type, pin fastenings, main spans 262 ft.			85,402		
2	Do		American lattice type, pin fastenings, main spans 328 ft.			91,586	do do	
3	Do		American lattice type, pin fastenings, main spans 343 ft.			98,857	do do	
O	P. & W. Maclellan.....		Riveted lattice, with straight top, main spans 261 ft.			92,535/6/2	do do	

No. 22.

Mr. Augustus Morris to The Engineer-in-Chief for Railways.

Sir,

24, Bridge-street, Sydney, 22 December, 1885.

My friends the Edgemoor Iron Co., who sent in a design and tender (£350,000) for the construction of the railway bridge over the River Hawkesbury, which, they inform me, has been recommended, jointly with another design and tender, for favourable consideration, think that the London Board of Engineers have not fully appreciated the value of the piers and foundations they submitted. They have laid their plans before three eminent American engineers who are accustomed to the foundations proposed, and they ask me to forward to you their opinions and other papers bearing upon the discussion. Mr. Shaler Smith is, perhaps, the first bridge engineer in America, and he is the professional adviser to the Canadian Government.

Mr. Wilson is the consulting engineer to the Pennsylvania Railroad, and Mr. Whitmore is the engineer of 5,000 miles of railway. I leave the whole matter, without comment in your hands, feeling assured that you will very quickly grasp whatever merit there is in the question.

I have, &c.,

AUGUSTUS MORRIS.

No. 23.

The Agent-General to The Colonial Secretary.

Hawkesbury Bridge.

Sir,

5, Westminster Chambers, 18 September, 1885.

I have the honour to inform you that applications are being made to me by tenderers for the Hawkesbury Bridge for the return of their drawings, in the event of their offers not being accepted.

As the whole of the documents are now in course of transit to you, I beg leave to ask that, so soon as the Government have come to a determination in the matter, the drawings may be returned to this Department, to be distributed to the various parties furnishing the designs.

I have, &c.,

SAUL SAMUEL.

The Secretary for Public Works.—P.A.J., 28/10/85. The Under Secretary for Public Works.—C.W., B.C., 29 Oct., /85.

In the last letter received from Agent-General, dated 18 September last, he said the detailed drawings would be forwarded by next mail. In this letter he says, "As the whole of the documents are now in course of transit," &c., &c. The drawings should therefore have reached us before this letter was received, but I have not seen them. Please make inquiry.—CHAS. A.G., 3/11/85.

I have made every inquiry, but cannot find that these drawings have yet come to hand. The Principal Under Secretary assures me that they have not arrived, and promises to let you have them as soon as he gets them.—G.B., 7/11/85. Commissioner. Let me hear directly next mail arrives.—C.A.G., 9/11/85.

Bill of lading now endorsed by Principal Under Secretary. Will Superintendent of Stores please obtain the case, and let me have it as early as possible, and return these papers.—G.B., B.C., 21/11/85. Urgent.

I have made arrangements for the delivery of these plans to the Commissioner at the earliest moment possible.—A.R. The Secretary, 23/11/85. Case of plans has been received from the steamer to-day, and sent to Engineer-in-Chief.—G.B., 25/11/85. Has the Minister sent the papers to the Engineer-in-Chief?—C.A.G., 1/12/85. The Minister says "yes—days ago."—C.A.G., 9/12/85. Superintendent of Stores to see.—G.B., B.C., 12/12/85. Seen.—A.R., 14/12/85. The Secretary.

No. 24.

The Agent-General to The Colonial Secretary.

Sir,

5, Westminster Chambers, 2 October, 1885.

Referring to my previous communications to you on the subject of the proposed bridge over the river Hawkesbury, and especially to my despatch 370/85, of the 18th ultimo, I have now the honor to forward herewith bill of lading for one case, shipped per "Iberia" s.s., containing the plans and documents relating to the bridge, which are enumerated on the particulars attached hereto.

I have, &c.,

SAUL SAMUEL.

The Under Secretary for Public Works.—B.C., 13/11/85.

HAWKESBURY BRIDGE.

List of plans and documents contained in tin-lined case forwarded to the Agent-General, 18th September, 1885:—

Bundle A.—THE EDGEMOOR IRON COMPANY.

General elevations, designs A and B; 18 drawings of details—blue prints.

Paper A. Specification of superstructure.

„ B. Detailed estimate of tender No. 1.

„ C. „ „ „ 2.

„ D. „ „ „ 3.

„ E. Schedule of prices for sinking cylinders upon plan A.

„ F. „ „ „ B.

„ G. Detailed estimate of tender No. 4.

Bundle B.—THE UNION BRIDGE COMPANY.

General elevation and drawings of details, Nos. 1 to 7 inclusive.

Detailed specification and tenders.

Designs 1, 2, and 3.

Bundle

Bundle C.—THE PHOENIX BRIDGE COMPANY.

General elevation and drawings of details, A to F, inclusive.
Specification and tenders—designs 1, 2, 3, and 4.

Bundle D.—MESSRS. FFORDE & YOUNG.

General elevation and drawings of details—Nos. 1 to 7 inclusive.
Specification and tenders—designs 1 and 2.
Schedule of prices and diagram of strains.

Bundle E.—MESSRS. ROYCE & COMPANY.

General elevation and drawings of details—Nos. 1 to 7 inclusive.
Specification for superstructure by the Butterley Company.
Tender for erection by Royce & Company.
Detailed estimate for superstructure by Butterley Company.

Bundle F.—MESSRS. HANDYSIDE & COMPANY.

General Elevations—designs Nos. 1 and 2.
Drawings of details—Nos. 3 to 15 inclusive.
Specification and tenders—designs Nos. 1 and 2.

Bundle G.—MESSRS. ARROL BROTHERS.

General elevation—design No. 1, drawing No. 1.
" alternative design, drawing No. 1a.
Drawings of details—Nos. 2 to 7 inclusive.
Description and specification.
Tender for construction and erection; also, supplementary tender for materials for superstructure.

Bundle H.

General elevation—design No. 2, drawing No. 1.
Drawings of details—Nos. 2 to 7 inclusive.
Description and specification.
Tender for construction and erection.

Bundle I.—MESSRS. REICHENBACH & GODFREY.

General elevation and drawings of details—Nos. 1 to 7 inclusive.
Specification, tender, bill of quantities.
Strains on girders.
Letters of introduction, &c. to Agent-General.

Bundle J.—JOHN DIXON.

General elevation and diagrams of strains—drawing No. 1.
Drawings of details—Nos. 1 to 4 inclusive.
Specification, tender, estimate of weights and quantities.

Bundle K.—R. PARKINSON.

General elevation and drawings of details—Nos. 1 to 3 inclusive.
Diagram of strains—specification and detailed tender.

Bundle L.—FIVES-LILLE COMPANY.

General elevations—designs Nos. 1 and 2.
Drawings 1 and 2.
Drawings of details—Nos. 2 to 15 inclusive.
Details of girders and piers.
Diagram of strains, &c.
Resistance calculations.
Detailed estimates, and condition of execution of works, &c.
Tenders and correspondence.
Amended tender.

Bundle M.—DOMINION BRIDGE COMPANY.

Drawings, specification and tender for superstructure only.

Bundle O.—E. P. MILLAR (Melbourne).

Specification and detailed estimate. (Tender withdrawn). No drawings sent in.

Bundle P.—P. & W. MACLELLAN.

General elevation and details for superstructure.
Specification and tender for superstructure only.

Bundle Q.—J. R. BELL.

General elevation.
Details of girders.
Schedule and tender incomplete.

No. 25.

Messrs. Eldred & Co. to The Secretary for Public Works.

Tender for the Hawkesbury Bridge.

Sydney, 7 October, 1885.

Sir,

Craving reference to our respects of 29th June last, we beg to advise that we have received instructions from our friends the Phoenix Bridge Company to communicate to you their willingness to reduce the amounts of the tender sent by them for the construction of the above bridge by 5 per cent., of which we have now to request you will be good enough to take note.

We remain, &c.,
ELDRED & CO.

No. 26.

Mr. R. W. Cameron to The Commissioner for Railways.

New York, 12 October, 1885.

My dear Goodchap,

Mr. Field has just called on me to say that he departs hence for Sydney by the present out going steamer *vid* San Francisco. Mr. Field is one of the leading members of the Union Bridge Company Firm, and visits your Colony in the hope of securing the contract for building the Hawkesbury River structure. His firm is certainly second to none in this Great Republic; but the purport of this is to introduce him to you socially, in order that he may enjoy the pleasure of your friendly acquaintance. I am quite sure you will be mutually pleased with each other, and thanking you in advance for your courtesy,

I have, &c.

R. W. CAMERON.

I have seen General Field, and issued a free pass over the railways for his use.—CHAS. A. G.

No. 27.

Messrs. Eldred & Co. to The Secretary for Public Works.

Tender for the Hawkesbury Bridge.

Sydney, 20 November, 1885.

Sir,

We crave reference to our respects of 29th June and 7th October last, regarding the tender entered by our friends, the Phoenix Bridge Company of Philadelphia, for the construction of the above bridge, and to intimate to you the following, which, we trust, will have your kindest consideration:—

1. In response to the call made for tenders they, in a letter addressed to the Agent-General, dated 12th May last, offered to make this bridge under four different sizes and styles for certain given amounts.

2. These amounts they altered in a telegram to Sir Saul Samuel, of 27th May, by an increase of \$150,000.

3. On receipt of copies of these from Philadelphia, we at once conjectured that they laboured under a misapprehension regarding certain points, and while advising your Department in ours of 29th June, that we were urging the Company to at least reduce this increase, we gave them information which we thought would warrant such a reduction. Under instructions received from them, we, in ours of the 7th ultimo, intimated to your Department that the Phoenix Bridge Company agreed to reduce the amended tender by 5 per cent.

4. Now, after more full and complete explanations by letter and cable, it appears that our conjecture was correct, and having never done work for this Colony, they formed inconceivably erroneous impressions, which prompted them to send the already mentioned amended tender of 27th May.

5. We are, however, now in receipt of a final instruction by cable, dated Philadelphia 10th inst. to restore the tender to the original sums contained in their above-mentioned first letter to Sir Saul Samuel, dated 12th May, 1885.

6. We trust, therefore, that you will be good enough to consider that as the only tender in force of the Phoenix Bridge Company of Philadelphia for the construction of the projected Bridge over the Hawkesbury.

7. The figures of their tender are now, therefore, to be taken as follows:—

Phoenix construction, substructure	\$627,000
Thirteen spans, superstructure	627,000
Total	\$1,254,000
E. & O. E.	
Plate, angle construction, substructure	\$627,000
Thirteen spans, superstructure	655,000
Total	\$1,282,000
E. & O. E.	
Phoenix construction, substructure... ..	\$547,000
Eleven spans, superstructure	717,750
Total	\$1,264,750
E. & O. E.	
Plate and angle construction, substructure	\$547,000
Eleven spans, superstructure	747,700
Total	\$1,294,700
E. & O. E.	

Other terms and conditions as contained in aforesaid letter being unchanged.

8. You will observe the rapidity with which they undertake this large work shall be completed, and as not only their reputation as first rank bridge builders, who, without a single failure, have already constructed over 70 miles of railway and other bridges, is guarantee of perfect work being done in this instance, but they and we feel convinced, that once seen, the quality of bridges put up by them will induce further work ; and as their representatives here, we trust their tender may be the one selected.

We have, &c.,
ELDRED & CO.

No. 28.

Messrs. Eldred & Co. to The Secretary for Public Works.

Sir,

Sydney, 26 November, 1885.

Referring to our official of 20th inst., affecting a tender for the construction of the Bridge over the Hawkesbury, we trust we may be forgiven for what may be considered as trenching on ground which is forbidden, but as all matters affecting the Colony may be deemed as of importance to each individual in it, and as our purpose is to convey the opinion of a recognized leader of his profession, we hope our temerity will not offend. You are doubtless aware of the high ability of Mr. W. W. Evans, Civil Engineer, of New York, and Member of the Institute of Civil Engineers of London, who, now a very old man, has spent a lifetime to good purpose in engineering matters all over the world. You know, also, that the high opinion entertained of his ability and probity prompted the Agent-General, or his advisers, to request him to act as member of the Commission of investigation of tenders for this Bridge, and which, owing to ill-health, at his advanced age, he was reluctantly obliged to refuse, although he thoroughly recognized and appreciated the compliment paid to him. Mr. Evans has all along felt much interested in the proposed great Bridge, as the following extracts of some of his letters, especially those last received, will show. He says : "It does not matter a penny to me who gets the work, but what bothers me and worries me is to see your Government waste a pile of money on a double track bridge when a single track bridge would do as well ; a double track bridge for a single track railway would be looked on here as an abominable extravagance, and any engineer here who would propose such a thing would not hold his position. I will venture to bet a round sum that the difference in cost between a single track bridge and a double track bridge over the Hawkesbury, put out at compound interest, would build a second bridge for a second track every fifteen years or less."

Quoting a circumstance which occurred during a visit to London in 1853, he goes on to say : "It was about this time that John Weale, of London, published his book called 'Examples of Railway Building,' in which he takes an English and an American railway and compares them. If you can find a copy of this work and read it, you will have some points to base an argument on against extravagance in railway building."

Again: "You will see in Mr. Mais' Railway Report on his tour round the world, plate 67, a picture of how we sometimes make a *single track bridge* answer for a double track railway." He finishes thus : "If you can get your Government to insist on single track bridges being built until it is clear that double tracks are required, you will be doing your Colony a good service." As you are aware, the designs furnished by our friends, the Phoenix Bridge Company, adopt the use of the well known "Phoenix" columns for the piers of the substructure.

Whether or not these columns have found favour in the eyes of the examiners we, of course, do not yet know, but it is a matter of certainty that, whereas the systems of the ordinary caissons would not allow of the single track being doubled, unless they are originally built for a double bridge, the Phoenix principle will allow of a complete single bridge being built now, and when an enlargement is demanded, additional columns can be added without interfering with the original bridge, indeed adding strength to it. By this method the money now to be expended would be reduced to the lowest possible point.

On this subject we can, if required, easily get from our principals, by cable, an estimate of what such single bridge would cost, and what the increase would be for its alteration—years hence, perhaps, and then reduced by cheaper improved iron—into a double bridge.

These points having all been brought to our notice by such a high recognized authority in a thorough going country as America, we think we are only discharging an imperative duty as colonists in placing his opinion before you, and trust we may have your indulgence for having done so.

We have, &c.,
ELDRED & CO.

As Mr. Evans is ignorant of the subject on which he has written I forgive him ; but I cannot excuse Messrs. Eldred & Co. for sending copies of his communications to this Department.

J.W., 17/12/85.

No. 29.

Messrs. Eldred & Co. to The Secretary for Public Works.

Tender for the Hawkesbury Bridge.

Sir,

Sydney, 21 December, 1885.

Referring to our respects of 20th ultimo, we have now to intimate that, being in receipt of letters from our friends, the Phoenix Bridge Company, confirming their telegram of 10th November, to which we referred under No. 5, they have now further authorized us to make an offer to construct only the superstructure of the said bridge at the corresponding prices set down in their original tender of May the 12th last.

Trusting you will be good enough to take note of this,

We remain, &c.,
ELDRED & CO.

Mr. Whitton.—J.R., B.C., 23/12/85.

No. 30.

W. H. Eldred to The Under Secretary for Public Works.

My dear Rae, Sydney, 7 January, 1886.
Will you kindly ask the Honorable the Minister for Works if he will have the goodness to grant me an interview, and when, as I am anxious to see him. Your reply will oblige,

Yours, &c.,

W. H. ELDRED.

I will see Mr. Eldred Monday next 2:30 p.m.—J.G., 8/1/86. Write at once.

No. 31.

Messrs. Eldred & Co. to The Secretary for Public Works.

Sir,

Sydney, 11 January, 1886.

We take the liberty of craving reference to our respects of 26th November last addressed to your predecessor.

A few days ago we learnt to our extreme astonishment and sorrow that we had unwittingly given offence to a highly esteemed officer of your Department, viz., Mr. Whitton, by the use of an expression taken from the letters we quoted.

We do not for a moment deny that the purport of the letter was, if by any straightforward means we might advance the claims of our constituents *re* the contract for the big bridge; but we most emphatically assure you that it never for a moment struck us that such an offence, as we have mentioned, existed in the letter. We must, however, admit now that our attention has been called to it that such an interpretation can be put upon it, and we consequently determined to wait upon you to express our unbounded regret, and to support this written assurance, that neither at the time of writing, nor at any other time, had we any intention of casting a reflection on such a long tried and faithful servant of the Colony as your Engineer-in-Chief, Mr. J. Whitton.

Requesting that you will be good enough to communicate to Mr. Whitton this expression of our apology and regret at the unintentional slight contained in our letter, We have, &c.,

ELDRED & CO.

Engineer-in-Chief.—J.G., 11/1/86. I had no intention of taking any further notice of this matter, as I am quite sure that so far as Captain Eldred is concerned the communication referred to had not his concurrence.—J.W., 15/1/86. Under Secretary, B.C. Submitted.—J.R., 18/1/86. Seen.—J.G., 18/1/86.

No. 32.

Minute by The Engineer-in-Chief for Railways.

Hawkesbury Railway Bridge,—Union Bridge Co.'s design.

Engineer-in-Chief's Office, Sydney, 22 January, 1886.

If the above Company approve of the following conditions, in addition to those already printed, I advise that their tender of £327,000 be accepted.

Complete working drawings and specification, to be furnished and approved before the contract is signed.

A schedule to be sent in stating the price at which any increase or diminution of work shall be allowed for.

The horizontal stiffener, extending from the inclined strut at the ends of the main girders, to be extended so as to stiffen two more of the vertical struts at each end.

The area of cross section of the bottom boom in the third bay to be increased, the tensile strain being somewhat in excess of the tensile strain named in the printed conditions.

The outer skin of the caisson, where it is flat and unsupported for a length of 14 feet between the centres of the cylinders sunk within it, would require staying to the cylinder and to an inner plate extending from the centre lines of the cylinder, at a distance of about 6 feet from the outer skin; also the thickness of some of the plates forming the caisson should be increased and stiffened by vertical and horizontal T and L bars at the joints.

The longitudinal bearers under the rails should be deepened and more securely braced.

The testing of the eye-bars to be carefully carried out in accordance with the most recently approved method.

The cement concrete for the caisson to be formed with Kiama bluestone instead of sandstone, as proposed, which will increase the cost about 6s. a cubic yard. The proportion of cement shall not be less than one part of cement to nine parts of broken stone, gravel, &c., each measured separately.

I propose that the contractors shall be paid this difference in the value of the concrete, which will amount to about £7,800, and by using this improved concrete the outer walls (18 inches in thickness) round the inside of the caisson, as suggested by the Board in London, may be dispensed with.

I also propose that the cost of strengthening the ironwork, named above, shall be paid to the contractors at prices to be agreed upon, the total cost not to exceed £15,000; but should any increase in strength be required to any other portions of the bridge, after the detail drawings have been prepared, the total cost of such additional ironwork and labour shall be provided at the expense of the contractors.

As I understood that all the detailed drawings and the specification of this bridge will be prepared in London, and the larger proportion of the ironwork manufactured there, I propose that in order to save time these be referred to Sir John Fowler, as Inspecting Engineer to the Government, whose decision in all matters affecting the stability of the bridge shall be binding on the contractors.

A formal contract can also be entered into in London by the Agent-General and the Union Bridge Company. As General Field, the agent of the Company, is anxious to leave the Colony not later than the 28th instant, I have written this paper as a provisional arrangement to enable him to do so. He should, however, be asked to give his sanction in writing to my proposals before leaving.

My report on the whole of the designs for this bridge will follow in a few days.

JOHN WHITTON.

The

The following minutes are endorsed on the Engineer-in-Chief's report of 22/1/86 :—

Minute by Secretary for Works.

For the favourable consideration of the Cabinet.—J.G., 25/1/86.

Minute of Premier.

The Cabinet concur in recommendation of the Minister for Works and the Engineer-in-Chief.—JOHN R., 25/1/86.

Minute by Commissioner.

Letter to General Field, the accredited representative of the Union Company, submitting these amendments and additions to the specification and conditions, and intimating that if he will, on behalf of his Company, express his acceptance of these terms the Agent-General will be instructed to enter into a contract with his Company for the construction of the work.—CHAS. A.G., 27/1/86.

Minute of Commissioner.

See letter from Mr. Field in reply agreeing to terms dated 27/1/86. Letter to Agent-General forwarding correspondence and requesting him to enter into contract upon the amended terms, impressing upon him the importance of the work being completed within contract time, viz, two and a half years after execution of contract, and intimating that a penalty should be exacted at £2,000 per week or a portion of a week the contract time is exceeded.—C.A.G., 1/2/86.

No. 33.

The Commissioner for Railways to General G. S. Field.

Sir,

Department of Railways, Sydney, 27 January, 1886.

Referring to the tender, No. 3, from the Union Bridge Company, New York, U.S.A., of which Company you are the accredited representative, for the construction of a bridge over the Hawkesbury River, N.S.W., I have the honor to inform you that if the above Company approve of the following conditions, in addition to those already printed, the Government of this Colony will instruct the Agent-General to accept their offer and to execute a contract embodying the printed and these additional conditions, viz :—

The Company to furnish complete working drawings and specifications, to be approved of by the Inspecting Engineer in England before the contract is signed.

The Company to submit a Schedule stating the prices at which any increase or diminution of work shall be allowed for.

The horizontal stiffener, extending from the inclined strut at the ends of the main girders, to be extended, so as to stiffen two more of the vertical struts at each end.

The area of cross section of the bottom boom in the third bay to be increased.

The outer skin of the caisson, where it is flat and unsupported for a length of 14 feet between the centres of the cylinders sunk within it, to be stayed up to the cylinder and to an inner plate extending from the centre lines of the cylinder at a distance of about 6 feet from the outer skin.

The thickness of some of the plates forming the caisson to be increased and stiffened by vertical and horizontal T and L bars at the joints.

The longitudinal bearers under the rails to be deepened and more securely braced.

The testing of the eye-bars to be carefully carried out in accordance with the most recently approved method.

The cement concrete for the caissons to be formed with Kiama bluestone, instead of sandstone as proposed. The proportion of cement to be not less than one part of cement to nine parts of broken stone, gravel, &c., each measured separately. This difference in the value of the concrete to be paid for at the rate of 6s. per cubic yard.

The cost of strengthening the iron work named above to be paid to the contractors at prices to be agreed upon, the total cost not to exceed £15,000. Should any increase in strength be required to any other portions of the bridge, after the detail drawings have been prepared, the total cost of such additional iron work and labour to be provided at the expense of the contractors.

As it is understood that all the detail drawings, specifications, &c., will be prepared in London, it has been determined in order to save time, that your Company shall submit, through the Agent-General, such drawings, &c., to be referred to Sir John Fowler, as Inspecting Engineer of the Government, and whose decision on all matters affecting the stability of the bridge shall be binding upon your Company.

In the event of the acceptance of these additional conditions, which must be at once communicated to me in writing, the Agent-General will be instructed to enter into contract with your Company for the construction of the bridge on the terms and conditions of your tender as amended.

I have, &c.,

CHAS. A. GOODCHAP.

No. 34.

The Union Bridge Company to The Commissioner for Railways.

Sir,

Sydney, 27 January, 1886.

We have your letter of this date relating to additional conditions in the matter of the contract for the Hawkesbury Bridge. We accept the additional conditions, and hereby amend our tender accordingly. We shall be able to present to the Agent-General, at his office in London, on or about 1st April, 1886, with the plans mentioned for the approval of the Inspecting Engineer in England. We trust that full instructions and all papers will have been received by that time, that no delay will occur in executing the contract, with a view of starting the work at once.

UNION BRIDGE CO.,
(By Geo. S. Field).

Agent-General advised, 1, 2, 86.

No. 35.

The Secretary for Public Works to The Agent-General.

Sir,

Department of Railway, Sydney, 1 February, 1886.

Referring to your letter of the 11th September last, covering tenders for proposed railway bridge over the Hawkesbury River, together with the Board of Engineers' and the Inspecting Engineer's reports, I have the honor to inform you that this Government has decided to accept, subject to certain amendments, the tender, No. 3, for £327,000, submitted by the Union Bridge Company of New York, for the construction of the bridge, the acceptance of such tender being recommended by the Board of Engineers and the Inspecting Engineer in England, and by the Engineer-in-Chief of this Colony.

The basis of the proposed amendments is set forth in the copy of letter enclosed, addressed to Mr. G. S. Field, the accredited representative of the Union Bridge Company.

Mr. Field, on behalf of the Company, has signified his acceptance of the new conditions in a letter dated 27th instant (copy enclosed), and is willing that the Company's tender be amended.

I shall be glad if you will enter as early as possible, on behalf of this Government, into the necessary agreement in this matter, on the basis of the tender and our amendments therein.

The time for the completion of the work to be as stated in the Union Bridge Company's offer, 2½ years, and the Company should be given to understand that no extension of time will be allowed, as it is most important that the bridge should be completed within the contract time. Penalties must, of course, be provided in the conditions for the non-fulfilment of the terms of contract, which should be £2,000 per week, or portion of a week, beyond the stipulated time.

I have, &c.,
J. GARRARD.

No. 36.

The Compagnie de Fives-Lille to The Minister for Public Works.

Sir,

Sydney, 29 January, 1886.

I have the honor to inform you that, at the invitation of the Government of New South Wales, the Compagnie de Fives-Lille, which I represent in Australia, have sent in a competitive design and tender for a bridge over the Hawkesbury River.

I hear that this contract is probably going to be given to an American firm.

I now respectfully beg to request you that the report of the engineers who have examined the designs should be communicated to me, that I may know on what grounds we have been discarded, and be allowed, as a matter of justice, to present my remarks in defence of the interests of my company before the Government arrive at a final decision.

I trust that you will consider my request entirely justified in consideration of the fact that we are the only Continental firm who have responded to the invitation of the Government, and that we have gone to a greater amount of trouble and expense than any of the other tenderers, in order to supply you with a first-class design and a *bona fide* tender.

I remain, &c.,

(Per pro Co. de Fives-Lille),

CLEMENT VAN DE VELDE.

Acknowledge this, and say that his letter will receive consideration.—J.G., 29/1/86. Done, 31/1/86. The Union Bridge Co.'s tender has been accepted.—D. C. M.L., 3/2/86.

There was a recommendation by the Board of Engineers I think, that in consideration of the interest taken in this matter of the bridge by eminent firms, who submitted most elaborate plans at considerable expense, an expression of the thanks of the Government might be tendered when intimating to those interested the result of the competition.—CH. A.G., 4/2/86.

Minute of Commissioner.

Keep this, in order that the recommendation may be acted upon generally when papers are returned. The Agent-General will be asked to write the letters when returning the plans to tenderers, &c., who sent their offers through him.—CHAS. A. G., 5/2/86.

No. 37.

Minute of Commissioner.

Proposed Railway Bridge over the River Hawkesbury.

The only action now remaining in respect of the tenders and designs received is to return to the unsuccessful tenderers their plans, &c., and to intimate to them the result.

Sir John Fowler in his report on these designs has a paragraph to the following:—"In my work of investigation of the drawings, tenders, and calculations which preceded the preparation of this report, I was much impressed with the amount of labour and expense which the parties tendering for the Hawkesbury Bridge must have incurred, and I would suggest that the New South Wales Government might perhaps be disposed, in communicating their final decision to the contractors, to recognize the fact of careful and laborious work in the preparation of the designs by the terms of their communication to the parties whose tenders are not accepted. If this suggestion be thought worthy of consideration, the mode of giving effect to it will be better determined at Sydney than by anything I can propose for the guidance of the Government."

There are thirteen unsuccessful tenders (some with more than one design, and three tenders for superstructure only.)

The terms of Sir John Fowler's recommendation or suggestion would seem to imply that the recognition should take a more substantial shape than words of appreciation and thanks.

A graceful way, perhaps, of recording the appreciation of the Government would be to have a gold medal struck with appropriate inscription, to be presented to each of the tenderers. The Agent-General could get this done in London, and present them on behalf of the Government.—C.A.G., 6/3/86.

Minute

Minute of Secretary for Works.

I do not object to the suggestion being carried out, but should like to know the cost likely to be incurred.—W.J.L., 16/3/86.

I suppose the cost would not exceed £150. Please ask some of the medallists.—C.A.G., 18/3/86. £150 will more than cover the cost of thirteen first-class medals.—D.C. M'L., 23/3/86. Approved cost not to exceed £100.—W.J.L., 22/4/86. Agent-General advised, 12/5/84.

No. 38.

Telegram from The Agent-General, London, to The Colonial Secretary.

London, 20 April, 1886.

HAWKESBURY Bridge settled, except penalty. Field agrees to £250 per week delay. Same premium, earlier completion. Fowler considers this usual condition. Recommends acceptance. Contractors to give Bank deposit receipt, payable to order Government in Sydney, for £10,000 instead sureties. Reply quickly. SAMUEL.

Government approve Fowler's recommendation Hawkesbury Bridge. Penalties, premium, and deposit, £10,000.—G.R.D. Inform,—C.A.G.

Minute of Commissioner.

I do not think the Government should be asked to pay premiums for earlier completion. The contractors will get returned the retention money and the deposit money, which should be sufficient compensation. The question whether £10,000 should be accepted as security for proper completion of contract instead of personal security should be referred for the opinion of the Engineer-in-Chief.—C.A.G., 21/4/86.

Approved.—W.J.L., 22/4/86. Engineer-in-Chief, *pro* Commissioner.—G.B., B.C., 24/4/86.

As the Union Company fixed the time for completion of this bridge themselves, I do not think they should be paid a premium for completing before that time. I am under the impression that Messrs. Cameron & Co., of New York, guaranteed the due completion of this bridge by the Union Co. I have not the original papers to refer to, but if this be so, it would be better to accept them as sureties instead of the cash security of £10,000 proposed.—J.W., 28 April, /86.

Minute of Premier.

Cabinet approve of premium and penalty being paid, and that the £10,000 security be accepted instead of sureties.—P.A.J., 29/4/86.

Dear Lyne,

Colonial Secretary's Office, Sydney, Thursday.

Samuel's cable *re* Hawkesbury Bridge,—Will you decide, and let me have your decision, as to the reply to be made? They are cabling from home for your decision. G.R.D.

Copy of cablegram sent by Colonial Secretary herewith.—D.C.M'L., 4/5/86. Government approve Fowler's recommendation Hawkesbury Bridge. Penalties, premium, and deposit £10,000 here.—GEORGE R. DIBBS, 29 April, /86.

No. 39.

The Secretary for Public Works to The Agent-General, London.

Bridge over the Hawkesbury River.

Sir,

Department of Railways, Sydney, 12 May, 1886.

I have the honor to inform you that the design and tender of the Union Bridge Company of New York for the above named bridge having been accepted, it only remains to return the plans to the unsuccessful tenderers, and to acquaint them with the result.

This I will ask you to do; but we can scarcely close our intercourse with the gentlemen who have devoted so much talent and time and labour to the matter with a bare intimation that they have been unsuccessful.

Sir John Fowler, in his report on the designs, writes as under:—

"In my work of investigation of the drawings, tenders, and calculations which preceded the preparation of this report, I was much impressed with the amount of labour and expense which the parties tendering for the Hawkesbury Bridge must have incurred; and I would suggest that the New South Wales Government might perhaps be disposed, in communicating their final decision to the contractors, to recognize this fact of careful and laborious work in the preparation of the designs by the terms of their communication to the parties whose tenders are not accepted. If this suggestion be thought worthy of consideration, the mode of giving effect to it will be better determined at Sydney than by anything I can propose for the guidance of the Government."

The terms of Sir John Fowler's recommendation would seem to imply that, in his opinion, the recognition by the Government should take a more substantial shape than mere words of appreciation and thanks.

In this view I cordially concur; and it seems to me that it would be a graceful mode of showing the appreciation of the Government to present to each of the unsuccessful tenderers a gold medal bearing a suitable inscription.

I shall be glad if you will take steps to have the requisite number of medals struck off, at a cost not exceeding £100, and that you will present a medal to each of the unsuccessful competitors, accompanied by a letter in suitable terms, expressive of the high appreciation of the Government of the talent displayed in the preparation of the respective designs.

I may add, that the sum of £100 will be placed at your disposal for this purpose.

I have, &c.,
WILLIAM JOHN LYNE.

No. 40.

The Secretary for Public Works to The Engineer-in-Chief for Railways.

Re Hawkesbury Bridge.

Department of Public Works, Sydney, 19 May, 1886.

I SHALL be glad if the Engineer-in-Chief will advise me if the Government have anything to do with the carriage of the materials from America for the Hawkesbury railway bridge. Have the Union Company an agent in Sydney? if so, please give name, and can Mr. Whitton say what has been done towards the commencement of the work?

W. J. L.

The Government has nothing to do with the carriage of the bridge material from America or elsewhere, the contract of the Union Company being to fix the bridge complete. I am not aware that the Company has an agent in the Colony. I understand that the detailed drawings for the bridge are being prepared in London.—J. W., 21/5/86. Seen.—W. J. L. Under Secretary.—B. C.

No. 41.

The Agent-General, London, to The Secretary for Public Works.

Hawkesbury Bridge.

Sir, 5, Westminster Chambers, London, 21 May, 1886.

Referring to your letter of the 1st February last, 86-1444, in which you desired me to enter into a formal contract for the construction and erection of the Hawkesbury bridge, upon the terms set forth in the tender of the Union Bridge Company of New York, forwarded in your before quoted communication, I have the honor to inform you that, yesterday, the formal contract was duly signed by General Field, on behalf of the Union Bridge Company, at this Department, and I hope by next mail, to be able to forward to you copies of the contract.

I take this opportunity to draw attention to the power of attorney held by myself on behalf of the Commissioner for Railways.

The power in question, in accordance with the opinion of Mr. Want, only gives me authority to enter into contracts for the purpose of purchasing plant and machinery for the Commissioner for Railways; and Mr. Want is of opinion that I should hold an authority having a more general power, as the one I now possess does not permit of me to enter into contracts such as that for the Hawkesbury bridge.

I have, &c.,
SAUL SAMUEL.

Minute of Commissioner.

The question of the sufficiency of the Agent General's authority to act for the Commissioner for Railways has been referred to Crown Solicitor by separate memo.

C.A.G.
17/7/86.

No. 42.

The Agent-General, London, to The Secretary for Public Works.

Hawkesbury Bridge.

Sir, 5, Westminster Chambers, London, 28 May, 1886.

20th May, 1886.
Contract.

In continuation of my letter P.W. 76-86, of 21st instant, I have now the honor to forward herewith the contract entered into with the Union Bridge Company of New York, U.S.A., for the construction of a bridge over the Hawkesbury River.

The signed drawings will be forwarded by a subsequent opportunity. I also enclose a copy of a letter addressed to me by the Inspecting Engineer, in regard to the final arrangements made respecting this contract.

I have, &c.,
SAUL SAMUEL.

Hawkesbury Bridge.

Sir, 2, Queen-square Place, Westminster, S.W., 27 May, 1886.

The contract with the Union Bridge Company for the above work being concluded, I have now to report the final arrangements made by myself and the contractors represented by General Field.

In settling the details of the specification, I have given due consideration to the instructions received from the Secretary of Public Works (February 1st), the correspondence between Commissioner of Railways (January 27th) and General Field; and also to the suggestions of the Engineer-in-Chief for Railways, embodied in a letter addressed to me and dated March 1st, 1886.

I am glad to be able to report that no difficulty has arisen in settling the contract in conformity with the spirit of my instructions, and on a satisfactory basis, the contractors having shown every desire to meet my views on all important points.

Detailed

Detailed drawings and specification.

The detailed drawings submitted to me here by the contractors differed in some respects from those accompanying their tender. The modifications were, however, in my opinion, improvements; and I accepted them, after making exact calculations of all stresses, and ascertaining that the section of metal proposed to be given to the different members of the bridge was in accordance with the maximum stresses which were specified.

In accordance with the suggestions of the Engineer-in-Chief, additional stays have been introduced in the caissons, and the thickness of some of the plates has been increased. Ample provision is thus made against every contingency.

Experience has disclosed a possible source of danger in exceptionally deep foundations, from the tearing of the iron caissons through a circumferential seam of rivet-holes, owing to the severe stress arising from the binding of the sand on the upper part of the caisson, and from the excavation being in advance of the cutting edge.

Under the contract this, as well as all contingencies of construction, is the sole responsibility of the contractors; but I thought it proper to point it out to General Field, and I suggested to him that the best way of completely guarding against all risk would be to make the outer skin of the caissons and the T bar covers of steel instead of iron, and to strengthen the riveting considerably. He at once saw it was vital to the interests of the contractors to take every precaution to guard against such a risk as I indicated, and he undertook, therefore, to substitute steel for iron, and therein strengthen the caissons, as suggested, without extra cost.

I have thus been able to make a very satisfactory settlement financially, the total extras amounting to £13,000 only, or about £10,000 less than the sum I was authorized to accede to, if necessary.

This £13,000 includes the £7,800 proposed in the letter of the Engineer-in-Chief, dated January 2nd, 1886, to be paid for the substitution of Kiama bluestone for sandstone in the concrete; and further includes the substitution of crushed sandstone for local sand in the mortar and concrete, and also the strengthening of the metal-work where indicated.

It is unnecessary for me to set forth the several clauses of the contract, which were all arranged after careful discussion and consultation with the solicitors. They have been specially framed with a view to prevent disputes arising hereafter, and are, in my opinion, fair and equitable as between the parties.

One of the points which received my most careful consideration was the clauses affecting the pier-work. The tender was for piers sunk through the material shown by the borings furnished to the contractors, and it was necessary to provide for the contingency of the material which may be met with in the excavation of the piers differing from that described in the borings, and which in very deep foundations is not unusual.

To meet this possible contingency, an arbitration clause has been introduced in the contract, which will provide a fair basis for settlement, in the event of any important difference arising as regards the character of the material sunk through.

Steel Superstructure.

The manufacture of the steel superstructure, with the exception of the eyebars, has been undertaken by Messrs. Arrol & Co., the contractors of the Forth bridge, which will be a sufficient guarantee of excellence of material and workmanship. The steel plates and bars will be rolled by Messrs. Colville, of Glasgow, one of the best makers; and the steel for the eyebars by the Steel Company of Scotland, also a firm of the highest reputation.

Caissons.

The manufacture of the steelwork and ironwork of the caissons has been undertaken by Messrs. Head, Wrighton, & Co., of Stock-on-Tees, who have much experience in this class of work.

Cement.

The whole of the cement will be supplied by Messrs. Burge & Barrow, of Rainham, who are in the first rank of cement manufacturers.

It is proper for me to state that, in sub-letting the work to the above firms, the contractors have been greatly guided by my experience and knowledge as to the works executed and character of the firms, and not merely by the price quoted.

I am, &c.,
JOHN FOWLER.

No. 43.

Telegram from The Agent-General, London, to Acalemma, Sydney.

Is Hawkesbury bridge deposit sackage lodged? Send credit, shipments now being made.

The Under Secretary for Public Works.—B.C., 15 July, 1886.

No. 44.

Telegram from Union Bridge Company, New York, to The Commissioner for Railways.

15 July, 1886.

Has deposit been made to your satisfaction?

See telegram to Colonial Secretary from Agent-General. Union Bridge Company propose making deposit in London. Mr. Secretary Lyne had no objection, provided expenses of transmission of money to Colony are borne by Company. Telegram sent to Agent-General through Colonial Secretary. When reply is received will reply to this cablegram.—C.A.G., 21/7/86.

Principal Under Secretary written to to-day, asking him to send cable to Agent-General.—27/7/86.

Minute

Minute of Commissioner.

Mr. Stokes, of Towns & Co., called upon me recently in respect of the security. Write to Towns & Co., stating that I have now received contract duly executed, on the 20th May. One of the conditions, of which is that £10,000 should be deposited in my favour in a Sydney Bank, as security, within sixty days. As the time will expire on the 20th July instant, point out that the deposit receipt of the Commercial Bank should be in my hands by that date.—C.A.G., 17/7/86.

Minute by Commissioner.

See telegram from Agent-General to Colonial Secretary, asking if deposit can be made in London. Reply, with Mr. Secretary Lyne's approval, sent. No objection, provided expenses of transmitting money to the Colony are borne by Company.—C.A.G., 29/7/86.

Messrs. Towns & Co., agents for the Union Bridge Company, written to to-day to provide a bank deposit receipt for £10,000, as security on the contract, on or before the 20th instant. Resubmit this on 20/7/86.—D.C. M'L., 17/7/86.

No. 45.

The Commissioner for Railways to Messrs. Town & Co., Sydney.

Gentlemen, Department of Railways, Sydney, 17 July, 1886.

Referring to your Mr. Stokes inquiry of a few days since, relative to the security to be deposited by the contractors in connection with their contract for the bridge across the Hawkesbury River, I have the honor to inform you that I received the contract for this bridge, duly executed, on the 20th May last, one of the requirements of which is that there shall be deposited in some bank in Sydney, approved of by me, the sum of £10,000, before the expiration of sixty days from the abovementioned date. As the sixty days will expire on the 20th instant, I have to point out that a deposit receipt on the Commercial Bank for £10,000 in my favour should be in my hands by that date.

I have, &c.,
C. A. GOODCHAP,
Commissioner for Railways.
(per D. V.).

No. 46.

Telegram from The Agent-General, London.

UNION Bridge Company have cabled credit sackage here. Reply quickly if I can accept and transfer to credit of Government in Colony.

Minute of Commissioner.

No objection, I presume; but all charges for bringing money out should be borne by contractors.—CHAS. A. G., 21/7/86.

Minute of Secretary for Works.

There is no objection if charges are paid. Send telegram.—W.J.L., 21/7/86.

Cablegram herewith for signature and transmission to Agent-General, 21/7/86. Union Bridge Company. Accept deposit. Charges of transfer to Colony must be borne by Company. Reply.—D.C.M'L. (pro Commissioner), B.C., 21/7/86. Principal Under Secretary. Very Urgent.

No. 47.

The Agent-General, London, to The Colonial Secretary.

Sir, Westminster Chamber, London, 23 July, 1886.

Referring to the telegrams that have recently passed between your Department and mine, respecting the deposit to be lodged by the contractors (the Union Bridge Company, New York), in respect of their contract for the Hawkesbury Bridge, I have the honor to inform you that Messrs. Brown, Shipley, & Co., of London, have received the amount from the Union Bridge Company to be handed over to me on account of the Commissioner of Railways, as provided for in their contract.

I have, accordingly, requested Messrs. Brown, Shipley, & Co. to pay the amount at once into the London and Westminster Bank to the credit of the Government account, and I propose to cause the said amount to be transferred to Sydney without delay; and I anticipate being able, by the next mail, to report to you that the transfer has been made.

I have, &c.,
SAUL SAMUEL.

No. 48.

Telegram from The Agent-General, London.

26 July, 1886.

UNION Bridge Company have lodged deposit, ten thousand, to credit Government, London and Westminster Bank.

Minute of Commissioner.

I think it would be better to have this money sent to the Colony, and deposited with some approved Bank in Sydney, to the order of the Commissioner for Railways, as provided by the 20th condition of the contract. If any complication arise this money should be at command.—CHAS. A. G., 30/7/86.

The Secretary for Public Works,—G.R.D., 2/9/86. The Under Secretary for Public Works.—B.C., 2 September, 1886. Railways.—B.C., 6/9/86.

The

The money has now, I understand, been received in the Colony. Please inquire at the Treasury whether the £10,000 has been paid to the credit of the Commissioner in one of our local banks. Ascertain this at once in order that we may reply to the Union Company's cablegram.—D.C.M'L., 20/9/86.

On inquiry at the Treasury, I find this money, £10,000, has been received and sent to the Commercial Bank, to be placed to the credit of the Commissioner. When deposit receipt is received, it will be forwarded by the Hon. G. Eagar to the Commissioner.—W.M., 21/9/6. The Chief Clerk.

No. 49.

The Under Secretary to The Commissioner for Railways.

Sir,

The Treasury, N.S.W., 1 October, 1886.

I have the honor, by direction of the Colonial Treasurer, to inform you that, under date 6th August last, the Agent-General advised that the Union Bridge Company of New York had lodged, in terms of its contract, a sum of £10,000 in the Commercial Banking Company of Sydney, London Office, as security in connection with its contract for the erection of the railway bridge over the Hawkesbury, and that such sum was in course of transfer to Sydney. The amount was placed to credit of the public account of the Government in the Commercial Bank here on 16th ultimo, and, inquiry at your office elicited the information that the conditions of contract provided that the money was to be placed on fixed deposit to your order with interest payable to the contractors. The Bank in question was asked to state what rate of interest they were prepared to allow, and their offer of 6 per cent. per annum for a fixed deposit for twelve months having been accepted by the Treasurer; the transaction was completed yesterday, and I am now to hand you, enclosed, a fixed deposit receipt of £10,000 as described in the margin hereof, and to request the favour of an acknowledgment of the same.

No. 31,805, dated 30th September, 1886, in favour of the Commissioner for Railways for £10,000, Commercial Banking Company of Sydney, fixed deposit for twelve months at 6 per cent.

I have, &c.,

G. EAGAR.

The Accountant.—D.V., 7/10/86. Received deposit receipt, £10,000, due 30th September, 1887,—W.W., 1/10/86. Accountant, entered.—W.W., Sec., B.C., 5/10/86.

[Three Plans.]

Sydney: Charles Potter, Government Printer.—1887.

[3s 3d.]

Plate I.

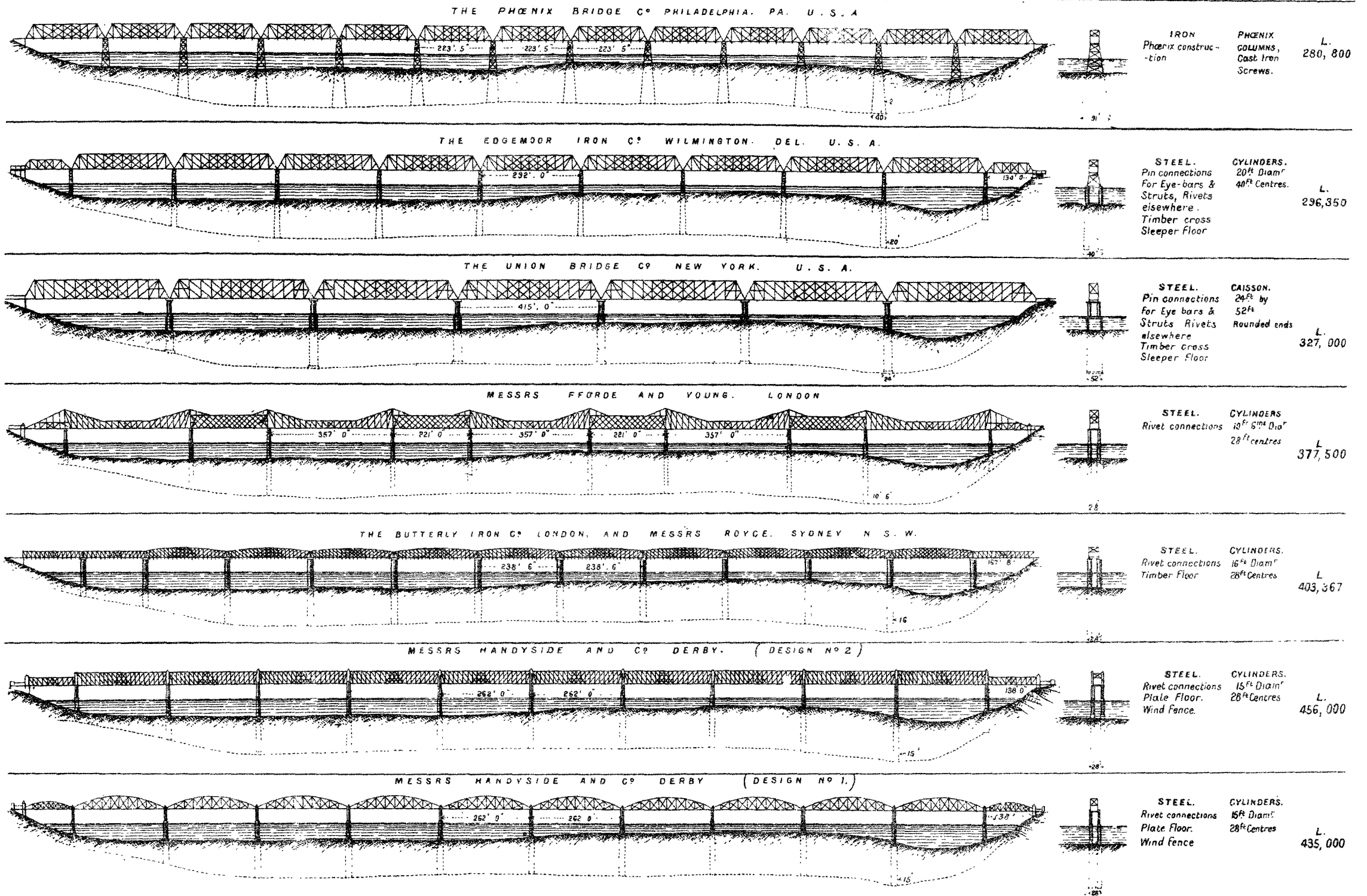
NEW SOUTH WALES RAILWAYS.

COMPETITIVE DESIGNS FOR THE HAWKESBURY RIVER BRIDGE, NEW SOUTH WALES.



ELEVATIONS

SECTIONS SUPERSTRUCTURE REMARKS. PIER AT BASE. AMT. OF TENDER



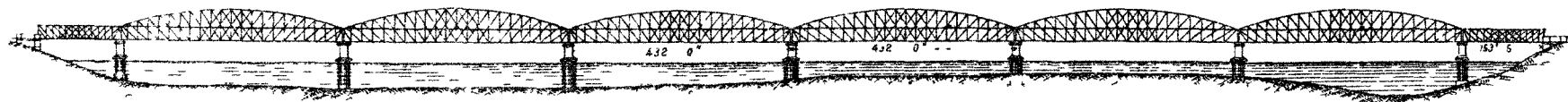
(Sig. 54)

NEW SOUTH WALES RAILWAYS.

COMPETITIVE DESIGNS FOR THE HAWKESBURY RIVER BRIDGE, NEW SOUTH WALES.

100 0 200 300 400 500 600 700 800 900 1000 Feet.

MESSRS ARROL BROS GLASGOW (DESIGN NO 2)

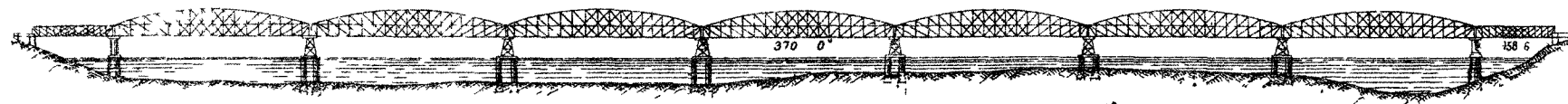


STEEL
Rivet connections
Plate floor
Wind fence

CAISSON
70' x 33'
Elliptical

L
580,000

MESSRS ARROL BROS GLASGOW (DESIGN NO 1)

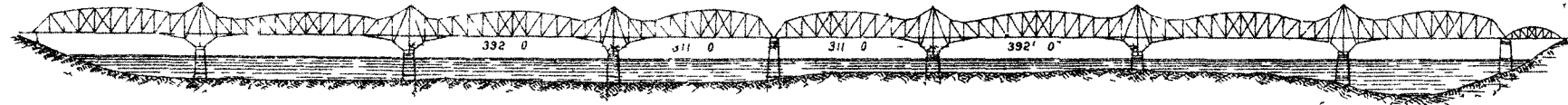


STEEL
Rivet connections
Plate floor
Wind fence

CYLINDERS
18' Diam
40' Centres

L
439,847

MESSRS REICHENBACH GODFREY AND JONES LONDON

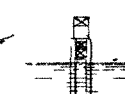
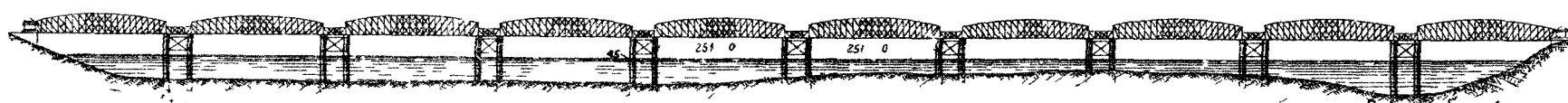


STEEL
Rivet connections
Plate floor

CAISSON
54' x 22'
Rectangular

L
466,032

JOHN DIXON LONDON

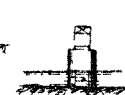
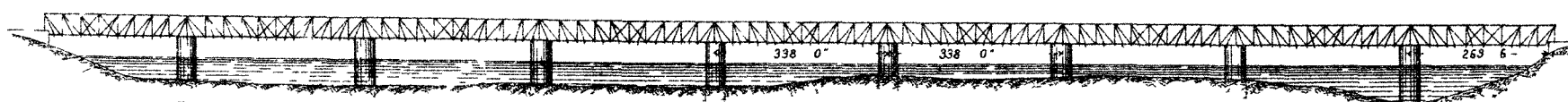


STEEL
Rivet connections
Plate floor

CYLINDERS
12' Diam
25' Centres

L
486,100

RICHARD PARKINSON LONDON

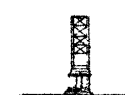


STEEL
Rivet connections
Timber floor

CAISSON
40' Diam

L
584,898

LA COMPAGNIE DE FIVES LILLE PARIS

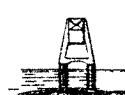
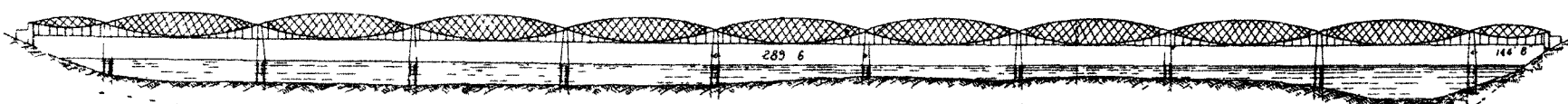


STEEL
Rivet connections
Timber floor

CAISSON
57' 5" Diam

L
685,000

DAVID MUNROE MELBOURNE VICTORIA



STEEL
Rivet connections
Timber floor

CYLINDERS
14' Diam

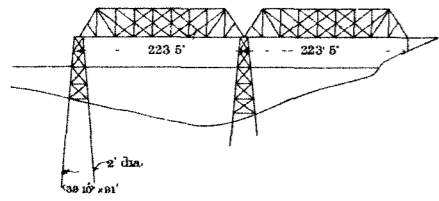
L
702,384

A S CATTELL & CO ENGRS

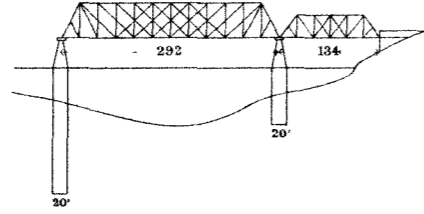
(Sig 54)

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES

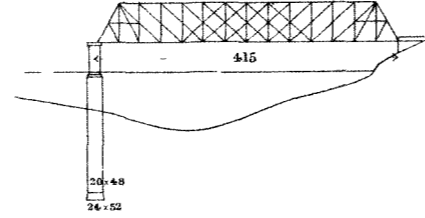
HAWKESBURY BRIDGE.



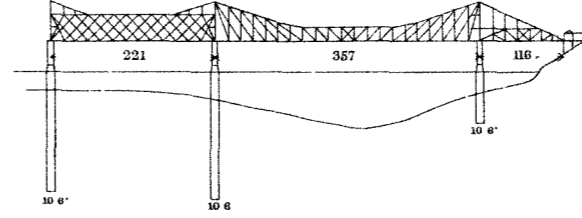
PHOENIX BRIDGE CO (N°1)



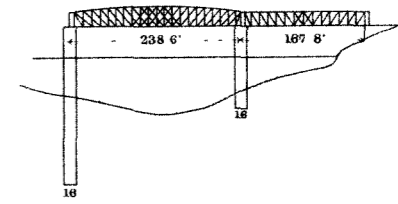
EDGEMOOR IRON CO (N°2)



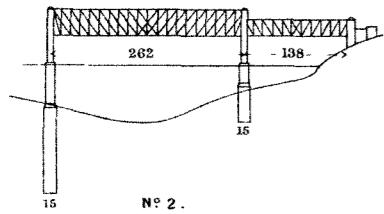
UNION BRIDGE CO (N°3)



FFORDE AND YOUNG (N°2)

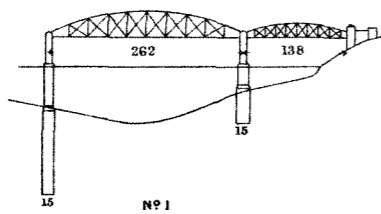


BUTTERLEY CO AND ROYCE & CO



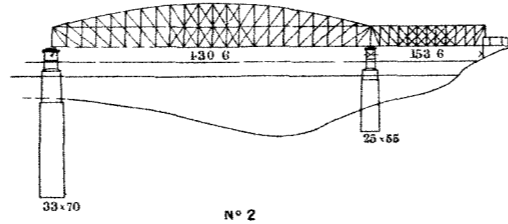
N° 2.

HANDYSIDE AND CO



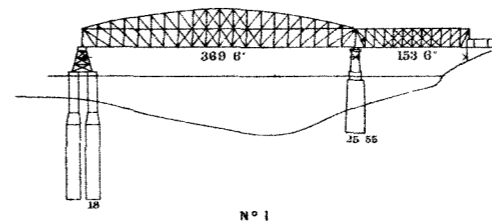
N° 1

HANDYSIDE AND CO



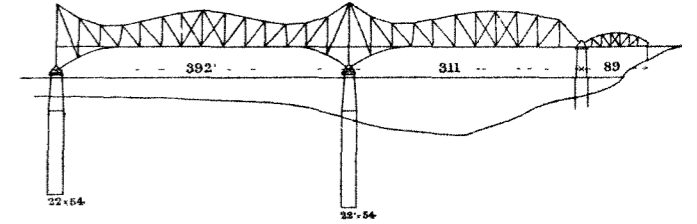
N° 2

ARROL BROS

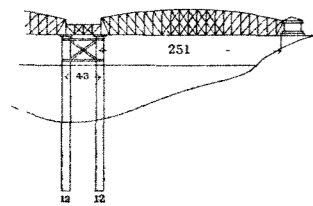


N° 1

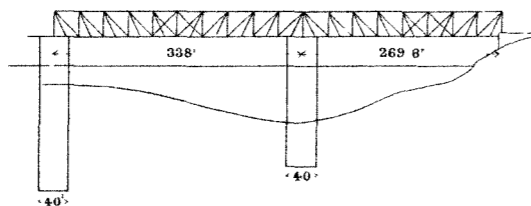
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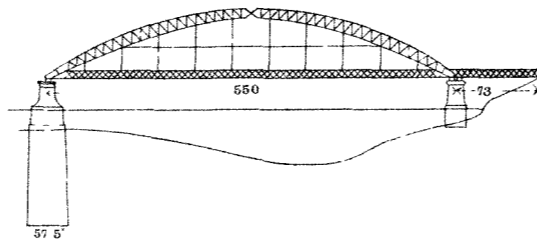
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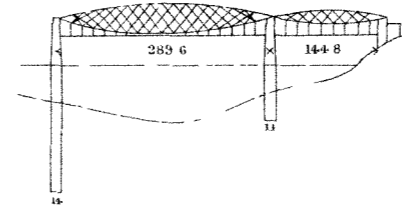
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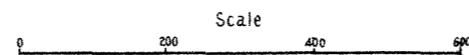
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CIÉ DE FIVES LILLE (N° 2)



MUNROE



(Sig. 54-87)

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE,
SYDNEY, NEW SOUTH WALES.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAY FREIGHTS.

(REDUCED CHARGES, &c., DURING LAST SIX MONTHS OF 1885.)

Ordered by the Legislative Assembly to be printed, 18 March, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 27th August, 1886, That there be laid upon the Table of this House,—

“Copies of all letters, minutes, reports, or other documents, having reference to the introduction of the reduced charges on goods forwarded by railways in consignments aggregating 6 tons in weight, together with a statement showing, separately, to what extent the concession has been availed of by individual consignors and the various railway carrying firms of this Colony, for the last six months of the year 1885, the total tonnage carried and revenue earned by the railways being shown in each case, and also the approximate loss to the revenue as compared with the amount that would have been earned had not such reduction in ordinary rates been sanctioned.”

(Mr. Davies.)

SCHEDULE.

	PAGE.
1. Copies of Extracts from newspapers relative to railway rates at Wagga, with minutes	1
2. Report of Assistant Traffic Manager, dated 10th October, 1882, respecting Merchandise rates and traffic from Melbourne <i>via</i> Wodonga, with minutes, &c., relating thereto	2
3. Notice relative to reduction of Merchandise and Parcels rates, dated 14th October, 1882	4
4. Return showing name of senders, and weight of goods forwarded during six months ending 31st December, 1885, at mixed truck rate (£20) and the amount received, together with approximate amount of loss as against former tonnage rates, with summary thereof	4

No. 1.

Extract from *Evening News*, dated 25 September, 1882.

The Railway Rates at Wagga.

Wagga Wagga, Monday.

There is great dissatisfaction among mercantile men here in reference to the delay which has occurred in the publication of the revised railway tariff, which was promised two months ago. The reductions which have been made by the Victorian Railway Department are inducing traders to return again to Melbourne, and large orders are being sent to the Victorian Metropolis by houses whose trade has hitherto been almost exclusively done with Sydney. With the advent of fine weather, and the consequent facilities for team carriage, the struggle against the iniquitous differential rates between Albury and Wagga will be renewed, as goods can be landed here from Melbourne at much lower rates than those now charged from Sydney. For example, candles and jam can be landed here at 55s. per ton less than from Sydney, galvanized iron at 31s., sugar at 10s. per ton less, and other articles at rates lower than those of Sydney. Two of the largest firms here say that they have sent large orders to Melbourne owing to the effect of the New South Wales rates, and they have opened negotiations for the transfer of their trade altogether to the Melbourne market. They are determined to take their stand against the differential rates now that the season approaches, rendering traffic upon the roads a matter of no difficulty to teams.

98—A

Minute

[817 copies—Approximate Cost of Printing (labour and material), £7 9s. 10d].

Minute of Commissioner.

The new railway rates will come into operation on the 4th October next. The Traffic Manager should keep himself informed of the course of the traffic at Wagga. I discredit the statement that recourse is being had to the Melbourne market. As to carriage by road competing with the rates between Albury and Wagga, it is not possible I think.—CH. A. G., 28/9/82.

I regret to find that the "paragraph" is quite correct. The Victorian Railway Department reduced their rates on the 1st instant, from Melbourne to Wodonga to 30s. per ton for 1st, 2nd, 3rd, and 4th class goods, whereas they were previously 62s. 6d. per ton 1st class, and 65s. for 2nd, 3rd, and 4th classes. See my report of yesterday please.—W. V. READ, *per* D.K., 12/10/82. Commissioner.

Extract *Sydney Morning Herald*, 6 October, 1882.

Breakers ahead.

To the Editor of the *Herald*.

Sir,

4 October.

Are the Sydney merchants asleep in allowing Victoria to euchre them in railway freight? They are bringing goods from Melbourne to Wodonga for Wagga at 30s. per ton all round, teams from thence to Wagga 40s. per ton, thus landing them at the latter place at £3 10s. per ton. The same goods cost from Sydney to Wagga £6 10s. per ton, or a difference of 60s. per ton in favour of Victoria. Trade must gravitate to Melbourne unless immediate steps are taken by your Railway authorities to checkmate them. We want here to trade with our own city, but the difference is too great. I am, &c.,
WAGGA.

Minute by Commissioner.

A good horse team, eight horses, will carry 6 tons, that is £12 between Wagga and Albury; there would be no return traffic, or (say) at the outside 2 tons, in all £16 for the double trip; the double journey would take 10 days. If in constant work 30 trips in the year could be made, the gross earnings being 30 trips at £16 = £480. What would the expenses be? The teamster would have to be paid £110 a year, the wear and tear of plant and renewals would be £60 a year, the horse feed would be 10s. a week for each horse, or £4 a week, equal to (say) £200 a year, leaving a margin of £110 a year to meet interest upon capital and profit. It does not seem good enough.

It may be, however, that the traffic or trade is going to Melbourne from Wagga, of course it is expected that the Traffic Manager will watch the course of traffic and give me timely notice. I should like to see Mr. Roberts' local inspector's report on the representation made.—CHAS. A. G., 8/10/82. Traffic Manager, B.C.

I beg to refer the Commissioner to my report of this date respecting the rates between Melbourne and Wodonga and Echuca.—W. V. READ, *per* D.K., 11/10/82. Commissioner.

No. 2.

Report of Assistant Traffic Manager.

Merchandise Rates, Traffic from Melbourne, *via* Wodonga.

While in the Southern District I have taken occasion to make some inquiries respecting the rates charged on the Victorian lines for traffic coming into New South Wales, and I find that for general goods coming from Melbourne to stations north of Gerogery, and including all the country north of an imaginary line drawn straight from Jingalee, on the Murray; thence to the southern portion of the Urana swamp; thence to the south-west boundary of Thurowa station, to include in that line Cocketgedong, Colomaba, and Thurowa stations; thence in a northerly direction to the south-west boundary of Ugobit block "A," to include in that line Bundure, Yanko F east, and Ugobit block A; thence in a westerly direction along the south boundary of the river back blocks to the intersection of the Murrumbidgee River at Balranald, the rates to Wodonga have been reduced from 62s. 6d. per ton, first class, and 65s. for second, third, and fourth classes to 30s. per ton all round; and even upon Albury goods the same low rate is now charged for the following goods, carried in lots of not less than five tons, viz:—Wire, woolpacks, salt, rocksalt, timber, sugar, cement, tea, kerosene, candles, oilmen's stores, spirits in cases or casks, bottled beer, bar iron, and tanks of malt. These greatly reduced rates which came into operation on the 1st instant, have had the effect of driving the Wagga Wagga storekeepers and others to Melbourne for their supplies, particularly as, at the present time, the rate by team from Wodonga to Wagga Wagga for general goods is only 35s. per ton, and I even saw a letter dated the 3rd instant, from Messrs. Wm. M'Culloch and Co., of Wodonga, to Messrs. Wright, Heaton, and Co., of Wagga Wagga, intimating that they had had the offer of teams for 30s., and as low as 20s. per ton. This I am informed will continue until March next, during which timewool will be being conveyed to Wodonga by teams, and even after that time I am told the rate of carriage will not exceed 40s. per ton, and if that be so, the maximum rate from Melbourne to Wagga Wagga will henceforth be, allowing 5s. for forwarding charges at Wodonga, equal to £3 15s. per ton. Last week five bullock teams left Wodonga for Wagga Wagga with 25 tons of general goods, viz:—Groceries, drapery, sugar, wines, spirits, ironmongery, &c.; and two more teams were loading yesterday with ten tons of sugar and groceries.

Our existing rates from Albury to Wagga Wagga are as follow:—40s. 1st, 49s. 3d. 2nd, 67s. 9d. 3rd, 87s. 9d. 4th class, and to each of these would require to be added at least 5s. for forwarding charges and cartage from Wodonga to Albury. These rates, it must be admitted, were fixed high for obvious reasons, and the result, until the present reduction on the Victorian lines, has fully justified the step that was taken, but some alteration will now be necessary to counteract the action taken by the Victorian Railway Department.

My opinion is that the rates between Albury and Wagga Wagga should be left as they are, and that whatever concession is made should take effect from the Sydney end, whence the maximum rate for any class of goods (except explosives) should be £5 10s. per ton to stations on the Southern and South-western Lines distant over 305 miles from Sydney, and that a truck rate of £20 should be fixed for any or all kinds of 1st, 2nd, 3rd, and 4th class goods, not exceeding six tons; and if that be agreed to, the truck rate

rate for sugar would of course have to be reduced from £24 to £20. Assuming that 5 tons can be put in a truck, and it is very rarely indeed that such a weight of 3rd or 4th class goods can be got into one, in fact the average weight of trucks forwarded from Sydney to Wagga Wagga during September was 3 tons 16 cwt. 3 qr., that would be equal to £4 per ton, and I am inclined to think we would get that rate, but as the rates from Melbourne are now so very low I do not think we would get any more. It would hardly be possible to estimate the loss to the revenue consequent upon such a reduction, because, notwithstanding the reduction of the rate per ton, we would secure full loading for the trucks. I am having a return prepared of the 1st, 2nd, 3rd, and 4th class goods received at Wagga Wagga from Sydney during the first nine months of this year, but it will not be finished for several days yet, and a statement is also in course of preparation of the traffic that has come from Victoria into New South Wales at Albury during the six months ended 30th September ultimo.

The only possible way that the Victorian reduction could be resented would be by placing several heavy tolls on this side of the border, but I understand that the road between Albury and the Murray is within the Municipality of Albury, and that after leaving that town northwards, there are so many different roads which the teams could take, that such a plan would be impracticable, and therefore the only alternative is to lower our own rates.

When at Albury I was informed that after the extension from Albury to Wodonga is opened early next year, the Victorian Railway Department will have a goods shed at Albury, and that they will receive and deliver all their New South Wales goods there. If that be so, it will be so much the more in favour of that department.

I saw the first of the New South Wales wool (five teams) arrive at Wodonga from the Urana district, and I have ascertained that up to Saturday, the 7th instant, 426 bales of New South Wales wool have been taken to Wodonga by team and taken to Melbourne.

I always thought it was a great mistake to allow Victoria to bring their gauge of line into Albury.
—CHAS. A. G.,
12/10/82.

Traffic from Melbourne, *via* Echuca and River, to Hay.

These rates have also been reduced from 48s. to 30s. per ton for 1st, 2nd, 3rd, and 4th class goods, and when at Hay I was shown a letter from Messrs. Wm. McCulloch and Co. to the principal storekeepers (Messrs. Meakes and Fay, who informed me that during the past six weeks they had paid Messrs. McCulloch and Co. nearly £1,200 in freight alone, and that, all things being equal, they would much prefer dealing in Sydney), quoting a through rate of 57s. 6d. a ton for general goods from Melbourne to Hay, and 52s. 6d. for such traffic as corrugated iron, wire, &c. The insurance charges have, of course, to be added to these rates, but they are now also very low, being 10s. per cent. for iron, wire, &c., 20s. per cent. for liquids, drapery, produce, &c., and 40s. per cent. for sugar, salt, cigars, &c. I make full allowance for all these charges when I recommend a maximum truck rate of £20.

At Hay I was introduced to a Mr. Gordon, who has commenced the manufacture of soap in that district, and he called my attention to the high rate for silicate of soda as compared with soda crystals and soda caustic, and he informed me that of the former he uses about 30 tons per annum. I told him there were objections to the reduction of the rate for soda silicate, which he recognized, but he said he could not possibly pay 130s. per ton from Sydney when he can get it from Melbourne for about 60s. I have no doubt but that the £20 truck rate would secure the traffic, and I merely mention the incident in support of my recommendation.

Complaints were also made to me at Hay about the rates for gunpowder and other explosives from Sydney, which are at present £22 14s. for quantities in excess of 10 cwt., and £35 1s. for smaller quantities. As the revenue will not be affected to any material extent, I think the maximum rates from Sydney might be fixed at £10 and £15 per ton respectively for any line.

In the course of a few days the Western Line will be opened to Warren Road; and whether the maximum rate of £5 10s. per ton or £20 per truck should apply to that line is quite another matter. My opinion is that the reductions herein recommended should apply solely to the Southern and South-western Lines, and only because of the special circumstances of the case. I hope that at no very distant date we shall be able to raise the rates again as far as the more distant stations on the South-western Line are concerned, but that will only be possible after river dues have been imposed to such an extent as to raise the rates on the Victorian lines to the same amounts as are charged to those persons who live in that Colony (Echuca, for instance), or to those who do not live within the favoured imaginary line.

The wool traffic from Hay up to Saturday, the 7th instant, amounted to 1,688 bales forwarded to Sydney, and 10,645 bales to Melbourne, and it is generally believed in the Riverina district that next year we shall get a large number of the clips that this year are being forwarded to Melbourne.

I am strongly of opinion that if the reductions recommended are approved, they should be brought into operation at the earliest possible moment, because there can be little doubt, I think, that every day's loss of time since the reductions in Victoria will tend to alienate the trade from Sydney, particularly as far as Wagga Wagga is concerned. As regards the Hay trade, we have only been getting a very limited share of it yet, but I think the reduction proposed will tend more than anything else to induce the storekeepers to look to Sydney for their supplies.

The rates for live stock are, in my opinion, already low enough, and reductions are neither desirable nor necessary, even if it should be decided to abolish the stock tax in Victoria.

Our rates from Hay to Homebush are as follow:—

Cattle (say 10 head) £10 5s. per truck = £1 0s. 6d. per head; sheep (say 100 head) £8 10s. 3d. per truck = 1s. 9d. per head; while the rates to Melbourne are, Deniliquin to Melbourne—cattle (say 10 head) £6 7s. 9d. per truck = 12s. 5d. per head, driving to Deniliquin and depreciation, 5s. = 17s. 5d. per head.

Deniliquin to Echuca and Echuca to Melbourne, sheep (say 100 head) £6 0s. 3d. per truck = 1s. 2d. per head, driving to Deniliquin and depreciation, 7d. = 1s. 9d. per head.

The rates to Melbourne are of course exclusive of the Victorian Stock Tax; and the impression among the squatters is that our live stock rates are very reasonable.—DAVID KIRKCALDIE, 10/10/82. W. V. READ, ESQ., Traffic Manager.

Report to Commissioner that Mr. Kirkcaldie visited Hay, Wagga Wagga, and Albury, with a view of reporting on the effect of recent reductions in Victorian Railway Rates, &c., on our traffic, and that his report shows that to retain the Riverina, Wagga Wagga, and Albury traffic, it will be necessary to fix the maximum rates for all goods except explosives on the Southern and South-western Lines at £5 10s. per ton, and £20 per truck for distances over 305 miles.—W. V. R., 11/10/82. Commissioner.

I must recommend this. For the present the rates proposed will pay us, and we must sacrifice some of the profit we are making to retain the trade and get more of it. I shall be glad if the Secretary will obtain the Minister's approval, if possible, to-morrow, for I should like to advertise at once at Wagga Wagga and Hay what the new truck rates will be—£20 instead of £24—they should come into operation at once before the reduced rates of Victoria get too great a hold of the trade.—CHAS. A. GOODCHAP, 12/10/82.

Minute of Minister.

Approved,—J.L., 13/10/82. Traffic Manager please submit draft advertisement early to-morrow.—L.P.J., 13/10/82. Draft advertisement enclosed; I am issuing general order to-day, and will watch the effect.—W. V. READ, *per* D.K., 14/10/82. Commissioner.

No. 3.

Reduction of Merchandise and Parcels Rates.

Merchandise Rates.

On and after Monday, the 16th October, a truck rate of £20 will be charged for 1st, 2nd, 3rd, and 4th class goods conveyed from Sydney to stations on the Southern and South-western Lines for distances 305 miles therefrom, such load not to exceed 6 tons. Wire will, however, remain at £18 per truck as at present. For smaller consignments under the classes named the maximum rate to the stations indicated will be £5 10s. per ton.

For gunpowder and other explosives the rate for quantities in excess of 10 cwt. will be £10 per ton, and for smaller quantities £15 per ton.

Parcels Rates.

The maximum rates for parcels between Sydney and any station on the South and South-western lines will be reduced as follows:—

1 to 3 lb.	3 to 7 lb.	7 to 14 lb.	14 to 28 lb.	28 to 56 lb.	56 to 84 lb.	84 to 112 lb.
1/6	3/-	4/-	5/6	7/-	8/6	10/1.

And for every additional 28 lb. or part thereof 2/5.

For further particulars apply to the Traffic Manager or the station-masters.

Department of Railways,
Sydney, 14th October, 1882.

CHAS. A. GOODCHAP,
Commissioner for Railways.

No. 4.

RETURN showing the names of Senders and the weight of goods forwarded during six months ending 31st December, 1885, at mixed truck rate (£20), and the amount received, together with the approximate amount of loss as against former tonnage rates.

SUMMARY.

Senders.	Weight.	Amount earned.	Amount estimated at rate existing prior to 16/10/82.		Estimated loss.	
			£	s. d.	£	s. d.	£	s. d.
Wright, Heaton, & Co.	Tons cwt. qr. lb. 1,919 13 1 0	£ s. d. 6,423 7 5	£ s. d. 10,421 11 11	£ s. d. 3,998 4 6		
Permewan, Wright, & Co.	628 15 1 0	2,111 2 4	3,393 18 0	1,282 15 8		
Cramsie, Bowden, & Co.	111 2 1 0	374 6 4	536 10 11	162 4 7		
J. E. Ives & Co.	48 8 0 0	161 6 8	191 8 8	30 2 0		
Chalmers & Co.	11 19 2 0	40 0 0	62 14 4	22 14 4		
Dalgetty & Co.	5 12 0 0	20 0 0	29 4 6	9 4 6		
Holdsworth, M'Pherson, & Co.	6 8 2 0	21 8 4	35 5 9	13 17 5		
Gibbs, Bright, & Co.	37 1 3 0	123 15 10	144 4 4	20 8 6		
Lassetter & Co.	7 0 3 0	23 9 2	35 13 6	12 4 4		
Duffin	6 0 2 0	20 1 8	33 2 10	13 1 2		
Robinson	13 5 1 0	44 4 2	69 13 7	25 9 5		
M'Gregor	6 13 1 0	22 14 2	32 2 8	9 8 6		
On Chong & Co.	18 13 2 0	62 5 0	102 14 5	40 9 5		
A. Rowan & Co.	18 0 3 0	60 15 10	96 3 10	35 8 0		
Colonial Sugar Co.	12 1 1 0	40 5 0	46 2 8	5 17 8		
John Frazer & Co.	12 2 2 0	40 8 4	57 11 11	17 3 7		
Ostermeyer, Dewez, & Co.	5 5 2 0	20 0 0	27 11 5	7 11 5		
Raymond	12 16 2 0	42 15 0	48 18 11	6 3 11		
Hogg & Co.	17 18 2 0	60 5 6	79 9 11	19 4 5		
A. Wilson	6 8 3 0	21 9 2	34 9 2	13 0 0		
Dalton Bros.	5 19 3 0	20 0 0	32 17 8	12 17 8		
Hanson & Lewis	6 12 2 0	22 1 8	34 16 2	12 14 6		
Harris & Ackman	32 2 3 0	109 0 7	125 2 2	16 1 7		
Ellis	18 1 1 0	60 4 2	72 5 0	12 0 10		
Montefiore, Joseph, & Co.	12 7 0 0	41 3 4	47 4 3	6 0 11		
Civil Service Co. Society.....	4 7 3 0	20 0 0	24 2 8	4 2 8		
Butcher	30 3 2 0	100 11 8	127 11 5	26 19 9		
Kirchner & Co.	6 14 2 0	22 8 4	27 3 5	4 15 1		
Willis	6 2 0 0	20 6 8	22 4 6	1 17 10		
Harper & Co.	5 19 3 0	20 0 0	32 18 9	12 18 9		
Martin.....	6 7 0 0	21 3 4	36 14 10	15 11 6		
Panton.....	6 2 3 0	20 9 2	24 11 0	4 1 10		
J. Bridge & Co.	12 4 3 0	40 15 10	48 9 0	7 13 2		
Hooper.....	6 4 0 0	20 13 4	34 2 0	13 8 8		
Bardsley & Co.	6 4 3 0	20 15 10	24 19 0	4 3 2		
J. Keep	6 8 0 0	21 6 8	31 16 10	10 10 2		
Brown	6 5 2 0	20 18 4	25 2 0	4 3 8		
Friend & Co.	6 0 3 0	20 2 6	30 9 1	10 6 7		
Various	41 17 2 0	142 7 6	209 1 9	66 14 3		
Total.....	3,131 13 1 0	10,408 8 10	16,490 4 9	5,991 15 11*		

* In the heading of this column the words of the Resolution have been followed, but it is pointed out that no loss has been sustained; that, on the contrary, traffic has been secured by the reduction in the rate, which would not have been obtained under the old tariff, but would have passed into another channel.

Senders.	Consignees.	Weight.	Amount earned.	Amount estimated at rate existing prior to 16/10/32.	Estimated loss.
		Ton. cwt. qr.	£ s. d.	£ s. d.	£ s. d.
Wright, Heaton, & Co.	Edmondson & Co., per W., H., & Co.	6 4 2	29 15 0	24 18 0	4 3 0
Do do	W., H., & Co.	1,913 8 3	6,402 12 5	10,396 13 11	3,994 1 6
		1,919 13 1	6,423 7 5	10,421 11 11	3,998 4 6
Permewan, Wright & Co.	P. M'Caughey	10 13 1	40 18 4	53 7 2	12 8 10
Do do	J. K. Bradford	6 4 0	20 13 4	34 2 0	13 8 8
Do do	T. Robertson	12 1 3	40 10 0	61 16 10	21 6 10
Do do	P., W., & Co.	599 16 1	2,009 0 8	3,244 12. 0	1,235 11 4
		628 15 1	2,111 2 4	3,393 18 0	1,282 15 8
Cramsie, Bowden, & Co.	D. Copeland	24 13 3	83 11 8	99 2 0	15 10 4
Do do	Ferrier & Co.	6 2 3	20 9 2	22 7 3	1 18 1
Do do	Lorimer & Martin	6 1 1	20 4 2	25 5 11	5 1 9
Do do	Cramsie Bowden	74 4 2	250 1 4	389 15 9	139 14 5
		111 2 1	374 6 4	536 10 11	162 4 7
J. E. Ives & Co.	Cramsie Bowden	6 0 3	20 2 6	24 3 0	4 0 6
Do	W. Travis	6 1 0	20 3 4	24 4 0	4 0 8
Do	Fay & M'Cluer	6 1 3	20 5 10	24 7 0	4 1 2
Do	Edmondson	6 0 3	20 2 6	24 3 0	4 0 6
Do	Seignior & Co.	12 2 0	40 6 8	48 8 0	8 1 4
Do	D. Copeland & Co.	6 0 2	20 1 8	24 2 0	4 0 4
Do	Ferrier & Co.	6 1 1	20 4 2	22 1 8	1 17 6
		48 8 0	161 6 8	191 8 8	30 2 0
Chalmers & Co.	Magil & Co.	11 19 2	40 0 0	62 14 4	22 14 4
Dalgetty & Co.	J. H. Speller	5 12 0	20 0 0	29 4 6	9 4 6
Holdsworth M'Pherson	Henry Hill	6 8 2	21 8 4	35 5 9	13 17 5
Gibbs, Bright, & Co.	J. Kops, per S. Richards	6 0 0	20 0 0	21 17 2	1 17 2
Do do	Edmondson & Co.	6 2 0	20 6 8	24 8 0	4 1 4
Do do	A. Tarta Kover	6 12 1	22 0 10	26 9 0	4 8 2
Do do	Whitcombe	6 5 2	20 18 4	25 2 0	4 3 8
Do do	Ferrier & Co.	6 3 0	20 10 0	22 8 2	1 18 2
Do do	Seignior & Co., per P. Wright & Co.	5 19 0	20 0 0	24 0 0	4 0 0
		37 1 3	123 15 10	144 4 10	20 8 6
Lassetter & Co., Ltd.	J. Jackson	7 0 3	23 9 2	35 13 6	12 4 4
Duffin	H. A. Laird	6 0 2	20 1 8	33 2 10	13 1 2
Robinson	Handley	13 5 1	44 4 2	69 13 7	25 9 5
M'Gregor	C. Develin	6 13 1	22 14 2	32 2 8	9 8 6
On Chong & Co.	On Yuen Lea & Co.	18 13 2	62 5 0	102 14 5	40 9 5
A. Rowan & Co.	J. W. M'Gaw	6 1 0	20 3 4	31 8 0	11 4 8
Do	Mills, Nelson, & Smith...	6 3 3	20 12 6	33 16 2	13 3 8
Do	J. Haines, per Permewan, W., & Co.	5 16 0	20 0 0	30 19 8	10 19 8
		18 0 3	60 15 10	96 3 10	35 8 0
Colonial Sugar Co.	Ferrier & Co.	6 1 2	20 5 0	22 2 8	1 17 8
Do	Lorimer & Martin	5 19 3	20 0 0	24 0 0	4 0 0
		12 1 1	40 5 0	46 2 8	5 17 8
John Frazer & Co.	J. H. Harris	6 1 1	20 4 2	24 5 0	4 0 10
Do	G. Williamson, per Cram- sie Bowden.	6 1 1	20 4 2	33 6 11	13 2 9
		12 2 2	40 8 4	57 11 11	17 3 7
Ostermeyer, Dewez, & Co.	E. C. B. Smith	5 5 2	20 0 0	27 11 5	7 11 5
H. Raymond	Jones & Co.	6 12 0	22 0 0	24 0 11	2 0 11
.....	W. T. Heaton	6 4 2	20 15 0	24 18 0	4 3 0
		12 16 2	42 15 0	48 18 11	6 3 11
Hogg & Co.	T. Baillie	5 19 2	20 0 0	31 19 11	11 19 11
Do	Wright, Heaton, & Co.	5 17 3	20 0 0	23 5 0	3 5 0
Do	Edmondson	6 1 1	20 5 6	24 5 0	3 19 6
		17 18 2	60 5 6	79 9 11	19 4 5
A. Wilson	D. M'Tarby	6 8 3	21 9 2	34 9 2	13 0 0
Dalton Bros.	Hy. Hill	5 19 3	20 0 0	32 17 8	12 17 8
Hanson & Lewis	F. L. Flanagan	6 12 2	22 1 8	34 16 2	12 14 6

Senders.	Consignees.	Weight.	Amount earned.	Amount estimated at rate existing prior to 16/10/82.	Estimated loss.
		Ton cwt. qr.	£ s. d.	£ s. d.	£ s. d.
Harris & Ackman	Richards & Co.	12 12 1	42 0 10	45 19 1	3 18 3
Do	C. Dyring.....	7 6 2	26 6 9	29 6 0	2 19 3
Do	L. Mandelson, per W., H., & Co.	6 2 0	20 6 4	25 9 1	5 2 9
Do	D. Copeland & Co.	6 2 0	20 6 8	24 8 0	4 1 4
		32 2 3	109 0 7	125 2 2	16 1 7
Ellis	Mandelson, per W., H., & Co.	6 0 2	20 1 8	24 2 0	4 0 4
Do	D. Copeland & Co.	6 0 2	20 1 8	24 2 0	4 0 4
Do	Seignior & Co.	6 0 1	20 0 10	24 1 0	4 0 2
		18 1 1	60 4 2	72 5 0	12 0 10
Montefiore, Joseph, & Co.	W. Travis	6 4 1	20 14 2	24 17 0	4 2 10
Do	Ferrier & Co.	6 2 3	20 9 2	22 7 3	1 18 1
		12 7 0	41 3 4	47 4 3	6 0 11
Civil Service Co. Society	P. A. Westley	4 7 3	20 0 0	24 2 8	4 2 8
Butcher.....	J. H. Harris & Co.	6 0 0	20 0 0	24 0 0	4 0 0
Do	Ferrier & Co.	6 1 2	20 5 0	22 2 8	1 17 8
Do	Copeland & Co.	12 1 2	40 5 0	48 6 0	8 1 0
Do	J. Graham	6 0 2	20 1 8	33 2 9	13 1 1
		30 3 2	100 11 8	127 11 5	26 19 9
Kirchner	Hardy	6 14 2	22 8 4	27 3 5	4 15 1
Willis	W. Jones & Co.	6 2 0	20 6 8	22 4 6	1 17 10
Harper & Co.	S. Richardson	5 19 3	20 0 0	32 18 9	12 18 9
Martin	Various (3)	6 7 0	21 3 4	36 14 10	15 11 6
Panton	C. Dyring.....	6 2 3	20 9 2	24 11 0	4 1 10
J. Bridge & Co.	D. Copeland & Co.	6 1 2	20 5 0	24 6 0	4 1 0
.....	Mandelson, per W., H., & Co.	6 3 1	20 10 10	24 3 0	3 12 2
		12 4 2	40 15 10	48 9 0	7 13 2
Hooper	Ferrier & Co.	6 4 0	20 13 4	34 2 0	13 8 8
J. Bardsley & Co.	Fay & M'Clure	6 4 3	20 15 10	24 19 0	4 3 2
John Keep	R. Le Poer Trench.....	6 8 0	21 6 8	31 16 10	10 10 2
Brown	Fay & M'Clure	6 5 2	20 18 4	25 2 0	4 3 8
Friend & Co.	Ferrier & Co.	6 0 3	20 2 6	30 9 1	10 6 7
Various (10).....	Cramsie Bowden.....	12 2 3	41 2 6	66 15 2	25 12 8
Do (4).....	Ferrier & Co.	12 4 2	40 15 0	57 19 2	17 4 2
Do (6).....	P. Moran	5 7 1	20 0 0	29 9 11	9 9 11
Do (2).....	Seignior & Co.	6 2 0	20 6 8	24 8 0	4 1 4
Do (5).....	Various (2)	6 1 0	20 3 4	30 9 6	10 6 2
		41 17 2	142 7 6	209 1 9	66 14 3

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAYS.

(FREIGHT ON MERCHANDISE—CONCESSIONS TO MESSRS. BARTON & GOOLD.)

Ordered by the Legislative Assembly to be printed, 30 June, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 3rd August, 1886, That there be laid upon the Table of this House,—

“Copies of all Letters, Minutes, Reports, or other Documents, having reference to concessions made by the Railway Department since the year 1880 for the carriage of merchandise on the Railways of the Colony to Messrs. Barton and Goold or other persons engaged in business in the Northern, Western, and Southern Districts.”

(Mr. Dalton.)

SCHEDULE.

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No. 1.

Messrs. Barton and Goold to The Commissioner for Railways.

Sir,

Cobar, 13 April, 1880.

Having an extensive business in Cobar, and getting from 800 to 1,000 tons of goods per annum for our store, which we have hitherto obtained from South Australia, we desire to address you on the subject of railway freight, as we are naturally anxious to do business with the capital of the Colony in which we reside, if it is possible to do so without suffering a considerable loss.

Our Mr. Goold, being in Sydney on his way to Adelaide, has been interviewed by Messrs. Wright, Heaton, & Co., who made him such liberal proposals for road carriage from Orange to Cobar, that he considers, if the Railway Department are prepared to meet him at all in the shape of a reduction of rail freight, it may be possible for him to buy in Sydney instead of going on to South Australia, and as we are anxious to give Sydney the preference, we now address you in the hope that you may see your way clear to make a reduction, and beg to submit for your approval the following proposition, viz.:—We are prepared to forward to Orange within one month from date from 100 to 160 tons of general merchandise, comprising goods chargeable under first, second, and third class rates, provided you agree to convey the lot at £3 15s. 2d. per ton, or at second class rates. Even this concession would leave us at a disadvantage as compared with purchasing in South Australia, as the following table will show that the difference in carriage would still remain in favor of that Colony to the extent of from 15s. to 40s. per ton. In the

455—

first

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first instance the freight from Adelaide to Louth, is £4 per ton; carriage thence to Cobar, £2 per ton, and insurance 35s. per ton, making a total of £7 15s., as the cost of carriage per ton on general merchandise from Adelaide to Cobar. The cost from Sydney would be as follows:—Rail carriage from Sydney to Orange, as per proposed concession, £3 15s. 2d. per ton; carriage thence to Cobar £4 10s. by bullock teams, and by horse teams £5 10s., and commission 5s., making the total cost from Sydney per ton £8 10s. 2d. and £9 10s. 2d. respectively, according as the goods may be carried by bullock or horse teams. We might further point out that in obtaining supplies from South Australia, a considerable saving of time is effected.

Notwithstanding the advantage to be derived from dealing with Adelaide, we are prepared to obtain the whole of our supplies from Sydney, provided the Railway Department will treat our proposal in a liberal spirit.

Trusting to receive at once a favorable reply in order that we may without delay commence our purchases in Sydney.

We have, &c.,
BARTON & GOOLD.

May be taken at second class rates.—J.L., 21/4/80.

The Commissioner for Railways to Messrs. Barton & Goold.

Gentlemen,

Department of Railways, Sydney, 23 April, 1880.

In referring to your letter of the 13th instant, respecting the carriage of goods from Sydney to Orange for transmission to you at Cobar, and stating that you are prepared to forward within one month from 100 to 160 tons of general merchandise, on condition that it is carried at £3 15s. 2d. per ton, I have the honor to inform you that Mr. Secretary Lackey, with the view of encouraging the trade between Cobar and the Metropolis, has approved of these goods being carried on the special terms asked for, viz., at 2nd class rates.

I have, &c.,

C. A. GOODCHAP,
Commissioner for Railways.

Traffic Manager.—G.B., 24/4/80. Goods Superintendent to inform all concerned.—W.V.R., 26/4/80. Mr. Harper, Sydney Goods, will please note.—G. F. EVANS, 26/4/80. Noted. I presume this arrangement will apply to all down traffic for this Company all the year round, including special class traffic and gunpowder.—J. HARPER, 27/4/80. I should think so.—G. F. EVANS, 27/4/80.

No. The concession only specifies that 1st, 2nd, and 3rd class traffic for this Company is to be charged at 2nd class rates, all the year round of course. Special class traffic and gunpowder will be charged for according to rate sheet.—W.V.R., 28/4/80. Goods Superintendent.

No. 2.

Memo. from The Traffic Auditor.

MEMO. to Sydney Goods.—Please give your authority for charging wire and other 1st class goods in truck loads for Barton & Goold. Should not goods of 1st, 2nd, and 3rd class for Barton & Goold be charged at 2nd class rates?
H.J.W., *pro* Traffic Auditor.
12/3/83.

The Invoice Clerk charged according to the Rate Book, considering that the truck rate was a special one which did not apply to the ordinary conditions under which their 1st, 2nd, and 3rd class goods were carried.—J. HARPER, 13/3/83. Traffic Auditor. Can 1st class goods be charged at truck rate when conveyed for Barton & Goold? See our 80/2,335.—T.T.B., 14/3/83. Traffic Auditor.

The minute referred to applied to goods conveyed from Sydney to Orange only, and should not be extended to other stations without approval.—THOS. CARLISLE, 14/3/83. Mr. Bonamy. Noted.—T.T.B., 14/3/80.

No. 3.

Memo. from The Traffic Auditor.

I PRESUME the authority for charging trainage on Barton & Goold's 1st, 2nd, and 3rd class goods at 2nd class rates is still in force.

Traffic Manager.

THOS. CARLISLE, 16/3/83.

As Mr. Harper says he charged according to the book of merchandise rates, I do not think the invoice should be interfered with unless Traffic Auditor says it is wrong to do so. Will I get up the old papers, and go into the question afresh?—W. V. READ, 19/3/83. Traffic Auditor. The line has been extended, and the rates revised since 1880. I think the Commissioner's attention should be directed to the matter. The Department does not lose by the arrangement.—THOS. CARLISLE, 20/3/83. Mr. Kirkcaldie will, no doubt, know all about this arrangement.—T.L., 21/3/83. Should special arrangements (including this one) made prior to 4th October, 1882, not included in the book of merchandise rates now in force, be considered as still in operation? I think not.—P.J.T., 6/4/83.

It was decided two or three years ago to carry 1st, 2nd, and 3rd class goods to the Western Terminus (which was then Orange) for the Great Cobar Mining Company at 2nd class rates, and the arrangement is still in force, although when the line is opened to Nyngan it will very probably be abolished. It was on the 4th October last that a maximum truck rate of £18 was fixed for fencing wire and corrugated iron. Had the 7-ton lot in question been invoiced to Narromine at 2nd class rates, the trainage would have amounted to £35 19s. 10d., whereas it was charged at 1st class rates, and the trainage came to £28 18s. 8d. But even that is not in accordance with the rate-book, because the maximum rate for a truck of fencing wire (if it was fencing wire) is £18; and suppose the extra ton had been charged at 1st class rate, the total would only have been £22 2s. 8d. The arrangement made in 1880 should certainly have been adhered to. Do Messrs. Barton & Goold get much 3rd class traffic from Sydney.—W. V. READ, 15/5/83.

Goods

Goods Superintendent. Second class rates are still charged Barton & Goold for 1st, 2nd, and 3rd class goods, who have large consignments of latter class. I have instructed Invoice Clerk to charge all goods, except special and fourth, at 2nd class rates in future.—G.F.E., 17/5/83. Traffic Manager.

(1) Wright, Heaton & Co.	...	...	...	...	...	£5 9 6
(2) do	...	...	...	...	...	1 15 11
(3) do	...	...	...	...	...	1 0 5
						£8 5 10

(1). We got 6 tons of wire in six different consignment notes, all marked "part of truck load." Two of them we received on 30th, and four on 31st January. Redfern forwarded those received on 30th on that day, and those received on 31st went forward in a separate truck. The charge made is correct, seeing that six tons were not all in the same truck.

(2). Eight cases were consigned as containing wire, and charged 3rd class. It was colonial (N.S.W.) wire, and the charge being under a ton, should have been first-class. The exact account is 19/5.

(3). Is an error in weight, but the account is only 2½ cwts. on 3 cwts as claimed.—F.T., 5/4/83.

Inform and say that no allowance on the trainage of the wire can be made; the consignment was delivered to us on different days. The other accounts will be allowed.—W.H.C., 7/4/83. Wright, Heaton, & Co. informed. Goods Superintendent to arrange.—W.V.R., 16/4/83. Station Master, Dubbo, to arrange. Allow 19/5 on wire and 15/3 on groceries.—J.D., (*pro* Supt. EVANS), 16/6/83. Credited Wright, Heaton, & Co. for above amounts this day.—J.H., 18/4/83. S.M., Dubbo.

No. 4.

Memo. by The Traffic Manager.

OBTAIN the papers on which the Cobar Copper Co. were granted second class rates on all their traffic to Dubbo. The concession was made to get the trade, in supplies, from Adelaide, and there will not be any necessity to continue it when the railway is open as far as Nyngan, because we can then deliver their traffic at lower rates than by the overland route.—W.V.R., 30/4/83.

Herewith.—4/5/83. To what station is this Company's traffic now being forwarded, and is the concession of 2nd class rates on all 1st, 2nd, and 3rd class traffic still being allowed.—W.V.R., 5/5/83.

Goods Superintendent. To Narromine and Nevertire? Yes.—G. F. EVANS, 9/5/83.

The concession as per enclosed papers had reference only to goods to Orange. Why has it been allowed to other stations without fresh authority?—W.V.R., 18/5/83. Goods Superintendent. Mr. Harper for explanation.—G. F. EVANS, 19/5/83.

As the line extended westward, it appears to have been assumed that the privilege would be extended to the Company as the different termini were reached. The same Invoice Clerk to whom the original instructions were given has continued invoicing to the extreme Western stations, and the question not having been raised, it has been continued under the impression that the instructions were general, as far as the Cobar Company's goods were concerned.—J. HARPER, 25/5/83. Superintendent Evans.

Traffic Manager to see G. F. EVANS.—25/5/83. Without further instructions the concession must not be allowed after the opening to Nyngan.—W.V.R., 30/5/83. Goods Superintendent. Mr. Harpur to note.—G.F.E., 31/5/83. Noted.—G.H., 1/6/83. Mr. Paull to note.—G.F.E., 2/6/83. Noted.—C.P., 6/6/83. Inspector Hornidge to note and inform all concerned.—G. F. EVANS, 7/6/83. Noted.—M.A.H., 8/6/83. All concerned informed.—G. F. EVANS, 9/6/83. Traffic Manager.

No. 5.

Minute by The Commissioner for Railways.

1st, 2nd, and 3rd class goods for Cobar Company taken at 2nd class rates.

I SEE that Mr. Secretary Lackey approved of this on 21/4/80. How long was it in force? Ask Traffic Manager.—CH.A.G., 28/7/86.

The arrangement was in force from May, 1880, till 9th June, 1883. It was discontinued when the line was opened to Nyngan.—W. V. READ, 29/7/86. Commissioner.

I must have a *précis* of this case and a return of the goods sent, with statement showing revenue that would have been received (presupposing that they would have been sent by our railway) had ordinary rates been charged, and the amount that was received. There is a consignment of wire referred to, which under the arrangement should have been charged 2nd class, but which the rate sheet introduced subsequently to the arrangement, admitted of being carried at a cheaper rate. Was that lower rate allowed, and why?—CH.A.G., 29/7/86.

Per minute of 21/4/80 Mr. Lackey, then Minister, sanctioned a concession on the rates in favour of Messrs. Barton and Goold, of Cobar, viz., that goods of the 1st, 2nd, and 3rd class conveyed for them to Orange should be charged at 2nd class rates. I will thank you to let me have at your earliest convenience a return of the goods carried under that arrangement and the amount paid. Also a statement of the revenue we should have received if the same goods had been carried by us at ordinary rates. A consignment of wire was carried for this firm, and 2nd class rate should of course have been charged, but subsequent to the arrangement above referred to, a reduction in the rate for this commodity was sanctioned. Was the wire in question charged 2nd class under the arrangement, or was the lower rate allowed? If the latter, why?—D. C. M'L., 30/7/86. Traffic Manager.

This

This matter has been carefully looked into, and I find that, from the time the arrangement to carry 1st, 2nd, and 3rd class goods at 2nd class rates for Barton & Goold of Cobar, commenced in April, 1880, to the time it was discontinued in June, 1883, the trainage amounted (at the 2nd class rate) to £3,171 12s. 2d. If the traffic had been charged at the ordinary rate applicable to each class, the amount would have been £4,371 11s. 1d., so that the difference in favour of Barton & Goold was £1,119 18s. 11d. I am strongly inclined to think that the original papers will show that up to the beginning of 1880 all the Cobar traffic had reached its destination by river from Melbourne or Adelaide, and that but for the concession which was made the traffic would have continued to go that way, and would therefore have been lost to our railways. The wire was charged at 2nd class rate, that having been the rate chargeable at the time.—W.V.R., 12/8/86. Commissioner.

• CONCESSION made on freight of goods carried for the Cobar Company.

UNDER date of 13th April, 1880, Messrs. Barton and Goold wrote a letter stating that they were getting 800 or 1,000 tons of goods per annum for their store at Cobar; that hitherto they had obtained them from South Australia, but were very desirous of doing the business in Sydney; that Wright, Heaton, & Co. had made liberal proposals to them for the road carriage from Orange to Cobar, and that if the Railway Department would make a suitable reduction of freight from Sydney to Orange they might be able to buy in Sydney. They were prepared to forward to Orange within a month from 100 to 160 tons of goods, which under the tariff would be chargeable at 1st, 2nd, and 3rd class rates, if they could all be carried at 2nd class rates. This would still leave them at some disadvantage in dealing with Sydney, but nevertheless they were prepared to forego the advantage of dealing with South Australia if the Department would meet their views in the way proposed.

This letter, in some manner not explained, did not come into the Commissioner's hands, but went direct to the Minister, Mr. Secretary Lackey, who minuted to carry the goods at 2nd class rate. The concession accordingly was granted, and goods were conveyed for the firm named under that arrangement, which continued in force until the 9th June, 1883.

Commissioner now (29/7/86) minutes for a *précis* of the case, and for a return of goods forwarded under the arrangement, with a statement showing the revenue that would have been received had ordinary rates been charged, and the amount that was actually received, pointing out that there was a consignment of wire which should have been charged 2nd class under this arrangement, but which the rate sheet, introduced subsequently, admitted of being carried at a cheaper rate. Was the lower rate allowed, and why?

The Traffic Manager on 31/7/86 was called upon to furnish the information asked for by Commissioner, but (having had to send a clerk to Nevertire to obtain the details) the particulars have only to-day been received from the Traffic Manager.

Mr. Read reports that in the period referred to the amount paid by Barton & Goold (at 2nd class rate) was £3,171 12s. 2d., and that if ordinary rates had been charged the amount would have been £4,371 11s. 1d., the difference in favour of Barton & Goold being therefore £1,199 18s. 11d.

The wire referred to by Commissioner, Traffic Manager says, was carried at 2nd class rate. Mr. Read adds that up the time this concession was granted all the Cobar traffic had gone by river from Melbourne or Adelaide, and that if the concession had not been granted it would have continued to go by that route and would have been lost to the railway.

C.A.B., 12/8/86.

For Minister's information. As this matter was alluded to in Wright, Heaton, & Co.'s case (it is difficult to see how it bears upon it), the papers, when the Minister has seen them, will be forwarded to Crown Solicitor.—Ch.A.G., 14/8/86. Minute by Secretary for Public Works.—This case may be forwarded to the Crown Solicitor, but I cannot see anything in it but a special arrangement made between the Secretary for Public Works and Messrs. Barton & Goold.—W.J.L., 24/9/86.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAYS.

(REBATE ON CARRIAGE OF GRAIN AND FLOUR FROM 1879 TO DATE.)

*Ordered by the Legislative Assembly to be printed, 31 May, 1887.**[Laid upon the Table of the House in accordance with promise made in answer to Question No. 14 on Votes and Proceedings of 26 April, 1887.]*

CONVEYANCE OF GRAIN AND FLOUR BY RAILWAY.

RETURN showing the names of Millers on the Southern Line and the amount of rebate allowed to each in connection with the concession for the conveyance of flour and wheat, from January, 1879, to present date—29th April, 1887.

Name.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
J. & J. Hayes ...	...	...	272 14 8	467 10 10	671 6 11	970 15 6	832 17 7	...	...	3,215 5 6
Cox & Worrall ...	...	...	.....	.....	57 4 3	.....	.....	...	...	57 4 3
W. G. Cox .....	...	...	.....	.....	.....	57 1 0	86 13 2	..	...	143 14 2
W. Connolly .....	...	...	*288 16 2		134 10 7	205 2 9	298 11 7	...	...	926 11 1
										£4,342 15 0

* This amount represents the rebates granted to Mr. Connolly during the years 1881 and 1882.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAYS.

(BILLS OF QUANTITIES FOR RAILWAY WORKS—EXISTING LINES.)

*Ordered by the Legislative Assembly to be printed, 29 April, 1887.**[Laid upon the Table of the House in accordance with promise made in answer to Question No. 9, on Votes and Proceedings of 6th April, 1887.]*

- (9.) Bills of Quantities for Railway Works:—Mr. O'Sullivan asked the Secretary for Public Works,—
- (1.) When was the Order first given to the Department for Existing Railway Lines, and by whom, to supply bills of quantities of works to contractors?
Answer: On 2nd August, 1883, by the then Secretary for Public Works (F. A. Wright).
 - (2.) The number and amount of each contract that bills of quantities were furnished for?
 - (3.) The number of copies of bills sold for each contract?
 - (4.) The number of copies of bills prepared for each contract?
 - (5.) The cost of measuring, computing, compiling, and printing, including all stationery, of the bills for each separate work?
Answer: The information is furnished on annexed statement.
 - (6.) The total amount received for bills of quantities by the Government since the introduction of the principle up to the present date?
Answer: £450 12s. This amount includes the proceeds of sale of specifications, a copy of which is sold to contractors with each set, the set consisting of one copy of specification with form of tender and schedule of quantities attached, and one separate form of tender and schedule of quantities.
 - (7.) The total cost of preparing all the bills of quantities since the introduction of the system up to the present date?
Answer:—£327 8s. 8d. This sum represents the cost of printing and stationery only. No extra cost is incurred in computing quantities which have to be taken out in any case in order to estimate the cost of the work, and for office use.

STATEMENT showing Contracts for which Bills of Quantities were prepared and sold, and Approximate Cost of preparing such Bills of Quantities

Nature of Contract	Amount of Contract	No of Bills of Quantities sold	No of Bills of Quantities prepared	Cost of preparing Bills of Quantities	Remarks, &c
	£ s d			£ s d	
Refreshment-rooms, Werris Creek	5,247 7 6	14	90	5 10 0	
Chimney-stack, Redfern	1,056 12 0	20	60	1 1 0	
Station master's House, Esk Bank		8	60	3 18 0	No tender accepted.
Footbridge, Orange—Ironwork	510 0 0	8	100	1 1 9	
Additions to Gatekeepers' Cottages, Richmond Line	780 0 0	4	50	2 5 8	
Foundations, &c, for shops, Nos 5 to 15 (No 5), Eveleigh	10,420 18 0	26	100	1 1 9	
Bridges under Railway, Parramatta—Abutments, &c	8,517 10 0	18	150	1 2 6	
Additions to Stations, Warne and Ironbarks	471 13 0	4	50	2 5 8	
Footbridge, Orange—Foundations, &c.	451 8 0	8	100	1 1 9	
Do Goulburn do	985 0 0	14	100	1 1 9	
Excavation of Sidings, Newbridge	645 0 0	34	50	1 0 10	
Tarpaulin-shed, Eveleigh	4,330 17 8	12	100	2 6 8	
Roofs, Girders, and Columns for shops, Nos 1 to 4, Eveleigh	15,223 19 0	16	100	1 1 9	
Combined Fire and Locomotive Tanks and Bath, Bathurst	2,380 17 6	10	60	1 13 6	
Pointsman's Cottage, Lithgow Zig Zag	365 9 5	10	60	2 6 0	
Bridge over Railway, Harris Park—Contract No 1	1,151 9 4	12	100	1 1 9	
Sheep-trucking Yards, Narromine	196 9 3	10	60	1 1 0	
Bridge over Railway, Harris Park—Contract No 2	1,929 18 10	16	100	1 1 9	
New Tunnel, Redfern—Contract for Ironwork	7,132 7 6	14	100	1 1 9	
Footbridge, Petersham—Abutments, &c	1,008 2 6	8	100	1 1 9	
Ash-pits, Eveleigh	3,474 17 6	10	100	1 1 9	
Additions to Passenger Station, Mount Victoria		6	100	5 10 6	do
Turntable pits, Eveleigh	1,048 8 6	16	100	1 1 9	
Closets and Urinals, Blackheath		2	50	1 0 10	do
Platform Walls, Harris Park	578 4 0	10	50	1 0 10	
Driver's Room, Moss Vale	100 6 0	16	60	1 1 0	
Water tank, Newcastle		4	50	1 0 10	No tenders accepted.
Signal-box, Parramatta Station	342 5 7	4	50	2 5 8	
Refreshment rooms, Harden	942 13 4	14	50	2 5 8	
Guard's Quarters, Junee Junction	533 12 0	8	50	2 5 8	
Pointsman's Cottage, Young Junction	393 8 4	8	40	2 5 8	
Driver's Quarters, Wellington	885 16 9	10	50	2 5 8	
Bridge over Railway, Wells st, Redfern—Contract No 1	2,033 5 8	10	100	1 1 9	
Do do do do No 2	3,388 10 0	10	100	1 1 9	
Platform Walls, Emu Plains	451 7 8	6	50	1 0 10	
Footbridge, Wagga—Contract No 1		10	100	1 1 9	Tender not accepted
Do do do No 2	378 18 0	8	~100	1 1 9	Tender was accepted, but it was subsequently decided not to proceed with the work
Porter's House, Murrumburrah	466 6 7	4	50	2 5 8	No tender accepted
Do Macdonald River		4	50	2 5 8	
Duplication of Line, Parramatta to Penrith	79,343 1 6	28	130	2 7 0	
Do do do do Supply of					
Iron Bridges	11,365 6 3	8	60	1 1 0	
Platform Walls, Eveleigh	1,278 0 0	18	100	1 1 9	
Signal box, Rookwood	277 17 5	6	50	1 13 3	
Telegraph Battery Room, Redfern		2	50	1 13 3	do
Footbridge at Goulburn—Erection of Superstructure, &c	691 0 0	6	100	1 1 9	
Signal-box, Petersham Station	209 6 0	8	50	1 13 3	
Closets and Urinals, Eveleigh		2	40	1 13 0	do
Goods-shed, Bundanoon	165 6 4	10	50	1 13 3	
Retaining Wall, Woodburn street, Redfern	1,686 4 0	26	100	1 1 9	
Water-tank, Newcastle		2	50	1 0 10	do
Footbridge, Orange—Contract No. 3—Erection of Superstructure, &c.	402 5 0	8	100	1 1 9	
Coal-stage, Eveleigh	3,662 0 0	18	100	1 1 9	
New Viaduct, Petersham—Contract No 1	7,509 17 6	4	100	1 1 9	
Station-master's House, Eskbank	913 7 10	14	50	3 16 9	
Do do Newcastle	1,049 18 4	10	50	3 16 9	
Do do Windsor	679 14 1	6	50	3 16 9	
New Boiler-shop, Honeysuckle Point	3,115 11 0	2	50	2 5 8	
New Workshops, Eveleigh—Contract No 5A	37,611 0 0	8	100	1 1 9	
Traffic Manager's House, Newcastle	1,229 14 6	10	50	3 16 9	
Additions to Goods shed on Wharf, Newcastle	835 6 10	8	50	1 13 3	
Water tank and Cesspit at Springwood Station	146 10 9	16	50	1 0 10	
Porter's House, Carrathool	406 8 7	6	50	1 13 3	
Post Office, Marulan	240 19 10	10	50	1 13 3	
Station-master's House, Doughboy Hollow	393 13 0	10	50	2 5 8	
New Workshops, Eveleigh—Contract No 9—Foundations, &c, for shops Nos 16 to 25	8,343 15 8	24	100	1 1 9	
Passenger Station, Spring Hill	1,498 12 7	8	50	5 7 9	
Additions to Passenger Station, Mount Victoria	2,357 18 9	16	60	5 8 9	
Viaduct over Long Cove Creek, Petersham—Contract No. 2	1,914 6 6	14	60	1 1 0	
Duplication of Line, Parramatta to Penrith—Contract No. 3	2,200 0 0	10	60	1 1 0	
Carpenter's Shop, Goulburn	984 18 4	6	100	1 14 3	
Workshops, Eveleigh—Contract No 4B—Superstructure, &c, of shops, Nos 1 to 4	12,216 4 9	14	100	1 14 3	
Porter's House, Booking Office, and Urinals, Curlewis		12	50	2 5 8	do
Bridge over railway, William Henry-street, Darling Harbour—Contract No 1	5,862 5 0	8	60	1 1 0	
Fire and Locomotive Tanks & Bath, Bathurst—Ironwork	417 1 8	12	60	1 1 0	
Refreshment rooms, Nyngan	2,249 17 2	2	50	5 7 9	
Bridge under railway, Burren-street, Macdonald Town—Ironwork	932 2 6	4	60	1 1 0	

Nature of Contract.	Amount of Contract.	No. of Bills of Quantities sold.	No. of Bills of Quantities prepared.	Cost of preparing Bills of Quantities.	Remarks, &c.
	£ s. d.			£ s. d.	
Bridge over Throsby's Creek, Waratah—Ironwork.....	308 15 0	6	60	1 1 0	No tender accepted.
Overbridge, near Wellington		2	60	1 1 0	
New Boiler-shop, Honeysuckle Point—Ironwork	2,015 5 0	8	60	1 13 3	
Passenger Station, Summerhill	2,083 6 2	22	50	5 7 9	
Engine-shed and Pits, Wellington	5,392 14 8	22	60	1 13 9	
Offices for Running Foreman, Eveleigh	737 14 0	10	50	2 5 8	
Painting, coloring, tar paving, and general repairs to Passenger Station, Parramatta	393 9 6	14	50	1 0 10	
Passenger Station, Werris Creek	6,051 16 0	14	75	5 9 9	
Pumper's House at Narramine, Nevertire, Trangie, and Nyngan	1,703 1 8	6	50	2 5 8	
Porter's House, Glennie's Creek	424 16 6	12	50	2 5 8	
Duplication of line, Goulburn to Joppa Junction—Iron- work	1,864 7 6	12	60	1 1 0	
Superstructure of Bridges at 22 miles 40 chains, 23 miles, and 24 miles 10 chains, south	1,189 10 0	8	60	1 1 0	
Passenger Station, Petersham	4,804 0 0	28	100	5 10 6	
Locomotive Inspector's Office, Harden	447 6 7	4	50	2 5 8	
Station-master's House, Blayney	1,039 4 8	14	50	3 16 9	
Offices, Pier-street, Darling Harbour	2,019 9 6	10	50	3 16 9	
Residence for Porter-in-Charge, Trangie		6	50	2 5 8	do
Refreshment and Accommodation-Rooms, Wellington ..	5,053 15 1	22	60	5 8 9	
Additions to Refreshment and Accommodation-Rooms, Harden	532 16 8	6	50	2 5 8	
Refreshment-Rooms, Singleton	2,390 8 11	10	50	3 16 9	
Under-bridge at 254 miles 12 chains, South—Ironwork ...	202 5 0	10	60	1 1 0	
Platforms at Burrandong and Ponto, G.W.R.	504 18 0	6	50	1 0 10	
New Workshops, Eveleigh—Contract No. 4c	7,800 10 0	22	100	1 14 3	
Bridge over Argyle-street, Moss Vale—Ironwork	912 10 0	8	60	1 1 0	
New Workshops, Eveleigh—Contract No. 9A	35,285 0 0	14	100	1 1 9	
Passenger Station and Waiting-shed, Stanmore	2,512 2 11	10	100	5 10 6	
House for Porter-in-Charge, Blackheath		4	100	2 6 8	do
Passenger Station, Millthorpe	1,779 5 0	24	50	5 7 9	
New Workshops, Eveleigh—Contract No. 10—Driver's Quarters	2,136 3 2	16	100	1 14 3	
Pumper's House, Granville	491 13 8	10	50	2 5 8	
Bridge over Railway, William Henry-street, Darling Harbour—Contract No. 2	10,791 12 6	42	50	1 0 10	
Duplication of Line Goulburn to Joppa Junction— Contract No. 2		32	60	1 1 0	Work not carried out. No tender accepted.
Over-bridge, Millthorpe		10	60	1 1 0	No tender accepted.
New Workshops, Eveleigh—Contract No. 5B	24,967 10 8	18	100	1 14 3	do
Custom-house, Albury		2	75	2 6 6	
Residence for Porter-in-Charge, Mt. Druitt	549 7 1	6	75	2 6 6	
House for Porter-in-Charge, Wimbleton	660 10 7	10	50	2 5 8	
Passenger Station on up Platform, and Waiting-shed on down Platform, Macdonald Town	1,266 11 1	16	50	5 7 9	
Over-bridge, Culvert, and Embankment, Guinea-street, Albury		18	60	1 1 0	No tender accepted. Fresh plan prepared.
Station-master's Residence, Riverstone	615 1 10	8	50	2 5 8	
Do do Orange	999 13 7	8	50	3 16 9	
Do do Ravensworth		10	50	2 5 8	No tender accepted.
Do do East Maitland	828 12 8	8	50	3 16 9	
Waiting-shed on down Platform, Summer Hill	913 12 4	8	50	3 16 9	
Roofs, Girders, and Columns for Paint Shop, Eveleigh ..	11,398 6 0	12	100	1 1 9	
Station-master's Residence, Waratah	700 14 9	16	50	2 5 8	
Do do Blackheath	650 11 7	18	50	2 5 8	
Offices for Locomotive Branch, Eveleigh		36	90	5 10 6	No tender accepted. Fresh specification pre- pared. Plan altered.
Engine-shed and Pits, Eskbank	2,351 10 4	26	50	1 13 3	
Pumper's House, Wilga	289 1 4	14	40	1 13 0	
Do Byrock	372 18 3	10	40	1 13 0	
Cattle Trucking Yards, Narramine	262 3 6	14	50	1 0 10	
Gas Works, Werris Creek		32	60	5 8 9	No tender accepted.
Pumper's House, Bourke	459 6 2	6	50	2 5 8	
Goods-shed and Landing Stage, East Tamworth	946 10 10	32	50	1 13 3	
Overbridge, Culvert, and Embankment, Guinea-street, Albury	1,692 4 0	14	60	1 1 0	
Passenger Station, Cootamundra	1,918 14 8	18	50	5 7 9	
New Workshops, Eveleigh Contract, No. 12, E.C.'s and Urinals	1,348 18 10	12	100	1 14 3	
Locomotive Overseer's and Timekeeper's Office, Eveleigh	1,872 7 1	12	100	2 6 8	
Engine Driver's Quarters, Bathurst	989 0 2	14	50	2 5 8	
New Workshops, Eveleigh, Contract 14—Foundations and Pits for Traversers for Shops	2,471 14 0	24	50	1 0 10	
Passenger Station and Post Office, Auburn	1,377 15 10	34	50	5 7 9	
Residence for Officer-in-Charge, Coolabah	499 1 11	10	40	2 5 8	
Residences for Officers-in-Charge at Stove Creek and Mumbil		18	40	5 6 0	Fresh tenders now being invited.
Extension of Footbridge, Homebush Station		8	60	1 1 0	Tender not yet accepted.

Nature of Contract.	Amount of Contract.		No. of Bills of Quantities sold.	No. of Bills of Quantities prepared.	Cost of preparing Bills of Quantities.		Remarks, &c.
	£	s. d.			£	s. d.	
TRAMWAYS.							
Construction of Line—Waverley Tea Gardens to Bondi...	12,596	5 0	10	150	1	2 8	
Extension of Leichhardt Line to Short-street	8,276	17 0	4	75	1	1 0	
Waiting-room and Coke-shed, Waterloo.....	345	6 8	6	50	1	13 3	
Laying Wooden Pavement, Newtown Road	11,832	5 2	16	100	1	1 9	
Smiths' and Boiler Shop, Randwick	3,988	0 10	14	50	1	13 3	
Coke-shed, Enmore	367	19 2	6	50	1	13 3	
Waiting-room at Coogee Bay	257	19 3	8	50	1	13 3	
Bridge over Sydney Water Supply Canal, Campbell Town to Camden Tramway	1,587	2 0	12	60	1	1 0	
Laying Wooden Pavement, Crown-street	23,064	11 8	24	100	1	14 3	
Construction of Tramway—Newcastle to Wallsend and Plattsburg	30,855	7 6	26	60	1	13 6	
Car-shed, North Shore Cable Tramway	1,173	8 8	18	100	1	14 3	
Tramway—Waverley to Randwick .....	.....		40	80	1	14 0	Tender not accepted.
					£327	8 8	

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

RAILWAYS.

(ORANGE TO MOLONG—BLAYNEY TO BOURKE)

Ordered by the Legislative Assembly to be printed, 20 April, 1887.

RETURN to an Order of the Honorable the Legislative Assembly of New South Wales, dated 2nd June, 1886, That there be laid upon the Table of this House,—

- “1. The amount of revenue and expenditure at the respective Stations on the Orange and Molong Railway from the date of opening to 31st May, 1886, together with a list of the number of passengers that have travelled to and from the various Stations, and the amount received at each.
- “2. The number of men or officials employed at each Station, and the amount of goods received and despatched therefrom respectively.
- “3. The same information with regard to the various Stations on the Railway from Blayney, Orange to Bourke.”

(Dr. Ross.)

RETURN showing Revenue and Expenditure, Number of Employés, and Tonnage of Goods of Stations on Molong Line, and Stations Blayney to Bourke, from 21st December, 1885, to 31st May, 1886.

Station	No of persons employed	Expenditure			Revenue			Passengers carried			Tonnage of goods			Remarks.
					Coaching traffic	Goods traffic	Total	To	From	Total	Received	Despatched	Total	
Blayney	14	£ 740	s 8	d 0	£ 5,499	£ 14,225	£ 19,724	6,310	7,050	13,360	9,020	1,534	10,554	The one third of the staff are chargeable to coaching traffic
Lime Siding	Nil					798	798				444	921	1,365	
Milthorpe	5	23	11	4	985	2,147	3,132	2,361	3,247	5,608	1,293	2,513	3,506	Including 1 lad, porter, and 1 operator
Spring Hill	5	279	0	1	613	1,043	1,656	1,751	3,060	4,811	396	1,338	1,784	do do
Orange Meat Company's Siding	Nil					3		145						
Huntley	5				77	52	129	817	367	1,184	261	2	263	
Orange	3	1,986	13	4	13,500	21,616	35,116	16,225	17,001	33,226	10,101	7,229	17,330	Including 3 operators for repeating stations
Mullion Creek	3	128	0	7	158	139	297	456	576	1,032	46	1,177	1,223	2 officers and probationer at 2s 6d. per week.
Kear's Creek	2	77	16	11	171	160	331	366	614	980	17	874	891	
Waine	3	174	16	0	381	495	876	620	895	1,515	118	457	575	
Storie Creek	2	111	1	1	36	2	38	108	176	284	3		3	Crossing place and watering station for trains
Ironbarks	4	188	7	8	540	492	1,032	1,091	1,068	2,159	208	80	288	3 officers and 1 porter.
Mumbil	2	153	5	5	164	109	273	409	636	1,045	87	330	417	
Springs	2	113	5	7	297	190	487	562	760	1,322	29	398	427	
Wallington	19	1,028	1	4	3,256	4,639	7,895	3,978	3,550	7,528	2,230	1,453	3,683	Including 2 telegraph operators—changing stations for trains.
Apsley	Nil				23	1	24	132	61	193	1		1	
May Vale	2	125	3	8	174	28	432	525	700	1,225	48	475	523	
Ponto	2	124	14	6	116	54	170	176	244	420	54	105	159	Crossing place for trains
Murrumbidgee	3	119	7	7	262	73	99	573	738	1,311	92	1,256	1,348	
Dubbo	31	1,785	15	9	10,066	13,765	23,831	5,928	5,900	11,828	6,748	4,235	7,983	Includes depot staff, shunters, and receiving men
Narranmore	3	186	17	3	470	547	1,017	654	651	1,305	94	447	541	
Triangle	1	119	0	10	931	1,665	2,596	685	774	1,459	329	485	814	
Nevestire	3	412	5	2	2,788	10,663	13,751	1,312	1,394	2,706	1,198	253	1,451	Live stock trucking place.
Mullengudger	3	101	1		134	137	271	120	139	259	34	2	36	Crossing place for trains
Nyngan	15	757	4	10	5,540	10,089	24,629	2,225	2,166	4,391	3,906	2,073	5,979	Live stock trucking place
Guilambone	3	173	4	2	437	1,343	1,780	267	20	287	77	42	119	
Wilga	3	6	2	10	128	741	869	96	14	110	33	51	84	Now closed
Coolabah	3	145	2	11	462	1,042	1,564	194	252	446	122	173	365	
Glengauiff	Nil				19	4	23	37	6	43	1		1	
Byrock	9	394	1	2	2,504	5,245	7,749	1,023	1,133	2,156	1,358	137	1,495	
Moorcutta	1	57	5	8	86	22	108	162	192	354	4	149	153	
Bourke	19	1,135	9	0	9,700	39,002	49,602	2,368	2,264	4,632	5,493	1,580	7,073	Live stock trucking
Orange Racecourse	Nil				151	8	159	2,744	18	2,762	60		60	
Cargo	3				23	53	76	60	48	554	191	39	230	
Boenore	3	291	3	5	247	57	822	728	1,091	2,719	827	413	1,240	
Amaroo	Nil				76	180	256	808	70	968	950	12	962	
Molong	7	472	13	2	1,999	3,534	5,533	2,633	2,909	5,542	1,339	999	2,338	
Total	212	11,663	0	8	62,016	145,068	207,984	59,210	61,074	120,284	44,222	31,232	75,454	

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAY FROM TARAGO TO BRAIDWOOD.

(MINUTES, &c., RELATIVE TO PROPOSED.)

Ordered by the Legislative Assembly to be printed, 1 June, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 3rd May, 1887, That there be laid upon the Table of this House,—

“(1.) Copies of all minutes, papers, and other documents having reference to the proposed railway from Tarago to Braidwood.”

(Mr. S. Smith.)

NO.	SCHEDULE.	PAGE.
1.	Mr. Ryrie to Minister for Works asking for Deputation <i>re</i> Railway to Braidwood. June, 1883	1
2.	Extract from 48 Vic. No. 26, authorizing the raising of a loan for the Public Service of the Colony, and for other purposes. November, 1884	2
3.	Reports from Mr. Surveyor Hotson <i>re</i> Railway to Braidwood. 5 January, 1886	2
4.	Mr. Ryrie, M.P., to Minister for Works asking him to receive Deputation <i>re</i> Railway, and Report of Deputation. 19 January, 1886	3
5.	Mr. Tait, M.P., asking for copy of Mr. Surveyor Hotson's report <i>re</i> Railway. 12 April, 1886	4
6.	Mr. Ryrie, M.P., to Minister for Works asking him to receive Deputation <i>re</i> Railway, and Report of same. 5 May, 1886	4
7.	Engineer-in-Chief forwarding Plan, Section, and Book of Reference of proposed Railway, Tarago to Braidwood. 27 May, 1886	5
8.	Extract from Votes and Proceedings <i>re</i> approval of plans of Railway in Legislative Assembly. 16 September, 1886	7
9.	Extracts from Minutes <i>re</i> approval of plans of Railway in the Legislative Council. 14 October, 1886	7
10.	Extract from Votes and Proceedings <i>re</i> Question asked in the Legislative Assembly <i>re</i> traffic, &c. 6 October, 1886	8
11.	Mr. Ryrie, M.P., to Minister for Works asking for information <i>re</i> Railway. 4 December, 1886	8
12.	Minute of Commissioner for Railways <i>re</i> probable revenue from Railway, and reports. 10 December, 1886	9
13.	Mr. Ryrie, M.P., to Minister for Works asking for Deputation <i>re</i> Railway. 20 January, 1887	10
14.	Précis of case. 9 March, 1887	11

No. 1.

A. Ryrie, Esq., M.P., to The Secretary for Public Works.

Sir,

June, 1883. ¶

Can you receive a deputation from the Braidwood district on Friday, the 22nd instant; the gentlemen comprising the deputation have all come down and are in Sydney.

I have, &c.,

ALEX. RYRIE.

For branch railway, Tarago to Braidwood—get information for Minister to-day for this.—J.R., 21/6/83.

Tarago is on the line from Goulburn to Cooma, now being made, Tarago being about 22 miles from Goulburn. From the railway map it will be seen that it is in contemplation to make a line from some point on the present G.S. Railway to Braidwood.—CH.A.G., 21/6/83.

EXTRACT

363—A

[817 copies—Approximate Cost of Printing (labour and material), £11 10s. 1d.]

EXTRACT from *Echo* 22 June, 1883.

RAILWAY EXTENSION TO BRAIDWOOD.

INTRODUCED by Mr. Ryrie, M.L.A., a deputation consisting of Mr. W. Clark, M.L.A., Mr. H. Badgery, M.L.A., Mr. R. Maddrell, chairman of a public meeting held at Braidwood, Mr. Thomas Stewart, and Mr. Rowland Hassall, waited this morning upon the Hon. F. A. Wright, Minister for Works, to ask that a light branch railway line should be constructed from Tarago to Braidwood. They urged that such a line would confer great advantages upon the district through which it passed, and quoted statistics showing that the country was rich in minerals, had immense timber resources, and was unusually good for agriculture. If a light line 26 miles in length were constructed, the district would become very prosperous, and the traffic would repay the cost of construction.

Mr. Wright replied that he was not in favour of the construction of light lines, as those branches we had were signal failures. Substantial lines should be constructed, and indeed the traffic they indicated would require a substantial line to carry it. At present, owing to the destruction of plans and surveys in the Garden Palace fire, the railway surveyors were kept very busy, but he could promise them that a trial survey should be made of the route they indicated, and when Parliament assembled, and he submitted a comprehensive scheme of railway policy, Braidwood would not be overlooked.

EXTRACT from M.-P. 83-3,327.

THE Minister for Works (Hon. F. A. Wright)—Instructions to make a trial survey for a light line of railway, from near Tarago to Braidwood. August, 1883.

No. 2.

EXTRACT from 48 Victoria, No. 26.

AN Act to authorize the raising of a loan for the Public Service of the Colony, and for other purposes. (Assented to 1 November, 1884.)

Tarago to Braidwood, 31 miles, £310,000.

No. 3.

Reports from Mr. Surveyor Simpson *re* Railway to Braidwood.

Mr. Surveyor Hotson to The Engineer-in-Chief.

Sir,

Braidwood, 5 January, 1886.

I have the honor to report that, in accordance with instructions conveyed to me in memo. dated 23rd December, I have examined the line of country from Tarago to Braidwood, *via* Larbert. The accompanying map shows the staked line of permanent survey and the route followed by me in the explanation just made.

The route diverges from the staked line at about 60 chains from the junction of the latter with the Cooma line at Tarago, and, after crossing the Goulburn and Braidwood Road, passes over a level tract of country until the Lake Bathurst Road is crossed, about 4 miles from Tarago—the elevation throughout this length being about 2,300 feet.

Thence it falls gradually along a flat valley, in which the Millended Creek is situated, to the crossing of the Boro Road, about 8½ miles from Tarago, the elevation being about 2,100 feet.

From this point there is a difficult country met with, falling towards Boro Creek.

The line would require to be very carefully chosen here, winding down around the spurs from the range lying to the west, so as to obtain workable grades, but avoiding the deep gulleys coming down apparently from Coghill Mountain.

The creek would probably be somewhere near where shown on plan, about 10 miles from Tarago, the height of creek bed being about 1,965 feet. A bridge of considerable dimensions would be required here.

After crossing some tributaries of Boro Creek, the line would rise thence along the slopes of the hills to a tableland, commencing at about 13½ miles from Tarago; the elevation here being about 2,100 feet.

From this position the line would be continued over a flat sandy scrub country, presenting no features of importance, until reaching the crossing of the Marulan Road, at about 16 miles from Tarago, and an elevation of 2,145 feet or thereabouts.

Thence the fall towards the Shoalhaven River would commence, being carried down around the slopes of a range of hills lying to the eastward of line. The level of river bed, where crossing would probably be made, at 19¼ miles from Tarago, is about 1,950 ft. by aneroid observation, which shows but little fall from the crossing of permanent survey, 7 miles up river. The most favourable point for crossing will probably be found at or near the position indicated.

A large flat, subject to floods, occupies the north bank, between this point and the village of Larbert, and the main channel in the vicinity of Larbert increases so greatly in width that the bridge and approaches could be constructed in that neighbourhood only at greatly increased cost.

At the point shown on plan the length of bridge would probably not differ materially from that on permanent survey, but a high bank on south side, and the general conformation of the country, appear to indicate that in this case a greater height would be required for the structure.

The line from this point would rise along slope of hill on south bank to a height of about 2,040 ft., falling again to crossing of Durran Durra Creek, at 1,980 ft. elevation, and 22 miles from Tarago.

Thence around range, and avoiding St. Omer Creek, the line would continue over a moderately easy country, rising to 2,255 ft., at about 26 miles from Tarago, and falling thence to Braidwood, the height of which at Gaol step is 2,142 ft., and at terminus of permanent survey 2,133·40 ft.

The total distance by route followed by me is about 30 miles.

I estimate the extreme length of line as probably 30½ miles, as against 29½ miles by permanent survey. There

There is a large extent of barren country traversed in portions of this route, but it does not compare very unfavourably in that respect with the line of permanent survey.

In the nature and extent of the works required the two routes appear to be similar, and so far as one inspection enables me to judge, the average cost per mile would not differ materially.

The village of Larbert is a place of no importance, the population being very small. The settlement on and near either route is not very great, but the promoters of the route now reported on claim that the settlers along line of permanent survey are already in a great measure provided with railway communication by their nearness to the Cooma line.

I have, &c.,

JOHN B. HOTSON.

I have not yet received the plan referred to by Mr. Hotson. The working section of the permanently staked line has, however, been plotted, and is a most favourable one for the whole distance between Tarago and Braidwood. The permanent survey has been completed, and as there do not appear to be any special advantages to be gained by adopting the Larbert route (the survey of which has only been asked for after the completion of the permanent survey), I do not think a trial survey need be made, and recommend that Mr. Hotson be allowed to break up his party and return to Sydney.—H.P., 11/1/86. The Engineer-in-Chief. Approved.—J.W., 12/1/86.

Mr. Surveyor Hotson to The Engineer-in-Chief.

Sir,

Braidwood, 5 January, 1886.

I have the honor to return under separate cover the compilation of parish maps between Tarago and Braidwood, on which I have shown the line of permanent staking, and the apparently best route, *via* Larbert, should a trial survey be required.

My report on the latter route is enclosed.

An accident having occurred to Mr. Caswell's level when he had commenced taking the cross levels yesterday, will delay the completion of the work for a day and I shall therefore be unable to leave on Friday as proposed.

In the absence of any instructions to the contrary, I shall leave with camp on Saturday or Sunday, so as to be enabled to proceed to Sydney by night train on Monday. Mr. Caswell will proceed to Goulburn and Crookwell survey as soon as possible.

I have, &c.,

JOHN B. HOTSON.

Received.—H.P., 12/1/86.

Mr. Surveyor Hotson to The Engineer-in-Chief.

Sir,

Braidwood, 10 January, 1886.

I have the honor to inform you that I have forwarded to Tarago, for despatch thence by rail to Sydney, a roll containing the completed working plans of permanent survey, in pencil, the book of reference, and two tracings, which I was instructed to return with working plans. A separate package contains field and level books.

I am informed that the lock-spitting, &c., will be completed on Wednesday next. I have to request instructions as to my examining work, and giving certificate for it, if required to do so.

I have, &c.,

JOHN B. HOTSON.

Received.—H.P., 13/1/86.

No. 4.

Telegram from A. Ryrie, Esq., M.P., to The Secretary for Public Works.

Braidwood Station.

WILL Monday be suitable for interviewing deputation? No reply to telegram.

ALEX. RYRIE.

Monday will not be convenient to Minister. Appoint Friday week, at 11 o'clock. Letter by post. In the meantime please state subject.—Telegram, 19/1/86.

The Under Secretary for Public Works to A. Ryrie, Esq., M.P.

Sir,

Department of Public Works, Sydney, 20 January, 1886.

Referring to your telegrams of the 18th and 19th instant, I am directed to inform you that the Secretary for Public Works will receive the deputation on Friday week, the 29th instant, at 11 o'clock a.m., and I am to request that in the meantime you will state the subject which it is proposed to bring before the Minister.

I have, &c.,

JOHN RAE.

A. Ryrie, Esq., M.P., to The Under Secretary for Public Works.

Sir,

Micalago, 24 January, 1886.

In reply to yours of the 20th inst., *re* Braidwood railway deputation fixed for Friday, 29th inst., I beg to say that the deputation wish to point out to the Minister that the sectional or final survey being now completed, that by request he will order the plans to be gone on with as little delay as possible, they wish to assure the Minister that the route surveyed is approved of by the residents of Braidwood and of the district, and they wish further to point out the benefits it will confer.

I am instructed by the members of the deputation to say that they will accept of Friday, the 29th, to wait upon the Minister.

I have, &c.,

ALEX. RYRIE.

Mr. Palmer.—W.H.Q., 28/1/86. The working plan and section of the Tarago and Braidwood extension are well advanced, and the Parliamentary plan, section, and book of reference will be completed in about ten days.—H.P., 28/1/86. The Engineer-in-Chief.

Department

Department of Public Works, Sydney, 29 January, 1886.

Railway—Tarago to Braidwood.

A DEPUTATION from Braidwood, introduced by Mr. A. Ryrie, M.P., waited upon me to-day to urge that an early commencement might be made with the Tarago to Braidwood Railway. It was represented that an agitation had been got up to have the line taken by a different route than that originally proposed—viz., *via* Larbert, but it was stated that the agitation was merely got up by those who would be personally benefited by the deviation.

It was stated that the original route was the most direct and economical one that could be chosen, while it would serve the greater number of people; no bridge over Reedy Creek was necessary, and crossing the Shoalhaven would be inexpensive.

If, however, the alternate line was adopted, the bridge over the Shoalhaven would be very costly, the country passed through was poorer and more sparsely populated, and it would not prove so suitable to the Braidwood people. They therefore protested against the deviation, and considered that even the expense incurred in a flying survey would not be justifiable. Mr. Ryrie stated he had property along the proposed alternative route, and although he would be personally benefited if it were adopted, he had to express his conviction that the original route was the best one that could be chosen.

It was further represented, in support of the early construction of the line, that the present traffic was very considerable both in passengers and goods, that its mineral resources, principally silver and gold, were becoming more developed, and would give a large traffic.

I informed them that I was glad to meet them, and would give due attention to their representations. At the same time I thought it very desirable that all possible information should be gathered before we definitely committed ourselves to any railway extension.

The want of obtaining sufficient information before approving of lines had in some instances caused extensions to be constructed which did not serve the best interests of the country, and I wished to guard against such mistakes by giving proper attention to all representations made, and having full inquiry before definitely deciding on any route.

I had anticipated that I would have been in possession of a report from the Engineer-in-Chief to have enabled me to give some decision in the matter, but until inquiry had been made I could say nothing definite. If the deviation seemed feasible, and to offer any advantages over the surveyed route, I would, in the interests of the community, have to defer action in connection with the latter until examination was made, but I promised that whatever was done would be done quickly, and that no time would be lost in coming to a decision.

I admitted that Braidwood, on account of its rising importance, merited my best consideration; and the arguments they put forward, coupled with Mr. Ryrie's support, were very weighty, but I could do nothing until the matter had had full consideration.

I shall be glad to see the Engineer-in-Chief in reference to this question.
The Engineer-in-Chief.

J.G., 29/1/86.

The Engineer-in-Chief is absent from Sydney on official business.—W.H.Q., 1/2/86.

No. 5.

F. Tait, Esq., M.P., to The Secretary for Public Works.

Sir,

Legislative Assembly, 12 April, 1886.

I understand a flying survey has been made of a proposed line of railway from Tarago to Braidwood *via* Larbert.

Will you kindly supply me with a copy of the surveyor's report, and oblige,

Yours, &c.,

FRANCIS TAIT.

Shall be glad if information asked for is supplied to Mr. Tait.—W.J.L., 14/4/86. Mr. Tait, M.P., enclosing copies, 22/4/86.

W. H. Quodling, Esq., to F. Tait, Esq., M.P.

Sir,

Sydney, 22 April, 1886.

Referring to your letter, dated 12th instant, to the Hon. the Minister for Works, I have the honor to forward the enclosed copies of reports on the following railway trial survey, viz., from Tarago to Braidwood *via* Larbert, *per* Mr. Surveyor J. B. Hotson.

I have, &c.,

W. H. QUODLING.

No. 6.

A. Ryrie, Esq., M.P., to The Under Secretary for Public Works.

Sir,

Sydney, 5 May, 1886.

Will you be good enough to inform me if the Minister will be able to receive a deputation on the subject of a railway from Tarago to Braidwood on Friday next, the 7th instant, at 11.30 a.m.

I have, &c.,

ALEX. RYRIE.

Inform application granted.—J.R., 5/5/86. Done, 5/5/86.

Minute by the Secretary for Public Works.

Deputation—A. Ryrie, M.P.—Railway from Tarago to Braidwood.

THE deputation, accompanied by Messrs. A. Ryrie, O'Sullivan, Hyam, and Dawson, M.'s P., waited upon me to-day with reference to the Railway from Tarago to Braidwood, and urged that the plans, &c., should be laid before Parliament as early as possible, and the line put in hand without delay.

They believe the railway could be made for less than was estimated, and one of the deputation suggested it might be made a light line. I

I informed them that the plans were ready, and I would take an early opportunity of looking into them. With regard to the suggestion that it should be made a light line, I stated that I was an advocate of light railways where the traffic was not extremely heavy, and on Sir John Fowler's recent visit to the Colony had taken occasion to obtain a report from him, and I found his views entirely coincided with my own. Wherever it was possible, I intended to have light lines constructed, and I would give attention to this extension to see if anything could be done in the way of reducing the cost of the line by laying it down on the lines suggested by Sir John Fowler, *i.e.*, with less sleepers and less ballast, the gauge, however, would have to be the same under the Railway Act, and the rails the usual weight to carry the rolling stock employed.

I promised to look through the plans and papers as soon as I had a convenient opportunity, and stated I saw no reason why action should be delayed in any way.—W.J.L., 7/5/86.

Re-submitted, 12/5/86.—CH.A.G. Could a cheap railway be constructed over this route, and if so, can the Engineer-in-Chief give me an idea of the cost?—W.J.L., 13/5/86. This line could not be constructed as a cheap railway, in consequence of the steep gradients and heavy cuttings.—J.W., 26/5/86. Seen.—W.J.L., 2/6/86.

No. 7.

The Engineer-in-Chief to The Secretary for Public Works.

Department of Public Works, Railway Branch, Engineer-in-Chief's Office,
Sydney, 27 May, 1886.

Railway, Tarago to Braidwood—Forwarding Parliamentary Plan, &c.

I HAVE the honor to forward herewith copies of the plan, section, and book of reference of the proposed railway from Tarago to Braidwood, to be laid before Parliament in accordance with section 9 of "The Government Railways Act of 1858."

JOHN WHITTON.

Report from Trial Survey Branch—Tarago to Braidwood.

THIS is an early settled district, and is for the most part fertile, well watered, and fit for agricultural settlement.

There is little, if any, Crown land along the route of the proposed railway, which is at no part very distant from the first-class macadamized road which now serves the district.

The country around Braidwood is chiefly in the hands of large landed proprietors, and from the nature of the country there is no probability of the railway being extended beyond Braidwood in any direction, except at an enormous cost.

TARAGO TO BRAIDWOOD.

THIS line, it will be seen, will leave the Southern Railway at Tarago, and pass thence to Braidwood, a distance of 29 miles, bringing it within 183 miles of Sydney. The districts through which the line would pass are capable of large production, but are handicapped owing to the want of a cheap and convenient means of transit. The statistics of the Braidwood district, which the railway would affect, are as follows:—

Land in cultivation. acres.	Total area of holdings.	Wheat. bus.	Maize. bus.	Barley. bus.	Oats. bus.	Potatoes. tons.	Hay. tons.	Horses.	Cattle.	Sheep.
5,661	242,200	39,319	3,091	1,977	7,083	623	3,174	3,461	22,407	39,937

This, of course, affords no fair criterion of the traffic that would be gained if a railway were made, as no doubt much larger production will follow the railway; and, in addition, the mineral resources of the district, which are considerable, are likely to be more fully developed, and an all-round benefit to the Colony will result. The railway will not only affect the Braidwood district, but will also, to some extent, serve a large district between it and the coast, and open up a large extent of available agricultural country. In addition to agricultural productions, there will be a considerable traffic locally in live stock; while stock will be travelled from the adjoining districts.

This line might be made, as proposed in other cases, as a cheap railway. The estimated cost can probably be reduced, and the working by running mixed trains in the daytime curtailed as much as possible. There is abundance of excellent timber in the district, which can economically be used in the construction of the railway, and form an item of traffic when the line is made.

The cost of the line is rendered heavy by the expense of the timber openings necessary and bridge over Shoalhaven River, these works absorbing £60,000 of the estimated cost.

The book of reference shows 142 portions of land will be taken.

THE description of this line, as supplied by the Engineer for Trial Surveys, is as follows:—

TARAGO TO BRAIDWOOD (Permanent Survey—Length—29 miles 12 chains.)

THIS proposed branch line leaves the Goulburn and Cooma line at the southern end of the Tarago Station, 158 miles from Sydney; thence across Merigan Creek to the Goulburn and Braidwood road; thence in a very straight direction to Reedy Creek; thence crossing the Bungendore and Braidwood road to Doughboy Creek; thence across Manar Creek, near the Manar homestead; thence via Spring Creek and down Blue's Creek to a crossing of the Shoalhaven River, about a mile and a half above the road-bridge across that river on the Goulburn and Braidwood road; thence passing to the back of the Braidwood race-course, and terminating close to the town of Braidwood, near the junction of the Tarago and Shoalhaven roads, at a point 29 miles from Tarago and 187 miles from Sydney. Appended are tables of the gradients and curves to be used on this extension; also an estimate of the cost of construction, prepared from the working section of the permanent survey. The sharpest curve has a radius of 20 chains, the steepest gradient used being 1 in 40. The estimate as now prepared, agrees very nearly with that supplied when the vote for the construction of this line was approved, the vote showing a small surplus.

TARAGO

August, 1886.

TARAGO TO BRAIDWOOD. (Permanent Survey.—Length—29 miles 12 chains.)

Table of Gradients.				Table of Curves.			
Grade.			Length.	Radius of Curve.			Length.
1 in 40	...	...	1 mile 59 chains.	20 chains	...	...	1 mile 10 chains.
1 in 44	...	...	0 " 50 "	25 "	...	...	1 " 5 "
1 in 48	...	...	0 " 24 "	30 "	...	...	1 " 41 "
1 in 50	...	...	1 " 21 "	40 "	...	...	0 " 30 "
1 in 55	...	...	0 " 78 "	60 "	...	...	2 " 26 "
1 in 60	...	...	2 " 45 "	80 "	...	...	0 " 16 "
1 in 66	...	...	1 " 74 "	160 "	...	...	0 " 15 "
1 in 75	...	...	1 " 55 "	Straight	...	...	22 " 29 "
1 in 80	...	...	1 " 14 "				
1 in 88	...	...	3 " 4 "				
1 in 100	...	...	1 " 22 "				
1 in 110	...	...	0 " 31 "				
1 in 120	...	...	2 " 5 "				
1 in 132	...	...	0 " 68 "				
1 in 150	...	...	0 " 34 "				
1 in 165	...	...	2 " 35 "				
1 in 200	...	...	0 " 30 "				
1 in 220	...	...	0 " 53 "				
1 in 264	...	...	0 " 14 "				
1 in 300	...	...	0 " 38 "				
1 in 330	...	...	0 " 14 "				
1 in 400	...	...	0 " 6 "				
1 in 440	...	...	0 " 47 "				
Level.	...	...	3 " 71 "				
Total ... 29 miles 12 chains.				Total ... 29 miles 12 chains.			

ESTIMATE FROM WORKING SECTION (Tarago to Braidwood); Length, 29 miles 12 chains. August, 1886.

		Excavation—		Culverts—		Bridge over Shoalhaven River—		Station buildings—		Engineering and supervision		Contingencies...		Total	
420,000 c. yds.	Cutting to embankments	...	...	...	3/-	63,000							
90,000 "	Side cutting	...	...	...	1/6	7,250							
3,120 "	Brickwork in cement	...	...	...	£3	9,360							
920 lin. ft.	Timber openings, 10 ft. spans	...	...	...	£8	7,360							
			" " 26 ft. "	...	...	...	£12	9,072							
			Three spans of 150 ft. each, lattice girders, c.i. cylinders	...	...	...		36,000							
			Two spans of 66 ft. each, plate girders	...	...	...		5,280							
			Abutments	...	...	...		2,500							
19,040 rods	Fencing	...	...	...	8/6	8,092							
29¼ miles	Permanent Way laid and ballasted	...	...	...	£3,000	87,750							
3 "	" " in sidings	...	...	...	£3,000	9,000							
No. 7	Public road—Level crossings and gatehouses	...	...	...	£500	3,500							
No. 30	Occupation crossings	...	...	...	£50	1,500							
No. 2	Third class Stations	...	...	...	£4,000	8,000							
			Station buildings—Water supply, &c., at terminus at Braidwood	...	...	...		12,000							
			Engineering and supervision	...	...	...	5 %	13,483							
			Contingencies...	...	...	...	5 %	14,157							
			Total	...	...	...		£297,304							

Amount voted, £310,000; surplus, £12,696.

BRANCH LINE OF RAILWAY FROM TARAGO TO BRAIDWOOD.

INFORMATION showing the Resources of the District.

Population.

THE population of the Braidwood electorate by the last census of 1881 was 6,948, and that of the adjoining coast districts, 11,484, making a total of 18,534, which has considerably increased since that date, and which will all participate in the advantages to be derived from this branch line of railway.

Productions.

The district is now looked upon as one of the most important in the southern part of the Colony for its grazing, agriculture, and mining combined.

Stock.

Stock.

There are some thousands of cattle fattened annually for market, the most of which find their way to Sydney and Melbourne. There are also a large number of horses, cattle, sheep, and pigs bred in the district, the former being famed throughout the Colony. In addition to the valuable horses which have distinguished themselves on the turf, a large number are exported annually for the Indian market. The character of the soil and climate render the district eminently suited for dairying pursuits, a large quantity of butter and cheese, beyond local consumption, being sent throughout the year to the neighbouring districts of Monaro and Queanbeyan, as well as to Sydney.

Agriculture.

There are 7,000 acres of land under cultivation, consisting of wheat, oats, barley, maize, hay, and potatoes, as well as 300 acres of orchards and vineyards. Many of the above products would be considerably increased in quantity if more speedy means of transit existed.

Mining.

The district abounds in minerals, consisting of gold, copper, silver, lead, tin, iron, coal, and shale. The quantity of gold sent to Sydney in 1882 and 1883 was 21,271 ozs., valued at £80,000. The value of machinery used for gold-mining purposes was £33,615 in 1883, and the number of miners employed 675.

Timber.

Around and to the eastward of Braidwood there are at present twelve saw-mills in full operation, and the railway will afford increased facilities for carrying timber to the interior from there, and additional mills will be erected to meet the growing demand, the timber consisting of iron and stringybark, with the best descriptions of gums, together with other timbers suitable for general purposes. It may be mentioned, as showing the suitability of this timber for railway purposes, that the contractor for the last extension of the Cooma line is at present obtaining the whole of the sleepers required from the Braidwood district, and now employs between 400 and 500 men in that work. The revenue from this source is very considerable, as the Government impose a license fee of £6 per annum for each man, and 2s. 6d. per tree on the reserved lands, and as these contractors pay as much for the carriage of the sleepers as for getting them, the benefit of a railway is self-evident.

Coaching and Passenger Traffic.

There are two coaches running daily between Braidwood and Tarago, carrying an average of twenty-five passengers per day, making a total between them of 9,125 during the year.

Imports.

The quantity of goods imported into Braidwood during the year exceeds 3,000 tons, which must necessarily come by train.

General Remarks.

Beyond what has been already advanced, it must be borne in mind that the district, from its elevated position and temperate climate, must attract the attention of all persons seeking health, and its proximity to the metropolis must render it the sanatorium of the Colony. In addition to its climatic advantages it is splendidly watered with five running streams, which at some future date will prove of immense value for wool-washing and manufacturing purposes. The district is an extensive plateau or steppe between the coast and the table-land, through which the Shoalhaven River flows for a distance of about 100 miles, the valley averaging from 30 to 50 miles in width along its course, and comprising an area of a million and a half acres, a large portion of which consists of fine pasture land, and the wooded portions of rich soil, which, when cleared, will prove as fertile as any similar lands in the coast districts, and bring in a large return to the revenue.

No. 8.

EXTRACT from Votes and Proceedings, No. 128.

Legislative Assembly—No. 128—Thursday, 16 September, 1886.

Railway from Tarago to Braidwood:—Mr. Lyne moved, pursuant to Notice, "That this House approves of the Plan, Section, and Book of Reference of the proposed Railway from Tarago to Braidwood, laid before the House on the 3rd August, 1886, in accordance with the 9th section of the Government Railways Act, 22 Vic. No. 19."

Debate ensued.

Question put:—Ayes, 36; noes, 8.

Resolved in the affirmative.

No. 9.

EXTRACT from Minutes.

Legislative Council—No. 75—Thursday, 14 October, 1886.

Railway Plans, Tarago to Braidwood:—Dr. Mackellar moved, pursuant to Notice, "That this House approves of the Plan, Section, and Book of Reference of a proposed Railway from Tarago to Braidwood, laid before the House on the 29th September last, in accordance with the 9th section of the Government Railways Act, 22 Victoria, No. 19."

Mr. Thornton moved, "That the Question be amended by the omission of all the words after the word 'That,' at the commencement, with a view to the insertion in their place of the words, 'the Question of the approval of the Plan, Section, and Book of Reference of a proposed Railway from Tarago to Braidwood, laid before the House on the 29th September last, in accordance with the 9th section of the Government Railways Act, 22 Vic., No. 19, be referred for the consideration and report of a Select Committee, with power to send for persons and papers; and that such Committee consist of the following members, viz., Mr. Dangar, Mr. King, Mr. Lackey, Mr. Alexander Campbell, Mr. Macintosh, Dr. Mackellar, Mr. Mort, Mr. Terry, Mr. Watt, and Mr. Piddington.'"

Debate ensued.

Question

Question put,—That the words proposed to be omitted stand part of the Question,—Ayes, 7 ; Noes, 14.
 Question,—That the words proposed to be inserted, in place of the words omitted, be so inserted—put and passed.

Question, as so amended,—That the Question of the approval of the Plan, Section, and Book of Reference of a proposed Railway from Tarago to Braidwood, laid before the House on the 29th September last, in accordance with the 9th section of the Government Railways Act, 22 Vic. No. 19, be referred for the consideration and Report of a Select Committee, with power to send for persons and papers ; and that such Committee consist of the following members, viz., Mr. Dangar, Mr. King, Mr. Lackey, Mr. Alexander Campbell, Mr. Macintosh, Dr. Mackellar, Mr. Mort, Mr. Terry, Mr. Watt, and Mr. Piddington,—then put and passed.

No. 10.

Question in Legislative Assembly.

Legislative Assembly—No. 142—Wednesday, 6 October, 1886.

Railway, Tarago to Braidwood.—Mr. Sydney Smith asked the Secretary for Public Works ;—Will he state the name or names of the official or officials who supplied the information which was distributed among Honorable Members during the consideration of the motion approving of the plans, sections, and books of reference of the Tarago to Braidwood Railway ?

Mr. Lyne answered,—The figures quoted in statement No. 1 were taken from the Statistical Register ; the information quoted relative to the gradients, cost of construction, was supplied by the Engineer-in-charge of Trial Surveys ; and the general information was given from my own knowledge of the locality. The information given in statement No. 2 was obtained from general sources. I said so when moving the adoption of the plans, and stated that although I could not altogether guarantee it, I would vouch for the correctness of the information in paper No. 1.

Legislative Assembly—No. 142—Wednesday, 6 October, 1886.

Railway, Tarago to Braidwood.—Mr. Sydney Smith asked the Secretary for Public Works,—If the whole of the produce and live stock, enumerated in the Return laid upon the Table of the House in connection with the Tarago to Braidwood Railway, were transmitted from Braidwood to Tarago, what would be the approximate railway revenue derived therefrom ?

Mr. Lyne answered,—£3,964 for the 29 miles.

No. 11.

A. Ryrie, Esq., M.P., to The Secretary for Public Works.

Sir,

Michalago, 4 December, 1886.

As I have to attend a Railway meeting at Braidwood, on Thursday, the 9th inst., I write to ask if you would forward me something I could read to the meeting with regard to your intention of causing a reduced estimate of its construction to be made out. If you recollect you approved of my getting the line referred to a Select Committee, and you then promised to do what I now state. There will be a large meeting—it was postponed for my attendance,—and I would like if you would oblige me by doing what I ask. The chief object of the meeting is to take steps to procure all statistics with reference to the resources, traffic, &c., of the district, to lay before the Select Committee. You could address me to Braidwood, to the care of Mr. John Wallace, as I hope to be there on Wednesday evening.

I am, &c.,

ALEX. RYRIE.

Please inform Mr. Ryrie, in regard to his inquiry, that the matter of the Railway is before the Legislative Council, and no doubt the Select Committee will be reappointed, when every information can be laid before them. So far as I am concerned I shall endeavour to have the line cheapened as much as possible, and as far as practicable make it a light line.—W.J.L., 6/12/86. Urgent.

The Under Secretary for Public Works to A. Ryrie, Esq., M.P.

Sir,

Department of Public Works, Sydney, 7 December, 1886.

In reply to your letter of the 4th instant, with respect to the proposed line of railway to Braidwood, I am directed to inform you that the matter is under the consideration of the Legislative Council, and that no doubt a Select Committee will be appointed to obtain all information necessary for the guidance of the members of that Chamber.

I am to add that the Secretary for Public Works will endeavour to cause the cost of construction to be reduced and make the length in question, as far as practicable, a light line of railway.

I have, &c.,

JOHN RAE.

Engineer-in-Chief.—CHAS. A. G. (*per* D.C.M'L.), 8/12/86.

THE estimate for this proposed line of railway was prepared with a view of its being constructed similarly to the main trunk lines of the Colony, and considering the nature of the country passed through, it is not I think by any means an extravagant one. My experience has been that in reducing estimates additional votes have been required to complete the works. If it should be intended to reduce the estimate for the construction of this line, instructions would be required as to the extent to which reductions would be authorized by the adoption of steeper gradients, lighter rails, &c., &c.—H.P., 13/12/86.

Not possible to make what is called a light line of this length, and I do not consider the estimate excessive.—J.W., 14/12/86. For Minister.—CH. A. G. Inform that the Engineer-in-Chief does not consider it possible to make it a cheap line.—W.J.L., 20/12/86.

The

The Commissioner for Railways to A. Ryrie, Esq., M.P.

Sir,

Department of Railways, Sydney, 24 December, 1886.

Referring to your letter, addressed to the Honorable the Minister for Public Works, respecting the proposal to submit a reduced estimate for the construction of a line of railway from Tarago to Braidwood, I have the honor, by direction of Mr. Secretary Lyne, to inform you that the matter has been referred to the Engineer-in-Chief, who reports that he does not consider it possible to make a cheap line between the places named.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.
(Per A.R.)

No. 12:

Minute by The Commissioner for Railways.

Railroad to Braidwood.

INQUIRY will no doubt be made as to the probable revenue to be received from the above line.

We should have to compete with the traffic by the Clyde; please find out what the rate is now by that service, and what the railway rate will be.

CH.A.G., 10/12/86.

Traffic Manager.

Goulburn, 16 December, 1886.

Railroad to Braidwood.

THE traffic (goods) to and from Tarago for the last two months was as follows:—

	ton	cwt.	qr.	lb.	ton	cwt.	qr.	lb.
October—Inwards	175	2	0	0				
„ Outwards	41	17	0	0				
					216	19	0	0
November—Inwards	137	13	1	0				
„ Outwards	131	5	1	0				
					268	18	2	0
					485	17	2	0

A large portion of the outwards of November consisted of wool; including this it only showed an average of 9 tons 6 cwt. 3 qr. 14 lb. per diem.

Taking 3rd class goods the rates are as follows:—

	£	s.	d.	£	s.	d.
Rail, Sydney to Tarago	4	8	1			
Team, Tarago to Braidwood	1	0	0	5	8	1
Sydney to Nelligen...	0	15	0			
Nelligen to Braidwood	1	5	0	2	0	0
Difference in favour of steamers				3	8	1

If the line Tarago to Braidwood was made 188 miles, Sydney to Braidwood, £5 2s. 7d., still showing a difference of £3 2s. 7d. per ton in favour of the steamers.

On the other hand we get all or nearly all the special class goods, as the steamer charges this class much higher than they do our 3rd class.

	£	s.	d.	£	s.	d.
Maize, Sydney to Nelligen...	1	5	0			
„ Nelligen to Braidwood	1	10	0	2	15	0
„ Sydney to Tarago	0	14	0			
„ Tarago to Braidwood	1	0	0	1	14	0

A difference of 21/- per ton in favour of New South Wales Railways.

If the Braidwood line was made, Sydney to Braidwood 188 miles, a difference of 39/- per ton.

Coaching Traffic.		£	s.	d.	£	s.	d.
September—Number of passengers,	395	178	13	2	209	12	4
October—	323	148	4	2	173	12	4
November—	364	128	0	10	151	13	11

It is estimated that not more than 100 passengers a month travel from Braidwood; the rest are local.

Traffic Manager.

ALEX. CRAWFORD.

I would like Mr. Crawford to get some information as to the amount of traffic likely to be directed to Railway by the opening of the line to Braidwood.—W.V.R., 17/12/86. Inspr. Crawford.

Traffic Managers' Office, Sydney, 23 December, 1886.

Inspr. Crawford,—Please let me have my 86-4,946^v re probable traffic that might be calculated upon for support of Braidwood extension. Commr. wishes to know what has been done in the matter. Very urgent.—W. V. READ (per C.F).

Railway to Braidwood.

THERE are considerable difficulties in forming anything like an accurate estimate of what traffic would likely be diverted to the railway if this line was made under existing rates. I am afraid very little would be diverted, as the difference of rates are to be marked.

There is little or no traffic derived from the country between Braidwood and Tarago, and no matter what rates might be charged to Braidwood the difference between water and rail carriage is so great that at most only a portion will be obtained; what that portion might be is difficult to say.

Between Braidwood and the coast are several towns and villages, such as Jembaicumbene, Monga, Rudsdale, Elencton, Araluen, Araluen West, and Major's Creek. All this traffic will still go to the coast except in cases where time is an object.

There can be little doubt that when this line is made the Steamship Co. will bid for the Braidwood traffic by a reduction of rates, and when the carriers are drawn off the road between Braidwood and Tarago, they will also bid for the coast traffic in conjunction with the Steamship Co. The population of Braidwood is a little over 1,000 souls. The town has made little or no progress for several years.

ALEX. CRAWFORD.

I have a strong impression that I reported upon the Braidwood traffic and rates a long time ago, although I cannot trace the paper. At all events, Mr. Crawford's reports bear out the opinion I have held all along, that while we shall continue to get all the Braidwood traffic which is carried at low rates, we shall not be able to command the higher classes of traffic in face of the very low rate by sea; and my own impression is, much as I should like to secure it, that the Department should not enter into a competition, at all events to any great extent, with persons who are carrying on a Colonial trade either by sea or land, and I do not suppose there is any such intention. Of course it is altogether different in the case of intercolonial traffic where we have to quote very low rates to secure as much as we can of the produce of our own Colony.—W.V.R., 5/1/87. The Commissioner.

There are other papers in the office about the Railway to Braidwood; let me have all papers at once, especially those referring to probable traffic.—CH.A.G., 9/1/87.

Plan enclosed. Will Traffic Manager please show on it the places from which traffic is likely to come by rail, and also the places from which it is probable traffic will be sent by sea. The Commissioner would like this early.—A.R., 21/1/87. Traffic Manager.

Inspector Crawford,—For early attention. Return papers as soon as possible.—W. V. READ, 22/1/87.

Braidwood Traffic.

UNDER existing rates I do not think that any traffic east, south-east, or south of Braidwood will go by rail, except in cases where time is of value.

I have endeavoured to show by blue pencil line, traffic that possibly might be attracted to the railway.

All inside the blue lines, even if intended for Nelligen, must pass through Rudsdale; from some parts it would be nearer to Braidwood, but then the great difference in rates will attract it to the coast. West of the blue line goes either to Bungendore or Queanbeyan. West and south to the coast. The Traffic Manager.

ALEX. CRAWFORD, 1/2/87.

Commissioner to see.—I have ascertained that the rates for general goods from Sydney to Nelligen is 25s. per ton measurement, and for dead weight 20s. per ton; whence, according to Inspector Crawford, the team carriage is 25s. per ton = 45s. to 50s. If the line were constructed from Tarago to Braidwood the ordinary mileage rates from Sydney would be 58/11 first and 101/8 third class, so that I should say even the traffic to the town and district of Braidwood would be doubtful.—W.V.R., 14/2/87.

The Commissioner has asked Mr. Badham to prepare *précis* of case. Submit papers.—D.C.M'L., 18/2/87.

Proposed Line—Tarago to Braidwood.

THE Commissioner will be glad to have further information relative to this line, probable traffic, cost of working, &c., &c., also * competition by sea.

The details already furnished by the Traffic Manager are not sufficiently full and explicit for Commissioner's purposes.

The Traffic Manager might place himself in communication with the Locomotive Engineer for any information the latter should furnish.

The Traffic Manager.

D.C.M'L., 22/1/87.

I have reported on the Commissioner's M.P. 87/644, on the question of the rates. I have endeavoured to get information as to the probable traffic, but it is a most difficult thing to do, because the great bulk of the Braidwood traffic is sent by sea to Nelligen. I do not think that even the construction of a railway to that town will secure the trade of the district in the face of the low water rates, and I am of opinion that the line will not pay.—W.V.R., 15/2/87.

No. 13.

Telegram from A. Ryrie, Esq., M.P., to The Secretary for Public Works.

Michalago Station.

WISH you arrange for deputation to interview Minister *re* Tarago to Braidwood Railway, Friday, 21st inst. Wire me Queanbeyan this evening "Royal Hotel."

ALEX. RYRIE.

Plans, &c., before the Select Committee of the Legislative Council.—CH.A.G., 20/1/87. Inform cannot deal with this matter before the elections are over.—J.S., 25/1/87.

The

* This, I think, has been asked for on other papers.

The Commissioner for Railways to A. Ryrie, Esq., M.P.

Sir,

Department of Railways, Sydney, 28 January, 1887.

Referring to your telegram of the 17th instant, addressed to the Under Secretary for Public Works, in which you solicit an interview for a deputation relative to the Tarago to Braidwood Railway, I have the honor, by direction of Mr. Secretary Sutherland, to inform you that he will be unable to deal with this matter before the Elections are over.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.
(Per A.R.)

No. 14.

Précis.

Proposed Line, Tarago to Braidwood.

The proposed line is 29 miles 12 chains in length, making the total distance, Sydney to Braidwood, by this route something less than 188 miles. It is said to run through land which, to a great extent, is in the hands of large proprietors.

The following statistics, which refer to year ending 31 March, 1886, will afford some idea of the resources of the district:—

Land under cultivation—Freehold, 3,776 acres; leasehold, 864 acres; the produce of which was as under:—

Wheat	14,682 bushels	Rye	65 bushels	Grain ..	800 tons
Maize	5,132 "	Potatoes	915 tons	Potatoes	900
Barley	592 "	Tobacco	526 cwt.	Hay	1,800
Oats	3,210 "	Hay	1,800 tons		3,500

It should be stated that in the agricultural returns for the year to which the above figures refer there was a remarkable falling off, notwithstanding that the area of land under cultivation was pretty nearly the same. The live stock of the district in the year 1885 (the most recent obtainable date) stood as under:—

Horses	3,323	*Sheep	48,298	48,298*	
Cattle	20,557	Pigs	1,573	4 lbs. of wool.	

The timber trade of the district is said to be very extensive, and there are in the town of Braidwood three tanneries, four boot factories, and two flour mills; but there are no manufactories which would tend to create a traffic.

The population of the town of Braidwood is over 1,000, and of the district, about 7,000.

The question of the traffic to be expected if the line be constructed has been dealt with by the Traffic Branch.

They state that the goods traffic to and from Tarago in the preceding two months was:—

October.—Inwards	Tons	175	2	0	0	
Outwards		41	17	0	0	
						216 19 0 0
November.—Inwards		137	13	1	0	
Outwards		131	5	1	0	
						268 18 2 0
Making a total of	Tons	485	17	2	0	

That a large part of the November outwards traffic consisted of exceptional goods (wool), and that including this the daily average was only 9 tons 6 $\frac{3}{4}$ cwt. For third-class goods the rates for freight were as follows:—

By land—

Rail—Sydney to Tarago... ..	...per ton	£4	8	1
Team—Tarago to Braidwood ... ..	... "	1	0	0
				£5 8 1

By sea—

Steamer—Sydney to Nelligen ... ..	...per ton	0	15	0
Team—Nelligen to Braidwood ... ..	... "	1	5	0
				2 0 0

Difference in favour of sea route £3 8 1

If this line were made to Braidwood the through rate (for 188 miles) would be reduced to £5 2s. 7d., but it would still show a difference in favour of the steamer of £3 2s. 1d.

They

They state that we get the bulk of the (unprofitable) special class goods for the simple reason that the steamer charges for that class of goods are made higher than ours. Take maize, for instance:—

By sea—		Steamer—Sydney to Nelligen per ton	£1 5 0	
		Team—Nelligen to Braidwood „	1 10 0	£2 15 0
By land—				
		Rail—Sydney to Tarago... .. per ton	£0 14 0	
		Team—Tarago to Braidwood „	1 0 0	1 14 0
Difference in favour of land route				£1 1 0

And if this line were made to Braidwood our charge to that town would be 16s., 39s. less than the cost by the sea route.

The coaching traffic to and from Tarago had been as under:—

							Passengers.	Amount.	Total Coaching.
								£ s. d.	£ s. d.
Say 400 per month, or 48,000 per year, at 5s. average fare between Tarago and Braidwood, equal to £1,200.	September	...	...	...	...	395	178 13 2	209 12 4
	October	...	...	...	...	323	148 4 2	173 12 4
	November	...	...	...	...	364	128 0 10	151 13 11

It had been estimated, however, that of these only 100 per month were Braidwood people, the remainder being local people.

Mortua, Reisdale, and other places.

Under existing rates, if the railway were made, very little traffic would be diverted from the existing channels, and the rates for water-carriage are so very low that a reduction in our rates would have very little influence upon the traffic. At the best we should only secure a portion of the Braidwood local traffic; all the traffic of the towns between Braidwood and the coast would always go the coast, except in cases where time was an object. If the railway were made the steamer would always be prepared to bid for the traffic, even by a reduction of rates, and that the carriers driven off the road between Tarago and Braidwood would act in the same direction in concert with the steamers.

Traffic Manager concurred in these remarks. He was of opinion that if this railway were constructed we should secure such of the Braidwood traffic as would be carried at low rates, but that we should not be able to command the higher classes of traffic. He did not think, however, that we should enter into competition with persons who were carrying on a colonial trade, whether by sea or land.

Subsequently Mr. Read added that if this line were constructed the rates to Braidwood would be 1st class, 58/11, and 3rd class, 101/8, while the freight by steamer to Nelligen, and thence by team to Braidwood, was only 45/- to 50/-, and that he was doubtful of our securing the traffic even of the town and neighbourhood of Braidwood.—C.A.B., 9/3/87.

Required—statement Nos. 1 and 2, referred to in Mr. Lyne's answer to question asked in House, 6th October, 1886. (Herewith.)

Furnish particulars of amount voted for this line, £310,000.

Probable gross revenue from the statistics given for the 29 miles:—

Goods, special class	...	...	...	...	...	£	s.	d.
						525	0	0
Merchandise, 1st to 4th class...	...	...	...	...	...	1,500	0	0
						500	0	0
						225	0	0
Live stock	...	...	...	...	...	90	0	0
Wool	...	...	...	...	...	58	0	0
Passengers and mails	...	...	...	...	...	2,000	0	0
						£1,898	0	0
Working expenses—								
Per. Way—7 gangers...	...	...	...	...	...	800	0	0
20 men	...	...	...	...	...	2,000	0	0
1 Inspector	...	...	...	...	...	250	0	0
						£3,050	0	0
Traffic and Loco.—								
(Say) 30,000 miles at 3s.	...	...	...	...	...	4,500	0	0
						£7,550	0	0, or (say) £251 per mile.
Interest upon capital, 4 per cent.	...	...	...	...	...	12,400	0	0
						£19,950	0	0

CH.A.G.

Particulars filled in, showing a balance against the line of £15,052, but the calculations are based on the official statistics, and Commissioner thinks the figures of the statement presented to the House had better be made use of.—C.A.B.

Taking the figures given in the statement submitted to the House (which however are in some cases considerably in excess of the figures given in the Statistical Register for 1886), the following is an estimate of

of the anticipated traffic of this line (based upon the supposition that the entire agricultural produce of the district will be carried) in comparison with the annual cost of the line in working expenses and interest on capital cost:—

Working expenses	£	7,550	s.	0	d.	0
Interest on capital	£	12,400	s.	0	d.	0
Earnings, special class goods, viz. :—						
Cereals... ..		1,166	tons.			
Potatoes		623	„			
Hay		3,174	„			
		4,963	tons @ 3/-	£744		
Horses				238		
Cattle				560		
Sheep				90		
Wool				44		
Goods traffic				1,500		
				£3,176		
Add 20 per cent. for possible development of traffic				635		
				£3,811		
Passengers and Mails				2,000		
Balance against line				14,139		
				£19,950	19,950	0 0

Balance against line, £14,139.

Tarago to Braidwood—Mr. H. M'Lachlan's Statistics.

<i>Wheat.</i> 39,319 bushels (say) 983 tons.	<i>Maize.</i> 3,091 bushels (say) 78 tons.	<i>Barley.</i> 1,977 bushels (say) 49 tons.	<i>Oats.</i> 7,083 bushels. (say) 125 tons.
Wheat... ..	983 tons.		<i>Horses.</i> 10 %, 3,461
Maize	78 „		346
Barley... ..	49 „		£238 14 0
Oats	125 „		
Potatoes	623 „		<i>Cattle.</i> 20%, 22,407
Hay	3,174 „		4,480
	5,032 tons @ 3/-, £754 16 0		£560
	£	s.	d.
Goods (special)	754	0	0
Do (1 to 4)	1,500	0	0
Wool	44	0	0
Horses	238	0	0
Cattle	560	0	0
Sheep	80	0	0
	£3,176	0	0
Passengers and Mails	2,000	0	0
	£5,176	0	0
Add 20 % for possible development of goods traffic	635	0	0
	£5,811	0	0
			<i>Merchandise.</i> Classes 1 to 4 (say) 2,000 tons, @ 15/-
			£1,500
			<i>Wool.</i> 39,937—4 lbs. for fleece 532 bales @ 1/8
			£44

Proposed line, Tarago to Braidwood.

In compliance with the Commissioner's request I have to-day seen Captain Turner, the manager of the Illawarra Steamship Company, and he was good enough, in reply to my questions, to give me figures and information (as follows) which may be of some use to Commissioner.

Captain Turner was not very communicative, but I think his statements may be relied upon.

As regards Nelligen, he informed me that it is a very insignificant place—"no place at all" was the expression; and that the district round and beyond it is very thinly populated, without any centre of population, the places marked in the maps not being worthy the name. If it were not for the Braidwood and Araluen traffic it would not pay them to send a boat to Nelligen. They carry general merchandise down, and bring back a little produce, such as maize, potatoes, &c., chiefly from Moruya.

The Araluen traffic goes indifferently to Nelligen or Moruya, some shippers preferring the former, others the latter.

The Nelligen freight averages about £140 a month, and the Moruya freight about £250 a month. The rate of freight is much lower than the Traffic Manager stated. They charge 15s. a ton to either port for general merchandise—maize, 1s. 6d. a bag of 4 bushels (say) 2 cwt. equal to 15s. a ton, and similar charges for other produce.

The passenger traffic to both ports brings from £100 to £150 a month, the fare being 30s. single and 45s. return.

There has been, Captain Turner said, a remarkable falling off in the population of the town and district of Braidwood, consequent on the exhaustion of the gold-fields and in the amount of business transacted.

Formerly they carried 500 or 600 passengers, and ran three boats a week. Now they do not carry so many passengers in three months, and it hardly pays to run one boat.

Captain Turner describes the country between Nelligen and Braidwood as very wild and rough, offering no scope for agricultural operations, and only here and there affording good grazing.

If any other points occur to the Commissioner upon which Captain Turner would be likely to afford information, I shall be happy to call upon that gentleman again.

C. A. B., 16/3/87.

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

BORENORE-FORBES RAILWAY.

(PETITION—INHABITANTS OF CUDAL, CARGO, TOOGONG, &c.)

Received by the Legislative Assembly, 23 March, 1887.

To the Honorable the Legislative Assembly, in Parliament assembled.

The humble Petition of the undersigned inhabitants of Cudal, Cargo, Toogong, Murga, &c.,—

SHOWETH:—

1. That your humble Petitioners have been amazed at the action of the Legislative Council in refusing their approval of the plans and book of reference of the Borenore-Forbes Railway, which is part of a line from Orange to Forbes which has been passed by their different Parliaments, by large majorities of the people's Representatives, and twice by the Chamber which has now refused its sanction.

2. That your humble Petitioners, considering the vital importance of obtaining direct railway communication with the Metropolis, and being fully convinced that the Borenore-Forbes line will prove one of the best paying lines in the Colony—a fact of which your Honorable House has been long convinced, now pray your Honorable House to take such immediate steps as will afford the Upper Chamber an opportunity of revising their former decision.

And your Petitioners will, as in duty bound, ever pray.

[Here follow 676 signatures.]

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAY COMMUNICATION FROM GRAFTON TO THE TWEED.

(PETITION IN FAVOUR OF RESIDENTS OF THE ELECTORATES OF GRAFTON AND THE CLARENCE.)

Received by the Legislative Assembly, 31 May, 1887.

To the Honorable the Legislative Assembly of New South Wales, in Parliament assembled.

The Petition of the undersigned residents of the Electorates of Grafton and the Clarence,—

HUMBLY SHOWETH:—

That your Petitioners continue to be deprived of those advantages of Railway communication, enjoyed by the great bulk of the people of the Colony.

That the deprivation has become calamitous to your Petitioners, and most seriously affects the progress of profitable settlement in these Districts.

That in the opinion of your Petitioners, it is of the utmost national importance in view of promoting the settlement of the country, facilitating the interchange of commodities between conterminous Districts and with the Metropolis, and opening up profitable channels for the employment of labour, that the authorised lines of Railway from Grafton, especially that to the Tweed, should be constructed with the least possible delay.

Your Petitioners therefore humbly pray, your Honorable House to take the premises into your most favourable consideration, and give such relief as may be deemed meet.

And your Petitioners, as in duty bound, will ever pray.

[*Here follow 1,563 signatures.*]

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAY FROM GRAFTON TO THE TWEED.

(PETITION IN FAVOUR OF—F. B. GULLEY, MAYOR OF CASINO.)

Received by the Legislative Assembly, 9 June, 1887.

To the Honorable the Legislative Assembly of New South Wales.

The Petition of the undersigned (for and on behalf of the residents of Casino and the Upper Richmond River),—

HUMBLY SHOWETH:—

That your Petitioners, while having to bear a share of the cost of loans raised to provide railway communication in other parts of the Colony, and also suffer severely from the delay in carrying out improvements at the entrance to the Richmond River, are deprived of the great advantages of railway communication enjoyed by the residents of most other districts.

That the delay in proceeding with the construction of the authorized line of railway from Grafton to the Tweed most seriously retards the progress and development of the universally acknowledged natural resources of the districts through which the said line of railway will pass.

That in the opinion of your Petitioners the construction of the said line of railway is a matter of national importance as a means to facilitate an interchange of commodities between northern districts and with the metropolis, and your Petitioners would urge that the work should be undertaken with the least possible delay.

Your Petitioners therefore humbly pray your Honorable House to take the premises into your most favourable consideration, and give such relief as may be deemed meet.

And your Petitioners, as in duty bound, will ever pray.

Signed for and on behalf of the residents of Casino and the Upper Richmond River,—

F. B. GULLEY,
Mayor of Casino.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAY COMMUNICATION BETWEEN SYDNEY AND CANTERBURY.

(PETITION FROM INHABITANTS OF THE MUNICIPALITY OF CANTERBURY.)

Received by the Legislative Assembly, 20 April, 1887.

To the Honorable the Speaker and Members of the Legislative Assembly of New South Wales, in
Parliament assembled.

The Petition of the inhabitants of the Municipality of Canterbury,—

RESPECTFULLY SHOWETH :—

That your Petitioners do most respectfully beg that your Honorable House will take into your consideration the very great inconvenience that we are now experiencing through want of railway communication with Sydney.

That we would respectfully urge upon your Honorable House that this, the oldest settled district in the Colony, is still the most backward, and although within six miles of the metropolis our only means of transit is by omnibuses, many of us having to lose upwards of three hours daily going to and returning from business.

That there is a large and increasing population here, and many who at present own land in this district would immediately build but for the large amount of time lost in travelling to and fro by the present means of transit.

That your Petitioners therefore respectfully pray that your Honorable House will grant them relief by giving them railway communication with Sydney.

And your Petitioners, as in duty bound, will ever pray.

[*Here follow 221 signatures.*]

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

RAILWAY FROM LIVERPOOL TO ST. PETERS.

(PETITION IN FAVOR OF—RESIDENTS OF LIVERPOOL AND DISTRICT.)

Received by the Legislative Assembly, 12 July, 1887.

To the Speaker and Honorable Members of the Legislative Assembly of New South Wales, in Parliament
assembled.

The humble Petition of the undersigned residents of Liverpool and District,—

SHOWETH :—

1. That your Petitioners are desirous of having a line of railway constructed from Liverpool to St. Peters, inasmuch as such a line will be 5 miles shorter than the present existing line to Sydney, and will afford a much needed additional track to run the Southern trains, now incessantly delayed from the blocking on the present line.

2. The area through which the proposed line will run is all suitable for suburban settlement, and being already well settled it will give a profitable passenger traffic.

Your Petitioners therefore humbly pray that your Honorable House will be pleased to pass the necessary measures to cause the line of Railway between Liverpool and St. Peters to be constructed.

And your Petitioners, as in duty bound, will ever pray.

Dated this 9th day of July, A.D. 1887.

[*Here follow 334 signatures.*]

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAY LOCOMOTIVES.

(PAPERS RELATIVE TO SUPPLY OF, WITH SPECIFICATIONS.)

*Ordered by the Legislative Assembly to be printed, 27 April, 1887.***The Locomotive Engineer to The Commissioner for Railways.**

Additional Engines required for new Extensions, &c.

In view of the number of additional miles that will be opened for traffic within the next two years, I beg to recommend tenders be invited at once for the number of engines required to work them.

On the Northern Line there are not sufficient goods engines now in stock to meet the traffic in the busy season; and when the line is opened to Tenterfield, we shall have very great difficulty in meeting the increased requirements, so that it is absolutely necessary that more locomotives be supplied at the earliest possible moment for that line.

While we have sufficient engine power to meet the traffic on the Southern and Western Lines at the present time, yet when the new extensions are opened (over 300 miles) an increase to our locomotive stock will be indispensable.

In view of the many advantages accruing from as few types of engines as possible being used, I strongly recommend that the terms of the specification for the two classes now required be strictly adhered to.

The class most suitable for our passenger traffic is that provided for in the Specification upon which tenders were last invited, and for which the Vulcan Foundry Company, of England, obtained the contract. The advantages gained by having even the same class made by the same makers are so considerable, and in view of the very low price at which the Vulcan Foundry Company are supplying, induces me to strongly recommend that an order for those now required be given to the same firm.

For the goods traffic I do not think that a more suitable engine than the Mogul class, Specification No. 191, can be obtained. We have now had some years experience of them, and, as regards loads hauled, economy in "Running Stores," and small cost of repairs and renewals, they have given general satisfaction. I therefore strongly urge that this type of engine be adhered to.

The following are the number of engines required, and the estimated cost:—

Great Northern Railway—

4 Passenger Engines, @ £2,450 each	...	...	...	...	= £ 9,800
8 Goods " @ £2,780 each	...	...	...	...	= 22,240

Great Southern and Western Lines—

12 Passenger Engines @ £2,450 each	...	...	...	...	= £29,400
20 Goods " @ £2,780 each	...	...	...	...	= 55,600
Total	...	...	...	...	<u>£117,040</u>

I intend to submit a separate paper upon the quantity and description of tank engines which will be required to meet increased requirements on our suburban lines.

W. SCOTT, 25/5/86.

I cannot concur in Mr. Scott's recommendation that for the reasons given the order for the sixteen passenger engines required be given to the Vulcan Company without competition.

We have not, I think, received the engines which the Vulcan Company obtained recently the contract for, and therefore cannot know much of the quality of the work; but even if it be all that can be desired, I do not think it right that we should depart from the approved system of inviting tenders.—C.A.G., 28/5/86.

The system of inviting tenders should not be departed from. It is represented that it is absolutely necessary these engines should be obtained. I therefore approve of tenders being called.—W.J.L., 29/5/86.

Re Railway Rolling Stock, &c.

With reference to the specification for twenty-eight goods and sixteen passenger engines, it seems to me, from a perusal of them, that they provide for a different type of engines to any we have now running, and their adoption would, in my opinion, be a serious mistake. There are many provisions that would make the engines unnecessarily complicated and costly, and debar Colonial makers from having any success in tendering. I think we might, for instance, substitute best steel for iron; it would be cheaper, and would give the locomotives a longer life.

Three-fourths of the trade we have over the mountains, on the steep gradients, could be best and cheapest carried by one class of engines, simple in construction and powerful in action; but we have a number of engines of various designs that it would pay the Department better in the long run to put on the scrap heap, if we could be sure of replacing them by a class of engines more suitable to our requirements.

I am not in favour of any increase in the rates for passengers and produce to augment our revenue, as, I believe, by improving our rolling stock we shall be able, with economical working, to improve our returns, so as not to require any increase. We have at present a large traffic in live stock which has proved unprofitable, both to the Railway Department and the owner, the latter asserting that the loss to him through delay in transit by rail, &c., is sometimes equal to 10% on the value of the consignment, and this must be taken in a degree as adding to the railway rates. We will always have a large traffic, either in live stock or dead-meat, and I do not think a permanent improvement will come until we have improved rolling stock for this traffic, both in engines and trucks. Stock trains should be run at almost the same speed as our mail and passenger trains, and should give precedence to nothing but them.

For the purpose of obtaining opinions as to the best class of engines for this purpose, I wish an early report from Mr. Midelton, now Superintendent of Tramway Rolling Stock, Mr. Midelton having had a large engineering experience both in England and the Colonies, and has already shown evidence of his ability with regard to his plans for the Goulburn running sheds, and in regard to his advice in connection with the Eveleigh workshops. He has already designed ten locomotives which, after two years' service, have proved to be the most economical in working that we have; and for these and other reasons, although he is not now in the Railway Locomotive Branch, I should like his opinions on this question.

JOHN SUTHERLAND.

Mr. Midelton.—A.R., B.C., 19/4/87.

Seen. My report was forwarded, on the morning of the 20th, to the Commissioner, as per request on paper, with Locomotive Engineer, original paper, dated 25/5/86, M.P., 86-8,560.—THOS. MIDEULTON, 22/4/87. Commissioner.

The Superintendent, Tramway Rolling Stock, to The Secretary for Public Works.

Additional Locomotives.

Sir,

After a careful perusal of the papers which provide for the addition of forty-eight locomotives to our present stock, I have the honor, in obedience to your command, to report as follows:—

In the original recommendations of the Locomotive Engineer, dated 25/5/86, I notice he writes there are "many advantages accruing from as few types of engines as possible being used. I strongly recommend that the terms of the specification for the two classes now required be strictly adhered to. The class *most suitable* for our passenger traffic is that provided for in the specification upon which tenders were last invited, and for which the Vulcan Foundry Company of England obtained the contract. The advantages gained by having even the same class, made by the same makers, are so considerable, and in view of the very low price at which the Vulcan Foundry Company are supplying, induces me to strongly recommend that an order for those now required be given to the same firm." Although Mr. Scott has had a very long experience here, I venture to assert that he is in error upon this question. We have had no experience of the engine which the Vulcan Foundry are now supplying, and I am at a loss to understand how Mr. Scott arrives at the conclusion that they are the most suitable for our passenger traffic. I have gone very carefully into the merits of the designs of these engines, and must express my conviction that their unsuitability will be established on trial; they cannot be successful unless they are ruinously *overloaded* on their (four) coupled wheels.

Referring to the Goods Engines, Mr. Scott states: "I do not think that a more suitable engine than the 'Mogul Class'—Specification No. 191—can be obtained. We have now had some years' experience of them, and, as regards *loads* hauled, economy in running stores, and small cost of repair and renewals, they have given general satisfaction. I therefore strongly urge that this type of engine be *ADHERED TO*." I will at once say that my views, based on a large experience of the running of these engines, are quite to the contrary, and the records will show that I tried to improve them when the second lot was being ordered in December, 1883 (*vide* Comr's. M.P., 83/19,720), but Mr. Scott opposed it; indeed, it is evident Mr. Scott now practically admits that the principal feature—the hauling power—is deficient, for he stipulates that the power of the new engines is to be *increased* 5 lb. by making the cylinders *one inch larger in diameter*, and by *shortening the stroke two inches*. I would point out in this connexion that, while the improvement as regards increased power is immaterial, Mr. Scott contradicts, by introducing it, his professed anxiety to limit the types of engines—for undoubtedly he thus introduces another class.

In reporting on Specification No. 188A for twenty passenger engines, it will be well to consider what has already been done in the matter of equipping our railways with locomotive engines. We, unfortunately, have no less than forty-two different "classes" at the present time of nearly every possible shape and dimensions, twenty-two of which are for passenger traffic, and the rest for goods traffic. This is objectionable and costly, for almost any railway could be properly worked with, at the most, six different "classes" of engine, and many lines could be worked with three.

We

We began in 1855 with a "class" which exerted a power of	93·10 lb.
In 1856 we had	79·85 "
" 1865	71·10 "
" 1867	112·70 "
" 1870	105·00 "
" 1875	168·00 "
" 1877	117·80 "
" 1877	123·40 "
" 1880	102·40 "
" 1883	104·00 "
" 1884	117·00 "
" 1884	140·40 "

I have here referred to twelve "classes," but do not think it necessary to name the other passenger engines which were introduced between 1855 and 1886, as they are all *less* powerful than the above.

As we have a large stock of the class which give off a power of 117·80 lb., this would lead some people to the conclusion that they were the best engines for our lines. But such is not the case, as it often—daily, I might say—happens to be necessary to put two of these engines on many of the passenger trains to work them to schedule time. The class of passenger engine introduced by me in 1884 (*vide* Com. M.P., 83/2,350, &c.), which exerts a power of 140·40 lb., has answered our requirements satisfactorily in every respect during the past two years on all lines; and the proof of it seems to reside in the fact that the author of the Specification 188A actually describes an engine *which will exert exactly the same power, but will be of totally different design and dimension*; and not only that, it will not be such a suitable engine for the New South Wales lines generally. It will have cylinders and wheels each larger in diameter than is necessary for the power required, and the insistent weight on the wheels will be *much more*—7½ tons per wheel—as against 6 tons. This, I need not remark, will be destructive to the permanent way, and to the engine itself.

The comparison between the two engines stands thus:—

Present Passenger Engine and Tender.

Cylinders—18" diameter, 26" stroke, 60" driving wheels, 6 wheels coupled, and 2-wheel'd bogie.
Power = 140·40 lb. as aforesaid.

Tender on 8 wheels carries 3,600 gallons of water and 6½ tons coal.

Proposed Passenger Engine and Tender.

Cylinders—19" diameter, 26" stroke, 66½" driving wheels, 4 wheels coupled, and 4-wheel'd bogie.
Power = 141·14 lb., or 742 lb. more.

Tender on 6 wheels carries 2,500 gallons of water and 3 tons of coal.

We here propose to introduce another "type of engine" of practically the same power, but which will in *practice* be certainly not so servicable an engine as the present one, but *why* it is done it is difficult to see. I contend it would be best in every way to go on reproducing the type which has proved to be the best, instead of further complicating matters and increasing our difficulties and expenses for no good purpose. It is more than probable that the weight on the coupled wheels of the proposed engine will largely exceed the weight specified, viz., 30 tons; if it does not, the engines will slip, and will require the use of a lot of sand, which will increase wear and tear of rails and tires, and cause other trouble. It is best to so proportion an engine that the use of sand shall be avoided, and this has been done in the engines we have; and as it is specified that each box shall hold 4 cubic feet of sand, it is evident that much is to be expected from the free use of it, if the load on the coupled wheels does not exceed 30 tons. To be a good reliable engine in all weathers, there should be not less than 9 tons on each of the (four) coupled wheels; but as that weight is *too much for our rails* it is proposed to put 7½ tons on each wheel, and that is excessive. In short, the engine *should have six* coupled wheels instead of *four* coupled wheels, and I cannot see a valid reason for proposing to have such engines. Quite the contrary; we should now reproduce in our own shops the engines and tenders we have found to answer our requirements best; and as locomotive builders only *manufacture* very little of our engines and tenders, I consider the Government should import the necessary raw material—consisting of steel plates for boilers, copper plates, boiler tubes, Staffordshire iron plates, steel tires, axles, &c., &c. (articles which cannot for some time be made in the Colony), direct from the various manufacturers of such articles, in the same way exactly that the locomotive builders do at home, and I dare say the Government could obtain such material at the same—perhaps lower—prices than they do. Then we could, with the splendid special machine tools and new workshops at Eveleigh, fully and profitably employ our skilled mechanics and others constantly in constructing new engines and repairing old ones, under the supervision of specially trained, expert officers, on the spot, and I feel confident that the total cost of engines built in this manner, under proper discipline and control, would not exceed the highest—perhaps the average—tender which will be received for supplying the engines now under consideration, as the profit now paid the manufacturers, cost of freight, inspection, trial, dismantling, and other items would about balance the extra price of labour here. Indeed, unless this is done, I do not see how the new Eveleigh Works, which have cost about £600,000, can be fully utilized. We have only recently been able to haul, with *one* engine, mail trains consisting of thirteen carriages, or 104 tons, exclusive of weight of engine tender and passengers, up a grade of 1 in 30 and over the 8-chain curves of the Western road; we cannot do *more* with the proposed new engine; they will not do as much, if constructed to the specification, which specification I might say is certainly a curious one. The first few lines run thus:—"Specification for a four-coupled, outside cylinder, passenger (Bogie), *with* engine and tender." Sixteen are to be delivered in Sydney, and four in Newcastle. Now, as it is almost certain that railway connection with the Southern and Northern lines will be established long before the delivery of the engines takes place, it would have been more convenient and economical for all of them to be delivered in Sydney.

The general arrangement of the engine, it is stipulated, is to be in accordance *with a plan to be prepared by the Contractors, in which certain leading particulars are to be faithfully embodied and adhered to*. For instance, the cylinders are to be 6 feet 3 inches apart, centre to centre, and the slide bars are to be 5 inches wide, the slide blocks ½ inch thick, the tires are all to be 5½ inches wide. Now, if these dimensions are faithfully adhered to, I think the bogie wheels will, in radiating, rub hard against the

main

main frames, or the slide-blocks or bars, on the sharp curves of the Western road, and serious results might occur, as the "clearance" is certainly not sufficient. The said specification is not only curious, but it is incongruous and amusing, as can be seen by comparing the above with the last clause on page 13, which states that "Tenderers in England or America may either Tender to the within Specification, or if they wish to depart from it—in almost every particular—they will be allowed to submit alternate 'Tenders', provided they adhere to the general dimensions of the engine." This practically means that the author of the specification describes an engine such as he thinks he wants, but he is so undecided in the matter that if any contractor will design and specify a better engine, he will accept it and his tender. A specification embodying such conditions could have been printed on half a sheet of foolscap, and the trouble and expense of preparing the present one entirely avoided.

I consider the engine and tender unnecessarily complicated, and consequently expensive to manufacture. To give an instance, it is specified that one of three makes of Yorkshire iron is to be used in the boilers, whereas *steel*, of far greater strength, and about half the cost, should have been used instead. The connecting rods are composed of no less than sixteen separate parts, whereas three only are necessary. The same argument also applies with equal force to the side rods, and nearly all the other details. There are to be four slide-bars where two only are required. The driving and trailing axle-boxes are to be of wrought iron, well case-hardened. This is wholly unnecessary, and very expensive. Brass boxes and keeps are to be used on the bogies. Cast iron is all that is necessary, and it is of course cheaper and better.

The steam "dome" in the boiler is very expensive to make; it is ugly; not only that, but it weakens the boiler, and it is utterly useless.

The regulator is of a class which is anything but good. The spark-arresters are to be of the "best design" known; that is very vague; surely something definite could have been specified.

The Roscoe lubricator is a very old device; there are many others less expensive and far more efficient lubricators to be had. A water-jet is to be applied to each tire of each wheel of the engine and tender for the purpose of "cooling," and it might have been added, for the purpose of causing the engine to "slip" on the rails unnecessarily, which they will do oftener than is convenient, even with a dry rail, as they have not sufficient weight on them to use up the cylinder power.

It is also difficult to see why the tender and train brakes only are to be worked by the Westinghouse gear. The engine brake is to be worked by *hand*, I notice, whereas the whole lot should be worked by one handle operating the Westinghouse gear to be thoroughly efficient and up to modern requirements.

The tender, which is to have a "well," is a costly and inefficient design; the water and coal capacity is small, and the coal will have to be piled up very high to enable the proper quantity to be carried. This is dangerous, as it often happens that large lumps drop off and sometimes strike the men engaged in repairing the road. There are only six wheels to the tender; this is a grave error, as each wheel will be excessively loaded. There should be eight wheels (two bogies), but it would seem that six wheels are preferred.

The side-lamp brackets should be put at the front end of tender, and *not* at the back, for many good reasons.

To sum this matter up, I consider that the author of the specification has ignored the main questions, of first cost, utility, simplicity, and efficiency; and I have no hesitation in saying that a simpler, a far more efficient, and less costly engine and tender could be made in our own workshops at Eveleigh than the one proposed. I should strongly recommend the construction in our own shops of twenty-five more of the 304 class of engine, which were designed for and intended to work five different kinds of traffic, viz., mail trains, fast cattle and goods, suburban passenger, and goods traffic, and shunting generally.

Specification No. 191 for Twenty-eight Goods Engines.

This specification describes what is known here as the 205 class of engine—indeed if it were not stipulated that the cylinders were to be 19" in diam. and 24" stroke, instead of 18" diam. and 26" stroke, it would exactly describe the 205 class of engine, a great many of which we have been supplied with by Messrs. Beyer, Peacock, & Co.; but the author of the specification is not content with introducing another class of passenger engine, but he wishes to have another class of goods engine also, without securing any benefit. The 205 class are well known to be the most sluggish engines we have, and there are grave defects in them, as at times enormous weights are thrown on the bogie and trailing wheels, on account of the absence of proper compensating levers in the required positions, and I notice that it is not intended to remedy this defect; therefore we are not only destroying the permanent way with the engines we have, but we propose to build a still *heavier* type to expedite the destruction. The 205 class are evidently poor copies of the American consolidated engines introduced in 1877, and intended to compete with them; but they have ignominiously failed, and if the proposed engines are built further failure will take place. I consider the consolidated type have proved themselves to be the best goods engines we have: they are lightly loaded per wheel, and are therefore easy on the road; they give off 200·00 lb. of power, and the proposed engine will give off 180·5 lb., only with *more* weight per wheel. I should strongly recommend that the new design be abandoned, and that twenty-five more of the consolidated engines be built in our Eveleigh Works. Nearly all the arguments I have advanced against the passenger engines can be made to apply to the proposed goods engines.

We now have eleven engines (of the 48 class) which are lighter, and give off 195·00 lb. of power—far more than is proposed; therefore we are taking a backward step by ordering less powerful goods engines than we now have.

As the recommendation indicates, the passenger engines are to be made by the Vulcan Foundry Co.; and it is evident that the goods engines are intended to be made by Messrs. Beyer, Peacock, & Co.

In my opinion it would be a serious mistake to have such engines constructed. I should advocate not only what I have hereinbefore stated, but I would construct a great many new engines of a more suitable type, in place of a lot of obsolete engines we seem to be unable to utilize. We have the best appliances for the purpose, and unless this is done, it is difficult to see what use the appliances can be put to; indeed, it is a huge co-operative concern, in my view, in which every railway man is personally interested; and, as the railways are State properties, the whole question is a national one.

I have, &c.,

THOS. MIDELTON,

Superintendent of Tramway Rolling Stock.

19 April, 1887.

GOVERNMENT

GOVERNMENT RAILWAYS OF NEW SOUTH WALES.

Specification No. 191 for a Six-coupled, outside-cylinder Goods Engine (Bogie),
with Tender.

Number required—Twenty, delivered in steam at Sydney; Eight, delivered in steam at Newcastle.

PRINCIPAL DIMENSIONS.

ENGINE:—	ft.	in.
Gauge of Railway	4	8½
Cylinders, diameter	1	7
" stroke	2	0
" " distance C. to C.	6	8¾
Wheels, 6 coupled and 2 bogie.		
" diameter coupled (tread)	4	0
" " bogies	2	9
Wheel, base, bogie to 1st driver	8	0
" " 1st driver to main	5	7
" " main driver to trailer	5	5
" " total	19	0
Fire-box, length inside at top	5	10½
" " " at bottom (measured on the level)	6	0
" breadth	3	5¾
Tubes, number 189.		
" diameter (outside)	0	2
Boiler, barrel, diameter (outside)	4	5
" length, barrel part	10	4
" height of C. above rail	6	9
Working pressure, 140 lb.		
Distance between frame plates	4	1¾
TENDER (Horse-shoe, with Well):—		
Wheels, number—6.		
" diameter (tread)	3	6½
" base, total	11	0
Water carried, 2,500 gallons.		

General Arrangement.

The general arrangement and dimensions of the several parts of the engine and tender are to be made exactly in accordance with the foregoing principal dimensions, together with such detail and other drawings as may be hereafter exhibited in connection with this specification, for the contractor's guidance.

In accordance with this specification, the contractor shall prepare a complete set of working (full size and general) drawings, showing the form and dimensions of every detail of the engine and tender, and it is to be understood that the approval of such drawings by the Inspecting Engineer, shall in no way whatsoever relieve the contractor of the whole or any part of the responsibility for possible error in design or dimensions, or any other matter incompatible with construction, or at variance with this specification (unless approval of such variations shall have been previously given by the Inspecting Engineer), and any loss arising therefrom shall be borne by the contractor.

The engine is to be carried on a two-wheeled bogie and six coupled wheels.

The springs of the main driving and trailing wheels are to be coupled by balance beams, to equalize as much as possible the weight on the rails, and provision is to be made, by supplying extra beams (and fixings attached to the frames to receive the same), to enable the springs of the leading pair of driving wheels to be also coupled at any time to those of the main driving wheels, or the engine to be worked with the front driving springs independent, as may be required. The fulcrum pins and various joints of these connections to be made an easy fit, and with special provision for efficient lubrication throughout.

The flanges of the middle pair of driving wheels are to be reduced to half the thickness of the others.

Cylinders.

The cylinders are to be placed horizontally, and are to be made of fine close-grained cast-iron, perfectly free from honeycomb, and of the utmost degree of hardness compatible with the requirements of machining.

The flanges are to be bolted to the frames by turned bolts driven in a dead tight fit, all the holes being bored out and rymered true with those in the frames.

The slide-valves are to be of hard gun-metal. They are to be stiffened by two suitable ribs outside, the valve-faces to be scraped true, and in slotting the ports the corners are to be rounded to $\frac{5}{8}$ " radius. The junctions of the valve-face with the sides of the chest, top and bottom, are to be recessed $\frac{1}{8}$ " deep and $\frac{3}{8}$ " wide, with a round-nosed tool, to facilitate the scraping of the valve-face.

The slide-valves are to have $\frac{1}{8}$ " lead, $\frac{2}{8}$ " outside lap, and no inside lap.

The cylinder and steam-chest covers are to be truly turned and planed and scraped to faces, and the joints made metal to metal; all nuts to be case-hardened. The front and back covers are to be fitted with polished covering plates. Each cylinder is to be fitted with a mud-cock at each end, worked simultaneously by suitable cross-shafts and rods from the foot-plate; also, each valve-chest to have one mud-cock at back end, similarly worked.

Pistons

Pistons and Cross-heads.

The pistons to be of cast-iron, with cast-iron packing rings $\frac{3}{4}$ " wide and $\frac{7}{16}$ " thick. Piston-rods to be of mild cast-steel with coned ends, secured to the pistons by screwed wrought-iron nuts (6 threads per inch), with split pins; front end of piston-rod (reduced in diameter) to be carried forward through front cylinder cover, with suitable stuffing-box, gland, and sleeve. The pistons are to be turned $\frac{1}{32}$ " less than the diameter of the cylinders, and the rings $\frac{1}{4}$ " larger than the cylinders, and cut and sprung into their places. The pistons to have $\frac{3}{8}$ " clearance at each end of the cylinders. The cross-heads to be of wrought-iron, case-hardened, the bearing pins of mild steel.

Slide-bars and blocks.

The slide-bars to be of cast-steel, as hard as possible, with copper liners at both ends for adjustment.

The slide-blocks to be of hard cast-iron, with guide flanges 1" deep and shoulders front and back of cross-head (to take the strain off the socket).

Connecting-rods.

The connecting-rods are to be of wrought-iron, forged in one length, without weld; the small end to be solid,—the large end to be forked and finished with a block and stout tapering bolt. The brasses (both ends) to be in two halves, those at the large end being tightened with a steel cotter, and those at the small end with a tapering steel cotter block, and wrought-iron (case-hardened) or steel liner. Brasses (except front small end) to be flat-ended. Length, 6' from centre to centre.

The oil-cups are to be forged on solid, and finished with screwed brass covers. The bearing brasses are to be of the best hard and tough gun-metal.

Coupling-rods.

The coupling-rods are to be of the same material as the connecting-rods, and similarly made and finished.

They are to be parallel in the body, and to have solid ends to receive the gun-metal bearings in two parts. Each bearing is to be secured by a steel cotter, and made and finished similarly to those for the connecting-rods. The joint is to be in front of the main driving wheel, the pin being secured by a $\frac{1}{2}$ " split pin passing through it and the outer jaw.

NOTE.—The section of the body part of the connecting- and coupling-rods to be suitably proportioned to the size of cylinder, &c.

Link-motion.

The link-motion is to be of wrought-iron, and got up bright throughout. It is to be well fitted, and all joints and rubbing surfaces and pins are to be thoroughly case-hardened. The links are to be curved, and are to be suspended from the centre, the weigh-bar shaft being above.

The valve-spindles are to have glands and stuffing-boxes at both ends, and are to be connected to the valve-rods by iron socket joints and pins with steel cotters secured by split pins, the joint being suitably guided. The buckles, which are to be in one piece (solid) with the spindles, are to be accurately fitted to the valves. The valve-rods are to be suspended from the cross-stay plate by iron links, pins, &c.

The link-blocks are to be of cast-steel or iron case-hardened, suitably guided at front end.

The eccentric-rods and straps are to be of wrought-iron with solid oil-cups, and brass covers screwed in; and the rods are to be made with T ends, and attached to the straps, each by two $1\frac{1}{8}$ " bolts, secured by double nuts and split pins.

The two halves of the straps are to be bolted together by 1" bolts, with square heads, and to have brass distance-pieces 1" thick between the lugs, secured by double nuts and split pins. They are to be fitted with gun-metal semicircular liners. The bolts to be screwed 11 threads per inch.

The larger part of the eccentric sheaves is to be of cast-iron, and the smaller part of wrought-iron, unless steel castings be substituted for both. The two parts are to be bolted together by two $1\frac{1}{8}$ " screwed pins with steel split cotters. Each sheaf to be fixed on the axle by a steel key, well fitted halfway into the axle, also by two tight-fitting steel set-screws projecting through into the axle, and secured with lock nuts. Set-screws to be tempered.

All pins and joints in the link-motion are to be a good fit, and thoroughly case-hardened.

The weigh-bar shaft is to be made with solid arms, soundly welded on. The outer, or "reversing arm," is to be forged in one piece with the bar, the weld (if any) being at the mid-length of the arm. It is to be carried in cast-iron brackets, with bearings 4" long.

The reversing gear to consist of a double-threaded left-hand steel screw $2\frac{3}{8}$ " diameter, with square threads 2" pitch, engaging a wrought-iron (case-hardened) nut 8" long, the whole to be carried in a cast-iron bracket, fixed on the right-hand side of the engine.

The screw is to have suitable thrust, &c., bushes, and to be fitted with a circular collar and catch, to secure it in any position.

The link-motion is to be balanced by two cast-iron weights.

The whole of the link-motion and gearing, as well as the connecting-rods, coupling-rods, and all parts of the engine and tender that have to stand a working strain, such as spring-links, brake-work, &c., are to be made (except when otherwise specified) of best charcoal iron, or carefully selected best Yorkshire scrap, of the finest quality, clean, well hammered, and free from all defects. Oil-holes must be provided to all joints.

Framing.

The framing to be of the plate-frame type, either wrought-iron or steel (Bessemer or Siemens), and manufactured by makers of good repute only. The plates to be $1\frac{1}{4}$ " thick, weldless throughout.

They must be broad enough to form axle-forks out of the solid plates, and are to be slotted in pairs.

They

They are to be fastened together by the front buffer-plate—by a horizontal $\frac{3}{4}$ " plate, extending from front buffer-beam to behind the smoke-box tube-plate (flanged upwards along the sides), forming the bottom of the smoke-box—by a $\frac{3}{8}$ " vertical cross-stay plate (flanged all round) behind the steam-chests, and by a $\frac{3}{8}$ " horizontal plate (flanged downwards along the sides) beneath the steam-chests—by a $\frac{3}{4}$ " vertical cross-stay plate which carries the valve-rod guides—by a $\frac{3}{4}$ " vertical cross-stay plate (flanged) in front of the fire-box, and behind the fire-box by a cast-iron draw and foot-plate. Fastened together.

The axle-forks are to be fitted with cast-steel horn blocks, those of the main driving and leading coupled axles being united in one piece. The front blocks of each axle are to be fitted with case-hardened wrought-iron parallel liners, the blocks to be cast with suitable bosses to receive $\frac{7}{8}$ " bolts with countersunk heads, for fastening the liners. The main driving and leading coupled blocks are also to have long bosses for guiding the spring pillars. The forks are to be stayed together by wrought-iron keeps. Horn-blocks.
Liners.

The motion-bracket, which is to be $1\frac{1}{4}$ " thick, is to be flanged and secured to the outside of the frames by 1" turned bolts, the flange to run from top to bottom edge of frame (platform L iron made to suit). Axle-fork keeps.
Motion-bracket.

The cross-stay plates are to be $\frac{3}{4}$ " thick, flanged and secured to the frames by $\frac{7}{8}$ " rivets.

The engineman's foot-plate is to be of cast-iron suitably cored out for the draw-bar and shackles, and firmly secured to the frames by $1\frac{1}{8}$ " turned bolts. A central buffing wedge-block to be provided. Engineman's foot-plate.

The draw-gear is to consist of a central wrought-iron bar, $2\frac{1}{2}$ " diameter, and two safety shackles $1\frac{1}{4}$ " x $1\frac{3}{4}$ ", with suitable wrought-iron pins. Draw-gear.

A hinged flap-plate, suitably curved, is to cover the space between the engine and the tender. Flap-plate.

The buffer-plate is to be of wrought-iron or steel, bolted to the angle-irons riveted at the ends of the frames, and stiffened at either side by corner brackets, to transmit the thrust of the buffers to the frames. Front buffer-plate.

Turton's patent buffers are to be supplied, pattern H $1\frac{1}{2}$,—in Turton's catalogue—centred, 5' 9" apart and 3' 4" from rail. Buffers.

The front buffer-plate is to have a stout wrought-iron draw-hook, fitted with an indiarubber spring and washer-plate on the inside, secured by a nut and split cotter. There are also to be two safety chains (links made of 1" iron) and hooks. Front draw-gear

There are to be side platforms continuous from the front buffer-plate to the rear end of the foot-plate, attached to the frames by angle-irons, and by the corner brackets for carrying the brake hangers; the outer edge of the platforms to be stiffened by a 3" angle-iron. Side platforms

The upper portions of the wheels are to be covered in by cast-iron splashers, secured to platforms by bolts. Splashers.

The frames are to be fitted with suitable wrought-iron brackets to take the equalizing beams and spring-links. Brackets for spring-link, &c.

Bogie.

The bogie is to have two wheels and a radial arm, the weight from the engine being transmitted through a large cast-iron slide-plate.

The entire frame is to be of cast iron, in one piece, and carefully annealed. Frames.

The bogie is to be fitted with the ordinary laminated bearing springs, and to have side check-springs of the same type. Bearing springs

Wheels.

All the engine wheels are to be of wrought-iron, forged out of the best selected well-hammered scrap, and neatly smithed and hand-dressed.

The spokes to be forged with solid T ends (unless special appliances be provided for dabbing on the rim pieces under the steam-hammer). The six coupled wheels to have fifteen spokes each, and to be suitably bossed for the crank-pins and axle-ends. Coupled wheels.

The whole of the wheels to be manufactured according to the most approved modern method, and as far as possible die forged.

The bogie wheels are to have nine spokes each, and to be made and finished after the same manner as the coupled wheels. Bogie wheels.

The welds in bosses, spokes, and rims must be thoroughly sound and free from all defects, as any defective welding will necessitate the rejection of the wheel. The wheels are to be turned or planed on the faces of the bosses, and turned on the face and edges of the rims; they are to be tooled round the axle and crank-bosses, and the spokes are to be chipped and neatly finished by hand. They are to be forced on the axles by hydraulic pressure of $1\frac{1}{2}$ tons per square inch of the area of the hole for the axle, and each wheel is to be secured by a strong steel key, let halfway into the axle (on the same side as the crank-boss in the coupled wheels), carefully fitted all ways, having a taper on the flat of 1 in 96, and driven in with a sledge-hammer, or tup. Welds.
How finished.

The crank-pin holes of the coupled wheels are to be bored out taper and countersunk, and the pins are to be pressed in by hydraulic pressure, and riveted up cold. Crank pins to be of "Vickers' " mild cast-steel. Wheels fixed on axles.
Crank-pin holes

Tires.

The tires to be of Vickers, Sons, & Co.'s cast-steel ("Australia Brand"), $2\frac{3}{4}$ " thick on the tread. They are to clip the wheel-rims on the outer edge, and to be bored out and shrunk on tight, and secured with screwed studs. They are to be stamped with the maker's name and date of manufacture. Tires.
How fastened.

The flanges of the middle pair of driving wheels to be reduced to half the thickness of the others. Thin flanges.

Axles.

The axles throughout to be of Vickers, Sons, & Co.'s cast-steel, and of the following dimensions:—Bogie, $5\frac{1}{4}$ " diameter in the middle, with bearings $5\frac{1}{2}$ " diameter by 10" long; leading and trailing coupled, $6\frac{1}{2}$ " diameter in the middle; driving, $6\frac{3}{4}$ " diameter, the whole of the driving bearings being 7" diameter by $8\frac{1}{2}$ " long. The main driving axle to be turned 7" diameter on the eccentric seats. Axles.

All axles to be stamped with the maker's name and date of manufacture.

Axle-boxes.

Axle-boxes.

- Driving.** The boxes for the coupled axles are to be of wrought-iron (case-hardened), and fitted with semi-circular bearings of hard gun-metal. They are to be planed to fit the axle-box guides, and fitted with syphon-tubes and covers.
- Keeps.** The brasses are to be finished $\frac{1}{8}$ " shorter than the journals. The axle-box keeps are to be of cast-iron; in the case of the trailing, suitably shaped for the spring-hangers and pins.
- Bogie axle-boxes.** The bogie axle-boxes to be of cast-iron, planed to fit the axle-box guides, to have hard gun-metal bearings, cast-iron keeps, two syphon holes in each box, and wrought-iron covers.

Springs.

- Buckles.** The bearing and side check springs are to be manufactured by makers of good repute only, and to be of the best spring steel, and stamped by the maker. The ends of the upper plates are to be made with eyes slotted in the middle to receive the links, and bored to receive the pins. The buckles are to be of wrought-iron, shrunk tightly on; those for the bogie springs are to be made with a shank or pillar forged solid with the buckle, to sit on the axle-box. The pins, links, and link-brackets on frames are to be well case-hardened. All spring-links to be made with solid eyes and plain pins (no screwed ends to be used). Driving-spring pillars to be $1\frac{1}{2}$ " diameter.
- Testing.** Each spring must be tested before being used, and should sustain a load producing double the working displacement, without permanent set or deflection.

Boiler.

- Material.** All the plates used in the boiler shell and dome, as well as the angle-irons and rivets, are to be of the best Yorkshire iron, manufactured either by the Lowmoor, Bowling, Monkbridge, or Taylor Bros., care being taken in bending the plates to leave the "brand" of the manufacturer visible outside. The brand of iron to be used to be named in Tender.
- Plates to be planed.** All the plates, butt-strips, and hoops to be planed or turned on their edges. Prevailing thickness of plating in boiler shell (when not otherwise specified) to be $\frac{1}{2}$ ".
- Barrel.** The barrel is to be 10' 4" long, and 4' 5" diameter, outside. It is to consist of three plates, with one longitudinal joint each, placed in a line between water-level and base of dome, alternately right and left side of engine, and circumferential butt joints; the longitudinal joints to have lap-plates both inside and out, and to be double riveted, zig-zag, the circumferential joints to have outside lap-plates only, and to be single riveted, the lower portion, for one-third of the circumference, to be protected inside by lap-plates $\frac{1}{4}$ " thick.
- Front tube-plate.** The front tube-plate, $\frac{1}{8}$ " thick, is to be flanged, to take the smoke-box side-plates. It is to be carried down, flanged and bolted, to the smoke-box floor-plate. It is to be attached to the boiler by an angle-iron $4\frac{1}{2}$ " by $3\frac{1}{4}$ " by $\frac{1}{8}$ " thick, turned inside and on the face and edges, single riveted to the tube-plate, and double riveted to the boiler-barrel. The edge of the front barrel-plate is to butt closely against tube-plate.
- Fire-box casing.** The front fire-box casing-plate is to be $\frac{3}{16}$ " thick, flanged forward with a radius (outside) of $1\frac{1}{4}$ ", to overlap the barrel-plate outside, and flanged backwards at the sides to form a lap joint inside the side-plates. The back casing-plate is to be flanged with a radius (inside) of 3", to form a joint with the side-plates in a similar manner. The sides and top are to be formed of three plates, which are to lap each other and the barrel, as well as the front and back casing-plates, and are to be single riveted throughout, except at the horizontal joints, which are to be double riveted, zig-zag. The side-plates are to be lapped round the lower corners of the front and back plates, and riveted thereto, to form a double thickness for the mud-plugs.
- Dome.** A wrought-iron dome, 1' 9" diameter inside, and 2' $11\frac{1}{2}$ " high, is to be fixed on the middle plate of the boiler-barrel. It is to consist of a double-flanged seating, 6" high at shallowest part, formed out of specially-rolled L iron or plate, welded up solid, the lower flange curved suitably to the boiler-barrel, the upper flange to be $1\frac{1}{8}$ " thick (after being turned and faced). The upper portion of the dome to consist of a hemispherical-ended cylinder, terminating below, in a faced flange $1\frac{1}{8}$ " thick, made similar to the seating, the whole being welded up solid. The lower joint-face to be recessed $\frac{1}{8}$ " deep, to fit a corresponding projection on the upper face. The lower flange of dome-seat to be single riveted to boiler-barrel; the hole in the barrel to be 1' 4" diameter, the edge of the barrel-plate being stiffened by two wrought-iron rings $2\frac{1}{4}$ " x 1" (riveted one inside and one out).
- Man-hole.** There is to be a man-hole, 1' 1" diameter, on the crown of the fire-box casing, fitted with a wrought-iron ring (double riveted), forming a seating, to which is to be attached, by $\frac{7}{8}$ " studs, a wrought-iron cover.
- Safety valves.** The wrought-iron cover is to be turned on both sides, and at the outer edge underneath is to be recessed to take the upper edge of the brass moulding of the clothing. It is to be bored, and fitted on the upper side, to take the columns of two Ramsbottom's $3\frac{1}{2}$ " safety valves and other fittings, all of which, except the spring, the lever, and their attachments, are to be of gun-metal. The valves to be set to a working pressure of 140 lbs. per square inch.
- Crown plate L irons.** The top fire-box casing-plate is to have two double transverse rows of angle-iron bent to the proper curve and firmly riveted to the plate, to carry the roof stay slings.
- Longitudinal stays.** The smoke-box tube-plate and the back fire-box casing-plate are to be stayed to each other by seventeen longitudinal wrought-iron through-stays (eleven threads per inch), made with forged heads, and screwed with copper washers into the back casing-plate; front end $1\frac{1}{2}$ " diameter, and parallel, body part $1\frac{1}{8}$ " diameter, back end $1\frac{3}{8}$ " diameter (largest), and tapering 1 in 16. They are to be adjusted to the tube-plate by a nut and copper washer on each side. The upper portion of the back casing-plate, where the stays and fire-box fittings are attached, is to be strengthened by a $\frac{1}{2}$ " plate inside, suitably riveted. The longitudinal through-stays are to be supported at mid-length by a plate $\frac{1}{2}$ " thick, and not less than 4" wide, riveted to the barrel, and by slings where required.
- Copper fire-box.** The plates (as well as the stays and rivets) of the fire-box are to be made of the best selected copper, manufactured either by the Broughton Copper Co., Pontifex & Wood, Vivian & Sons, Pascoe, Grenfell, & Sons, or Nevill, Druce, & Co. They are to bear the maker's stamp, which is to be placed so that it can be seen after the boiler is finished. The

The fire-box plates are to be $\frac{1}{2}$ " thick, except the portion of the front plate which receives the tubes, and which is to be $\frac{2}{5}$ " thick.

Strips must be cut off the plates, and they, with the bars for the stays and rivets, must stand the test of being bent double when cold, without any sign of cracking. If any cracks appear in any of the strips or bars they must be annealed, and if, after being annealed, the same do not stand the test of bending cold, the plates or bars from which such test pieces have been cut must be rejected. Testing.

All copper stays to be thoroughly annealed before being screwed.

The tube and back plates are to be flanged to a radius of 1" inside at the top and round the tube space, otherwise $1\frac{1}{2}$ ", to make lap-joints with the roof and side-plates. Tube and back plates.

The sides and roof are to be in one plate, the top corners bent to a 5" radius. Sides and roof.

Special care and attention should be directed to all corners of the copper-box, as any signs of cracking or injury will necessitate rejection. Care in flanging.

The prevailing water-space between the outer and inner plates at the bottom is to be $2\frac{3}{8}$ " all round. Water-space.

The joint at bottom of fire-box and casing is to consist of a solid wrought-iron forged ring $2\frac{1}{2}$ " deep at the shallowest part, with $\frac{7}{8}$ " iron rivets. The plates, both inside and out, reach to within $\frac{1}{8}$ " of the bottom of the ring, and the centre-line of the rivets is to be $1\frac{3}{8}$ " above the bottom of the same. Bottom ring.

The ring is to be brought down at the corners to take a double row of rivets, and at the sides, to carry the ash-pan.

The fire-hole is to be oval, $11\frac{1}{2}$ " x $14\frac{1}{2}$ ", the joint being formed by a solid wrought-iron ring $2\frac{3}{8}$ " wide (planed on both sides), with $\frac{7}{8}$ " rivets countersunk on the outside, and finished flush. Fire-door ring.

The roof of the fire-box is to be strengthened by wrought-iron girders, $2\frac{1}{2}$ " thick by not less than 7" deep at the middle, carefully bedded at the ends to the front and back edges of the box. Roof stays.

The space between the top of the box and the girders is to be not less than $1\frac{1}{2}$ ". The top of the box is to be attached to the girders by 1" set-screws (standard Whitworth thread), tapped into the girders from below. The screws must be a tight fit in the holes in the roof-plate, the throats being left full and screwed well home, the corners of the head next the plate being chamfered off. Wrought-iron ferules to be used as distance-pieces, covering as little area as possible. Space between roof-stays and box. Roof-bolts.

Twelve safety-links, with oblong holes (to permit the free expansion of the fire-box crown, when heated) are to be suspended between the six intermediate girders and the transverse angle-irons on the roof of the casing, the girders being forged with suitable lugs for this purpose. Safety-links.

The roof-plate is to be fitted with a fusible lead plug $1\frac{1}{4}$ " diameter at the point (tapered 1 in 6), and screwed 10 threads per inch, and bored and tapped $\frac{7}{16}$ ". The box is to be stayed to the shell by copper stays $\frac{7}{8}$ " diameter, screwed 10 threads per inch, centred not more than $4\frac{1}{2}$ " apart C. to C., screwed tightly into both plates, riveted over at both ends, and with a sufficiently large head inside. The thread is to be turned off in the water space. The first rows on the sides are to be centred $8\frac{1}{16}$ " from the outside of the front and back casing-plates, and at the front and back $7\frac{1}{2}$ " from the outside of the side casing-plates. The tube-plate is stayed to the barrel-plate below the tubes by eight 1" copper stays, screwed 10 threads per inch, tapped into the copper plate and into wrought-iron sockets riveted to the barrel, and riveted over on the outside. Lead plug. Copper stays. Lower barrel stays.

All rivets used in the boiler-shell are to be $\frac{3}{4}$ " diameter, centred $1\frac{3}{4}$ " apart, except those attaching the angle-iron to the front tube-plate, which are to be $\frac{1}{2}$ " diameter, and those in the fire-door and foundation and manhole rings, which are to be $\frac{7}{8}$ " diameter, centred $1\frac{7}{8}$ " apart. Those in the copper box (excepting the foundation ring) are to be of copper, and $\frac{3}{4}$ " diameter. All the rivets must completely fill the holes, and the riveting is to be done by steam or hydraulic power, wherever it is possible to do so, for which special appliances must be provided. Rivet-holes, if necessary, to be adjusted by ryming; no drifting to be allowed. Rivets. Steam riveting.

At each bottom corner of the fire-box casing there is to be a gun-metal wash-out plug $1\frac{1}{4}$ " diameter (at small end), fitting into a gun-metal bush 2" diameter screwed into the casing-plate. There is also to be an oval mud-hole with suitable cover, &c., at lowest part of throat-plate; also two $1\frac{1}{4}$ " plugs in the front tube-plate, on a level with the lowest row of tubes. There are also to be two $1\frac{1}{4}$ " plugs at the back of the fire-box casing, above the level of the top of the copper box (for filling). All the foregoing are to be screwed 10 threads per inch, and tapered 1 in 16. Wash-out plugs.

A brass blow-off cock, fitted with a pipe leading to ash-pit, is to be fixed by a flange and studs to the fire-box casing on left side, and worked by a handle placed conveniently above the side platform. Blow-off cock.

The fire-bars are to be of wrought-iron, carried on two round wrought-iron bars shaped at the ends to fit into suitable brackets bolted to the prolonged portion of the fire-box foundation ring. These carrier bars are to be drilled and fitted with pegs (not tapered) of $\frac{7}{8}$ " round iron centred 2" apart, to regulate the spacing of the fire-bars. Fire-bars.

The ash-pan is to be of wrought-iron, the full length and width of the fire-box, and is to have a tight-fitting damper door at both front and back, with a hinge-bar running the full length of the door, and worked from the foot-plate by suitable levers and rods, having convenient notches and lips. They must also have springs to prevent rattling and flying out of gear. The bottom is to be stiffened by cross angle-irons, inside, at front and back ends. Ash-pan.

The fire-door is to consist of two sliding wrought-iron plates, and is to be provided with a wrought-iron deflector and fender mouth-piece. Fire-door.

The fire-box to be fitted, at front end, with a fire-brick arch, supported by angle-irons attached to the side-plates by studs. Brick arch.

A swan-necked cast-iron pipe 4" diameter is to be fixed in the steam dome. The lower portion is to be attached by an angle-iron bracket to the dome base. It is to be surmounted by a gridiron regulator valve of gun-metal, working on a cast-iron seat having suitable ports, placed as high in the dome as possible, and worked by levers and rods from the foot-plate. Regulator.

The stuffing-box is to be of gun-metal, with suitable stops to limit the travel of the handle, and stamped "Shut" and "Open" on the right and left hand respectively. Stuffing-box.

A copper pipe, 4" diameter inside, and No. 9 W.G. thick, is to connect the regulator with the pipe in the smoke-box. It is to be fitted to the regulator pipe by a gun-metal cone, brazed on and secured by a circular wrought-iron clip, cast-iron split bush, and two bolts, the hole in the clip being large enough to slip over the cone; it is to terminate at the front end in a gun-metal flange (brazed on), and to be bolted to the tube-plate by seven $\frac{3}{4}$ " studs. Steam-pipe.

T pipe in smoke-box. There is to be a cast-iron T pipe in the smoke-box fixed by the studs which secure the flange of the steam-pipe. Copper pipes 4" diameter inside, and No. 7 W.G. thick, with gun-metal flanges brazed on, are to connect the T pipe with the cylinders.

They are to be bent round the sides of the box to clear the line of tubes. The copper pipes are to project 1" through the bottom flanges into the valve-chests. Circular recesses are to be cut in the valve-chest castings for corresponding projections on the flanges of the steam-pipes to fit into.

A No. 2 Roscoe's lubricator to be attached to each side of smoke-box, with copper pipe leading into centre of cylinders.

Flue-tubes.

Material and make. The tubes are to be of brass, solid drawn, and of the best quality, manufactured either by the Broughton Copper Company, Elliott's Metal Company, Allan, Everett, & Sons, J. Wilkes & Company, or other good makers, subject to the approval of the Inspecting Engineer.

Number and diameter. They are to be 189 in number, and 2" outside diameter, swelled to 2 $\frac{1}{16}$ " diameter in front tube-plate, and are to bear the maker's stamp. Thickness, No. 10 W. G. at the fire-box, and No. 12 W. G. at the smoke-box end.

Care must be taken to make the tubes perfectly steam-tight at both ends by rolling them with Dudgeon's expanders.

Steel ferules. Tapering steel ferules are to be inserted at both ends.

The tubes are to project $\frac{3}{8}$ " beyond the fire-box tube-plate, and $\frac{3}{8}$ " beyond the smoke-box tube-plate when fixed, and they are not to be rolled over or beaded at the ends.

Smoke-box.

The smoke-box to be of the "extended" type; plates, L irons, rivets, and forgings to be of the best Staffordshire iron.

The sides of the smoke-box are to be attached to the tube-plate by $\frac{5}{8}$ " rivets, and to be carried down and bolted to the frames. The front-plate is to be connected to the side-plates by an angle-iron (riveted), and to be stiffened round the doorway by a 3" L iron (riveted).

Door. The door is to be circular and dished, flanged 1 $\frac{1}{2}$ " all round the edge, and carried by two wrought-iron hinges. It is to be fitted with a $\frac{1}{4}$ " protecting liner, attached by rivets and ferules, with an air space of $\frac{3}{4}$ " at the edges. It is to be kept closed by a central handle with a minor locking handle and screw, with a removable horizontal cross-bar.

The smoke-box must be made perfectly air-tight, by bringing down the plates square into the corners.

The exhaust-pipe is to be of cast-iron, with branches leading from each cylinder and uniting at the centre; the diameter at the top is to be 4 $\frac{3}{4}$ " inside. All the joints to be planed and scraped metal to metal.

Spark-arrester. Spark-arresters to be fitted of the best design known for the prevention of burning matter being emitted.

Chimney. The chimney to be of wrought-iron, the base being formed of a plate welded up without seam, and shaped on a block to suit the curve of the smoke-box. The barrel is to be made of one plate with a butt joint and inner lap-plate. It is to be fitted into and riveted to the base. It is to be surmounted by a polished copper top. All the rivets in the chimney are to be countersunk outside, and finished flush. The extreme height from rail to chimney top is to be 13' 6".

Blower. A blower-cock is to be fixed on the boiler behind the chimney, worked from the foot-plate by a spindle passing through the right-hand rail. A copper pipe is to lead the steam to the top of blast-pipe.

A No. 2 Roscoe's patent lubricator is to be fixed on each side of the smoke-box, with a copper pipe leading into the centre of each cylinder.

Hand-rail. A hand-rail is to be fixed to the front of the smoke-box, continuous with the side-rails.

Injectors.

Injectors. Two No. 9 Giffard's injectors (Gresham and Craven's make), are to be provided. They are to be carried by wrought-iron brackets bolted to under-side of cast-iron foot-plate, and fitted with waste-water cock and copper pipe to carry the waste water below the edge of the platform.

Injector-pipe. The injectors, clack-boxes, and cocks are to be of gun-metal, and the steam, suction, delivery, and overflow pipes of copper, with gun-metal flanges. The steam pipe is to be 1 $\frac{3}{8}$ " diameter inside, No. 11 B.W.G.; the delivery pipes 1 $\frac{3}{8}$ " diameter, and No. 10 B.W.G.; and the suction pipes 1 $\frac{3}{8}$ " diameter, No. 12 B.W.G. The injector feed-pipes to be carried by wrought-iron hangers attached to the under-side of the foot-plate.

Fire-box Fixings.

The fire-box fixings are to consist, in addition to those already mentioned, of the following:—

Gauges, &c. One Bourdon's patent metallic pressure gauge, indicating up to 200 lbs. per square inch, with cock and copper pipe. Two glass gauges (one right and one left side), with top and bottom cocks, and waste-water cocks and copper pipes, fixed to back casing-plate with stout gun-metal flanges and studs. One whistle, connected with a branch from the body of the hind safety-valve, and placed at such a height as to enable the steam to pass above the cab roof. There is also to be an iron socket screwed into the back casing-plate, to carry the gauge-glass lamp, and a wrought-iron tray (with angle-iron rim) fixed with studs, above the fire-door. All the cocks and fittings are to be made of gun-metal, unless specially named to the contrary, and all fittings screwed into the boiler are to have 11 threads to the inch, unless otherwise specified.

Clothing.

Boiler clothing. The boiler is to be covered with dry pine battens, 1 inch thick, tongued and grooved. At each joint of the lagging-plates a wrought-iron hoop, 2" wide by $\frac{3}{8}$ " thick, is to be put on (in two halves), screwed together with countersunk screws to metal joint-blocks let in through the battens and bearing on the boiler; also distance-pieces, about 20 inches apart, bearing on the boiler, to adjust the hoops to the proper distance. All are to be finished flush with the outer surface of the wood lagging, and covered with sheet-iron, No. 16 W.G., and bound together round the barrel and over the fire-box casing with hoop-iron.

Dome casing. The dome is to be enclosed in a helmet-shaped casing of charcoal sheet-iron. Polished brass mouldings are to be fitted round the back corners of the fire-box casing, the smoke-box angle-iron, and under the safety-valve seating.

The front corners of the fire-box casing are to be fitted with mouldings of charcoal sheet-iron.

The

The House.

The house is to consist of a front weather screen of $\frac{3}{8}$ " sheet-iron, carried by an angle-iron, secured Cab. to four suitable wrought-iron brackets riveted to the top of the fire-box casing, and of a curved $\frac{1}{4}$ " sheet-iron roof-plate, stiffened at front and back ends by a light $2\frac{1}{2}$ " angle-iron, and fitted with longitudinal $2\frac{1}{2}$ " light angle-irons to take the wrought-iron supporting pillars. The roof-plate is to extend backwards the full length of the foot-plate, and in front of weather-screen $12\frac{1}{2}$ ", and is to be attached to the latter by a light 2 " L iron. The outer edges of the roof-plate, along the sides, are to have light 1 " L irons from end to end to act as gutters.

The weather-screen is to be $5' 9\frac{1}{2}"$ wide in body part, widened out at top to meet side L irons. It is to be fitted with two swivelling circular windows, fixed in brass frames, &c. The pillars are to be connected $3'$ above the foot-plate by a polished wrought-iron hand-rail, and the space is to be filled up by a $\frac{3}{8}$ " wrought-iron panel-plate fastened to the platform by light 2 " L iron. The gaps at front end between panel-plates and fire-box casing are also to be filled up by $\frac{3}{8}$ " wrought-iron plates.

Brakes.

An efficient hand-brake is to be fitted to the engine, as well as the tender, consisting of an $1\frac{3}{8}"$ screw spindle with a square thread, having a $\frac{3}{8}"$ pitch with a $12"$ double-ended hand-lever at top, and an $11"$ lever on brako-shaft at lower end with a suitable screw-nut. The handle for working it is to be placed on the left-hand side of the foot-plate, and is to be carried on a hollow cast-iron pillar bolted to the foot-plate by four $\frac{3}{4}"$ bolts. There is to be a wrought-iron hanger, with cast-iron block, fitted to each of the six driving wheels, and a wrought-iron brake-shaft $3\frac{1}{4}"$ diameter carried by cast-iron brackets bolted to the frames, and having the arms forged on solid, the screw-arm being forked and bored to take the screw-nut.

The right-hand end of the shaft is to be made with an arm suitable to couple up with a steam-brake cylinder, which is to be bolted to the frame-plate, and controlled by a steam-cock on back casing-plate, fitted with all necessary pipes, &c.

Efficient gear to be provided for supplying a jet of water from the tender to the tire of each wheel of engine and tender, immediately above each brake-block (for cooling), the whole to be controlled by suitable handles, &c., from tender foot-plate.

Hand-rails.

There are to be polished hollow wrought-iron hand-rails along the sides of boiler, supported by three cast-iron carriers on either side, each bolted to a short piece of L iron riveted to the barrel of the boiler. The hand-rail to be continuous round front of smoke-box, and suitably attached to the same.

Sand-boxes.

Large cast-iron sand-boxes, capable of carrying 7 cubic feet of sand each, are to be fixed to the platforms, forward of the front coupled wheels, and worked, both sides simultaneously, by suitable levers and rods from the foot-plate.

The sand-pipes to be of wrought-iron, $1\frac{3}{4}"$ diameter inside, attached by suitable flanges and studs to the boxes, and bent in such a way as to convey the sand as near as possible to the tread of the wheel.

Lamp-brackets.

A head-lamp bracket to be fixed on each side of the front buffer-beam, in line with buffers.

Painting.

After being tested, the boiler is to receive two coats of metallic oxide paint, and when dry the clothing is to be put on. When finished the engine is to receive not less than two coats of lead colour in oil. The whole of the surfaces requiring it are then to be filled up with hard stopping, and after being well rubbed down smooth are to receive a third coat of lead colour in oil, and to be finished with two coats of selected colour in oil and two coats of varnish.

Tool-box and Tools.

Each engine is to be provided with a portable wooden tool-box $3' 3"$ by $2' 0"$ by $1' 9"$ (to be carried on the top of the tender), made of oak or tallow-wood, bound with iron at the corners, and the lid covered with galvanized sheet-iron; to have strong hinges, hasp and padlock, and till inside at one end; also two monkey-wrenches (one large and one small); one heavy hammer; one light hammer; one copper hammer; two flat chisels; two cross-cut chisels; two pin-punches; one complete set of screw-keys to fit all nuts; two short keys for piston glands; two short keys for valve spindles; light close-ended keys for all syphon covers; one fire-bucket; one fire-shovel; one fire-dart; one fire-pricker; one rake; one pinch-bar (large); one tube-plug socket-rod and six tube-plugs; two 15-ton traversing screw-jacks, with ratchet, ratchet head, and jackbars; two oil-cans (one large and one small); two oil-feeders (one large and one small), copper tallow-kettle, hand-brush, and gauge-lamp.

Pitch of Screws.

The threads of all bolts, studs, and nuts are to be cut to Whitworth's standard, unless where specially stated to the contrary. Where fine threads are specified, eleven threads per inch are to be used, except in the case of piston-rods, the threads of which are to be six per inch. All bolt-heads and nuts are to be hexagonal, and measured across the corners are to equal twice the diameter of the bolt (except in the larger sizes of bolts, in which case the next size less for heads and nuts may be taken if more suitable). The size across the flats will not therefore be Whitworth's standard.

Lubrication.

Special care is to be taken in designing oil-cups, &c. (especially for reciprocating parts of the gear), to prevent the oil being thrown out and wasted when the engine is in motion.

Wire-gauge.

The Birmingham wire-gauge is to be used.

Case-hardening.

Case-hardening.

All the motion-work, brake-work, the nuts of the cylinders and glands, and all journals, pins, joints, and rubbing surfaces about the engine and tender (except where of brass, cast-iron, or steel) shall be thoroughly case-hardened to a depth of $\frac{1}{16}$ " and so hard as to wholly resist filing.

Specimens of case-hardening, which have been hardened in the same boxes with the work, will be broken in the presence of the Inspecting Engineer or his deputy.

TENDER.

(Contents, 2,500 gallons.)

General Arrangement.

The following are the leading particulars of the design and construction of the Tender (based on the assumption of a rigid or fixed wheel-base, not exceeding 11', and plate frames); and it is to be clearly understood, that in the event of bogie being adopted in lieu of rigid wheel-base, the details and dimensions as here set forth are, of course, subject to modification, but must still be adhered to as far as practicable, a certain amount of latitude being allowed to meet the conditions of enlarged tank, &c.

The tender to be of the ordinary horseshoe type, with the addition of a well underneath the tank 10' long, 4' 1" broad, and 1' 6" deep inside, and extending over the front and middle axles. The fuel space (shaped in the tank) to be 7' 9" long (from the front end), and 2' 6" wide; the whole to be carried on six wheels 3' 7" diameter at the tread; wheels 5' 6" apart C. to C.; total wheel-base 11'.

Wheels.

Bodies to be of wrought-iron, 3' $1\frac{1}{2}$ " diameter, and to have ten spokes each. They are to be made of the same material, put together and finished in the same way as the engine wheels.

Tires.

To be of the same material, brand, section, and method of fastening as specified for the engine tires, with flanges on all the wheels.

Axles.

To be of the same material and brand as specified for the axles of the engine; to be $5\frac{1}{2}$ " diameter in the middle, parallel for a distance of 2' 6", to run into $6\frac{1}{8}$ " diameter at the collars, which are to be $\frac{3}{8}$ " broad; the wheel seats to be 6" diameter; the journals to be $4\frac{1}{2}$ " diameter by 8" long and parallel; the radius of the corners being $\frac{3}{4}$ ". The distance from C. to C. of bearings to be 6' 2".

Axle-boxes.

To be of fine-grained hard cast-iron. The castings to be clean and free from flaws of every description. To be planed to fit the axle-box guides, but to be left $\frac{1}{8}$ " wider between the flanges, to allow of lateral motion. The bearings to be of hard gun-metal, octagonal on crown, and perfectly bedded into the axle-boxes. Two syphon-tubes to each box; the tubes to be continued through the cast-iron into the brass bearings for a $\frac{1}{4}$ ". The keeps to be of cast-iron, and planed to fit the axle-boxes (so that they can be put up and taken down by hand without hammering), and secured by two $\frac{5}{8}$ " round wrought-iron pins. The covers to be of cast-iron, recessed in the top to take the ends of spring pillars. The lid to be of cast-iron, secured by a wrought-iron pin.

Bearing.

Keeps.

Covers.

Axle-box Guides.

To be of fine close-grained cast-iron, free from flaws of every description. To be planed on the face, edges, and flange, and to be fastened to the frames by four tight-fitting $\frac{7}{8}$ " turned bolts in each, the bolts to be countersunk into frames, the nuts to be secured by split pins.

Axle-fork Keeps.

To be of wrought-iron, a good fit on the forks, and secured by a $\frac{7}{8}$ " bolt at each end.

Springs.

To be of the same material as specified for the engine springs. The spring pillars to have two wrought-iron guides each, fastened to the inside of frames. The wrought-iron spring link carriers also to be attached to the inside of the frames.

Framing.

The frames are to be of the same material as specified for the engine frames, and are to be $\frac{7}{8}$ " thick, running from buffer-plate to buffer-plate, and formed each of one solid plate. The minimum depth to be 12", and above the axle-boxes 1' $2\frac{1}{2}$ ", deepened at the front end to take the brake shaft and footsteps. The main frames to be braced together at the front end by a $\frac{5}{8}$ " wrought-iron vertical plate (serving as a buffer-plate, *q.v.*) 1' 2" deep, and a $\frac{1}{2}$ " vertical plate 1' $2\frac{1}{2}$ " deep, united by two horizontal $\frac{1}{2}$ " plates 1' 9" wide; also at back end by a $\frac{1}{2}$ " vertical plate (serving as a buffer-plate) 1' deep, united to a $\frac{1}{2}$ " horizontal plate 1' 6" wide, and finally by two intermediate $\frac{1}{2}$ " vertical plates, each 1' deep, the whole riveted together with suitable L irons, &c.

"Well."

There are to be two $\frac{1}{2}$ " wrought-iron longitudinal stretchers, each in one continuous plate, running from the front intermediate cross-stay to the hind buffer-plate, and spaced 4' 1" apart. The longitudinal stretchers to form the well sides, the front plate of well to be $\frac{3}{8}$ " thick, and spaced 10" from the back of the front cross-stay; the back of the well being formed by the back intermediate cross-stay, suitably deepened.

The middle cross-stay divides the well, consequently care must be taken to cut holes in it to allow the water to circulate, also a hole large enough to admit of a man passing through. The intermediate cross-stays will be secured to the longitudinal stretchers and throughout the well by angle-irons.

Foot-plate,

Foot-plate, Draw-plates, &c.

The foot-plate to be $\frac{3}{8}$ " thick, the extreme width over platform being 7' 6". The front horizontal draw-plate to be $\frac{1}{2}$ " thick, and spaced 6 $\frac{1}{2}$ " below the foot-plate, and fastened to buffer-plate, frames, and front cross-stay plate by 2 $\frac{1}{2}$ " angle-iron and $\frac{3}{4}$ " rivets. The horizontal stiffening-plate to be $\frac{1}{2}$ " thick, and 4' below the draw bar horizontal plate, and to be flanged down at the front, and fastened to the buffer-plate, and secured to the frames and vertical cross-stay plate by 2 $\frac{1}{2}$ " angle-iron and $\frac{3}{4}$ " rivets.

On the underside of the stiffening-plate will be fixed two wrought-iron feed-pipe carriers, to be securely fastened and braced together. The distance from C. to C. of feed-pipes to be 2' 11". The draw-bar pin is centred 1' 3 $\frac{1}{2}$ " back from the buffer-plate. The draw-shackle pin holes to be 5 $\frac{3}{4}$ " from the back of the buffer-plate and 1' 10" apart C. to C.; strengthening plates to be riveted on round the holes in the plates. A wrought-iron (case-hardened) rubbing block to be securely fixed to front buffer-plate, to bear against the wedge block on engine, and securely riveted to plate, with laterally extended landings; no rivets to pierce the middle of block.

Two wrought-iron water-tight sand-boxes are to be placed on the foot-plate at the front end of the tank, one on each side, each capable of holding 2 cubic feet of sand, and fitted with cast-iron water-tight lids, also with suitable valve and gear for working same, the filling hole to be 4 $\frac{1}{2}$ " diameter.

The sand-pipes to be of wrought-iron, the same size as for the engine, and bent so as to convey the sand as near the tread of the front wheels as possible. There is to be a polished wrought-iron hand-rail on each side, at front end, supported by two wrought-iron pillars, and secured to the tank. The left-hand one to have a boss forged on to take the brake-spindle. Two substantial wrought-iron double shackle screw-couplings are to be provided with each Tender; screw, 2" diameter; shackle and link-iron, 1 $\frac{1}{2}$ " diameter.

Brake.

The general design and arrangement to be similar to that specified for the engine brake; the handle to be on the left-hand side of the tender. The shaft to be 3 $\frac{1}{4}$ " diameter, with all the levers forged on solid; the whole to work in cast-iron bushes in the frames. There is to be a wrought-iron hanger and cast-iron brake-block (clipping the flanges) to each wheel. The hangers to be suspended by means of stout wrought-iron pins passing through the frames and liners riveted to the longitudinal stretchers. The hangers for the trailing-wheels to be prolonged to form life-guards.

Back Buffer-plate.

This to consist of a wrought-iron plate $\frac{1}{2}$ " thick, 12" deep, and 7' long, secured to frames and longitudinal stretchers by 2 $\frac{1}{2}$ " angle-iron ($\frac{3}{4}$ " rivets). The horizontal draw-plate to be 8 $\frac{3}{4}$ " below the bottom of the tank, to be $\frac{1}{2}$ " thick and 1' 6" broad, fastened to frames and buffer-plate by 2 $\frac{1}{2}$ " angle-iron ($\frac{3}{4}$ " rivets).

The vertical (draw-spring) plate to be 2' 6" long, 12" deep, and $\frac{1}{2}$ " thick, secured to the horizontal plate and bottom of tank by 2 $\frac{1}{2}$ " angle-iron ($\frac{3}{4}$ " rivets); $\frac{3}{4}$ " strengthening-plates to be riveted on to the back of the buffer-plate and front of the vertical plate. Two buffers, of same type as those specified for the engine, to be fastened to buffer-plate by four 1" bolts in each. Height from top of rail to centre, 3' 4"; distance apart from centre to centre, 5' 9". A stout wrought-iron draw-hook to be provided, having a shank passing through the buffer-plate and vertical draw-plate, and fitted with a powerful volute spring, secured by a washer and split cotter. A case-hardened wrought-iron socket is to be securely attached to the hind buffer-plate, to give sufficient surface for the shank of the hook to work in. Two safety-chains (links, 1" iron) terminating in stout hooks, to be securely attached to the buffer-plate, at a distance of 1' 6" apart.

Tool-box.

A plate-iron tool-box is to be built at the back of the tank, and of the full width of the same, with a hinged lid, hinges, and staple, catch, and lock complete.

Tank.

The thickness of the top and side plates to be $\frac{1}{4}$ ", and the bottom to be $\frac{3}{8}$ ". The top, bottom, and sides to be well stayed to each other by L irons, &c. A curved wrought-iron moulding to extend along the upper edge (outside) of sides and back of tank.

A wrought-iron man-hole ring made of $\frac{3}{8}$ " plate, 18" diameter, 8 $\frac{3}{4}$ " high, flanged at the bottom, is to be riveted on to the top of tank, centred 1' 6" from back of same. It is to be fitted with a wrought-iron cover and handle. The hole to be cut in the tank top is to be 1' 4 $\frac{1}{4}$ " diameter, round which will be supported a wrought-iron sieve, made out of $\frac{1}{8}$ " plate, to be 1' 4" diameter at the top, 1' 3 $\frac{1}{2}$ " diameter at the bottom, and 4' 0 $\frac{1}{2}$ " long.

The tank to be supplied at the back end with a wrought-iron lifting shackle in each corner, with strengthening corner-plates. At the front end, over the front axle, on the inside of the coal bunker, two bent plates will be riveted for the same purpose. A lamp-bracket to be fixed respectively on the left and right hand side at the back end of tank. The feed-valves to be circular, and of gun-metal, with central guide pin, and situated one on each side of the tank, protected by proper strainers, and worked from the top by levers, &c., on circular castings with inclined planes. The vertical rods to be weighted. A brass cock $\frac{3}{4}$ " bore to be fitted to the outside of the tank at the front end and near the bottom (for drawing water into a bucket). The well to have a man-hole 15" diameter, cut in the bottom plate at a distance of 2' 4" from the back plate of well, to have a thickening piece 2" broad and $\frac{3}{8}$ " thick, riveted round the hole on the inside by $\frac{3}{8}$ " rivets, countersunk flush on the bottom. The cover to be $\frac{3}{8}$ " thick, 1' 7" diameter, fastened on by $\frac{5}{8}$ " studs; pitch, 3 $\frac{1}{2}$ ".

Feed-pipes.

The feed-pipes to be of copper, 1 $\frac{1}{2}$ " bore, and No. 12 W.G. thick, and the feed connection between the engine and tender to consist of strong indiarubber hose-pipe, 2 $\frac{1}{8}$ " bore, stiffened with spiral spring inside (tested to 200 lb. pressure per square inch), and fitted with brass union joints at the engine end.

Painting.

The inside of the tank and well to be thoroughly served with three coats of best metallic oxide paint, and the other parts outside to be filled up, rubbed down, and painted in the same manner as the Engines.

W. SCOTT,

February, 1886.

Locomotive Engineer.
GENERAL

GENERAL CONDITIONS, IF ENGINES ARE BUILT BY ENGLISH OR FOREIGN
MANUFACTURERS.

Everything necessary to be provided.	Everything necessary to the proper finish and equipment of the engine and tender must be supplied, whether stated in this specification or not, and no advantage is to be taken of any omission of detail in the specification or any plans which may be supplied for guidance, as the contractor may, by applying to the Inspecting Engineer, obtain full explanation of any part of the work not sufficiently specified or otherwise particularized.
Alterations.	The Commissioner reserves to himself the right to supply, after tenders have been lodged and accepted, a set of "Working Plans" for the contractor's guidance; and in such event said plans will have to be rigidly adhered to, both as regards general design and detail. Any alteration or modification of detail which shall be ordered by the Inspecting Engineer during the progress of the work, as being in his opinion necessary for the proper execution of the contract in accordance with the spirit of this specification, shall be executed by the contractor without extra charge.
Suggestions from contractor.	Any suggestion that the contractor may desire to make, with the object of improving or economising, in his opinion, the working of the engine, or of modifying the mode of manufacture, or the material specified to be used, or the details or dimensions, are in every case to have the previous written consent of the Inspecting Engineer, before being carried out.
Materials used. Workmanship. Inspection.	All the materials used are to be of the very best description of their respective kinds, and the work is to be executed in the most approved, substantial, and workmanlike manner, according to the direction and to the satisfaction of the Inspecting Engineer, who is to have power to inspect the manufacture, either personally or by deputy, in all its branches and details, in such manner as he may think fit, and to reject at any stage, any work or material of which he may disapprove, as not being in accordance with the spirit and intention of the specification; and his decision on any point of dispute or doubt which may arise in reference to the contract, shall be final and binding on the contractor.
Sub-letting.	The contractor shall not assign or sublet the contract, or allow any portion of the work to be done other than in his own establishment (except where implied and provided for by the clauses of this specification), unless with the previous written consent of the Inspecting Engineer.
One set of templates and patterns to be used.	The work is to be finished to one set of templates and patterns, so that the engines and tenders may be exact duplicates of each other, and that all moving parts, including the wheels and axles, must be interchangeable.
Numbering of parts.	The maker's (progressive) number to be stamped upon all parts of each engine and tender, for identification; also maker's name, date, and place of manufacture, to be exhibited upon a brass plate fixed to each engine.
Testing.	All brackets having been riveted on, the whole of the studs and mud-plugs screwed in, and all mountings fitted on (previous to being put in the frames), each boiler shall be tested (without the clothing) in the presence of the Inspecting Engineer or his deputy, first with water to a pressure of 200 lbs. per square inch, and afterwards in steam at the intended working pressure.
Finishing.	When complete and finished in every respect, the engines and tenders shall, after having been satisfactorily tested (in steam) in the maker's yard, be delivered in accordance with the terms of the "Form of Tender."
Protection of bright work.	For the purpose of transit, all bright work to be thoroughly protected against rust by a coating of white lead and tallow, and all parts (other than those in packing cases) to be substantially protected from damage by wood battens or other suitable means. The bearings of the wheels and axles are also to be coated with white lead and tallow, and are then to be lapped with flannel which has been soaked in the lead and tallow, and afterwards tightly and closely lapped with spun-yarn which has been first soaked in the mixture. The outer surface of the spun-yarn is then to be well coated with boiling pitch and tar, and protected overall by battens and wood secured by hoop iron. All studs or joints on the boiler or framing must be protected by wood, and all holes must be plugged (to prevent pinch-bars being inserted when loading or unloading). The cylinders are not to be removed from the framing for transit. Stout cross-stretchers of wood are to be inserted between the axle forks at the front and hind ends of the engine, to prevent any straining of the frames.
Protection of bearings.	
Studs, &c., to be protected.	The movable pieces must be packed in strong cases made of deals $1\frac{1}{4}$ " thick, strengthened by battens placed about 2' 6" apart, and the ends and sides bound down with stout hoop iron, well nailed. All loose pieces in each case must be packed with distance-pieces of wood to prevent any of them moving; and the contractor will be held responsible for any damage arising (during transit) from neglect of this.
Cylinders not to be removed. Cross-stretchers	
Packing cases.	The cases containing the bright work are to be lined with stout sheet tin or zinc, and soldered perfectly watertight, the lids of these cases being fastened down with screws.
Tin linings.	Each case and each unpacked portion of every engine and tender must be marked and numbered, as may be directed, to facilitate the shipment of the parts in the required order.
Marking.	The price named in the "Form of Tender" must include the cost of all templates, royalties, plans, and other charges for the use of patents (if any) involved, and of the delivery of the engines in steam, as per terms of "Form of Tender," to the satisfaction of the Inspecting Engineer or Commissioner for Railways, as the case may be.
Price named to include all costs.	The contractor must deliver complete, as per specification, the various engines and tenders by not later than the dates respectively named in his "Form of Tender," and should he fail to do so, a sum at the rate of £20 per week per engine will be deducted, by way of liquidated damages, from the price named in the "Form of Tender."
Delivery within contract time.	The contractor will be required to execute a formal deed of contract with the Agent-General of the New South Wales Government in London, or the Commissioner for Railways, Sydney, New South Wales, embodying this specification, the terms of the "Form of Tender," and all other conditions necessary to ensure the due completion of the contract, as stated in the "Form of Tender."
Bond to be executed.	Detailed packing lists must be furnished in duplicate written copies, giving the outside measurement of each package, as well as the weight thereof, as nearly as possible.
Packing lists.	Payment will be made for each engine as follows:—90 per cent. in cash in London, on receipt by the Agent-General for New South Wales of the bills of lading, together with a certificate from the Inspecting Engineer, that the terms of this specification, as to the completion and packing, &c., &c. of the engines, have been fulfilled.
Payment.	And

And it is hereby expressly declared that the giving of a certificate by the Inspecting Engineer in London, that the work done by the contractor has been satisfactorily executed and completed up to the period of delivery, shall be a condition precedent to the contractor's having any right of action or lawful claim to the payment of the 90 per cent., to be made under this specification.

The balance of 10 per cent. will be paid by the Agent-General, on receipt by him of a certificate that each engine has run 2,000 miles on the Government Railways of New South Wales to the satisfaction of the Locomotive Engineer of the Government; and if any engine or engines should fail to run the specified 2,000 miles to the satisfaction of the Locomotive Engineer, the contractor will be called upon to make good the defects. If he fail to do so within reasonable time, the Commissioner for Railways shall spend any such sum (not exceeding in the total the 10 per cent. on the contract price of the engine or engines that shall have arrived in the Colony) as may be considered necessary, in the opinion of the Locomotive Engineer, to make the engine or engines conform to this specification, such sum to be deducted by way of liquidated damages from the forementioned balance of 10 per cent.

A complete set of working plans or drawings (on vellum) to be supplied by the contractor to the Agent-General or Commissioner for Railways, as soon as the whole of the working plans or drawings shall have been completed.

Each Tenderer to submit (if possible), along with his tender, an outline plan, showing the general features and design of the engine and tender which he proposes to supply, along with a skeleton specification of the leading particulars of the same.

Should the rate of progress made with the work be such as to prevent, in the opinion of the Inspecting Engineer, the engines being delivered within the time specified in the "Form of Tender," the Commissioner for Railways or the Agent-General shall have full power and authority, after due notice given to the contractor, to cancel the contract forthwith, upon which all moneys due to the contractor under this contract shall be forfeited.

Tenderers in Europe or America may either tender to the within specification, or if they wish to depart from it in respect of substituting bar for plate frames, cast-steel for wrought-iron centres for wheels, other brands of copper, brass, and iron for those mentioned, will be allowed to submit alternative tenders, provided that they adhere to the general dimensions of the engine, and clearly and minutely specify the nature of the departure they propose to make from the specification.

CHAS. A. GOODCHAP,
Commissioner for Railways.

Department of Public Works,
Railway Branch,
Sydney, 1st June, 1886.

GOVERNMENT RAILWAYS OF NEW SOUTH WALES.

Form of Tender for manufacture of Engines in England or Foreign Countries.

THE undersigned, having read the attached Specification, (No. 188A), hereby offer to supply the Government of New South Wales with Locomotive Engines and Tenders, made in accordance with the various requirements, particulars, and conditions set forth in said Specification, on the following terms as to delivery and payment viz. : Engines (with their Tenders), delivered in steam at _____, at the price of £ _____ each, the whole to be completed and delivered within _____ months from date of official acceptance of Tender; and further promise and agree to be firmly bound by and faithfully to adhere to all the conditions and requirements of the said Specification, and to forfeit to the New South Wales Government, or its lawful representatives, the sum of £20 sterling per Engine and Tender per week (to be deducted from the abovenamed contract sum by way of liquidated damages) for each and every week that each Engine (with its Tender) shall remain undelivered after the time herein specified for delivery.

We are,
Your obedient Servants,

Name
Address

To the

N.B.—This Tender must not be detached from the Specification. The Government do not bind themselves to accept the lowest or any Tender.

GOVERNMENT RAILWAYS OF NEW SOUTH WALES.

Specification No. 188A for a Four-coupled, outside-cylinder Passenger (Bogie) with Engine and Tender.

Number required—Twelve, delivered in steam at Sydney; Four, delivered in steam at Newcastle.

PRINCIPAL DIMENSIONS.

ENGINE:—	ft.	in.
Gauge of Railway	4	8½
Cylinders—diameter	1	7
" stroke	2	2
Coupled wheels, D. and T. (front and back of fire-box)—4.		
" " diameter of do. (tread)	5	6½
" " distance from C. to C. do. approximate	8	3
" " bogie, number—4.		
" " " diameter, tread (if possible not less than)	3	7
" " " distance from C. to C.	6	10
" " " base (total) ... do. approximate	21	8
Fire-box length of foundation ring (not less than) do....	5	9
" breadth do. do. do.	3	6
Tubes, minimum number—198.		
" diameter outside	0	2

Boiler,

		ft. in.
Boiler, diameter (internal minimum), barrel portion (if possible) ...	...	4 4
" length do. do. approximate ...	...	10 4
" centre line, height from rail (if possible not to exceed) ...	...	7 0
Working steam pressure in boiler, 140 lbs.		
Weight on rails, per pair of Driving Wheels (in steam), if possible not to exceed ...	...	15 tons.
TENDER (horse-shoe, with well) ; minimum content, 2,500 gallons :—		
Wheels, number—if all fixed wheel-base—6.		ft. in.
" diameter (tread) ...	...	3 7
" base (total) ...	...	11 0

General Arrangement.

The general arrangement and design to be in accordance with a plan to be prepared by the contractor, in which the following leading particulars are to be faithfully embodied and adhered to, viz. :—Cylinders to lie horizontal and to be situated outside the frames, and not to exceed 6 ft. 3 in. C. to C. apart, valve-chests on top (as in American practice),—connecting rods to be next to the crank bosses, with coupling rods outside of and close to them,—frames sufficiently prolonged and arranged in front of cylinders to take the buffer beam, &c. An extended smoke-box (as in American practice),—with efficient deflector-plate and spark-arrester inside—frames thoroughly and efficiently stayed to one another at front end, and arranged underneath to suit the design of bogie exhibited by the Inspecting Engineer for this purpose. Steel slide-bars arranged as usual for outside cylinder engine, viz. :—one above and the other below C' line of piston-rod. Beyond this, the entire boiler and fire-box arrangement, size, and position of driving and trailing wheels, framing (aft of the motion plate), platforms, foot plating and buffer plates, fire-box fixtures, brake gear, as well as those details of the engine which are unaffected by the re-arrangement of cylinders and bogie shall be in conformity with the working drawings or plans exhibited, or directions issued, by the Inspecting Engineer, in connection with this specification for the contractor's guidance, and any departure from the same is only permissible with the written consent and authority of the said engineer.

The successful tenderer shall make his own copies of the various drawings or plans exhibited for his guidance, and prepare, at his own cost, any further detail or other drawings which may be necessary in carrying out the work, such extra drawings to be subject to approval.

Cylinders.

The cylinders are to be made of fine close-grained cast-iron, perfectly sound and good castings in all respects, and as hard as can with difficulty be bored and planed. They are to have stout flanges, and to be bolted to the frames by tight-fitting turned bolts $1\frac{1}{8}$ " diameter, all the holes being bored out and rymered true for this purpose.

Slide-valves.

The slide-valves are to be of hard gun-metal, stiffened by two suitable ribs inside the exhaust chamber, the valve-faces scraped true, and the corners of the ports rounded to $\frac{3}{4}$ " radius.

Cylinder covers.

The cylinder and steam-chest covers are to be truly planed or turned and scraped to faces, and the joints made metal to metal ; all nuts to be case-hardened ; those in the smoke-box are to be of gun metal.

Mud-cocks.

The front covers are to be fitted with $\frac{1}{8}$ " polished covering plates, secured by set-screws, the holes for which must pass through the covers. Each cylinder is to be fitted with mud-cock at each end, worked simultaneously by suitable cross-shafts, rods, and levers from the foot-plate, the handle to be situated on left side of engine. Cylinders, valve-chests, and passages to be efficiently clothed and covered in.

Pistons and Cross-heads.

The pistons to be of cast-iron with cast-iron packing rings $\frac{3}{4}$ " wide and $\frac{1}{16}$ " thick. Piston-rods to be of mild cast-steel 2" diameter with coned ends, secured to the pistons by screwed wrought-iron nuts (6 threads per inch), the nuts being secured by split pins ; front end of piston rod (reduced in diameter) to be carried forward through front cylinder cover, with suitable stuffing-box, gland, and sleeve. The pistons are to be turned $\frac{1}{32}$ " less than the diameter of the cylinders, and the rings $\frac{1}{4}$ " larger than the cylinders, and cut and sprung into their places. The pistons to have $\frac{3}{8}$ " clearance at each end of the cylinders. The cross-heads to be of wrought-iron, case-hardened, the bearing-pins of mild steel.

Slide-bars and blocks.

Each cylinder to have two slide-bars, which are to be of cast-steel, as hard as possible, 5" wide, with $\frac{1}{8}$ " copper liners at both ends for adjustment ; the bars to be placed 12" apart vertically. The slide-blocks to be of hard cast-iron, not less than 15" long, with flanges $\frac{1}{2}$ " thick and 1" in depth.

Connecting-rods.

Clearing of pistons.
Cross-heads.

The connecting-rods are to be of wrought-iron, forged in one length, without weld ; the small end to be, by preference, solid,—the large end to have a wrought-iron strap and tapering bolts, or to be forked and finished with a block and stout tapering bolt. The brasses (both ends) to be in two halves, those at the large end being tightened with a steel cotter, and those at the small end with a tapering steel block, wrought-iron (case-hardened) liner, screwed bolt, &c. Brasses to be flat-ended, corners rounded to $\frac{3}{4}$ " radius.

The oil-cups and syphons are to be forged on solid, and finished with screwed brass covers. The bearings are to be of the best hard and tough gun-metal.

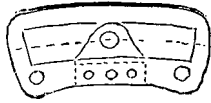
Coupling-rods.

The coupling-rods are to be of the same material as the connecting-rods, and similarly made and finished, including the solid forged oil-cups and syphons.

They are to be parallel in the body, and to have solid ends to receive the gun-metal bearings, which are to be in two halves, of similar design to those of the connecting-rod. Each bearing is to have a steel cotter secured and finished similarly to those for the connecting-rods. The crank-pins to be of Vickers' mild cast-steel, and to be fitted on the ends with screwed (case-hardened) wrought-iron nuts, secured by parallel steel split cotters. Bearings to be $3\frac{1}{2}$ " diameter by $3\frac{1}{2}$ " wide.

Link-motion.

Link-motion.



The form of link-motion or valve-gear, exhibited in the margin, to be used, the links, levers, pins, valve radius-rod, &c., to be of wrought-iron, thoroughly case-hardened. The work, generally, to be finished bright, and the working joints and surfaces to be liberally proportioned. Intermediate rocking shaft, &c., as in American practice.

The valve-spindle is to work in a stuffing-box and gland at the back end, and in a bushed boss in the steam-chest cover at the front end, and is to be connected to the valve-rod by a tapered socket and steel cotter, secured by a split pin. Valve-spindle.

The whole of the link-motion and gearing, as well as the connecting-rods, coupling-rods, and all parts of the engine and tender that have to stand a working strain, such as spring-links, brake-work, &c., are to be made (except when otherwise specified) of best charcoal iron, or carefully selected best Yorkshire scrap iron, clean and well hammered, thoroughly sound, and free from all defects. Oil-holes must be provided to all working joints. Material for link-motion.

Framing.

The framing to be of the type known as "plate frame"—of the very best quality, and manufactured by makers of good repute only. Material. How made.

Each frame is to be $1\frac{1}{8}$ " thick from front buffer-plate to off-set for motion-plate; from thence to back buffer-plate 1" thick, and broad enough to form axle-forks out of the solid plates. Thickness, &c.

The plates are to be slotted in pairs (or more). They are to be securely attached by the bogie bolster-plate, the smoke-box floor-plate, front-plate, and tube-plate, the motion bracket, a cross-stay in front of fire-box, the plate in front of the hind buffer plank, and the draw-plate and buffer-plates. Slotted in pairs. Cross-stays.

The axle-forks are to be fitted with cast-steel horn-blocks, those of the driving-axle being united in one solid casting. They are to be fastened to the frames by $1\frac{1}{8}$ " turned bolts, driven in tight, and secured by split pins. The back blocks for the coupled axle boxes are to be fitted with case-hardened wrought-iron parallel liners, the blocks being cast with suitable bosses to receive two $\frac{7}{8}$ " bolts with counter-sunk heads for securing the liners. The forks are to be stayed together by wrought-iron keeps, with jaws slightly tapered to fit the ends of the forks, and drawn on tight by $1\frac{1}{8}$ " turned bolts, provided with split-pins at the backs of the nuts. The motion-bracket is to consist of a stout wrought-iron plate thoroughly secured to each frame. Horn-blocks. Fork-keeps. Motion-bracket.

The engineman's foot-plate is to consist of a $\frac{3}{8}$ " wrought-iron plate, secured firmly to the frames by suitable L irons and rivets. On each side of the foot-plate a plate carrying two footsteps is to be fixed. Engineman's foot-plate. Footsteps.

The main frames are to be provided at either end with stout L irons securely riveted on, and serving as seats for the two vertical transverse end plates, the hind one $\frac{3}{4}$ " thick, forming a buffing plate, the front one $\frac{5}{8}$ " thick, forming a portion of the buffer-beam, which is further stiffened by plate-gussets with angle-irons to transmit the thrust of the buffer to the frames. Transverse end plates.

The front buffer-beam is to be of well-seasoned oak 1' 6" deep by 6" thick. Turton's patent engine buffers to be used, having volute springs and wrought-iron plungers with solid heads. The cases are to be either wrought-iron or steel, and are to be securely bolted to the beam. The back buffer-plate to be provided with an adjustable wrought-iron (case-hardened) wedge block, &c., as in American practice, in lieu of spring buffers. (*Vide* plan exhibited.) Buffers to pattern H $1\frac{1}{2}$ of Turton's Catalogue, 22" long over all, heads 13" diameter. Buffers.

The draw-gear between engine and tender is to consist of one wrought-iron draw-bar $2\frac{1}{2}$ " diameter, with a circular hole $2\frac{5}{8}$ " diameter at tender end, and a slot $2\frac{5}{8}$ " x 3" at engine end, also two safety draw-bars $1\frac{3}{4}$ " x $1\frac{3}{8}$ ". Draw-gear. Main intermediate.

The front buffer-beam is to have a wrought-iron hook fitted with an indiarubber spring on the inside, and a wrought-iron washer-plate inside and out, secured by a nut and split cotter. There are also to be two safety-chains and hooks. The frames are to be adapted at the front end to take the cylinders, and to be carried down behind the bogie to carry the motion-bracket, &c., and between the D. and T. wheels to carry the compensating lever. A wrought-iron life-guard to be fixed to the front of each frame. Side platforms $\frac{3}{8}$ " thick, running from front buffer-beam to back of engineman's foot-plate, to be fixed to the frames by suitable angle-irons, brackets, &c. Front. Life-guards. Side platforms.

The frames are also to be fitted with wrought-iron brackets to carry the four brake-hangers, and with wrought-iron brackets to take the spring-links, &c. Brackets and guides.

Extreme width over side platforms (if possible not to exceed)...	...	ft. in.
Total length of buffer-beam	...	7 9
Distance from centre to centre of buffers	...	8 3
Distance from top of rail to centre of buffers (when engine is in steam) ...	...	5 9
	...	3 3

Bogie.

The bogie to be of the centre-pin type, in accordance with the drawing exhibited for this purpose.

Wheels.

The wheel-bodies to be of wrought-iron 5' 1" diameter, made of the best-selected, well-hammered scrap-iron, and neatly smithed and hand-dressed. The spokes to be forged solid with T-ends (unless special appliances be provided for dabbing on the rim-pieces under the steam-hammer, or by hydraulic pressure), which when veed up shall form the rims. The D. and T. wheels to have eighteen spokes each. Three of the spokes are to be welded solid together high enough to form the boss to take the crank-pins. The heads of the other spokes are to be formed in a suitable die, so that when they are laid together with the crank-boss they shall form a solid boss for the axle and crank-pin, after which a washer (as thick as possible) shall be soundly welded on each side. D. and T. wheels.

The revolving and reciprocating parts of the engine are to be balanced by blocks forged solid in the wheels. Balance weights. The

Bogie wheels.

The bogie wheel-bodies, 3' 1½" diameter (if tread diameter equals 3' 7"), are to have ten spokes each, to be put together and finished after the same manner as the D. and T. wheels.

Welds.**How finished.****Wheels fixed on axles.**

The welds in the bosses, spokes, and rims must be thoroughly sound and free from all defects, as any defective welding will necessitate the rejection of the wheel. The wheels are to be turned or planed on the faces of the bosses, and turned on the faces and sides of the rims; they are to be tooled round the axle and crank-bosses, and the spokes are to be chipped and neatly finished by hand. They are to be forced on the axles by hydraulic pressure of 1½ ton per square inch of the area of the hole for the axle, and each wheel is to be secured by a strong steel key bedded for half its depth into the axle (on the same side as the crank-boss in the D. and T. wheels), carefully fitted sideways, and with a taper on the flat of 1 in 96, and driven in with a sledge-hammer or tup.

The crank pin-holes are to be bored out to a taper of 1 in 48 and countersunk. The pins are to be of Vickers' mild cast-steel. They are to be forced in by hydraulic pressure and riveted up cold.

Tires.

All the tires to be of Vickers' cast-steel, "Australia" brand, 5½" wide and 2¾" thick on tread; the section and method of fastening to be as shown on drawing exhibited.

Axles.

The axles throughout to be of Vickers' mild cast-steel, the best quality, and of the following dimensions, viz.: in the middle, bogie wheels 5¼", driving and trailing 7" diameter; journals, bogie 5¾" diameter by 8" long, driving and trailing 7½" diameter by 9¼" long. The axles to be stamped with maker's name and date of manufacture. The right-hand crank is to lead. In turning the bearings and other portions of the axles, care to be taken to avoid breaking the continuity of the metal by making small corners; no radius less than ½" will be allowed. Wheel-seat diameter of bogie axles, 6¾". Wheel-seat diameter of driving and trailing axles, 8½".

Axle-boxes.

The D. and T. axle-boxes to be wrought-iron thoroughly case-hardened, and fitted with bearings of hard gun-metal, in accordance with drawing to be exhibited for this purpose, the brasses being forced in a dead tight fit. The boxes to take the springs from below; to be truly planed to fit the axle-box guides, and fitted with wrought-iron syphon-tubes and covers. The brasses to be finished transversely ⅛" shorter than the axle-bearings.

Bogie axle-boxes.

The bogie axle-boxes and their keeps to be, by preference, of hard gun-metal, truly planed to fit the axle-box guides.

All axle-boxes to have two syphon-holes in each, and to be provided with sheet-iron covers.

Springs.**D. and T. springs.**

The bearing-springs are to be of the very best quality, and manufactured by makers of good repute only, and to bear the stamp of the maker. The ends of the upper plates of the D. and T. springs are to be made with solid eyes, slotted in the middle to receive the links, and bored to receive the pins. The buckles are to be of wrought-iron, shrunk tightly on, and to be forged so as to form eyes out of the solid, for attachment to the axle-box hanger.

Buckles.**Bogie springs and buckles.**

The bottom plates of the bogie springs are to be reduced to 4¼" broad at the ends, where the spring-links rest, the tip of bottom plate being turned down to retain the links. The buckles are to be of wrought-iron shrunk tightly on, and to be made so that a wrought-iron carrier-bar 3" diameter can pass through them (under the springs), to form the attachment to the bogie-frames. Each plate is to be nibbed and slotted near the ends, to keep the plates in position. The plates (in all the springs) to be secured to buckle by a ⅞" steel pin passing through spring and buckle, and riveted over countersunk.

Corners rounded. Pins, &c., case-hardened.

Care must be taken to have the inner corners of all the buckles well-rounded, the corners of the upper and lower spring-plates being rounded to suit. The spring-pins, links, and link-brackets to the frames are to be well case-hardened.

Testing.

Each spring must be tested before being used, by being loaded until the original camber in the D. and T. springs is reduced by 3½", and the bogie springs by 5", and they should resume their original camber on the removal of the load.

Compensating lever.

Between the D. and T. springs on each side of the engine there is to be a wrought-iron compensating lever, formed of a solid forging swelled out at the middle for the fulcrum-pin, and with a forged jaw at each end to receive the joint-pins which take the screwed links or hangers, and which are each to have two nuts and a split pin. Each lever is to be attached to the frame by a bossed wrought-iron bracket, with a hole 3" diameter to receive the wrought-iron cross-shaft.

Boiler.**Material.**

All the plates used in the boiler-shell and dome, as well as the angle-irons and rivets are to be made of the best Yorkshire iron, manufactured by either the Lowmoor, Bowling, Monkbridge, or Taylor Bros., care being taken in bending the plates to leave the name of the manufacturer visible outside. The brand of iron to be used to be named in tender.

Plates, thickness, &c.

All the plates of the barrel and fire-box casing, with the exception of the throat-plate, which is to be ⅝" thick, are to be ½" thick, and planed on their edges.

Barrel.

The barrel is to be not less than 10' 4" long, and (if possible) 4' 5" diameter outside, with "butt" joints throughout, and to consist of three plates only, the longitudinal joint to be situated between the water-level and the base of the dome, to have lap-plates both inside and out, and to be double riveted (zig-zag); the transverse joints to have outside lap-plates only (solid welded rings), and to be single riveted.

Front tube-plate.

The front tube-plate, ⅜" thick is to be flanged forward to take the smoke-box side-plates. It is to be attached to the boiler by an angle-iron 4¾" x 3¾" x ¾", turned inside on the face and edges, and double riveted to the boiler-barrel.

Fire-box casing.

The front fire-box casing-plate is to be flanged forward with a radius of 1¼" outside, to take the barrel-plate, with a lap-joint (outside), and is to be flanged backwards at the sides to form a lap-joint (inside) with the side-plates.

Fire-box casing.

The back casing-plate is to be flanged forward, to form a joint (inside) with the side-plates in a similar manner.

The

The sides and top of the fire-box casing are to be formed of three plates, which are to lap each other and the barrel (as well as the front and back casing-plates), and are to be single-riveted throughout, except at the horizontal joints, which are to be double-riveted (zig-zag). The side plates are to be extra lapped round the lower corners of the front plate, and riveted thereto, to form a double thickness for the mud-plugs. Fire-box casing.

A wrought-iron dome, 1' 9" diameter inside, and 3' 0" high from boiler-barrel, is to be fixed on the the third plate of the barrel, having the same vertical centre-line as the driving-axle. It is to consist of a double-flanged seating, 6" high at shallowest part, formed out of specially-rolled L iron or plate, welded up solid, the lower flange curved suitably to the boiler-barrel, the upper flange to be $1\frac{1}{8}$ " thick (after being turned and faced). The upper portion of the dome to consist of a hemispherical-ended cylinder, terminating below in a stout-faced flange $1\frac{1}{8}$ " thick, made similar to the seating, the whole being welded up solid. The lower joint-face to be recessed $\frac{1}{8}$ " deep, to fit a corresponding projection on the upper face. The lower flange of dome-seat to be single-riveted to boiler-barrel; the hole in the barrel to be 1' 4" diameter, the edge of the barrel-plate being stiffened by two wrought-iron rings $2\frac{1}{4}$ " x 1" (one inside and one out). Dome.

There is to be a man-hole 1' 1" diameter on the crown of the fire-box casing, fitted with a wrought-iron ring (double-riveted), forming a seating, to which is to be attached a wrought-iron cover. Man-hole.

The wrought-iron cover is to be turned on both sides, and at the outer edge underneath is to be recessed to take the upper edge of the brass moulding of the clothing. It is to be bored, and fitted on the upper side to take two Ramsbottom's valves ($3\frac{1}{2}$ " diameter), and other fittings shown on the drawing to be exhibited. Safety-valve.

The top fire-box casing-plate is to have two transverse rows of double angle-irons bent to the proper curve, and firmly riveted to the plate, serving for attachment of the roof girder slings. Top casing-plate stiffened.

The smoke-box tube-plate and the back fire-box casing-plate are to be stayed to each other by ten longitudinal wrought-iron stays screwed 11 threads per inch, made with solid heads, and screwed through the casing-plate, with copper washers at the back, and adjusted and attached to front tube-plate by nuts and copper washers, inside and out. Longitudinal stays.

The upper portion of the back casing-plate, where the stays and fire-box fittings are attached, is to be strengthened by a $\frac{1}{2}$ " plate on the inside, suitably attached by rivets.

The longitudinal stays, as well as the regulator rod, are to be supported at mid-length by cross-plates $\frac{1}{2}$ " thick, and not less than $4\frac{1}{2}$ " wide, riveted to the boiler-barrel.

The copper fire-box is to be approximately 5' 9" long, and 3' 6" wide inside at foundation ring and 5' $6\frac{1}{4}$ " deep. Copper fire-box.

The plates, stay-bolts, and rivets of the fire-box are to be made of the best selected copper, manufactured either by Broughton Copper Company, Pontifex and Wood, Vivian & Sons, or Pascoe, Grenfell, & Sons. They are to bear the maker's stamp, which is to be placed so that it can be seen after the boiler is finished. Material.

The plates are to be $\frac{1}{2}$ " thick, except the portion of the front plate which receives the tubes, which is to be $\frac{1}{4}$ " thick. Strips must be cut off the plates, and they, with the bars for the stays and rivets, must stand the test of being bent double when cold, without any signs of cracking. If any cracks appear in any of the strips or bars they must be annealed, and if after being annealed any strips or bars do not stand the test of bending cold, the plates or bars from which such test pieces have been cut must be rejected. Thickness of plates.
Testing.

Special care must be taken to anneal all the stay-bolts before cutting the threads.

The tube and back-plates are to be flanged to a radius of not less than 1" inside at the top and sides, to make the lap joints with the sides and roof-plates. Tube and back-plates.

The sides and roof are to be in one piece, the upper corners of the sides and roof-plate to have a large radius inside. Sides and roof.

During inspection special attention will be directed to all the corners of the copper-box, and if any plate shows signs of cracking or injury of any kind it will be rejected. Care in flanging.

The water-space between the outer and inner plates all round at foundation ring is to be $2\frac{1}{2}$ ". The plates of the fire-box and casing are to be attached at the bottom by a solid forged ring $2\frac{1}{2}$ " deep at shallowest part, with $\frac{7}{8}$ " rivets. The ring is to be brought down at each corner to take a double row of rivets, and at the sides to carry the ash-pan. Water-space.
Fire-box ring.

The fire-hole is to be oval, the plates being connected by a solid wrought-iron ring, planed on both sides, and secured by $\frac{7}{8}$ " rivets, countersunk on the outside, and finished flush. Fire-hole rivets.

The roof of the copper-box is to be strengthened by seven rectangular wrought-iron girders, not less than 6" deep in the centre (except the centre one, which is to $5\frac{3}{4}$ " deep), to be carefully bedded at the ends to the front and back edges of the box. Roof stays.

The space between the top of the box and the girders is to be not less than $1\frac{1}{2}$ ", nor more than 2". The top of the box is to be attached to the girders by 1" stud-bolts tapped into the girders from below. These bolts must be a tight fit in the holes in the roof-plate, the throats being left full, and screwed well home, the corners of the heads next the plate being chamfered off; wrought-iron ferules $1\frac{1}{8}$ " diameter outside to be used as distance-pieces. Space between roof-stays and box.

Four safety-links, with oblong holes (to admit of the top of the copper-box rising when heated), are to be suspended between two of the girders and the transverse angle-irons on the roof of the casing, the two girders being forged with suitable lugs for this purpose. Safety-links.

The roof-plate is to be fitted with a fusible gun-metal plug $1\frac{1}{2}$ " diameter at the point (tapered 1 in 6), and screwed 10 threads per inch, and bored out in the middle, and tapped $\frac{7}{16}$ " to receive the alloy. Lead plugs.

The walls of the box are to be stayed to the shells by copper stays either $\frac{7}{8}$ " or 1" diameter, screwed 10 threads per inch, placed not more than 4" apart C. to C., screwed tightly into both plates, and riveted over at both ends (leaving a sufficiently large head inside). The end vertical rows at the sides are to be centered $8\frac{1}{2}$ " from the outer face of the front and back casing-plates, and at the front and back $7\frac{1}{2}$ " from the outer face of the side casing-plates. Copper stays.

The tube-plate is to be stayed to the lower portion of the boiler-barrel by not less than seven 1" copper screws (10 threads per inch), tapped through the copper plate into wrought-iron sockets (riveted to the boiler-barrel), and finally riveted over inside the box. Throat stays.

All

- Rivets.** All rivets used in the boiler are to be $\frac{3}{4}$ " diameter, spaced $1\frac{3}{4}$ " apart C. to C., except those attaching the angle-iron to the front tube-plate, which are to be $\frac{1}{2}$ " diameter and $1\frac{2}{3}$ " pitch, and those in the fire-hole and foundation rings, which are to be $\frac{7}{8}$ " diameter, spaced $1\frac{1}{2}$ " C. to C. Those in the copper box are to be made of copper. All the rivets must completely fill the holes, and must be closed up by steam or hydraulic power wherever it is possible to do so.
- Wash-out plugs.** There is to be a tapered brass wash-out plug $1\frac{3}{4}$ " diameter (at large end) situated at each of the two front bottom corners of the fire-box, and two $1\frac{3}{4}$ " plugs at the back of the box (above the level of the fire-box crown), and two $1\frac{1}{4}$ " plugs in the front tube-plate, below the level of the lowest row of tubes; all are to be screwed, 10 threads per inch, and tapered 1 in 8.
- Mud-hole.** There is to be an oval mud-hole, with suitable wrought-iron bolt, nut, and cover, situated at the bottom and centre of the back casing-plate.
- Blow-off cock.** A brass blow-off cock (flanged) is to be fixed by studs to the bottom of the back casing-plate, and worked by a socket key from the foot-plate, the key being cranked at top to form a handle, and swelled out in the shaft to fit the hole in the foot-plate, and secured to square of the cock-plug by a strong split pin.
- Fire-bars.** The fire-bars to be of wrought-iron $3\frac{1}{2}$ " x 1", carried on two wrought-iron cross-bearers, which are $3\frac{1}{4}$ " diameter, and shaped at the ends to fit into suitable brackets, bolted to the prolonged portion of the fire-box bottom ring. These cross-bearers are to be drilled and fitted with pegs (not tapered) of $\frac{7}{8}$ " round iron placed 2" apart C. to C. to regulate the spacing of fire-bars.
- Ash-pan.** The ash-pan is to be of wrought-iron, the full length and width of the fire-box, and is to have a tight-fitting door at both front and back, swung on a hinge bar running the full length of the door, and worked from the foot-plate by suitable levers and rods. The bottom is to be stiffened by three cross angle-irons.
- Fire-door.** The fire-door is to consist of two sliding wrought-iron plates, and is to be provided with a wrought-iron deflector.
- Brick arch.** The fire-box to be fitted with a fire-brick arch, supported by angle-irons attached to the side-plates by studs.
- Regulator.** A swan-necked cast-iron pipe, 4" internal diameter, is to be fixed in the steam dome. The lower portion is to be attached by an angle-iron bracket to the dome base. The top of this pipe is to be fitted with a gridiron regulator of cast-iron, having a gun-metal slide or valve worked by levers and rods from the foot-plate. The regulator rod to be made so that it can be put in or taken out without interference with the steam-pipe.
- Stuffing-box.** The regulator stuffing-box is to be of brass, with suitable stops to limit the travel of the handle, and stamped "Shut" and "Open" on the right and left hand respectively.
- Steam-pipe.** A copper pipe, 4" diameter inside, and No. 9 W.G. thick, is to connect the regulator with the elbow-pipe in the smoke-box. It is to be fitted to the regulator-pipe by a brass cone (brazed on), secured by a circular clip and two bolts, the hole in the clip being large enough to slip over the cone, the front end of the pipe is to be attached to the front tube-plate by a brass flange (brazed solid to the pipe), and having seven wrought-iron screwed studs.
- Elbow-pipe in smoke-box.** There is to be a cast-iron T pipe in the smoke-box fixed by the studs which secure the flange of the steam-pipe. Two copper pipes, $3\frac{1}{2}$ " diameter inside, and No. 9 W.G. in thickness, with brass flanges, (brazed solid) are to connect the T pipe with the cylinders. They are to be close to the sides of the smoke-box, so as to clear the line of tubes. The lower ends of these copper pipes are to project 1" beyond the flange into the cylinder casing, and a circular recess or groove is to be cut in the joint of the cylinder for a corresponding projection in the flange of the steam-pipe to fit into it.

Flue Tubes.

- Material and make.** The tubes are to be of the best quality solid drawn brass, manufactured by the Broughton Copper Company, of Manchester; Elliott's Metal Company; Allan, Everett, & Sons; J. Wilkes & Company, of Birmingham; to be first approved, in writing, by the Inspecting Engineer.
- Number and diameter.** They are to be 198 in number, and 2" outside diameter, and are to bear the maker's stamp. They are to be No. 10 W.G. thick at the fire-box end, and No. 12 do. at the smoke-box end. Front ends swelled to $2\frac{1}{16}$ " diameter in smoke-box tube-plate.
- Care must be taken to make the tubes perfectly steam-tight at both ends by rolling them with Dudgeon's expander.
- Steel ferules.** Turned tapering steel ferules are to be inserted at both ends of the tubes. The tubes are to project $\frac{1}{8}$ " beyond the fire-box tube-plate, and $\frac{3}{8}$ " beyond the smoke-box tube-plate when fixed, and they are not to be rolled over or beaded at the ends.

Smoke-box.

- The sides of the smoke-box are to be attached to the tube-plate by rivets, and to each frame by a wrought-iron thickening strip riveted to the side plates, and bolted to the frame-plates. Side plates to be connected to front plate by an angle iron (riveted), the latter plate to be bolted at bottom to the floor of the smoke-box.
- Door.** The door is to be circular and dished, and carried by two wrought-iron hinges. It is to be fitted inside with a liner attached by rivets and ferules, with an air-space of $\frac{1}{2}$ " at the edges. It is to be kept closed by a removable horizontal cross-bar, and a central handle with a minor locking handle and screw.
- Exhaust-pipe.** The exhaust-pipe is to be of cast-iron, and is to be surmounted by a movable cap or nozzle. The joints of the exhaust-pipe and cap are to be planed.
- Spark-arrester.** Spark-arresters are to be fitted of the best design known for the prevention of burning matter being emitted.
- Chimney.** The chimney to be of wrought-iron, the base being formed of a plate welded up without seam, and shaped on a block to suit the curve of the smoke-box. The barrel is to be made of one plate with a butt joint and inner lap-plate, and fitted into and riveted to the base. It is to be surmounted by a polished copper top. All the rivets in the chimney are to be countersunk and flush outside. The extreme height of the chimney from the rail is not to exceed 13 feet 6 inches.

A blower-cock is to be fixed on the boiler behind the chimney, or otherwise neatly arranged, worked by a handle (passing through the right-hand rail) from the foot-plate, a copper pipe leading the steam inside the smoke-box. Blower.

A No. 2 Roscoe's lubricator is to be fixed on each side of the smoke-box, with copper pipe leading into the centre of each cylinder. Lubricators.

The hand-rail in front of the smoke-box to be a continuation of the side-rails. Hand-rail.

Fire-box fixings.

The fire-box fixings are to consist, in addition to those already mentioned, of the following:—

One Bourdon's gauge, to indicate 200 lbs. per square inch, with cock and copper pipe. Two glass gauges, with top and bottom cocks, and waste water-cock and copper pipe, the top and bottom cocks to be screwed into the plate $1\frac{1}{4}$ " diameter, 11 threads per inch. There is to be a whistle fixed to front of cab, and connected by a copper pipe to the injector steam-cock branch. There is to be also an iron socket screwed into the back casing-plate to carry the gauge-glass lamp, and a wrought-iron tray with angle-iron rim fixed with studs above the door. All the cocks and fittings are to be made of brass, unless specially named to the contrary, and all fittings screwed into the boiler are to have 11 threads to the inch, unless otherwise specified.

There are to be two No. 9 Giffard's injectors (Gresham and Craven's make), one fixed on each side of the engine in such a position that the handles can be readily reached for adjustment by the driver. Each injector is to have a steam-cock fixed on a special branch casting, placed on the top of fire-box casing-plate, and to have a clack-box fixed on the centre line of the boiler near the front end. Each clack-box flange is to be secured by W.I. studs to a wrought-iron seating riveted to the boiler. Injectors.
Steam-cocks.

The injectors as well as the cocks and clack-boxes are to be of gun-metal, and the steam, suction delivery, and overflow pipes of copper, No. 10 W.G. thick. Materials of injectors, &c.

Clothing.

The boiler is to be covered with dry pine battens, tongued and grooved. At each joint of the lagging plates a wrought iron hoop, $2\frac{1}{4}$ " by $\frac{5}{16}$ ", is to be put on in two halves, provided with distance-pieces 20" apart, and screwed together with countersunk screws and metal joint blocks let in through the battens, bearing on the boiler, the whole finished flush, covered with sheet iron No. 14 W.G., and bound together round the barrel and over the fire-box with hoop-iron straps secured by screws.

The dome is to be enclosed in a helmet-shaped casing of polished brass. Polished brass mouldings are to be fitted round the back corner of the fire-box casing, the smoke-box angle-iron, and under the safety-valve seating. Dome casing.

Cab.

The cab over the foot-plate is to be of the modern English type covered in at the sides, and is to consist of wrought-iron plates and L irons; front plate $\frac{5}{16}$ " thick, side plates $\frac{1}{8}$ " thick, and roof plate No. 12 W.G. It is to be fitted in front with spectacle glasses in brass frames, made to open and shut. The roof plate is to have a light angle-iron $1" \times 1"$ fixed on the edges, running fore and aft, to carry off the drip.

Brakes.

An efficient hand-brake is to be fitted to the engine, as well as the tender, consisting of a $1\frac{3}{8}$ " screw spindle with a square thread, having a $\frac{3}{8}$ " pitch with a 12" double-ended hand-lever at top, and an 11" lever on brake-shaft at lower end, with a suitable screw-nut. The handle for working it is to be placed on the left-hand side of the foot-plate, and is to be carried on a hollow cast-iron pillar bolted to the foot-plate by four $\frac{3}{4}$ " bolts. There is to be a wrought-iron hanger, with cast-iron block, fitted to each of the four driving wheels, and a wrought-iron brake-shaft $3\frac{1}{4}$ " diameter carried by cast-iron brackets bolted to the frames, and having the arms forged on solid, the screw-arm being forked and bored to take the screw-nut.

Wrought-iron hangers with cast-iron blocks (clipping the flanges) are to be fitted to each of the four driving wheels. Hangers.

A strong wrought-iron brake-shaft not less than $3\frac{1}{4}$ " diameter is to be carried by wrought-iron brackets, with cast-iron bushes, secured to the frames; it is to have the arms forged on solid, the screw-arm being forked and bored to take the screw-nut. Brake-shaft.

Both engine and tender must be fitted with all the necessary appliances for working the latest improvements of the Westinghouse automatic air-brake on the tender and carriages. The air-pump for the Westinghouse brake must be fixed to the left-hand frame between the D. and T. wheels, and the pipes and nozzles on the tender must be arranged to suit those on the present rolling stock. Westinghouse brake.

Gear to be provided for supplying a jet of water from the tender to the tire of each wheel of engine and tender (except bogie wheels), at the root of the flange, immediately above the brake-block. Two branched $\frac{1}{2}$ " wrought-iron pipes, with two brass cocks, one for engine and one for tender, to be connected with the tank and worked from the foot-plate; the nozzles to be of brass, with $\frac{3}{16}$ " bore at the ends, screwed on to the pipes. Water-jet to tires.

Hand-rails.

Polished hollow wrought-iron hand-rails to be carried on each side of the engine by castings bolted to short wrought-iron brackets, which are riveted to the boiler.

Sand-boxes.

A sand-box (content, not less than 4 cubic feet) is to be fixed in front of each driving wheel, fitted with valve, and worked conveniently by gear from the foot-plate. The valves in both boxes are to be worked simultaneously. The boxes must be perfectly watertight.

Sand-pipes.

Brass pipes $1\frac{1}{2}$ " inside diameter, are to be fixed and bent so as to convey the sand as near as possible to the tread of the wheels.

Lamp-brackets.

Two lamp-brackets to be fixed on the front platform—one on the right and one on the left-hand side. Painting.

Painting.

After being tested, the boiler is to receive two coats of metallic oxide paint; and when dry, the clothing is to be put on. When finished, the engine is to receive not less than two coats of lead-colour in oil. The whole of the surfaces requiring it are then to be filled up with hard stopping, and after being well rubbed down smooth, are to receive a third coat of lead-colour in oil, and to be finished with two coats of selected colour in oil, and two coats of varnish.

Tool-box and Tools.

Each engine is to be provided with a portable wooden tool-box 3' 3" by 2' 0" by 1' 9" (to be carried on the top of the tender), made of oak or tallow wood, bound with iron at the corners, and the lid covered with galvanized sheet-iron, to have strong hinges, hasp, and padlock, and till inside at one end; also two monkey-wrenches (one large and one small); one heavy hammer; one light hammer; one copper hammer; two flat chisels; two cross-cut chisels; two pin punches; one complete set of screw-keys to fit all nuts; two short keys for piston glands; two short keys for valve spindles; light close-ended keys for all syphon covers; one fire-bucket; one fire-shovel; one fire-dart; one fire-pricker; one rake; one pinch-bar (large); one tube-plug socket rod and six tube-plugs; two 15-ton traversing screw-jacks, with ratchet, ratchet head, and jackbars; two oil-cans (one large and one small); two oil-feeders; (one large and one small), copper tallow-kettle, hand-brush, and gauge-lamp.

Pitch of Screws.

The threads of all bolts, studs, and nuts are to be cut to Whitworth's standard, unless where specially stated to the contrary. Where fine threads are specified, eleven threads per inch are to be used, except in the case of piston-rods, the threads of which are to be six per inch. All bolt-heads and nuts are to be hexagonal, and measured across the corners are to equal twice the diameter of the bolt (except in the larger sizes of bolts, in which case the next size less for heads and nuts may be taken if more suitable). The size across the flats will not therefore be Whitworth's standard.

Wire-gauge.

The Birmingham wire-gauge to be used.

Case-hardening.

All the motion-work, brake-work, the nuts of the cylinders and glands, and all journals, pins, joints, and rubbing surfaces about the engine and tender (except when of brass, cast-iron, or steel) shall be thoroughly case-hardened to a depth of $\frac{1}{16}$ -inch, and so hard as to wholly resist filing.

Specimens of case-hardening, which have been hardened in the same boxes with the work, will be broken in the presence of the Inspecting Engineer or his deputy.

TENDER.

(Content, 2,500 gallons.)

General Arrangement.

The following are the leading particulars of the design and construction of the tender, based on the assumption of a rigid or fixed wheel-base, not exceeding 11 feet, and plate-frames; and it is to be clearly understood that, in the event of bogie being adopted (in lieu of rigid wheel-base), the details as here set forth, are of course subject to modification, but must still be adhered to as far as practicable. A certain amount of latitude is also allowed to meet the conditions of enlarged tank, &c.

The tender to be of the ordinary horseshoe type, with the addition of a well underneath the tank, 10 feet long, 4 feet 1 inch broad, and 1 foot 6 inches deep, and extending over the front and middle axles. The fuel space (shaped in the tank) to be 7 feet 9 inches long from the front end, and 2 feet 6 inches wide; the whole to be carried on six wheels (unless bogies be adopted), 3 feet 7 inches diameter at the tread; wheel centres, 5 feet 6 inches; total wheel-base, 11 feet.

Wheels.

Bodies to be of wrought-iron, 3 feet $1\frac{1}{2}$ inch diameter, and to have ten spokes. They are to be made of the same material, put together, and finished in the same way as the engine wheels.

Tires.

To be of the same material, section, and method of fastening, as specified for the engine wheels. To have flanges on all wheels. Centre tires not to be reduced in flanges.

Axles.

To be of the same material as specified for the axles of the engine; to be $5\frac{1}{2}$ inches diameter in the middle, and to be parallel for a distance of 2 feet 6 inches, to run into $6\frac{1}{2}$ inches diameter at the collars, which are to be $\frac{1}{2}$ inch broad; the wheel-seats to be 6 inches diameter; the journals to be $4\frac{1}{2}$ inches diameter and 8 inches long; the radius of the corners being $\frac{3}{4}$ ". The distance from C. to C. of bearings to be 6 feet 2 inches.

Axle-boxes.

To be of a fine-grained hard cast-iron. The castings to be clean and free from flaws of every description. To be planed to fit the axle-box guides, but to be left $\frac{1}{8}$ " wider between the flanges, to allow of lateral motion. The bearings to be of hard gun-metal perfectly bedded into the axle-boxes, and octagonal at the crown. Two syphon-tubes to each box; the tubes to be continued through the cast-iron into the brass bearings for a $\frac{1}{4}$ ". The keeps to be of cast-iron and planed to fit the axle-boxes (so that they can be put up and taken down by hand without hammering), and secured by two $\frac{5}{8}$ -inch round iron pins. The covers to be of cast-iron, recessed in the top to take the ends of spring pillars. The lid to be of cast-iron, secured by a wrought-iron pin.

Axle-box

Bearings.

Keeps.

Cover.

Axle-box Guides.

To be of fine close-grained cast-iron, free from flaws of every description. To be planed on the face, edges, and flange, and to be fastened to the frames by four $\frac{7}{8}$ -inch turned bolts in each, driven in tight, the bolts to be countersunk into frames, the nuts to be secured by split pins.

Axle-fork Keeps.

To be of wrought-iron, a good fit on the forks, and secured by a $\frac{7}{8}$ " bolt at each end.

Springs.

To be of the same material as specified for the engine springs. The spring pillars to have two guides each, fastened to the inside of the frames. The spring-link carriers also to be attached to the inside of the frames.

Framing.

The frames are to be of the same material as specified for the engine frames, and are to be $\frac{3}{4}$ -inch thick, running from buffer-beam to buffer-beam, and formed each of one solid plate. The minimum depth to be 12 inches, and above the axle-boxes 1 foot $2\frac{1}{2}$ inches, deepened at the front end to take the brake shaft and footsteps. The main frames to be braced together at the front ends by a $\frac{5}{8}$ " wrought-iron vertical plate (serving as a buffer-plate, *q. v.*) 1 foot 2 inches deep, and a $\frac{1}{2}$ " vertical plate 1 foot $2\frac{1}{2}$ inches deep, united by two horizontal $\frac{1}{2}$ " plates 1 foot 9 inches wide; also at back ends by a $\frac{1}{2}$ " vertical plate (serving as a buffer-plate) 1 foot deep, united to a $\frac{1}{2}$ " horizontal plate 1 foot 6 inches wide, and finally by three intermediate $\frac{1}{2}$ " vertical plates, each 1 foot deep, the whole riveted together with suitable L irons.

There are to be two $\frac{1}{2}$ " wrought-iron longitudinal stretchers, each in one continuous plate, running from the front intermediate cross-stay to the hind buffer-plate, and spaced 4 feet 1 inch apart. The longitudinal stretchers will form the well sides, and the front plate of well is to be $\frac{3}{8}$ -inch thick, and spaced 10 inches from the back of the front cross-stay; the back of the well being formed by the back intermediate cross-stay.

The middle cross-stay divides the well, consequently care must be taken to cut holes in it to allow the water to circulate, also a hole large enough to admit of a man passing through. The intermediate cross-stays will be secured to the longitudinal stretchers and throughout the well by angle-irons.

Foot-plate, Draw-plates, &c.

The foot-plate to be $\frac{3}{8}$ " thick, the extreme width over platform being 7 feet 6 inches. The front horizontal draw-plate to be $\frac{1}{2}$ " thick, and spaced $6\frac{1}{2}$ " below the foot-plate, and fastened to buffer-plate, frames, and front cross-stay plate by $2\frac{3}{8}$ " angle-iron and $\frac{3}{4}$ " rivets. The horizontal stiffening-plate to be $\frac{1}{2}$ " thick and 4" below the drawbar horizontal plate, and to be flanged down at the front, and fastened to the buffer-plate, and secured to the frames and vertical cross-stay plate by $2\frac{1}{2}$ " angle-iron and $\frac{3}{4}$ " rivets.

On the underside of the stiffening-plate will be fixed two feed-pipe carriers, to be securely fastened and braced together. The distance from C. to C. of feed-pipes is 2' 11". The drawbar pin is centred 1' $3\frac{3}{8}$ " back from the buffer-plate. The draw-shackle pin holes to be $5\frac{3}{4}$ " from the back of the buffer-plate and 1' 10" apart C. to C.; strengthening plates to be riveted on round the holes in the plates. A wrought-iron (case-hardened) rubbing block to be securely fixed to front buffer-plate to bear against the wedge block on engine.

Two water-tight sand-boxes are to be placed on the foot-plate at the front end of the tank, one on each side, each capable of holding 2 cubic feet of sand, and fitted with cast-iron water-tight covers, the filling hole to be $4\frac{1}{2}$ " diameter, and provided with suitable valve and gear for working same.

The sand-pipes to be of brass, the same size as for the engine, and bent so as to convey the sand as near the tread of the front wheels as possible. There is to be a polished wrought-iron hand-rail on each side, supported by two wrought-iron pillars, and secured to the tank. The left-hand one to have a boss forged on to take the brake-rod. Two substantial wrought-iron double-shackle screw couplings are to be provided with each tender; screw, 2" diameter; shackle and link-iron, $1\frac{1}{2}$ " diameter.

Brake.

The general design and arrangement to be similar to that specified for the engine brake, the handle to be on the left-hand side of the tender. The shaft to be $3\frac{1}{4}$ " diameter, with all the levers forged on solid, including one 1' $0\frac{1}{2}$ " long, for coupling up to the Westinghouse gear; the whole to be supported by cast-iron carriers in the frames. There is to be a wrought-iron hanger and cast-iron brake-block (clipping the flanges) to each wheel. The hangers to be suspended by means of stout W.I. pins passing through the frames and carriers, fastened to the longitudinal stretchers. The hangers for the trailing-wheels to be prolonged to form life-guards.

Back Buffer-beam.

This to consist of a wrought-iron plate $\frac{1}{2}$ " thick, 12" deep, and 7' long, secured to frames and longitudinal stretchers by $2\frac{1}{2}$ " angle-iron, $\frac{3}{4}$ " rivets. The horizontal draw-plate to be $8\frac{3}{4}$ " below the bottom of the tank; to be $\frac{1}{2}$ " thick and 1' 6" broad, fastened to frames and buffer-beam by $2\frac{1}{2}$ " angle-iron.

The vertical (draw-spring) plate to be 2' 6" long, 12" deep, and $\frac{1}{2}$ " thick, secured to the horizontal plate and bottom of tank by $2\frac{3}{8}$ " angle-iron. $\frac{3}{4}$ " strengthening-plates to be riveted on to the back of the buffer-beam and front of the vertical plate. Two buffers, of same type as those specified for the engine, to be fastened to buffer-beam by four 1" bolts in each. Height from top of rail to centre, 3' 3"; distance apart from centre to centre, 5' 9". A wrought-iron draw-hook to be provided, having a shank passing through the buffer-beam and vertical draw-plate, and fitted with a powerful volute spring, secured by a washer and split-cotter. A case-hardened wrought-iron socket is to be fitted to the hind buffer-beam, to give sufficient surface for the shank of the hook to work in. Two safety-chains to be securely attached to the buffer-beam, at a distance of 1' 6" apart.

Tool-box.

A plate iron tool-box is to be built at the back of the tank, and of the full width of the same, with a hinged lid, hinges, and staple, catch, and lock complete.

Tank.

Tank.

Plating, &c.

The thickness of the top and side plates to be $\frac{1}{4}$ " and the bottom to be $\frac{3}{8}$ ". The top, bottom, and sides to be well stayed to each other by L irons, &c., as per drawing. A curved wrought-iron moulding to extend along the upper edge (outside) of sides and back of tank.

Man-hole.

A wrought-iron man-hole ring made of $\frac{3}{16}$ " plate, 18" diameter, 8 $\frac{1}{2}$ " high, flanged at the bottom, is to be riveted on to the top of tank in the centre, 1' 6" from its centre to the back of tank. It is to be fitted with a wrought-iron cover and handle. The hole to be cut in the tank top is to be 1' 4 $\frac{1}{4}$ " diameter, round which will be supported a wrought-iron sieve, made out of $\frac{1}{8}$ " plate, to be 1' 4" diameter at the top, and 1' 3 $\frac{1}{2}$ " diameter at the bottom. It is to be 4' 0 $\frac{1}{2}$ " long.

Feed-valves.

The tank to be supplied at the back end with wrought-iron lifting shackles in each corner, with strengthening corner-plates. At the front end, over the front axle, on the inside of the coal bunk, two bent plates will be riveted for the same purpose. A lamp-bracket to be fixed respectively on the left- and right-hand side at the back end of tank. The feed-valves to be circular, and of gun-metal, with central guide pin, and situated one on each side of the tank, protected by proper strainers, and worked from the top by levers, &c., on circular castings with inclined planes. The vertical rods to be weighted. A brass cock $\frac{3}{4}$ " bore to be fitted to the outside of the tank at the front end and near the bottom (for drawing water into a bucket). The well to have a man-hole 15" diameter, cut in the bottom plate at a distance of 2' 4" from the back plate of well, to have a thickening piece 2" broad and $\frac{3}{8}$ " thick, riveted round the hole on the inside by $\frac{5}{8}$ " rivets, countersunk flush on the bottom. The cover to be $\frac{3}{8}$ " thick, 1' 7" diameter, fastened on by $\frac{5}{8}$ " studs, pitch 3 $\frac{1}{2}$ ".

Man-hole in well.

Feed-pipes.

Feed-pipes.

The feed-pipes to be of copper, 1 $\frac{3}{4}$ " bore, and No. 12 W.G. thick, and the feed connection between the engine and tender to be strong indiarubber hose-pipe, 2 $\frac{1}{2}$ " bore, stiffened with spiral spring inside (tested to 200 lbs. pressure per square inch), and fitted with brass union joints at the engine end.

Painting.

The inside of the tank and well to be thoroughly served with three coats of best metallic oxide paint, and the other parts outside to be filled up, rubbed down, and painted in the same manner as the engines.

June, 1885.

W. SCOTT,
Locomotive Engineer.

GENERAL CONDITIONS, IF ENGINES ARE BUILT BY ENGLISH OR FOREIGN
MANUFACTURERS.

Everything necessary to be provided.

Everything necessary to the proper finish and equipment of the engine and tender must be supplied, whether stated in this specification or not, and no advantage is to be taken of any omission of detail in the specification or drawings, as the contractor may, by applying to the Inspecting Engineer, obtain full explanation of any part of the work not sufficiently shown or understood.

Alterations.

The Commissioner reserves to himself the right to supply, after tenders have been lodged and accepted, a set of working plans for the contractor's guidance; and in such event said plans will have to be rigidly adhered to, both as regards general design and detail.

Suggestions from Contractor.

Any alteration or modification of detail which shall be ordered by the Inspecting Engineer, during the progress of the work, as being in his opinion necessary for the proper execution of the contract in accordance with the spirit of this specification, shall be executed by the contractor without extra charge.

Any suggestion that the contractor may desire to make with the object of improving or economising, in his opinion, the working of the engine, or of modifying the mode of manufacture, or the material specified to be used, are to be forwarded in writing to the Inspecting Engineer. If approved of, the authority to carry them out will be given in writing by the said Engineer, otherwise they will not be allowed.

Materials used. Workmanship. Inspection.

All the materials used are to be of the very best description of their respective kinds, and the work is to be executed in the most approved, substantial, and workmanlike manner, according to the direction and to the satisfaction of the Inspecting Engineer, who is to have power to inspect the manufacture, either personally or by deputy, in all its branches or details, in such manner as he may think fit, and to reject at any stage, any work or material of which he may disapprove, as not being in accordance with the spirit and intention of the specification; and his decision on any point of dispute or doubt which may arise in reference to the contract shall be final and binding on the contractor.

Sub-letting.

The contractor shall not assign or sublet the contract, or allow any portion of the work to be done other than in his own establishment (except where permitted by any of the foregoing clauses of this specification), unless with the previous written consent of the Inspecting Engineer.

One set of templates and patterns to be used.

The work is to be finished to one set of templates and patterns, so that the engines and tenders may be exact duplicates of each other, and that all moving parts, including the wheels and axles must be interchangeable.

Numbering of parts.

The maker's (progressive) number to be stamped upon all the parts of each engine and tender for identification; also, maker's name, date, and place of manufacture to be exhibited upon a brass plate fixed to each engine.

Testing.

All brackets having been riveted on, the whole of the studs and mud-plugs screwed in, and all mountings fitted on, previous to being put in the frames, each boiler shall be tested (without the clothing) in the presence of the Inspecting Engineer or his deputy, first with water to a pressure of 200 lbs. per square inch, and afterwards in steam at the intended working pressure.

Finishing.

When complete and finished in every respect, the engines and tenders shall, after having been satisfactorily tested in the maker's yard, be delivered in accordance with the terms of the tender.

Protection of bright work.

For the purpose of transit, all bright work to be thoroughly protected against rust by a coating of white lead and tallow, and all parts (other than those in packing cases) to be substantially protected from damage by wood battens or other suitable means. The bearings of the wheels and axles are also to be coated with white lead and tallow, and are then to be lapped with flannel which has been soaked

Protection of bearings.

in

in the lead and tallow ; afterwards tightly and closely lapped with spun-yarn which has been first soaked in the mixture. The outer surface of the spun-yarn is then to be well coated with boiling pitch and tar, and each bearing is to be protected by battens of wood secured by hoop-iron. All studs or joints on the boiler or framing must be protected by wood, and all holes must be plugged to prevent pinch-bars being inserted when loading or unloading. The cylinders are not to be removed from the framing. Cross-stretchers of wood are to be inserted between the axle-forks at the front and hind ends of the engine, to prevent any straining of the frames. Studs, &c., to be protected.
Cylinders not to be removed.
Cross-stretchers

The movable pieces must be packed in strong cases made of deals 1½" thick, strengthened by battens placed about 2' 6" apart, and the ends and sides bound down with stout hoop-iron well nailed. All loose pieces in each case must be packed with distance-pieces of wood to prevent any of them moving, and the contractor will be held responsible for any damage arising from neglect of this. Packing cases.

The cases containing the bright work are to be lined with stout sheet tin or zinc, and soldered perfectly water-tight, the lids of these cases being fastened down with screws. Tin linings.

Each case and each unpacked portion of the engine must be marked and numbered, as may be directed, to facilitate the shipment of the parts in the required order. Marking.

The price named in the tender must include the cost of all templates, royalties, and other charges for the use of patents (if any) involved, and of the delivery of the engines in steam, to the satisfaction of the Inspecting Engineer. Price named to include all costs.

The contractor must deliver complete, as per specification, the various engines and tenders by the dates respectively named in his form of tender ; and should he fail to do so, a sum at the rate of £20 per week per engine will be deducted, by way of liquidated damages, from the price named in the form of tender. Delivery within contract time.

The contractor will be required to execute a formal deed of contract with the Commissioner for Railways, Sydney, New South Wales, or the Agent-General of the New South Wales Government in London, embodying this specification (the terms of tender) and all other conditions necessary to ensure the due completion of the contract. Bond to be executed.

Detailed packing lists must be furnished in duplicate written copies, giving the outside measurement of each package, as well as the weight thereof, as nearly as possible. Packing lists.

Payment will be made for each engine as follows :—90 per cent. in cash in London, on receipt by the Agent-General for New South Wales of the bills of lading, together with a certificate from the Inspecting Engineer, that the terms of this specification, as to the completion and packing, &c., &c., of the engines, have been fulfilled. Payment.

And it is hereby expressly declared that the giving of a certificate by the Inspecting Engineer in London, that the work done by the contractor has been satisfactorily executed and completed up to the period of delivery, shall be a condition precedent to the contractor's having any right of action or lawful claim to the payment of the 90 per cent. to be made under this specification.

The balance of 10 per cent. will be paid by the Agent-General, on receipt by him of a certificate that each engine has run 2,000 miles on the Government Railways of New South Wales, to the satisfaction of the Locomotive Engineer of the Government ; and if any engine or engines should fail to run the specified 2,000 miles to the satisfaction of the Locomotive Engineer, the contractor will be called upon to make good the defects. If he fail to do so within reasonable time, the Commissioner for Railways shall spend any such sum (not exceeding in the total the 10 per cent. on the contract price of the engine or engines that shall have arrived in the Colony) as may be considered necessary, in the opinion of the Locomotive Engineer, to make the engine or engines conform to this specification, such sum to be deducted by way of liquidated damages from the formentioned balance of 10 per cent. Balance payment.
Mileage to run.
Contractor to make good defects.

A complete set of working plans or drawings (on vellum) to be supplied by the contractor to the Agent-General or Commissioner for Railways, as soon as the whole of the working plans or drawings shall have been completed.

Each Tenderer to submit (if possible) along with his tender an outline plan, showing the general features and designs of the engine and tender which he proposes to supply, along with a skeleton specification of the leading particulars of the same.

Should the rate of progress made with the work be such as to prevent, in the opinion of Inspecting Engineer, the engines being delivered within the time specified in the Form of Tender, the Commissioner for Railways or the Agent-General shall have full power and authority, after due notice given to the contractor, to cancel the contract forthwith, upon which all moneys due to the contractor under this contract shall be forfeited. Progress of work.
Cancelling contract.

Tenderers in Europe or America may either tender to the within specification, or if they wish to depart from it in respect of substituting bar for plate frames, cast-steel for wrought-iron centres for wheels, other brands of copper, brass, and iron for those mentioned, will be allowed to submit alternative tenders, provided they adhere to the general dimensions of the engine, and clearly and minutely specify the nature of the departure they propose to make from the specification.

CHAS. A. GOODCHAP,
Commissioner for Railways.

Department of Public Works,
Railway Branch,
Sydney, 1st June, 1886.

GOVERNMENT RAILWAYS OF NEW SOUTH WALES.

Form of Tender for Manufacture of Engines in England or Foreign Countries.

THE undersigned, having read the attached Specification (No. 188A), hereby offer to supply the Government of New South Wales with Locomotive Engines and Tenders, made in accordance with the various requirements, particulars, and conditions set forth in said Specification, on the following terms as to delivery and payment, viz. : Engines (with their Tenders) delivered in steam at the price of £ each, the whole to be completed and delivered within months from date of official acceptance of Tender, and further promise and agree to be firmly bound by and faithfully to adhere to all the conditions and requirements of the said Specification, and to forfeit to the

New South Wales Government, or its lawful representatives, the sum of £20 sterling per engine and tender per week (to be deducted from the abovenamed contract sum by way of liquidated damages) for each and every week that each Engine (with its Tender) shall remain undelivered after the time herein specified for delivery.

We are,
Your obedient Servants,

Name
Address

To the

N.B.—This Tender must not be detached from the Specification. The Government do not bind themselves to accept the lowest or any Tender.

GOVERNMENT RAILWAYS OF NEW SOUTH WALES.

Specification No. 188A for a Four-coupled, outside-cylinder Passenger (Bogie) with Engine and Tender.

Number required—Twelve, delivered in steam at Sydney; Four, delivered in steam at Newcastle.

PRINCIPAL DIMENSIONS.

ENGINE:—		ft. in.
Gauge of Railway	... ..	4 8½
Cylinders, diameter	... ..	1 7
" stroke	... ..	2 2
Coupled Wheels, D. and T. (front and back of fire-box)—4.		
" " diameter of do. (tread)	... ..	5 6½
" " distance from C. to C. do. approximate	... ..	8 3
" " bogie, number—4.		
" " " diameter, tread (if possible not less than)	... ..	3 7
" " " distance from C. to C. ...	... ..	6 10
" " " base (total) ... do. approximate	... ..	21 8
Fire-box length of foundation ring (not less than) do	... ..	5 9
" breadth do. do. do. ...	... ..	3 6
Tubes, minimum number—198.		
" diameter outside	... ..	0 2
Boiler, do. (internal minimum) barrel portion (if possible)	... ..	4 4
" length do. do. approximate	... ..	10 4
" centre line, height from rail (if possible not to exceed)	... ..	7 0
Working steam pressure in boiler, 140 lbs.		
Weight on the rails, per pair of Driving Wheels (in steam), if possible not to exceed	... ..	15 tons.
TENDER (Horse-shoe, with well) minimum content 2,500 gallons:—		
Wheels, number—if all fixed wheel-base—6.		
" diameter (tread)	... ..	3 7
" base (total)	... ..	11 0

General Arrangement.

The general arrangement and design to be in accordance with a plan to be prepared by the contractor, in which the following leading particulars are to be faithfully embodied and adhered to, viz.:—Cylinders to lie horizontal, and to be situated outside the frames, and not to exceed 6 ft. 3 in. C. to C. apart, valve-chests on top (as in American practice),—connecting rods to be **next to the crank bosses**, with coupling-rods outside of and close to them,—frames sufficiently prolonged and arranged in front of cylinders to take the buffer-beam, &c. An extended smoke-box (as in American practice) with efficient deflector-plate and spark-arrester inside—frames thoroughly and efficiently stayed to one another at front end, and arranged underneath to suit the design of bogie exhibited by the Inspecting Engineer for this purpose. Steel slide-bars arranged as usual for outside cylinder engines, viz.: one above and the other below C' line of piston-rod. Beyond this, the entire boiler and fire-box, arrangement, size, and position of driving and trailing wheels, framing (aft of the motion plate), platforms, foot-plating and buffer-plates, fire-box, fixtures, brake-gear, as well as those details of the engine which are unaffected by the re-arrangement of cylinders and bogie shall be in conformity with the working drawings or plans exhibited, or directions issued by the Inspecting Engineer, in connection with this specification for the contractor's guidance, and any departure from the same is only permissible with the written consent and authority of the said Engineer.

The successful tenderer shall make his own copies of the various drawings or plans exhibited for his guidance, and prepare, at his own cost, any further detail or other drawings which may be necessary in carrying out the work, such extra drawings to be subject to approval.

Cylinders.

The cylinders are to be made of fine close-grained cast-iron, perfectly sound and good castings in all respects, and as hard as can with difficulty be bored and planed. They are to have stout flanges, and to be bolted to the frames by tight-fitting turned bolts 1½" diameter, all the holes being bored out and rymered true for this purpose.

Slide-valves.

The slide-valves are to be of hard gun-metal, stiffened by two suitable ribs inside the exhaust-chamber, the valve-faces scraped true, and the corners of ports rounded to ¼" radius.

Cylinder covers.

The cylinder and steam-chest covers are to be truly planed, or turned and scraped to faces, and the joints made metal to metal; all nuts to be case-hardened; those in the smoke-box are to be of gun-metal. The front covers are to be fitted with ½" polished covering plates, secured by set-screws, the holes for which

which must not pass through the covers. Each cylinder is to be fitted with mud-cock at each end, worked simultaneously by suitable cross-shafts, rods, and levers from the foot-plate, the handle to be situated on left side of engine. Cylinders, valve-chests, and passages to be efficiently clothed and covered in. Mud-cocks.

Pistons and Cross-heads.

The pistons to be of cast-iron with cast-iron packing rings $\frac{3}{8}$ " wide and $\frac{1}{16}$ " thick. Piston-rods to be of mild cast-steel 3" diameter with coned ends, secured to the pistons by screwed wrought-iron nuts (6 threads per inch), the nuts being secured by split pins; front end of piston-rod (reduced in diameter) to be carried forward through front cylinder cover, with suitable stuffing box, gland and sleeve. The pistons are to be turned $\frac{1}{32}$ " less than the diameters of the cylinders, and the rings $\frac{1}{4}$ " larger than the cylinders, and cut and sprung into their places. The pistons to have $\frac{3}{8}$ " clearance at each end of the cylinders. The cross-heads to be of wrought-iron, case-hardened, the bearing pins of mild steel.

Slide-bars and Blocks.

Each cylinder to have two slide-bars, which are to be of cast-steel, as hard as possible, 5" wide, with $\frac{1}{8}$ " copper liners at both ends for adjustment; the bars to be placed 12" apart vertically. The slide-blocks to be of hard cast-iron, not less than 15" long, with flanges $\frac{1}{2}$ " thick and 1" in depth.

Connecting-rods.

The connecting-rods are to be of wrought-iron, forged in one length, without weld; the small end to be, by preference, solid,—the large end to have a wrought-iron strap and tapering bolts, or to be forked and finished with a block and stout tapering bolt. The brasses (both ends) to be in two halves, those at the large end being tightened with a steel cotter, and those at the small end with a tapering steel block, wrought-iron (case-hardened) liner, screwed bolt, &c. Brasses to be flat-ended, corners rounded to $\frac{3}{4}$ " radius. Clearing of pistons. Cross-heads.

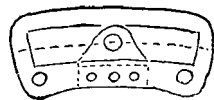
The oil-cups and syphons are to be forged on solid, and finished with screwed brass covers. The bearings are to be of the best hard and tough gun-metal.

Coupling-rods.

The coupling-rods are to be of the same material as the connecting-rods, and similarly made and finished, including the solid forged oil-cups and syphons.

They are to be parallel in the body, and to have solid ends to receive the gun-metal bearings, which are to be in two halves, of similar design to those of the connecting-rod. Each bearing is to have a steel cotter secured and finished similarly to those for the connecting-rods. The crank pins to be of Vickers' mild cast-steel, and to be fitted on the ends with screwed (case-hardened) wrought-iron nuts, secured by parallel steel split cotters. Bearings to be $3\frac{1}{2}$ " diameter by 3" wide.

Link-motion.



The form of link-motion or valve-gear, exhibited in the margin, to be used; the links, levers, pins, valve radius-rod, &c., to be of wrought-iron, thoroughly case-hardened. The work, generally, to be finished bright, and the working joints and surfaces to be liberally proportioned. Intermediate rocking shaft, &c., as in American practice.

The valve-spindle is to work in a stuffing-box and gland at the back end, and in a bushed boss in the steam-chest cover at the front end, and is to be connected to the valve-rod by a tapered socket and steel cotter, secured by a split pin. Valve-spindle.

The whole of the link-motion and gearing, as well as the connecting-rods, coupling-rods, and all parts of the engine and tender that have to stand a working strain, such as spring-links, brake-work, &c., are to be made (except when otherwise specified) of best charcoal iron, or carefully selected best Yorkshire scrap iron, clean and well hammered, thoroughly sound, and free from all defects. Oil-holes must be provided to all working joints. Material for link-motion.

Framing.

The framing to be of the type known as "plate frame"—of the very best quality, and manufactured by John Brown & Co., Monkbridge, or Parkgate Iron Companies. Material—how made.

Each frame is to be $1\frac{1}{2}$ " thick from front buffer-plate to offset for motion-plate; from thence to back buffer-plate 1" thick, and broad enough to form axle-forks out of the solid plates. Thickness, &c.

The plates are to be slotted in pairs (or more). They are to be securely attached by the bogie bolster-plate, the smoke-box floor-plate, front-plate, and tube-plate, the motion-bracket, a cross-stay in front of fire-box, the plate in front of the hind buffer plank, and the draw-plate and buffer-plates. Slotted in pairs. Cross-stays.

The axle-forks are to be fitted with cast-steel horn-blocks, those of the driving-axle being united in one solid casting. They are to be fastened to the frames by $1\frac{1}{2}$ " turned bolts, driven in tight, and secured by split pins. The back blocks for the coupled axle-boxes are to be fitted with case-hardened wrought-iron parallel liners, the blocks being cast with suitable bosses to receive two $\frac{3}{4}$ " bolts with counter-sunk heads for securing the liners. The forks are to be stayed together by wrought-iron keeps, with jaws slightly tapered to fit the ends of the forks, and drawn on tight by $1\frac{1}{2}$ " turned bolts provided with split-pins at the backs of the nuts. The motion-bracket is to consist of a stout wrought-iron plate thoroughly secured to each frame. Horn-blocks. Fork keeps. Motion-bracket.

The engineman's foot-plate is to consist of a $\frac{3}{8}$ " wrought-iron plate; secured firmly to the frames by suitable L irons and rivets. On each side of the foot-plate a plate carrying two footsteps is to be fixed. Engineman's foot-plate. Footsteps.

The main frames are to be provided at either end with stout L irons securely riveted on, and serving as seats for the two vertical transverse end plates, the hind one, $\frac{3}{4}$ " thick, forming a buffing plate, the front one, $\frac{5}{8}$ " thick, forming a portion of the buffer-beam, which is further stiffened by plate gussets with angle-irons to transmit the thrust of the buffer to the frames. Transverse end plates.

The front buffer-beam is to be of well-seasoned oak 1' 6" deep by 6" thick. Turton's patent engine buffers to be used, having volute springs and wrought-iron plungers with solid heads. The cases are to be either wrought-iron or steel, and are to be securely bolted to the beam. The back buffer-plate Buffers.

plate to be provided with an adjustable wrought-iron (case-hardened) wedge-block, &c., as in American practice, in lieu of spring buffers. (*Vide* plan exhibited.) Buffers to pattern H 1½ of Turton's Catalogue, 22" long over all, heads 13" diameter.

Draw-gear.
Main intermediate.

The draw-gear between engine and tender is to consist of one wrought-iron draw-bar 2½" diameter, with a circular hole 2⅝" diameter at tender end, and a slot 2⅝" x 3" at engine end, also two safety draw-bars 1¾" x 1⅜".

Front.

The front buffer-beam is to have a wrought-iron hook fitted with an indiarubber spring on the inside, and a wrought-iron washer-plate inside and out, secured by a nut and split cotter. There are also to be two safety-chains and hooks. The frames are to be adapted at the front end to take the cylinders, and to be carried down behind the bogie to carry the motion-bracket, &c., and between the D. and T. wheels to carry the compensating lever. A wrought-iron life-guard to be fixed to the front of each frame. Side platforms ⅝" thick, running from front buffer-beam to back of engineman's foot-plate, to be fixed to the frames by suitable angle-irons, brackets, &c.

Life-guards.
Side platforms.

Brackets and guides.

The frames are also to be fitted with wrought-iron brackets to carry the four brake-hangers, and with wrought-iron brackets to take the spring-links, &c.

		ft. in.
Extreme width over side platforms (if possible not to exceed)	...	7 9
Total length of buffer-beam	... ..	8 3
Distance from centre to centre of buffers	... ..	5 9
Distance from top of rail to centre of buffers (when engine is in steam)	... ..	3 3

Bogie.

The bogie to be of the centre-pin type, in accordance with the drawing exhibited for this purpose.

Wheels.

The wheel-bodies to be of wrought-iron, 5' 1" diameter, made of the best-selected, well-hammered scrap-iron, and neatly smithed and hand dressed. The spokes to be forged solid with T-ends (unless special appliances be provided for dabbing on the rim-pieces under the steam-hammer, or by hydraulic pressure), which when veed up shall form the rims. The D. and T. wheels to have eighteen spokes each. Three of the spokes are to be welded solid together, high enough to form the boss to take the crank-pins. The heads of the other spokes are to be formed in a suitable die, so that when they are laid together with the crank-boss they shall form a solid boss for the axle and crank-pin, after which a washer (as thick as possible) shall be soundly welded on each side.

D. and T. wheels.

Balance weights.

The revolving and reciprocating parts of the engine are to be balanced by blocks forged solid in the wheels.

Bogie-wheels.

The bogie-wheel bodies, 3' 1½" diameter (if tread diameter equals 3' 7"), are to have ten spokes each, to be put together and finished after the same manner as the D. and T. wheels.

Welds.

How finished.

Wheels fixed on axles.

The welds in the bosses, spokes, and rims, must be thoroughly sound and free from all defects, as any defective welding will necessitate the rejection of the wheel. The wheels are to be turned or planed on the faces of the bosses, and turned on the faces and sides of the rims; they are to be tooled round the axle and crank-bosses, and the spokes are to be chipped and neatly finished by hand. They are to be forced on the axles by hydraulic pressure of 1½ ton per square inch of the area of the hole for the axle, and each wheel is to be secured by a strong steel key bedded for half its depth into the axle (on the same side as the crank-boss in the D. and T. wheels), carefully fitted sideways, and with a taper on the flat of 1 in 96, and driven in with a sledge-hammer or tup.

The crank-pin holes are to be bored out to a taper of 1 in 48 and countersunk. The pins are to be of Vickers' mild cast-steel. They are to be forced in by hydraulic pressure and riveted up cold.

Tires.

All the tires to be of Vicker's cast-steel, "Australia" brand, 5½" wide and 2¾" thick on tread; the section and method of fastening to be as shown on drawing exhibited.

Axles.

The axles throughout to be of Vickers' mild cast-steel, the best quality, and of the following dimensions, viz.: in the middle, bogie wheels, 5¼"; driving and trailing, 7" diameter; journals, bogie, 5¾" diameter by 8" long; driving and trailing, 7⅝" diameter by 9¾" long. The axles to be stamped with maker's name and date of manufacture. The right-hand crank is to lead. In turning the bearings and other portions of the axles, care to be taken to avoid breaking the continuity of the metal by making small corners; no radius less than ½" will be allowed. Wheel-seat diameter of bogie axles, 6¾"; wheel-seat diameter of driving and trailing axles, 8½".

Axle-boxes.

The D. and T. axle-boxes to be wrought-iron thoroughly case-hardened, and fitted with bearings of hard gun-metal, in accordance with drawing to be exhibited for this purpose, the brasses being forced in a dead tight fit. The boxes to take the spring from below; to be truly planed to fit the axle-box guides, and fitted with wrought-iron syphon-tubes and covers. The brasses to be finished transversely ⅜" shorter than the axle-bearings.

Bogie axle-boxes.

The bogie axle-boxes and their keeps to be, by preference, of hard gun-metal, truly planed to fit the axle-box guides.

All axle-boxes to have two syphon-holes in each, and to be provided with sheet-iron covers.

Springs.

The bearing-springs are to be of the very best quality, and manufactured by makers of good repute only, and to bear the stamp of the maker. The ends of the upper plates of the D. and T. springs are to be made with solid eyes, slotted in the middle to receive the links, and bored to receive the pins. The buckles are to be of wrought-iron, shrunk tightly on, and to be forged so as to form eyes out of the solid, for attachment to the axle-box hanger.

D. and T. springs.

Buckles

The

The bottom plates of the bogie springs are to be reduced to $4\frac{1}{4}$ " broad at the ends, where the spring-links rest, the tip of bottom plate being turned down to retain the links. The buckles are to be of wrought-iron shrunk tightly on, and to be made so that a wrought-iron carrier-bar 3" diameter can pass through them (under the springs), to form the attachment to the bogie frames. Each plate is to be nibbed and slotted near the ends, to keep the plates in position. The plates (in all the springs) to be secured to buckle by a $\frac{7}{16}$ " steel pin passing through spring and buckle, and riveted over, countersunk.

Bogie springs and buckles.

Care must be taken to have the inner corners of all the buckles well rounded, the corners of the upper and lower spring-plates being rounded to suit. The spring-pins, links, and link-brackets to the frames are to be well case-hardened.

Corners rounded. Pins, &c., case-hardened.

Each spring must be tested before being used, by being loaded until the original camber in the D. and T. springs is reduced by $3\frac{1}{2}$ ", and the bogie-springs by 5", and they should resume their original camber on the removal of the load.

Testing.

Between the D. and T. springs on each side of the engine there is to be a wrought-iron compensating lever, formed of a solid forging swelled out at the middle for the fulcrum-pin, and with a forged jaw at each end to receive the joint-pins which take the screwed links or hangers, and which are each to have two nuts and a split pin. Each lever is to be attached to the frame by a bossed wrought-iron bracket, with a hole 3" diameter to receive the wrought-iron cross-shaft.

Compensating lever.

Boiler.

All the plates used in the boiler-shell and dome, as well as the angle-irons and rivets, are to be made of the best Yorkshire iron, manufactured by either the Lowmoor, Bowling, Farnley, Monkbridge, or Taylor Bros., care being taken in bending the plates to leave the name of the manufacturer visible outside. The brand of iron to be used to be named in Tender.

Material.

All the plates of the barrel and fire-box casing, with the exception of the throat-plate, which is to be $\frac{9}{16}$ " thick, are to be $\frac{1}{2}$ " thick, and planed on their edges.

Plates, thickness, &c.

The barrel is to be not less than 10' 4" long, and (if possible) 4' 5" diameter outside, with butt joints throughout, and to consist of three plates only, the longitudinal joint to be situated between the water-level and the base of the dome, to have lap-plates both inside and out, and to be double riveted (zig-zag); the transverse joints to have outside lap-plates only (solid welded rings), and to be single riveted.

Barrel.

The front tube-plate, $\frac{1}{2}$ " thick, is to be flanged forward to take the smoke-box side-plates. It is to be attached to the boiler by an angle iron $4\frac{7}{8}$ " x $3\frac{3}{4}$ " x $\frac{3}{4}$ ", turned inside on the face and edges, and double-riveted to the boiler-barrel.

Front tube-plate.

The front fire-box casting-plate is to be flanged forward with a radius of $1\frac{1}{2}$ " outside, to take the barrel-plate, with a lap-joint (outside), and is to be flanged backwards at the sides to form a lap-joint (inside) with the side-plates.

Fire-box casing.

The back casing-plate is to be flanged forward, to form a joint (inside) with the side-plates in a similar manner.

Fire-box casing.

The sides and top of the fire-box casing are to be formed of three plates, which are to lap each other and the barrel (as well as the front and back casing-plates), and are to be single-riveted throughout, except at the horizontal joints, which are to be double-riveted (zig-zag). The side plates are to be extra lapped round the lower corners of the front plate, and riveted thereto, to form a double thickness for the mud-plugs.

Fire-box casing.

A wrought-iron dome, 1' 9" diameter inside, and 3' 0" high from boiler-barrel, is to be fixed on the third plate of the barrel, having the same vertical centre-line as the driving-axles. It is to consist of a double-flanged seating, 6" high at shallowest part, formed out of specially-rolled L iron or plate, welded up solid, the lower flange curved suitably to the boiler-barrel, the upper flange to be $1\frac{1}{8}$ " thick (after being turned and faced). The upper portion of the dome to consist of a hemispherical-ended cylinder, terminating below in a stout-faced flange $1\frac{1}{8}$ " thick, made similar to the seating, the whole being welded up solid. The lower joint-face to be recessed $\frac{1}{8}$ " deep, to fit a corresponding projection on the upper face. The lower flange of dome-seat to be single-riveted to boiler-barrel; the hole in the barrel to be 1' 4" diameter, the edge of the barrel-plate being stiffened by two wrought-iron rings $2\frac{1}{4}$ " x 1" (one inside and one out).

Dome.

There is to be a man-hole, 1' 1" in diameter, on the crown of the fire-box casing, fitted with a wrought-iron ring (double-riveted), forming a seating, to which is to be attached a wrought-iron cover.

Man-hole.

The wrought-iron cover is to be turned on both sides, and at the outer edge underneath is to be recessed to take the upper edge of the brass moulding of the clothing. It is to be bored and fitted on the upper side to take two Ramsbottom's valves ($3\frac{1}{2}$ " diameter), and other fittings shown on the Drawing to be exhibited.

Safety-valve.

The top fire-box casing-plate is to have two transverse rows of double angle-irons bent to the proper curve, and firmly riveted to the plate, serving for attachment of the roof girder slings.

Top casing-plate stiffened.

The smoke-box tube-plate and the back fire-box casing-plate are to be stayed to each other by ten longitudinal wrought-iron stays, screwed 11 threads per inch, made with solid heads, and screwed through the casting-plate, with copper washers at the back, and adjusted and attached to front tube-plate by nuts and copper washers, inside and out.

Longitudinal stays.

The upper portion of the back casing-plate, where the stays and fire-box fittings are attached, is to be strengthened by $\frac{3}{8}$ " plate on the inside, suitably attached by rivets.

The longitudinal stays, as well as the regulator rod, are to be supported at mid-length by cross-plates $\frac{1}{2}$ " thick, and not less than $4\frac{1}{2}$ " wide, riveted to the boiler-barrel.

The copper fire-box is to be approximately 5' 9" long, and 3' 6" wide inside at foundation ring, and 5' 6 $\frac{1}{4}$ " deep.

Copper fire-box.

The plates, stay-bolts, and rivets of the fire-box are to be made of the best selected copper, manufactured either by Broughton Copper Company, Pontifex and Wood, Vivian & Sons, or Pascoe, Grenfell, & Sons. They are to bear the maker's stamp, which is to be placed so that it can be seen after the boiler is finished.

Material.

The plates are to be $\frac{1}{2}$ " thick, except the portion of the front plate which receives the tubes, which is to be $\frac{1}{4}$ " thick. Strips must be cut off the plates, and they, with the bars for the stays and rivets, must stand the test of being bent double when cold, without any signs of cracking. If any cracks appear in any of the strips or bars, they must be annealed; and if after being annealed any strips or bars do not stand the test of bending cold, the plates or bars from which such test pieces have been cut must be rejected.

Thickness of plates. Testing

Special

- Special care must be taken to anneal all the stay-bolts before cutting the threads.
- Tube and back-plates.** The tube and back-plates are to be flanged to a radius of not less than 1" inside at the top and sides, to make the lap-joints with the sides and roof-plate.
- Sides and roof.** The sides and roof are to be in one piece, the upper corners of the sides and roof-plate to have a large radius inside.
- Care in flanging.** During inspection special attention will be directed to all the corners of the copper-box; and if any plate shows signs of cracking or injury of any kind, it will be rejected.
- Water-space.** The water-space between the outer and inner plates all round at foundation ring is to be $2\frac{1}{2}$ ". The plates of the fire-box and casing are to be attached at the bottom by a solid forged ring $2\frac{1}{2}$ " deep at the shallowest part, with $\frac{7}{8}$ " rivets. The ring is to be brought down at each corner to take a double row of rivets, and at the sides to carry the ash-pan.
- Fire-box ring.**
- Fire-hole rivets.** The fire-hole is to be oval, the plates being connected by a solid wrought-iron ring, planed on both sides, and secured by $\frac{7}{8}$ " rivets, countersunk on the outside, and finished flush.
- Roof stays.** The roof of the copper-box is to be strengthened by seven rectangular wrought-iron girders, not less than 6" deep in the centre (except the centre one, which is to be $5\frac{3}{4}$ " deep), to be carefully bedded at the ends to the front and back edges of the box.
- Space between roof-stays and box.** The space between the top of the box and the girders is to be not less than $1\frac{1}{2}$ ", nor more than 2". The top of the box is to be attached to the girders by 1" stud-bolts tapped into the girders from below. These bolts must be a tight fit in the holes in the roof-plate, the throats being left full, and screwed well home, the corners of the heads next the plate being chamfered off; wrought-iron ferules, $1\frac{3}{8}$ " diameter outside, to be used as distance-pieces.
- Safety links.** Four safety links, with oblong holes (to admit of the top of the copper-box rising when heated), are to be suspended between two of the girders and the transverse angle-irons on the roof of the casing, the two girders being forged with suitable lugs for this purpose.
- Lead plug.** The roof-plate is to be fitted with a fusible gun-metal plug $1\frac{1}{2}$ " diameter at the point (tapered 1 in 6), and screwed 10 threads per inch, and bored out in the middle, and tapped $\frac{7}{8}$ " to receive the alloy.
- Copper stays.** The walls of the box are to be stayed to the shell by copper stays either $\frac{7}{8}$ " or 1" diameter, screwed 10 threads per inch, placed not more than 4" apart C. to C., screwed tightly into both plates, and riveted over at both ends (leaving a sufficiently large head inside). The end vertical rows at the sides are to be centered $8\frac{1}{2}$ " from the outer face of the front and back casing-plates, and at the front and back $7\frac{1}{2}$ " from the outer face of the side casing-plates.
- Throat stays.** The tube-plate is to be stayed to the lower portion of the boiler-barrel by not less than seven 1" copper screws (10 threads per inch), tapped through the copper plate into wrought-iron sockets (riveted to the boiler-barrel), and finally riveted over inside the box.
- Rivets.** All rivets used in the boiler are to be $\frac{3}{4}$ " diameter, spaced $1\frac{3}{4}$ " apart C. to C., except those attaching the angle-iron to the front tube-plate, which are to be $1\frac{3}{8}$ " diameter and $1\frac{7}{8}$ " pitch, and those in the fire-hole and foundation rings, which are to be $\frac{7}{8}$ " diameter, spaced $1\frac{1}{2}$ " C. to C. Those in the copper box are to be made of copper. All the rivets must completely fill the holes, and must be closed up by steam or hydraulic power wherever it is possible to do so.
- Steam-riveting.**
- Wash-out plugs.** There is to be a tapered brass wash-out plug $1\frac{3}{4}$ " diameter (at large end) situated at each of the two front bottom corners of the fire-box, and two $1\frac{3}{4}$ " plugs at the back of the box (above the level of the fire-box crown), and two $1\frac{3}{4}$ " plugs in the front tube-plate, below the level of the lowest row of tubes; all are to be screwed, 10 threads per inch, and tapered 1 in 8.
- Mud-hole.** There is to be an oval mud-hole, with suitable wrought-iron bolt, nut, and cover, situated at the bottom and centre of the back casing-plate.
- Blow-off cock.** A brass blow-off cock (flanged) is to be fixed by studs to the bottom of the back casing-plate, and worked by a socket key from the foot-plate, the key being cranked at top to form a handle, and swelled out in the shaft to fit the hole in the foot-plate, and secured to square off the cock-plug by a strong split pin.
- Fire-bars.** The fire-bars to be of wrought-iron $3\frac{1}{2}$ " x 1", carried on two wrought-iron cross-bearers, which are $3\frac{1}{2}$ " diameter, and shaped at the ends to fit into suitable brackets, bolted to the prolonged portion of the fire-box bottom ring. These cross-bearers are to be drilled and fitted with pegs (not tapered) of $\frac{7}{8}$ " round iron placed 2" apart C. to C. to regulate the spacing of the fire-bars.
- Ash-pan.** The ash-pan is to be of wrought-iron, the full length and width of the fire-box, and is to have a tight-fitting door at both front and back, swung on a hinge bar running the full length of the door, and worked from the foot-plate by suitable levers and rods. The bottom is to be stiffened by three cross angle-irons.
- Fire-door.** The fire-door is to consist of two sliding wrought-iron plates, and is to be provided with a wrought-iron deflector.
- Brick arch:** The fire-box to be fitted with a fire-brick arch, supported by angle-irons attached to the side-plates by studs.
- Regulator.** A swan-necked cast-iron pipe, 4" internal diameter, is to be fixed in the steam dome. The lower portion is to be attached by an angle-iron bracket to the dome base. The top of this pipe is to be fitted with a gridiron regulator of cast-iron, having a gun-metal slide or valve worked by levers and rods from the foot-plate. The regulator rod to be made so that it can be put in or taken out without interference with the steam-pipe.
- Stuffing-box.** The regulator stuffing-box is to be of brass, with suitable stops to limit the travel of the handle, and stamped "Shut" and "Open" on the right and left hand respectively.
- Steam-pipe.** A copper pipe, 4" diameter inside, and No. 9 W.G. thick, is to connect the regulator with the elbow-pipe in the smoke-box. It is to be fitted to the regulator pipe by a brass cone (brazed on), secured by a circular clip and two bolts, the hole in the clip being large enough to slip over the cone; the front end of the pipe is to be attached to front tube-plate by a brass flange (brazed solid to the pipe), and having seven wrought-iron screwed studs.
- Elbow-pipe in smoke-box.** There is to be a cast-iron T pipe in the smoke-box fixed by the studs which secure the flange of the steam-pipe. Two copper pipes, $5\frac{1}{2}$ " diameter inside, and No. 9 W.G. in thickness, with brass flanges (brazed solid) are to connect the T pipe with the cylinders. They are to be close to the sides of the smoke-box so as to clear the line of tubes. The lower ends of these copper pipes are to project 1" beyond the flange into the cylinder casing, and a circular recess or groove is to be cut in the joint on the cylinder for a corresponding projection in the flange of the steam-pipe to fit into it. Flue

Flue Tubes.

The tubes are to be of the best quality solid drawn brass, manufactured by the Broughton Copper Company, of Manchester; Elliott's Metal Company; Allan, Everett, & Sons; J. Wilkes & Company, of Birmingham; to be first approved in writing by the Inspecting Engineer. Material and make.

They are to be 198 in number, and 2" outside diameter, and are to bear the maker's stamp. They are to be No. 10 W.G. thick at the fire-box end, and No. 12 do. at the smoke-box end. Front ends swelled to $\frac{1}{16}$ " diameter in smoke-box tube-plate. Number and diameter.

Care must be taken to make the tubes perfectly steam-tight at both ends by rolling them with Dudgeon's expander.

Turned tapering steel ferules are to be inserted at both ends of the tubes. Steel ferules

The tubes are to project $\frac{1}{8}$ " beyond the fire-box tube-plate, and $\frac{3}{8}$ " beyond the smoke-box tube-plate when fixed, and they are not to be rolled over or beaded at the ends.

Smoke-box.

The sides of the smoke-box are to be attached to the tube-plates by rivets and to each frame by a wrought-iron thickening strip riveted to the side-plates, and bolted to the frame-plates. Side-plates to be connected to front-plate by an angle iron (riveted), the latter plate to be bolted at bottom to the floor of the smoke-box.

The door is to be circular and dished, and carried by two wrought-iron hinges. It is to be fitted inside with a liner attached by rivets and ferules, with an air-space of $\frac{1}{2}$ " at the edges. It is to be kept closed by a removable horizontal cross-bar, and a central handle with a minor locking handle and screw. Door.

The exhaust-pipe is to be of cast-iron, and is to be surmounted by a movable cap or nozzle. The joints of the exhaust-pipe and cap are to be planed. Exhaust-pipe.

Spark-arresters to be fitted of the best design known for the prevention of burning matter being emitted. Spark-arrester.

The chimney to be of wrought-iron, the base being formed of a plate welded up without seam, and shaped on a block to suit the curve of the smoke-box. The barrel is to be made of one plate with a butt joint and inner lap-plate, and fitted into and riveted to the base. It is to be surmounted by a polished copper top. All the rivets in the chimney are to be countersunk and flush outside. The extreme height of the chimney from the rail is not to exceed 13 feet 6 inches. Chimney.

A blower-cock is to be fixed on the boiler behind the chimney, or otherwise neatly arranged, worked by a handle (passing through the right-hand rail) from the foot-plate, a copper pipe leading the steam inside the smoke-box. Blower.

A No. 2 Roscoe's lubricator is to be fixed on each side of the smoke-box, with copper pipe leading into the centre of each cylinder. Lubricators.

The hand-rail in front of the smoke-box to be a continuation of the side-rails. Hand-rail.

Fire-box Fixings.

The fire-box fixings are to consist, in addition to those already mentioned, of the following:—

One Bourdon's gauge, to indicate 200 lb. per square inch, with cock and copper pipe. Two glass gauges, with top and bottom cocks, and waste-water cock and copper pipe, the top and bottom cocks to be screwed into the plate $1\frac{1}{4}$ " diameter, 11 threads per inch. There is to be a whistle fixed to front of cab, and connected by a copper pipe to the injector steam-cock branch. There is to be also an iron socket screwed into the back casing-plate to carry the gauge-glass lamp, and a wrought-iron tray with angle-iron rim fixed with studs above the door. All the cocks and fittings are to be made of brass, unless specially named to the contrary, and all fittings screwed into the boiler are to have 11 threads to the inch, unless otherwise specified.

There are to be two No. 9 Giffard's injectors (Gresham and Craven's make) one fixed on each side of the engine, in such a position that the handles can be readily reached for adjustment by the driver. Each injector is to have a steam-cock fixed on a special branch casting, placed on the top of fire-box casing-plate, and to have a clack-box fixed on the centre line of the boiler near the front end. Each clack-box flange is to be secured by W.I. studs to a wrought-iron seating riveted to the boiler. Injectors.

The injectors as well as the cocks and clack-boxes are to be of gun-metal, and the steam, suction delivery, and overflow pipes of copper, No. 10 W.G. thick. Materials of injectors, &c.

Clothing.

The boiler is to be covered with dry pine battens, tongued and grooved. At each joint of the lagging plates a wrought-iron hoop $2\frac{1}{4}$ " by $\frac{5}{16}$ " thick is to be put on in two halves, provided with distance-pieces 20" apart, and screwed together with countersunk screws, and metal joint blocks let in through the battens, bearing on the boiler, the whole finished flush, covered with sheet-iron No. 14 W.G., and bound together round the barrel and over the fire-box with hoop-iron straps secured by screws.

The dome is to be enclosed in a helmet-shaped casing of polished brass. Polished brass mouldings are to be fitted round the back corner of the fire-box casing, the smoke-box angle iron, and under the safety-valve seating. Dome casing.

Cab.

The cab over the foot-plate is to be of the modern English type covered in at the sides, and is to consist of wrought-iron plates and L irons; front plate $\frac{5}{16}$ " thick, side plates $\frac{3}{8}$ " thick, and roof plate No. 12 W.G. It is to be fitted in front with spectacle glasses in brass frames, made to open and shut. The roof-plate is to have a light angle-iron 1" x 1" fixed on the edges, running fore and aft, to carry off the drip.

Brakes.

An efficient hand-brake is to be fitted to the engine, as well as the tender, consisting of $1\frac{3}{8}$ " screw spindle with a square thread, have a $\frac{3}{8}$ " pitch with a 12" double-ended hand lever at top, and an 11" lever on brake-shaft at lower end, with a suitable screw-nut. The handle for working it is to be placed on

on the left-hand side of the foot-plate, and is to be carried on a hollow cast-iron pillar bolted to the foot-plate by four $\frac{3}{4}$ " bolts. There is to be a wrought-iron hanger, with cast-iron block, fitted to each of the four driving wheels, and a wrought-iron brake-shaft $3\frac{1}{4}$ " diameter carried by cast-iron brackets bolted to the frames, and having the arms forged on solid, the screw-arm being forked and bored to take the screw-nut.

Hangers. Wrought-iron hangers with cast-iron blocks (clipping the flanges) are to be fitted to each of the four driving wheels.

Brake-shaft. A strong wrought-iron brake-shaft not less than $3\frac{1}{4}$ " diameter is to be carried by wrought-iron brackets, with cast-iron bushes, secured to the frames; it is to have the arms forged on solid, the screw-arm being forked and bored to take the screw-nut.

Westinghouse brake. Both engine and tender must be fitted with all the necessary appliances for working the latest improvements of the Westinghouse automatic air-brake on the tender and carriages. The air-pump for the Westinghouse brake must be fixed to the left-hand frame between the D. and T. wheels, and the pipes and nozzles on the tender must be arranged to suit those on the present rolling stock.

Water-jet to tires. Gear to be provided for supplying a jet of water from the tender to the tire of each wheel of engine and tender (except bogie wheels), at the root of the flange, immediately above the brake-block. Two branched $\frac{1}{2}$ " wrought-iron pipes, with two brass cocks, one for engine and one for tender, to be connected with the tank and worked from the foot-plate; the nozzles to be of brass, with $\frac{3}{16}$ " bore at the ends, screwed on to the pipes.

Hand-rails.

Polished, hollow, wrought-iron hand-rails to be carried on each side of the engines by castings bolted to short wrought-iron brackets, which are riveted to the boiler.

Sand-boxes.

A sand-box (content, not less than 4 cubic-feet) is to be fixed in front of each driving-wheel, fitted with valve, and worked conveniently by gear from the foot-plate. The valves in both boxes are to be worked simultaneously. The boxes must be perfectly water-tight.

Sand-pipes.

Brass pipes $1\frac{1}{2}$ " inside diameter, are to be fixed and bent so as to convey the sand as near as possible to the tread of the wheels.

Lamp-brackets.

Two lamp-brackets to be fixed on the front platform—one on the right- and one on the left-hand side.

Painting.

After being tested, the boiler is to receive two coats of metallic oxide paint, and when dry the clothing is to be put on. When finished, the engine is to receive not less than two coats of lead-colour in oil. The whole of the surface, requiring it are then to be filled up with hard stopping, and after being well rubbed down smooth, are to receive a third coat of lead-colour in oil, and to be finished with two coats of selected colour in oil and two coats of varnish.

Tool-box and Tools.

Each engine is to be provided with a portable wooden tool-box 3' 3" by 2' 0", by 1' 9" (to be carried on the top of the tender), made of oak or tallow-wood, bound with iron at the corners, and the lid covered with galvanized sheet-iron, to have strong hinges, hasp, and padlock, and till inside at one end; also two monkey-wrenches (one large and one small); one heavy hammer; one light hammer; one copper hammer; two flat chisels; two cross-cut chisels; two pin punches; one complete set of screw-keys to fit all nuts; two short keys for piston glands; two short keys for valve spindles; light close-ended keys for all syphon covers; one fire-bucket; one fire-shovel; one fire-dart; one fire-pricker; one rake; one pinch-bar (large); one tube-plug socket-rod and six tube-plugs; two 15-ton traversing screw-jacks, with ratchet, ratchet-head, and jackbars; two oil-cans (one large and one small); two oil-feeders (one large and one small), copper tallow-kettle, hand-brush, and gauge-lamp.

Pitch of Screws.

The threads of all bolts, studs, and nuts are to be cut to Whitworth's standard, unless where specially stated to the contrary. Where fine threads are specified, eleven threads per inch are to be used, except in the case of piston-rods, the threads of which are to be six per inch. All bolt-heads and nuts are to be hexagonal, and measured across the corners are to equal twice the diameter of the bolt (except in the larger sizes of bolts, in which case the next size less for heads and nuts may be taken if more suitable). The size across the flats will not therefore be Whitworth's standard.

Wire-gauge.

The Birmingham wire-gauge to be used.

Case-hardening.

All the motion-work, brake-work, the nuts of the cylinders and glands, and all journals, pins, joints, and rubbing surfaces about the engine and tender (except when of brass, cast-iron, or steel) shall be thoroughly case-hardened to a depth of $\frac{1}{8}$ -inch, and so hard as to wholly resist filing.

Specimens of case-hardening, which have been hardened in the same boxes with the work, will be broken in the presence of the Inspecting Engineer or his deputy.

TENDER.

(Content 2,500 gallons.)

General Arrangement.

The following are the leading particulars of the design and construction of the tender, based on the assumption of a rigid or fixed wheel-base, not exceeding 11 feet, and plate frames; and it is to be clearly understood that in the event of bogie being adopted (in lieu of rigid wheel-base), the details as here set forth are, of course, subject to modification, but must still be adhered to as far as practicable. A certain amount of latitude is also allowed to meet the conditions of enlarged tank, &c.

The tender to be of the ordinary horseshoe type, with the addition of a well underneath the tank, 10 feet long, 4 feet 1 inch broad, and 1 foot 6 inches deep, and extending over the front and middle axles. The fuel space (shaped in the tank) to be 7 feet 9 inches long from the front end, and 2 feet 6 inches wide; the whole to be carried on 6 wheels (unless bogies be adopted), 3 feet 7 inches diameter at the tread; wheel centres 5 feet 6 inches, total wheel-base 11 feet.

Wheels.

Bodies to be of wrought-iron, 3 feet $1\frac{1}{2}$ inch diameter, and to have ten spokes. They are to be made of the same material, put together, and finished in the same way as the engine-wheels.

Tires.

To be of the same material, section, and method of fastening, as specified for the engine wheels. To have flanges on all wheels. Centre tires not to be reduced in flanges.

Axles.

To be of the same material as specified for the axles for the engine; to be $5\frac{1}{2}$ inches diameter in the middle, and to be parallel for a distance of 2 feet 6 inches, to run into $6\frac{1}{2}$ inches diameter at the collars, which are to be $\frac{1}{2}$ -inch broad; the wheel-seats to be 6 inches diameter; the journals to be $4\frac{1}{2}$ inches diameter and 8 inches long; the radius of the corners being $\frac{3}{4}$ ". The distance from C. to C. of bearings to be 6 feet 2 inches.

Axle-boxes.

To be of fine-grained hard cast-iron. The castings to be clean and free from flaws of every description. To be planed to fit the axle-box guides, but to be left $\frac{1}{8}$ " wider between the flanges to allow of lateral motion. The bearings to be of hard gun-metal perfectly bedded into the axle-boxes, and octagonal at the crown. Two syphon-tubes to each box; the tubes to be continued through the cast-iron into the brass bearings for a $\frac{1}{4}$ ". The keeps to be of cast-iron, and planed to fit the axle-boxes (so that they can be put up and taken down by hand without hammering), and secured by two $\frac{5}{8}$ -inch round iron pins. The covers to be of cast-iron, recessed in the top to take the ends of spring pillars. The lid to be of cast-iron, secured by a wrought-iron pin.

Axle-box Guides.

To be of fine close-grained cast-iron, free from flaws of every description. To be planed on the face, edges, and flange, and to be fastened to the frames by four $\frac{7}{8}$ -inch turned bolts in each, driven in tight, the bolts to be countersunk into frames, the nuts to be secured by split pins.

Axle-fork Keeps.

To be of wrought-iron, a good fit on the forks, and secured by a $\frac{3}{8}$ " bolt at each end.

Springs.

To be of the same material as specified for the engine springs. The spring pillars to have two guides each fastened to the inside of the frames. The spring-link carriers also to be attached to the inside of the frames.

Framing.

The frames are to be of the same material as specified for the engine frames, and are to be $\frac{7}{8}$ -inch thick, running from buffer-beam to buffer-beam, and formed each of one solid plate. The minimum depth to be 12 inches, and above the axle-boxes 1 foot $2\frac{1}{2}$ inches, deepened at the front end to take the brake-shaft and footsteps. The main frames to be braced together at the front ends by a $\frac{5}{8}$ " wrought-iron vertical plate (serving as a buffer-plate, *q.v.*) 1 foot 2 inches deep, and a $\frac{1}{2}$ " vertical plate, 1 foot $2\frac{1}{2}$ inches deep, united by two horizontal $\frac{3}{4}$ " plates 1 foot 9 inches wide; also at back ends by a $\frac{1}{2}$ " vertical plate (serving as a buffer-plate) 1 foot deep, united to a $\frac{1}{2}$ " horizontal plate 1 foot 6 inches wide, and finally by three intermediate $\frac{1}{2}$ " vertical plates, each 1 foot deep, the whole riveted together with suitable L irons.

There are to be two $\frac{1}{2}$ " wrought-iron longitudinal stretchers, each in one continuous plate, running from the front intermediate cross-stay to the hind buffer-plate, and spaced 4 feet 1 inch apart. The longitudinal stretchers will form the well sides, and the front plate of well is to be $\frac{3}{8}$ -inch thick, and spaced 10 inches from the back of the front cross-stay; the back of the well being formed by the back intermediate cross-stay.

The middle cross-stay divides the well, consequently care must be taken to cut holes in it to allow the water to circulate, also a hole large enough to admit of a man passing through. The intermediate cross-stays will be secured to the longitudinal stretchers and throughout the well by angle-irons.

Foot-plate, Draw-plates, &c.

The foot-plate to be $\frac{3}{8}$ " thick, the extreme width over platform being 7 feet six inches. The front horizontal draw-plate to be $\frac{1}{2}$ " thick, and spaced $6\frac{1}{2}$ " below the foot-plate, and fastened to the buffer-plate, frames, and front cross-stay plate by $2\frac{1}{2}$ " angle-iron and $\frac{3}{4}$ " rivets. The horizontal stiffening-plate to be $\frac{1}{2}$ " thick and 4" below the drawbar horizontal plate, and to be flanged down at the front, and fastened to the buffer-plate, and secured to the frames and vertical cross-stay plate by $2\frac{1}{2}$ " angle-iron and $\frac{3}{4}$ " rivets.

On the underside of the stiffening-plate will be fixed two feed-pipe carriers, to be securely fastened and braced together. The distance from C. to C. of feed-pipes is 2' 11". The drawbar pin is centred 1' $3\frac{1}{2}$ " back from the buffer-plate. The draw-shacklepin holes to be $5\frac{1}{4}$ " from the back of the buffer-plate and 1' 10" apart C. to C.; strengthening plates to be riveted on round the holes in the plates. A wrought-iron (case-hardened) rubbing block to be securely fixed to front buffer-plate to bear against the wedge-block on engine.

Feed-pipe carriers.

Volute spring buffers.

Two

Sand-boxes.

Two water-tight sand-boxes are to be placed on the foot-plate at the front end of the tank, one on each side, each capable of holding 2 cubic feet of sand, and fitted with cast-iron water-tight covers, the filling hole to be $4\frac{1}{2}$ " diameter, and provided with suitable valve and gear for working same.

Hand-rails.

The sand-pipes to be of brass, the same size as for the engine, and bent so as to convey the sand as near the tread of the front wheels as possible. There is to be a polished wrought-iron hand-rail on each side, supported by two wrought-iron pillars, and secured to the tank. The left-hand one to have a boss forged on to take the brake-rod. Two substantial wrought-iron double shackle screw couplings are to be provided with each tender; screw, 2" diameter; shackle and link-iron, $1\frac{1}{2}$ " diameter.

Brake.

The general design and arrangement to be similar to that specified for the engine brake, the handle to be on the left-hand side of the tender. The shaft to be $3\frac{1}{4}$ " diameter, with all the levers forged on solid, including one 1' $0\frac{3}{4}$ " long, for coupling up to the Westinghouse gear; the whole to be supported by cast-iron carriers in the frames. There is to be a wrought-iron hanger and cast-iron brake-block (clipping the flanges) to each wheel. The hangers to be suspended by means of stout W.I. pins passing through the frames and carriers, fastened to the longitudinal stretchers. The hangers for the trailing-wheels to be prolonged to form life-guards.

Back Buffer-beam.

This to consist of wrought-iron plate $\frac{1}{2}$ " thick, 12" deep, and 7' long, secured to frames and longitudinal stretchers by $2\frac{1}{2}$ " angle-irons, $\frac{3}{4}$ " rivets. The horizontal draw-plate to be $8\frac{3}{4}$ " below the bottom of the tank; to be $\frac{1}{2}$ " thick and 1' 6" broad, fastened to frames and buffer-beam by $2\frac{1}{2}$ " angle-iron.

The vertical (draw-spring) plate to be 2' 6" long, 12" deep, and $\frac{1}{2}$ " thick, secured to the horizontal plate and bottom of tank by $2\frac{1}{2}$ " angle-iron. $\frac{3}{4}$ " strengthening-plates to be riveted on to the back of the buffer-beam and front of the vertical-plate. Two buffers, of same type as those specified for the engine, to be fastened to buffer-beam by four 1" bolts in each. Height from top of rail to centre, 3' 3"; distance apart from centre to centre, 5' 9". A wrought-iron draw-hook to be provided, having a shank passing through the buffer-beam and vertical draw-plate, and fitted with a powerful volute spring, secured by a washer and split-cotter. A case-hardened wrought-iron socket is to be fitted to the hind buffer-beam, to give sufficient surface for the shank of the hook to work in. Two safety-chains to be securely attached to the buffer-beam, at a distance of 1' 6" apart.

Tool-box.

A plate-iron tool-box is to be built at the back of the tank, and of the full width of the same, with a hinged lid, hinges, and staple, catch and lock complete.

Tank.

Plating, &c.

The thickness of the top and side plates to be $\frac{1}{4}$ ", and the bottom to be $\frac{3}{8}$ ". The top, bottom, and sides to be well stayed to each other by L irons, &c., as per drawing. A curved wrought-iron moulding to extend along the upper edge (outside) of sides and back of tank.

Man-hole.

A wrought-iron man-hole ring made of $\frac{1}{16}$ " plate, 18" diameter, $8\frac{3}{4}$ " high, flanged at the bottom, is to be riveted on to the top of tank in the centre, 1' 6" from its centre to the back of tank. It is to be fitted with a wrought-iron cover and handle. The hole to be cut in the tank top is to be 1' $4\frac{1}{4}$ " diameter, round which will be supported a wrought-iron sieve, made out of $\frac{1}{8}$ " plate, to be 1' 4" diameter at the top, and 1' $3\frac{1}{2}$ " diameter at the bottom. It is to be 4' $0\frac{1}{2}$ " long.

Feed-valves.

The tank to be supplied at the back end with wrought-iron lifting shackles in each corner, with strengthening corner-plates. At the front end, over the front axle, on the inside of the coal-bunk, two bent plates will be riveted for the same purpose. A lamp-bracket to be fixed respectively on the left and right-hand side at the back end of tank. The feed-valves to be circular, and of gun-metal, with central guide pin, and situated one on each side of the tank, protected by proper strainers, and worked from the top by levers, &c., on circular castings with inclined planes. The vertical rods to be weighted. A brass cock $\frac{3}{4}$ " bore to be fitted to the outside of the tank at the front end and near the bottom (for drawing water into a bucket). The well to have a man-hole 15" diameter cut in the bottom plate at a distance of 2' 4" from the back plate of well, to have a thickening piece, 2" broad and $\frac{3}{8}$ " thick, riveted round the hole on the inside by $\frac{5}{8}$ " rivets, countersunk flush on the bottom. The cover to be $\frac{3}{8}$ " thick, 1' 7" diameter, fastened on by $\frac{3}{8}$ " studs, pitch $3\frac{1}{2}$ ".

Man-hole in well

Feed-pipes.

Feed-pipes.

The feed-pipes to be of copper, $1\frac{1}{4}$ " bore, and No. 12 W.G. thick, and the feed connection between the engine and tender to be strong indiarubber hose-pipe, $2\frac{1}{8}$ " bore, stiffened with spiral spring inside (tested to 200 lbs. pressure per square inch), and fitted with brass union joints at the engine end.

Painting.

The inside of the tank and well to be thoroughly served with three coats of best metallic oxide paint, and the other parts outside to be filled up, rubbed down, and painted in the same manner as the engines.

W. SCOTT,

Locomotive Engineer.

June, 1886.

GENERAL CONDITIONS IF ENGINES ARE MANUFACTURED IN THE COLONY.

Everything necessary to be provided.

Everything necessary to the proper finish and equipment of the engine must be supplied, whether stated in this specification or not, and no advantage is to be taken of any omission of detail in the specification or plans, as the contractor may obtain full explanation of any part of the work not sufficiently shown or understood.

Alterations.

Any minor alteration or modification of detail which shall be ordered by the Locomotive Engineer during the progress of the work, as being in his opinion necessary for the proper execution of the contract in accordance with the spirit of this specification, shall be executed by the contractor without extra charge, provided the cost of such alteration or modification of detail shall not exceed £5.

All

All the materials used are to be of the very best description of their respective kinds, and the work is to be executed in the most approved, substantial, and workmanlike manner, according to the direction and to the satisfaction of the Locomotive Engineer, who is to have power to inspect the manufacture, either personally or by deputy, in all its branches or details, in such manner as he may think fit, and to reject at any stage any work or material of which he may disapprove as not being in accordance with the spirit and intention of the specification; and his decision on any point of dispute or doubt which may arise in reference to the contract shall be final and binding on the contractor, unless the latter avail himself of his right of arbitration.

Materials used.
Workmanship.
Inspection.

The contractor shall not assign or sublet the contract, or allow any portion of the work to be done other than in his own establishment (except where permitted by any of the foregoing clauses of this specification), unless with the previous written consent of the Locomotive Engineer.

Sub-letting

The work is to be finished to one set of templates and patterns, so that the engines may be exact duplicates of each other, and that all moving parts, including the wheels and axles, may, if necessary, replace each other in the different engines.

One set of templates and patterns to be used.

The maker's (progressive) number to be stamped upon all the parts of each engine for identification; also maker's name, date, and place of manufacture, to be exhibited upon a brass plate fixed to each engine.

Numbering of parts.

All brackets having been riveted on, the whole of the studs and mud-plugs screwed in, and all mountings fitted on, previous to being put in the frames, each boiler shall be tested without the clothing in the presence of the Locomotive Engineer or his deputy, first with water to a pressure of 200 lb. per square inch, and afterwards in steam at the intended working pressure.

Testing.

When complete and finished in every respect, the engines will be placed by the contractor on the Railway Line, Sydney as directed in accordance with the terms of the tender.

Finishing.

The price named in the tender includes the cost of all templates and royalties, and other charges for the use of patents (if any) involved, and of the delivery of the engines in steam, to the satisfaction of the Locomotive Engineer.

Price named to include all costs.

The contractor will be held responsible for all defects in materials or workmanship until each engine shall have run at least 2,000 miles, such defects to be made good at his expense.

Mileage to run.

The contractor must deliver complete, as per specification, the engines by the dates respectively named in his tender; and should he fail to do so, a sum at the rate of £5 per week per engine will be deducted by way of liquidated damages from the price named in the tender.

Delivery within contract time.

No certificate will be given in respect of this contract after the date specified in the tender for its completion until the whole of the engines shall have been properly completed to the satisfaction of the Locomotive Engineer.

If at any time the progress made with the work by the contractor should not be such as to satisfy the Locomotive Engineer that the engines will be supplied within the prescribed time, the Commissioner shall have power and authority to cancel the contract forthwith, and to take possession of all materials connected with the contract upon which any advance has been made by him.

Progress of work.
Cancelling contract.

If the contractor become insolvent, have his estate placed under sequestration, or shall make an assignment of his estate for the benefit of his creditors, it shall be lawful for the Commissioner for Railways, without previous notice to the contractor, or to the Official or other Assignee or Assignees of his insolvent estate, or to the Trustee or Trustees under the assignment, to take such of and all portions of the engines and tenders, whether completed or not, from the contractor and of the Assignees or Trustees of his estate, and re-contract with any other person or persons to proceed with and complete the said engines and tenders upon such terms, stipulations, and conditions as shall be deemed expedient.

Insolvency.

The contractor will be required to execute a formal deed of contract with the Commissioner embodying the specification (and the terms of the tender) and the conditions necessary to ensure the due completion of the contract as stated in the Form of Tender.

Bond to be executed.

If required, temporary advances will be made on the certificate of the Locomotive Engineer, to the extent of 80 per cent. on the value of the work done in completing, to the satisfaction of the said Engineer, the following main parts of the engine, viz. :—

Advances

- (1.) The boiler.
- (2.) Cylinders (in pairs).
- (3.) Motion-work, including connecting and coupling-rods (in sets).
- (4.) Frames (in pairs).
- (5.) Wheels and axles (in sets).

Each of these parts of the engines being completed ready for erection, a further payment up to the extent of 90 per cent. of the value of each engine will be made upon delivery, in steam, on the rails, the final balance of 10 per cent. will be retained until completion of the stipulated mileage.

These temporary advances, however will not be made more frequently than once a month.

The advances to be previously secured by a bond to be entered into by the contractor, and two approved sureties.

Final payments will only be made as aforesaid on the certificate of the Locomotive Engineer that each engine has completed to his satisfaction 2,000 miles, in steam, on the rails.

Final payments.

And it is hereby expressly declared that the obtaining a certificate that the work done by the contractor has been satisfactorily executed or completed shall be a condition precedent to his having any right or cause of action in respect of any work done, or materials provided, or any right of action or claim to the payments from time to time to be made hereunder, as well as to the final payment upon completion of the contract.

Obtaining of certificate.

Wherever the names of manufacturers or special brands of material to be used are inserted in the specification, the material so specified will have to be inspected and approved by the Inspecting Engineer of the Government, in London, before any advances are made in respect of them.

Special brands of material.

The following portions only of each engine may be imported; the remainder must be manufactured in the Colony of New South Wales :—

Wheels and axles finished, including tires and crank-pins, but without eccentrics.

Buffer-springs and buffers, complete, ready for fixing.

Domes and dome seat, welded and flanged, but not bored, faced, or drilled.

Copper plates for fire-boxes, flanged (but not bent, drilled, or planed), and copper bars for Boiler-plates,

Parts to be imported.

stays.

Boiler-plates, as plates, not flanged, bent, drilled, or planed.
 Injectors for boilers, finished, ready for fixing.
 Lubricators for cylinders, finished, ready for fixing.
 Steam-pressure gauges, finished, ready for fixing.
 Safety-valve springs or spring balances.
 Steel slide-bars as forgings, not planed (except roughly to ascertain soundness), shaped, or drilled.
 Brass boiler-tubes.
 Copper pipes without flanges.
 Steel piston-rods as forgings, not turned (except in the rough to ascertain soundness.)
 Frame-plates, slotted, but not drilled, and without fixings of any kind.
 All steel and steel castings unfinished.
 Engine-springs with buckles complete and ready for fixing.

Arbitration.

Should any question arise as to the cancellation of the contract, or should the Locomotive Engineer and the contractor be unable to agree as to the price to be paid for extras, or upon any other point or matter except design and workmanship, both of which are expressly exempted and reserved from arbitration, the question in dispute shall be referred to arbitration, and shall be settled by the award, order, or determination of one or more disinterested engineers to be appointed to arbitrate thereon as hereinafter: That is to say, if the Commissioner of Railways and the contractor concur in the appointment of a single arbitrator, then the matters and questions aforesaid shall be referred to and decided by such single arbitrator; but if the Commissioner for Railways and the contractor cannot concur in the appointment of a single arbitrator, each party, on the request in writing of the other party, shall by writing under his hand nominate and appoint an arbitrator, to whom such questions and matters mentioned in this proviso shall be referred. Every such appointment shall be delivered to the arbitrator, and be deemed a submission to arbitration on behalf of the party by whom the same shall have been made; and neither party shall have power to revoke the same without the consent in writing of the other, nor shall the death of either party operate as a revocation. And if for twenty-one days after the notice in writing by the contractor or by the Locomotive Engineer, that the contractor and the Locomotive Engineer cannot agree, shall have been served, and for seven days after a request in writing to appoint an arbitrator shall have been served by the one party on the other party, such last-mentioned party fail to appoint such arbitrator, then upon such failure, the party making the request, and having himself appointed an arbitrator, may appoint such arbitrator to act on behalf of both parties; and the arbitrator may proceed to hear and determine the matter or question covered by this proviso between the contractor and the engineer aforesaid, and in such case the award or determination of such single arbitration shall be final.

If, before the matter so referred shall be determined, any arbitrator appointed by either party shall die or become incapable, the party by whom such arbitrator was appointed may nominate and appoint in writing some other engineer to act in his place; and if for the space of seven days after notice in writing from the other party for that purpose, he fail to do so, the remaining or other arbitrator may proceed *ex parte*; and every arbitrator so to be substituted as aforesaid shall have the same powers and authorities as were vested in the former arbitrator at the time of his death or disability as aforesaid.

If more than one arbitrator shall be appointed, such arbitrators shall, before they enter into the matter or question referred to them, nominate and appoint by writing under their hands, an umpire to decide on any such points on which they shall differ; and if such umpire shall die or become incapable of acting, they shall forthwith, after such death or incapacity, appoint another umpire in his place, and the decision of every such umpire on the matters referred to him shall be final.

If in either of the cases aforesaid the said arbitrators shall refuse, or shall for seven days after request of either party neglect to appoint an umpire, the Governor for the time being of the Colony of New South Wales shall appoint an umpire, and the decision of such umpire on the matters on which the arbitrators shall differ shall be final.

If a single arbitrator shall be appointed, and he shall die or become incapable to act before he shall have made his award, the matters referred to him shall be determined by arbitration under this clause as if such arbitrator had not been appointed.

If more than one arbitrator shall be appointed, and either of them shall refuse, or for seven days neglect to act, the other arbitrator may proceed *ex parte*; and the decision of such other arbitrator shall be as effectual as if he had been the single arbitrator appointed by both parties.

If more than one arbitrator shall be appointed, and neither of them shall refuse or neglect to act as aforesaid, then if such arbitrators shall fail to make their award within fourteen days after the day on which the last of such arbitrators shall have been appointed, the matters so referred to them shall be determined by the umpire appointed as aforesaid.

The arbitrator, or arbitrators, or their umpire, may call for the production of any documents in the possession or power of either party which he or they may think necessary for determining the questions or matters in dispute and so referred, and may examine the parties and their witnesses, and may inspect the works and view the place out of, from, or in respect of which, any of the matters referred to shall have arisen.

The award of the arbitrator or arbitrators, or umpire, shall be in writing, ready to be delivered to either party within three weeks from the appointment of such arbitrator, or the last of such arbitrators. This submission may be made a Rule of the Supreme Court. The amount of costs shall be decided by the arbitrators, arbitrator, or umpire.

It is to be distinctly understood and agreed by and between the Commissioner for Railways and the Contractor, that the appeal to arbitration from the certificate or decision of the Locomotive Engineer shall be limited only to such of the matters in the above proviso mentioned as subjects for the arbitration of engineers as shall be set forth in the notice in writing given as hereinbefore provided by the party requiring such arbitration; and that nothing in this clause contained shall extend to or affect or be construed to extend to or affect any decision, determination, or certificate of the Locomotive Engineer, or any other matters or questions than those in respect of which an appeal shall lie under the proviso above contained. And furthermore, that all questions as to design and workmanship are absolutely and expressly reserved and exempted from arbitration as aforesaid. If

If upon arbitration in respect of claims made by the contractor the sum awarded to the contractor shall be less than one-half of the amount of his said claim, all the costs, charges, and expenses of and incident to the said arbitration and award shall be borne and paid by the contractor; but if the amount awarded shall exceed one-half of the amount of said claim, then each party shall pay his own costs, and one-half of the arbitrators' and umpire's fees.

No work or material applied to the engine shall be deemed an extra, unless it be used in the construction of some appliance which is without corresponding use or purpose in the sample engine or is not named or indicated in the specification and plans, or unless the principal dimensions of the engine (as given on page No. 1 of the specification) or the thickness of the plates, or of the boiler-tubes, or of the tires (on the tread) are thereby increased.

Department of Public Works,
Railway Branch,
Sydney, 30th November, 1886.

CHAS. A. GOODCHAP,
Commissioner for Railways.

FORM OF TENDER FOR MANUFACTURE OF ENGINES IN THE COLONY.

GOVERNMENT RAILWAYS.

Tender for the supply of Engines for the New South Wales Government Railways (to be manufactured in the Colony of New South Wales.

Contract No.

I (or we) hereby offer to supply and deliver, in steam, on the Government Railway Lines, at Redfern or Eveleigh, as may be directed, Engines and Tenders, constructed in strict accordance with Specification No. for the following sums:—

£ each engine and tender (pounds sterling).
And I (or we) hereby undertake to deliver the first engine and tender by the 188 , and to deliver the remaining engines and tenders at the rate of engines and tenders per calendar month from the abovenamed day, thereby completing the whole contract by the 188 .

And I (or we) hereby agree to forfeit to the Commissioner for Railways a sum or sums, at the rate of £5 (five pounds sterling) per engine and tender per week, to be deducted by way of liquidated damages from the abovenamed prices respectively, or from any money due, or that may become due to me (or us) for every week, or part of a week, during which any of the abovenamed engines and tenders shall remain undelivered beyond the time or times respectively named above for their delivery, in steam, at the abovenamed Station.

I (or we) hereby name Mr. (occupation) (address) and Mr. (occupation) (address) as sureties, to enter into a Bond with the Commissioner for Railways in the penal sum of £250 (two hundred and fifty pounds sterling) per engine and tender for the due performance of the contract.

(Signed)

(Address)

(Date) 188 .

GOVERNMENT RAILWAYS OF NEW SOUTH WALES.

Specification No. 191 for a Six-coupled, outside-cylinder Goods Engine (Bogie), with Tender.

Number required—Twenty, delivered in steam at Sydney; Eight, delivered in steam in Newcastle.

PRINCIPAL DIMENSIONS.

ENGINE:—	ft.	in.
Gauge of Railway	4	8½
Cylinders, diameter	1	7
" stroke	2	0
" " distance C. to C.	6	8½
Wheels, 6 coupled and 2 bogie.		
" diameter coupled (tread)	4	0
" " bogies	2	9
Wheel-base, bogie to 1st driver	8	0
" " 1st driver to main	5	7
" " main driver to trailer	5	5
" " total	19	0
Fire-box, length inside at top	5	10½
" " " at bottom (measured on the level)	6	0
" breadth	3	5¾
Tubes, number 189.		
" diameter (outside)	0	2
Boiler, barrel	4	5
" length, barrel part	10	4
" height of C. above rail	6	9
Working pressure, 140 lbs.		
Distance between frame plates	4	1¾
TENDER (Horse-shoe, with well):—		
Wheels, number—6.		
" diameter (tread)	3	6½
" base, total	11	0
Water carried, 2,500 gallons.		

General

General Arrangement.

The general arrangement and dimensions of the several parts of the engine and tender are to be made exactly in accordance with the foregoing principal dimensions, together with such detail and other drawings as may be hereafter exhibited in connection with the specification, for the contractor's guidance.

Preparation of drawings.
Error in drawings.

In accordance with this specification, the contractor shall prepare a complete set of working (full size and general) drawings, showing the forms and dimensions of every detail of the engine and tender; and it is to be understood that the approval of such drawings by the Inspecting Engineer, shall in no way whatever relieve the Contractor of the whole or any part of the responsibility for possible error in design or dimensions, or any other matter incompatible with construction, or at variance with this specification (unless approval of such variations shall have been previously given by the Inspecting Engineer), and any loss arising therefrom shall be borne by the contractor.

The engine is to be carried on a two-wheeled bogie and six coupled wheels.

Springs.

The springs of the main driving and trailing wheels are to be coupled by balance beams, to equalize as much as possible the weight on the rails, and provision is to be made, by supplying extra beams (and fixings attached to the frames to receive the same), to enable the springs of the leading pair of driving wheels to be also coupled at any time to those of the main driving wheels, or the engine to be worked with the front driving springs independent, as may be required. The fulcrum pins and various joints of these connections to be made an easy fit, and with special provision for efficient lubrication throughout.

The flanges of the middle pair of driving wheels are to be reduced to half the thickness of the others.

Cylinders.

The cylinders are to be placed horizontally, and are to be made of fine close-grained cast-iron, perfectly free from honeycomb, and of the utmost degree of hardness compatible with the requirements of machining.

The flanges are to be bolted to the frames by turned bolts driven in a dead tight fit, all the holes being bored out and rymered true with those in the frames.

Slide-valves.

Valve-faces.

The slide-valves are to be of hard gun-metal; they are to be stiffened by two suitable ribs outside, the valve-faces to be scraped through, and in slotting the ports the corners are to be rounded to $\frac{5}{8}$ " radius. The junctions of the valve-face with the sides of the chest, top and bottom, are to be recessed $\frac{1}{8}$ " deep and $\frac{1}{16}$ " wide, with a round-nosed tool, to facilitate the scraping of the valve-face.

Lap and lead.

Cylinder covers.

The slide valves are to have $\frac{1}{8}$ " lead, $\frac{7}{8}$ " outside lap, and no inside lap.

Mud-cocks.

The cylinder and steam-chest covers are to be truly turned and planed and scraped to faces, and the joints made metal to metal; all nuts to be case-hardened. The front and back covers are to be fitted with polished covering plates. Each cylinder is to be fitted with a mud-cock at each end, worked simultaneously by suitable cross-shafts and rods from the foot-plate; also, each valve-chest to have one mud-cock at back end, similarly worked.

Pistons and Cross-heads.

The pistons to be of cast-iron, with cast-iron packing rings $\frac{3}{4}$ " wide and $\frac{7}{16}$ " thick. Piston-rods to be of mild cast-steel with coned ends, secured to the pistons by screwed wrought-iron nuts (6 threads per inch) with split pins; front end of piston-rod (reduced in diameter) to be carried forward through front cylinder cover, with suitable stuffing-box, gland, and sleeve. The pistons are to be turned $\frac{1}{32}$ " less than the diameter of the cylinders, and the rings $\frac{1}{4}$ " larger than the cylinders, and cut and sprung into their places. The pistons to have $\frac{3}{8}$ " clearance at each end of the cylinders. The cross-heads to be of wrought-iron, case-hardened, the bearing-pins of mild steel.

Cross-heads.

Slide-bars and Blocks.

Slide-bars.

The slide-bars to be of cast-steel, as hard as possible, with copper liners at both ends for adjustment.

Slide-blocks.

The slide blocks to be of hard cast-iron, with guide flanges 1" deep and shoulders front and back of cross-head (to take the strain off the socket).

Connecting-rods.

Connecting rods.

The connecting-rods are to be of wrought-iron, forged in one length, without weld; the small end to be solid,—the large end to be forked and finished with a block and stout tapering bolt. The brasses (both ends) to be in two halves, those at the large end being tightened with a steel cotter, and those at the small end with a tapering steel cotter block, and wrought-iron (case-hardened) or steel liner. Brasses (except from small end) to be flat-ended. Length, 6' from centre to centre.

The oil-cups are to be forged on solid, and finished with screwed brass covers. The bearing brasses are to be of the best hard and tough gun-metal.

Coupling-rods.

Coupling-rods.

The coupling-rods are to be of the same material as the connecting-rods, and similarly made and finished.

They are to be parallel in the body, and to have solid ends to receive the gun-metal bearings in two parts. Each bearing is to be secured by a steel cotter, and made and finished similarly to those for the connecting-rods. The joint is to be in front of the main driving wheel, the pin being secured by a $\frac{1}{2}$ " split pin passing through it and the outer jaw.

NOTE.—The section of the body part of the connecting and coupling rods to be suitably proportioned to the size of cylinders, &c.

Link-motion.

Links.

The link-motion is to be of wrought-iron, and got up bright throughout. It is to be well fitted, and all joints and rubbing surfaces and pins are to be thoroughly case-hardened. The links are to be curved, and are to be suspended from the centre, the weigh-bar shaft being above.

The

The valve-spindles are to have glands and stuffing-boxes at both ends, and are to be connected to the valve-rods by iron socket joints and pins with steel cotters secured by split pins, the joint being suitably guided. The buckles, which are to be in one piece (solid) with the spindles, are to be accurately fitted to the valves. The valve-rods are to be suspended from the cross-stay plate by iron links, pins, &c.

The link-blocks are to be of cast-steel or iron case-hardened, suitably guided at front end.

The eccentric rods and straps are to be of wrought-iron, with solid oil-cups, and brass covers screwed in; and the rods are to be made with T ends, and attached to the straps, each by two $1\frac{1}{8}$ " bolts, secured by double nuts and split pins.

The two halves of the straps are to be bolted together by 1" bolts, with square heads, and to have brass distance-pieces 1" thick between the lugs, secured by double nuts and split pins. They are to be fitted with gun-metal semicircular liners. The bolts to be screwed, 11 threads per inch.

The larger part of the eccentric sheaves is to be of cast-iron, and the smaller part of wrought-iron, unless steel castings be substituted for both. The two parts are to be bolted together by two $1\frac{1}{8}$ " screwed pins with steel split cotters. Each sheaf to be fixed on the axle by a steel key, well fitted halfway into the axle, also by two tight-fitting steel set-screws projecting through into the axle, and secured with lock nuts. Set-screws to be tempered.

All pins and joints in the link-motion are to be a good fit, and thoroughly case-hardened.

The weigh-bar shaft is to be made with solid arms, soundly welded on. The outer, or "reversing arm," is to be forged in one piece with the bar, the weld (if any) being at the mid-length of the arm. It is to be carried in cast-iron brackets, with bearings 4" long.

The reversing-gear to consist of a double-threaded left-hand steel screw $2\frac{5}{8}$ " diameter, with square threads 2" pitch, engaging a wrought-iron (case-hardened) nut 8" long, the whole to be carried in a cast-iron bracket fixed on the right-hand side of the engine.

The screw is to have suitable thrust, &c., bushes, and to be fitted with a circular collar and catch, to secure it in any position.

The link-motion is to be balanced by two cast-iron weights.

The whole of the link-motion and gearing, as well as the connecting-rods, coupling-rods, and all parts of the engine and tender that have to stand a working strain, such as spring links, brake-work, &c., are to be made (except when otherwise specified) of best charcoal iron, or carefully selected best Yorkshire scrap, of the finest quality, clean, well hammered, and free from all defects. Oil-holes must be provided to all joints.

Framing.

The framing to be of the type known as "plate-frame," and manufactured by John Brown & Co., Monkbridge, or Parkgate Iron Cos. The plates to be $1\frac{1}{4}$ " thick, weldless throughout.

They must be broad enough to form axle-forks out of the solid plates, and are to be slotted in pairs.

They are to be fastened together by the front buffer-plate,—by a horizontal $\frac{3}{4}$ " plate extending from front buffer-beam to behind the smoke-box tube-plate (flanged upwards along the sides), forming the bottom of the smoke-box,—by a $\frac{5}{8}$ " vertical cross-stay plate (flanged all round) behind the steam-chests, and by a $\frac{3}{8}$ " horizontal plate (flanged downwards along the sides) beneath the steam-chests,—by a $\frac{3}{4}$ " vertical cross-stay plate which carries the valve-rod guides,—by a $\frac{3}{4}$ " vertical cross-stay plate (flanged) in front of the fire-box, and behind the fire-box by a cast-iron draw and foot-plate.

The axle-forks are to be fitted with cast-steel horn blocks, those of the main driving and leading coupled axles being united in one piece. The front blocks of each axle are to be fitted with case-hardened wrought-iron parallel liners, the blocks to be cast with suitable bosses to receive $\frac{7}{8}$ " bolts with counter-sunk heads, for fastening the liners. The main driving and leading coupled blocks are also to have long bosses for guiding the spring pillars. The forks are to be stayed together by wrought-iron keeps.

The motion bracket, which is to be $1\frac{1}{4}$ " thick, is to be flanged and secured to the outside of the frames by 1" turned bolts, the flange to run from top to bottom edge of frame (platform iron made to suit).

The cross-stay plates are to be $\frac{3}{4}$ " thick, flanged and secured to the frames by $\frac{7}{8}$ " rivets.

The engineman's foot-plate is to be of cast-iron suitably cored out for the drawbar and shackles, and firmly secured to the frames by $1\frac{1}{8}$ " turned bolts. A central buffing wedge-block to be provided.

The draw-gear is to consist of a central wrought-iron bar, $2\frac{1}{2}$ " diameter, and two safety shackles $1\frac{1}{4}$ " x $1\frac{3}{4}$ ", with suitable wrought-iron pins.

A hinged flap-plate, suitably curved, is to cover the space between the engine and the tender.

The buffer-plate is to be of wrought-iron or steel, bolted to the angle-irons riveted at the ends of the frames, and stiffened at either side by corner brackets, to transmit the thrust of the buffers to the frames.

Turton's patent buffers are to be supplied, pattern H $1\frac{1}{2}$ in Turton's catalogue, centred, 5' 9" apart and 3' 4" from rail.

The front buffer-plate is to have a stout wrought-iron draw-hook, fitted with an indiarubber spring and washer-plate on the inside, secured by a nut and split cotter. There are also to be two safety chains (links made of 1" iron) and hooks.

There are to be side platforms continuous from the front buffer-plate to the rear end of the foot-plate, attached to the frames by angle-irons, and by the corner brackets for carrying the brake-hangers; the outer edge of the platforms to be stiffened by a 3" angle-iron.

The upper portions of the wheels are to be covered in by cast-iron splashers, secured to platforms by bolts.

The frames are to be fitted with suitable wrought-iron brackets, to take the equalizing beams and spring links.

Bogie.

The bogie is to have two wheels and a radial arm, the weight from the engine being transmitted through a large cast-iron slide plate.

The entire frame is to be of cast-iron, in one piece, and carefully annealed.

The bogie is to be fitted with the ordinary laminated bearing springs, and to have side check-springs of the same type.

Wheels.

Valve-spindles.

Buckles.

Valve-rods.

Guides.

Link-blocks.

Eccentric rods

and straps.

Sheaves.

Pins.

Weigh-bar shaft.

Reversing.

Balance weights.

Materials for

link-motion.

Material.

How made.

Axle-forks.

Fastened

together.

Horn blocks.

Liners.

Axle-fork keeps.

Motion bracket.

Engineman's

foot-plate.

Draw-gear.

Flap-plate.

Front buffer-

plate.

Buffers.

Front draw-gear.

Side platforms.

Splashers.

Brackets for

spring link, &c.

Frames.

Bearing-springs.

Wheels.

All the engine wheels are to be of wrought-iron, forged out of the best selected well hammered scrap, and neatly smithed and hand-dressed.

Coupled wheels. The spokes to be forged with solid T ends (unless special appliances be provided for dabbing on the rim pieces under the steam-hammer). The six coupled wheels to have fifteen spokes each, and to be suitably bossed for the crank-pins and axle-ends.

The whole of the wheels to be manufactured according to the most approved modern method, and as far as possible die forged.

Bogie wheels. The bogie wheels are to have nine spokes each, and to be made and finished after the same manner as the coupled wheels.

Welds. The welds in bosses, spokes, and rims must be thoroughly sound and free from all defects, as any defective welding will necessitate the rejection of the wheel. The wheels are to be turned or planed on the faces of the bosses, and turned on the faces and edges of the rims; they are to be tooled round the axle and crank-bosses, and the spokes are to be chipped and neatly finished by hand. They are to be forced on the axles by hydraulic pressure of $1\frac{1}{2}$ tons per square inch of the area of the hole for the axle, and each wheel is to be secured by a strong steel key, let halfway into the axle (on the same side as the crank-boss in the coupled wheels), carefully fitted all ways, having a taper on the flat of 1 in 96, and driven in with a sledge-hammer, or tup.

Wheels fixed on axles. The crank-pin holes of the coupled wheels are to be bored out taper and countersunk, and the pins are to be pressed in by hydraulic pressure, and riveted up cold. Crank-pins to be of Vickers' mild cast-steel.

Crank-pin holes. The crank-pin holes of the coupled wheels are to be bored out taper and countersunk, and the pins are to be pressed in by hydraulic pressure, and riveted up cold. Crank-pins to be of Vickers' mild cast-steel.

Tires.

Tires. The tires to be of Vickers, Sons, & Co.'s cast-steel ("Australia" brand), $2\frac{3}{4}$ " thick on the tread. They are to clip the wheel-rims on the outer edge, and to be bored out and shrunk on tight, and secured with screwed studs. They are to be stamped with the maker's name and date of manufacture.

Thin flanges. The flanges of the middle pair of driving wheels to be reduced to half the thickness of the others.

Axles.

Axles. The axles throughout to be of Vickers, Sons, & Co.'s cast-steel, and of the following dimensions:— Bogies, $5\frac{1}{4}$ " diameter in the middle, with bearings $5\frac{1}{2}$ " diameter by 10" long; leading and trailing coupled, $6\frac{1}{2}$ " diameter in the middle; driving, $6\frac{3}{4}$ " diameter, the whole of the driving bearings being 7" diameter by $8\frac{1}{2}$ " long. The main driving axle to be turned 7" diameter on the eccentric seats.

All axles to be stamped with the maker's name and date of manufacture.

Axle-boxes.

Driving. The boxes for the coupled axles are to be of wrought-iron (case-hardened), and fitted with semi-circular bearings of hard gun-metal; they are to be planed to fit the axle-box guides, and fitted with syphon-tubes and covers.

Keeps. The brasses are to be finished $\frac{1}{8}$ " shorter than the journals. The axle-box keeps are to be of cast-iron; in the case of the trailing, suitably shaped for the spring-hangers and pins.

Bogie axle-boxes. The bogie axle-boxes to be of cast-iron, planed to fit the axle-box guides, to have hard gun-metal bearings, cast-iron keeps, two syphon holes in each box, and wrought-iron covers.

Springs.

The bearing and side-check springs are to be manufactured by makers of good repute only, and to be of the best spring steel, and stamped by the maker. The ends of the upper plates are to be made with eyes slotted in the middle to receive the links, and bored to receive the pins. The buckles are to be of wrought-iron, shrunk tightly on; those for the bogie springs are to be made with a shank or pillar forged solid with the buckle, to sit on the axle-box. The pins, links, and link-brackets on frames are to be well case-hardened. All spring links to be made with solid eyes and plain pins (no screwed ends to be used). Driving spring pillars to be $1\frac{1}{2}$ " diameter.

Testing. Each spring must be tested before being used, and should sustain a load producing double the working displacement, without permanent set or deflection.

Boiler.

Material. All the plates used in the boiler shell and dome, as well as the angle-irons and rivets, are to be of the best Yorkshire iron, manufactured either by the Lowmoor, Bowling, Farnley, Monkbridge, or Taylor Bros., care being taken in bending the plates to leave the brand of the manufacturer visible outside. The brand of iron to be used to be named in tender.

Plates to be planed. All the plates, butt-strips, and hoops to be planed or turned on their edges.

Barrel. Prevailing thickness of plating in boiler shell (when not otherwise specified) to be $\frac{1}{2}$ ".

The barrel is to be 10' 4" long, and 4' 5" diameter, outside. It is to consist of three plates, with one longitudinal joint each, placed in a line between water-level and base of dome, alternately right and left side of engine, and circumferential butt joints; the longitudinal joints to have lap-plates both inside and out, and to be double riveted, zig-gag, the circumferential joints to have outside lap-plates only, and to be single riveted, the lower portion, for one-third of the circumference, to be protected inside by lap-plates $\frac{1}{4}$ " thick.

Front tube-plate. The front tube-plate, $\frac{1}{2}$ " thick, is to be flanged, to take the smoke-box side-plates. It is to be carried down, flanged, and bolted to the smoke-box floor-plate. It is to be attached to the boiler by an angle-iron $4\frac{1}{2}$ " by $3\frac{1}{2}$ " by $\frac{1}{2}$ " thick, turned inside and on the face and edges, single riveted to the tube-plate, and double riveted to the boiler-barrel. The edge of the front barrel-plate is to butt closely against tube-plate.

Fire-box casing. The front fire-box casing-plate is to be $\frac{1}{16}$ " thick, flanged forward with a radius (outside) of $1\frac{1}{4}$ ", to overlap the barrel-plate outside, and flanged backwards at the sides to form a lap joint inside the side-plates. The

The back casing-plate is to be flanged with a radius (inside) of 3', to form a joint with the side-plates in a similar manner. The sides and top are to be formed of three plates, which are to lap each other and the barrel as well as the front and back casing-plates, and are to be single riveted throughout, except at the horizontal joints, which are to be double riveted, zig-zag. The side-plates are to be lapped round the lower corners of the front and back plates, and riveted thereto, to form a double thickness for the mud-plugs.

A wrought-iron dome, 1' 9" diameter inside, and 2' 11½" high, is to be fixed on the middle plate of the boiler-barrel. It is to consist of a double-flanged seating, 6" high at shallowest part, formed out of specially-rolled L iron or plate, welded up solid, the lower flange curved suitably to the boiler-barrel, the upper flange to be 1½" thick (after being turned and faced). The upper portion of the dome to consist of a hemispherical-ended cylinder, terminating below in a faced flange 1½" thick, made similar to the seating, the whole being welded up solid. The lower joint-face to be recessed ½" deep, to fit a corresponding projection on the upper face. The lower flange of dome-seat to be single riveted to boiler-barrel; the hole in the barrel to be 1' 4" diameter, the edge of the barrel-plate being stiffened by two wrought-iron rings 2¼" x 1" (riveted one inside and one out). Dome.

There is to be a man-hole, 1' 1" diameter, on the crown of the fire-box casing, fitted with a wrought-iron ring (double riveted), forming a seating, to which is to be attached by ¾" studs a wrought-iron cover. Man-hole.

The wrought-iron cover is to be turned on both sides, and at the outer edge underneath is to be recessed to take the upper edge of the brass moulding of the clothing. It is to be bored, and fitted on the upper side to take the columns of two Ramsbottom's 3½" safety valves and other fittings, all of which, except the spring, the lever, and their attachments, are to be of gun-metal. The valves to be set to a working pressure of 140 lbs. per square inch. Safety valves.

The top fire-box casing-plate is to have two double transverse rows of angle-iron, bent to the proper curve and firmly riveted to the plate, to carry the roof stay-slings. Crown plate
L irons.

The smoke-box tube-plate and the back fire-box casing-plate are to be stayed to each other by seventeen longitudinal wrought-iron through-stays (eleven threads per inch), made with forged heads, and screwed with copper washers into the back casing-plate; front end 1¼" diameter and parallel, body part 1½" diameter, back end 1¾" diameter (largest), and tapering 1 in 16. Longitudinal
stays.

They are to be adjusted to the tube-plate by a nut and copper washer on each side. The upper portion of the back casing-plate, where the stays and fire-box fittings are attached, is to be strengthened by a ½" plate inside, suitably riveted. The longitudinal through stays are to be supported at mid-length by a plate ½" thick, and not less than 4" wide, riveted to the barrel, and by slings where required.

The plates (as well as the stays and rivets) of the fire-box are to be made of the best selected copper, manufactured either by the Broughton Copper Co., Pontifex & Wood, Vivian & Sons, Pascoe, Grenfell, & Sons, or Nevill, Druce, & Co. They are to bear the maker's stamp, which is to be placed so that it can be seen after the boiler is finished. Copper fire-box.

The fire-box plates are to be ½" thick, except the portion of the front plate which receives the tubes, and which is to be ¾" thick.

Strips must be cut off the plates, and they, with the bars for the stays and rivets, must stand the test of being bent double when cold, without any sign of cracking. If any cracks appear in any of the strips or bars, they must be annealed; and if, after being annealed, the same do not stand the test of bending cold, the plates or bars from which such test pieces have been cut must be rejected. Testing,

All copper stays to be thoroughly annealed before being screwed.

The tube and back-plates are to be flanged to a radius of 1" inside at the top and round the tube space, otherwise 1½", to make lap-joints with the roof and side-plates. Tube and back
plates.

The sides and roof are to be in one plate, the top corners bent to a 5" radius. Sides and roof.

Special care and attention should be directed to all corners of the copper box, as any signs of cracking or injury will necessitate rejection. Care in flanging.

The prevailing water-space between the outer and inner plates at the bottom is to be 2⅝" all round. Water-space.

The joint at bottom of fire-box and casing is to consist of a solid wrought-iron forged ring 2⅝" deep at the shallowest part, with ¾" iron rivets. The plates, both inside and out, reach to within ⅝" of the bottom of the ring, and the centre-line of the rivets is to be 1⅝" above the bottom of the same. Bottom ring.

The ring is to be brought down at the corners to take a double row of rivets, and at the sides to carry the ash-pan.

The fire-hole is to be oval, 11½" x 14½", the joint being formed by a solid wrought-iron ring 2⅝" wide (planed on both sides), with ¾" rivets countersunk on the outside, and finished flush. Fire-door ring.

The roof of the fire-box is to be strengthened by wrought-iron girders, 2½" thick by not less than 7" deep at the middle, carefully bedded at the ends, to the front and back edges of the box. Roof stays.

The space between the top of the box and the girders is to be not less than 1½". The top of the box is to be attached to the girders by 1" set-screws (standard Whitworth thread), tapped into the girders from below. The screws must be a tight fit in the holes in the roof-plate, the throats being left full and screwed well home, the corners of the head next the plate being chamfered off. Wrought-iron ferules to be used as distance-pieces, covering as little area as possible. Space between
roof-stays and
box.
Roof bolts.

Twelve safety links, with oblong holes (to permit the free expansion of the fire-box crown, when heated) are to be suspended between the six intermediate girders and the transverse angle-irons on the roof of the casing, the girders being forged with suitable lugs for this purpose. Safety links.

The roof-plate is to be fitted with a fusible lead plug, 1¼" diameter at the point (tapered 1 in 6), and screwed 10 threads per inch, and bored and tapped ⅞". The box is to be stayed to the shell by copper stays ¾" diameter, screwed 10 threads per inch, centred not more than 4⅝" apart C. to C., screwed tightly into both plates, riveted over at both ends, and with a sufficiently large head inside. The thread is to be turned off in the water-space. The first rows on the sides are to be centred 8⅞" from the outside of the front and back casing-plates, and at the front and back 7⅝" from the outside of the side casing-plates. The tube-plate is stayed to the barrel-plate below the tubes by eight 1" copper stays, screwed 10 threads per inch, tapped into the copper plate and into wrought-iron sockets, riveted to the barrel, and riveted over on the outside. Lead plug.
Copper stays.
Lower barrel
stays.

All rivets used in the boiler-shell are to be ¾" diameter, centred 1¼" apart, except those attaching the angle-iron to the front tube-plate, which are to be ⅝" diameter, and those in the fire-door and foundation and man-hole rings, which are to be ⅞" diameter, centred 1⅝" apart. Those in the copper-box (excepting Rivets.

- (excepting the foundation ring) are to be of copper, and $\frac{3}{4}$ " diameter. All the rivets must completely fill the holes, and the riveting is to be done by steam or hydraulic power, wherever it is possible to do so, for which special appliances must be provided. Rivet-holes, if necessary, to be adjusted by ryming; no drifting to be allowed.
- Steam riveting.**
- At each bottom corner of the fire-box casing there is to be a gun-metal wash-out plug $1\frac{1}{4}$ " diameter (at small end), fitting into a gun-metal bush 2" diameter screwed into the casing-plate. There is also to be an oval mud-hole with suitable cover, &c, at lowest part of throat-plate; also, two $1\frac{1}{4}$ " plugs in the front tube-plate, on a level with the lowest row of tubes. There are also to be two $1\frac{1}{4}$ " plugs at the back of the fire-box casing, above the level of the top of the copper-box (for filling). All the foregoing are to be screwed 10 threads per inch, and tapered 1 in 16.
- Wash-out plugs.**
- A brass blow-off cock, fitted with a pipe leading to ash-pit, is to be fixed by a flange and studs to the fire-box casing on left side, and worked by a handle placed conveniently above the side platform.
- Blow-off cock.**
- The fire-bars are to be of wrought-iron, carried on two round wrought-iron bars shaped at the ends to fit into suitable brackets bolted to the prolonged portion of the fire-box foundation ring. These carrier bars are to be drilled and fitted with pegs (not tapered) of $\frac{7}{8}$ " round iron, centred 2" apart to regulate the spacing of the fire-bars.
- Fire-bars.**
- The ash-pan is to be of wrought-iron, the full length and width of the fire-box, and is to have a tight-fitting damper door at both front and back, with a hinge-bar running the full length of the door, and worked from the foot-plate by suitable levers and rods, having convenient notches and lips; they must also have springs to prevent rattling and flying out of gear. The bottom is to be stiffened by cross angle-irons, inside, at front and back ends.
- Ash pan.**
- The fire-door is to consist of two sliding wrought-iron plates, and is to be provided with a wrought-iron deflector and fender mouth-piece.
- Fire-door.**
- The fire-box to be fitted at front end, with a fire-brick arch, supported by angle-irons attached to the side-plates by studs.
- Brick arch.**
- A swan-necked cast-iron pipe 4" diameter is to be fixed in the steam-dome. The lower portion is to be attached by an angle-iron bracket to the dome-base. It is to be surmounted by a gridiron regulator valve of gun-metal, working on a cast-iron seat having suitable ports, placed as high in the dome as possible, and worked by levers and rods from the foot-plate.
- Regulator.**
- The stuffing-box is to be of gun-metal, with suitable stops to limit the travel of the handle, and stamped "Shut" and "Open" on the right and left-hand respectively.
- Stuffing-box.**
- A copper pipe 4" diameter inside, and No. 9 W.G. thick, is to connect the regulator with the T pipe in the smoke-box. It is to be fitted to the regulator pipe by a gun-metal cone, brazed on, and secured by a circular wrought-iron clip, cast-iron split bush, and two bolts, the hole in the clip being large enough to slip over the cone; it is to terminate at the front end in a gun-metal flange (brazed on), and to be bolted to the tube-plate by seven $\frac{3}{4}$ " studs.
- Steam-pipe.**
- There is to be a cast-iron T pipe in the smoke-box fixed by the studs which secure the flanges of the steam-pipe. Copper pipes 4" diameter inside, and No. 7 W.G. thick, with gun-metal flanges brazen on, are to connect the T pipe with the cylinders.
- T pipe in smoke-box.**
- They are to be bent round the sides of the box to clear the line of tubes. The copper pipes are to project 1" through the bottom flanges into the valve-chests. Circular recesses are to be cut in the valve-chest castings for corresponding projections on the flanges of the steam-pipes to fit into.
- A No. 2 Roscoe's lubricator to be attached to each side of smoke-box, with copper pipe leading into centre of cylinders.

Flue-tubes.

- The tubes are to be of brass, solid drawn, and of the best quality, manufactured either by the Broughton Copper Company, Elliott's Metal Company, Allan, Everett, & Sons, J. Wilkes & Company, or other good makers, subject to the approval of the Inspecting Engineer.
- Material and make.**
- They are to be 189 in number, and 2" outside diameter, swelled to $2\frac{1}{16}$ " diameter in front tube-plate, and are to bear the maker's stamp. Thickness, No. 10 W.G. at the fire-box, and No. 12 W.G. at the smoke-box end.
- Number and diameter.**
- Care must be taken to make the tubes perfectly steam-tight at both ends, by rolling them with Dudgeon's expanders.
- Steel ferules.**
- Tapering steel ferules are to be inserted at both ends. The tubes are to project $\frac{1}{2}$ " beyond the fire-box tube-plate, and $\frac{3}{8}$ " beyond the smoke-box tube-plate when fixed, and they are not to be rolled over or beaded at the ends.

Smoke-box.

- The smoke-box to be of the "extended" type; plates, L irons, rivets, and forgings to be of the best Staffordshire iron.
- The sides of the smoke-box are to be attached to the tube-plate by $\frac{5}{8}$ " rivets, and to be carried down and bolted to the frames. The front plate is to be connected to the side plates by an angle-iron (riveted), and to be stiffened round the doorway by a 3" L iron (riveted).
- Door.**
- The door is to be circular and dished, flanged $1\frac{1}{2}$ " all round the edge, and carried by two wrought-iron hinges. It is to be fitted with a $\frac{1}{4}$ " protecting liner, attached by rivets and ferules, with an air-space of $\frac{3}{4}$ " at the edges. It is to be kept closed by a central handle with a minor locking handle and screw, with a removable horizontal cross-bar.
- The smoke-box must be made perfectly air-tight, by bringing down the plates square into the corners.
- The exhaust-pipe is to be of cast-iron, with branches leading from each cylinder and uniting at the centre; the diameter at the top is to be $4\frac{3}{4}$ " inside. All the joints to be planed and scraped metal to metal.
- Spark-arrester.**
- Spark-arresters to be fitted of the best design known for the prevention of burning matter being emitted.
- Chimney.**
- The chimney is to be of wrought-iron, the base being formed of a plate welded up without seam, and shaped on a block to suit the curve of the smoke-box. The barrel is to be made of one plate, with a butt joint and inner lap-plate. It is to be fitted into and riveted to the base. It is to be surmounted by a polished copper top. All the rivets in the chimney are to be countersunk outside, and finished flush. The extreme height from rail to chimney top is to be 13' 6".
- A

A blower-cock is to be fixed on the boiler behind the chimney, worked from the foot-plate by a Blower spindle passing through the right-hand rail. A copper pipe is to lead the steam to the top of blast-pipe. Hand-rail. A No. 2 Roscoe's patent lubricator is to be fixed on each side of the smoke-box, with a copper pipe leading into the centre of each cylinder.

A hand-rail is to be fixed to the front of the smoke-box, continuous with the side-rails.

Injectors.

Two No. 9 Giffard's injectors (Gresham and Craven's make) are to be provided. They are to be Injectors. carried by wrought-iron brackets bolted to under-side of cast-iron foot-plate, and fitted with waste-water cock and copper pipe to carry the waste water below the edge of the platform.

The injectors, clack-boxes, and cocks are to be of gun-metal, and the steam, suction, delivery, and Injector-pipes. overflow pipes of copper, with gun-metal flanges. The steam pipe is to be $1\frac{3}{8}$ " diameter inside, No. 11 B.W.G.; the delivery pipes $1\frac{5}{8}$ " diameter, and No. 10 B.W.G.; and the suction pipes $1\frac{5}{8}$ " diameter, No. 12 B.W.G. The injector feed-pipes to be carried by wrought-iron hangers attached to the under-side of the foot-plate.

Fire-box Fixings.

The fire-box fixings are to consist, in addition to those already mentioned, of the following:—

One Bourdon's patent metallic pressure gauge, indicating up to 200 lbs. per square inch, with cock Gauges, &c. and copper pipe. Two glass gauges (one right and one left side), with top and bottom cocks, and waste-water cocks and copper pipes, fixed to back casing-plate with stout gun-metal flanges and studs; one whistle, connected with a branch from the body of the hind safety-valve, and placed at such a height as to enable the steam to pass above the cab roof. There is also to be an iron socket screwed into the back casing-plate, to carry the gauge-glass lamp, and a wrought-iron tray (with angle-iron rim) fixed with studs above the fire-door. All the cocks and fittings are to be made of gun-metal, unless specially named to the contrary, and all fittings screwed into the boiler are to have 11 threads to the inch, unless otherwise specified.

Clothing.

The boiler is to be covered with dry pine battens, 1 inch thick, tongued and grooved. At each Boiler-clothing. joint of the lagging-plates a wrought-iron hoop, 2" wide by $\frac{3}{8}$ " thick, is to be put on (in two halves) screwed together with countersunk screws to metal joint-blocks let in through the battens and bearing on the boiler; also distance-pieces, about 20 inches apart, bearing on the boiler, to adjust the hoops to the proper distance. All are to be finished flush with the outer surface of the wood lagging, and covered with sheet-iron, No. 16 W.G., and bound together round the barrel and over the fire-box casing with hoop-iron.

The dome is to be enclosed in a helmet-shaped casing of charcoal sheet-iron. Polished brass Dome casing. mouldings are to be fitted round the back corners of the fire-box casing, the smoke-box angle-iron, and under the safety-valve seating.

The front corners of the fire-box casing are to be fitted with mouldings of charcoal sheet-iron.

The House.

The house is to consist of a front weather screen of $\frac{3}{16}$ " sheet-iron, carried by an angle-iron, secured Cab to four suitable wrought-iron brackets riveted to the top of the fire-box casing, and of a curved $\frac{1}{8}$ " sheet-iron roof-plate, stiffened at front and back ends by a light $2\frac{1}{2}$ " angle-iron, and fitted with longitudinal $2\frac{1}{2}$ " light angle-irons to take the wrought-iron supporting pillars. The roof-plate is to extend backwards the full length of the foot-plate, and in front of weather-screen $12\frac{1}{2}$ ", and is to be attached to the latter by a light 2" L iron. The outer edges of the roof-plate, along the sides, are to have light 1" L irons from end to end, to act as gutters.

The weather-screen is to be 5' $9\frac{1}{2}$ " wide in body part widened out at top to meet side L irons. It Weather-screen. is to be fitted with two swivelling circular windows, fixed in brass frames, &c. The pillars are to be connected 3' above the foot-plate by a polished wrought-iron hand-rail, and the space is to be filled up by a $\frac{3}{8}$ " wrought-iron panel-plate fastened to the platform by light 2" L iron. The gaps at front end between panel-plates and fire-box casing are also to be filled up by $\frac{3}{8}$ " wrought-iron plates.

Brakes.

An efficient hand-brake is to be fitted to the engine, as well as the tender, consisting of an $1\frac{3}{8}$ " screw spindle with a square thread, having a $\frac{3}{8}$ " pitch with a 12" double-ended hand-lever at top, and an 11" lever on brake-shaft at lower end with a suitable screw-nut. The handle for working it is to be placed on the left-hand side of the foot-plate, and is to be carried on a hollow cast-iron pillar bolted to the foot-plate by four $\frac{3}{4}$ " bolts. There is to be a wrought-iron hanger, with cast-iron block, fitted to each of Hangers. the six driving wheels, and a wrought-iron brake-shaft $3\frac{1}{4}$ " diameter carried by cast-iron brackets bolted Brake-shaft. to the frames, and having the arms forged on solid, the screw-arm being forked and bored to take the screw-nut.

The right-hand end of the shaft is to be made with an arm suitable to couple up with a steam-brake cylinder, which is to be bolted to the frame-plate and controlled by a steam cock on back casing-plate, fitted with all necessary pipes, &c.

Efficient gear to be provided for supplying a jet of water from the tender to the tire of each Water-jet to wheel of engine and tender, immediately above each brake-block (for cooling), the whole to be controlled tires. by suitable handles, &c., from tender foot-plate.

Hand-rails.

There are to be polished hollow wrought-iron hand-rails along the sides of boiler, supported by three cast-iron carriers on either side, each bolted to a short piece of L iron riveted to the barrel of the boiler. The hand-rail to be continuous round front of smoke-box, and suitably attached to the same.

Sand-boxes.

Large cast-iron sand-boxes, capable of carrying 7 cubic feet of sand each, are to be fixed to the platforms forward of the front coupled wheels, and worked, both sides simultaneously, by suitable levers and rods from the foot-plate.

The

Sand-pipes.

The sand-pipes to be of wrought-iron, $1\frac{3}{4}$ " diameter inside, attached by suitable flanges and studs to the boxes, and bent in such a way as to convey the sand as near as possible to the tread of the wheel.

Lamp-brackets.

A head-lamp bracket to be fixed on each side of the front buffer-beam, in line with buffers.

Painting.

After being tested, the boiler is to receive two coats of metallic oxide paint, and when dry the clothing is to be put on. When finished, the engine is to receive not less than two coats of lead-colour in oil. The whole of the surfaces requiring it are then to be filled up with hard stopping, and after being well rubbed down smooth are to receive a third coat of red colour in oil, and to be finished with two coats of selected colour in oil and two coats of varnish.

Tool-box and Tools.

Each engine is to be provided with a portable wooden tool-box 3' 3" by 2' 0" by 1' 9" (to be carried on the top of the tender), made of oak or tallow-wood, bound with iron at the corners, and the lid covered with galvanized sheet-iron; to have strong hinges, hasp, and padlock, and till inside at one end; also two monkey-wrenches (one large and one small); one heavy hammer; one light hammer; one copper hammer; two flat chisels; two cross-cut chisels; two pin punches; one complete set of screw-keys to fit all nuts; two short keys for piston glands; two short keys for valve-spindles; light close-ended keys for all syphon covers; one fire-bucket; one fire-shovel; one fire-dart; one fire-pricker; one rake; one pinch-bar (large); one tube-plug socket-rod and six tube-plugs; two 15-ton traversing screw-jacks, with ratchet, ratchet-head, and jackbars; two oil-cans (one large and one small); two oil-feeders (one large and one small), copper tallow-kettle, hand-brush, and gauge-lamp.

Pitch of Screws.

The threads of all bolts, studs, and nuts are to be cut to Whitworth's standard, unless where specially stated to the contrary. Where fine threads are specified, eleven threads per inch are to be used, except in the case of piston-rods, the threads of which are to be six per inch. All bolt-heads and nuts are to be hexagonal, and measured across the corners are to equal twice the diameter of the bolt (except in the larger sizes of bolts, in which case the next size less for heads and nuts may be taken if more suitable). The size across the flats will not therefore be Whitworth's standard.

Lubrication.

Special care is to be taken in designing oil-cups, &c. (especially for reciprocating parts of the gear), to prevent the oil being thrown out and wasted when the engine is in motion.

Wire-gauge.

The Birmingham wire-gauge is to be used.

Case-hardening.

All the motion-work, brake-work, the nuts of the cylinders and glands, and all journals, pins, joints, and rubbing surfaces about the engine and tender (except where of brass, cast-iron, or steel) shall be thoroughly case-hardened to a depth of $\frac{1}{16}$ ", and so hard as to wholly resist filing.

Specimens of case-hardening, which have been hardened in the same boxes with the work, will be broken in the presence of the Inspecting Engineer or his deputy.

TENDER.

(Contents, 2,500 gallons.)

General Arrangement.

The following are the leading particulars of the design and construction of the tender (based on the assumption of a rigid or fixed wheel-base not exceeding 11', and plate frames); and it is to be clearly understood that, in the event of bogie being adopted in lieu of rigid wheel-base, the details and dimensions as here set forth are, of course, subject to modification, but must still be adhered to as far as practicable, a certain amount of latitude being allowed to meet the conditions of enlarged tank, &c.

The tender to be of the ordinary horseshoe type, with the addition of a well underneath the tank 10' long, 4' 1" broad, and 1' 6" deep inside, and extending over the front and middle axles. The fuel space (shaped in the tank) to be 7' 9" long (from the front end), and 2' 6" wide; the whole to be carried on six wheels 3' 7" diameter at the tread; wheels 5' 6" apart C. to C.; total wheel-base, 11'.

Wheels.

Bodies to be of wrought iron, 3' $1\frac{1}{2}$ " diameter, and to have ten spokes each. They are to be made of the same material, put together and finished in the same way as the engine-wheels.

Tires.

To be of the same material, brand, section, and method of fastening as specified for the engine tires, with flanges on all the wheels.

Axles.

To be of the same material and brand as specified for the axles of the engine; to be $5\frac{1}{2}$ " diameter in the middle, parallel for a distance of 2' 6", to run into $6\frac{1}{2}$ " diameter at the collars, which are to be $\frac{1}{2}$ " broad; the wheel seats to be 6" diameter; the journals to be $4\frac{1}{2}$ " diameter by 8" long, and parallel; the radius of the corners being $\frac{3}{4}$ ". The distance from C. to C. of bearings to be 6' 2".

Axle-boxes.

Axle-boxes.

To be of fine-grained hard cast-iron. The castings to be clean and free from flaws of every description. To be planed to fit the axle-box guides, but to be left $\frac{1}{8}$ " wider between the flanges, to allow of lateral motion. The bearings to be of hard gun-metal, octagonal on crown, and perfectly bedded into the axle-boxes. Two syphon-tubes to each box; the tubes to be continued through the cast-iron into the brass bearings for a $\frac{1}{4}$ ". The keeps to be of cast-iron and planed to fit the axle-boxes (so that they can be put up and taken down by hand without hammering), and secured by two $\frac{5}{8}$ " round wrought-iron pins. The covers to be of cast-iron, recessed in the top to take the ends of spring pillars. The lid to be of cast-iron, secured by a wrought-iron pin.

Bearings

Keeps.

Covers.

Axle-box Guides.

To be of fine close-grained cast-iron, free from flaws of every description. To be planed on the face, edges, and flange, and to be fastened to the frames by four tight-fitting $\frac{7}{8}$ " turned bolts in each, the bolts to be countersunk into frames, the nuts to be secured by split pins.

Axle-fork Keeps.

To be of wrought-iron, a good fit on the forks, and secured by a $\frac{7}{8}$ " bolt at each end.

Springs.

To be of the same material as specified for the engine-springs. The spring pillars to have two wrought-iron guides each, fastened to the inside of frames. The wrought-iron spring-link carriers also to be attached to the inside of the frames.

Framing.

The frames are to be of the same material as specified for the engine frames, and are to be $\frac{7}{8}$ " thick, running from buffer-plate to buffer-plate, and formed each of one solid plate. The minimum depth to be 12", and above the axle-boxes 1' 2 $\frac{1}{2}$ ", deepened at the front end to take the brake-shaft and footsteps. The main frames to be braced together at the front end by a $\frac{5}{8}$ " wrought-iron vertical plate (serving as a buffer-plate, *q.v.*) 1' 2" deep, and a $\frac{1}{2}$ " vertical plate 1' 2 $\frac{1}{2}$ " deep, united by two horizontal $\frac{1}{2}$ " plates 1' 9" wide; also at back end by a $\frac{1}{2}$ " vertical plate (serving as a buffer-plate) 1' deep, united to a $\frac{1}{2}$ " horizontal plate 1' 6" wide, and finally by two intermediate $\frac{1}{2}$ " vertical plates, each 1' deep, the whole riveted together with suitable L irons, &c.

Well.

There are to be two $\frac{1}{2}$ " wrought-iron longitudinal stretchers, each in one continuous plate, running from the front intermediate cross-stay to the hind buffer-plate, and spaced 4' 1" apart. The longitudinal stretchers to form the well sides, the front plate of well to be $\frac{3}{8}$ " thick, and spaced 10" from the back of the front cross-stay; the back of the well being formed by the back intermediate cross-stay, suitably deepened.

The middle cross-stay divides the well, consequently care must be taken to cut holes in it to allow the water to circulate, also a hole large enough to admit of a man passing through. The intermediate cross-stays will be secured to the longitudinal stretchers and throughout the well by angle-irons.

Foot-plates, Draw-plates, &c.

The foot-plate to be $\frac{3}{8}$ " thick, the extreme width over platform being 7' 6". The front horizontal draw-plate to be $\frac{1}{2}$ " thick, and spaced 6 $\frac{1}{2}$ " below the foot-plate, and fastened to buffer-plate, frames, and front cross-stay plate by 2 $\frac{1}{2}$ " angle-iron and $\frac{3}{4}$ " rivets. The horizontal stiffening-plate to be $\frac{1}{2}$ " thick and 4' below the drawbar horizontal plate, and to be flanged down at the front, and fastened to the buffer-plate, and secured to the frames and vertical cross-stay plate by 2 $\frac{1}{2}$ " angle-iron and $\frac{3}{4}$ " rivets.

On the underside of the stiffening-plate will be fixed two wrought-iron feed-pipe carriers, to be securely fastened and braced together. The distance from C. to C. of feed-pipes to be 2' 11". The drawbar pin is centred 1' 3 $\frac{1}{2}$ " back from the buffer-plate. The draw shackle-pin holes to be 5 $\frac{3}{4}$ " from the back of the buffer-plate and 1' 10" apart C. to C.; strengthening plates to be riveted on round the holes in the plates. A wrought-iron (case-hardened) rubbing block to be securely fixed to front buffer-plate, to bear against the wedge block on Engine, and securely riveted to plate, with laterally extended landings; no rivets to pierce the middle of block.

Feed-pipe carriers.

Intermediate rubbing block.

Two wrought-iron water-tight sand-boxes are to be placed on the foot-plate at the front end of the tank, one on each side, each capable of holding 2 cubic feet of sand, and fitted with cast-iron water-tight lids, also with suitable valve and gear for working same, the filling hole to be 4 $\frac{1}{2}$ " diameter.

Sand-boxes.

The sand-pipes to be of wrought-iron, the same size as for the Engine, and bent so as to convey the sand as near the tread of the front wheels as possible. There is to be a polished wrought-iron hand-rail on each side, at front end, supported by two wrought-iron pillars, and secured to the tank. The left-hand one to have a boss forged on to take the brake-spindle. Two substantial wrought-iron double-shackle screw couplings are to be provided with each Tender; screw, 2" diameter; shackle and link-iron, 1 $\frac{1}{2}$ " diameter.

Hand-rails.

Screw couplings.

Brake.

The general design and arrangement to be similar to that specified for the engine brake; the handle to be on the left-hand side of the tender. The shaft to be 3 $\frac{1}{4}$ " diameter, with all the levers forged on solid; the whole to work in cast-iron bushes in the frames. There is to be a wrought-iron hanger and cast-iron brake-block (clipping the flanges) to each wheel. The hangers to be suspended by means of stout wrought-iron pins passing through the frames and liners riveted to the longitudinal stretchers. The hangers for the trailing-wheels to be prolonged to form life-guards.

Back Buffer-plate.

This to consist of a wrought-iron plate $\frac{1}{2}$ " thick, 12" deep, and 7' long, secured to frames and longitudinal stretchers by 2 $\frac{1}{2}$ " angle-iron ($\frac{3}{4}$ " rivets). The horizontal draw-plate to be 8 $\frac{1}{4}$ " below the bottom of the tank, to be $\frac{1}{2}$ " thick and 1' 6" broad, fastened to frames and buffer-plate by 2 $\frac{1}{2}$ " angle-iron ($\frac{3}{4}$ " rivets).

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The vertical (draw-spring) plate to be 2' 6" long, 12" deep, and $\frac{1}{2}$ " thick, secured to the horizontal plate and bottom of tank by 2 $\frac{1}{2}$ " angle-iron ($\frac{3}{4}$ " rivets); $\frac{3}{4}$ " strengthening-plates to be riveted on to the back of the buffer-plate and front of the vertical plate. Two buffers, of same type as those specified for the engine, to be fastened to buffer-plate by four 1" bolts in each. Height from top of rail to centre, 3' 4"; distance apart from centre to centre, 5' 9". A stout wrought-iron draw-hook to be provided, having a shank passing through the buffer-plate and vertical draw-plate, and fitted with a powerful volute spring, secured by a washer and split-cotter. A case-hardened wrought-iron socket is to be securely attached to the hind buffer-plate, to give sufficient surface for the shank of the hook to work in. Two safety-chains (links, 1" iron) terminating in stout hooks to be securely attached to the buffer-plate, at a distance of 1' 6" apart.

Tool-box.

A plate-iron tool-box is to be built at the back of the tank, and of the full width of the same, with a hinged lid, hinges, and staple, catch, and lock complete.

Tank.

Plating, &c.

The thickness of the top and side plates to be $\frac{1}{4}$ ", and the bottom to be $\frac{3}{8}$ ". The top, bottom, and sides to be well stayed to each other by L irons, &c. A curved wrought-iron moulding to extend along the upper edge (outside) of sides and back of tank.

Man-hole.

A wrought-iron man-hole ring made of $\frac{1}{8}$ " plate, 18" diameter, 8 $\frac{3}{4}$ " high, flanged at the bottom, is to be riveted on to the top of tank, centred 1' 6" from back of same. It is to be fitted with a wrought-iron cover and handle. The hole to be cut in the tank top is to be 1' 4 $\frac{1}{4}$ " diameter, round which will be supported a wrought-iron sieve, made out of $\frac{1}{8}$ " plate, to be 1' 4" diameter at the top, 1' 3 $\frac{1}{2}$ " diameter at the bottom, and 4' 0 $\frac{1}{2}$ " long.

Feed-valves.

The tank to be supplied at the back end with a wrought-iron lifting-shackle in each corner, with strengthening corner-plates. At the front end, over the front axle, on the inside of the coal bunker, two bent plates will be riveted for the same purpose. A lamp-bracket to be fixed respectively on the left and right-hand side at the back end of tank. The feed-valves to be circular, and of gun-metal, with central guide pin, and situated one on each side of the tank, protected by proper strainers, and worked from the top by levers, &c., on circular castings with inclined planes. The vertical rods to be weighted. A brass cock $\frac{3}{4}$ " bore to be fitted to the outside of the tank at the front end and near the bottom (for drawing

Man-hole in well.

water into a bucket). The well to have a man-hole 15" diameter cut in the bottom plate, at a distance of 2' 4" from the back plate of well, to have a thickening piece 2" broad and $\frac{3}{8}$ " thick riveted round the hole on the inside by $\frac{5}{8}$ " rivets, countersunk flush on the bottom. The cover to be $\frac{3}{8}$ " thick, 1' 7" diameter, fastened on by $\frac{5}{8}$ " studs; pitch, 3 $\frac{1}{2}$ ".

Feed-pipes.

The feed-pipes to be of copper, 1 $\frac{3}{4}$ " bore, and No. 12 W.G. thick, and the feed connection between the engine and tender to consist of strong indiarubber hose-pipe, 2 $\frac{3}{8}$ " bore, stiffened with spiral spring inside (tested to 200 lb pressure per square inch), and fitted with brass union joints at the engine end.

Painting.

The inside of the tank and well to be thoroughly served with three coats of best metallic oxide paint, and the other parts outside to be filled up, rubbed down, and painted in the same manner as the engines.

W. SCOTT,

Locomotive Engineer.

February, 1886.

GENERAL CONDITIONS, IF ENGINES ARE BUILT BY ENGLISH OR FOREIGN MANUFACTURERS.

Everything necessary to be provided.

Everything necessary to the proper finish and equipment of the engine and tender must be supplied, whether stated in this specification or not, and no advantage is to be taken of any omission of detail in the specification or any plans which may be supplied for guidance, as the contractor may, by applying to the Inspecting Engineer, obtain full explanation of any part of the work not sufficiently specified or otherwise particularized.

Alterations.

The Commissioner reserves to himself the right to supply, after tenders have been lodged and accepted, a set of *Working Plans*, for the contractor's guidance; and in such event, said plans will have to be rigidly adhered to, both as regards general design and detail.

Suggestions from contractor.

Any alteration or modification of detail which shall be ordered by the Inspecting Engineer, during the progress of the work, as being in his opinion necessary for the proper execution of the contract in accordance with the spirit of this specification, shall be executed by the contractor without extra charge.

Materials used. Workmanship. Inspection.

Any suggestion that the contractor may desire to make, with the object of improving or economising, in his opinion, the working of the engine, or of modifying the mode of manufacture, or the material specified to be used, or the details or dimensions, are in every case to have the previous written consent of the Inspecting Engineer before being carried out.

All the materials used are to be of the very best description of their respective kinds, and the work is to be executed in the most approved, substantial, and workmanlike manner, according to the direction and to the satisfaction of the Inspecting Engineer, who is to have power to inspect the manufacture, either personally or by deputy, in all its branches and details, in such manner as he may think fit, and to reject at any stage any work or material of which he may disapprove, as not being in accordance with the spirit and intention of the specification; and his decision on any point of dispute or doubt which may arise in reference to the contract shall be final and binding on the contractor.

Sub-letting.

The contractor shall not assign or sublet the contract, or allow any portion of the work to be done other than in his own establishment (except where implied and provided for by the clauses of this specification), unless with the previous written consent of the Inspecting Engineer.

One set of templates and patterns to be used.

The work is to be finished to one set of templates and patterns, so that the engines and tenders may be exact duplicates of each other, and that all moving parts, including the wheels and axles, must be interchangeable. The

The maker's (progressive) number to be stamped upon all parts of each engine and tender, for identification; also maker's name, date and place of manufacture, to be exhibited upon a brass plate fixed to each engine. Numbering of parts.

All brackets having been riveted on, the whole of the studs and mud-plugs screwed in, and all mountings fitted on (previous to being put in the frames) each boiler shall be tested (without the clothing) in the presence of the Inspecting Engineer or his deputy, first with water to a pressure of 200 lb. per square inch, and afterwards in steam at the intended working pressure. Testing.

When complete and finished in every respect, the engines and tenders shall, after having been satisfactorily tested (in steam) in the maker's yard, be delivered in accordance with the terms of the "Form of Tender." Finishing.

For the purpose of transit, all bright work to be thoroughly protected against rust by a coating of white lead and tallow, and all parts (other than those in packing cases) to be substantially protected from damage by wood battens or other suitable means. The bearings of the wheels and axles are also to be coated with white lead and tallow, and are then to be lapped with flannel which has been soaked in the lead and tallow, and afterwards tightly and closely lapped with spun-yarn which has been first soaked in the mixture. The outer surface of the spun-yarn is then to be well coated with boiling pitch and tar, and protected overall by battens and wood secured by hoop-iron. All studs or joints on the boiler or framing must be protected by wood, and all holes must be plugged (to prevent pinch-bars being inserted when loading or unloading). The cylinders are not to be removed from the framing or transit. Stout cross-stretchers of wood are to be inserted between the axle-forks at the front and hind ends of the engine to prevent any straining of the frames. Protection of bright work.
Protection of bearings.
Studs, &c., to be protected.
Cylinders not to be removed.
Cross stretchers.

The movable pieces must be packed in strong cases made of deals 1½" thick, strengthened by battens placed about 2' 6" apart, and the ends and sides bound down with stout hoop-iron, well nailed. All loose pieces in each case must be packed with distance-pieces of wood to prevent any of them moving, and the contractor will be held responsible for any damage arising (during transit) from neglect of this. Packing cases.

The cases containing the bright work are to be lined with stout sheet-tin or zinc, and soldered perfectly water-tight, the lids of these cases being fastened down with screws. Tin linings.

Each case and each unpacked portion of every engine and tender must be marked and numbered, as may be directed, to facilitate the shipment of the parts in the required order. Marking.

The price named in the "Form of Tender" must include the cost of all templates, royalties, plans, and other charges for the use of patents (if any) involved, and of the delivery of the engines in steam, as per terms of "Form of Tender," to the satisfaction of the Inspecting Engineer, or Commissioner for Railways, as the case may be. Price named to include all costs.

The contractor must deliver complete, as per specification, the various engines and tenders by not later than the dates respectively named in his "Form of Tender;" and should he fail to do so, a sum at the rate of £20 per week per engine will be deducted, by way of liquidated damages, from the price named in the "Form of Tender." Delivery within contract time.

The contractor will be required to execute a formal deed of contract with the Agent-General of the New South Wales Government in London, or the Commissioner for Railways, Sydney, New South Wales, embodying this specification, the terms of the "Form of Tender," and all other conditions necessary to ensure the due completion of the contract as stated in the "Form of Tender." Bond to be executed.

Detailed packing lists must be furnished in duplicate written copies, giving the outside measurement of each package, as well as the weight thereof, as nearly as possible. Packing lists.

Payment will be made for each engine as follows:—90 per cent. in cash in London, on receipt by the Agent-General for New South Wales of the bills of lading, together with a certificate from the Inspecting Engineer, that the terms of this specification, as to the completion and packing, &c., &c., of the engines, have been fulfilled. Payment.

And it is hereby expressly declared that the giving of a certificate by the Inspecting Engineer in London, that the work done by the contractor has been satisfactorily executed and completed up to the period of delivery, shall be a condition precedent to the contractor's having any right of action or lawful claim to the payment of the 90 per cent. to be made under this specification.

The balance of 10 per cent. will be paid by the Agent-General, on receipt by him of a certificate, that each engine has run 2,000 miles on the Government Railways of New South Wales to the satisfaction of the Locomotive Engineer of the Government; and if any engine or engines should fail to run the specified 2,000 miles to the satisfaction of the Locomotive Engineer, the contractor will be called upon to make good the defects. If he fail to do so within reasonable time, the Commissioner for Railways shall spend any such sum (not exceeding in the total the 10 per cent. on the contract price of the engine or engines that shall have arrived in the Colony) as may be considered necessary, in the opinion of the Locomotive Engineer, to make the engine or engines conform to this specification, such sum to be deducted by way of liquidated damages from the forementioned balance of 10 per cent. Balance payment.
Mileage to run.
Contractor to make good defects.

A complete set of working plans or drawings (on vellum) to be supplied by the contractor to the Agent-General or Commissioner for Railways, as soon as the whole of the working plans or drawings shall have been completed.

Each tenderer to submit (if possible), along with his tender, an outline plan, showing the general features and design of the engine and tender which he proposes to supply, along with a skeleton specification of the leading particulars of the same.

Should the rate of progress made with the work be such as to prevent, in the opinion of the Inspecting Engineer, the engines being delivered within the time specified in the "Form of Tender," the Commissioner for Railways or the Agent-General shall have full power and authority, after due notice given to the contractor, to cancel the contract forthwith, upon which all moneys due to the contractor under this contract shall be forfeited. Progress of work.
Cancelling contract.

Tenderers in Europe or America may either tender to the within specification, or if they wish to depart from it in respect of substituting bar for plate frames, cast-steel for wrought-iron centres for wheels, other brands of copper, brass, and iron for those mentioned, will be allowed to submit alternative tenders, provided that they adhere to the general dimensions of the engine, and clearly and minutely specify the nature of the departure they propose to make from the specification.

CHAS. A. GOODCHAP,

Commissioner for Railways.

Department of Public Works,

Railway Branch,

Sydney, 1st June, 1886.

GOVERNMENT

GOVERNMENT RAILWAYS OF NEW SOUTH WALES.

Form of Tender for manufacture of Engines in England or Foreign Countries.

THE undersigned, having read the attached Specification (No. 180A), hereby offer to supply the Government of New South Wales with locomotive engines and tenders, made in accordance with the various requirements, particulars, and conditions set forth in said specification, on the following terms as to delivery and payment viz. : engines (with their tenders) delivered in steam at at the price of £ each, the whole to be completed and delivered within months from date of official acceptance of Tender, and further promise and agree to be firmly bound by and faithfully to adhere to all the conditions and requirements of the said specification, and to forfeit to the New South Wales Government, or its lawful representatives, the sum of £20 sterling per engine and tender per week (to be deducted from the abovenamed contract sum by way of liquidated damages) for each and every week that each engine (with its tender) shall remain undelivered after the time herein specified for delivery.

We are,

Your obedient Servants,

(Signed)

(Address)

To the

N.B.--This tender must not be detached from the specification. The Government do not bind themselves to accept the lowest or any tender.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAYS.

(REMOVAL OF LOCOMOTIVE ENGINES FROM DUBBO TO WELLINGTON.)

Ordered by the Legislative Assembly to be printed, 28 June, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 24th March, 1887, That there be laid upon the Table of this House,—

- “ (1.) Copies of all papers, documents, and correspondence in connection with the removal of the locomotive engines from Dubbo to Wellington.
 “ (2.) Copies of all papers and documents showing the cost of the engine-sheds at Wellington.
 “ (3.) A Return showing the loss, if any, sustained by the country through such locomotives being at Wellington instead of Dubbo.”

(Mr. Penzer.)

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RAILWAYS.

No. 1.

E. Barton, Esq., M.P., to The Commissioner for Railways.

Sir,

107, Elizabeth-street, Sydney, 25 November, 1881.

I understand that the question of a locomotive depôt for the Western Line beyond Bathurst is under consideration. It was my intention to ask the favour of a personal interview with you, for the purpose of pointing out the manifest advantages offered by Wellington as a site for such depôt. Business pressure has during this week prevented me from seeing you, and to-morrow I shall leave town for two or three days. I can only write a few lines on the subject, and shall defer the greater part of what I have to urge until I shall be again in Sydney.

I understand that the object is to choose a convenient site between Bathurst and Nyngan. The distance is about 234 miles. Wellington, a little short of half-way, is an admirable site. Dubbo, about as much over half-way, is an undesirable site for many reasons, among which is the fact that very little land is available in the vicinity of Dubbo Station, unless it be determined to purchase some at a high figure. I hear sufficient land for the purpose is available at and about the Wellington Station. If it were not, the expense of obtaining it would be far less in that township than at Dubbo, and the convenience, I submit, is equal, unless there be some very heavy departmental reason to the contrary. Leaving further consideration to be put before you at an early opportunity,

I am, &c.,

EDMUND BARTON, M.P.

Mr. Scott for report, B.C., 29/11/81.—CH.A.G. A locomotive depôt is not required beyond Bathurst at present.—W. SCOTT, 7/2/81. Commissioner.

The Commissioner for Railways to E. Barton, Esq., M.P.

Sir,

Department of Public Works, Railway Branch, Sydney, 11 February, 1882.

Referring to your letter of the 25th November last, suggesting that Wellington should be the site for any proposed locomotive depôt between Bathurst and Dubbo, I have the honor to inform you that the matter has been referred to the Locomotive Engineer, who reports that a locomotive depôt is not required beyond Bathurst at present.

I have, &c.,

CH. A. GOODCHAP,
Commissioner for Railways.

No. 2.

Petition.

To the Honorable the Minister for Public Works in and for the Colony of New South Wales.

The humble Petition of the inhabitants of the town and district of Wellington,—

RESPECTFULLY SHOWETH:—

That at a public meeting, held at Wellington on the 7th October, 1882, and convened by the Mayor of Wellington by advertisement in the *Wellington Gazette* newspaper, the following resolution was carried unanimously:—"That in the opinion of this meeting the claims of Wellington as a site for the Western Railway workshops ought to be recognized by the Commissioner for Railways."

That the grounds on which the above resolution is based are as follows:—

Firstly.—That there is abundance of land within the area of the station reserve at Wellington for the purpose of erecting workshops.

Secondly.—That Wellington is a stopping-place for engine-drivers and others (the next stage being Bathurst, distant over 100 miles), and the proper distance between Bathurst and Nyngan for the workshops. And

Thirdly.—That there are extensive mines of coal, iron, and copper in the neighbourhood of Wellington, which might be of great benefit in connection with the railway workshops.

That at the public meeting aforesaid a resolution was carried unanimously requesting and empowering the Mayor of Wellington, as Chairman of the meeting, to sign this Petition on behalf of the meeting.

Your Petitioners therefore pray that railway workshops may be erected at Wellington. And your Petitioners will ever pray.

Signed, on behalf of the aforesaid meeting,

D. A. FERGUSON,
Mayor.

No. 3.

No. 3.
Petition.

To the Honorable the Minister for Public Works.

The humble petition of the inhabitants of Wellington,—

RESPECTFULLY SHOWETH :—

That, at a public meeting held at Wellington, on the 10th day of April, 1883, convened by the Mayor of Wellington, and by advertisement in the *Wellington Gazette*, the following resolution was carried unanimously :—“That this meeting is of opinion that it is desirable the attention of the Government should be drawn to the superior advantages Wellington offers as the site for the intended locomotive depôt.”

The grounds on which the above resolution is founded are as under :—

- 1st. That there is abundance of land within the area of the station reserve at Wellington for the purpose of erecting locomotive sheds or depôt.
- 2nd. That Wellington is a stopping-place for engine-drivers and others (the next stage being Bathurst distant 100 miles) and the most convenient distance between Bathurst and Nyngan for the sheds or depôt.

At the public meeting aforesaid, a resolution was carried unanimously, requesting the Chairman of the meeting to sign the petition on behalf of the meeting.

You petitioners therefore pray that the locomotive depôt may be erected at Wellington.

And your petitioners will ever pray, &c., &c.

Signed, on behalf of the abovementioned public meeting,

ROBT. RYGATE, J.P.,

Chairman.

Presented by David A. Ferguson, M.P. For Mr. Goodchap.—F.A.W., 18/6/83.

Wellington, from its position in regard to the divisions of the running, will, I believe, be found to be the best position for locomotive running shed and depôt. Will Mr. Scott inform me what has been done, and what is required to be done. Is there a running shed at Dubbo?—CH.A.G., 26/6/83.

I VISITED Wellington on Sunday last, and find that the present house used by drivers and firemen is of wood, and that it is full of insects.

Before anything is done in this matter, I consider that a complete plan should be prepared, showing the whole yard, and the proposed building to be erected.

It is absolutely necessary to erect a new running shed at Wellington (that at Dubbo is entirely out of place, as I have before pointed out), and the Dubbo yard is even now too small for traffic requirements.

I therefore recommend that a new shed, drivers' house (of brick and stone), and the appliances for establishing a locomotive depôt be at once put in hand. There is a splendid 50-foot American turntable there lying useless, a coal stage, and sand-house, plenty of land available, and a splendid water supply from river, &c., &c. I think the same design which I have proposed for Goulburn should be carried out also at Wellington.

THOS. MIDELTON.

The Commissioner.

30/6/83.

Locomotive Engineer's Office, Redfern, 14 June, 1883.

Memo. to the Locomotive Overseer.

I HAVE arranged for the three trains, Nos. 1, 29, and 37, down goods, to run from Bathurst to Wellington and Wellington to Nyngan, and their returns, 38, 40, and 46 up, from Nyngan to Wellington, and from the latter station to Bathurst. This will necessitate the engines being washed out and cleaned at Wellington, instead of at Dubbo. I would therefore recommend that 6-inch water-pipes be laid from the water-crane, east of station platform, to the ash-pit at level stage, and that a hydrant be erected at the ash-pit, for washing out engines, at once.

J. TURTON.

Sir,

Locomotive Engineer's Office, Redfern, 14 June, 1883.

Now that the extension, Nevertire to Nyngan, is opened, it will be necessary to run the engines in sections—Bathurst to Wellington, Wellington to Nyngan and return. This will necessitate an engine-shed to accommodate at least twelve engines being built at Wellington, and the gradual shifting of the residences of the men from Dubbo to Wellington, which latter station will become the depôt. The above arrangement will equalize the work and hours of the engines and men.

J. TURTON,

Locomotive Overseer.

It has been evident to me, since I was at Bathurst, relieving Mr. Turton, that what he recommends above would be sure to be wanted as we opened further west.

I therefore beg to refer you to my 83-3,448, herewith. This matter should, I consider, be settled without delay, as Wellington seems a natural place for a locomotive depôt.—THOS. MIDELTON, 30/6/83.
Locomotive Engineer.

Locomotive Engineer's Office, Bathurst, 21 September, 1883.

Memorandum to Locomotive Overseer.

I AM of opinion it would benefit the Department if the accommodation for engines asked for at Wellington Station was provided without delay. Considerable inconvenience to the Bathurst men is caused by there being frequently no men at Wellington, from Dubbo, to relieve them. If temporary accommodation is provided—that is, siding room, and means for washing out and cleaning the engines there, those now stationed at Dubbo can run from Wellington to Nyngan or Narramine, as required. It will also be much better for the engines, as they will not then have to pass through so many hands between departure from, and arrival at, Bathurst. The men, also, would be less harassed than they occasionally are.

J. TURTON.

The

I have held the same opinion a long time.—J.M.

I do not at all agree with this temporary work; it spoils the whole thing in making permanent arrangements.—T.M.

The plans for Goulburn shed are nearly finished; they will also do for Wellington. I asked for a plan of Wellington yard from Mr. Cowdery. I think when we get this, steps should be taken to put in roads, &c., even if the shed is not built immediately; this would relieve us immensely, and if the general plan is agreed upon, we can add at any time as required.—T.M., 28/9/83. Locomotive Engineer.

Locomotive Engineer's Office, Bathurst, 19 October, 1883.

Memorandum to the Locomotive Overseer.

To make a commencement with the contemplated change of locomotive depôt from Dubbo to Wellington, I propose to run the stock trains as follows:—From Bathurst to Wellington and return alternate days, Wellington to Narramine and return same day, with engines class 93. Or, Wellington to Nyngan and return alternate days, as required; Narramine to Nyngan and return, alternate days, stock or goods trains, as required, with Bogie engines. This arrangement will enable me to work the traffic on the heaviest part of the road with engines of 93 class, and the Bogies are quite capable of working it west of Narramine. To enable me to carry this out, it will be necessary to lengthen the locomotive siding between the main line and coal stage, and the road over the turntable, at Wellington, each 100 yards. This will enable me to clean and do other necessary work to engines, and will provide the necessary standing accommodation. I would recommend this be done at once, so that the proposed change can be effected on the issue of the contemplated new time table.

J. TURTON.

No. 4.

Minute by the Locomotive Overseer to The Locomotive Engineer.

Proposed Locomotive Depôt at Wellington, G.W.R.

REFERRING to the question of making Wellington a locomotive depôt instead of Dubbo, I herewith forward for your approval tracing No. 867 and this recommendation, feeling confident that what is proposed will further the work of the Department in the best and most economical manner.

As you are aware we have for two years actually made Wellington the depôt, as all engines (except the two which work the mail trains) running between Bathurst and Dubbo change hands at Wellington, and it has been found from actual experience that Wellington is the natural and best place for a locomotive depôt, and I consider that immediate steps should be taken to put in hand what I propose, which is as follows:—

On tracing 867 is shown the existing roads (as far as it concerns this Department) and these portions are coloured blue; what I propose is coloured pink and is in fact a duplicate of the Goulburn yard as now being put in for our use. I have shown a running shed at the left of the turntable, which is also a duplicate of the Goulburn shed, except that it will hold sixteen instead of thirty engines, but if sufficient land is resumed outside the railway fence for future extensions this will make matters simple in case we should require to extend the shed accommodation. As there is nothing on the land except a small wooden house the work could be started at once, that it is to say, the roads could be put in and everything done as shown on the said tracing, except erecting the shed; this could be left until after the Goulburn shed is erected and used, when the same drawings will come in for use at Wellington. The roads will give us all the accommodation we require, except shelter, but if you consider it desirable to erect the shed at once it will, of course, be a more complete work. The Dubbo shed is very small and also most inconveniently placed for locomotive purposes, and when we move from there to Wellington the old shed would do remarkably well for the Traffic Department as a carriage shed or for outward goods. You will remember some time ago I submitted plans (according to your orders) showing what was wanted for the accommodation of the drivers (changing) at Wellington; there is ample space for what I proposed for them between the through road and the fence.

This recommendation, and the tracing 867 herewith, will, I hope, fully meet your minute of 17/10/83, or your 83-6,562.

THOS. MIDELTON, 7/1/84.

Please refer to Commissioner's 83-15,284.

Engineer for Existing Lines, Sydney, 15 February, 1884.

Memo. to Mr. Avern.

REFERRING to my 84-237 of the 12th instant requesting you to return 84-447, relative to the estimated cost in detail of proposed loco. additions, &c., Wellington, I wish you to forward this paper at once as it is urgently required by Commissioner.

GEO. COWDERY,

Per D. H. ARMSTRONG.

I return these papers as requested, and I regret that having for the last month had to be absent so much from head quarters in connection with the Board for Inquiry into the carriage of live stock, I have been unable hitherto to give the matter attention.—F. M. AVERN, 17/2/84. Mr. Cowdery.

Please forward reply to Commissioner's minute, as the matter is urgent.—G.C., per G.L. Mr. Avern.

I have seen Mr. Cowdery on this subject and he thinks it best that Mr. Parry should work out an entirely new scheme as he does not approve of the one submitted by Mr. Midelton, I therefore return these papers. It will be necessary for the purpose of replying to Commissioner's minute to ascertain from Mr. Scott the cost of a 50-foot traverser—also from the Engineer-in-Chief, or from the Accounts, Railways Department, the cost of locomotive arrangements at Dubbo.—F.M.A., 22/2/84. Mr. Cowdery.

Will Mr. Scott please inform of the cost of a 50 feet traverser.—G.C. (per G.L.), 25/2/84. Locomotive Engineer. The one I ordered in England for the new running shed at Eveleigh, cost there £1,200, including engine and capstan complete.—W.S. (per R.J.S.), 27/2/84. Mr. Cowdery. Will

Accountant

Accountant please inform me the cost of locomotive arrangements at Dubbo.—G.C. (*per G.L.*), 7/3/84. Accountant. Engine-shed and pits, £2,315 3s.; coal stage, £299 14s. 6d.; tank and pit, £333 5s.; total, £3,448 2s. 6d. Existing Lines.—B.C., 13/3/84.—W.W. Will Mr. Scott please forward me at his convenience a detail estimate of these proposed works.—G.C., 2/4/84. Locomotive Engineer. Mr. Midelton for estimate.—W. Scott, 9/4/84. The proposed work will be a duplicate of that at Goulburn (except as regards size of shed). I estimate the work at £9,065, as per Dr. 867, exclusive of water columns (there are two there at present). Shed to hold sixteen engines.—T.M., 16/6/84. Locomotive Engineer. Mr. Cowdery.—W.S. (*per D.C.M.L.*), 20/6/84. Mr. Parry for report.—23/6/84. Plan herewith, showing engine shed with roads through (with no traverser), to accommodate twelve engines, estimated cost, £5,600; shed with six roads, to accommodate eighteen engines, will cost about £7,600. My estimate for Mr. Midelton's scheme with traverser, is £10,500.—J.P., 31/7/84. I do not see how Mr. Parry can estimate for what I propose, seeing that no details of shed are given.—T.M., 30/8/84.

No. 5.

The Council Clerk, Dubbo, to the Secretary for Public Works.

Municipal District of Dubbo Council Chambers,

Dubbo, 30 June, 1884.

Sir,

In pursuance of resolution of Council Meeting, held 16 June, 1884, I am instructed by the Mayor and Aldermen of the above Municipal District, to respectfully offer to the Government, for the purpose of erecting railway workshops and other railway works, all that piece and parcel of land comprising 5 acres, situated on the north of railway line, within the municipality of Dubbo, and adjoining station yard, and being the eastern end of the recreation reserve north of railway line.

I have, &c.,

T. W. HEAYDON,

Council Clerk.

Railways.—J.R., B.C., 2/7/84. Mr. Cowdery for report.—R.J.S., B.C., 7/7/84. Mr. G. R. Cowdery for report.—G.C. (*per G.L.*), 10/7/84.

No. 6.

The Council Clerk, Wellington, to D. A. Ferguson, Esq., M.P.

Sir,

Council Clerk's Office, Wellington, 18 July, 1884.

In compliance with a resolution passed at a public meeting, I have the honor, by direction of the Wellington Municipal Council, most respectfully to request that you will be pleased to wait upon the Commissioner for Railways and point out to him that, in consequence of the great depression that afflicts all classes, business people, mechanics, labourers of every description, &c., it would be a great benefit to the town of Wellington if the workshops, cleaning sheds, &c., connected with the railway line, were at once commenced. Such work would help to relieve the stagnation that exists and stimulate private enterprise.

That Parliament has voted the money for the purpose, and we have been led to believe that Wellington is the place decided upon at which these buildings are to be erected, a decision which is in uniformity with its position as regards distance, and is unanimously approved of by all those employed in working the line. That the mutual advantages, sanitary condition, and general convenience of the position commend it to the travelling public and those who employ the railway as a carrier for merchandise and live stock.

And to point out the desirableness of at once commencing this work, which is absolutely requisite for the safe working of the line.

I have, &c.,

W. H. FORWOOD,

Council Clerk.

No. 7.

The Council Clerk, Dubbo, to The Secretary for Public Works.

Sir,

Municipal District of Dubbo, Council Chambers, Dubbo, 29 July, 1884.

In reference to letter of June 30, 1884, *re* park for railway purposes, the Council have reconsidered the matter, and beg to offer to the Department, for the erection of railway workshops and other railway works of a permanent character, the whole of that portion of park at Dubbo north of railway line, and of which part only was previously offered.

I have, &c.,

T. W. HEAYDON,

Council Clerk.

Railways.—J.R., B.C., 31/7/84. Mr. Cowdery.—R.J.S., B.C., 4/8/84. Mr. G. R. Cowdery for report. Previous paper, 84/5,374, was forwarded to you, 10/7/84.—G.C. (*per G.L.*), 5/8/84. Mr. G. R. Cowdery. See my report on my 84/1,641, forwarded to you 5/8/84.—G.R.C. (*per A.M.*), 7/8/84. Engineer for Existing Lines. Full report herewith.—G.C. (*per G.L.*), 8/8/84. Commissioner.

Railway Department, Existing Lines Branch, Office of District Engineer,
Bathurst, 5 August, 1884.

Memorandum to G. Cowdery, Esq.

I beg to inform you I have examined the land, and interviewed the Mayor of Dubbo in connection with the offer of the corporation to convey to the Railway Department land for the erection of workshops, &c. I find the land offered is that which lies between Gipps and Bourke Streets, and a portion of 11 acres

21·8 perches of recreation reserve on the northern side of the railway opposite the station. I pointed out to the Mayor that the same quantity of land, viz., 5½ acres, running parallel to the yard for the whole of its length would be much more suitable for railway requirements, as it would give plenty of length for siding accommodation.

This would leave a narrower strip of land, 21 chains long facing Erskine-street, which would be of no use for recreation purposes, and which I believe the corporation have no power to sell. The Mayor, however, intimated he believed the Council would be willing to convey the whole of the land, 11 acres 21·8 perches, to the Department. Should a branch line leave Dubbo for Coonamble further siding accommodation will be necessary. I also believe that Dubbo will be a large depôt within a very few years, bordering, as it does, on the flat country westward. Should the corporation offer the whole of the land, as already intimated by the Mayor, I would strongly recommend that the offer be accepted, believing, as I do, that in a very few years it will be required.

The land in question is very suitable for the purposes offered, being perfectly flat and adjacent to the railway yard.

G. R. COWDERY,
Acting District Engineer.

No. 8.

Minute by The Commissioner for Railways.

PLEASE draw up statement showing amount expended at Dubbo and Wellington to this time, for locomotive sheds, how many engines can be taken in at each place, how many are taken in at each place, and how many are taken.

If Wellington be made the station for running shed what is proposed to be done with the building at Dubbo?

How many engines can be stabled by the plan proposed by Mr. Midelton? I see that by Mr. Cowdery's plan twelve can be stabled, to be increased to nineteen by extension of shed.

What is proposed to be done with present running-shed at Wellington?—CH. A.G., 6/8/84.

Locomotive Engineer.—R.J.S. B.C., 8/8/84. Urgent. Locomotive Overseer.—W.S. (*per* D.C. M'L.), 12/8/84.

There is a running-shed at Dubbo, which holds four engines only; I do not know its cost. There is no running-shed at Wellington; but what I propose is to build a new shed half the size of the Goulburn shed, and from the same drawings as per plan No. 867 herewith. It will shelter sixteen engines, and can be extended to any size at any time without interfering with the proposed arrangements; my shed will be easily and cheaply worked; that proposed by Mr. Cowdery will be (the long shed) old fashioned, and extremely costly to work. I still recommend what I proposed on my paper of 7th January, 1884 (L.E., 84-152) herewith, and should be glad to have the work carried out as soon as possible, as the opening to Byrock on the 2nd ultimo will make it clearer than ever that Wellington must be the depôt. I do not agree in any way with the plans (herewith) submitted by Mr. Cowdery.—THOS. MIDEルトON, 30/8/84.

Where there is sufficient land available (as in this case) to allow of a running-shed being built and at the same time admit of the engines being taken in and out by points and crossings, I am opposed to the use of traversers in a small shed such as will be required for Wellington. I quite approve of Mr. Cowdery's plan, as it will, according to Mr. Cowdery's estimate, be much less expensive, and answer the purpose at all events equally as well as if a traverser were used, I therefore recommend that Mr. Cowdery's plan be adopted, and the work proceeded with at once.—W. SCOTT, 3/9/84. Commissioner.

For Minister's approval.—CH. A.G., 9/9/84. Approved.—F.A.W., 17/9/84. Mr. Cowdery, B.C.

No. 9.

Minute by The Commissioner for Railways.

THE proposal is to make Wellington the running-shed station. There are recent papers on the subject upon which I have asked for information respecting the number of engines at present stabled at Dubbo and Wellington. At no distant time Mudgee will be connected with Wellington by rail, and it is probable that the traffic beyond Wellington will be taken by the route from Wellington to Mudgee and by the Colo River route to Penrith, and thence to Sydney. It is moreover far more likely that the line to Coonamble will go from Mudgee, not Dubbo. In the traffic arrangements Wellington will be a far better changing station than Dubbo.

The report of the Locomotive Engineer may be obtained.—CH. A.G., 11/8/84.

Locomotive Engineer, B.C. Locomotive Overseer, in connection with other papers sent to him on this subject yesterday.—D.C. M'L., 13/8/84.

I have always held that Wellington must be the locomotive depôt and not Dubbo, and I now think so stronger still after reading the Commissioner's minute of 11/8/84 above. We have always changed men there, but not engines, as they run through to Nyngan and Dubbo; and when we open to Byrock and Bourke, then Wellington will, with Nyngan and Bourke, be the three locomotive depôts west of Bathurst. We have now more land at Dubbo than we can possibly want for some years to come.—T.M., 26/8/84. Locomotive Engineer.

I concur.—W. SCOTT, 3/9/84. Commissioner. As the land is offered for workshops, &c., its acceptance would be deemed to be a tacit promise to make Dubbo the changing station for engines, &c. I think that it would be injudicious to accept the land on such terms.—CH. A.G., 6/9/84. Approved.—F.A.W., 9/9/84.

No. 10.

The Commissioner for Railways to The Council Clerk, Dubbo.

Sir, Department of Public Works, Railway Branch, Sydney, 12 September, 1884.

I have the honor to acknowledge the receipt of your letter of the 29th July last, addressed to the Honorable the Minister for Public Works, offering to this Department the whole of that portion of the Park at Dubbo north of the railway line, but while thanking you for the kind offer, have to state that I am unable to accept it, as the Department has already sufficient land at Dubbo for all requirements.

I have, &c.,

CH. A. GOODCHAP,
(Per G.B.),
Commissioner for Railways.

No. 11.

Minute by The Commissioner for Railways.

BEFORE inviting tenders I wish some questions put in previous papers answered. First, when running shed is erected at Wellington, what is proposed to be done with Dubbo shed? What number of engines are now stabled at each place? As there is no shed at Wellington, how are the engines now stabled there cleaned, and where? Will Dubbo shed still be used, and why? I must have a programme drawn out, showing the whole case, what is now being done, and what is required between Bathurst and Byrock (or Bourke).
Mr. Cowdery. CH.A.G., B.C., 26/2/85.

I presume Mr. Scott will answer these questions.—G.C. (per D.A.A.), 27/2/85. Locomotive Engineer. Locomotive Overseer.—R.J.S., 2/3/85. As soon as the shed accommodation is ready at Wellington the shed at Dubbo will not be required, but as a shed of same size has been approved of some time back for Orange, I recommend that the Dubbo shed be removed to there. For particulars of present and proposed arrangements of working, see report herewith.—W. SCOTT, 9/3/85. The Commissioner.

REPORT of the Locomotive Engineer.

THERE are no engines stabled at Wellington. At present the Bathurst goods engines, twelve in number, run through to Dubbo in consequence of want of accommodation at Wellington, but as this is too long a run for the men, they change at Wellington with the Dubbo drivers. Under this necessarily imperfect arrangement, the engines only run three double trips per week, whereas, when proper accommodation is supplied at Wellington, the same engines will be enabled, if necessary, to run five double trips per week, besides which the drivers and firemen will be, as regards mileage and time on journey, more easily and advantageously employed. In addition to the foregoing, three of the Bathurst passenger engines run through to Dubbo now.

There are fifteen engines in the Dubbo district, viz., nine passenger and six goods. The grades being very easy in this district many of the passenger engines run goods trains when necessary. The majority of these are now stabled at Dubbo, only a few being stationed at Nyngan and Byrock. When the accommodation at Wellington is available, all the engines now stationed at Dubbo will be removed to Nyngan.

When the line is opened to Bourke, it is intended to arrange for the engines to be run as follows:—Bathurst to Wellington, 104 miles; Wellington to Nyngan, 129 miles; Nyngan to Bourke, 126 miles. The time occupied in these runs will be about the same, as the grades between Bathurst and Wellington are much heavier than on the other sections.

Commissioner.

W. SCOTT, 9/3/85.

No. 12.

Minute by The Commissioner for Railways.

INSERT advertisement inviting tenders. Do not for the present disturb the running shed at Dubbo, it is for four engines only, and may be required in connection with branch lines.

CH.A.G., 12/3/85.

Mr. Cowdery.—D.C.M'L., 12/3/85. Mr. Watson to note decision *re* removal of shed.—G.C. (per D.A.A.), 12/3/85. Noted and returned to Engineer for Existing Lines.—A.F.W., 24/3/85. Draft advertisement inviting tenders herewith.—G.C. (per G.L.), 10/4/85. Commissioner. Advertise.—D.C.M'L., 13/4/85. Advertised, 14/4/85.

No. 13.

Analysis of Tenders received.

Erection of engine-sheds and pits, Wellington.

	£	s.	d.
John Ahearn	5,392	14	8
M'Sweeney & Kirwan	6,543	2	6
Stephen Smith	6,698	6	9
William Sharp	6,805	6	8
B. Geddes	7,133	8	8
William Murray	7,461	13	0
Alex. H. Scouller	7,465	15	3
Louis C. Young (not initialled by Tender Board)	6,933	11	6

The tender of John Ahearn is the lowest, and I recommend it be accepted. There are errors in the schedule, which, if his tender be accepted, Mr. Ahearn will require to correct.
Commissioner.

G.C., 14/5/85.

For approval of Minister.—CH.A.G. Approved.—F.A.W., 11/5/85.

No. 14.

The Commissioner for Railways to Mr. J. Ahearn.

Sir,

Department of Public Works, Railway Branch, Sydney, 19 May, 1885.

I have the honor to accept your tender dated 12th instant, for the construction and erection of an engine-shed and pits at Wellington, on the Great Western Railway, in accordance with plan and specification, and to the entire satisfaction of the Engineer for Existing Lines.

Please forward deposit receipt for cash security mentioned in the specification in order that the bond may be prepared by the Crown Solicitor.

I may add there are a few errors in the schedule of prices, which will require to be corrected, and have to request that you will wait upon Mr. Cowdery in order that they may be rectified.

I have, &c.,

CH. A. GOODCHAP,
Commissioner for Railways.

No. 15.

Minute by The District Engineer, Bathurst.

New engine-shed at Wellington.

It is necessary to remove the carriage examiner's house from the site, and re-erect it elsewhere—probable cost, £130. It is also necessary to remove the present drivers' quarters, and re-erect them elsewhere as an office for the Locomotive Inspector—probable cost, £150. Shall I estimate for laying in the new roads, and for the new coal stage shown on plan?

Engineer for Existing Lines.

A. F. WATSON, 26/6/85.

Forward estimate including new roads and coal stage.—G.C. (*per G.L.*), 30/6/85. Mr. Watson. Please estimate for these as per tracing of Wellington station-yard lately sent from Sydney.—A.F.W., 1/7/85. Mr. Davidson. Estimate herewith.—P.D., 6/7/85.

ESTIMATE for new Siding and Coal Stage at Wellington.

Quantities.	Particulars.	Rate.	Amount.	Totals.
			£ s. d.	£ s. d.
1,190 lin. feet...	Permanent Way— Rails, fastenings, sleepers, and ballast, in long siding to dead end.	10s.	595 0 0	
482 „ „	Do do Engine coaling road	10s.	241 0 0	
346 „ „	Do do in coal wagon road.....	10s.	173 0 0	
190 „ „	Do do turntable road.....	10s.	95 0 0	
1,266 „ „	Do do engine-shed roads	10s.	633 0 0	
720 „ „	Do do four roads over ash-pits and through engine-shed, rails to be supplied and laid with fastenings only.	4s.	144 0 0	1,881 0 0
9 sets	Points and crossings, £28 and £7 for fixing	£35	315 0 0	315 0 0
150 lin. feet...	Coal stage, 150 ft. × 15 ft. = 2,250 sq. ft.	2s. 6d.	281 5 0	281 5 0
.....	Removing and re-erecting gate and fencing Maxwell-street crossing.	.....	10 0 0	10 0 0
.....	Removing and re-erecting carriage examiner's house .....	.....	130 0 0	
.....	Removing and re-erecting present drivers' barracks as an office for Locomotive Inspector.	.....	150 0 0	280 0 0
	Grand total.....			2,767 5 0

Herewith I submit detailed estimates for these works, amounting to £2,767 5s. I may state that the contractor (Mr. Ahearn) for the new engine-shed, has not yet commenced work. His agent (Mr. King) is unable to purchase suitable bricks. It is now about six weeks since the tender was accepted, and no material yet on the ground.—A.F.W., 7/7/85. Engineer for Existing Lines. I recommend this work be carried out as per tracing and estimate. Mr. Ahearn has been written to with reference to carrying out the works of the new shed.—G.C., 4/8/85. Commissioner. Recommended.—CH.A.G., 6/3/85. Approved.—F.A.W., 7/8/85. Mr. Watson to carry out.—G.C. (*per G.L.*), 8/8/85. Please send tracing referred to showing position of new roads and coal stage, without which I cannot give orders to carry out the works.—A.F.W., 11/8/85. Engineer for Existing Lines. Carry out the work according to your detailed estimate.—G.C. (*per G.L.*), 12/8/85. Mr. Watson.

Mr. Hollis to carry out all the new roads shown on the accompanying tracing. Engine coaling road to be first laid in, as it is urgently required by the traffic. Mr. Mayo to erect,—1. Coal stage, shown on tracing 150 feet long by 15 feet wide. 2. Gate and fencing to be removed and re-erected for Maxwell-street crossing. 3. Carriage examiner's house to be removed and re-erected. 4. Present drivers' barracks to be removed and re-erected on site selected by Mr. Turton.—A.F.W., 13/8/85.

No. 16.

Minute by The Locomotive Engineer.

THE Commissioner is desirous of knowing what arrangements have been made for working the Western Line between Bathurst and Wellington since the extension to Bourke. Please therefore let me have, as early as possible, a detailed statement shewing the present arrangement of running trains, the number of engines and where stationed, and how far these arrangements will be affected when depôts at Wellington and Nyngan are completed.

Mr. Turton.

W.S.,

Per (R.J.S.), 26/11/85.

Report attached.—J. TURTON, 7/12/85.

Sir,

Sir, Locomotive Engineer's Branch, Bathurst, 17 December, 1885.

Re your M.P. 85-2,552 re working between Bathurst and Wellington since opening of the extension to Bourke, I have to report as follows:—Four sets of drivers and firemen have been transferred from Dubbo to Wellington to work the Bathurst engines and trains to and fro between those stations, so as to facilitate the traffic, avoid damage to engines, and disputes arising therefrom, and save the expense of men travelling as passengers to and fro between Dubbo and Wellington to work those trains. I also stationed one Bogie engine at Wellington, to run between Orange and Wellington, but as this train is now discontinued, I have stationed one of class 93 in her place to work with other two of same class that I am now stationing there to work between Wellington and Dubbo with trains from and to Bathurst. I purpose, as soon as the engine-shed at Wellington is finished, to station five other engines of same class to work in with the engines from Bathurst up and down on alternate days. This will affect a considerable saving in lodging expenses for men, and also do away with the necessity of sending engines attached from Bathurst to work up stock trains to a very great extent. Those engines are frequently sent at very short notice, as many as ten or eleven extra engines being required in one day in addition to those of the ordinary trains. The above arrangements will work in with the projected new arrangement for working west of Bathurst and Wellington when the latter and Nyngan and Bourke are established as depôts. The three engines first mentioned will then work as follows:—One to Narramine and back to Wellington daily; the other two each twice daily between Wellington and Dubbo, or to Narramine and back, as may be required, but I anticipate two engines will be required to work between Wellington and Dubbo. I have stationed in Bathurst District thirty-four engines in all, namely, fourteen of class 93, goods; six of class 205, goods; one American Passenger, class 304; five Express engines, class 30; and five double Bogie Passenger, class 79, working as follows:—

Three, class 304, Sydney Mail.

Two, „ 30, Dubbo Mail.

Three „ „ 37 Down, 16 Up, mixed, Bathurst and Dubbo and Dubbo Mail.

Twelve „ 93, Goods, Bathurst and Dubbo, and two same class stationed at Wellington from to-morrow, working between there and Dubbo.

Five, class 205, Goods and Stock, Bathurst and Dubbo.

Five, „ 79, Ordinary Trains, Bathurst and Orange, Wellington or Dubbo, attached or single; pilots and shunting, Bathurst yard.

On account of the number of extra engines required daily to be sent from Dubbo, attached or as second divisions, I have found it impossible to adhere to a running table as formerly, and drivers have to be arranged to run as may be required. I have now seven sets of drivers and firemen stationed at Wellington, three sets having been sent from Bathurst; all these men are working trains between Wellington and Dubbo.

Locomotive Engineer.

J. TURTON.

The Commissioner is desirous of knowing what arrangements have been made for working the Western line between Wellington and Bourke since the extension to the latter place. Please, therefore, let me have as early as possible a detailed statement, showing the present arrangement of running trains, the number of engines and where stationed, and how far these arrangements will be affected when depôts at Wellington and Nyngan are completed.—W.S. (per R.J.S.), 26/11/85.—MR. HUBBARD.

My report attached, showing that it is impracticable to make Wellington a Locomotive Depôt, and abolishing Dubbo as such, without a large increase in the present working expenses; also, statement showing a week's work ending 26th November, 1885, the number of live-stock trucks, cattle and sheep (other live stock not included), loaded at Dubbo and stations west of Dubbo, and all particulars asked for.—J. P. HUBBARD, 29/11/85. Locomotive Engineer.

Sir, Locomotive Engineer's Branch, Dubbo, 29 November, 1885.

I have to report on your 85-2,553 of 26/11/85, Locomotive Engineer's M.P. 85-7,392, Commissioner's M.P. 85-16,196, in reference to Wellington and Nyngan being made Locomotive Depôts.

If it is intended to make Wellington a Locomotive Depôt, and to abolish Dubbo as such, I consider it to be impracticable and unworkable without entailing a very large addition to the present working expenses.

The gradients on the line between Dubbo and Wellington, and *vice versa*, being too heavy to admit of only taking half a load, as is brought over from Narramine to Dubbo, and *vice versa*.

All trains are divided at Dubbo. One train arriving from Narramine has to be made into two trains for Wellington and Bathurst, and so on to Penrith.

Two additional mail engines at least would be required to run the mail-trains between Wellington and Nyngan, as the present engines now doing the work could not run (or work) the mail-trains between Wellington and Dubbo, or *vice versa*, they not being powerful enough. Eight or ten additional goods engines would also be required to be stationed at Wellington to carry on the present traffic, as will be seen on referring to the attached running sheets of work actually now being performed for week ending 26th November, 1885; or engines will have to be sent right through from Bathurst to Dubbo. They will require turning, coaling, cleaning, and necessary repairs as is now done; as, for example, on Friday, 20th November, 1885, seven engines hauled the traffic from stations west of Dubbo, and thirteen engines were required to take the same to Wellington for Bathurst; on the 24th instant six engines hauled the traffic to Dubbo, and fourteen engines were required to take it on from Dubbo to Wellington for Bathurst and Penrith. This, of course, includes the Dubbo traffic; thus showing the engines must come to Dubbo in any case.

Without a relay of engines, eight or ten are kept at Wellington to run between Wellington and Dubbo, and *vice versa*.

It is not as if it was non-perishable goods that a short train could be kept continually running between Wellington and Dubbo to collect the goods at that point. Live stock admits of no delay, and, as I stated before, a double number of engines must be in readiness, cleaned, turned, coaled, &c., at Dubbo, to take the live-stock trains right through to Wellington, Bathurst, and on to Penrith.

I respectfully submit, you can no more abolish Dubbo as a Locomotive Depôt than you can Penrith without entailing a very large addition to the present working expenses.

My views are well known in the matter.

I

I arranged some time since (about two months ago) with Messrs. Turton & Stanger to send one of the through trains at any time to Wellington, and thus let those gentlemen see how it will work.

I do not wish to be considered as putting obstacles in the way; but, at the same time, I am bound to state what, in my opinion, will be the result, namely, two Locomotive Depôts (one at Wellington and the other at Dubbo), additional engines and men, and consequently a very large increase in the working expenses.

The following will, no doubt, be considered a startling statement, but nevertheless it is true that the present system of running the mail-trains between Dubbo and Bourke, 225 miles, with the three present engines now doing the work, namely, Nos. 14, 15, and 16 (class 14), the engines and men running 900 miles per week will bear comparison with cost per train-mile, not only with any other mail-train in the Australian Colonies, but also with any English or Continental railways. Our cost per train-mile is much less.

The proper system, in my opinion, is to run the engines and men through from Bathurst to Dubbo (133 miles) down one day, up the next, and a day off; half the men to run from Bathurst end, the other half from Dubbo end. All the men would be home on Sundays. It could be so arranged, and thus abolish Wellington as a Locomotive Depôt.

If any complaint is made of the distance from Bathurst to Dubbo for the men to run 133 miles, then the same objection would apply more forcibly from Wellington to Nyngan, 129 miles, it being a much hotter climate than from Bathurst to Wellington.

Attached are all the particulars asked for, and a running sheet for last week ending 26th November, 1885. This statement (or report) is based on the present traffic now actually being carried on, and Wellington could only be made a Locomotive Depôt when there was actually nothing to do, *i.e.*, no traffic.

It often occurs, through the erratic movements of live stock, that engines are required at short notice at Dubbo. Engines could not be obtained so readily from Wellington as at Dubbo, and therefore lead to delay.

I wish to direct your attention to the large number of live-stock trucks loaded and carried through from Dubbo and stations west of Dubbo for the last two months, namely, October and November. The return includes fifteen trucks of sheep to be loaded at Bourke to-morrow, the 30th November, 1885:—

Loaded at stations west of Dubbo for eastwards	...	...	...	...	...	1,570
Do. Dubbo stock-yards for eastwards	...	...	...	...	...	817
					Total	2,387 trucks.

This does not include live stock other than cattle and sheep.

Locomotive Engineer.

J. P. HUBBARD.

I forward this for your information, and any remarks you may have to offer. Please obtain Mr. Stanger's views on the matter. It would appear from Mr. Hubbard's report that a depôt at Wellington is a mistake; but I am aware that before it was decided on full inquiry was made.—W.S. (*per* R.J.S.), 30/11/85. Mr. Turton. Reports attached.—J. TURTON, 8/12/85. Locomotive Engineer.

Sir,

Locomotive Engineer's Branch, Bathurst, 7 December, 1885.

Re Mr. Hubbard's report on the impracticability of working the traffic from Wellington, as a depôt, to Nyngan and Bourke, I make the following replies to his statements:—

I do not see why it is impracticable, neither does he show why, and I am sure it will effect a reduction of working expenses, as, when engines are stationed at Wellington, they will be available at short notice for up stock trains, and those save unnecessary expense in running extra engines attached from Bathurst, as is now the rule.

The gradients will be no worse between Dubbo and Wellington when the latter is the depôt than they are now, and the work can be more efficiently carried on by having engines at command at Wellington.

Trains will always have to be divided at Dubbo or Narramine. This should be done at the latter place as much as possible; the Nyngan engines running on to Wellington with full loads, and Wellington engines bringing on remainder to be sent on as specials to Bathurst.

I can see no reason why two additional mail engines will be required to run between Wellington and Nyngan. Two of the express or ordinary Bogie express engines can do this, as previously, which will relieve two of Mr. Hubbard's engines of class 14, for other work, and I understand it is contemplated to do away with the mail train between Nyngan and Bourke, and to run a mixed train instead, as one train daily is enough for the work of that section.

I am of opinion that the goods engines now stationed in Bathurst and Dubbo Districts are sufficient for the work if proper arrangements are made. There is at present one regular goods train and one mail train running each way daily between Dubbo and Nevertire and Dubbo and Bourke, but several specials run with stock occasionally; but it must be remembered that one ordinary Bogie engine will bring a load of thirty trucks easily between Byrock and Narramine.

Mr. Hubbard says seven engines have hauled the traffic west of Dubbo, and he has twenty engines in all. By this it would appear that some of his engines should be transferred to Wellington, which I have no doubt could well be done without putting him to inconvenience. One engine on Dubbo to Byrock, or I may say Bourke, is equal to two on Bathurst section. He has twenty and I have thirty-four engines, and I have to run trains to Sydney, Eskbank, and Wallerawang, as well as to Orange, Wellington, and Dubbo.

Whether perishable (which I take to be stock) or not, the trains can be worked through more expeditiously and economically with engines stationed at Wellington, as they can start with a clean fire and ashpan, and in every way better prepared for the rough and heavy part of the journey, and by being coaled at Wellington, a very considerable saving in cost of freight of coal will be effected, and delays coaling engines passing Wellington, and cleaning fires and ashpans at Store Creek, will be altogether avoided, and the traffic generally facilitated, added to which, the engines can, if required, make three single, and possibly two double trips, in thirty-six hours, which is a consideration when we are short of them.

I can see no comparison between Penrith and Dubbo, and cannot see what is to cause an increase in the expenses, but can see the reverse.

I am quite aware of the views of Mr. Hubbard on the matter, but must disagree with them, and he might, if so inclined, have assisted me on many occasions, by sending one or two of his engines through to Wellington or Bathurst.

Mr. Hubbard, of course, is right to give his opinion, but as I before stated, I can see no reason for an increase in expense of working the new arrangement of depôts. It merely requires, in my opinion, a rearrangement of the engines and men, and an earnest desire, on the part of both officers and men, to arrange and work for the best interests of the Department.

The present system of running the mail west of Dubbo is against the Commissioner's instructions *re* working the men over hours, and which must be very hard on them in the hot climate of Dubbo District.

The better system is for the mail engines and men to run from Bathurst to Wellington and back in the day, as previously done, and from Wellington to Nyngan, down one day and up next, with Bogie-engines.

This objection has, I am informed, been made by the men of Dubbo mail, but inducements were held out to them to cause them to put up with it. By Mr. Hubbard's own showing, he has more engines than the traffic west of Dubbo requires, and I fail to see why Wellington could only be made a depôt if the traffic failed altogether.

To meet the erratic movements of live stock, engines could be obtained at short notice at Bourke, Nyngan, or Wellington, as required, and this would save or prevent the necessity for sending engines empty from Dubbo to either of the stations west, before named, for running up stock trains.

As a further reason why Wellington is most suitable for a depôt, the Traffic Inspector's Office is there, and earlier and more accurate information can be obtained there than at Dubbo for making arrangements at Bathurst or stations west.

In conclusion, I may mention that the number of extra engines sent from Bathurst to Dubbo during last month (November) is sixty-five. This will shew the advisability of establishing the depôt at Wellington, as, although during that time most of those engines were required at short notice, Mr. Hubbard only sent one of his engines through to Bathurst.

J. TURTON.

Locomotive Engineer.

Locomotive Engineer's Branch, Bathurst, 3 December, 1885.

In response to the Locomotive Engineer's minute on Mr. Hubbard's report as to the working of engines between Wellington and Bourke, I now beg to state as fully as possible my views on the matter.

I will commence by saying that now I have been nearly two years stationed at Wellington. No one has had a better opportunity of judging of the present system, which is to let the engines work through to and from Bathurst, while the men change at Wellington, and I cannot too strongly condemn it as being opposed to efficient and economical railway working. An engine now, between the time of leaving the shed at Bathurst to returning, passes always through the hands of three sets of men, and occasionally of four sets. It would be difficult to exactly show what this means in increased wear and tear to the engines and expense of repairs, but I really believe if it could be got out it would horrify the Commissioner.

Again, the men, when taking charge of an engine at Wellington, have only 15 minutes allowed them in which to oil and examine the engine. This is not enough; it has frequently happened that a mishap has occurred to an engine directly after leaving Wellington, a cottar working out, for instance, the man in charge of the engine at the time is held responsible for the mischief, though probably it began many hours before. Of course, had the men time to properly examine the engine, there would be no excuse for them, but I say that in many cases they have not the necessary time without seriously delaying the traffic.

Another objection to the present system is, that frequently engines have not enough coal on them to work the trains through; and then from 10 to 25 minutes is lost taking coal. This has not been so common an occurrence this year since the engines have been burning Lithgow coal; but last year, with Wallerawang coal, hardly an engine passed with a full load without requiring coal. And I would express my opinion that 103 miles over such gradients as exist between Bathurst and Wellington is a very fair distance for one trip; and that a driver, before commencing it with an important train, such as live stock, should have a fair start by having a clean fire and empty ashpan and smoke-box. There would not then be so much danger of fires along the line, and better time would be kept. I do not think anyone is an advocate for continuing the present system, but I have thought it well to point out the chief objections to it.

The last two objections apply with equal force to Mr. Hubbard's proposal to work the trains through between Bathurst and Dubbo, with men and engines from each depôt. And a third objection to this course is the long hours the men would be on duty, running to time they would be at least eleven and a half hours over the trip, and it is a common occurrence for the down night trains to be one, two, and even three hours late. This running through between Dubbo and Bathurst was tried two or three years ago, but had to be abandoned on account of the complaints made by the men.

Mr. Hubbard considers the proposal to make Wellington a depôt, is both impracticable and unworkable without a very large increase of the present working expenses. I think the traffic can be worked by engines stationed at Wellington with great efficiency, and I think, also, with greater economy than under the present system. I cannot see that the gradients between Wellington and Dubbo in any way affect the question, as under any mode of working they remain the same. It will always in any case require about double the engine-power to work trains this side of Dubbo; and Mr. Hubbard loses sight of the fact that there are now five regular goods trains from Bathurst to Dubbo, two of which only go beyond Dubbo. In the same way from Nyngan to Dubbo there are only two goods trains, whereas from Dubbo to Bathurst there are five; this means that the through train takes to, or picks up at, Dubbo the load of a train starting from, or arriving at, Dubbo. This has been and always will be the mode of working on account of the change of gradients, no matter where the engines are stationed. Mr. Hubbard appears to base all his statements on the live-stock traffic which, coming at the same time as the wool, has for the last three months been very heavy, but which it is not fair to represent as the normal condition of things. An engine takes into Dubbo, say, twenty-six trucks of sheep from Nyngan, now that engine is taken off, and the train divided, two fresh engines being put on to take the train to Bathurst. If the proposed change is made, the engine bringing in this train to Dubbo will simply back half

half the load on to another brake van, which has now to be done, and will at once complete her journey to Wellington, where the Bathurst engine and men will be ready. The half put off will be brought on, either by an engine which has taken a down train, which goes on further than Dubbo, or by an engine sent from Wellington. There would be no increased cost in this. At present, engines to work up-stock specials have to be sent empty from Bathurst, though in some cases some of these engines assist to work the empty sheep vans, &c., which can be done equally well under the new system.

One point Mr. Hubbard overlooks is, that there will be a saving of about, on the average, £15 a week in the haulage of coal alone. Now, all the coal required for the Bathurst engines on the up journey has to be hauled 133 miles to Dubbo, and there loaded on the engines.

I do not believe the total number of engines between Bathurst and Bourke will need to be increased unless by one mail engine. A proportion of the Bathurst engines will need to go to Wellington to work the 30 miles they now work, and a proportion of the Dubbo engines will need to go to Wellington to work the portion of the line now worked by Dubbo engines.

As for Mr. Hubbard's statement that the run from Wellington to Nyngan is equally hard on the men, as the run from Bathurst to Dubbo, I must most entirely disagree with him, for though both the mileage and time are nearly equal, though both slightly in favour of the Wellington and Nyngan section, the work is much less severe owing to the different state of the gradients, &c., on the two sections.

Another statement to the effect that, owing to the erratic movements of live stock, engines are required at short notice, which can be better supplied at Dubbo than Wellington is not worth much when I say that during the last three months, when the traffic has been so heavy that both men and engines were severely taxed, I have frequently begged of Mr. Hubbard to assist by sending one of his engines to Bathurst when one has been required at short notice to avoid upsetting all arrangements and depriving men of their rest. He has only once sent his engine through, and then not his men, which was really no assistance at all.

Four engines will certainly be required to work the mail between Wellington and Bourke, and it is true that more powerful engines will be required from Wellington. Engines of class 256 will be the most suitable. They could work any load from Wellington to Nyngan that will ever be required on the mail, as I believe there will be no difficulty in getting the sleeping car left at Wellington. It is not required beyond this was proved last year when, for one month, the passengers were counted, and it was found that the sleeping car simply robbed the first-class carriages of their passengers.

Mr. Hubbard's views have undergone a singular change since it was first proposed to remove the depôt from Dubbo to Wellington, now about two and a half years ago. Then he seemed to hail with delight the prospect of going to Wellington, and even asked a party in Wellington to look out for a piece of land for him; but since I have been sent to Wellington, Mr. Hubbard has appeared to oppose the proposed change.

C. H. STANGER.

No. 17.

Memo. by Mr. C. H. Stanger to The Locomotive Foreman.

Sir,

Locomotive Branch, Wellington, 26 January, 1886.

Finding that the three goods engines I have here are not sufficient for working the whole of the trains between Wellington and Dubbo and one occasionally to Bathurst when there is not time to procure an engine from Bathurst, I have seen Mr. Hurst and arranged with him to take over, subject to your approval, another goods engine instead of a Bogie engine which Mr. Turton had arranged to hand over to me. Now that the district is divided, I consider it more important than ever to avoid sending Bathurst men and engines beyond Wellington; but on busy days I am compelled to send engines through. This will not often be necessary when I have a fourth goods engine.

C. H. STANGER,
26/1/86.

I should be glad if you could visit Wellington and report.—J.C., 27/1/86. Mr. Loughry.

Four goods engines (Nos. 1, 2, 93, and 95) and a proportionate number of men have been transferred from Dubbo to Wellington. There are now eight engines stationed at Wellington, including those previously transferred from Bathurst. The goods traffic being slack at the present time this number will, I think, meet the requirements.—E. A. LOUGHRY, 23/2/86. Locomotive Engineer. Seen.—W. SCOTT, 26/2/86.

Sir,

Locomotive Branch, Wellington, 26 January, 1886.

I wish to call your attention to the advantages to be gained by having the pilot engine for up-mail moved from Dubbo to Wellington at once. In the first place, it is very rarely indeed that the load from Dubbo exceeds thirteen vehicles, and these can be brought as far as Wellington by one engine of the class No. 268 now working these trains. By attaching the pilot at Wellington there would be a saving of three hours time for both driver and firemen whenever the pilot is on the mail.

And secondly, I should have the advantage of having a passenger engine here ready for any emergency, and could also frequently make use of this engine to assist stock trains, for which purpose it would serve as well as a goods engine.

I might say that a pilot engine will soon never be required between Dubbo and Wellington, as it is the intention of the Traffic Department to entirely break up the mail train here, and only to run beyond Wellington a train consisting of equal to nine vehicles. I think it will be advisable, so soon as you are able, to provide me with two engines capable of taking a load of (say) ten vehicles up the 1" in 40 banks between Wellington and Dubbo, and suitable for the level straight road between Narramine and Nyngan (the class 256 would, I think, be very suitable for this purpose) for the engines of the mail trains to be changed at Wellington and again at Nyngan.

For the present, I would suggest that Mr. Hubbard hand over to me a Bogie engine in good order, as I have no fitter at present, with a set of suitable men for working a pilot engine on the mail trains, and one cleaner.

Locomotive Foreman.

C. A. STANGER.

Sir,

Sir,

Locomotive Branch, Bathurst.

I would recommend that four goods engines, class 93, and two Bogie engines, class 79, be transferred from Dubbo to Wellington, to work between Wellington and Nyngan. I can spare one Bogie engine of the class named. I believe the above, with the three of class 93 already transferred from Bathurst, will be ample to carry on the traffic for some time to come.

Locomotive Engineer.

J. TURTON,
15/1/87.

Can Mr. Hubbard arrange this?—W. SCOTT, 16/6/86.

Yes. These engines (six) can be removed at any time from Dubbo to Wellington. At the same time, to prevent any unnecessary delay to traffic, I would call attention to my previous suggestion that one train at a time can be taken over, *i.e.*, run through between Wellington and Nyngan, and *vice versa*.—J. B. HUBBARD, 24/1/86. Locomotive Engineer.

No. 18.

The Hon. Secretaries, Dubbo Railway League, to Sir Patrick Jennings.

Dear Sir Patrick,

Dubbo, 17 February, 1886.

It has been rumoured in town for some time past that the Commissioner for Railways has issued instructions to remove the engines usually stationed at the Dubbo engine-shed to Wellington, and to make the latter town the changing station for all traffic between there and Bourke. On this rumour a public meeting was called here; but as we had nothing definite to go on, it was decided to ask the Members for the district to make inquiries from the Commissioner as to the truth of the report, and, if found that such change is contemplated, to protest against it.

Dubbo has always been the changing station, and for the best of reasons, that it is the starting point for the level country. The heaviest traffic between Bourke and Dubbo has always been done with one engine, but a second, and frequently a third engine, is required from here to Wellington, and *vice versa*; so that if Wellington is made the changing station as reported, engines will have to be sent here daily to take the traffic from here, thus making expenses heavier on an already expensively worked section. Will you, with Mr. Cass, make the necessary inquiries at your earliest convenience, and let us know the result.

Yours &c.,

W. G. MORGAN,
P. M'ENCROE,

Hon. Secretaries Dubbo Railway League.

Dear Mr. Cass,

Dubbo, 17 February, 1886.

A rumour has been prevalent in town for some time past that the Railway Department have issued instructions to have the engines usually stationed at Dubbo removed to Wellington, with the object of making the latter town the changing station for the traffic between there and Bourke. On this rumour a public meeting was held here a week or so since; but as we had nothing definite to work upon, it was decided that the Secretaries of the Railway League should communicate with the Members for the district, and ask them to inquire from the Commissioner as to the truth of the report. Apart from the great loss to Dubbo people such a change would be, in removing the railway employes to Wellington, a great departmental error would be made in thus altering the traffic. You are aware that Dubbo is the starting point for the level country; and if the rumoured change is made, two or three engines would be doing the work now done with one. We are writing to Sir Patrick also in this matter, and hope that you and he will see the Commissioner as early as possible, and learn from him if such change is contemplated; also, let us know the result.

Yours &c.,

W. G. MORGAN,
P. M'ENCROE,

Hon. Secretaries Railway League.

With Mr. Cass's compliments to the Honorable W. J. Lyne, Minister for Works. Let nothing be done until the question can be more fully considered.—W.J.L., 3/3/86. I should like to see Mr. Scott on the matter, with a statement of all the reasons for the proposed change.—CH.A.G., 18/2/86. I have seen the Commissioner. Report herewith.—W. SCOTT, 22/2/86.

REPORT by Locomotive Engineer.

Removal of Locomotive Depot from Dubbo to Wellington.

It is for obvious reasons a rule on all railways to arrange the locomotive depôts, so as to equalise as much as possible the number of miles to be run by the engines, and the number of hours the enginemen and firemen will require to be on duty. Keeping these two very important points in view, there can be no doubt that Wellington is the proper place for the locomotive depôt, as the distances are—Bathurst to Wellington, 103 miles; Wellington to Nyngan, 130 miles; Nyngan to Bourke, 126 miles. The usual number of hours the enginemen and firemen would require to be on duty on these runs are—Bathurst to Wellington, ten hours; Wellington to Nyngan, ten hours; Nyngan to Bourke, ten hours. When the Bathurst men ran to Dubbo they were continually complaining of the number of hours they were kept on duty, and forwarded a petition to the Commissioner on the subject. With the view of removing this grievance, the Bathurst men were relieved at Wellington, and their engines were run to Dubbo by another set of men, which involved in nearly all cases a third set of men bringing the same engines back to Wellington, and frequently a fourth set of men taking them back to Bathurst, which system was found to be a prolific source of trouble and expense, through engines breaking down and causing trains to be late; and to such an extent did this prevail that it became necessary to station an officer at Wellington to control it as much as possible. A subsequent petition was received from the Dubbo men, wherein they complained of being away from their homes for a considerable number of hours, for which they were not paid.

paid. This resulted from the steps taken to relieve the Bathurst men (before referred to), by running from Dubbo to Wellington and back, which necessitated their standing several hours at Wellington. They were actually on duty only about forty hours per week, and received a full week's wages.

As regards the contention that Dubbo should be the depôt, as it is the starting point of the level country, the same argument would apply to Narramine, as the change of grade between Dubbo and there has an equal effect in reducing the hauling power of the engine. It is not, however, intended to remove all the engines from Dubbo, so that the additional power that will be required on that account will be available when necessary. As a matter of fact the empty running of engines will not be more by the depôt being at Wellington than it has or would be if at Dubbo.

On the grounds of economy alone I submit there are sufficient to justify the making of Wellington the locomotive depôt, as will be seen by the following statement, showing the amount that is and will be saved by the depôt being at Wellington instead of at Dubbo, based on past experience:—

	Per week.
To extra haulage of coal to Dubbo for six goods engines, 126 tons	£15 15 0
Do. of 10 tons of coal per week for mail engine	1 5 0
„ Time claimed to be paid for by four sets of men when standing idle at Wellington, <i>vide</i> petition	12 0 0
„ Cost of additional attention required to engines engaged running from Bathurst to Dubbo, consequent on the unusual practice of having so many different sets of men running the same engine	6 0 0
„ Salary of officer specially stationed at Wellington to control working of engines through depôt being at Dubbo	5 0 0
„ Extra haulage of carriages to and from Dubbo and Wellington saved by making Wellington the changing station	5 0 0
	£45 0 0

equal to £2,340 per annum.

W. SCOTT, 22/2/86.

No. 19.

Mr. R. Davidson to The Secretary for Public Works.

Honorable Sir,

Darling-street, Dubbo, 4 March, 1886.

I trust you will kindly pardon the intrusion of my humble remarks. At present there appears to be a multiplicity of opinions about the erection of the new sheds at Wellington. Yet the glaring error must be patent to any ordinary mind that the originators of this fallacious plan of judiciously dividing the different sections of the Western line from Bathurst to Bourke has, and ever will prove to be, the result of an erroneous calculation, if nothing else. Common sense suggests that the proper place for the erection of the new sheds was Kerr's Creek, which is 65 miles 45 chains from Bathurst and 68 miles 28 chains from Dubbo. If it had been arranged for the trains to change, or rather the men, at Kerr's Creek, the men could have run from Bathurst to Kerr's Creek and back to Bathurst, and the same from Dubbo and back for one day's work, which I have no doubt would meet with the approval of the majority of the men; and such a plan would be an immense saving to the country—3s. per night for each engineman, 3s. for each fireman, and 3s. for each guard, would be saved in the shape of all night from home expenses. Also the apparently insurmountable difficulty of equitably protecting the public interests, and judiciously working the railways of New South Wales, so that instead of the railways being a public burden they would soon be a public benefit, which, in the present state of the public finances, is a most material consideration. The thing is quite simple: it takes two engines to bring from Bathurst the same load that one engine can draw from Dubbo to Bourke; therefore the trains have, and always will have, to be made up in Dubbo. Where then is the proof of skilful management in expending such a large sum of public money in the erection of new sheds in Wellington, the thing speaks for itself; the engines are not required at Wellington, what use can the new sheds be. Perhaps they are being erected as monuments of error similar to the stone sheds erected at Wallerawang and Junee Junction, which were erected with three roads in each to accommodate eight engines each, and seldom or ever has more than one engine in each shed.

I have, &c.,

R. DAVIDSON.

File with other papers upon this matter.—W.J.L., 5/3/86.

No. 20.

Minute by The Secretary for Public Works.

Proposed removal of engine-sheds, Dubbo to Wellington.

A DEPUTATION from Wellington, introduced by D. A. Ferguson, M.P., accompanied by Messrs. Davies, Kidd, Smith, and Taylor, M's.P., waited upon me to-day, with reference to the proposed removal of the engine-sheds from Dubbo to Wellington. It was represented that the decision to have the engine-sheds at Wellington was the outcome of long and careful deliberation on the part of responsible railway officers who recommended Wellington as the most suitable site both for the location of the men and in view of the economical working of the railway. In pursuance of the decision arrived at, running sheds had been erected, as well as drivers quarters, at Wellington, and to reverse the previous arrangement would be to render useless the large sum expended in the erection of the locomotive buildings.

It was represented that Wellington was at a convenient distance from the next depôt, Bathurst, the distance between these two points being a fair day's work for the engines and men, while Dubbo was a point too far; that there was an excellent water supply at Wellington while the climate was better, and general supplies for the men were more easily obtainable than at Dubbo. It was said that coal was to be had

had at Dubbo, but the deputation pointed out that excellent coal was to be found nearer the line at Wellington than at Dubbo. In regard to coal haulage, it was pointed out that the location of the sheds at Wellington would mean a saving of some thousands of pounds annually. The deputation pointed out that the matter had already received the sanction of the previous Ministers who considered the matter, and was recommended by the proper and competent officers who had to deal with it.

I informed them that I had not yet had an opportunity of perusing the papers connected with this case, so as to make myself perfectly acquainted with the facts, and I could not therefore at the present moment give them any definite decision.

The matter had previously come under my notice, when a petition was presented by Mr. D. A. Ferguson to the effect that it was rumoured some movement was on foot to have the sheds removed to Dubbo, &c., but, on inquiry, I found there was no truth in it at the time. I knew nothing more of the matter until a few days ago, when a deputation waited upon Sir Patrick Jennings, but the Premier made no promise whatever, and Sir Patrick had not attempted to influence me in any way. He simply mentioned to the deputation that he was not going to offer any bribe to them by saying "this or that," and the opinion he held as a private member he retained as a Minister of the Crown, and without promising anything he said the whole matter would be reconsidered.

That was precisely the state of the case. Mr. Cass had waited on him the other day, when he referred incidentally to the question of coal, and pointed out that the working of coal in the locality would effect to some degree the establishment of the shed. The saving further would not be so extensive as they anticipated, as from a report before me, favourable to Wellington, it was said the saving would be equal to about £2,340 per annum, about £900 being for the haulage of coal.

I stated I could give them no definite reply to-day. I would thoroughly investigate the matter and give a decision, not in the interests of Wellington or Dubbo, but in the interests of the economical working of the railways. Expenditure had taken place at both Dubbo and Wellington, and this would be taken into consideration when deciding the question. With regard to the men themselves there did not appear to be any unanimous feeling in the matter, some seeming to prefer Wellington, others Dubbo. I promised finally to go carefully into the whole matter.

W.J.L., 15/3/86.

No. 21.

Minute by The Secretary for Public Works.

Proposed removal of engine-sheds to Wellington.

A DEPUTATION, introduced by Mr. Cass, M.P., and consisting of Mr. Muller, Morgan, Penzer, Caro, M'Enroe, and Phillips, waited upon me to-day with reference to the proposed removal of the engine-sheds from Dubbo to Wellington. The deputation represented Dubbo interests and spoke against the proposal to remove the sheds.

It was represented that five engines had been removed, and since the removal of the engines two required to run light or empty four days per week, and four or five two days per week between these two places in consequence of the different loads that had to be hauled. One engine could haul as many as from thirty-five to forty trucks between Dubbo and Bourke, keeping good time, while thirteen trucks constituted a load between Dubbo and Wellington, so that an engine could take three times the load west that it could take east, and consequently all trains had to be "split up" at Dubbo, and this was one reason why the depôt should be there. It had been stated that Bathurst and Wellington, and Wellington and Nyngan formed fair limits for a day's work, but the deputation urged the division was not equitable, and such sections as Bourke to Nyngan, Nyngan to Dubbo, Dubbo to Orange could be worked cheaper and with much more advantage than the scheme proposed, as the sections would be about equal distances, and Dubbo in particular would be found to be a convenient and economical site for one depôt. It was said further that the local officers were in favour of the retention of Dubbo, and it was understood they had made reports recommending Dubbo as being the most natural and eligible station for the works. At the present time three engines worked the mail trains between Dubbo and Bourke at an expenditure they estimated at £1,255; if the depôt were changed to Wellington they considered four engines would be required, and in addition to the first cost of the extra engine the working expenses would be increased to £1,916 per annum for the mail trains alone on this section, while under the system of working light engines—the engine that ran the down mail to Nyngan, on Friday, would have to return to Wellington, on Saturday, to run the down mail on Sunday; and the engine that took the up mail to Wellington on Sunday, would have to run light back to Nyngan, on Monday, to bring up mail on Tuesday. If any other system were adopted it would require six engines to work the mail.

It had been said that the saving by the adoption of Wellington would be £3,000, but the deputation alleged there would be a loss of £10,000 per annum by extra working if the change were made. It was represented that only on Wednesday last in connection with the stock traffic seven engines had to run from Wellington to Dubbo empty in order to take up the divided loads.

In addition there was abundant evidence that coal existed in the vicinity of Dubbo, and a diamond drill was now being put down to try the seams, and satisfactory results were anticipated; this was an important consideration, and should weigh heavily in favour of Dubbo as the site. Again sooner or later there was bound to be undertaken an extension from Dubbo to Coonamble, and a connecting line from Werris Creek to Dubbo to join the western and northern systems, and this would make Dubbo the most important junction in the west. In view of this it would be unwise to establish a depôt at Wellington as the working would prove both expensive and inconvenient.

In reply I informed them that I intended to give this matter my most serious consideration, and would lose no time in coming to a decision. I had had a deputation from Wellington to see me in the matter, and in connection therewith had looked carefully through the papers, but I find that so far the responsible officers of the Department had reported in favour of the establishment of the depôt at Wellington, and action had been taken accordingly. I had seen no report from the local officers in favour of Dubbo, and was surprised to hear the assertion that they were suppressed; this, however, I felt confident was not a fact, and I promised to have enquiry made to ascertain if reports were made, and, if so, why they were not submitted.

They

They (the deputation) submitted a most exhaustive statement in favour of the claims of Dubbo, and in considering the matter, the facts they had urged would be fully taken into account, and I would obtain a full departmental report as to the merits of their claim. It seemed to me the question in some degree was whether the depôt should be on the top or at the foot of a hill. The arguments they had advanced in regard to the existence of coal in the vicinity of Dubbo, and the probability that it would become an important junction were matters of weight, and would be duly considered. I should be guided not by the interests of Dubbo or Wellington, but by what would be best in the interests of the economical working of the Department; if Wellington offered superior advantages I would unhesitatingly decide in favour of Wellington; but if on the other hand Dubbo seemed to me the best site I would approve of its selection, and the settlement of the question would depend upon what was best in the interests of the Department and the country.

W.J.L., 26/3/86.

No. 22.

Minute by The Chief Clerk.

Locomotive Depôt.—Wellington *versus* Dubbo.

WITH reference to the further papers sent by you to this office in connection with the removal of the locomotive depôt from Dubbo to Wellington, I notice that the copy of the report said to have been sent in by the Shed Inspector Horsefield is absent. The Minister wishes to have a copy of it at once. The matter is urgent, and I shall be glad if you will give it early attention.—D.C.McL., 12/4/86. Locomotive Engineer.

It will be seen by telegram from Inspector Hubbard that there is no report from Mr. Horsefield.—W.S. (per C.A.N.), 14/4/86. Commissioner.

Telegram from Mr. Inspector Hubbard, Dubbo, to Mr. Locomotive Engineer Scott.

14 April, 1886.

YOUR telegram received. There is no report from Shed Inspector Horsefield *re* depôt Dubbo and Wellington.

No. 23.

Précis.

Question of the conflicting claims of Wellington and Dubbo to be adopted as a locomotive depôt on the Western line.

THIS question was probably discussed on papers of an earlier date than any which I have been able to obtain; but the following statement will, I trust, be sufficiently to the point for the Commissioner's purposes.

In June, 1883, a petition was presented to the Minister by certain inhabitants of Wellington, embodying resolutions passed at a public meeting, setting forth (1) that there was abundance of land within the railway reserve at Wellington for the erection of workshops and a depôt; (2) that Wellington was a stopping-place for the engine-drivers and others, and was the proper distance between Bathurst and Nyngan for workshops; and (3) that there were in the neighbourhood extensive mines of coal and copper. For these reasons the petitioners prayed that workshops might be erected there.

The Commissioner minuted that he believed Wellington, from its position in the division of the running, was the best position for running-sheds and depôt. Would Mr. Scott say what has been done, and what was required? Was there a running-shed at Dubbo?

Locomotive Engineer obtained reports on the subject from Mr. Turton, to the effect that the extension Nevertire to Nyngan having been opened, it would be necessary to run the engines in sections, Bathurst to Wellington, and Wellington to Nyngan and return; but this would necessitate the erection of running-sheds at, and the gradual removal of the men to, Wellington, which should be the depôt. Also from the Locomotive Overseer, who minuted that ever since he was on duty at Bathurst it had been evident to him that what Mr. Turton recommended would have to be done as we moved further west.

On the 21st September Mr. Turton further wrote, that it would greatly benefit the Department if the accommodation asked for at Wellington were provided promptly; that the Bathurst men were often much inconvenienced by there being no men from Dubbo to relieve them at Wellington. Temporary sidings and washing out and cleaning appliances might be provided. It would be a good thing for the engines, as they would not pass through so many hands, and the men would be less harassed. The Locomotive Overseer concurred, except in respect of providing any accommodation of a merely temporary character.

Nothing further transpired (so far as the papers show) until the 7th January, 1884, when Mr. Midelton submitted plan No. 867, and stated that it had been found from actual experience that Wellington was the natural place for a locomotive depôt. The Dubbo shed was inconveniently placed for locomotive purposes, and on the completion of the Wellington, arrangements would do for traffic purposes. Went on to describe what he proposed for Wellington. Shed to accommodate sixteen engines, and to be worked by a traverser.

Locomotive Engineer minuted that if four roads were put in, in addition to those shown in the plan, the shed would accommodate twenty-four instead of sixteen engines, and that he did not see the use of a traverser for so small a shed, as it took up one-third of the space without any benefit.

Commissioner minuted (25/1/86) for a detailed estimate and cost of additional roads if traverser were dispensed with. What was cost of Dubbo arrangements? Application was made to the Engineer-in-Chief for amount of expenditure at Dubbo, which was given at £3,447.

Mr. Midelton stated the cost of his scheme for Wellington (duplicate of Goulburn) at £9,065, to hold sixteen engines.

Mr.

Mr. Cowdery did not approve of Mr. Midelton's scheme, and submitted a new plan, with roads to accommodate (without traverser) twelve engines, cost £5,600, with six roads for eighteen engines, cost £7,600. Estimated the cost of Mr. Midelton's scheme at £10,500.

Commissioner minuted Locomotive Engineer to draw up a statement of expenditure to date at Dubbo and Wellington, and to show how many engines could be stabled at each place, and how many were accommodated. If Wellington were made the depôt, what would be done with the buildings at Dubbo? By Mr. Cowdery's plan twelve engines could be accommodated, to be increased to nineteen by extension of shed. How many engines would Mr. Midelton's accommodate? What would be done with the present Wellington shed? Mr. Midelton reported that there was at Dubbo a shed for four engines and none at Wellington; that what he proposed was to build a shed half the size of Goulburn, and to the same plans, for sixteen engines, to be extended at any time and that Mr. Cowdery's scheme was old fashioned; and costly to work, and he did not approve of it at all.

So far as the papers show, no further action was taken at that time.

Soon after the Dubbo claim came on the *tapis*.

Under date of 30th June, 1884, the Council Clerk, Dubbo, wrote to the Minister, offering, by direction of the Council, to give 5 acres of land for the erection of railway workshops. The District Engineer having pointed out to the Mayor (Dubbo) that another piece of land at the disposal of the Council would be more suitable, the Council Clerk again wrote (29/7/84) offering to give the entire area—11 acres 21 perches.

Commissioner minuted that it was proposed to make Wellington the running-shed station; that, on recent papers, he had asked as to the number of engines stabled respectively at Dubbo and Wellington; that, at no distant date, Mudjee would be connected with Wellington by rail, and it was probable the traffic beyond Wellington would be taken by that route to Mudjee, and by the Colo River route to Penrith and thence to Sydney. The line to Coonamble, also, would probably go from Mudjee. Wellington would be a far better changing station than Dubbo. Locomotive Engineer to report.

Locomotive Overseer had also held that Wellington must be the locomotive depôt, and was confirmed in that view by Commissioner's minute. Wellington, Nyngan, and Bourke would be the locomotive depôts west of Bathurst. We already had more land at Dubbo than we should want for some years to come. Locomotive Engineer concurred.

Commissioner minuted that as the land was offered for workshops, its acceptance would be a tacit promise to make Dubbo the changing station, and it would be injudicious to accept the land on that basis.

The Council Clerk was advised accordingly (12/9/84).

On the 3rd September, 1884, Mr. Scott minuted that where there was sufficient land to admit of engines being taken out by points and crossings, he was opposed to the use of a traverser for a small shed like Wellington. Recommended Mr. Cowdery's plan for adoption.

Commissioner referred to Mr. Secretary Wright, who signified his approval.

Mr. Cowdery having recommended inviting tenders for the Wellington shed, Commissioner minuted (26/2/85) that before doing this he would like to know,—

- (1.) What would be done with the Dubbo shed after the completion of the Wellington shed?
- (2.) As there was no shed at Wellington, how were engines now stabled there, cleaned, and would Dubbo shed still be used, and how?
- (3.) How many engines were stabled at each place now? A programme must be prepared of what was being done and required between Bathurst and Byrock or Bourke.

Mr. Scott reported (9/3/85) that no engines were stabled at Wellington. The Bathurst goods engines (twelve in number) ran through to Dubbo because there was no accommodation at Wellington; but as this was too long a run for the men they changed engines with the Dubbo drivers. Only three double trips per week were thus run; but when accommodation was available at Wellington the same engines would be able to do five double journeys a week, and the men would be more easily and advantageously worked. In addition to this three passenger engines ran through to Dubbo. In the Dubbo district there were nine passenger and six goods engines; but the grades being easy many of the passenger engines ran goods trains. The majority of these were now stabled at Dubbo; but as soon as accommodation was available, the Dubbo engines would be removed to Nyngan. On the opening to Bourke the engines would run as under:—Bathurst to Wellington, 104 miles; Wellington to Nyngan, 126 miles; Nyngan to Bourke, 129 miles, which, as the grades between Bathurst and Wellington were heavy, would occupy about the same time.

Commissioner minuted (12/3/85) to call for tenders. The Dubbo shed for four engines not to be disturbed, as it might be required for branch lines.

Tenders were invited accordingly, and the tender of Mr. John Ahearn for the sum of £5,392 14s. 8s. was accepted by Mr. Secretary Wright.

In July of the same year an estimate of £2,767 5s. for a coal stage at Wellington, was recommended by the Commissioner and sanctioned by the Minister.

In October following an expenditure of £358 10s. for laying water pipes was approved by the Commissioner as being part of the work already sanctioned by the Minister.

Under date of 21/11/85 the Commissioner minuted that there was in Dubbo a shed which should not be pulled down, because it would be required when the line was opened to Coonamble. A statement should be furnished showing how the traffic would be worked where the engines would be stabled, &c.

The Locomotive Engineer thereupon requested Inspector Hubbard to state his views; and that officer reported in strong terms against the selection of Wellington as the depôt. Mr. Hubbard stated,—

1. That the scheme of abolishing Dubbo as the depôt was impracticable without entailing a large additional expenditure.
2. That the grades between Dubbo and Wellington were too heavy to admit of taking only half a load, as is brought from Narramine to Dubbo, and *vice versa* (*sic*).
3. Trains arriving from Narramine having to be made into two trains for Wellington, Bathurst, and Penrith.
4. That two additional engines at least would be required to work the mail between Wellington and Nyngan, the present engines not being powerful enough.

5. And that eight or ten additional goods engines would be required at Wellington, as would be seen by the running-sheets for week ending 26th November, 1885, or engines would have to be sent right through from Bathurst to Dubbo, and would require turning, oiling, clearing, and repairing, as was now the case.
6. Mr. Hubbard went on to state on the 20th November seven engines sufficed for the traffic west of Dubbo; while for the same traffic thirteen engines were required from Wellington to Bathurst; that on the 24th six engines hauled the traffic to Dubbo, while fourteen engines were required thence to Wellington.
7. It was not, Mr. Hubbard added, as if there were non-perishable goods, which could be collected at any time by a train running continuously, but there was live stock, which admitted of no delay, and for which a double number of engines must be kept in readiness at Dubbo.
8. Dubbo could no more be abolished as a depôt than could Penrith, without great extra expense.
9. Had arranged with Messrs. Turton and Stanger to run a through train at any time to Wellington, in order that they might see how it worked.
10. The result of having two depôts—Wellington and Dubbo—would be that additional engines and men would be required, and expenditure be largely increased. It was, however, never proposed to have two depôts, one at Wellington and one at Dubbo.
11. Mr. Hubbard continued that the mail between Dubbo and Bourke, 225 miles, worked with three engines of class 14, engines and men working 900 miles a week, would bear comparison with any mail train in Australia or Europe, the cost per train-mile being much less.
12. Wellington should be abolished as a depôt. Engines and men should run through from Bathurst to Dubbo, 133 miles, up one day and down the next, half the men to work from Bathurst and half from Dubbo, by which arrangement the men would be home on Sundays.
13. If objection were made to the length of the run from Bathurst to Dubbo (133 miles), the same objection would apply and with greater force to the run from Wellington to Nyngan (129 miles), it being a much more trying climate. Wellington could only be made a depôt if there were nothing to do—if there were no traffic. The movements of live stock were erratic, and engines were often required at short notice at Dubbo, where they could be more readily obtained than at Wellington. In October and November 2,387 trucks of cattle and sheep had been loaded at Dubbo and stations west of Dubbo.

[*Note.*—The foregoing is the report of Mr. Hubbard which could not be found, and was supposed to have been mislaid, and with regard to which imputations of unfair suppression were made. It was found in the Minister's room on a file of papers referring to Nyngan arrangements, with which it has a remote connection; but no suspicion existed that it was with those papers, and it was quite by accident that it was discovered.]

Mr. Hubbard's report was forwarded by Mr. Scott to Mr. Turton for any remarks he might have to make. Mr. Turton accordingly reported upon the several issues raised by Mr. Hubbard to the following effect:—

1. That Mr. Hubbard did not show why the arrangement of making Wellington a depôt to work the traffic from was impracticable. He (Mr. Turton) was sure expense would be saved by the arrangement, because engines would then be available for stock trains instead of sending them from Bathurst, as was now done.
2. That the gradients between Dubbo and Wellington would be no worse when the latter was made the depôt than they were now, and
3. That trains would always have to be divided at Dubbo or Narramine. It should be done as far as possible at Narramine, the Nyngan engines running on to Wellington with full loads, and the Wellington engines bringing on the remainder as specials.
4. That there was no reason why two additional mail engines should be required between Wellington and Nyngan, two of the express or ordinary bogie engines being able to do the work, thereby relieving two of Hubbard's No. 14 engines. Moreover, it was in contemplation to do away with the mail train between Nyngan and Bourke, and to run a mixed train instead.
5. That in his (Mr. Turton's) opinion the goods engines now stationed at Bathurst were sufficient for the work under proper arrangements. There was one regular goods train and one mail train between Dubbo and Nevertire and Nyngan, and stock specials ran occasionally, but one ordinary engine would take thirty trucks between Narramine and Byrock.
6. It would appear that Mr. Hubbard had too many engines, if his statement were correct that seven engines hauled the traffic west of Dubbo. If this fact were as stated some of Mr. Hubbard's twenty engines should be transferred to Wellington. An engine on the Dubbo to Bourke section was equal to two on the Bathurst section. He (Turton) had thirty-four engines, and he had to run trains to Sydney, Eskbank, Wallerawang, Orange, Wellington, and Dubbo.
7. Whether goods were perishable or not there was more expedition and economy in working trains with engines stationed at Wellington, inasmuch as they could start with a clean fire and ash-pan, and there would be a large saving in freight of coal by coaling at Wellington. Moreover the engines could, if required, make three single or two double journeys in thirty-six hours, a great consideration if we were short of engines.
8. Could see no comparison between Dubbo and Penrith.
9. Could not agree with Mr. Hubbard's views. That officer might have assisted often by sending one of his engines through to Wellington or Bathurst.
10. Saw no reason why the proposed rearrangement of depôts should increase expenditure.
11. It only required a readjustment of engines and men, and for all to exert themselves in the interests of the Department.
12. The best arrangement was for the men to work from Bathurst to Wellington in one day, and from Wellington to Nyngan up one day and down the next with bogie engines.
13. The men had objected to the length of the run—Bathurst to Dubbo, but they had been induced to put up with it.

14. By Mr. Hubbard's own showing he had more engines than he required, and it was not easy to see why Wellington could only be made a depôt if there were no traffic. To meet the erratic movements of the stock traffic, engines could be obtained from Bourke, Nyngan, or Wellington which would save the cost of sending engines empty from Dubbo. The Inspector's office was at Wellington, and more accurate information could be obtained there for making arrangements with Bathurst and stations west. The number of extra engines sent from Bathurst to Dubbo in November was sixty-five, which would further show the desirability of having the depôt at Wellington. Although those engines were required on short notice, Mr. Hubbard only sent one of his engines through to Bathurst.

Mr. Stanger also lodged a report, upon which Mr. Turton's report would seem to have been based; but as the former places some facts in a forcible light, I will give a *resumé* of such of his remarks as seem to have an important bearing on the subject. Mr. Stanger was strongly in favour of the establishment of the depôt at Wellington. He pointed out that under present arrangements an engine passed through the hands of three sets of men, increasing the expenditure to an extent which would horrify the Commissioner. The men had only fifteen minutes at Wellington to examine the engines, which was not sufficient, and the men were often blamed for a mishap which they might have had nothing to do with. Again, the supply of coal taken in would often not last the distance (Bathurst to Dubbo), and ten minutes to twenty-five minutes were lost en route in taking in a supply. With such gradients as existed between Bathurst and Wellington 103 miles, was a fair distance for one trip. A driver should start with a clean fire and empty ash-pan and smoke-box, which would diminish the risk of fires along the line. The gradients could not in any way affect the question, because under any system of working they would remain the same. Mr. Hubbard lost sight of the fact that it would always take double engine-power to work the traffic on the Bathurst side of Dubbo, and the trains would be arranged accordingly. Mr. Hubbard based his argument upon the fact of the live-stock traffic coming on with the wool; but it was not fair, because that was not the normal condition of things, but even so the change would be beneficial. An engine brought into Dubbo (say) twenty-six trucks of sheep; two fresh engines had to be put on there to take the train into Bathurst, and his arrangement would not involve any increased expense; quite the contrary, because at present engines had to be sent from Bathurst to work up stock specials. Mr. Hubbard also lost sight of the fact that under the proposed arrangement there would be a saving of at least £15 a week in coal haulage. Did not believe the mail engines would have to be increased beyond one engine; and was quite sure that the total number of engines between Bathurst and Bourke would not have to be increased. The run from Wellington to Nyngan was clearly not so hard upon the men as that from Bathurst to Dubbo, because the grades in the former were so favourable. During the last three months the live stock traffic had been heavy, and engines had been required on short notice. He had frequently begged Mr. Hubbard to assist by sending one of his engines to Bathurst; but only once had he done so, and then not with his own men, so that it was no help at all. Four engines would be required for the mail from Wellington to Nyngan, more powerful engines; but engines of class 256 would suffice for the purpose, as the sleeping car could be left at Wellington. Mr. Stanger wound up his report by stating that in the last two or three years Mr. Hubbard's views on this subject had undergone a great change, that when the proposed change was first mooted he hailed the project of going to Wellington with delight, and made arrangements to buy land there, and that it was only since he (Stanger) had been stationed at Wellington that Mr. Hubbard had set his face against the establishment of that place as the depôt.

About this time Mr. D. A. Ferguson, M.L.A., inquired of Mr. Secretary Lyne as to the truth of a report which had reached him, to the effect that the workmen and business of the Locomotive Department were about to be located finally at Dubbo, and the Commissioner replied (12/12/85) that there was not any truth in the report.

The matter was soon after brought under the notice of the Minister, in the interests of Dubbo. Under date of 7/2/86, the Secretary of the Dubbo Railway League addressed Sir Patrick Jennings, stating that it was rumoured that the Commissioner for Railways was about to remove the engines from Dubbo to Wellington with the view of making the latter the changing station for the traffic between there and Bourke; that Dubbo had always been the changing station, because it was the starting point for the level country. The heaviest traffic between Dubbo and Bourke had always been done with one engine, but thence to Wellington two and sometimes three were required, and therefore, if Wellington were made the changing station, engines would have to be sent daily from Dubbo to take on the traffic, thus largely increasing the cost of an already costly section.

Mr. Scott, in reply to Commissioner, minuted that on all Railways the practice was to locate the depôts as to equalise the miles worked by the engines, and the number of hours worked by the men. In this view Wellington was the proper place for a depôt. The distances would be Bathurst to Wellington, 103 miles, Wellington to Nyngan, 130 miles, Nyngan to Bourke, 126 miles, and in each case the period of duty of the men would be the same—ten hours. When the Bathurst engines ran on to Dubbo the men petitioned the Commissioner on the subject of long hours; and, with a view to relieve them, the engines were changed at Wellington, the men taking their engines to Dubbo, which involved in nearly every case a third set of men to take the engines back to Wellington, and frequently a fourth set to take them on to Bathurst. This caused much trouble and expense through engines breaking down; and an officer had to be stationed at Wellington to regulate the arrangement. It also elicited a complaint from the Dubbo men that they were kept away from their homes for a number of hours, for which they were not paid. They worked in fact only forty hours, and had to be paid a full week's wages. The contention that the depôt should be at Dubbo, because that was the starting point of the level country, would apply with equal force to Narramine, the change of grade between that place and Dubbo having an equal influence in reducing the hauling power of the engine; and there would in fact be no more empty running by having the depôt at Wellington than if it were at Dubbo. The saving by having the depôt at Wellington instead of at Dubbo would amount to £2,340 per annum.

A letter to the same purport was addressed by the Secretary of the Dubbo League to Mr. Cass, M.L.A., who handed it to the Minister. Mr. Secretary Lyne minuted that nothing further would be done until the question had been more fully considered.

On the 4th March, 1886, a Mr. Davidson addressed a letter to the Minister condemnatory of the proposal to make Wellington the depôt.

On the 12th *idem* a meeting was held in Wellington to protest against the delay in establishing the depôt in that town.

The

The outcome of the meeting was that a deputation, introduced by Mr. Ferguson, M.L.A., waited upon the Minister.

Hereon Mr. Secretary Lyne minuted that the deputation had represented that the decision to have the running sheds at Wellington was due to the recommendation of the responsible officers, on the ground that it was the most suitable location for them, and for the economical working of the line; that, in this view, a running shed and quarters for the men had been erected at Wellington; and that to reverse that decision would sacrifice the outlay. It was further represented that the distance of Wellington from Bathurst made it a fair day's run for engines and men, while Dubbo was too far; and that the climate of Wellington was good, and supplies easily obtained there. That, in regard to the plea that coal could be obtained at Dubbo, this mineral was found near Wellington; and, by the selection of the latter place, some thousands of pounds in the haulage of coal would be saved annually. Moreover, the previous Minister, on the advice of the officers, had approved of Wellington.

Mr. Lyne went on to say that he informed the deputation that he could not at present give a decision, not having had time to peruse the papers; that the matter had first come under his notice when a petition was presented to him by Mr. Ferguson relative to a rumour that the sheds were to be removed—a measure which had not then been entertained; that he heard nothing more about the matter until a deputation waited on the Premier, who made no promise, and had not attempted to influence him (Mr. Lyne), but simply told the deputation that he could only promise that there should be a reconsideration of the matter. That, the Minister continued, was the state of the case. He had informed Mr. Cass that the working of coal in the locality would influence the decision. The saving would be about £2,340 per annum; not so much as had been anticipated. As regarded the men, the feeling did not seem to be unanimous. His decision, which would be given in a few days, would not be given in the interests of Wellington or Dubbo, but of the economical working of the railway.

The partisans of the Dubbo interest next had their turn. On the 26th March a deputation, introduced by Mr. Cass, waited upon the Minister to protest on behalf of Dubbo. The Minister minuted that it was represented by the deputation that five engines had been removed; that, since the removal, two engines had had to run light or empty four days a week, and four or five two days a week between the two places; that one engine could haul thirty-five or forty trucks between Dubbo and Bourke, and keep good time, while thirteen trucks were a load between Dubbo and Wellington, and consequently all trains were split at Dubbo, and that was the reason why the depôt should be there. The deputation urged that Bourke to Nyngan, Nyngan to Dubbo, and thence to Orange would be the most equitable division of sections, and could be worked more cheaply and advantageously than those proposed. The local officers were in favour of Dubbo being the depôt, and had so reported; but their reports had been suppressed. At present three engines worked the mail between Dubbo and Bourke at a cost of £1,255; but if the depôt were at Wellington, four engines would be required at a cost of £1,916 for the mail-trains alone in this section, and that under any other system of working it would take six engines to run the mail. That it had been stated that £3,000 a year would be saved by having the depôt at Wellington; but, on the contrary, £10,000 a year would be expended in extra working if that measure were adopted. The deputation further represented that, on the previous Wednesday, in connection with the stock traffic seven engines had to run empty from Wellington to Dubbo to take up the divided trains; that there was abundant evidence of the existence of coal in the vicinity of Dubbo; and that sooner or later there was bound to be an extension from Dubbo to Coonamble, and also to Werris Creek, which would make Dubbo the most important junction in the west.

The Minister informed the deputation that he would give the matter his most serious consideration; that a deputation from Wellington had waited upon him, and he found, on examining the papers, that the responsible officers of the Department were unanimously in favour of Wellington, and measures had been taken accordingly; that he had seen no reports in favour of Dubbo, and was confident there was no foundation for the assertion that such reports had been suppressed; but inquiry should be made. The deputation had urged the claims of Dubbo exhaustively, and all the facts stated should have full consideration. The presumption of coal existing near Dubbo, and of that place becoming an important junction, would have full weight. He would not decide in the interests of Wellington nor of Dubbo, but would do what was best for the interests of the Department and of the country.

The foregoing is a *précis* of the papers which bear on the subject. There are many newspaper articles dealing with the question; but I have abstained from noticing them, because they do not deal with the real merits, but are of a one-sided character, and would therefore only tend to embarrass a consideration of the case.

The imputation of Inspector Hubbard's report having been suppressed is dealt with at page 18 of this *précis*, where it is shown that the document was fairly dealt with in the ordinary course of business, and that there was no ground whatever for the charge which was made by the Dubbo deputation.

C.A.B., 11/5/86.

No. 24.

Minute by Commissioner for Railways.

I UNDERSTAND that great expense in the management of the Locomotive Branch in the Western District is being incurred, because Mr. Stanger and Mr. Hubbard are not acting in concert.

Mr. Scott will be good enough to suspend both these officers unless they can act in unison. I will not have the public money wasted by their neglect, carelessness, or want of good management.

CH. A.G., 8/6/86.

REPORT by Locomotive Engineer.

IMMEDIATELY upon receipt of this paper I sent for these officers, and distinctly gave them to understand that, unless they acted in harmony, I should be compelled to make a change which would not be to their advantage. They each, in presence of each other, gave expression to their zeal for the interests of the Department influencing them on all occasions. Upon my referring to the article in the *Dubbo Dispatch*, about the unnecessary empty running of engines, and asking if there was any truth in the statement, Mr. Hubbard stated that he thought there was some justification for it, and while disclaiming any knowledge

knowledge of who was supplying information to the newspapers, he thought the making of Wellington a depôt was a mistake. He stated he considered that the proper load for the goods engines run in the district should be thirty live stock vehicles between Dubbo and Narramine; and that should one of the engines be unable to bring such a load, he would conclude it was not in good order. As this assertion was in direct conflict with the opinion of Mr. Stanger (which was supported by Mr. Loughry, whom I specially directed to inquire into the loads for engines in this district), I asked Mr. Hubbard to well consider what he said, pointing out to him the result of previous inquiry; but he still adhered to it, upon which I referred to previous reports on the same subject from Mr. Hubbard himself, wherein he asserted that twenty-six was the load on this section of the line, and asked him to reconcile it with his statement just made, that thirty could be taken and time kept, when he said, after some consideration, that what he meant was that an engine could take thirty, but if run from day to day he considered twenty-six a fair load.

Mr. Stanger asserts most positively that twenty-six live stock vehicles are as many as the 93-class of engine can take on this portion of the district without running considerable risk of losing time (which is very important on a single line, and particularly with live stock traffic), and expressed his desire to have the fullest inquiry made into his management, as he is prepared to justify the running of every light engine in his district.

I instructed both Mr. Hubbard and Mr. Stanger to report fully on the statements made in the *Dubbo Dispatch*, and gave them clearly to understand that the facts should be fully stated, irrespective of the steps taken to make Wellington a locomotive depôt.

When I received the reports, which, I may state, were chiefly confined to a repetition of the statements previously made in my presence, I forwarded Mr. Stanger's report to Mr. Hubbard, and Mr. Hubbard's report to Mr. Stanger, for any comments they might desire to make on them, but I regret to say the result has not been at all satisfactory, as they still adhere to their previous assertions, which are of a most conflicting nature. As Mr. Hubbard stated he could not particularly point out cases where an assisting engine had been sent unnecessarily, I could not decide if such had been done without I accepted Mr. Stanger's unsupported statements, so I have given instructions for a return to be compiled from the drivers' daily report sheets (which are in this office) showing the number of assisting engines run during three months of 1885 (when Mr. Hubbard had control), compared with the number run during a like period of the present year; also the load in each case, and the cause of detention of such trains, if any existed.

The great importance of this case, which has such a very important bearing upon the welfare of the Department, and the belief that the facts can only be arrived at by a searching inquiry on the spot, where testimony can be obtained from traffic officials, as well as those who work and are responsible for working the engines, induces me to recommend that a Board, representing both Traffic and Locomotive Branches, be appointed to investigate the matter thoroughly. Although not specially relating to the unnecessary light running of engines, which is said to be the practice, I submit that the causes which led to the making of Wellington a locomotive depôt should not be overlooked, as there is little doubt the jealousies that exist between the residents of Dubbo and Wellington about the best position for locomotive depôt will form a lasting subject for newspaper criticisms.

The Commissioner.

W. SCOTT, 28/6/86.

Minute by The Commissioner for Railways.

I WILL not comment upon the state of affairs which these papers disclose until the inquiry suggested has taken place.

I approve of the recommendation that the inquiry be remitted to locomotive and traffic officers who will be most at liberty and capable of conducting this inquiry.

I should like officers to be selected whose status is higher than that held by the Locomotive Inspectors.

CH. A.G.

Locomotive Engineer to arrange for the inquiry.—D.C.M'L., 30/6/86. Mr. Cobb will represent this branch. Please appoint an officer of your own branch.—W. SCOTT, 2/7/86. Traffic Manager. Mr. Richardson will represent this branch.—W. V. READ., 4/7/86.

Report from Messrs. Richardson and Cobb herewith. It appears that Mr. Hubbard without being able to bring anything forward in support of his views, considers that the statements in the *Dubbo Dispatch* are well grounded. Mr. Stanger on the contrary has satisfied the Board that the statements were inaccurate in most instances, and that when engines have been run light it was unavoidable, and would have to be done irrespective of whether the depôt was at Dubbo or Wellington. It is evident that until one of these inspectors is stationed at Nyngan, as I before recommended, there will be conflict between them which will be prejudicial to the best interests of the Department.—W. SCOTT, 16/7/86. Commissioner.

REPORT by Board appointed to inquire into alleged unnecessary running of light engines.

IN accordance with instructions we proceeded to Wellington and Dubbo on Wednesday night last, to inquire into the subject matter of an article in the *Dubbo Dispatch* of 8th June *re* alleged unnecessary running of light engines in May, caused through removal of engine-sheds from Dubbo to Wellington. From a perusal of the locomotive books at Wellington, and the traffic books at Dubbo, we find that twenty-six light engines (goods) were run between Wellington and Dubbo in the month of May, as under:—

1	May, Dubbo to Wellington, 3 engines.	17	May, Wellington to Dubbo, 1 engine.
4	" Wellington to Dubbo, 1 engine.	18	" " " 2 engines.
5	" " " 1 "	20	" Dubbo to Wellington, 1 engine.
6	" Dubbo to Wellington, 1 "	21	" " " 1 "
7	" " " 1 "	22	" " " 1 "
7	" Wellington to Dubbo, 1 "	25	" Wellington to Dubbo, 1 "
11	" " " 3 engines.	27	" " " 1 "
11	" Dubbo to Wellington, 1 engine.	28	" " " 2 engines.
12	" " " 1 "	31	" " " 1 engine.
12	" Wellington to Dubbo, 1 "		
15	" " " 1 "		
		Total	... .. 26 engines.

With

With the exception of two engines which ran on 11th and 12th May, caused by the night officer, Dubbo, not sending telegrams in time, the whole of the light engines run were unavoidable. For illustration take the three on 1st May:—two ran with double loads on No. 1 down on night of 30th April, and one to assist No. 29 down on 1st May, and there being no corresponding up traffic on 1st, 2nd, or 3rd engines had to return empty. On 18th May, there were two light engines on down journey, there being only fifty-six trucks on down journey, and 100 trucks on the up. Again on the 28th May there were two light engines on down journey; but there were only eighty-nine trucks against 115 trucks on the up journey. It is, therefore, absolutely necessary an engine must run light one direction or the other, whether engines are at Wellington, Dubbo, or Bathurst. In the first case mentioned, viz., 1st May, if engines had been stationed at Dubbo they would have to have been sent empty in first place to Wellington to bring in down traffic; or if engine had run through from Bathurst to Dubbo, they would have had to return empty. The same thing applies to both other cases referred to on the 18th and 28th. If engines had been stationed at Dubbo they would have started loaded from Dubbo, but would have to have returned empty. The removal of the engines from Dubbo to Wellington causes no additional light running, as stated by Dubbo newspaper; but it equalizes the work of drivers and mileage of engines, as the distance from Wellington to Bathurst is 104 miles, with fifteen staff stations to work, and on heavy grades throughout; and from Wellington to Nyngan is 129 miles, but grades are easy, and only eight stations. Some time ago the goods engines ran through from Bathurst to Dubbo; but it was found the men could not do the work, and they had to be changed at Wellington, and men had to be brought as passengers from Dubbo to run the trains on. This cost great expense, besides rendering it impossible to fix the blame upon anyone for damage done to engines. Having the depôt at Wellington saves at least two trains per week in the haulage of coal between Wellington and Dubbo, as engines can coal at Wellington; and if they cannot carry quite sufficient for run from Wellington to Nyngan and back, they could take a little coal, not more than one-fifth they now take at Dubbo.

With reference to Mr. Stanger's reply to the remarks in the *Dubbo Dispatch* we find that all he says is borne out by facts and records of the office. He keeps a record of the movements, and loads of every engine under his control. Mr. Hubbard, however, keeps no records, and was unable to give us a single instance of unavoidable light running as he says he kept no record, but based his report upon hearsay, and on broad grounds as he calls it. In his report of 16/6/86 referring to the article in Dubbo newspaper, he says the station-master told him fifty-five light engines had run between Dubbo and Wellington in May last, but on perusal of traffic books we find they agree with Mr. Stanger, and show only twenty-six. He also says that if Wellington is made the depôt for engines it will still be necessary to keep the large staff of workmen at Dubbo. We fail to see why, when the engines are removed from there it will require a staff of mechanics. Concerning engines from Wellington having often to be detained for loads, same thing would apply to them if at Dubbo; they would have to wait, but at other end of section. We cannot agree with Mr. Hubbard when he says that if mail is run with engines from Wellington it will require three and three sets of men. Two are now used, and only two would then be required, and men would be away from home only one night per week. We cannot understand Mr. Hubbard's remarks *re* coaling; why should he have to haul coals to Nyngan to coal engines which start from Wellington? They would coal at Wellington, and if required could take a little more at Dubbo, certainly not have to go to Nyngan for it. Mr. Hubbard in his verbal statement to us said he was sure the locomotive charges, since removal of engines to Wellington, were very much higher than before. We have referred to the accounts in Locomotive Engineer's Office, Sydney, and find the charges in May, 1885, between Bathurst and Byrock were £3,296, and in May, 1886, £3,548, or an increase of £250; but in the latter there are 48 miles more of line to work, which at £10 12s. per mile would increase the expenses to over £500, instead of which it is only £250. £10 12s. is the locomotive charges per mile open in May, 1885, between Bathurst and Byrock. We have not gone fully into each item mentioned in article of the *Dubbo Dispatch*, as we have satisfied ourselves Mr. Stanger has answered them thoroughly and correctly.

JOHN COBB.
HARRY RICHARDSON.

14/7/87.

[Extract from *The Dubbo Dispatch*.]

Economy with a vengeance.

THE Minister for Works and the Commissioner complain that our railways do not pay. Considering the way in which the Locomotive Department is managing matters on this line, it would be wonderful indeed if the railways would pay. During the month of May, we have ascertained that at least forty engines ran light from Wellington to Narramine or Dubbo. As each of these engines costs 3s. per mile to run, and as owing to their removal from Dubbo to Wellington, there were 30 miles of running, which would have been unnecessary if the engines had remained here, there is a dead loss of £4 10s. per run, or £180 for the month. Further than this, the locomotive authorities, in order to bolster up their Wellington blunder, have issued instructions which make running between Dubbo and Bourke nearly twice as expensive as it used to be. A few months ago it was a common thing for a single engine to bring in thirty-three laden trucks from Narramine to Dubbo. As only thirteen can be taken from Dubbo to Wellington, this necessitated three engines to take the load from here that one brought. So as to make the running of light engines as unnecessary as possible, orders were recently issued that only twenty-six trucks were to be brought from Narramine. An instance of how that worked occurred on Friday last. Train No. 68 with stock had twenty-seven trucks on at Narramine; but as one truck more than the regulation number was on, an engine was sent right from Wellington to help on 68. Actually an engine was run light 50 miles at a cost of £10 10s. to bring a load that one engine could, with perfect ease, have brought here. Of course, the object is obvious, the more so when the subsequent facts are taken into consideration. The engine load from Dubbo to Wellington is set down by the same orders at thirteen trucks. When the twenty-seven trucks reached here on Friday, the load was divided, and although on the light gradient, where thirty-three trucks have often been brought with one engine, it was thought advisable by the Wellington Inspector to send an extra engine to bring on twenty-seven trucks. Yet the regulation is immediately broken here, and fourteen trucks sent with one engine to Wellington. Why this inconsistency? why thus sticking to the general order, when over a light gradient, where the engine could not possibly be strained, and thus ignoring of it over the heavy gradient, where there was every possibility of hurting the engine? The motive is as plain as a pike-staff. It must be as obvious to Messrs. Lyne and Goodchap as ourselves

ourselves. It seems the veriest farce, the Minister and the Commissioner cudgelling their brains over time-tables, designed to save a few pounds, while here under their very eyes, there is a loss last month of £180, and a loss that will increase as the traffic augments. On June 2nd, five light engines ran, and when the wool commences to come in and stock to travel, that will be a daily occurrence. We should think these facts, which are under rather than over-stated, ought to hasten the Minister's decision as to the relative merits of Dubbo and Wellington, as the site of changing sheds. The Wellington blunder has already cost the country enough. Perpetuating it is only throwing good money after bad.

With Mr. Morgan's compliments to the Commissioner.

I heard of this blundering or more than blundering from another source this morning, and wrote a minute to the Locomotive Engineer on the subject. I will not allow Mr. Stanger or Mr. Hubbard to play ducks and drakes with the revenue to carry out any scheme which either may favour. Mr. Scott will at once inquire into this representation and take immediate steps to end this folly.—CH. A.G., 8/6/86. Please see my report on your 86-9,400 of this date.—W.L., *per* R.E.S., 28/6/86. The Commissioner.

No. 25.

Memo. from Mr. Inspector Stanger.

Sir,

Locomotive Engineer's Branch, Wellington.

Whilst I am preparing my report upon Wellington as a locomotive depôt, &c., I would suggest that Mr. Turton be invited to furnish a report upon the improvement or otherwise that he finds in the running of his engines and men now that they go no further than Wellington. As the change was made principally with the object of removing various objections in the old system, I imagine that such report from Mr. Turton would be of the greatest value.

Locomotive Engineer.

C. H. STANGER,
12/6/86.

Although the information referred to is not required specially it may serve to throw some additional light on the working, I shall therefore be glad if Mr. Turton will furnish a report showing the result of the change by Wellington having been made a depôt.—W. SCOTT, *per* R.J.S., 15/6/86. Mr. Turton.

Report attached.—J. TURTON, 17/6/86.

Sir,

Locomotive Engineer's Office, Bathurst.

Re your M.P. 86-3,064, dated 14th instant, *re* the benefit derived from the locomotive depôt being established at Wellington, I have to report as follows:—There are very few complaints from the men in consequence of working long hours, as used to prevail before it was, or disputes as to damage to engines, which also were of common occurrence, making it impossible in many cases to bring home to offenders the punishment due to them. The engines now rarely pass through the hands of two sets of men from time of departure to return to Bathurst, as the men who run them down return with them the same or next day. This effects a saving of stores and cost of repairs through damage to engines and failures on the road of, I am sure, considerable value. Fewer engines are now run light or attached each way between Bathurst and Dubbo, as Mr. Stanger, in emergency, sends his engines to Bathurst as pilot, or with special or other trains, he having sent fourteen so during the period, 1st March to 16th June, 1886, whilst in the corresponding period of 1885 Mr. Hubbard only sent four. This shows considerable benefit to the Department, as engines were often sent from Bathurst to Wellington or Dubbo, and returned light or attached to light trains, and sometimes were detained at Dubbo for several days against my repeated remonstrations. There is also an absence of detention of trains at Wellington on down, and Orange on up trip, through engines having to take coal in transit, as they frequently had formerly to do. There is also a saving of time in not having to clean fires on up trip at Store Creek, which was a source of frequent detention and inconvenience to traffic. There is also an absence of disputes that used to take place between the men when changing at Wellington, which were a source of continued annoyance. I consider the establishment of Wellington depôt for the true interests of the Department, and has proved itself so to the present.

Locomotive Engineer.

J. TURTON.
17/6/86.

No. 26.

Messrs. Inspectors Hubbard and Stanger to The Locomotive Engineer.

Sir,

Locomotive Engineer's Branch, Dubbo.

In obedience to your instructions, given to me at Sydney, on 11th June, 1886, to furnish a further report on the respective merits of Dubbo and Wellington as the best and most economical place for a permanent locomotive depôt, I beg to say that all my previous reports in this matter have been confirmed, in my opinion, from the experience gained since Wellington engines have been running to Nyngan, since middle of February last, now nearly four months. I am satisfied that Dubbo is the best place, and as I have already stated, it is just as reasonable to remove locomotive depôt from Penrith or Picton as to remove locomotive depôt from Dubbo. The station-master assures me there were at least fifty-five light engines run between Wellington and Dubbo during the past month (May). How many more would have been required you might judge by referring to the large number (237) of copies of telegrams, &c, attached. Assuming that Dubbo depôt had been closed, and no engines available at Dubbo to pick up the running, the number of light engines would have been much greater.

The question now resolves itself into this:—Assuming that Dubbo is closed as a locomotive depôt (which I maintain is an impossibility), there must still be a staff of hands—examiners, oilers, fuelmen, &c., &c., stationed here. The boiler-maker, two fitters and mates, of course, could either do their work at Nyngan or Dubbo; but such a large number of engines coming to Dubbo would require someone to attend to them.

Wellington

Wellington men and engines laying over at Dubbo from one day to another to save light running expense, and incurring expenses so laying over and proceeding west towards Nyngan the following day, makes other expenses to be allowed to the men shunting engine, and men required at Dubbo.

C Mail engines changed at Wellington would require three sets of men, and three engines besides that, others having to be used from Nyngan to Bourke.

Specials required from Dubbo to Narramine, assisting engines, &c., &c.

E Also night shed men would still be required if depôt was removed from here (same as now) to save Wellington men from making excessive overtime. Wellington men are delayed here for hours at a time, or working on their engines. Other times they are booked off here until the following day, then proceed to Nyngan or Nevertire, incurring more expense than if the engines and men were stationed at Dubbo.

B You will easily see by scanning over the large number of copies of telegrams, &c., that the above are facts without any exaggeration, and which cannot be disputed; and that on several occasions Dubbo engines and men have been used to run trains both east and west of Dubbo, owing to no Wellington engines being at Dubbo to take up the running. I am of opinion now—same as before—one or two, or even three or four, loaded stock trucks, in addition to twenty-six (the ordinary load) in cases of emergency, can be brought comfortably from Narramine to Dubbo without much loss of time (if any) with good management, and the engine is in fair order. On 2nd October, 1885, driver Richard Tate, with engine No. 15, class 14, brought from Narramine to Dubbo fifteen loaded trucks of live stock without any difficulty.

D Coal haulage is another important item. Now, as the Wellington engines (except the Bathurst mails) have not to be coaled at Dubbo, the coal must be hauled to Nyngan, 99 miles further west; and, on occasions of engines running to Nevertire, occasionally require coal at Dubbo, either before or after returning, before they can go on to Wellington. Coals have also to be taken occasionally at Dubbo by engines running from Wellington to Nyngan and *vice versa*; in fact, if it was not for Dubbo being in the position it is in, Wellington could not be worked at all, unless by an increase in the number of men, and a corresponding increase in the working expenses, to carry on the traffic.

I may here illustrate a little story in support of Dubbo in preference to Wellington as a depôt. For instance, suppose that I am Cobb & Co., general carriers. From Nyngan to Dubbo one horse is sufficient, from Dubbo to Wellington requires two horses; which of the two named places would be the most suitable and economical for my stables? Most assuredly I would say Dubbo, to save the horse travelling 30 miles before he commences his work, as well as exhaustion, and taking my chance of the back loading. The most economical place to keep either horses or engines would, in my opinion, be the place where the heavy work always commences; my horses or engines are then always fresh, and ready on the spot to

F meet the exigencies of the traffic.

Wellington, under other circumstances, would be an excellent place for a locomotive depôt; but, at present, the circumstances do not exist, and, therefore, Dubbo is the most suitable place. If the gradients were cut down, so that the same load could be taken on to Wellington as is brought to Dubbo by the same engine, then Wellington would answer very well.

If it is considered advisable to make a changing station between Bathurst and Dubbo, then Orange would be the best place, as the gradients, both east and west, are about equal. A round trip from Bathurst to Orange and back, and a single trip from Orange to Dubbo; but, as stated in my previous reports, running the engines right through from Bathurst to Dubbo and *vice versa* is, I believe, far the best and most economical plan, requiring a less number of engines to do the same work.

I think a perusal of the telegrams will clear up any misunderstanding that might exist, and show that Dubbo must be the locomotive depôt, if economy of working is to be the standard.

J. P. HUBBARD,

Locomotive Engineer.

16/6/86.

I forward this report for any comments you may desire to make upon the several matters dealt with in it. I have sent yours to Mr. Hubbard in like manner.—W. SCOTT, 21/6/16. Mr. Stanger. Reply herewith. I would particularly wish to call your attention to the paragraph in Mr. Hubbard's report which I have marked c. I do not think it well to trouble you with a mass of papers; but I can, if required, prove all the assertions made in my reports.—C. H. STANGER, 24/6/86. Locomotive Engineer.

Comments on Mr. Hubbard's report of 16/6/86, in reference to Dubbo or Wellington as a Locomotive Depôt.

I AM very glad to have the opportunity of commenting on and correcting some of the statements in Mr. Hubbard's report of the 16th instant.

For convenience of reference I have placed capital letters against the sentences I refer to, and corresponding letters against my remarks.

(A) The total number of light Wellington engines run during month of May was forty-eight, and I think it strange that Mr. Hubbard should prefer to obtain information as to the number of light engines from the station-master at Dubbo, and to make use of that information, when I, on the 15th instant, sent to him, in accordance with a promise made in Sydney in your presence on the 11th instant, a statement showing the numbers of the light engines, the names of their drivers, and the stations between which they ran for the month of May. Had Mr. Hubbard made use of that official document, he would have found that instead of fifty-five only twenty-six engines ran light between Wellington and Dubbo, though it is not perhaps surprising that he prefers to make use of the larger number.

(B.) Mr. Hubbard's method of putting in with his report that huge bundle of telegrams, &c., is most misleading and unfair; he quotes the number, 237, but numbers 207 and 208 are missing. These papers instead of each referring to separate cases, as Mr. Hubbard seems to imply, do nothing of the kind. For instance, Nos. 200, 201, 202, 203, 204, all refer to the working of one train, as also do Nos. 143, 144, 215, 216, and Nos. 221, 222, 223, and so on in many other instances. It really appears as though Mr. Hubbard expected these telegrams, &c., to carry weight from their bulk. If they are intended to show that some engine power is necessary in Dubbo they are unnecessary, as I have already admitted that. Many of these papers are altogether irrelevant; some are from driver in charge at Nyngan to Mr. Hubbard. I have spent hours in going through them, and if they are intended to show neglect or bad management on my part, I submit that with the exception of two instances they fail; these two cases are those shown in Nos. 104, and 221, 222, 223. (C.)

(C.) I cannot conceive how Mr. Hubbard can dare to state this when he well knows from January to August, 1884, the mail was worked between Wellington and Nyngan by two engines and two sets of men.

(D.) As regards this, I very much regret that in pointing out the saving made in coaling at Wellington, I omitted to allow for the cost of haulage of the extra coal now required to be put on the engines at Nyngan; this during month of May amounted to about £17, and must be set off against the saving to the extent of £75 for same month, made by coaling engines at Wellington.

(E.) Great difficulty has been found in working the traffic under the old time-table; but I believe the new one will simplify matters. At the worst I do not believe the present system, with all its faults, is more expensive than the old ones between Wellington and Nyngan, whilst the advantages to the Bathurst District are enormous.

In any case, when both Dubbo and Wellington are under one Locomotive Inspector a great improvement must ensue. I would here mention that if a siding, as has been suggested, is put in at 287 miles, it will, roughly speaking, halve the cost of working Dubbo and Narramine.

(F.) It is strange that although Mr. Hubbard lays so much stress upon the advantages of putting engines on fresh at Dubbo during the months of September, October, and November last year, when he had control of providing the engine power for the up trains to Bathurst, when both engines and men were overworked and though I frequently begged him to assist by sending one of his engines to Bathurst when one was required at short notice, Mr. Hubbard only once during those three months sent one of his engines to Bathurst.

Locomotive Engineer.

C. H. STANGER, 24/6/86.

WELLINGTON as a Locomotive Depot.

IN reporting as to whether the present system of working the trains between Wellington, Dubbo, and Nyngan, by engines and men stationed at Wellington, is any improvement upon the other systems previously tried, I think it well as briefly as possible to describe those other arrangements.

When the line was opened to Dubbo, the trains were, I believe, worked by engines and men stationed at Bathurst running through to Dubbo one day and back the next. This practice had at last to be stopped, owing to the men complaining to the Commissioner of the long hours. Then men were sent to Dubbo to meet the trains at Wellington, taking over the engines from the Bathurst men, and working the trains between Wellington and Dubbo. This changing at Wellington was regulated from Dubbo, and often the greatest confusion prevailed. It was no uncommon thing for a set of Dubbo men to be ordered to work a train through from Dubbo to Bathurst, leaving the Bathurst men, who had worked the engine to Wellington on the down trip, to go into Dubbo to do shed duty. Having done this, they would often travel to Wellington in the brake-van of an up goods train, and on arrival at Wellington would take the engine and work the train on to Bathurst, the Dubbo men who had worked the train to Wellington often returning as passengers; thus men would travel both ways "passengers" needlessly. Serious disputes often arose between drivers about any damage done to an engine, the men who delivered up the engine saying all was right, and the other side maintaining the engine was in that damaged condition when they took charge. Considerable inconvenience was also experienced at Bathurst through instructions relating to the working of the engines and men not being carried out. To meet this difficulty, it was decided in the beginning of 1884 to send me to Wellington to look after the interests of the Department by seeing that no time was lost in changing the men, and also by seeing the condition the engines were in when handed over from one driver to another. This mode of working continued for about eighteen months after my arrival, when the Dubbo men petitioned the Commissioner about the time they lost in Wellington when waiting for return trains. They represented that they were often away from home (say) twelve hours, and only made about six hours' time; and to make a full week they were nearly always away from home. Mr. Cobb came up to inquire into this grievance among others, and, if possible, to find a remedy, when I suggested that the men should live at Wellington instead of Dubbo, and that they should be considered on duty all the time they were away from home, with the exception of reasonable meal-hours. As the Bathurst engines then stood at Dubbo when waiting for return trains, it was possible for the men to be employed on shed duty to these engines in Dubbo; this was found to be a decided improvement. Up to this, from the opening of the line, the trains had been worked by one engine from Bathurst to Dubbo, and fifteen minutes at the least was taken up in handing over the engine from one set of men to another. Between leaving the shed at Bathurst and returning to it an engine always passed through the hands of three, and often four sets of men. It would be difficult to show exactly what this meant in increased repairs, but it was very heavy. Again, it frequently happened that some mishap occurred to an engine immediately after leaving Wellington, when the driver in charge of the engine at the time was held responsible, though possibly the mischief began hours before, and often the man had not had time to properly examine the engine before leaving Wellington. Another objection to sending the engines through was that they often had not enough coal on them, and then from ten to fifteen minutes would be lost here taking coal. These objections were so weighty, that in December last Mr. Turton, whose district then extended to Dubbo, took the opportunity of some new sidings here being ready for use to station four engines here to work the trains to and from Dubbo. This plan answered well; the Bathurst engines remained in the hands of one set of men during the round trip, and great benefit was found to result from the engines being clean when going on to the trains at Wellington, 103 miles over such gradients as exist between Wellington and Bathurst being quite enough for an engine for one trip. When more accommodation was ready here, the original intention was carried out; and five engines with men being transferred from Dubbo, the whole of the goods traffic to Nyngan was worked from Wellington. This system is still in operation, and I have no hesitation in saying is the best that has yet been tried. Roughly speaking, an engine can take double the load west of Dubbo that it can take on this side. The engine of the through down train, on arrival at Dubbo, has its load made up with the through portion of a preceding train which ran no further than Dubbo. In the same way the load of an up through train is divided in Dubbo; one portion coming through at once, and the other forming a load for a train which commences its journey at Dubbo. It is absurd for anyone to say that a greater total amount of engine power is required in working from Wellington. So long as the gradients between Wellington and Dubbo remain the same, the location of the engine power cannot affect the amount required.

I think it would be well if the Traffic Department were asked if they find any improvement in the running of the trains between Dubbo and Bathurst. I have reason to believe they find a great improvement since the engines were changed at Wellington. In the first place, five minutes suffices for changing the engines, whereas fifteen used to be required. Then time is saved at Store Creek, where the engines used to rake out when they had to run through from Dubbo, and better running time is kept, the engine having a clean fire, &c.

As Wellington has been made a depôt chiefly with the object of improving the working of the Bathurst men and engines, Mr. Turton's report upon the result, after the six months' trial which has elapsed, would be very valuable at this time.

It has been represented that the run from Wellington to Nyngan, 129 miles, is equally hard on the men, as the run from Bathurst to Dubbo, 133 miles, but this is not correct. In the first place, the time occupied between Wellington and Nyngan is two hours less, and in the next, the work is much lighter for three-fourths of the journey.

One point should not be overlooked, and that is, that there is a saving of about £75 each month in the freight on the haulage of coal, about 600 tons, that had to be taken to Dubbo before Wellington was made a depôt, for the Bathurst engines to work the up trains to Bathurst and for the Dubbo engines to work the down trains to Nyngan, is now only carried to Wellington, and the freight on this between Wellington and Nyngan is saved.

The full benefit of the change will not be felt until it is completed, and the mail engines changed here, and the Dubbo depôt moved on to Nyngan. One engine will need to be left in Dubbo. A powerful passenger engine will be the most suitable to do any shunting in Dubbo yard, to assist trains to and from Narramine, and also occasionally to run out to Trangie or Nevertire for light loads of live stock, &c.

Certain alterations, I believe, have been made in the new time table about to come into force, which, although not made with that object, will greatly assist the working of this Department over this district. These alterations will also to a great extent remove the one objection to the present system that I am now about to allude to, and I think it only right that, having pointed out the benefits of the new system, I should also point out the one drawback, viz., that there is now more light running between Wellington and Dubbo than there was. It is caused in this way:—Nine, or at the most ten, engines are sufficient to work the traffic between Wellington and Nyngan in its present condition; it happens often that five of these engines are away at Nyngan, and, at the same time, there may be a rush of down traffic, then the remaining engines, after working down trains to Dubbo, have to return light to Wellington to work other down trains. This light running, which I admit to be due to the present system of working, amounted in the month of May to 270 miles, which at 15s. 2d. per mile, amounts to £17 8s. 9d., less than one fourth of what is saved in the haulage of coal.

In conclusion, Sir, I hope and think I have a right to expect that it will not be thought I am advocating Wellington as the depôt from any personal motives; it is, on the contrary, only because I see, as an experienced railway man, that the advantages in favour of it as against Dubbo are overwhelming. For myself, I am ready to go to-morrow to any part of the line you may see fit to send me to.

Locomotive Engineer.

C. H. STANGER, 16/6/86.

Alleged extravagant working of Live Stock Trains between Narramine and Dubbo.

BEING called upon to explain my action with regard to the working of the live stock trains between Narramine and Dubbo, and also to show cause why I should not be suspended for that line of action, I beg to submit the following:—

As I believe an article in the *Dubbo Dispatch* of the 8th instant, headed "Economy with a vengeance," has led the Commissioner to take this course with regard to me, I think it well to deal with that article first. For convenience of reference, I have placed a number against each assertion on the attached copy, and will deal with them each in order.

1. Strange to say is under the mark, as forty-eight light engines ran during May, eight more than stated.
2. Is, of course, exaggerated, as the cost of running an engine is not 3s., but 1s. 3½d. a mile.
3. Is also a gross exaggeration. Only nine of these light engines would have been saved if the engines remained in Dubbo.
4. I need only state to be grossly untrue.
5. Is also untrue, as live stock are evidently meant when thirty-three trucks are mentioned. I cannot find any evidence of more than twenty-eight trucks having ever been taken by one engine between Narramine and Dubbo.
6. This also is untrue, as fourteen trucks of live stock have now been taken for six months regularly between Dubbo and Wellington.
7. The reasons given for this order are incorrect.
8. It is true that No. 68 up, on Friday, the 4th instant, had twenty-seven trucks of live stock on, but it is not true that an engine was sent light from Wellington to Narramine (50 miles) for this.
9. Is also incorrect, as the orders concerning the loads referred to did not apply to this side of Dubbo.
10. Is similar to No. 5, and the same answer applies.
11. No regulation was broken in this.
12. Hardly requires an answer.
13. Is grossly untrue.
14. Is in keeping with the other assertions; one light engine ran on 2nd June, not five.

There are two points in particular in this article, that probably have led to the Commissioner taking the action he has:—One is (I have placed a mark A against the paragraph), where it states that thirty-three trucks of live stock used to be a load, and that now only twenty-six are taken; the other is (marked B) that I sent an engine light from Wellington to Narramine to assist a train with only twenty-seven on. Both of these will bear investigation.

When I took over the working of the trains to Nyngan, in February last, I found that the greatest uncertainty prevailed as to what constituted a load. I thereupon set to work to determine the most profitable loads, having due regard to safety, efficiency, and economy. This I did by theory first. Calculating the power of engines, class 93, which are those used in this district, I found that on a 1 in 40 gradient (of which there

there are several between Wellington and Dubbo), after making the proper allowance for the internal friction of the engine, that 143 tons, exclusive of the weight of the engine itself, was the theoretical load at ten miles an hour. Now, 14 trucks of live stock and a brake van weigh 145 tons, and this load, from everyday experience, we find to be the utmost that these engines can take over 1 in 40 gradients; so here theory and practice are pretty well agreed.

The heaviest gradient west of Dubbo is between mileage 282.30 and 283.40, and is 1 in 55, being a little over a mile long. Using the same figures as in calculating the loads for the 1 in 40 gradients, it will be found that 203 tons, exclusive of the weight of the engine itself, is the theoretical, at 10 miles per hour. This is equal to twenty trucks of live stock and a brake-van; but, of course, on a short gradient, only a little over a mile long, a greater load can be taken than over one 3 miles long. In this case, it is approached by a falling gradient of 1 in 120, about $1\frac{1}{2}$ miles long; for this I allowed 25 per cent., making the load 25 trucks of live stock and the brake van. This was the result I got from theory alone. Having heard that 26 trucks and the brake-van had been a common load, and that twenty-seven trucks had been taken, I questioned some of the drivers. All admitted that twenty-six trucks could be taken in the time allowed, but that it was a heavy load; also, that twenty-seven had been taken with some lost time; moreover, that on one occasion twenty-eight had been taken, but with the greatest difficulty and risk. I could hear nothing of more than twenty-eight having been taken with one engine. On the 4th May last, No. 60 up live stock train was arranged to run with thirty trucks. I arranged for an assisting engine to go to Narramine, but through some oversight among the traffic people this engine, although in readiness in Dubbo, was not sent out. On arrival at Narramine the driver, W. Young, of No. 60, having a remarkably good engine (No. 95), started away with the thirty trucks. He lost a lot of time before reaching the 1 in 55 bank, and had only got a little way up when the up mail caught up to No. 60, and had to push the live stock train over the bank. This shows conclusively how much beyond the power of the engine is a load of thirty trucks. I attach the driver's report. The time allowed to these fast live stock trains is one hour for the 22 miles from Narramine to Dubbo. Having regard to the importance of these trains not being delayed, and also remembering that only two years since a Royal Commission inquired into this matter, I consider I was only studying the interests of the Department in trying to get such a load fixed, as the engines could keep time with without running down hill with these heavy loads at a dangerous pace. Should anything occur to make it suddenly necessary to pull up at the foot of the 1 in 120 bank, the driver, with the brake power at his command, could not possibly do so. I therefore submitted to you a list of such loads as can be efficiently worked, which, with very little alteration, you were pleased to approve of.

To make sure of my ground before writing this, I went to Narramine on Monday last, and in company with Mr. Hornidge returned in the brake van of No. 68 up, which train had twenty-seven trucks of live stock on. Although it was a fine dry night and an engine in good order was on the train, and after running down the 1 in 120 gradient with steam on at about 4.5 miles an hour we only crawled up the latter half of the 1 in 55 bank at about 4 miles an hour, and although the driver did his best and had his engine in full gear, with plenty of steam, eleven minutes was lost thus, also clearly showing that twenty-seven is too many for keeping good time and for safe working.

When a train is arranged to run with a certain number of trucks we can never depend upon that number being adhered to. Possibly an earlier train has started with one less than its number or a truck on that train has been put off at some station with hot boxes to be taken on by a later train. In many other ways an additional truck may be unexpectedly put on to a train. Then if this train has been arranged for to take twenty-six, the extra truck making twenty-seven, can be brought, but if the train was arranged to take twenty-seven and an extra truck put, most serious consequences might follow. It is for these reasons that I considered it advisable, as charged against me in paragraph B in the article in *Dubbo Dispatch*, to send out to Narramine an engine to assist a train when there are twenty-seven trucks on. On the occasion referred to, No. 68 up on 4th June, the engine did not run light from Wellington, but worked No. 29 down goods to Dubbo, and then ran light to Narramine from Dubbo. Supposing this sending the engine to Narramine was unnecessary, the actual expense incurred was £2 16s. 10d.; but as the men would have been paid their wages in any case, that amount (6s. 8d.) must be deducted, leaving the actual unnecessary expenditure at £2 10s. 2d., instead of £10 10s. as stated; but I humbly submit it was to the interests of the Department to incur that expense to ensure bringing in this important train without delay.

Again, I am charged with making the engine take fourteen trucks of live stock and the brake van from Dubbo to Wellington. This I have shown to be only a fair load. Thirteen used to be the load, but six months ago I increased it by one truck, mainly because fourteen is a suitable load for Mr. Turton's large engines of the Mogul type, class 215.

It is strange that I should be charged with cutting down the loads of engines. I have just shown that, on my own responsibility, I increased the loads of engines (class 93) between Wellington and Dubbo, and I was chiefly instrumental in the early part of 1884 in getting the loads of the mail engines (class 265) increased from eleven to twelve vehicles. I several times took off at this station the pilot engine supplied by Dubbo, and returned it to Dubbo when there was only one engine load on the train.

In conclusion, I can only leave myself in the hands of the Commissioner. This district, in its present unsettled state, is a very difficult one to work, and I have worked from early morning to midnight often, and I can only ask that the fullest inquiry be held, when I am sure that, instead of being held culpable, the energy and zeal I have displayed will not go unrewarded.

I have omitted to mention that since I took over the working to Nyngan only two engines have returned light from Nyngan, and one of these worked a load from Dubbo to Wellington. On these two occasions there had been a rush of through down traffic with no immediate up traffic for these, consequently they had to be brought back to carry on the work.

Locomotive Engineer.

C. H. STANGER,
17/6/86.

As there is a considerable discrepancy between your and Mr. Stanger's statements, I forward Mr. Stanger's for any comments you may have to make upon it, and will send yours to Mr. Stanger in like manner.—W. SCOTT, 21/6/86. Mr. Hubbard.

Report herewith.—J. P. HUBBARD, 24/6/86.

Sir,

Sir,

Locomotive Engineer's Branch, Dubbo, 24 June, 1886.

In accordance with your minute of 21/6/86, No. 86-3,148 of 18/6/86, for any comments I may have to make on Mr. Stanger's statements, *re* paragraph from the *Dubbo Dispatch*, of Tuesday, 8th June, 1883, I beg respectfully to say that I cannot be held accountable for any newspaper extract appertaining to the question of Dubbo or Wellington being made a permanent locomotive depôt. At the same time, I am convinced that my opinion is fully verified in stating that Dubbo is the natural and most economical place to work the traffic from, for the reasons already fully set forth in my previous report.

I can readily believe Mr. Stanger being on duty from early morn to midnight often to make ends meet. If Wellington was the proper place for changing, there should be no difficulty come in. I can only say to this, I had no trouble at Dubbo when I knew traffic requirements when I made my arrangements, the traffic being very far in excess of the present. The loads taken between Dubbo and Narramine must affect the question at issue, *viz.*, the permanent locomotive depôt to be either at Dubbo or Wellington; and if the loop-line siding is put in at about mileage 286 west (and which I recommended to be done in my report of 6/11/85) 8 miles west of Dubbo, it would then only require a bank engine to take from or assist into Dubbo loads that would require three engines to take away to Wellington, and so save light running to Narramine (22 miles) as against 8 miles.

I now take exception to certain statements made by Mr. Stanger, and produce documentary evidence to show that he is in error in the case of engine No. 95, driver W. Young, 60 up live stock train, with thirty loaded stock trucks and brake van (total 31), on 4th May, 1886.

Mr. Stanger says:—"On the 4th May last, No. 60 up live stock train was arranged to run with thirty trucks. I arranged for an assisting engine to go to Narramine, but through some oversight among the traffic people, this engine, although in readiness in Dubbo, was not sent out. On arrival at Narramine, the driver (W. Young) of 60, having a remarkably good engine (No. 95) started away with the thirty trucks. He lost a lot of time before reaching the 1 in 55 bank, and had only got a little way up it when the up mail caught up to No. 60, and had to push the live stock train over the bank. This shows conclusively how much beyond the power of the engine is a load of thirty trucks. I attach the driver's report."

On inquiry, and referring to the two reports from driver W. Young, of No. 60 up live stock train, on 4th May, 1886, and driver Charles Richards, of No. 20 up mail, same date, who overtook and assisted No. 60 up live stock train over the crown of the hill, there was no time lost, the journey from Narramine to Dubbo being run in less than one hour, *viz.*, fifty-five minutes—Narramine, depart 3:40 p.m.; Dubbo, arrive 4:35 p.m.; distance 22 miles. It appears to me that the driver's statement is not taken into consideration in this matter, as the driver, W. Young, states, "No time was lost." Please see driver W. Young's report, also driver C. Richards', of No. 20 up mail, who states:—"I had caution notice of No. 60 up live stock having left at 3:40 p.m. (twenty minutes ahead of the mail). I received the signal at 4 p.m. to leave for Dubbo, and I did so, running to time. On approaching Willardra, I saw No. 60 up live stock near the top of the bank; I ran up close, and I assisted him about 200 yards over the top. The train (No. 60 up live stock) was going at that time 6 or 7 miles per hour, and I feel confident that the driver could have taken them over easy. I arrived at Dubbo at 4:40 p.m.; usual time. I believe live stock train had thirty on and the van."

The driver of No. 60 up (W. Young), by the mere fact of his starting with his heavy load only twenty minutes ahead of the up mail from Narramine, shows that he himself was confident of being able to take the train clear into Dubbo, 22 miles, and as he was going, according to Richards' statement, 6 or 7 miles an hour, 200 yards from the top of the bank, he was doing very well indeed, even if he topped the bank at 4 miles per hour.

Mr. Stanger then goes on to state:—"On Monday last (14th June) and in company with Mr. Hornidge, returned in the brake-van of No. 68 up, which train had twenty-seven trucks of live stock on. Although it was a fine dry night, and an engine in good order was on the train, and after running down the 1 in 20 gradient with steam on at about 40 miles an hour, we only crawled up the latter half of the 1 in 55 bank at about 4 miles an hour, although the driver did his best, and had his engine in full gear with plenty of steam, 11 minutes were lost thus, also clearly showing that twenty-seven is too heavy for keeping good time and for safe running."

Mr. Stanger says he rode in the brake-van. I think he would have been better able to see what was done if he had gone with the driver on the engine. It is also very unfortunate that if the engine No. 164 was in such good order that she should have been taken into the shop the very next day for general repairs, and I had to send my boiler-maker to Wellington to work on her, and I believe he is still doing so.

The most satisfactory way would have been to have handed the same engine over to me for a trip with a similar load. I should also like to ask Mr. Stanger, at what rate of speed his load of fourteen live stock and brake-van with engines of 93 class have to run down Sandy Creek, between Dubbo and Murrumbidgee, to get up the bank of 1 in 40, and also to get up Foster's bank, between Ponto and Maryvale.

J. P. HUBBARD.

Locomotive Engineer.

No. 27.

Telegram from The Secretary for Public Works to D. A. Ferguson, Esq., M.P.

Wellington, 28 August, 1886.

Re your inquiry about the engine-sheds. In view of the great expense that has taken place in their erection at Wellington, I do not feel justified in removing them; but two or three engines, for which there is room in the Dubbo shed, will be stationed there to assist the heavy traffic between the two stations.

W. J. LYNE,

Secretary for Public Works.

No. 28.

Minute by The Secretary for Public Works.

Re question of Engine-sheds, Dubbo and Wellington.

WITH reference to the question of the establishment of running sheds on the Western Line, either at Dubbo or Wellington, I have given the matter much consideration, and have personally visited both stations in order to familiarize myself with the actual circumstances of the case.

I find that at Wellington an extensive running-shed, engine drivers' quarters, &c., have been provided at a cost of many thousand pounds (about £10,000), and it appears to me that, in view of that great expense, I cannot order the removal of the shed from Wellington, but had I been in office when the question was first considered, I would have had no hesitation in saying that the depôt should be at Dubbo, and I cannot conceive why it should have been established at Wellington. A much heavier train load can be hauled between Bourke and Dubbo than between Dubbo and Wellington, and there is consequently a great deal of dead running between the two last mentioned places, which would have been obviated had the engines been stationed at Dubbo, and a large annual expense would be saved by the Department.

The only argument that presents itself to my mind in favour of Wellington, is that it better proportions the distance between the engine depôts on either side, viz., Bathurst and Nyngan, and possibly offers a better climate for the men, although I cannot see that there can be much variation in the climate, as the difference in altitude between Dubbo and Wellington is only about 130 feet.

From information I gathered it seems to me judicious that two or three engines should be stationed at Dubbo during the wool season, to meet the traffic requirements, and I believe this will effect a saving to the Department. I inspected the shed at Dubbo, and find there is ample room for four or five engines in it.

W.J.L., 16/11/86.

A RETURN showing the loss (if any) sustained by the country through such locomotives being at Wellington instead of Dubbo.

No loss has been sustained, as will be seen by reference to the Locomotive Engineer's report of 22/2/86, in paper No. 18 of this Return, which shews that a saving of £2,340 per annum will be effected in the working expenses by the engines being at Wellington instead of Dubbo.

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

RAILWAYS.

(REMOVAL OF SLEEPING-CARS FROM WELLINGTON TO DUBBO.)

Ordered by the Legislative Assembly to be printed, 12 July, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 22nd June, 1887, That there be laid upon the Table of the House,—

“(1.) Copies of all letters, papers, and correspondence with reference to “the removal of the sleeping-cars and carriages from Wellington to “Dubbo.”

(*Mr. Melville.*)

SCHEDULE.

NO.	PAGE.
1. Letter from Mayor of Dubbo, <i>re</i> inconvenience to travellers by carriages standing in the sun all day at Dubbo, with minutes and reply. 31 January, 1887	1
2. Letter from Council Clerk, Dubbo, to Secretary for Public Works, complaining of inconvenience caused through carriages being changed at Wellington instead of Dubbo, with minutes and reply. 16 February, 1887.....	2
3. Letter from Council Clerk, Wellington, conveying thanks of Council for action taken by the Department. 26 February, 1887	3
4. Extract from letter to Minister for Mines from Mayor of Dubbo, <i>re</i> alteration of place for changing the carriages. 3 March, 1887.....	3
5. Minute by Commissioner, <i>re</i> sending carriages on to Dubbo, as formerly, with Traffic Manager's reply and letter to Mr. Penzer, M.P., and decision that Dubbo is to be the changing station for sleeping-car. 1 April, 1887.....	3

No. 1.

The Mayor, Dubbo, to The Commissioner for Railways.

Sir,

Municipal District of Dubbo, Town Hall, Dubbo, 31 January, 1887.

I have the honor, on behalf of my Council, as per instructions, to respectfully draw your attention to the inconvenience and discomfort which passengers by rail are subjected to on the journey from Dubbo to Bathurst, especially arising from the fact that the carriages arriving at Dubbo in the morning are left standing in the yard at Dubbo without any protection from the sun until the time of departure in the evening. Consequent upon which the carriages are like heated ovens, and sickening to travellers, especially to ladies; again, the water provided for passengers, standing all day, often, in the carriages, as stated above, is altogether unfit for use.

Trusting you will give these matters your consideration, with a view to bringing about a more desirable state of things,—

I have, &c.,

N. MULLER,

Mayor.
Inform

507—

Inform that instructions have been given to obviate this by making Wellington the changing station for the sleeping-car, as formerly.—A.R., 1/2/87. I see this has reference to all carriages. Please say if this can be remedied.—A.R., 1/2/87. Traffic Manager.

I have gone thoroughly into this question, and am satisfied that Wellington is the most suitable place for changing the passengers into clean carriages, because the work of changing can be accomplished while the passengers are taking breakfast or tea respectively. My intention is that the whole of the carriages which go from Sydney by the mail shall be taken off at Wellington and a fresh lot put on, in which the passengers can continue their journey in comfort. The Sydney carriages can then be put under cover at Wellington all day (in the engine-shed), and there cleaned and put in readiness for the up mail in the evening. This is being done with the sleeping-car at present under the authority of the Minister and the Commissioner; therefore there seems to be no good reason why the arrangement should not extend to all the carriages. Such an arrangement would effectually get rid of the trouble of the Dubbo Municipal Council. It can be carried out at once, if agreeable.—W. V. READ, 24/2/87. Commissioner.

Approved. Care must be taken in exchanging the personal luggage which passengers carry in the carriages with them.—CH.A.G., 26/2/87. Traffic Manager. Acting-Inspector Duff to note.—W.V.R., 3/3/87. This has been arranged and carried out. Fresh carriages are now attached at Wellington, instead of Dubbo, since 12th instant.—A. DUFF, 13/3/87. Traffic Manager. Now arranged.—W. V. READ, 14/3/87.

Sir,

Department of Railways, Sydney, 17 March, 1887.

Referring to your letter of the 31st January last, in which you represent the discomfort caused to passengers by rail through the absence of any covering for the carriages while waiting at Dubbo Station, I have the honor to inform you that the evil complained of has been remedied by transferring passengers arriving by mail train at Wellington into fresh carriages.

I have, &c.,

A. RICHARDSON,

(For the Secretary of Railways).

Council Clerk, Dubbo.

No. 2.

The Council Clerk, Dubbo, to The Secretary for Public Works.

Sir,

Municipal District of Dubbo, Town Hall, Dubbo, 16 February, 1887.

I have the honor, under instructions from my Council, to inform you that on the 31st day of January last, a letter was sent by my Council to your Department through the Commissioner for Railways, requesting that the sleeping-car at Dubbo should be placed under shelter from the heat from the time it arrived in Dubbo, viz., 9:30 a.m., until it left for Sydney at 4 p.m., each day.

Since the letter in question was sent, my Council has been informed that the sleeping-car has been taken off and does not run any further than Wellington.

My Council desire me to represent to you the great inconvenience that arises to the public through the action of the Government in not running the car to Dubbo, insomuch that persons travelling by sleeping car as far as Wellington, have now to remove their luggage to another carriage if proceeding to Dubbo or past that Station, and in the latter case have on their arrival at Dubbo, owing to a change of carriages, again to remove their luggage to the carriages in waiting at Dubbo.

This is a great inconvenience to persons travelling west past Wellington, and is one of the reasons urged why the car should run to Dubbo, as heretofore.

My Council also desire to mention that Dubbo, being a central town, is the station where passengers from Coonamble, Cobborah, The Bogan, and The Macquarie, and surrounding districts, book to and from Sydney, and consequently more people travel to and from Sydney and Dubbo, than to and from Sydney and Wellington.

My Council further direct me to respectfully point out to you, that if it is considered necessary to place the sleeping-car under shelter at Wellington, as they are given to understand, it is equally necessary that the carriages which run to Dubbo in the morning and remain there until 4 o'clock in the afternoon, should also be protected from the heat of the sun and the inclemency of the weather, as more persons travel by these carriages than do in the sleeping-car.

Trusting that the matter referred to will receive prompt and favourable consideration,—

I have, &c.,

T. W. HEAYDON,

Council Clerk.

Please acknowledge, and let me see papers. The Council seem to misunderstand the reason of the stoppage at Wellington, which was not so much for the protection of the carriages as to save empty running.—J.S., 18/2/87. I should like to have a statement of the earnings of this car. Traffic Manager.—D.C.McL., 19/2/87.

During the six months ended 31st January last the sleeping-car on the Western Line earned £1,616 17s. 6d. for sleeping berths, and that, of course, was irrespective of Members of Parliament or others who travelled free. As the Commissioner knows, the whole of the Western mail train which goes from Sydney, sleeping-car included, is left at Wellington, and a fresh train put on there.—W. V. READ, 10/4/87. Commissioner.

For Minister's information.—CH.A.G., 14/4/87. Inform.—J.S., 15/4/87.

Sir,

Department of Railways, Sydney, 20 April, 1887.

Referring to correspondence that has passed relative to the stoppage of the Western sleeping-car at Wellington, and asking that it might be run on to Dubbo, I have the honor, by direction of the Commissioner for Railways, to inform you that the matter has had inquiry, but the result tends to show that the present arrangement is more suitable, alike to the Department and the majority of travellers.

I have, &c.,

D. VERNON,

Secretary for Railways.

Council Clerk, Dubbo.

No. 3.

No. 3.

The Council Clerk, Dubbo, to The Commissioner for Railways.

Sir,

Council Clerk's Office, Wellington, 26 February, 1887.
I have the honor, by direction of the Wellington Municipal Council, most respectfully to convey to you their thanks for your favourable consideration of the question of the sleeping-car being detached at Wellington.

I have, &c.,

W. H. FORWOOD,
Council Clerk.

No. 4.

Extract.

EXTRACT from letter to Minister for Mines from Mayor of Dubbo, dated 3/3/87.

You will pardon me for troubling you on a matter outside of your Department. As you will remember, at the interview you granted my Council during your late visit to Dubbo, we casually brought up in conversation the fact of the sleeping-car being cut off at Wellington.

I have written the Honorable the Minister for Works on the matter, also drawing attention to the fact that first and second class carriages are still left exposed in the yard at Dubbo, and thus, without shelter, are extremely heated and uncomfortable for passengers, besides the detriment to rolling-stock.

As I before said, you will pardon me for intruding this matter, but I shall feel glad if you can at all help us in the redress sought.

Will Traffic Manager please deal with this matter, if he has not already done so?—A.R., 20/4/87.

No. 5.

Minute by The Commissioner for Railways.

Sleeping carriage to be sent on to Dubbo instead of Wellington.

WILL Traffic Manager look into this and let me know what he recommends. The people of Dubbo are now lamenting that they asked for the change.

CH. A. G., 1/4/87.

I cannot recommend any departure from the present practice, by which the train which goes from Sydney is left at Wellington and put under cover there all day. After breakfast the passengers get into a fresh and clean train, and of course the same is done on the up journey at night. The arrangement is a very convenient one to Department, and must be agreeable to passengers.—W. V. READ, 5/4/87. Commissioner.

Inform Mr. Penzer, M.P.—CH.A.G., 8/4/87.

Sir,

Department of Railways, Sydney, 14 April, 1887.

Referring to your personal interview, urging that the sleeping-car now detached at Wellington may be taken on to Dubbo, I have the honor to inform you that the matter has had inquiry, and the result tends to show that the present arrangement is the more suitable alike for the Department and the majority of travellers.

I have, &c.,

J. Penzer, Esq., M.P., Sydney.

C. A. GOODCHAP,
Commissioner for Railways.

Mr. Penzer has expressed his dissatisfaction with this reply. He urges that it reflects upon him the charge of having made a misrepresentation. His assertion was that the majority of travellers disliked the arrangement. This letter gives his statement a direct contradiction. I sought to disabuse his mind of the impression, but he still, while accepting the disclaimer, asserts that the majority of the travellers favour the idea of the sleeping-car going on to Dubbo.—CH.A.G., 20/4/87.

The Minister has decided that the sleeper is to run through to Dubbo permanently, to commence to-morrow (Friday) night. Be sure there is no mistake about the running commencing to-morrow night, as Mr. Penzer and others are going up.—CH.A.G., 21/4/87. Traffic Manager. Instructions issued accordingly.—W. V. READ, 21/4/87. Commissioner.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAYS.

(PROPOSED REMOVAL OF WORKSHOPS FROM JUNEE TO WAGGA WAGGA.)

Ordered by the Legislative Assembly to be printed, 11 July, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 6th August, 1886, That there be laid upon the Table of this House,—

“Copies of all letters, minutes, reports, or other documents having reference to the proposed removal of the Government Railway Workshops from Junee Junction to Wagga Wagga, together with an estimate of the additional cost of carrying on the work at Wagga Wagga.”

(Mr. Abigail.)

Mr. Inspector Close to The Acting Locomotive Engineer.

Government Railways, Locomotive Engineer's Branch,

Sir,

Wagga, 22 July, 1882.

Re Junee as our depôt for the Wagga District. In the running of regular trains a saving would be effected by centralizing and consolidating the Locomotive Staff, but it is in the irregular traffic that the greatest economy would be effected. This running cannot very well be shown in schedule form, as special trains are run at uncertain periods down the south-west from Junee and up on the main line, according to the exigencies of the traffic. It is a very rare occurrence for a special train to start from Junee for the down journey on main line. Junee has in fact a very large preponderance, as far as traffic is concerned, over any other main line station in the Wagga district. During the past twelve months a large number of engines have been sent from Wagga to work and assist trains from Junee and from Junee to Wagga for washing-out purposes. In going through the books I find it is almost impossible to get the correct number of engines that have been run, as in many cases they have been sent as extra engines attached to other goods trains, and we cannot very well state now unless statistics could be obtained from Traffic Branch whether their utility as assistant engines commenced at Wagga or Junee. From what I have seen of the traffic I should say it is a very rare occurrence for more than a single load for each train to start from Wagga, but a very common occurrence from Junee. Engines running from Junee to Harden would not require to be cleaned there as they are at present; this small item alone would give a saving of more than £300 per year. I believe I am within the mark when I state that at least £1,000 per year would be saved to the Locomotive Department. The running of the trains would come in rather badly with the present time-table, but this arises principally from the fact that the time-table has been adjusted for Wagga as a depôt. In case it is decided to make Junee our principal depôt for this district, it would be necessary to erect water-cranes at each end of Wagga platform, so that trains running from Junee to Albury could take water. A permanent water supply at Junee is also indispensable.

I have, &c.,

J. CLOSE,

Locomotive Inspector.

282—A

Mr.

Mr. Inspector Close to The Locomotive Overseer.

Government Railways, Locomotive Engineer's Branch,

Sir,

Wagga, 22 July, 1882.

I wish to point out for your special consideration the large saving that would be effected by making Junee the head-quarters of the Locomotive Inspector and Staff of the Wagga District. I understand that at the time Wagga was chosen as the depot for this district, the branch line from Junee to Hay was not under consideration.

This branch line has had the effect of making Junee the principal depot for traffic in this district. A large number of specials of live stock run into Junee from the branch line referred to. To work these specials from Junee to Homebush necessitates engines running light from our main line depôt at Wagga to Junee, a distance of 22 miles. This also involves the engines running light on the return journey from Junee to Wagga, making in the case of every extra or special engine required from Junee a distance of 44 miles run unnecessarily.

This means, in the course of a year, a very large sum in wages to men, wear and tear of permanent way, locomotive stock, and, what is equally important, the loss of the engine's services during the time occupied in unnecessary running. During the busy season the greater portion of my men are thus engaged in working the extra traffic from Junee, making Junee, in fact, the head centre for locomotives, but keeping the head-quarters nominally at Wagga.

Junee should also, I think, be made the break-station for men working the down mail trains from Goulburn; these men at present run from Goulburn to Wagga, a distance of 175 miles, and from the time of their coming on duty at Goulburn and going off duty on their return there, occupies a period of over 24 hours, not more than five of which are available for rest, and those in the middle of the day.

There is, I am aware, a difficulty in the way of making Junee the head-quarters of the Locomotive Staff. I allude to the want of water there. Very little need be taken by the main line engines. On the down journey engines water at Bethungra; they can run from that station to Junee and return without requiring water at Junee. On the up journey engines can take water at Wagga and run to Junee and return. The distances from Junee are 18 and 22 miles respectively. For washing out engines: On the up journey they can be washed out at Harden; on the down journey at Albury, and occasionally at Wagga. Two regular goods trains per day have their terminus at Wagga. These two trains can be so worked as to wash out engines at Wagga when required. For extraordinary circumstances a small supply of water might be obtained by well sinking.

If the Locomotive Overseer approves of what I have proposed, I would suggest that a driver in charge be placed at Wagga, to do what shunting is required there, and to look after the two goods engines which would start from there per day.

I have, &c.,

J. CLOSE,

Locomotive Inspector.

Memo. from Mr. Inspector Close to The Acting Locomotive Engineer.

Government Railways, Locomotive Engineer's Branch,

Wagga, 22 August, 1882.

Re assistant engines on main line through mail trains. It is and has been the custom for assistant engine to run the whole journey from Goulburn to Wagga and *vice versa* with the mail. I have been going into this matter and find that in nearly every instance there is no real necessity for the assistant engine to run further than Junee. A single engine will take thirteen vehicles, brake-van included, between Junee and Wagga; it is a very rare occurrence for the load to exceed that number. I calculate that on an average there are 250 assistant engines on the mail in the course of a year; this multiplied by 44 miles the double distance between Junee and Wagga = 11,000 miles; taking the expense of working at 2s. 6d. per mile run, equals £1,375 per annum saving to be effected to the Locomotive Department by stopping the assistant engine at Junee. I think if you look into this you will find my suggestion worth adopting.

J. CLOSE,

Loco. Inspector.

I understand this to mean that two engines are to work between Goulburn and Junee, and a Wagga engine to work train from Junee to Albury and back.—T.M. No; the assistant engine only to come off at Junee when there is one, and that is nearly every day.—J.C., 31/8/82. Can this be done without any increase of the staff at Junee? If so, it will be an economical matter as it will save a lot of coal being hauled to Wagga. The engine could, of course, turn on the triangle. If no increase of staff is required I think you might try the experiment and report the result.—T.M. Messrs. Close and Allan.

I cannot arrange for a Wagga engine to work the mail from Junee to Albury until water cranes are erected at Wagga platform. I could do so then without difficulty and without increasing the staff. I could arrange it now with one engine and set of men extra as follows:—Wagga engine to work No. 42 up to Junee and return to Wagga with 27 down mail; same engine to work No. 10 up mail, Wagga to Junee, and return to Wagga with 35 down. Arrangements for water are as follows:—Goulburn engines take water at Bethungra, run on to Junee, and return to Bethungra; distance 36 miles. Wagga engines take water at Wagga, and run to Junee and return to Wagga; distance 44 miles. In neither case will water be required at Junee. I applied for water cranes to be erected at Wagga platform on 19/8/82.—J. CLOSE, Loco. Inspector.

Water cranes are being made for this and other similar cases.—T.M., 6/9/82. Mr. Close.

Memo. from Mr. Inspector Close to The Locomotive Overseer.

Government Railways, Locomotive Engineer's Branch,

Sir,

Wagga, 25 August, 1882.

I beg again respectfully to repeat my request to allow locomotive inspector and timekeeper to reside at Junee. At present my time is about equally divided between Wagga and Junee. Junee, being the real working centre of the district, requires the greater portion of my time, but I am not able to give this, as I reside at Wagga. The work at Wagga bears no comparison to that at Junee. All
throughout

throughout the busy season the greater part of my engines and men will have to be kept at Junee; in fact there is nothing to prevent nearly the whole of them being kept there, even under present circumstances. It would greatly simplify the traffic, and effect a wonderful saving to the Locomotive Department, if I were resident there. If you think fit to grant my request I shall not require the man I applied for as sub-inspector. This will in itself effect a saving of £234 per annum. I shall be glad if the Locomotive Overseer will take this into consideration at once.

J. CLOSE,
Locomotive Inspector.

Mr. Inspector Close to The Acting Locomotive Engineer.

Sir,

Wagga, 10 September, 1882.

I desire to inform you that, with a view to the more economical working of the Locomotive Department in this district, I have made certain departmental alterations. I give below the alterations I have made, and the approximate saving that will be effected.

Alteration No. 1.—I have caused the engine that now runs nearly regularly as assistant to down mail to be taken off the train at Junee, instead of Wagga, as was formerly the case, leaving one engine to haul the train between Junee and Wagga, instead of two. I estimate that not less than 250 extra, or assistant, engines are run on the down mail in the course of the year, and the alteration made saves 11,000 miles of running for locomotives per annum. This, at 2s. per mile, equals £1,100. It also saves the freight on three trucks of coal per week hauled between Junee and Wagga. This equals £107 4s. per annum, or a total saving effected on alteration No. 1 of £1,207 4s. per annum—a very important item.

2.—Two engines have been regularly stationed at Junee to work occasional trains on south-west to Darlington, &c., the engines and men that worked the mixed trains being stationed at and running from Wagga to Hay. This caused the occasional engines stationed at Junee to be run empty to Wagga to be washed out; by stationing the whole of the men who work the South-Western traffic at Junee, it enables me to run the occasional engines to Hay working mixed trains. At Hay there is every facility for engines being washed out, so that the running empty to Wagga for washing-out purposes is entirely done away with. I estimate that fifty trips per annum between Junee and Wagga of empty engines are thus saved; this at 44 miles, the distance from Junee to Wagga and return, equals 2,200 miles; this at 2s. per mile equals £220. There is also the freight on four trucks of coal per week by coal only being hauled to Junee instead of Wagga; this, at 13s. 9d. per truck, equals £143; this, plus £220, equals £363 per annum. In consequence of stationing the whole of the South-western men at Junee it was also necessary that we should work the main line mail from Junee to Albury instead of its being worked by the Goulburn men to Wagga as was formerly the case. The Goulburn engines being coaled now at Junee instead of Wagga effects a further saving in freight of coal hauled of £143 per annum; this, added to the above-mentioned £363, equals £506 per annum saved to the Department by alteration No. 2.

3. In consequence of Wagga being the depôt for main line engines, No. 11 down goods has always run into that station, and No. 36 up goods always started from there. These two trains, though marked as occasional on the time-table, have run regularly for nearly 12 months past. Mr. Roberts, the Traffic Inspector, has consulted with me, and I find the two trains I have mentioned have been run into Wagga for the convenience of the Locomotive Department. It has been arranged for No. 11 down to run to Junee only in future, and No. 36 up to start from there. Allowing that it will probably be necessary to run into Wagga in the busy months, say fifty times in the year (it will certainly not exceed that) it leaves 263 trips between Junee and Wagga, which equals 11,572 miles saved, equal to £1,157 2s. haulage; of coal saved equals £71 9s. per year; fuel saved, 65 tons at 25s. per ton, equals £81 5s. As the trips of these particulars trains are shortened the engines will not require to be cleaned at Harden, but can run from Junee to Harden and return; this will save about £100 a year, or give a total saving in this alteration of £1,409 14s. per annum.

4. I have transferred the pilot engine and men to Junee to stand there instead of Wagga. This engine is usually required for specials over and above the regular traffic either on south-west or on main line. Formerly, if required to run a special on south-west, the engine would run from Wagga to Junee empty. As the engine is now stationed at Junee it is equally available for either main line or south-west, and there will be no useless running. I estimate the saving from this at £100 per annum at the least.

Note.—Although this engine and set of men have no regular trains to run, the mileage of the engine compares very favourably with the regular train engines.

The alterations I have mentioned have all been carried out, and have as a consequence involved the removal of a considerable portion of the men from Wagga to Junee. The total direct saving appears to be £3,012 18s. per annum. The indirect saving it is almost impossible to estimate. I will enumerate a few of the advantages I have gained.

Under the previous system I had not sufficient engines or men to work through the busy months; I believe at least two more engines and sets of men would have been required. I have been enabled to spare drivers and firemen (one set at a time) for holidays, which I could not otherwise have done. It has reduced the mileage of men running mail train between Goulburn and Wagga to a reasonable day's work, by their now only running as far as Junee; it also gives them a reasonable period of rest before commencing the return journey. It has increased the mileage of the men who formerly ran the mail trains from Wagga to Albury, as they now run them from Junee. It has not increased their pay, as the work they have to do still comes within a reasonable day's work. Less Newcastle coal will be used than formerly, also Erith; and in fact, less stores of all descriptions.

Hoping what I have done will meet with your approval,

I have, &c.,
JOHN CLOSE,
Loco. Inspector.

Mr.

Mr. Inspector Close to The Acting Locomotive Engineer.

Sir,

Junee, 29 September, 1882.

I desire to enter fully into the circumstances which have lately caused a number of men to be transferred from Wagga to Junee, and, to enable you to thoroughly understand the matter, I must refer back to 2nd July, or two days previous to the opening of south-western line to Hay. On the date mentioned there were stationed at Junee—5 engines, 5 drivers, 5 firemen, 3 cleaners, 1 pumper, and 1 examiner—total 20. On July 4, the mixed mail trains which had formerly run between Junee and Carrathool were made to run between Wagga and Hay. This portion of the year being the slack season and the loads not heavy, I found that I could work the mixed trains from Wagga to Hay, and *vice versa* without changing engines on the road, consequently I removed 3 drivers, 3 firemen, and 2 cleaners, from Junee to Wagga. Within the last three or four weeks the traffic on south-west increased so much that I found it was no longer possible to run one engine from Wagga to Hay, as they could not carry sufficient coal for the journey, consequently, I had to remove a similar number of men and engines back to Junee that I had ten weeks previously taken from there. This left the portion of south-west train (No. 42-up) that started from Wagga to be worked by men that reside at Wagga as far as Junee, and, as when the engine got to Junee it must have a train to work back to Wagga or return there empty, I caused the main line engine of 27 down mail to be taken off the train at Junee, and the engine that would otherwise have had to return to Wagga empty, to work No. 27 down mail on to Wagga. As the mail engines that were stopped at Junee had to be cleaned, coaled, &c., for their return journey, I was compelled to remove two cleaners and one fuelman from Wagga to Junee to do this. The only alternative would have been to have started fresh men and kept men at Wagga that I did not want. The next thing to which I have to refer is purely a traffic affair. The Traffic Inspector decided not to run No. 11 down goods past Junee; and No. 36 up goods, which had formerly started from Wagga, was made to start from Junee. Mr. Roberts informed me it was not necessary, as far as the traffic was concerned, to run these trains south of Junee. Both trains are occasional, and not regular trains on time-table. This compelled me to remove two goods' engines, two drivers, two firemen, and three cleaners from Wagga to Junee. I could not possibly have acted otherwise under the circumstances.

I also, on account of the great increase in south-west traffic, required an additional driver and fireman at Junee. I removed the night driver and fireman in charge of Wagga engine-shed to Junee, as I could do without one at Wagga. This saved me from starting additional men.

The position of affairs about September 15th was this: There were nine engines stationed at Wagga, ten at Junee, and one working water trains; two Goulburn engines also run daily into Junee, Monday excepted. The engines at Junee are much heavier worked than those stationed at Wagga, and require a great deal more repairs. Consequently I had the alternative of running the engines empty to Wagga for repairs or sending the fitters to the engines; I adopted the latter alternative on the ground of economy. The total number of persons affected by these arrangements, and removed to Junee, is twenty-seven,—that is, up to date (fourteen married and thirteen single). As far as the single men are concerned there are lodgings to be obtained at the two hotels; there is also a private boarding-house. There are five tents, which will accommodate ten men, in the railway yard, and a tank-house, 26 feet square. Eight of the married men prefer to reside in Junee, and the remaining six have raised no objection. Several of the men have purchased ground, and are erecting houses for themselves; there are also four brick cottages to be commenced next week. The effect of these alterations is that it has enabled me entirely to dispense with running empty engines to Wagga to wash out or repair. If you will kindly refer to pay-sheets for the last five or six weeks, you will find that not a single empty engine has run during that period, nor will it be necessary in future, thus saving a very large sum of money to the Department.

In concluding my report, I wish to state that I have been guided by no other motive than serving the Department to the best of my ability, and I am willing, nay, anxious, that my conduct throughout should be submitted to the most searching inquiry. My own personal interests would be best served by remaining in Wagga. I have refrained from purchasing ground in Junee so that my motives could not be called in question; and I fearlessly assert that any man, placed in a similar position to mine, could not have done otherwise without grossly neglecting his duty to the Department. If the state of affairs were restored that existed on July 4th, the present traffic could not be conducted without an increase of two extra engines and eight extra men; and I trust, as I have simply done my duty, I shall be supported by my superior officers.

I have, &c.,

JOHN CLOSE,

Loco. Inspector.

Secn.—T.M., 30/9/82.

Minute by The Commissioner.

RAILWAY GRIEVANCES AT JUNEES.

In the *Echo* of this afternoon there is a telegram from the *Echo's* own correspondent at Junee, setting forth certain grievances, mostly as regards the scarcity of water at Junee in connection with engine service, which, it is alleged, the men have. Please report.

Loco. Engineer.—CH.A.G., 22/1/84.

Mr. Midelton.—W.S., per C.A.N., 23/1/84. Full report herewith.—T.M., 25/1/84. Loco-motive Engineer.

EXTRACT

EXTRACT from "The Echo," Sydney, January 22, 1884.

RAILWAY GRIEVANCES AT JUNEES.

(By Telegraph—From our own Correspondent.)

Wagga, Tuesday.

(1.) Great dissatisfaction exists at Junees Junction amongst the railway employees, and the engine-drivers especially. (2.) The men say they would rather abandon their houses and return to Wagga than remain in possession of them at Junees. (3.) Only one locomotive man has bought an allotment and built a house on it, the remainder having built on Government land. (4.) Quite a number get provisions from Wagga. This state of things has lasted about eighteen months. (5.) Eight drivers and firemen now living with their families at Wagga have declined to take them to Junees, owing to the want of water there. One man would not go to Junees, and on being sent for by the Department, he had to pay his railway fare there. One engine-driver would not go until he received a telegram as guarantee for a railway pass. (6.) No provision is made for the men who frequently arrive in the township after all the lodging houses are closed, and they are compelled to get their night's rest where they can. (7.) They say if the engines would be distributed between Harden and Narrandera and Wagga, and the men given regular positions, the present inconveniences, would be, to some extent, obviated. (8.) The only water obtainable for drinking purposes is taken to Junees by train from Wagga, from a dam 5 miles away from the town, where a number of locomotives are washed out daily. (9.) Two trucks of this water are sent daily to the railway refreshment rooms; each truck contains three tanks, holding 400 gallons each. (10.) The men do not get their proper "spell day," which they should have once a week, as the boilers require washing out twice a week. (11.) The engine men are afraid to let out the water from their engines, in order to clean them properly, owing to there not being sufficient water to refill them, and a great loss of time has been occasioned in consequence. (12.) Some of the boilers of the engines, in use only three years, are all to pieces, in consequence of the manner in which they have been worked. (13.) One engine has been laid up at Junees with 14 stays on one side, and 11 on the other side, broken. (14.) There is only one boiler-maker employed to repair the boilers at Junees. (15.) The mail train, on Tuesday, could not cross the Junees bank, and had to be pushed behind by another engine, although the safety regulations forbid this practice. This was necessitated by the fact that the front engine had not sufficient water to take it on to Wagga. (16.) Frequently engines have not sufficient supplies, but the journey from Junees to Wagga is down hill, and this assists them in completing the journey. (17.) Although the engines should properly be cleaned out after each trip, they are sometimes run for 300 miles at a stretch. If the men had regular runs, they would have good opportunities to clean the engines after each run.

Report from Inspector Close.

Re Railway grievances at Junees, M.P., 84/512, attached.

I HAVE perused the newspaper cutting on paper attached, and will reply to the assertions made in detail.

(No. 1.) I do not believe that any general dissatisfaction exists amongst the employees; the large majority of the men are well content to remain at Junees. Dissatisfaction undoubtedly exists; but it can be localized amongst three or, at the most, four men. These men are employed at Junees, but still reside in Wagga; and I am satisfied that two of the men I refer to are determined to use every pretext to avoid residing at Junees.

(No. 2.) I do not believe there is any truth in this paragraph.

(No. 3.) This paragraph is untrue. I have made inquiry, and, as far as I can learn, there are at least twenty of the locomotive employees who have purchased ground at Junees, six of whom have erected houses on their own property, twelve reside in houses of their own, erected on Government land, and there are ten who are tenants of the Government.

(No. 4.) I am not in a position to be able to answer this paragraph.

(No. 5.) This paragraph is also partially untrue. In place of there being eight drivers and firemen, who still reside at Wagga, although employed at Junees, there are six—viz., four drivers and two firemen. One of the firemen, by name Daniel O'Sullivan, was transferred to Junees at his own request, in preference to going to Albury; the other, Timothy Finn, was promoted from being cleaner at Wagga to fireman at Junees, in place of a fireman dismissed from there. The four drivers who still have their homes in Wagga, are named G. Brett, H. Shephard, G. Piper, and J. Hughes. I believe the dissatisfaction is limited to the two first named. With reference to the man paying his railway fare, it was the man's own fault. Daniel O'Sullivan worked an engine from Junees to Wagga; he was to leave the engine there, and return to Junees, passenger; he omitted to get a "pass" to return with before leaving Junees, and, as a consequence, the station-master at Wagga refused to allow him to return without one, and he was made to pay his fare. There is no truth in the statement that one engine-driver would not go until he received a telegram as guarantee for railway "pass"; no telegram was ever sent by me for any such purpose.

(No. 6.) This paragraph is also untrue. There is very good provision made for all drivers and firemen who run into Junees. A good brick building is erected, containing two large rooms, a lobby, and kitchen; this is at all times available for drivers and firemen.

(No. 7.) The traffic could not be worked without a large increase in both men and engines if they were distributed in the manner mentioned. The men and engines are at present stationed where we can get the maximum of work out of them at the minimum of cost. When the traffic is itself irregular men cannot be given regular positions.

(No. 8.) It is quite true, that at present, and for some three or four weeks past, the only water obtainable for drinking purposes has been brought by the water-train from Wagga. There has been a long period of dry weather, and the ordinary sources of supply, viz., water-tanks to the houses, have proved insufficient, this is the case at all stations now, from Harden to Albury, and Junees to Hay, and even Wagga itself; all railway employees having to be supplied by the water-train. I presume the dam mentioned, is the one known as Mr. Hammond's, and on which we have a pumping station. No engines are washed out there, or ever have been.

(No.

These men, Brett and Shephard, worked under me in Tasmania, where, I am sure, if they had such a miserable excuse as they here seem to have, would have been ashamed to speak of it in the service of a Railway Company.—T.M.

Quite right.—T.M.

(No. 9.) The refreshment-rooms are supplied, I believe, with water from Wagga.

(No. 10.) This is not true; the drivers get one shed day a week, which is all they are entitled to; boilers do not require washing out twice a week, once a week is quite sufficient, and with proper attention on the part of a driver, an engine will run longer than a week without washing out. Some five weeks ago we were very busy, and drivers did not in all cases get a shed day once a week, but they were given one whenever it was possible to do so; the present traffic admits of them having one, and sometimes two shed days a week.

If they are (as I intend them to be) washed out with hot water we shall use very little water, and not allow the boilers to cool, in which case Junees will, even as it is, not fail for want of water.—T.M.

(No. 11.) This is again not true. I know of no instance where a driver has been afraid to blow his engine off, or where any loss of time has been occasioned. I do know of an instance where one driver named Shephard was wilfully neglecting to blow his engine off before starting with his train, until his attention was called to it by the Shed Inspector, who passed the remark to Shephard that he would be losing time, and putting it down to the water.

(No. 12.) All the boilers of engines stationed at Junees are in good order; there is not the slightest foundation for the statement that some of them are all to pieces.

(No. 13.) Engine 149, I presume, is the one referred to as having stays broken. This engine has just been fitted with twenty new copper stays in the fire-box, fifteen on the right side, and five on the left side next the tube-plate, this can in no way be attributed to the water or the want of it. This engine is a Dub's bogie, and I believe that several of the same class have had stays given way in the fire-box. I cannot state the cause of this with certainty, but it is certainly not the water; perhaps the Locomotive Overseer could throw some light on this.

This is true, and it is to be accounted for by the water space being contracted at this spot.—T.M.

(No. 14.) One boiler-maker at Junees is quite sufficient. This of itself proves that boiler and fire-box repairs are not excessive.

(No. 15.) With reference to mail train being pushed behind by another engine, no safety regulation is broken by this practice. The rule referred to is No. 393, and reads: "No engine shall be used to push a train unless in cases of shunting or assisting up steep gradients." It is and has been for some time our constant practice when an engine has an unusually heavy load, to send an engine to assist the train (pushing it behind) up the Junees bank, by doing so it enables an engine to take four or five more waggons than it otherwise could do. The gain in pushing up the bank instead of placing the engine in front is that it runs 3 miles only, whilst in the other case it would have to run 15 miles. I cannot see the slightest danger attached to this practice—the pushing engine invariably runs on the staff, and it is a certain saving to the Department. In the particular case of which mention is made the train was not overloaded. Driver, George Piper, who worked it, states that whilst the engine had been getting up steam the injectors had been blowing back, causing the water in his tank to get over heated. When he took his engine round the triangle, about half-an-hour previous to his time of leaving, the injectors worked right; his engine was then low in steam. When the steam had risen to 130 lbs. in his engine he could not get his injectors to work—this was caused, I have no doubt, by the water in his tank getting hot. He had plenty of water in the tank and a full boiler, and the shunting engine was sent to give him assistance up the bank to give him a chance to get his injectors started, and he got them to work immediately he had turned the bank, and the assistant engine was not required further.

(No. 16.) Engines invariably have enough water on leaving Junees to carry them to the next watering station.

(No. 17.) It is not necessary to clean engines after each trip; some of the trips run are very short ones, and to clean them after such trips would merely be a waste of time and stores. They are at all times kept as clean as the time at our disposal will admit of.

J. CLOSE,
24/1/84.

Locomotive Overseer.

Loco. Engineer.—J.M., 25/1/84. The Commissioner.—W. SCOTT, 30/1/84. For the Minister's information.—CH. A.G., 8/2/84. Seen.—F.A.W., 9/2/84.

The Engine-drivers and Firemen of Junees Junction to G. C. Loughnan, Esq., M.P.

Sir,

Junees Junction, 21 January, 1884.

We beg most respectfully to suggest to you that thousands of pounds now charged to the Locomotive Department could be avoided, and when enginemen and firemen could be at home nearly every night, also where enginemen could have their own engine; the enginemen having the same engine always it could be carefully looked after, as an engineman respects an engine the same as if it was a human being.

At the present time the engine-cleaners have a different engine every day, and there is not the interest taken in the engine as if the men always had the same one. Further, the engines are never but half cleaned, thereby causing them to wear out much quicker, and when a man has a "shed day" at Junees Junction on the engine he cannot do it justice for the want of water, thereby causing the trains to run late through the boilers not being washed out.

If the enginemen were stationed at Wagga Wagga, Narrandera, and Harden, there would not be one-third the haulage of coal that there is at the present time.

For example: The mail engines would take sufficient coal at Goulburn to carry them from Goulburn to Harden and return, thereby saving an annual haulage of coal in trucks of 250 tons; that is, only allowing for one engine.

Further example: An engine could take as much coal at Harden as would take her from Harden to Wagga and return, thereby saving a haulage of coal past Harden for the mail engines going to Wagga of about 300 tons annually.

Further example: A mail engine could load as much coal at Wagga as would take her from there to Albury and return, thereby saving a haulage of coal to Albury.

Further

Further example: The goods engines could take as much Bowenfels coal as would take them from Harden to Wagga and return, thereby saving a haulage of coal past Harden for goods engines of about 10 tons per week.

In the next place, an engine could take as much coal at Wagga as would take her from there to Narrandera and return, thereby saving a haulage of coal of about 40 miles.

Again, an engine could take as much coal at Narrandera as would carry her from Narrandera to Hay and return, thereby saving a haulage of coal to Hay, a distance of 106 miles.

If the engines were stationed at the above-mentioned towns there would be justice done to the said engines, as there is a permanent supply of water at the said towns and every convenience for locomotive purposes, whereas at Junee Junction there is not sufficient water for household purposes. There are no doctors at Junee, and one would think that Inspector Close's aim was to make the men as miserable and uncomfortable as he could, by compelling the men to run to a different destination every day, where no provision is made for them. It very often happens when we arrive at our journey's end the hotels are closed, and we are compelled to sleep anywhere, whereas every man would have a regular run and avoid the misery.

To show you how things are carried on at Junee Junction, the water that is used there for locomotive purposes is dirty, blown out of the boilers; the same water is repumped and used over and over again, thereby causing the stench from the water unbearable.

We are confident that every locomotive workman at Junee Junction would sacrifice everything they have at Junee to be removed from such a polluted village.

To show you the scarcity of water at Junee, the mail train had to be pushed over Junee bank on Tuesday morning, the 13th inst., as she had not sufficient water to take her to Wagga. At the same time it is not allowed to push a passenger train.

If you were to consider this letter over, and inquire into the working of Junee Junction from the enginemens at Junee, and kindly call a meeting, to be held at Junee, consisting of the locomotive men, you would then hear their grievances, as we sincerely trust you will take our cause up, and represent our cases to the Honorable Members of the Houses of Parliament, and cause an inquiry to be held.

If the engines were stationed at Wagga, Narrandera, and Harden, there would not be any cause for a water supply for Junee.

We have, &c.,

THE ENGINE-DRIVERS AND FIREMEN OF JUNEE JUNCTION.

Commissioner, for report.—F.A.W., 22/2/84.

Minute by The Commissioner for Railways.

WITHOUT, for the present, remarking upon the gross impropriety of the men going outside the Department for redress of alleged grievances until they have endeavoured to obtain, by appeal, that redress from the constituted authorities, and upon the evil effect which such a course of action must necessarily have upon the discipline of the staff, I wish to know from the Locomotive Engineer what truth there is in the allegations made, and whether the system of running, which these men advocate, would result in the economic working they represent it would.

I do not wish the men interrogated as to their connection with this paper; it would doubtless be repudiated by several, if not by all, while it is probably true that it has emanated from two or three only who have before striven to gain their ends by disparaging the management.

It is just possible, however, though not very likely, that the officers have overlooked, as being more economical, the system of running which the men advocate. If it would result in a saving I should not discard it because it has originated with the men, however irregular and subversive of discipline that action has been. Please report early.

CH.A.G., 23/2/84.

Mr. Midelton for report.—R.D.S., 27/2/84. Mr. Close first for his report.—J.M., 27/2/84.
Received per mail on 28/2/84; reply sent to-night.—J. CLOSE, 28/2/84.

Memo. by Mr. Inspector Close.

Junee, 28 February, 1884.

I HAVE carefully perused the printed petition with attached papers, and have answered the statements therein contained in detail (attached). It is necessary, however, to say a few words in reply to the written petition purporting to emanate from the drivers and firemen at Junee Junction. I have carefully read the Commissioner's Minute, and have strictly refrained from interrogating the men in any way. My answer to remaining portion of Commissioner's Minute you will find fully answered by the answer to clause 4, 3rd section of printed petition. If any saving to the Department could be effected by working the trains in the manner proposed, I would only be too ready to adopt it; but it is not so, it would involve the Department in heavy additional expense. Since I have been in charge of this district I have discharged my duties conscientiously and fearlessly in the interest of the Department I serve, and it has been my whole study to work the district as cheaply as possible, and I shall be very much mistaken if the returns for the year 1883 do not show this. I have in no way oppressed the men in doing this, unless they consider it oppression to do a fair day's work for a day's pay. From calculations I have made I believe a saving has been effected to the Government of at least £7,000 a year, and an inquiry will undoubtedly prove this.

I have not the slightest doubt that the written petition emanates from three or four discontented men, and I have on a previous paper mentioned two men, who are not now in this district, as being, I believe, the principal instigators of this. There is apparent, if not positive, proof of their connection prior to these men leaving the district. I could not pick up a Wagga paper without finding the most trivial

trivial things taking place at the Junction tortured and misrepresented, to bear meanings to suit their own views. In the paper I refer to these items suddenly ceased with the withdrawal of the men, and have not since reappeared.

There is also another person, a fireman named Edward M'Sullea, whom I strongly suspected of giving information to the press. My suspicion is confirmed to absolute certainty by four lines in the attached petition. They are, almost word for word, a similar sentence to one that occurs in an application from M'Sullea to Locomotive Overseer, for a pass, handed to me on January 17th or 18th last, by M'Sullea. It was not forwarded because the pass was not required; I removed him to Albury instead, in place of a fireman sick.

I have attached it to this, and if you will read and compare the lines I refer to, it will satisfy you that it is the work of the same person.

J. CLOSE, 28/2/84.

Memo. by Locomotive Foreman.

I MUST express my regret to find that our men, if it is the employees, taking such an extravagant and unjustifiable course as they have taken. Considering the privileges they enjoy, and the extreme courtesy extended to them on all occasions, I am indeed surprised that they do not fully appreciate their positions, and do their utmost to help the Department forward in a true and proper spirit. I am quite sure Mr. Close has done his utmost to work conscientiously, and to do that which has been best, to work cheaply and efficiently. The running proposed has been well considered long before the petitioners named it, and has been abandoned for the reasons given.

T. MIDDLETON, 1/3/84.

Memo. by Mr. Inspector Close.

I ATTACH with this, a copy of memo. from previous Inspector of Wagga District (Mr. Park), to Locomotive Overseer, of date 28 February, 1880, and prior to the engine sheds at South Wagga and Junee being built. It will be seen from Mr. Park's memo. that he had a very clear perception of the situation. As his memo. appears to have an important bearing on the case, I have attached the copy to present papers.

J. CLOSE.

[Enclosure.]

COPY of Memo. forwarded to Locomotive Overseer by Locomotive Inspector of Wagga District (Mr. Park), on 28th February, 1880.

Memo. 660.

SOME months since you called for a "return" showing the shed room which would be required for engines at South Wagga and Albury. It was sent in, stating that room for twelve would be required at South Wagga at that time no decision had been come to as to whether the branch line would be constructed from Junee to Narrandera, and consequently this was not taken into consideration in making out the "returns."

If it is not absolutely decided to build the shed at South Wagga, I would offer the suggestion that it be built at Junee, for the following reasons:—The staff would have to be increased but very little in comparison, to what would be required if one is built at South Wagga, and one at Junee for engines working on the branch line.

One inspector could do the work of both lines, saving the wages of a man in charge, and it would save at least the wages of one driver and fireman, one carriage examiner, one fuelman, of the pumper at Wallace Town, and probably of one or two cleaners; leaving out the cleaners, there would be a direct saving of about £14 per week, or about £700 a year, and the work being concentrated in one place, I have no doubt many other expenses could be avoided, and the work done much more economically than if carried out at two places. Other advantages are, that one spare engine would answer the purpose where two would be required; it would be available for either main line or the branch; it would equalize the running more for the drivers of mail and passenger trains, it being 153 miles from Goulburn to Junee, and I think 100 miles from Junee to Albury, instead of 175 miles from Goulburn to South Wagga, and 78 miles from Wagga to Albury; it would be more convenient for repairs at the junction of the two lines, and if tools were placed there, many repairs might be done there, which now necessitates engines being sent to Sydney.

I would also suggest that the carriage shed should be built at Junee instead of at Wagga Wagga. I do not think it practicable to run the carriages through from Sydney to Albury, as there would not be more than two hours for the carriage examiner to examine the train and do the necessary work after a run of nearly 400 miles; I think the better plan would be to have a separate set of carriages to run between Sydney and Junee, and a set between Junee and Albury. If the shed is built at Junee it will be available for both lines, and a spare carriage would answer the same purpose of two, if the shed is built at Wagga. I have heard that the want of water at Junee is a great drawback, but judging from the appearance of the country, on the left side of the line on the down journey, I should think one or more reservoirs might be easily constructed at comparatively little cost, and for the water to run into the yard by gravitation. If this could be done it would save the cost of pumping engine, and the wages of a pumper, which at £2 8s. per week, would pay the interest at 6 per cent. on over £2,000. This would go a good way towards paying the cost of constructing one or more dams across the gullies, and the water so provided would be better for locomotive purposes than water obtained from a well.

H. H. PARK.

Petition presented to the House from Residents of Wagga Wagga.

Re Mismanagement and Abuses said to exist at Junee Junction.

1. That it has day by day become more apparent that the present arrangements for the effective working of railways on the Southern and South-western lines are inefficient, and not conducive to the public convenience or welfare.

2. That to show that this is so, the following facts are quoted:—

1st. That when the railway was opened as far as North Wagga Wagga, only about 2 miles from the Murrumbidgee—now known as Bomen—very great expense was incurred by the Department in erecting engine-sheds, goods-sheds, turn-tables, homes for railway employees, and particularly in procuring a water supply for the use of the engines.

2nd. That when the extension across the Murrumbidgee River to South Wagga Wagga was opened, again very great expense was incurred in the erection of engine-sheds, goods-sheds, turn-tables, and cottages for the employees. This latter expense is estimated by people who are well able to judge, at a little over £8,000.

3rd. That this expense was gone to because it was found expedient to remove the engines from North Wagga Wagga, where—although but 2 miles from the river—it was found impossible to procure a full and proper supply of water for locomotive purposes.

4th.

- 4th. That arrangements were made at South Wagga Wagga by the erection of pumping machinery and tanks, whereby a constant supply from the Murrumbidgee River was obtained; and that the cost of the construction of such works was considerable.
- 5th. That, lately, the whole of the locomotive plant has been removed from South Wagga Wagga to Junee Junction, and, therefore, the costly buildings and plant at Bomen and South Wagga Wagga now lie empty, and by reason of disuse are falling into disrepair—buildings and plant, too, which cost the country, at the very lowest, approximately, £12,000.
- 6th. That without any warning whatever, without any reason being given, the whole staff and engines were, by one stroke of the Departmental pen, removed to Junee Junction, a place which was never intended by the engineers who constructed the line as a head locomotive station, because they were aware, and Mr. Whitton still asserts, that on account of its natural disadvantages, and by reason of there being no permanent water there, Junee Junction is unfitted for such a station, and the costly appliances erected by the Government at Bomen and South Wagga, at the expense of the Colony, rendered useless.
3. That to still further point to the necessity for an inquiry into the abuses said to have arisen from this removal of the Locomotive Staff to Junee Junction, the following facts are quoted:—
- 1st. That the most essential element for the proper working of locomotives, and therefore of the railway lines, is entirely wanting at Junee Junction. That element is water. Bore after bore has been put down by the Government, and yet no water has been reached sufficient in quantity to meet the demands of the Locomotive Department, and experts affirm that the formation of the country at and around Junee Junction precludes any probability that water will ever be obtained there by sinking.
- 2nd. That owing to this entire absence of water at Junee Junction the Colony is put to great expense, because all the water used at that place has to be drawn either from Wagga Wagga (a distance of 22 miles), Narrandera (a distance of 61 miles), or Yass (a distance of 100 miles).
- 3rd. That from the places named in section 2, over 30,000 gallons of water are drawn to Junee Junction weekly, at an approximate cost to the Colony of not less than £4,000 yearly.
- 4th. That, owing to there being no water in sufficient quantity at Junee Junction to wash out the boilers—the nearest places being Narrandera (61 miles), Wagga Wagga (22 miles), and Harden (59 miles)—the engines stationed at Junee Junction are becoming deteriorated in value; for the water which is used—being mainly drawn from Hammond's dam, purchased at great cost by the Government, a mere surface-drainage water now rapidly drying up—is necessarily very muddy; and the fact that there is insufficient water to wash out the boilers at Junee Junction, combined with the fact that it is impossible to get a supply of water nearer than the places abovenamed for washing-out purposes, leads to a condition of the boilers which means absolute deterioration, loss of power, and liability to accident.
- 5th. Owing to the want of a full supply of water, which at all times it is now impossible to obtain, engines are unable to perform their work, and as a consequence, trains run late, much to the inconvenience of travellers. This inefficiency of trainage power, too, must some day lead to a deplorable accident, the dread of which must militate against the use of the railways to the travelling public.

4. That again, to show that there is no necessity for bolstering up Junee Junction at so much loss to the Colony, it is affirmed that by making the stages shorter, that is—from Harden to Narrandera, from Narrandera to Hay, from Harden to Wagga Wagga, and from Wagga Wagga to Albury, the hauling of coals over the distance from Wagga Wagga to Albury, and from Narrandera to Hay would be unnecessary, and thereby a great saving would be made to the State; that on these short stages Lithgow coal could be used, whereas to enable the engines to travel the long stages it is necessary to have coal carried all the way from Newcastle.

5. That your Petitioners deem that they have laid sufficient facts before your Honorable House to warrant it in granting the prayer of their Petition, which is that your Honorable House will be pleased to appoint a Select Committee to inquire into the mismanagement and abuses said to exist in the working of the Southern and South-western Lines, with power to call for persons and papers, as regards those portions between Harden and Hay and Harden and Albury.

And your Petitioners, &c., &c.

“Said” to exist—this is cleverly put. There is certainly no evidence or facts in the petition to show that mismanagement or “abuses” do exist at Junee.—T.M.

Mr. Inspector Close's Report on the Petition *re* Mismanagement and Abuses “said” to exist at Junee Junction.

1. That it has day by day become more apparent that the present arrangements for the effective working of railways on the Southern and South-Western Lines are inefficient, and not conducive to the public convenience or welfare.

A GENERAL statement like the above can only be answered by a denial. I assert positively that as far as the general management for working the traffic in this district is concerned it is as efficient as any other section of our lines. If the persons who have drawn up this petition will enter into details and show

T.M.

where the public convenience has suffered by locomotive mismanagement I shall be prepared to answer each charge as made.

2. That to show that this is so, the following facts are quoted:—

1st. That when the railway was opened as far as North Wagga Wagga, only about 2 miles from the Murrumbidgee—now known as Bomen—very great expense was incurred by the Department in erecting engine-sheds, goods-sheds, turn-tables, homes for railway employees, and particularly in procuring a water supply for the use of the engines.

The above extract either betrays ignorance on the part of the persons who have drawn up the petition or else shows a deliberate intention to pervert facts to their own views. The public convenience was in no way affected by the abandonment of Bomen as a locomotive depôt; nor is the abandonment of this station any reflection upon the Loco. Department. I believe I am right in stating that the facts leading to the formation

formation and abandonment of this depôt, are as follows:—When the Southern Line was being constructed, and had reached North Wagga—now known as Bomen—it was expected that Bomen would remain a terminus for some considerable time, in fact, until the viaducts and iron bridge between Bomen and Wagga were completed. Provision (temporary) was therefore made at Bomen for the engines which

A shed to hold four engines was built, and a 40-foot turn-table put in; water was obtained by the contractors, and we took our supply from their temporary tank until we erected a tank of our own and a pump also.—T.M.

ran into that station; a small engine-shed was erected, and two or three cottages for the employees; a 40-foot turn-table was also put down. No water supply was ever provided to the engine-shed at Bomen, but a pump and tank was placed on a lagoon 1½ miles distant, to which the engines ran for water. I believe I am correct in stating that the reason why Bomen engine-shed was not provided with water, was, that it being a temporary depôt only it was not considered advisable to go to any more expense than could be avoided. On the completion of the engine-shed at Wagga Wagga, the temporary station at Bomen was abandoned. It will thus be seen that expense incurred at Bomen has no bearing whatever upon the case.

2nd. That when the extension across the Murrumbidgee River to South Wagga Wagga was opened, again very great expense was incurred in the erection of engine-sheds, goods-sheds, turn-tables, and cottages for the employees. This latter expense is estimated by people who are well able to judge, at a little over £8,000.

A shed with three roads to accommodate twelve engines was erected at Wagga Wagga, but the shed at Junee was finished before the Wagga shed.—T.M.

It is correct that an engine-shed, goods-shed, turn-table, and eight cottages for employees were erected at Wagga Wagga. I am not in a position to be able to state the cost of these, but it appears to me that the inference intended to be conveyed is, that by the withdrawal of the men and engines all this expense has been wasted, and the appliances rendered useless. Such is not the case, the engine-shed is constantly used for the housing and washing out of the engines, but not to the same extent as formerly, and no doubt a smaller engine-shed would suffice; the goods-shed is equally as much used

T.M.

and required now as formerly; turn-table also is used by one, and occasionally two engines per day; three of the loco. cottages are vacant, caused by the withdrawal of loco. staff. The loss in rental of these is trifling in comparison to the saving effected by their removal. The expense incurred in providing a water supply

Correct.—T.M.
A new water-crane has recently been put up at each end of the Wagga platform.—T.M.

for the engines was judicious, and the supply is equally as much required now as it was before the men's withdrawal; all engines running through Wagga take water there, and there are at least six engines per week washed out there.

3rd. That this expense was gone to because it was found expedient to remove the engines from North Wagga Wagga, where—although but 2 miles from the river—it was found impossible to procure a full and proper supply of water for locomotive purposes.

In my answer to clause 1 of the Petition I have fully explained how the depôt at North Wagga came to be abandoned. It was not at all impossible to procure a full and proper supply of water at Bomen, only as I have previously pointed out, this being a temporary station, it was not advisable to incur the additional expense. The engines and men were removed from Bomen to Wagga, about the month of

From the large shed erected at Junee it appears the Engineer-in-Chief thought Junee the best place. I don't think there can be much doubt about where the chief depôt should be—Junee or Wagga.—T.M.

No. 669 attached.—T.M.

March, 1882, although Mr. Park, who held the position of Inspector of the Wagga District just prior to the removal, was of the same opinion as myself, that the head locomotive depôt should be at the junction (Junee). The removal of the men and engines to Wagga took place during the first month I was in charge of this district, and I merely carried out a pre-arrangement. As bearing on Mr. Park's opinion as to where the men and engines should be stationed, please refer to his memo. No. 669, forwarded to the Loco. Overseer on 28th February, 1880. It appears from this memo, a copy of which is in this office, that as far back as February, 1880, and prior to the erection of the engine-shed at Wagga Wagga, Mr. Park formed a correct opinion as to where the men and engines should be stationed, and offered the suggestion that one engine-shed only be erected, and that at Junee. The reasons given by him are the same as eventually caused the men's removal, but of course with the increase in the traffic, the saving effected became much greater than Mr. Park could have anticipated.

This was a wise expenditure.—T.M.

4th. That arrangements were made at South Wagga Wagga, by the erection of pumping machinery and tanks, whereby a constant supply from the Murrumbidgee River was obtained, and that the cost of the construction of such works was considerable.

The above clause is answered by clause 2nd, as I have already pointed out; the pumping machinery is equally as much required now as at any time previous, consequently the above clause has no bearing on the case.

5th. That lately the whole of the locomotive plant has been removed from South Wagga Wagga to Junee Junction, and therefore the costly buildings and plant at Bomen and South Wagga Wagga now lie empty, and by reason of disuse are falling into disrepair—buildings and plant, too, which cost the country, at the very lowest, approximately £12,000.

On previous papers I have proposed that the Bomen shed be pulled down and re-erected at Junee, where it will be of great use to this Department.—T.M.

The Petitioners might add there is also a shed at Albury, Narrandera, and Hay, not fully used by any means.—T.M.

Reasons have been given to the head of the Department, and that is all that is necessary, I think.—T.M.

they were aware, and Mr. Whitton still asserts, that on account of its natural disadvantages, and by reason of there being no permanent water there, Junee Junction is unfitted for such a station—and the costly appliances erected by the Government at Bomen and South Wagga at the expense of the Colony rendered useless.

6th. That without any warning whatever, without any reason being given, the whole staff and engines were, by one stroke of the Departmental pen, removed to Junee Junction—a place which was never intended by the engineers who constructed the line as a head locomotive station, because they were aware, and Mr. Whitton still asserts, that on account of its natural disadvantages, and by reason of there being no permanent water there, Junee Junction is unfitted for such a station—and the costly appliances erected by the Government at Bomen and South Wagga at the expense of the Colony rendered useless.

For the reasons that have governed and caused the removal of the men and engines from Wagga to Junee Junction, I must refer you to my reports, in which all the removals from Wagga to Junee are fully explained. I am not aware what Mr. Whitton's opinion is, but as the large preponderance of traffic has concentrated itself at Junee, there must the engines be also. The expense would be enormous to run the engines of all trains that start from Junee for stations north and south-west into Wagga, and I need only refer you to the special train returns for the past seventeen or eighteen months to fully prove this. As a general thing, two goods trains each way per day are found to be amply sufficient for all the goods traffic between Junee and Albury; whilst on the down trip between Harden and Junee as many as thirteen engines have run, and on the "up" trip between

same.

In this respect Junee is like Picton, there is no water there either.—T.M.

same stations I have known eleven or twelve engines to leave on one day. It is quite true that there is no permanent water supply at Junee, or indeed any supply at all, and the outcry raised against the bad water at Mr. Hammond's dam at Old Junee is simply moonshine and set afloat from interested motives. The water from this dam has been used ever since the South-western line has been opened, and would still have to be used even were the engines stationed at Wagga. A chemical analysis of this water by the Government Analyst proved that this water exercised no prejudicial effect upon the boilers; indeed comparing the water from this dam with that taken at other watering stations, notably Albury, Cootamundra, Harden, and Rocky Ponds, it can be said to be good; it is not as good as river water, nor can it be expected to be so. From the position of Junee Junction it is favourably situated in one respect, viz., that a large water supply is not required; I should consider 20,000 gallons per day a very good supply, and equal to all our requirements. The watering stations on main line to the north and south of Junee are less than half a stage distant, consequently engines running into Junee have sufficient water to return to the watering station. They not only have sufficient, but a surplus, and it is from this surplus that emergencies, such as emptying a boiler or tank, are supplied; some little inconvenience has been caused at times, but nothing that can or has affected the travelling public, or caused any loss to the men, or to the Government. No doubt it is extremely desirable that a permanent water supply be procured at the Junction, as I believe persons who reside

outside the railway premises are at times put to great inconvenience from the want of water, and sooner or later this want must be supplied. The people themselves are to a great extent to blame in this matter; the natural rainfall of the district is enough to supply every one, were it properly conserved in tanks. The purpose for which the Locomotive Department requires the water is for the washing out of engine-boilers. This we cannot do at Junee; our engines are washed out at present at the different break stations in the district, viz., Wagga Wagga, Albury, Harden, Narrandera, and Hay. They are not run to any of the stations named specially for the purpose of being washed out, but work the trains there in the ordinary course of traffic, and are washed out when necessary before their return. It is again reiterated in clause 6 that the costly appliances at Bomen and Wagga are, in consequence of the removal to Junee, rendered useless. I can only reiterate in reply that the appliances at Wagga have not been rendered useless, but are extremely valuable, whilst the appliances at Bomen are rendered useless in any case.

There is very little difficulty about this.—T.M.

I don't know that water is the "most essential element." It seems to me that coal is; and perhaps in sinking for water we may come on coal, and so satisfy the Petitioners perfectly.—T.M.

3. That to still further point to the necessity for an inquiry into the abuses said to have arisen from this removal of the locomotive staff to Junee Junction, the following facts are quoted:—
1st. That the most essential element for the proper working of locomotives, and therefore of the railway lines, is entirely wanting at Junee Junction—that element is water. Bore after bore has been put down by the Government, and yet no water has been reached sufficient in quantity to meet the demands of the Locomotive Department, and experts affirm that the formation of the country at and around Junee Junction precludes any probability that water will ever be obtained there by sinking.

Water is, as I have stated in my answer to the previous clause, entirely wanting at Junee Junction.

This seems to indicate that water can be got by means of a few cast-iron segments being made.—T.M.

Bore after bore has been put down, and, from the insufficient appliances at the command of the men employed, have been in every case abandoned when water was struck. I believe I am correct in stating that in most of the bores put down water was struck at depths ranging from 100 to 120 feet. The bores were given up because with the appliances the men had (an ordinary shell auger worked by hand) they could not work deeper. A shaft was also sunk about 4 miles from the Junction, in which water was struck. This shaft appears to have been also given up, although a considerable amount of water was coming in at the time; "about 400 gallons an hour, I believe," and no attempt has since been made to test the supply by means of pumping. There is at present 35 or 40 feet of water in this shaft, and, as far as I am able to judge, of good quality.

The most essential element, "coal," is evidently wanted here.—T.M.

The Petitioners can only mean the water taken in the tenders to Junee. It is absurd to say that water is drawn from Yass to Junee except as I indicate.—T.M.

2nd. That owing to this entire absence of water at Junee Junction, the Colony is put to great expense, because all the water used at that place has to be drawn either from Wagga Wagga (a distance of 22 miles), Narrandera (a distance of 61 miles), or Yass (a distance of 100 miles).

3rd. That from the places named in section 2, over 30,000 gallons of water are drawn to Junee Junction weekly, at an approximate cost to the Colony of not less than £4,000 yearly.

To the statements contained in the above clause I give a most unqualified denial. During the time I have been in charge of this district (*i.e.*, for the past two years), not one drop of water has ever been hauled to Junee for the use of locomotives. The statement I have made can easily be proved by an inspection of the books of Traffic Department; nor is it necessary to haul water, and my answer to clause 6

On previous papers I have expressed the opinion that hauling water in tanks from Wagga is, perhaps, the cheapest way of getting water there.—T.M.

fully explains this. But I maintain that even supposing water was hauled to Junee for general purposes, such as washing out, &c., it would be cheaper to do so than to run all the engines from Junee to Wagga and back, a distance of 44 miles, for the water each engine might require. The case stated simply appears to me to amount to this, whether it is cheaper to run each engine to Wagga for its water, or to run one engine from Wagga to Junee hauling sufficient water to serve the whole—for washing out engines and for emergencies; not for ordinary running purposes. I say it is most decidedly cheaper to run the water to the engines, instead of running the engines to the water. It is asserted that 30,000 gallons of water per week is drawn to Junee Junction. A certain quantity of water, I am unable to say how much, is brought by the water train to Junee for the use of persons unconnected with the Loco. Department, namely, fettlers. These men are, and always have been, supplied with water by the water train, because, living in bark houses, they have no means of conserving a supply for themselves. There are also a few other employees, both traffic and loco., who are just at present receiving their supply for domestic purposes from the water train. The supply to the few loco. employees is comparatively insignificant, and does not exceed 2,000 gallons a week; it will be a liberal estimate to estimate that this costs 24s. a week, and this is not for the whole year, but only for the two or three dry summer months. The water train I have referred to supplies water to all fettlers from Albury to Goulburn, and from Junee to Hay; it ran

before

before the engines were removed to Junee, and would continue to run if they were taken away from there, so that it will be seen that the statement made that it costs £4,000 per year to haul water to Junee either is made in ignorance of the facts or is a wilful misstatement.

4th. That, owing to there being no water in sufficient quantity at Junee Junction to wash out the boilers—the nearest places being Narrandera 61 miles, Wagga Wagga 22 miles, and Harden 59 miles—the engines stationed at Junee Junction are becoming deteriorated in value, for the water which is used, being mainly drawn from Hammond's dam, purchased at great cost by the Government—a mere surface drainage water now rapidly drying up—is necessarily very muddy; and the fact that there is insufficient water to wash out the boilers at Junee Junction, combined with the fact that it is impossible to get a supply of water nearer than the places abovenamed for washing-out purposes, leads to a condition of the boilers which means absolute deterioration, loss of power, and liability to accident.

The statement made in the above clause, that from the absence of water at Junee the boilers are becoming deteriorated in value, is not true, and can easily be ascertained on inspection. The water used in this district, two stations excepted (Cootamundra and Albury), is remarkably free from corrosive properties, and we do not use a large quantity of water from Hammond's dam. At present we are not using more than 3,000 gallons per day from the dam, and as I have before explained, the water at this dam has no prejudicial effect on the boilers. I believe I am correct when I state that Hammond's dam has not been purchased by the Government. A charge is made (of £78 per year) for the water taken.

5th. Owing to the want of a full supply of water, which at all times it is now impossible to obtain, engines are unable to perform their work, and as a consequence trains run late, much to the inconvenience of travellers. This inefficiency of trackage power, too, must some day lead to a deplorable accident, the dread of which must militate against the use of the railways to the travelling public.

It is not true that engines have at any time been unable to perform their work in consequence of an insufficient supply of water, nor have any trains run late in consequence; and it would be extremely desirable if the persons who have drawn up the petition would state specially the particular instances when trains have run late through an insufficiency of water. As it is, the charge is a general one, and it is impossible to do more than give it a general denial.

6th. That again to show that there is no necessity for bolstering up Junee Junction at so much loss to the Colony, it is affirmed that by making the stages shorter—that is, from Harden to Narrandera, from Narrandera to Hay, from Harden to Wagga Wagga, and from Wagga Wagga to Albury, the hauling of coals over the distance from Wagga Wagga to Albury, and from Narrandera to Hay would be unnecessary, and thereby a great saving would be made to the State. That on these short stages Lithgow coal could be used, whereas to enable the engines to travel the long stages it is necessary to have coal carried all the way from Newcastle.

I have in my previous answers shown that there is no bolstering up of Junee at the expense of the Colony, as will be amply verified on inquiry, and the suggestion made that the stages be altered and made from Harden to Narrandera, Narrandera to Hay, Harden to Wagga, and Wagga to Albury, would, if carried into effect, be an enormous additional expense. It would mean in the first instance forming two additional locomotive depôts (Narrandera and Wagga). I need not point out the expense involved in this, as no doubt you are fully aware of it. One large depôt can always be managed much more economically than if the engines and men were divided and split up into three small depôts. The assumption that sufficient coal could be carried on the tenders to run from Harden to Narrandera and return is a false one. The double distance is 240 miles. We have no engine that will carry coal sufficient to run that distance. It appears also to be assumed that an engine could run from Narrandera to Hay and return taking sufficient coal on the tender at Narrandera to run the double trip, the distance (double) is 212 miles. Our engines will not carry coal to run that distance. I do not myself see how it is possible to run the engines from Harden to Narrandera profitably, and the south-western regular trains do not run in conjunction with the main line goods trains, so that a break of several hours would take place at Junee. Again, the engines used on the two sections (main line and south-west) are of a different type; on the south-western, Bogie passenger engines being used for goods trains, and on the main line 6-wheel coupled goods engines; the reasons for this are, that the grades on south-western being lighter than the grades on main line, a 4-wheel coupled Bogie passenger engine can haul as heavy a load on south-western as a 6-wheel coupled goods engine on main line, and what is still more important can run its load at a much higher rate of speed; this, on a line where the only regular trains are mixed goods and passenger, is an important consideration, and means a saving of several hours effected in the arrival of passengers and goods at Hay. In the case of live stock trains too, I think it is infinitely more preferable to use Bogie passenger engines for hauling them on south-western than goods engines. In conveying live stock from stations south-western to Homebush, time is a most important consideration, and time is saved by the use of Bogie passenger engines for live-stock trains on south-western line. It would not be economical to use the class of engine last mentioned for live stock trains on main line, I mean between Junee and Harden, for the following reasons:—A Bogie passenger engine can haul from Narrandera to Junee fourteen trucks of sheep or cattle; but from Junee to Harden the same class of engine can haul eleven trucks only of sheep or cattle, consequently three trucks of its load would have to be left behind at Junee or an additional engine attached; the same applies in the reverse direction, namely, from Harden to Narrandera. It is for this reason that when a live stock train arrives at Junee from south-western that a goods engine is attached; by its greater power it compensates for the heavier grades, it can take the same load from Junee to Harden that the passenger engine has hauled from Narrandera to Junee.

The second part of clause 4 states, that on main line between Harden and Albury the stages should be from Harden to Wagga and Wagga to Albury, this would be the reverse of economical, it would mean the maintenance of Wagga as a depôt with all its concomitants of shed inspectors, day and night, with firemen as their assistants; this expense is at present absolutely saved. The engines, also, in the intervals between trains, would lie where they could not be utilized, as the traffic between Junee and Albury is a regular traffic and it is a rare occurrence for a goods special to run, as the break stations are at present, viz., Harden to Junee and Junee to Albury; the engines in the interval between trains are lying where they can be most profitably utilized, that is they are available to be run in three directions, either up or down the main line and down the south-west; this matter is fully explained in my former memo. of 28/8/83. I am satisfied that by concentrating the

the engines and men in the depôt from which they can be most profitably used, has effected a very large saving to the Government, and I am quite content to await the result of any inquiry the Department may initiate.

The more the matter is inquired into the more economical will be the results, and the clearer it will be shown that what has been done is right.—T.M.

I find I am omitting to notice the statement made that Newcastle coal is used on the long stages. This is not true. There is no Newcastle coal used between Junee and Albury and between Junee and Hay, Bowenfels coal alone is used for these stages. A little Newcastle coal is used for the engines working the express and mail trains between Junee and Goulburn, and you will find on reference to the requisitions sent to you for Newcastle coal that we are not now using one fourth of the quantity that we formerly used when the engines were stationed at Wagga; this fact speaks for itself.

Running engines from Wagga to Narrandera and back. I find, on re-perusal, I have not touched upon this point. This could only be done by putting on additional trains, as the south-west trains do not run into Wagga but stop short at Junee, consequently additional trains would be required between Wagga and Junee.

J. CLOSE, 28/2/84.

Memo. by Mr. T. Midelton.

Report, in reply to written Petition, and also to the printed document herewith.—T.M., 2/3/84.

Re Commissioner's Minute Paper 84/5,762 herewith.

I NEED not point out how easy it is to "suggest" that thousands of pounds now charged to the Locomotive Department could be avoided—where engine-men and firemen could be at home nearly every night—where "engine-men could have their own engine, &c., &c." But the engine-drivers and firemen of Junee Junction will have some difficulty in showing how to carry into practical effect what they "state" or "suggest," especially under existing circumstances. I am not to be understood to mean that what they "suggest" is impossible to accomplish, but I do mean that it is impracticable, unnecessary, wrong, and inconsistent with good management.

- 1st. Whenever the traffic arrangements will admit of it, drivers are always allowed to keep to one engine and one run—that is, the engine-man always has the same engine; but if this rule were observed with each driver we should (as an inspection of the time-table will readily show) want about double the number of engines we have at present. It is manifestly absurd to expect to work a locomotive engine 8 hours per day, and then put her into the shed because the men cease work after 8 or 9 hours' duty.
- 2nd. It is stated that "the engine-cleaners have a different engine every day, &c., &c." I see no hardship in this, and a sensible cleaner, who wished to make himself efficient, would rather like this change, as it means greater experience for him. Again, if the engines are not half cleaned as stated it is because they cannot be allowed to stand idle long enough. I think firemen would show a disposition to help if they occasionally wiped their engines over when standing at a station, waiting, perhaps three-quarters of an hour or so, for a train to pass; this is what I should call "respecting an engine the same as if it were a human being."
- 3rd. *Re* shed days at Junee.—These are, as Mr. Close points out, made at other stations, or rather the washing out of boilers is done at other places, and if it occasionally happens that a boiler is washed out at Junee, it could be done with the hot water in the said boiler; there is no great difficulty about this, and I intend (as soon as I can possibly find time) to wash boilers out in this way and use the steam from them for heating the fresh water which will take the place of the dirty, and so keep the boiler hot instead of cooling it as is now (erroneously) done. Drivers have fixed notions now about washing out boilers, and I think it time it was moved. I am not aware of any train in the Junee district being caused to run late through the boilers not being washed out.
- 4th. "If the engine-men were stationed at Wagga, Narrandera, and Harden," it would entail a large extra expense, and I fail to see how the haulage of coal could be lessened one third.
- 5th. It is said that mail engines should take coals at Goulburn, and run to Harden and back, but it is not stated how the mail engine which runs from Harden to Wagga and back is to be provided with coal at Harden. It is presumed I suppose, that coal is to be got at Harden without hauling it there. Besides the mail leaves Goulburn (now, 2/3/84) at 2:55 night, gets to Harden at 7:2 a.m., "up" mail leaves Harden at 9:5 a.m., reaches Goulburn at 12:55 noon; I wonder if either of the Junee drivers would like to work this train down and back to this time, five days a week, and have a shed day? To do the down journey one day, and the up journey the next would not pay, it would mean but 94 miles per day, or 4½ hours work per man per engine.

I will not go further into the "suggestions," neither will I ask the "suggesters" to make out a table of their proposed running in accordance with the traffic time table, as I feel certain they will not come out economically for the Department, but highly so for themselves perhaps; I fancy they would have to ask the Traffic Manager to alter the time table to suit their running, instead of as now, our having to suit our running to the time table.

We do not, as you well understand, take any more coal to Hay and Albury than is absolutely necessary for emergencies. It seems to me the petitioners would be quite satisfied if they could either get away from Junee, or get water there; the tall talk about the engines, the running, &c., is not by any means well thought out by them, it is merely suggestions, so far.

It is evident, too, that there is nothing in the statement that "every locomotive workman at Junee Junction would sacrifice everything they have at Junee to be removed from there." This is entirely in their own hands of course; but I do not remember having received any resignations.

When the down mail train is very heavy, it is sometimes necessary (or expedient rather) to help her over the Junee bank—this is done by an engine pushing the train, on the straight, about 2 miles,—she then returns, so saving a run of 20 miles to Wagga and 20 miles back unnecessarily.

I trust you will consider the petitioners' letter over and inquire into the working of Junee Junction ; but not for the engine-men alone, that would be manifestly unfair. The more severe the inquiry the better it will be for the officers of the Department, as I feel sure they are in the right.
The Locomotive Engineer. THOS. MIDELTON, 2/3/84.

Petition of residents of Wagga Wagga, *re* removal of engines, &c., to Junee.

Memo. by The Chief Clerk.

The enclosed Petition is submitted for Commissioner's information and directions.—D.C.M'L., 12/3/84.

[Enclosure.]

SOUTHERN AND SOUTH-WESTERN RAILWAYS.

(PETITION AGAINST INEFFICIENT WORKING OF—RESIDENTS OF WAGGA WAGGA.)

Received by the Legislative Assembly, 20 February, 1884.

To the Honorable the Speaker and Members of the Legislative Assembly of New South Wales, in Parliament assembled.
The humble Petition of the undersigned residents and inhabitants of the District of Wagga Wagga,—

HUMBLY SHOWETH :—

1. That it has day by day become more apparent that the present arrangements for the effective working of railways on the Southern and South-western lines are inefficient, and not conducive to the public convenience or welfare.

2. That to show that this is so the following facts are quoted :—

- A 1st. That when the railway was opened as far as North Wagga Wagga—only about 2 miles from the Murrumbidgee—now known as Bomen, very great expense was incurred by the Department in erecting engine-sheds, goods-sheds, turn-tables, homes for railway employees, and particularly in procuring a water supply for the use of the engines.
- B 2nd. That when the extension across the Murrumbidgee River to South Wagga Wagga was opened, again very great expense was incurred in the erection of engine-sheds, goods-sheds, turn-tables, and cottages for employees. This latter expense is estimated, by people who are well able to judge, at a little over eight thousand pounds (£8,000).
- C 3rd. That this expense was gone to because it was found expedient to remove the engines from North Wagga Wagga, where—although but 2 miles from the river—it was found impossible to procure a full and proper supply of water for locomotive purposes.
- D 4th. That arrangements were made at South Wagga Wagga by the erection of pumping machinery and tanks, whereby a constant supply from the Murrumbidgee River was obtained, and that the cost of construction of such works was considerable.
- E 5th. That lately the whole of the locomotive plant has been removed from South Wagga Wagga to Junee Junction, and, therefore, the costly buildings and plant at Bomen and South Wagga Wagga now lie empty, and, by reason of disuse, are falling into disrepair, buildings and plant, too, which cost the country, at the very lowest, approximately, twelve thousand pounds (£12,000).
- F 6th. That without any warning whatever, without any reason being given, the whole of the staff and engines were, by one stroke of the Departmental pen, removed to Junee Junction, a place which was never intended by the engineers who constructed the line as a head locomotive station, because they were aware, and Mr. Whitton still asserts, that on account of its natural disadvantages, and by reason of there being no permanent water there, Junee Junction is unfitted for such a station, and the costly appliances erected by the Government at Bomen and South Wagga, at the expense of the Colony, rendered useless.
- G 3. That to still further point to the necessity for an inquiry into the abuses said to have arisen from this removal of the locomotive staff to Junee Junction, the following facts are quoted :—
- H 1st. That the most essential element for the proper working of locomotives, and therefore of the railway lines, is entirely wanting at Junee Junction—that element is water. Bore after bore has been put down by the Government, and yet no water has been reached sufficient in quantity to meet the demands of the Locomotive Department; and experts affirm that the formation of the country at and around Junee Junction precludes any probability that water will ever be obtained there by sinking.
- I 2nd. That owing to this entire absence of water at Junee Junction, the Colony is put to great expense, because all the water used at that place has to be drawn either from Wagga Wagga (a distance of 22 miles), Narrandera (a distance of 61 miles), or Yass (a distance of 100 miles).
- J 3rd. That from the places named in section 2, over thirty thousand gallons (30,000) of water are drawn to Junee Junction weekly, at an approximate cost to the Colony of not less than four thousand pounds (£4,000) yearly.
- K 4th. That owing to there being no water in sufficient quantity at Junee Junction to wash out the boilers, the nearest places being Narrandera (61 miles), Wagga Wagga (22 miles), and Harden (59 miles), the engines stationed at Junee Junction are becoming deteriorated in value, for the water which is used being mainly drawn from Hammond's dam, purchased at great cost by the Government, a mere surface drainage water, now rapidly drying up, is necessarily very muddy; and the fact that there is insufficient water to wash out the boilers at Junee Junction, combined with the fact that it is impossible to get a supply of water nearer than the places abovenamed for washing-out purposes, leads to a condition of the boilers which means absolute deterioration, loss of power, and liability to accident.
- L 5th. Owing to the want of a full supply of water, which at all times it is now impossible to obtain, engines are unable to perform their work, and, as a consequence, trains run late, much to the inconvenience of travellers. This inefficiency of trainage power, too, must some day lead to a deplorable accident, the dread of which must militate against the use of the railways to the travelling public.
- M 4. That, again, to show that there is no necessity for bolstering up Junee Junction at so much loss to the Colony, it is affirmed that by making the stages shorter, that is, from Harden to Narrandera, from Narrandera to Hay, from Harden to Wagga Wagga, and from Wagga Wagga to Albury, the haulage of coals over the distance from Wagga Wagga to Albury, and from Narrandera to Hay, would be unnecessary, and thereby a great saving would be made to the State. That on these short stages Lithgow coal could be used, whereas to enable the engines to travel the long stages it is necessary to have coal carried all the way from Newcastle.
- N 5. That your Petitioners deem that they have laid sufficient facts before your Honorable House to warrant it in granting the prayer of their petition.
- Your Petitioners therefore humbly pray that your Honorable House may be pleased to appoint a Select Committee to inquire into the beforementioned matters, with power to call for persons and papers.
- And your Petitioners, as in duty bound, will ever pray.

[Here follow 489 Signatures.]

I wish a report upon this representation—paragraph by paragraph.—CH. A. G., 18/3/84. Locomotive Engineer. Further report herewith; I fancy the Commissioner has not seen Mr. Close's report of 28/2/84, and mine of 2/3/84.—T. M., 20/3/84. Locomotive Engineer.

Minute

Minute of The Locomotive Foreman.

Re Petition from Residents Wagga Wagga.

In reply to clause 1, &c., I trust the following will suffice:—

Considering the petitioners cannot possibly have sufficient or correct data concerning the management &c., of the Locomotive and Traffic Departments in the Wagga district, I do not see how they can arrive at any other conclusion but the erroneous one they have recorded in their petition; I have often read similar sentiments (at home) in the daily papers about the best managed lines in the United Kingdom.

Clause 2. (No comment required.)

Clause A 1. This is magnified; an engine-shed, a turn-table, a goods-shed, and a few houses (built of wood) were erected and duly utilized, and now they are intended to be used elsewhere as soon as possible. There was no great difficulty or expense incurred in getting water as it was close to long viaduct, which is but a few hundred yards from the Bomen station.

Clause B 2.—This is also magnified in engine-sheds, goods-sheds, turn-tables, and cottages; but the management is not responsible for the appliances put down at either place, viz., Bomen or Wagga Wagga.

Clause C 3.—This is the first time I ever heard that it was impossible to get a full supply of water at Bomen, and I think the clause must be the result of pure imagination.

Clause D 4.—This is rather a proof of good management, I think, than the reverse, seeing that we can now take water at the Wagga station either on the up or down journey.

Clause E 5.—It is proposed to move the (costly) Bomen shed to Junee. The Wagga shed is still used when required, and so is the turn-table daily. The petitioners seem to think that if Wagga shed had been used instead of Junee that there would have been no building and costly plant lying empty and idle. It is clear if the one is used the other must necessarily be somewhat idle, whether we use Junee or Wagga shed.

Clause F 6.—This is very extravagant, warning was given, reasons were found, but not to the petitioners, it is true. Seeing that the engineers who constructed the lines made Junee, Bomen, and Wagga Wagga, locomotive depôts, it is difficult to tell which place really was intended for the chief depôt, and as necessity has indicated Junee, I consider the management good in remaining there.

Clause G 3.—Requires no comment.

Clause H 1.—This seems satisfactory in a measure seeing that a dam has been made at Junee, but up to now it has held no water; it is satisfactory to know that exertions have been made to obtain it by boring.

Clause I 2.—I am not aware of a drop of water being drawn to Junee from Wagga, Narrandera, or Yass in the sense the petitioners regard it. We fill up all tenders at these stations, and so take as much to Junee as possible, but as this is done at all stations (Picton especially) the argument used is fallacious.

Clause J 3.—Suppose this were true the question arises—would it not cost more to haul coal for Junee to Wagga for locomotive purposes than it does to haul water from Wagga to Junee?

Clause K 4.—The engines at Junee are becoming deteriorated the same as at all other stations, but not any more than if they had been stabled at Wagga or Bomen. I look upon the remaining portion of this clause and the whole of clause L 5 as rather sensational.

Clause M 4.—Is ill considered and wholly wrong, that is to say, if good and economical management is to be practised.

Clause N 5.—It seems to me questionable whether the petitioners would be fully satisfied if their prayer were answered as requested; I think they would only be wholly satisfied by a sudden removal from Junee to Wagga Wagga.

T.M., 20/3/84.

Minute by The Commissioner for Railways.

Commissioner's Minute Paper, 86/8,544.

THE scheme to bring water from Wagga to Junee is to cost £25,000, not £60,000, as stated (*vide Telegraph*, May 25th, 1886); the estimate, however, is being revised. I will treat this paper as a revival of the proposal to make Wagga the running shed station.

When the question was last discussed, it was shown that while there were only 2 engines employed on goods trains between Harden and Albury, there were 20 to 23 engines running between Harden and Junee, and Junee and South-western line.

To make Wagga the running shed station, it would involve the running of 22 engines to and from Wagga daily, which would leave and pick up again their trains at Junee.

Estimating the cost of running each engine at 1s. 6d. per mile, the cost would amount to, in round figures, £75 a day, or allowing for 20 engines only, £66 a day, equal to £20,000 a year; but then there is a proposal to make Narrandera a running shed station.

I wish the matter carefully gone into in the light of existing train running, and a statement prepared showing the effect, as regards cost of running, if Harden, Wagga, and Narrandera, were made locomotive depôts.

Mr. Laughry, Mr. Derbyshire, and Mr. Close, might form Board of Inquiry. CH.A.G., 29/5/86. Mr. Scott.

Commissioner's 86/8,544. Loco. 86/2,782.—Please arrange to fully inquire into this matter as directed by the Commissioner, and report as early as possible.—W. SCOTT. Mr. Laughry. Joint report attached.—E. A. LAUGHRY, 8/6/86. Loco. Engineer. The Commissioner.—W. SCOTT, 8/6/86.

Report of Board of Inquiry.

REPORT of Board of Inquiry in *re* making changing stations for Junee District at Harden, Wagga, and Narrandera.

Memorandum to Loco. Engineer.

Government Railways, Locomotive Engineer's Branch,

Junee Junction Station, 8 June, 1886.

WE have to report that in accordance with your instructions conveyed to us on your 86/2,782, Commissioner's 86/8,544, we proceeded from Sydney to Junee on 5th instant, for the purpose of holding an inquiry on the subject mentioned above.

We

We have carefully studied the matter in all its different phases, and find that to carry out the proposed arrangement would entail a very large additional expenditure on the Department, the details of which are as follows:—In consequence of ruling grades on south-west and on main line south of Junee being lighter than on main line north of Junee, engines of different types have to be used for each section; under the proposed change engines of the same class would be used over the two sections; this, we need scarcely point out, would not be economical working, more especially on the run from Narrandera to Harden. Engines leaving Narrandera with a full load of live stock to Junee would require to be assisted from there to Harden; it would follow that a light engine would have to be sent from Wagga for this purpose; the engine would of course have to return from Harden to Wagga light—thus making 103 miles of empty running and 59 miles with about one-quarter of its load. We estimate this to cost £16 11s. per train; this at two trains per day, £33 2s.:—

Equal to	£	s.	d.	
...	10,360	6	0	per annum.

Engines running in the contrary direction, viz., from Harden to Narrandera, would on arrival at Junee, owing to the change of grade, have only 60 per cent. of a load from Narrandera, 60 miles distant; but making a liberal allowance for traffic that may be picked up at Junee from stations south would probably increase its load to 75 per cent., leaving engines still deficient by 25 per cent. of a full load; we estimate this would be a loss to the Department of £3 per train; this at two trains per day = £6, or	1,878	0	0	„
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Engines running between Wagga and Harden.

Owing to the change of grade as previously mentioned, engines for each round trip would have to run 44 miles of the distance with 25 per cent. short of a full load; this would entail a loss of £4 8s. per train; this, at two trains per day = £8 16s., or	2,754	8	0	„
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The engines that run south-west, mixed trains between Junee and Hay, would require to leave Wagga and return from Junee empty; this 44 miles per day at 1s. 6d. = £3 6s., or	1,204	10	0	„
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The assistant main line mail engine, which is not required south of Junee, would also have to go on to Wagga empty. This engine runs on an average once a week—equal to	171	12	0	„
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Under the proposed arrangement an additional Locomotive Depôt would be formed, with all its concomitants of Sub-Inspectors, Shed Inspectors, their firemen, clerk, and storeman. Cost of this would be—

One Sub-Inspector at	275	0	0	„
Two Shed Inspectors at £245 each	490	0	0	„
Two firemen at £170 each	340	0	0	„
One storeman at £100	100	0	0	„
One clerk at £105	105	0	0	„
Office expenses	25	0	0	„

The present consumption of coal at Junee is about 30 tons per day; under proposed arrangement half this would go to Wagga and half to Narrandera, 22 miles and 60 miles respectively. Haulage of coal 15 tons per day to Wagga (from Junee) at 1½d. per ton per mile = £2 1s. 3d., or	645	11	3	„
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Haulage from Junee to Narrandera, 15 tons per day at 1½d. per mile = for 60 miles to £5 12s. 6d. per day, or	1,760	12	6	„
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To the above items should be added a further cost, which we can only estimate approximately, viz., that caused by working the comparatively short sections from Wagga to Albury and Narrandera to Hay. The men working on these sections could not be fully employed, but would have to be paid full time. The single run in each case would be under, and the double run over a day's work, we estimate extra cost at £600 per annum	600	0	0	„
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Gross total	£20,709	19	9	„
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From the above amount has to be deducted the saving that would be effected in the carriage of water to Junee. It appears to be assumed that were the proposed change carried into effect, the necessity for bringing water to Junee would cease. This is not the case. The necessity for bringing water to Junee arises through the temporary failures of Hammond's Dam, the 32-mile Tank, S.-west, and the permanent failure of water supply at Bethungra. So that even were Junee abolished as a depôt, it would still be necessary to bring water there for the use of engines running through; there would, however, be a reduction, which we estimate would be ¼rd of the quantity at present carried. Reckoning that the total cost of present water service is £3,900 per annum, this would leave £1,300 to be deducted from the £20,709 19s. 9d., leaving nett cost of proposed change at £19,409 19s. 9d. per annum.

Before concluding our report, we feel it our duty to point out other anomalies that would be created were proposed change carried into effect, which cannot well be estimated in cost. The figures we have given are based on the existing traffic, which is lower now than at any time during three or four years past. We need only refer you to special train returns for 1882, 1883, and 1884, to prove this fact. Two of these returns are with attached papers, which please see. Were the traffic to assume the proportions that it has done in former busy seasons, the preponderance of it would be between Junee and stations North and S.-west; this could only be met by running light engines from Wagga to Junee. This would not only result in a large increase on the figures we have given, but would result, as in former years, in delays and confusion to traffic.

There

There is another item which has an important bearing on the case, and was indeed one of the first causes which led to the formation of a locomotive depôt at Junee, viz., the long runs of Goulburn to Wagga mail-men. The distance ran was 175 miles, which was excessive. In addition to this the interval between down and up trains did not admit of sufficient rest before commencing the return journey. When the locomotive depôt was at Wagga the Locomotive Inspector found it necessary to spend the whole of his time at Junee, in order to be able to successfully manipulate the constantly fluctuating traffic from that point. He has also found from the experience of the past three years, during which time the locomotive power has been stationed at Junee Junction, that he has been able to successfully cope with the traffic at a saving of time and minimum of cost as regards motive power.

JOHN CLOSE.
E. A. LAUGHRY.
G. DERBYSHIRE.

Memo. by The Chief Clerk.

CHANGING Stations—Junee, Wagga, Harden, and Narrandera,—proposal to dispense with Junee and substitute the other places.

*In connection with the above please state, for the Commissioner's information, the probable cost of removing the locomotive sheds, at Junee, to Wagga, and what provision would be required at Narrandera and Wagga in addition to what there is already at those places.

*The Commissioner further wishes to know whether any additional building in connection with running shed is being erected at Junee, and directs that if there be work should be stopped.

Also, when the joint report of the Locomotive Engineer and the Engineer for Existing Lines, relative to the cost of pumping water from Wagga to Junee, or some other scheme for getting water at Junee, will be ready. The Commissioner is assured that a dam at Old Junee, with a pipe service to Junee, would meet the case.

Please report fully with the least possible delay.
Engineer for Existing Lines.

D.C.M'L., B.C., 15/6/86.

Mr. Stephens, for report on paragraphs marked *.—G.C., 18/6/86. This is being prepared.
I expect to have it completed by to-morrow evening.—R.D.S., July 12/86. Mr. Cowdery. Herewith attached.

Memo. by Mr. R. D. Stephens.

Office of District Engineer, Goulburn, 15 July, 1886.

Re changing Stations—Junee, Wagga, Harden, and Narrandera. Proposal to dispense with Junee.—
Your M.P., 86/3,750.

THE instructions are—to give "the probable cost of removing the loco. sheds at Junee to Wagga."

In the estimates to follow, I have acted on these instructions, though I hardly think that that can have been the original intention, for Wagga already has a large running-shed, and it would not be desirable to leave Junee without a shed of some kind. I am inclined to believe that the intention was to remove the workshops to Wagga, but to leave the Junee running-shed standing. I have, however, as stated above, carried out the orders as given.

Wagga.

Removing and re-erecting Junee running-shed and workshops:—		£	s.	d.
Foundations to running-shed	... ..	240	0	0
Three long inside engine-pits	... ..	770	0	0
Three 43-feet outside engine-pits	... ..	290	0	0
Foundations to workshops	... ..	280	0	0
Two 100-feet pits inside workshops	... ..	450	0	0
Carpenters' work (this includes the lining of corrugated iron roof)	... ..	2,350	0	0
		<u>£4,380</u>	<u>0</u>	<u>0</u>

New Work.

		£	s.	d.
New sand furnace...	... ..	150	0	0
Loco. Inspector's office	... ..	250	0	0
Loco. Inspector's residence	... ..	550	0	0
New workshop for waggon repairs	... ..	450	0	0
Laying on gas	... ..	220	0	0
Putting in new roads and alterations to those now existing	... ..	1,800	0	0
		<u>3,420</u>	<u>0</u>	<u>0</u>
Removing and re-erecting coal stage	... ..	200	0	0
		<u>£8,000</u>	<u>0</u>	<u>0</u>

To this has to be added cost of taking down, loading, unloading, and re-erecting the extensive machinery now in use in the Junee locomotive workshops. This is usually done by the Locomotive Department, and I consider ought to be estimated for by them. It, however, consists of—

- One overhead 20-ton crab-winch for lifting engines.
- One 4-feet wheel-lathe with overhead 3-ton crane.
- One 12-inch screw and surfacing gap-lathe.
- One 8½-inch " " "
- One 6-inch " " "
- One large radial drilling-machine.
- One 1¼-inch screwing-machine.
- One 14-inch stroke shaping-machine.

One

One steam-power grindstone.
 One 5-forged fan.
 Two blacksmith's forges, with fittings.
 100 feet of $\frac{3}{4}$ " shafting, with pulleys and belts for do.
 One 10-horse vertical engine and boiler.

I do not like to venture myself on an estimate for the removal and re-erection of these, but, with the above information, this can readily be done in Sydney.

Narrandera.

The existing shed would suffice, but provision would have to be made for Locomotive Inspector and engine drivers and firemen:—

Locomotive Inspector's office	£250	0	0
" " " residence	550	0	0
12 drivers' and firemen's cottages... ..	4,800	0	0
Drivers' barracks	300	0	0
	<hr/>		
	£5,900	0	0

Should this proposed change be actually carried out, it will materially affect the Traffic's present arrangements. It might, therefore, be advisable to consult them as to their requirements—but possibly this has already been done.

R. D. STEPHENS.

P.S.—There are no additional buildings in connection with the Junee running-shed being built at the present time.
 George Cowdery, Esq.

Memo. by Mr. D. C. M'Lachlan.

Re Changing Stations for Junee District at Harden and Narrandera.

WITH reference to the joint report on the above matter made by Messrs. Close, Laughry, and Derbyshire, and dated 8th inst., the Commissioner wishes to know where the runs for the engine drivers are at present (Goulburn to Junee, Junee to Albury, Junee to Hay?), and also how the runs would be regulated if Wagga and Narrandera were substituted for Junee.

The Commissioner further desires to be informed when the joint report of the Locomotive Engineer and the Engineer for Existing Lines as to the estimated cost of pumping water from Wagga to Junee, or some other scheme for getting water at Junee, will be ready. The Commissioner is assured that a dam at Old Junee would meet the case, with a pipe line to Junee.

Certain items of cost of superintendence and management are put down in report as being incurable if Wagga be made depôt, but what about saving at Junee? Is it proposed to remove that establishment to Narrandera?

Is any additional building in connection with running shed being erected at Junee? if so, Commissioner says work should be stopped.

Please reply to each of the inquiries with as little delay as possible.
 Locomotive Engineer.

D. C. M'L., 15/6/86.

Mr. Laughry will please furnish the inquiries—drivers' runs, &c., as early as practicable.—
 R.J.S., 17/6/86. Urgent. Joint report attached.—E. A. LAUGHRY, 22/6/86. Locomotive Engineer.
 The Commissioner.—W.S., per R.J.S., 23/6/86.

Memo. to Locomotive Engineer.

Locomotive Engineer's Branch, Junee Station, 22/6/86.

In reply to Commissioner's 86-9,884, your 86-3,104, we have to state the runs at present are as follows:—

Mail trains ... Goulburn and Junee	153 miles...	8 hours on duty.
" " " Junee and Albury	99 " ...	5½ " "
Express trains... Goulburn and Junee	153 " ...	7 " "
" " " Albury to Junee and back... ..	198 " ...	8¼ " "
Goods trains ... Junee and Harden and back	118 " ... *12	" "
" " " Junee and Albury	99 " ...	7½ and 8½ hours.
" " " Junee and Hay	167 " ...	†10¼ hours.
" " " Junee and Narrandera and back	120 " ... †10¼	" "

Under proposed arrangement "runs" would be:—

Mail trains ... Goulburn and Wagga	175 miles...	9¼ hours on duty.
" " " Wagga and Albury	77 " ...	4 " "
Express trains... Goulburn and Wagga	175 " ...	8 " "
" " " Albury and Wagga and back	154 " ...	||8¼ " "
Goods trains ... Wagga and Harden	80½ " ...	8¼ and 9 hours on duty.
" " " Wagga and Albury	77 " ...	§5½ hours on duty.
" " " Wagga and Narrandera	82 " ...	6¼ " "
" " " Narrandera and Hay	107 " ...	§7 " "
" " " Harden and Narrandera	119 " ...	9¼ " "

In reply to last query on Commissioner's memo. *re* items of expense for management, &c., shown on our previous report, we beg to explain—we assume that under proposed arrangement the existing staff and appliances at Junee would be removed from there to Wagga, and the additional staffs mentioned in our report would be required at Narrandera where an additional loco. depôt would be formed.

E. A. LAUGHRY.
 G. DERBYSHIRE.
 J. CLOSE.

¶ Men's runs are from four to five trips a week and a shed day. † Five days per week and shed day. ‡ Not continuously employed on this run, but get short days on mail trains between Junee and Albury. § The time shown in this needs explaining, it is the same as is occupied in running at present from Albury to Junee and return; it is accounted for by the fact that the men running the train would be on duty until their return to Albury which would be the same as at present. § These "runs" as mentioned in our previous report would be considerably affected; as in these cases the men and engines could not be fully employed.

Railway Employees' Statement.

To the Commissioner for Railways, Sydney,—

Sir,

Junee Junction, 16 July, 1886.

We, the undersigned railway employees of Junee Junction, humbly beg to submit for your consideration the subjoined statement.

From expressions of public opinion we are led to believe that it is the intention of the Government to remove the engine-sheds and workshops from Junee to Wagga.

We wish to submit for your favourable consideration the hardships and almost absolute ruin that this would entail upon us as employees.

The careful savings of years that have been accumulated by self-denial, and have been expended in building houses for the comfort of ourselves and families, would become absolutely worthless.

It has been in a great measure compulsory for us to build owing to the limited accommodation in the town.

Judging from the large amount of money that has been expended by the Government in the erection of buildings and workshops, thus giving stability to the town of Junee, we have been induced by these signs to invest our all.

The following amounts of moneys that have been invested by us is a proof of the careful and prudent habits of industry and energy.

We trust the foregoing statement will meet with your very favourable consideration.

[Here follows 43 signatures, representing £1,085 10s.]

Memo. by Mr. D. C. M'Lachlan.

WITH reference to the report of the Board of Inquiry relative to the proposal to dispense with Junee as a changing station, and substitute Wagga, Harden, and Narrandera, the Commissioner desires to know whether the trains enumerated therein are the trains now running—whether, for instance, there are two live stock trains between Narrandera and the North daily.

The Commissioner further wishes you to furnish a general report upon the rest of the estimated train-running as given in the enclosed.

Traffic Manager, Redfern. Urgent.

D. C. M'L., 17/6/86.

To Inspector Roberts, Junee,—Attached.—Be good enough to let me have your full report on this matter at your early convenience.—W. V. READ, *per* W.M., 22/7/86.

Memo. by Mr. G. Roberts.

Junee Junction, 26 July, 1886.

Re making Changing Stations for Junee district at Harden, Wagga, and Narrandera.

I PURPOSE dealing seriatim with the appended report of the Board of Inquiry, in *re* making the changing stations for No. 3 District South at Harden, Wagga, and Narrandera.

1. There is no doubt that the statements advanced by the Board are substantially correct, particularly with regard to the ruling grades on south west and on main line south of Junee Junction being easier than from Junee northwards; also the consequent necessity for different class of engine on that account.

Ever since the opening of the south-western line, bogie, or passenger engines have, as a rule, been used for trains on that branch, the advantage gained being an increased speed than would otherwise have been the case had goods engines been employed. This, in the case of live stock, is a great consideration, it must be admitted. The recognised load of live stock or wool on south-west line is fourteen trucks, as against ten on main line for bogie engines.

The load of a goods engine on main line being exactly that of a bogie on the branch. Assuming, therefore, that the engines are stationed at Wagga, the question naturally arises as to what action is to be taken on arrival of a train at Junee Junction with a full load of fourteen trucks? Is the same engine to proceed to Harden with a reduced load equal to ten waggons, or are arrangements to be made for a goods engine to run light from Wagga, to take on the full load to Harden. In the latter case what would be done with the engine from the branch? Is it to remain at Junee Junction, or be run empty to shed at Wagga? If the other course were adopted the delay to waggons left at Junee Junction would be a serious matter, especially so in the case of live stock, and would undoubtedly lead to endless complaints; let alone the decided objection senders have to their consignments being separated. They would contend, what is the use of a drover with stock in transit, if the whole are not conveyed by one train and the Department only allows one pass.

Respecting the estimate based on two live stock trains running between Narrandera and the North daily, I beg to state that for the years 1884, and 1885 (which give a fair average), live stock trains proper averaged one per day; but in addition to this there is an average of rather less than one train per day conveying live stock and goods between Narrandera and the North, which makes the estimate correct.

In making my estimate, I have assumed that every train ran with a full load, which, however, was not always the case, many instances occurring where consignments have amounted to more than a load for one, but not a full load for two engines, so that my calculation is more likely to be under than over the number of trains per day given.

2. The allowance of 15 per cent. of traffic being picked up at Junee Junction for south-west branch stations from south of that station is altogether over-estimated, seeing that the mixed trains running between Wagga and Hay would take all the traffic between those places, leaving nothing for other trains so that the loss would be even greater than it is put down at.

3. Under the proposed change, engines of all main line trains would have to run to Wagga, this would double the number now running there, which of course makes this estimate, as far as I am in a position to judge, correct.

4. From a traffic point of view, it is not necessary to run the south-western mixed trains between Wagga and Junee Junction, because, under existing arrangements, the requirements of the traffic between those stations are met by No. 22 up, leaving Wagga at 8 a.m. daily (Sundays excepted), with goods, passengers, &c., and running to Junee in time to catch No. 1 down mixed, from there to Hay. Again, No. 53 down takes passengers, goods, &c., arriving by No. 2 up, south-west mixed, from Junee Junction to Albury, so that if the engines of Nos. 1 down and 2 up south-west mixed trains are to be stabled at Wagga 44 miles of light running must follow, so as to have them available for the return trip from Junee Junction.

The

The present trains, viz., Nos. 22 up and 44 up, and Nos. 53 and 23 down, cannot be dispensed with between Junee, Wagga, and Albury, without completely upsetting the time-table and the present satisfactory working of this section of the line. Further, Nos. 3 and 4, south-west occasional trains, only run when sufficient traffic offers between Junee Junction and Narrandera, and *vice versa*; but in the busy season these trains, I may say, almost run daily (Sundays excepted), so that if engines are to be stationed at Wagga a very considerable amount of empty running must ensue. The same argument applies to Nos. 5 and 7 down, and Nos. 6 and 8 up, south-western trains, but these do not run so frequently. No. 4 up, goods, is a regular train running between Junee and Harden daily (Sundays excepted), so that the engine for it would have to run light from Wagga. The same may be said of No. 14 up, occasional, when running.

5. The assistant main line mail engine runs on an average once a week, and possibly oftener, but is not required beyond Junee Junction, as one engine can, owing to the easy grades, manage that train between Junee Junction and Albury and *vice versa*, without the slightest difficulty. Consequently a lot of useless running, equal to 44 miles per week at the least, would be brought about by the change of depôts. The guards' running would not be effected.

6, 7, 8. These matters concern the Locomotive Branch only; but I wish to observe that the carriage of coal and water is only estimated, and nothing added for extra haulage of stores, which item would amount to a good sum in the course of 12 months.

9. I have no doubt it would add to locomotive expenses if any alteration is made in existing arrangements, and the same may be said of the traffic if guards are to run in charge of light engines between Wagga and Junee and *vice versa*, or if trains now starting from Junee are required to do so from Wagga, and return there on completing the trip.

10. Under any circumstances water will be required at Junee Junction, but, of course, not to the same extent as under present working.

11, 12. The heaviest passenger traffic is between Junee Junction and Albury (as compared with that on S.W. and Jerilderie branches), for which express and mail trains are run. There is only one goods train between Junee and Albury and *vice versa*, while we have a mixed train running between Junee and Hay and *vice versa*, five days a week, besides several occasional trains over the same branch; and, owing to the severe drought now extending over many months, the latter service has been adopted, but will, no doubt, have to be increased again on a change in the seasons, which, from all appearances, has already set in.

In the years 1881 and 1882, and a portion of 1883, when the Locomotive Inspector and engine were stationed at Wagga and Bomen, we experienced the very greatest difficulty in conducting the traffic on the South-Western branch-line, owing to the engines being located so far from the point where their work really commenced. Numerous delays to traffic resulted through my being unable to give the requisite notice for engines to come to Junee Junction. Apart from this, there was the greatest danger to fettlers, &c., in having to look out for engines at all hours run on short notice between Junee and Wagga, let alone the objectionable issue of "line clear reports," which could not be avoided.

Matters at this juncture compelled me, at great personal inconvenience and pecuniary loss, to break up my home at Wagga, and remove to Junee Junction, so as to be the more capable of successfully coping with the fluctuating traffic, which I have been enabled to do ever since. I have no doubt the same will apply with equal force to the Locomotive Branch, as, when the engines were stationed at Wagga, and had to run the S.W. branch trains, drivers and firemen were loud in their complaints at not being able to get home regularly—in many instances having to run south-west again before going home.

The estimates given by the Board of Inquiry appear to have been arrived at purely from a locomotive point of view; but there are matters in connection with the case which would involve considerable outlay by the Traffic Department. There is, for example, the expense of guards running with light engines, if thought necessary, or by making the trains at present running to Junee terminate at Wagga. There is a good brick guards' barracks built at Junee Junction, but nothing of the kind provided or required at Narrandera as yet.

There are also a great number of Government cottages at Junee Junction that were erected for employees, but which would be useless there if the men are required to reside at Wagga. Considering the increase in telegraphic business this change would occasion an additional operator at Wagga, and a night officer at Narrandera would be wanted. The Wagga operator at present is also parcels clerk, and a night officer is not wanted at Narrandera. In the busy season too it would be very awkward having to turn engines coming from south-west required to take trains north.

My guards would also be very scattered and difficult of employing fully, besides the number would have to be increased.

As the change would result in the formation of another locomotive depôt at Narrandera, it would add largely to my difficulties in working the traffic, so much so, that I consider it would very likely necessitate the appointment of an assistant traffic inspector, to help me in successfully manipulating the traffic of the different sections of the line under my supervision, which, in point of mileage, is far in excess of that allotted to other gentlemen performing similar duties.

In conclusion, permit me to point out that ever since the depôt has been formed at Junee Junction there has been no difficulty in working the traffic, or of obtaining engines on short notice, and I say, without hesitation, that viewing the whole question from a traffic point, I maintain that Junee Junction is the centre from which any one is best able to manage the section, and with the least expense to the Department.

The Traffic Manager.

G. J. ROBERTS,
Traffic Inspector, 26/7/86.

Commissioner,—There are not two live-stock trains between Narrandera and the North daily at the present time, as business never was so slack as at present. However, now that there is a change of weather a good revival may soon be expected, and for an average season the mileage quoted is, if anything, under estimated. Of course the expenditure chiefly affects the Locomotive Branch, but it also, in a minor degree, affects the traffic expenditure, and to a considerable degree the traffic working. I am of opinion that the engine depôt should be at Junee. I enclose a report from Inspector Roberts on the subject.—W.V.R., 7/8/86.

1887.

(SECOND SESSION.)

—
LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

—
RAILWAY ROLLING STOCK.

(LOCOMOTIVES, TRUCKS, &c., AT GOULBURN, JUNEE, AND BATHURST.)

—
Ordered by the Legislative Assembly to be printed, 18 March, 1887.
 —

[Laid upon the Table of the House in accordance with promise made by the Honorable the Secretary for Public Works, in answer to Question No. 7, on Votes and Proceedings, No. 121, of the 2nd September, 1886.]

(1.) *Question—*

The number of engines stationed at Goulburn, Junee, and Bathurst respectively?

Answer—

Goulburn, 31; Junee, 32; Bathurst, 29.

(2.) *Question—*

The number of men employed in the engineering workshops, viz., fitters, turners, boiler-makers, and others, engaged in general repairs at Goulburn?

Answer—

Locomotive branch, 20.

(3.) *Question—*

The like information as regards Junee and Bathurst?

Answer—

Junee, 30; Bathurst, 29.

(4.) *Question—*

Have any locomotives, or trucks, or portions of either, been forwarded from Goulburn to Junee for repairs; if so, the number?

Answer—

The bogie-wheels of two of the Goulburn engines were turned up at Junee, the engines being there at the time.

(5.) *Question—*

The number of trains that run in and out of Junee (exclusive of water trains), Bathurst, and Goulburn during each week?

Answer—

Junee, 96; Bathurst, 231; Goulburn, 170. Note: The number of engines which come into Junee for repairs is far in excess of the number of regular trains given. The total number of trains run by Junee Engines is 164 per week. In addition to the locomotive work, there are in this district 15 steam pumping engines to be kept in repair.

(6.) *Question—*

The total amount of revenue derived at Goulburn, Bathurst, and Junee respectively during 1885?

Answer—

Goulburn, £104,445 1s. 10d.; Junee, £18,756 17s. 4d., and Bathurst, £71,895 19s. 8d.

(7.) *Question—*

The number of apprentices under indenture to the Government in the Engineering Departments at Goulburn, Junee, and Bathurst?

Answer—

There are no indentured apprentices, but there are three boys classed as apprentices at Junee; there are none at Bathurst or Goulburn.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAY TIRES AND AXLES.

(CORRESPONDENCE, &c.)

Ordered by the Legislative Assembly to be printed, 24 March, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 11th December, 1885, That there be laid upon the Table of this House,—

“Copies of all correspondence, reports, and minutes thereon, or attached
 “to, having reference to the purchase or supply of Railway Tires and
 “Axles that has taken place with the Government, the Commissioner for
 “Railways, and the Agent General, whether by public tender or otherwise,
 “with Messrs. Vickers & Co., or any other British manufacturers, or their
 “representatives, since 1st January, 1880, to date.

(*Mr. Abigail.*)

The Secretary for Public Works to Messrs. Cameron & Co.

Gentlemen, Department of Public Works, Railway Branch, Sydney, 20 December, 1879.

I have the honor to inform you that duplicate steel tires are required for the American passenger engines, supplied by Messrs. Burnham, Parry, Williams, & Co., of the Baldwin Locomotive Works, Philadelphia, and forward herewith an indent for the same, and I have to request that they may be supplied with the least possible delay.

I have, &c.,

JOHN LACKEY.

Indent for duplicate steel tires for the American passenger engines, supplied by Messrs. Burnham, Parry, Williams, & Co., Philadelphia, U.S.A. Makers' Nos., 4,074, and 4,398.

12 steel tires of the best quality for driving and trailing wheels.

8 tires of the same material for the engine bogie.

They are to be supplied in the rough, with all proper allowance for turning up on the sides and treads, but are to be bored out with allowance for shrinking on, if the makers can guarantee that they will be of the proper size, and accept all liability in case of any error in the inner diameter; otherwise, the tires must be supplied unbored, with proper allowance for boring and shrinking.

To be delivered at Sydney. Required as early as possible.

The Secretary for Public Works to The Agent-General.

Sir, Department of Public Works, Railway Branch, Sydney, 22 January, 1880.

I have the honor to inform you that an order was forwarded to Messrs. Cameron & Co., of New York, on the 20th ultimo, for steel tires for American engines, and to state that the Treasury has been requested to place the sum of £140 to your credit to meet the cost of same.

I have, &c.,

JOHN LACKEY.

R. W. Cameron & Co. to The Secretary for Public Works.

Sir, 23, South William-street, New York, 6 February, 1880.

We have the honor to acknowledge the receipt of your esteemed communication of the 20th December last, covering indent for steel tires for American passenger engines, which we have had pleasure in forwarding to Messrs. Burnham, Parry, Williams, & Co., with a request that they get them ready for shipment at the earliest possible moment.

We note that we are to recoup ourselves for the cost by drawing on the Agent-General in London,—

And have, &c.,

R. W. CAMERON & CO.

R. W. Cameron & Co. to The Secretary for Public Works.

Sir,

New York, 4 March, 1880.

We have now the honor to advise the shipment, per barque "Eidern," of the twenty steel tires for the American passenger engines supplied by Messrs. Burnham, Parry, Williams, & Co., as per your indent of 20th December last. We also enclose invoice of same, showing the cost to be £255 16s. 8d., for which, as instructed, we have drawn upon the Agent-General, in London, sending him shipping documents. The barque "Eidern" is loaded, and will sail for Sydney direct in a day or two.

We have, &c.,

R. W. CAMERON & CO.

INVOICE of tires shipped by R. W. Cameron & Co., on board barque "Eidern," Hertz, master, bound for Sydney, New South Wales, and consigned to order, for account and risk of whom it may concern.

In execution of indent dated Sydney, 20th December, 1879.

Twenty steel tires, as undernoted, furnished by Messrs. Burnham, Parry, Williams, & Co., of Philadelphia, for two American passenger engines supplied by them.

12 flanged steel tires bored $57\frac{1}{2}''$ x $5\frac{1}{2}''$ x $3\frac{1}{8}''$, 12,472 lb. @ $7\frac{1}{2}$ c.	\$935 40
8 do bored $25''$ x $5\frac{1}{2}''$ x $2\frac{3}{8}''$, 3,090 lb. @ $8\frac{1}{2}$ c.	262 65

1,198 05

$2\frac{1}{2}$ per cent. commission 29 95

1,228 00

@ \$4 80c. £255 16 8

Insurance to be attended to by Agent-General for N. S. Wales, in London.

R. W. CAMERON & CO.

New York, 26 February, 1880.

The Secretary for Public Works to The Agent-General.

Sir,

Department of Public Works, Railway Branch, Sydney, 10 February, 1880.

I have the honor to forward herewith indent for waggon fittings required for 1880 (under the five years contract for rolling stock) and shall be glad if you will obtain and forward same as early as possible.

I have, &c.,

JOHN LACKEY,

Secretary for Public Works.

INDENT for waggon fittings required for 1880, under the five years contract for rolling stock.

800 pairs 3-foot waggon wheels and axles, same as those ordered under indent by mail 29th June, 1877, and by cablegram of 10th April, 1879.

To be delivered in Sydney as early as possible.

Mr. G. N. Vickers to The Locomotive Superintendent.

Dear Sir,

"Royal Hotel," Sydney, 30 March, 1880.

Hearing that an indent is on its way to England for 800 pairs of wheels on axles in which Yorkshire iron axles are specified, I beg leave to ask you to alter this so as to substitute cast-steel for iron axles.

Steel axles have been almost universally adopted as having been found superior to iron, as they possess greater toughness than iron, and their durability is much greater, as the journals maintain their surface very much longer. You will doubtless have noticed one bent cast-steel carriage axle at the Exhibition, which shows the toughness and strength of the material.

Hoping that you will approve of my suggestion,

I remain, &c.,

G. N. VICKERS.

THE material specified for the axles of the 800 pairs of wheels for which the indent is now on its way to England, is Taylor Bros. iron, being a repetition of previous indents.

Taylor Bros.' axles long held the position of being amongst the best of their kind, but iron axles are now being extensively superseded by steel ones, as the latter material not only gives a stronger axle, but the bearings run cooler and last longer on account of the greater smoothness and hardness of the material. It would be well, therefore, to substitute steel axles in those wheels about to be let, and in order to ascertain the comparative merits of "cast" and "Bessemer" steels for axles, I recommend that they be ordered half and half of each material, as per the following telegram:—

"Axles of indent 80-479, of 10th February, to be steel, half Vickers, half Patent Shaft. Hasten delivery."

This alteration will not increase the cost.—R.H.B., 1/4/80. Commissioner.

Approved.—J.L., 7/4/80.

Cablegrams sent as follows:—"800 axles, indent tenth February, to be steel, half Vickers, half Patent Shaft. Hasten delivery."—D.C.M'L., 7/4/80.

Mr. James Brown to The Commissioner for Railways.

Sir,

Sydney, 23 December, 1881.

The object of this is to ask your permission to Messrs. Cammell & Company's name being inserted for cranks or straight axles and tires in specifications through the Agent-General accompanying indents for locomotives.

I

I may mention that for many years the firm I represent has given considerable attention to the manufacture and selection of steel (cast steel) for cranks and tires, and have supplied the same largely to all our Home railways, as well as to the Austrian, Belgian, Spanish, and various British Colonial and Continental railways.

Sir John Hawkshaw's Inspector (Madras and Oude and Rohilcund railways), recently stated, with regard to a series of tests for ductility and strength, which were conducted on Messrs. Cammell & Company's crank steel, that "the results were the best that had ever gone into Westminster."

In asking you the favour referred to I am under some disadvantage, inasmuch as, up to the present Messrs. C. C. & Co. have not been permitted the opportunity of sending out to you any of their manufactures in the lines indicated, still I trust from the list of railways I have given you which they have supplied, and from the long standing of the firm, it may be your pleasure to give them consideration.

I am, &c.,

JAMES BROWN.

Forward to Mr. Scott for report. In the indents which are going to England for sixty locomotives I think Vickers' crank axles are stipulated for. If there be other firms whose crank axles are as good, we might get the advantage of competition.—C.A.G., B.C., 23/12/81.

I have no objections to a portion of the axles for the sixty new engines being made by Messrs. C. Cammell & Company, of the very best quality, most suitable for the purpose as a trial of their make.—W. Scott, 28/12/81.

I hear from Mr. Downes that the car wheels supplied by Cammell & Co. are not very well fitted to the axles—display, in fact, slovenly work.

The papers on the subject of the carriage springs supplied by this firm, do not moreover, contribute to confidence in them.

And there is some reason to believe that the steel rails they have supplied are not made by the Landore Siemen process, but by Bessemer process, the former being specified. On the whole, I am not disposed to comply with Mr. Brown's request that Cammell & Co. be invited to tender for axles.—C.A.G., 2/1/82.

Inform that a compliance with his request is declined.—C.A.G., 3/1/82.

The Commissioner for Railways to Mr. James Brown.

Sir,

Department of Public Works, Railway Branch, 5 January, 1882.

With reference to your letter of the 23rd instant, asking my permission to Messrs. Cammell & Co.'s name being inserted for cranks or straight axles and tires in the specifications through the Agent-General, accompanying indents for locomotives, I have the honor to inform you that I am unable to grant a compliance with your request.

I have, &c.,

CHAS. A. GOODCHAP.

Sir John Robertson to The Secretary for Public Works.

My dear Lackey,

I have just been told by a gentleman from England that railway wheels and axles, tires, springs, buffers, cast steel, boiler plates, files, and other railway material, are, when contracts are called for by the Agent-General, confined to Messrs. Vickers, Sons, & Co., of Sheffield, and the Patent Shaft Company.

The effect of this is that, doubtless by arrangement, Vickers & Company supply the locomotive portions, and the other Company the other portions, thus there can be no competition.

It is worth while to ascertain whether the authorized tenderers are confined to two, and why. There are Sir John Brown & Co., of Sheffield, Charles Cammell & Company, and many others quite equal to the other firms.

SIR JOHN ROBERTSON.

Is the Commissioner aware if this is the case. It seems undesirable that the means of competition should be so limited.—J.L., 10/2/82.

Messrs. D. & W. Robertson to The Commissioner for Railways.

Dear Sir,

Central Exchange Buildings, Sydney, 16 February, 1882.

With reference to the conversation which you had with our Mr. Atkinson this morning with regard to our supplying sample sets of the railway wheels and axles, springs and buffers by the great firm of Sir John Brown & Co., Limited, for whom we act as sole Colonial agents, we shall have much pleasure in supplying the same on the terms and conditions suggested by Mr. Atkinson, viz., that should the sample sets not prove to your satisfaction under every fair and reasonable test to be applied under your direction, we shall at once remove the goods, and no liability will attach to your Department. What we propose to bring out is a complete set of wheels, axles, springs, and buffers for one locomotive and one tender, and one complete set of wheels and axles, springs, and buffers for one waggon, all manufactured to the specifications of your Department, the plans and specifications to be obtained with your consent from the Agent-General in London.

We would cable Sir John Brown & Company to apply to the Agent-General and to ship the sample sets by steamer as soon as possible.

Of the result we have no fear whatever, and there will be an important saving to your Department

We have, &c.,

D. & W. ROBERTSON.

Mr. Scott for Report.—C.A.G., B.C., 16/2/82.

Mr. W. Scott to the Commissioner for Railways.

82/1,377.

Steel Tires and Axles.

Sydney, 10 March, 1882.

WHEELS, tires, and axles are very important working parts of railway rolling stock, upon the quality and reliability of which the safety of life and property constantly depends. Such being the case, care has been taken to procure the best and most reliable material from the most reputed manufacturers, and to discard, at the first indication, and without favour, that which fails or becomes doubtful.

Acting upon this principle, we have always found Vickers' steel to be the most reliable material, and in consequence have been thus compelled to confine ourselves to it. With

With a view, however, to more extended competition, the patent shaft or Brunswick steel was inserted in a recent indent, but, owing to the failure of one of these axles, prudence constrains us to discard this make until the reliability or otherwise of their axles now running shall have been proved. However, as it is desirable, if possible, to encourage wholesome competition, I am not unwilling to include the under-mentioned firms, providing the tenders of Nos. 2 and 3 are not accepted unless the quality of the material is guaranteed equal to Vickers', to stand the same test, and the price sufficiently favourable to justify the Consulting Engineer in England in recommending the acceptance of either of these tenders.

No. 1. Vickers & Sons.

No. 2. C. Cammell & Co.

No. 3. John Brown & Co.

W. SCOTT.

Commissioner.—Return showing the quantity of wheels and axles, crank axles, tires, springs, and buffers, cast-steel files, and boiler-plates imported during the past ten years, and giving the name of the manufacturer in each case. The above return, verbally asked for, is enclosed.—A. RICHARDSON, 17/2/82.

RETURN showing quantities of undermentioned material received during the last ten years, 1872 to 1881 inclusive, and from whom.

Date.	Article.	From whom purchased.	Quantity.
1875	Wheels and axles, C.M.....	Patent Shaft and Axletree Co.....	150 prs.
1876	" " "	" "	850 "
1877	" " "	" "	1,100 "
1878	" " "	" "	232 "
1879	" " "	" "	1,512 "
1880	" " "	" "	800 "
1881	" " "	" "	550 "
			5,194 prs.
1877	" " "	Staffordshire Wheel and Axle Co.....	1,000 prs.
1878	" " "	" "	1,230 "
			2,230 prs.
1876	Wheels, engine, and tender.....	R. Stephenson & Co.....	18 prs.
1877	" " "	" "	4 "
			22 prs.
1877	" " "	Beyer, Peacock, & Co.....	8 prs,
1878	" " "	" "	36 "
			44 prs.
1874	Steel-cast	Wm. Bird & Co.....	cwt. qr. lb. 17 1 0
1875	"	" "	12 0 26
			29 1 26
1877	"	Chas. Cammell & Co.	21 2 20
1881	"	S. Osborne & Co	27 0 24
1877	Files, block	Ibbotson Bros. & Co.....	72 0 0
1881	Files	Chas. Cammell & Co.	354 doz.
1873	Boiler-plate	Stevens, Reynolds, & Co.....	tons. cwt. qr. lb. 8 19 1 10
1875	"	S. Groutt & Co.....	11 14 2 26
1875	"	Hird, Dawson, & Hardie	6 18 3 27
1879	"	" "	22 13 0 7
1880	"	" "	28 6 3 8
1881	"	" "	34 7 1 17
			92 6 1 3
1875	"	W. Burrows & Sons.....	18 9 0 14
1880	"	" "	1 17 0 21
			20 6 1 7
1879	"	George Davies.....	5 18 1 26
1879	"	Taylor, Bros., & Co.....	1 19 1 4
1875	C. & W. buffers	Chas. Cammell & Co.	500
1877	" "	" "	1,001
1878	" "	" "	704
			2,255
1877	" "	John Brown & Co.....	2,200
1873	Crank axles	(Vickers' stipulated for) Manning, Wardle, & Co.....	4

Date.	Article.	From whom purchased.	Quantity.	
1873	Crank axles	(Vickers' stipulated for)		
1873		Beyer, Peacock, & Co.	1	
1878		" (Vickers' stipulated for)	4	
1879		" (Krupp's)	2	
1880		" (Vickers')	6	
		" (")	6	
			19	
1874	" "	R. & W. Hawthorne	1	
1874		R. Stephenson	"	6
1876			"	2
1881			"	10
			18	
1874	" "	Vickers', Sons, & Co.	14	
1876		" "	6	
1877		" "	1	
1878		" "	9	
1879		" "	21	
1880		" "	3	
1881		" "	5	
			59	
1876	C. & W. axles	Taylor, Bros., & Co.	150	
1876	Springs volute	J. Turton & Sons	1,600	
1877		" "	400	
1880		" "	3,000	
1881		" "	1,500	
			6,500	
1878	" "	Chas. Cammell & Co.	1,700	
1880		" "	1,100	
			2,800	
1878	" "	John Brown & Co.	724	
1879		" "	2,500	
1880		" "	3,508	
			6,732	
1875	" V.S.R.	G. Spencer & Co.	1,736	
1877		" "	300	
1878		" "	200	
1880		" "	120	
1881		" "	500	
			2,856	
1876	" "	North British Rubber Co.	2,400	
1877		" "	2,260	
1878		" "	600	
1880		" "	1,500	
			6,760	
1877	" "	Britannia Rubber Co.	1,000	
1878		" "	362	
1879		" "	1,500	
1880		" "	1,200	
			4,062	
1877	Springs, I.R.	C. Macintosh	1,000	
1877	Springs, buffers	Railway Spring Company	48	
1878	" "	J. Turton & Sons	110	
1880	" "	C. Cammell & Company	150	
1878	" engine and tender	Beyer, Peacock, & Company	5 sets.	
1879	" draw	Chas. Cammell & Company	200	
1880	" recoil spiral	John Brown & Company	100	
1873	" bearing	Beyer, Peacock, & Company	100	
1873	" "	Brown, Bayley, & Dixon	8	
1875		" "	"	600
1879		" "	"	1,000
1880		" "	"	1,000
			2,608	

Date.	Article.	From whom purchased.	Quantity.
1876	Springs, bearing	J. Turton and Sons..	1,600
1878	" "	"	2,734
1881	" "	"	550
			4,884
1877	" "	C. Cammell and Company.....	1,000
1879	" "	"	280
			1,280
1877	" "	Railway Spring Company.....	2,200
1880	" "	John Brown and Company.....	896
1881	" "	"	1,104
			2,000
1875	" volute	Brown, Bayley, and Dixon.....	600
1877	" "	"	2,000
			2,600
1872	Tires	Taylor Brothers.....	8
1873	"	Manning, Wardle, and Company.....	54
1874	"	Fried Krupp.....	184
1875	"	"	98
1876	"	"	132
1877	"	"	153
1878	"	"	694
1879	"	"	182
1880	"	"	112
			1,555
1876	"	Vickers, Sons, & Company	420
1877	"	"	840
1879	"	"	126
1880	"	"	432
1881	"	"	712
			2,560
1880	"	R. W. Cameron and Company..	20

Mr. W. Scott to The Commissioner for Railways.

Steel Axles and Tires.

The Commissioner,

Sydney, 17 March, 1882.

Referring to my 82-1,377, I now enclose copy of my letter, No. 82-1,144, to Mr. Mirrls, and his reply thereto (82-1,535).

With the view of ascertaining whether or not it would be advisable to purchase from other firms than those from whom we now obtain axles and tires, I recommend that our Consulting Engineer in London be asked:—

- 1st. The test that Vickers' steel will stand for tires?
- 2nd. The test that Vickers' steel will stand for axles?
- 3rd. What other firms can produce steel to stand the same test?

I need scarcely point out to the Commissioner that the extremely steep gradients and sharp curves on our railways subject the axles and tires to an extraordinary strain, and renders it necessary that none but the very best material be used in their manufacture.

W. SCOTT.

The Acting Locomotive Engineer to The Locomotive Superintendent Victorian Railways.

Sir,

1 March, 1882.

Will you please be good enough to inform me what brand of crank axle, iron or steel, carriage and waggon axles, you have in use on the Victorian Railways; also similar information with reference to tires. And will you kindly say, from your long experience, which brand you prefer, and whether you have had any failure of carriage or waggon axles, giving the brands, &c., and oblige.

I have to acknowledge receipt of press copy of Report of Board of Trade, England, with best thanks.

I have, &c.,

W. SCOTT,
Acting Locomotive Engineer.

The Locomotive Superintendent Victorian Railways to The Acting Locomotive Engineer.

Dear Sir,

Melbourne, 13 March, 1882.

In reply to your letter of the 1st March, asking for information respecting axles and tires, the practice of the Victorian Railways now is to use steel tires and steel axles of every description, both for carriages and trucks. The brands of the crank axles are Krupp of Prussia and Vickers of Sheffield. It is only recently we have been using steel axles for carriages and waggons. They were formerly wrought iron, faggoted either by ourselves, or imported from England from the Patent Shaft and Axletree Company. We have had failures in both crank and waggon axles. The last axle broke about a couple of months ago. It was a truck axle of the Patent Shaft and Axletree Company's, and was badly made. We have also had straight leading steel axles snap in two like a carrot, these were made in the early days by Charles Cammell & Co., of Sheffield. We have all brands and shapes upon the Victorian Railways, but we are gradually working to uniformity. Most of our steel tires and axles are from Vickers, Son, & Co., Sheffield, who appear to give satisfaction in the quality of their manufactures.

I have, &c.,

S. MIRRLS,

Loco. Supt.

Minutes.

Minutes by Commissioner.

I wish to see Mr. Scott in this matter.—CH.A.G., 20/2/82. Let me have the other papers on this subject, with Minister's minute thereon.—CH.A.G., 28/2/82. Herewith.

I had a return prepared showing the names of firms from which the importations referred to were obtained during the past ten years. I forwarded it to Mr. Scott with a request that he would see me on the subject. What has been done in the matter?—CH.A.G., 26/2/86.

Storekeeper to see my remarks on the list he forwarded, then forward to Mr. Scott, who will please report with special reference to wheels, tires, and steel axles.

It is not the case, as was represented to Sir John Robertson, that railway supplies have been obtained from two firms only, when ordered from England.

It will be seen from returns herewith that supplies have been obtained from nearly 100 different firms, and that those firms specially referred to, viz., Sir John Brown & Co. and Cammell & Company, are included in the list of those who supply the Department with goods.

With regard to wheels, tires, and axles, it has been usual to specify certain firms from which those supplies should be obtained.

Even these special items have not been confined, I see, to Vickers and the Patent Shaft Company, although recently it has been stipulated that crank axles should be made of Vickers' steel, and straight axles either of Brunswick or Vickers' steel.

Tires are stipulated to be made of Vickers' steel, and I understand Vickers and Krupp (from whom we used to order) are recognized as the best tyre manufacturers in the world. Where so much depends, as regards the safety of the public, upon the quality of the material supplied, it can be well understood that the Department is anxious to go only to the best firms for special supplies of the kind.

Mr. Scott, however, will please report upon the desirability of widening the list as regards the supply of tires and axles.—CH.A.G., 2/3/82.

The Commissioner's remarks referred to have been duly noted, and information supplied. The papers are now forwarded to Mr. Scott.—A.R., 6/3/82. Storekeeper.

Colonial manufacturers of new engines provide their own wheels, axles, springs, and buffers, under their contract, in accordance with the specifications, and I understand they have indented for the number they require. English manufacturers contract for the supply of the engines complete, of which wheels, &c., form a part, the only conditions imposed are, Vickers and Sons cast steel axles and tires, and Turton's or Spencer's springs, so that, as a matter of fact, the tenders for wheels and buffers are open to all, J. Brown & Co. included, except for tires, axles, and springs.

It will thus be seen that the whole thing is resolved into a question of the material to be used for tires and axles, consequently I referred the Commissioner to my report 82-1,377, and now, further, to my 82-1,536. The principle adopted *re* axles and tires has been carried out with regard to springs, as the reliability of the latter is next in order of importance to that of tires and axles. If a set of wheels, axles, springs, and buffers is supplied on the terms and conditions offered, we shall have to take out a set with Vickers' tires and axles, now running, in order to experiment upon a material the reliability of which, as far as our experience goes, has not been proved, and considering the responsibility to be incurred by the trial of material not recommended to us by our Consulting or any other Engineer, and the fact that though one set specially prepared might turn out well, the success or failure of one set could be no criterion, compared with the result of about fifteen years' experience of the reliability of a great number of Vickers & Sons' axles and tires.

I recommend that the acceptance of this offer be postponed until we receive the reply of our Consulting Engineer to the questions in my 82-1,536.—W. SCOTT, 18/3/82. Commissioner.

Where is the paper referred, 82-1,536, and also 82-1,377?—CH.A.G., 22/3/82. Inform of the steps proposed to be taken in regard to the selection of firms to compete for axles and tires.—CH.A.G., 1/4/82. Approved.—J.L., 5/4/82.

The Commissioner for Railways to Messrs. D. & W. Robertson.

Gentlemen, Department of Public Works, Railway Branch, Sydney, 13 April, 1882.

With reference to your letter of the 16th February last, respecting the sample sets of railway wheels, and axles, springs, and buffers, manufactured by the firm of Sir John Brown & Company (Limited), which you wish tested on the lines of this Colony, I have the honor to inform you that, with the view of ascertaining whether it would be advisable to purchase materials from other firms than those from whom axles and tires are obtained, the Consulting Engineer in England has been asked the test that Vickers' steel will stand for tyres and axles, and what other firm can produce steel to stand the same test.

Under the circumstances, it is not necessary that the quality of Sir John Brown & Company's manufacture should be tested in the Colony, as no doubt the merits of the materials supplied by the firm you represent will receive due consideration at the hands of the Consulting Engineer.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

Mr. James Brown to The Commissioner for Railways.

Sir, Sydney, 29 March, 1882.

Referring to the question of cast-steel cranks, about which I wrote you a short time ago, asking that Messrs. Cammell & Co., Sheffield, might have the opportunity of supplying your Government, I now beg to enclose you a list, which I have recently received, showing the relative number of cranks supplied by the firm for the years 1879, 1880, 1881.

As you will notice, the supply in 1880 was 42 per cent. more than in 1879, and in 1881 an increase of 118 per cent. over 1880, and above 200 per cent over 1879.

I trust these particulars will be so far satisfactory to you as to obtain from you the sanction to Messrs. Cammell & Co.'s name appearing in future indents for locomotives through the Agent-General, and also that they may be permitted to have your favours for duplicate cranks which your Government may require from time to time.

I have, &c.,

JAMES BROWN.

List

LIST of Locomotive Crank Axles supplied by Messrs. Chas. Cammel & Co. (Limited), Cyclops Shiel and Iron Works, Sheffield, during the years 1879, 1880, and 1881.

To whom supplied.	Number of axles supplied in		
	1879.	1880.	1881.
Great Eastern Railway Company	38	14	42
Manchester, Sheffield, and Lincolnshire Railway Co.	4	24	33
London, Brighton, and South Coast	12	24	6
Maryport and Carlisle Railway Co.	1	.....	.....
Neilson & Co., Glasgow, for L. and Y. Railway Stock	10	.....	.....
" " Oude and Rohilkum Railway Stock	14	7	.....
" " Great Indian Peninsula Railway Stock	10	.....	.....
" " L. B. and S. C. Railway Stock .....	.....	.....	17
" " Unknown .....	.....	.....	12
Glasgow and South-Western Railway Co.	13	7	11
Midland Railway Co.	5	8	.....
Yorkshire Engine Co., Sheffield .....	.....	1	.....
Vulcan Foundry Co., Newton le willows .....	.....	3	1
Roman Railways .....	.....	2	.....
Crown Agents for the Colonies .....	.....	6	.....
Ritson & Co., Leeds .....	.....	2	.....
" " for Great Eastern Railway Stock .....	.....	.....	10
Oude & Rohilkund Railway Co. (Limited) .....	.....	20	.....
Hudswell, Clarke, & Rogers, Leeds .....	.....	2	.....
South Eastern Railway Co. ....	.....	2	.....
North of France Railway Co. ....	.....	2	1
Great Indian Peninsula .....	.....	3	8
Mathison & Co., London .....	.....	8	49
Great Russian Railway .....	.....	2	.....
R. & W. Hawthorne, Newcastle .....	.....	1	.....
" " for Great Eastern Railway Stock .....	.....	10	.....
Harrison & Camin, Rotherham .....	.....	4	.....
Madrid, Saragosa, and Alicante Railway Co. ....	.....	.....	28
Paris Orleans Railway Co. ....	.....	.....	13
Paris, Lyons, & Mediterranean Railway Co. ....	.....	.....	.....
Sharp, Stewart, & Co., Manchester .....	.....	.....	.....
New South Wales Government Railways .....	.....	.....	.....
Beyer, Peacock, & Co., Manchester, for L. & S. W. Railway Stock .....	.....	.....	.....
Western Railway of France .....	.....	.....	.....
London, Chatham, and Dover Railway Co. ....	.....	.....	.....
Madras Railway Co. ....	.....	.....	20
Total	107	150	327

Secn. See proposal in regard to testing steel for tires and axles; the Inspecting Engineer to test; the quality to be equal to Vickers' to admit of competition.—C.A.G., 5/4/82.

The Secretary for Public Works to The Agent-General.

Sir,

Department of Public Works, Railway Branch, Sydney, 17 April, 1882.

With the view of ascertaining whether or not it would be advisable to purchase axles and tires for our rolling stock from other firms than those from whom we now obtain them, I have the honor to request that you will have the goodness to instruct the Consulting Engineer to furnish a report.

1st. As to the test that Vickers' steel will stand for tires.

2nd. Do do do do for axles.

3rd. The names of any other firms which can be relied upon to produce steel to stand the same test.

The extremely steep gradients and sharp curves on our railways subject the axles and tires to an extraordinary strain, and render it necessary that none but the very best material be used in their manufacture.

The axles of the Patent Shaft Co. have not proved, in three separate instances, reliable (two having failed in New South Wales, and one in Victoria recently), and as, in consequence, we have been specifying in our orders for tires and axles that Vickers' steel should be used, the representatives in the Colony of other steel makers (notably Sir John Brown & Co. and Messrs. Cammell & Company) have been urging the Department to try their make of steel for these supplies. Hence the request for the test which I now make.

I have, &c.,

JOHN LACKEY,
Secretary for Public Works.

Mr. James Brown to The Commissioner for Railways.

Sir,

Sydney, 10 May, 1882.

By recent mail Messrs. Cammell & Company (Limited) forward me a tracing of their cast-steel wheel, "Mansell section," with cast-steel tire, which I enclose you with this. You will see the design of the centre is to combine strength with elasticity.

Should it be your pleasure to give Messrs. Cammell & Company a trial order, I am sure you would be well pleased with the result of the working.

Messrs. C. C. & Co. inform me that they have supplied several lots of these wheels recently, and that they are giving very satisfactory results.

I have, &c.,

JAMES BROWN.

Mr.

Mr. J. Brown to The Commissioner for Railways.

Sir,

Sydney, 10 May, 1882.

Messrs. Charles Cammell & Co. (Limited), Sheffield, desire me to draw your attention to their speciality in iron axles, viz., "Homogeneous Charcoal Iron."

They have been making these now for some considerable time, and from the many tests supplied, and the satisfactory results obtained, they have every confidence in recommending them to your notice.

They have supplied to the Great Indian Peninsular Railway, since 1879, over 13,000 of these axles for carriage and waggon purposes, besides various quantities to many other railways, and it is from the very excellent working of these, and the proved strength and ductility of the material, that they solicit an order from you.

As you know many engineers prefer iron for axles, owing to the extra toughness it possesses over steel, and it was to meet this requirement that Messrs. Cammell & Company have laid themselves out, obtaining, as a result, a material having the ductility of iron, but combining, at the same time, largely the strength of steel.

I trust it may be your pleasure to permit Messrs. Cammell & Company the opportunity of filling an order for you in this particular line of their manufacture.

I am, &c.;

JAMES BROWN.

List of engines with bad cranks.

No. of Engine.	Diameter of Wheels.	Material of Crank.	Maker's Name.	Mileage.	Remarks.
93	4 feet	Cast Steel	Vickers, Son, & Co. ...	58,338	Reported June, 1879
100	4 "	"	"	61,143	" July, 1879
14	6 "	"	"	52,153	" Aug., 1879
50	4 "	"	"	112,596	" April, 1880
56	4 "	"	"	27,869	" June, 1880
19	4 "	"	"	146,674	" July, 1880
57	4 "	"	"	95,622	" July, 1880
64	5 "	"	"	113,875	" Sept., 1880
102	4 "	"	"	88,665	" Sept., 1880
49	4 "	"	"	126,460	" Oct., 1880
94	4 "	"	"	95,802	" Jan., 1881
54	4 "	"	"	110,184	" May, 1881
55	4 "	"	"	116,340	" May, 1881
106	4 "	"	"	78,701	" July, 1881
35.....	4 "	"	"	123,341	" Aug., 1881
G.N. Ry. }	4 "	Cast Steel	Vickers, Son, & Co. ...	146,777	" Sept., 1881
48	4 "	"	"	117,862	" Dec., 1881
104	4 "	"	"	62,697	" Dec., 1881
32.....	4 "	"	"	42,024	" Dec., 1881
G.N. Ry. }	4 "	Cast Steel	Vickers, Son, & Co. ...	132,994	" Mar., 1882
53	4 "	"	"	119,994	" April, 1882
97	4 "	"	Krupp	175,789	" Oct., 1881
15	6 "	"	"		

Krupp's steel crank has run the greatest mileage, and is the engine with the largest driving wheel, which is the best test of all as the *leverage is greater*. I forward this for your information, as my experience is that Krupp's steel is the best for tires, but for axles I have no data.

THOS. MIDELTON,

Commissioner, 4/8/82.

I should like to see Mr. Midelton on this matter.—C.A.G., 10/8/82.

Please let me have the No. of miles that have been run with each good crank axle, the maker's name, &c.—C.A.G., 14/8/82. Please also say the No. of outside cylinder engines we have. We have 122 outside cylinder engines—axle return herewith.—THOS. MIDELTON, Commissioner, 16/10/82.

List of Good Crank Axles, Maker's name, &c.

No. or Class of Engine.	Date commenced to run.	Material of Crank.	Maker's Name.	Mileage.	Remarks.
1 to 4	1 May, 1880.....	Steel ..	Vickers, Son, & Co.	45,136	Up to 30 June, 1882
	3 May, 1880.....	do	do	65,694	
	24 April, 1880.....	do	do	71,819	
	28 April, 1880.....	do	do	75,681	
5	do	do	137,982	do
10	Iron	Cooper (Leeds)	323,151	do
14 to 16	1 Jan., 1876.....	Steel ..	Vicker, Son, & Co.	74,050	do
	15 June, 1878.....	do	do	33,828	
	14 Nov., 1880.....	do	do	15,663	
	13 Mar., 1871.....	do	do	191,360	
17 to 22	27 April, 1876.....	do	do	112,708	do
	12 June, 1878.....	do	do	60,509	
	8 July, 1881.....	do	do	23,124	
	15 Oct., 1872.....	do	do	152,971	
	3 July, 1873.....	do	do	170,246	

No. or Class of Engines.	Date commenced to run.	Material of Crank.	Maker's Name.	Mileage.	Remarks.
17 to 22	17 Oct., 1873.....	Steel	Bolton Iron & Steel Co.	124,890	Up to 30 June, 1882.
	27 Feb., 1875.....	do	Vickers, Son, & Co.	72,485	
29 to 31	.....	Iron	Cooper (Leeds)	Average per axle	do
	.....	do	do		
	.....	do	do		
36 to 39	6 Sept., 1870.....	Steel	Bolton Iron & Steel Co.	212,693	do
	24 Nov., 1870.....	do	do	196,907	do
	15 Jan., 1871.....	do	do	211,505	do
	15 Feb., 1871.....	do	do	198,051	do
	30 May, 1878.....	do	Vickers, Son, & Co.	55,624	do
40 to 43	8 Dec., 1870.....	do	Bessemer	238,141	do
	13 June, 1871.....	do	Vickers, Son, & Co.	242,809	do
	7 May, 1871.....	do	Bessemer	195,221	do
	8 May, 1871.....	do	do	167,988	do
44 to 47	11 May, 1872.....	do	Vickers, Son, & Co.	211,140	do
	9 June, 1871.....	do	do	105,852	do
	1 Feb., 1878.....	do	do	118,635	do
	18 Sept., 1878.....	do	do	50,762	do
	7 Dec., 1877.....	do	do	100,030	do
	9 June, 1871.....	do	do	187,319	do
	15 Dec., 1874.....	do	do	147,021	do
	5 Nov., 1881.....	do	do	11,335	do
	23 Dec., 1874.....	do	do	113,720	do
	5 Feb., 1875.....	do	do	175,819½	do
48 to 59	16 Nov., 1880.....	do	do	34,983	do
	16 May, 1882.....	do	do	3,382	do
	19 Aug., 1881.....	do	do	14,375	do
	7 Aug., 1880.....	do	do	40,661	do
	18 Jan., 1876.....	do	do	107,071	do
	18 Aug., 1881.....	do	do	23,439	do
	22 Sept., 1880.....	do	do	37,055	do
	22 Dec., 1880.....	do	do	39,008	do
	25 Jan., 1882.....	do	do	12,391	do
	16 Nov., 1874.....	do	do	162,407	do
60 to 65	9 Dec., 1874.....	do	do	108,431	do
	22 July, 1878.....	do	do	73,978½	do
	9 Dec., 1874.....	do	do	24,876	do
	14 Feb., 1878.....	do	do	93,035½	do
	1 Oct., 1878.....	do	do	64,402	do
66	6 Feb., 1879.....	do	do	62,894	do
	.....	Iron	do	173,797	do
67 to 74	8 Mar., 1875.....	Steel	do	112,062	do
	24 Marr, 1875.....	do	do	141,138	do
	12 June, 1875.....	do	do	145,566	do
	16 July, 1875.....	do	do	167,668	do
	27 July, 1875.....	do	do	126,877	do
	22 July, 1875.....	do	do	126,026	do
	26 July, 1875.....	do	do	148,219	do
75 to 78	3 Aug., 1875.....	do	do	98,946	do
	22 Jan., 1880.....	do	do	57,977	do
	17 Sept., 1877.....	do	do	91,280½	do
	13 Dec., 1877.....	do	do	81,118	do
	6 Aug., 1879.....	do	do	63,484½	do
93 to 117	9 Oct., 1879.....	do	do	69,343	do
	17 Sept., 1881.....	do	do	22,991	do
	21 June, 1880.....	do	Krupp	48,175	do
	20 Aug., 1879.....	do	Vickers, Son, & Co.	75,078	do
	28 May, 1880.....	do	do	46,586	do
	15 Feb., 1879.....	do	Krupp	87,027	do
	27 Jan., 1881.....	do	Vickers, Son, & Co.	22,563	do
	16 Sept., 1877.....	do	do	17,201	do
	3 Sept., 1878.....	do	do	97,133	do
	5 Sept., 1878.....	do	do	90,261	do
93 to 117	9 Sept., 1878.....	do	do	104,147	do
	29 Aug., 1878.....	do	do	97,743	do
	31 Aug., 1878.....	do	do	110,200	do
	24 Dec., 1878.....	do	do	98,302	do
	19 Dec., 1878.....	do	do	98,790	do
	24 Dec., 1878.....	do	do	92,790	do
	16 Dec., 1878.....	do	do	95,692	do
	12 Dec., 1878.....	do	do	96,031	do
	18 Dec., 1878.....	do	do	94,684	do
	1 Oct., 1878.....	do	do	95,256	do
127 to 129	17 Dec., 1878.....	do	do	104,378	do
	3 April, 1879.....	do	do	55,738	do
	1 May, 1879.....	do	do	54,413	do
52 and 103	15 April, 1879.....	do	do	52,712	do
	15 Jan., 1879.....	do	do	73,359	do
52 and 103	8 Jan., 1879.....	do	do	53,039	do
	15 Jan., 1879.....	do	do	do	do
142	8 Jan., 1879.....	Error	do	do	do
	15 Dec., 1879.....	Steel	do	54,778	do
158 to 163	2 Sept., 1880.....	do	do	43,420	do
	30 Aug., 1880.....	do	do	41,729	do
	20 Aug., 1880.....	do	do	41,114	do
	9 Sept., 1880.....	do	do	45,298	do
	21 Sept., 1880.....	do	do	44,979	do
164	22 July, 1880.....	do	do	43,068	do
	12 Aug., 1880.....	do	do	60,377	do
190 to 192	4 Sept., 1881.....	do	do	20,749	do
	26 April, 1882.....	do	do	3,447	do
	2 May, 1882.....	do	do	2,963	do

GREAT NORTHERN RAILWAY.
Analysis of good and defective Crank Axles.

No. or Class of Engine.	Date commenced to run.	Material of Crank.	Maker's Name.	Mileage.	Remarks.
1	Iron	221,764	Up to 30 June, 1882
2	do .....	.....	185,315	
3	do .....	.....	240,064	
4	do .....	.....	215,757	
9	do .....	.....	359,150	
11	do	Coeper (Leeds).....	72,736	
12	do .....	.....	64,081	
13	do	Bolton Iron and Steel Co.....	299,115	
18	do	do	238,495	
19	do	do	256,749	
20	do	do	264,786	
21	Cast steel	Taylor	196,219	
22	do	Vickers, Son, & Co.	199,268	
23	do	do	198,040	
24	Iron	Monkbridge.....	112,021	
25	do	do	91,020	
26	do	Taylor	169,423	
31	Steel	Vickers, Son, & Co.	109,429	
32	Iron .....	.....	144,449	
33	do .....	.....	141,806	
35	do .....	.....	120,572	
36	do .....	.....	140,693	
40	do .....	.....	136,854	
41	Steel	Vickers, Son, & Co.	142,612	
42	do	do	59,795	
43	do	do	2,151	
44	do	do	14,116	
45	do	do	26,739	
46	do	do	137,464	
				67,458	
				70,374	
				69,749	
				62,745	
				64,376	
				49,813	
				54,562½	

R.J.S., 16/10/82.

Minute by Commissioner.

I wish an analysis made of these returns, with a view to ascertain as far as possible, the percentage of good and bad axles of each kind.

The iron axles seem to have been the best; there are no bad iron axles reported, and they have run the largest number of miles. Of course the good steel axles may last as long or longer than the iron axles; they have not been sufficiently long in use to admit of comparative tests in this respect; but then a good number have failed, and I should like to have the percentage of failures to the total supply of each manufacturer.—Ch.A.G., 23/10/82. Loco. Engineer, B.C.

Analysis of good and defective Crank Axles.

Manufacturer.	Material of Axles.	No. of good axles by each manufacturer.	No. of defective axles by each manufacturer.	Total No. of axles by each manufacturer.	Percentage of bad axles.	Total mileage of good and bad axles by each manufacturer.	Average mileage of all axles by each manufacturer.	Percentage of mileage of bad axles to total mileage by same maker.
Vickers, Son, & Co.....	Steel .....	.....	.....	.....	14.51	8,541,115½	83,412.61	17.42
Do	do	106	18	124				
Bolton Iron and Steel Co.	do	5	.....	.....	.....	944,046	213,009	.....
Do	Iron	3	Nil.	8				
Cowper (Leeds).....	do	5	Nil.	5	.....	1,156,090	231,218	.....
Bessemer	Steel	3	Nil.	3				
Krupp	do	2	1	3	33.3	135,212	103,667	56.52
Do	do .....	.....	.....	.....	
Taylor	Iron	2	Nil.	2	.....	365,642	182,821	.....
Monkbridge	do	2	Nil.	2				
No name stated	do	13	Nil.	13	.....	2,452,072	188,620.92	.....
Do	Not stated ...	Nil.	3	3				
						228,062	76,020.66	

It would seem from the analysis that Vickers' steel axles are far from being the best. Whether this arises from defective design or material I do not know. The iron axles seem to have lasted the longest; but then our experience of them is not large, nor is it large of other manufacturers' steel axles, and therefore the axles made by Vickers' may, by this means of comparison, be placed at an undue disadvantage.

If the engineer (Mr. Midelton) is prepared to design an axle, and to recommend that it be made of faggotted iron, I will order some as an experiment.—C.A.G., 13/11/82.

Be good enough to let me have papers *re* last indent for tires half Vickers' and half Krupps'.—C.A.G., 3/1/83.

Let me see letter to Agent-General. Did we mention that the indent was to be divided between Vickers and Krupp.—C.A.G., 5/1/83.

Ask Mr. Midelton to see me about this.

I have seen Mr. Midelton, who informs me that he mentioned Krupp's tires because he considered they were, at all events, as good as Vickers', and under such circumstances it was not undesirable to widen the area of competition. This being so, I concur with Mr. Midelton.—C.A.G., 10/1/83.

The

The Agent-General to The Secretary for Public Works.

Report on Tests of Vickers' Steel.

Sir, 5, Westminster Chambers, Victoria-street, S.W., 12 January, 1883.

Referring to your letter of the 17th April last, in which you requested me to obtain a report from the Consulting Engineer,—

1. As to the test that Vickers' steel will stand for tires.
2. As to the test that Vickers' steel will stand for axles.
3. The names of any other firms which can be relied upon to produce steel to stand the same test.

I have the honor to transmit herein, for your information, the report of Mr. Fowler, as requested by you.

I have, &c.,
SAUL SAMUEL.

Mr. John Fowler to The Agent-General.

Sir, 2, Queen Square Place, Westminster, S.W., 8 November, 1882.

Your letter of the 23rd June, enclosing a communication from the Minister for Public Works, of 2nd March, respecting steel tires and axles, has had my serious attention, and I have now the honor to submit my report.

The questions referred to me for consideration are:—

1. The test that Vickers' steel will stand for tires.
2. The test that Vickers' steel will stand for axles.
3. The names of any other firms which can be relied upon to produce steel to stand the same test.

With reference to the first and second questions, I put myself in communication with Messrs. Vickers, and the following extract from a letter, dated 1st July, will best explain the character of the tests which Messrs. Vickers guarantee their tires and axles will sustain:—

“The tests which we consider the best for the double purpose of safety and durability necessarily differ as between tires and axles.

“Before describing them, we think it important to call your attention to one result of our experience, viz., that a shock, or drop test, is absolutely necessary. It is customary to rely upon a certain amount of elongation under tensile as a sufficient test for safety, but we have found that steel may elongate to a great extent, even after the tire from which the piece tested was cut had quickly broken under blows or shocks, and too much reliance must not be placed on elongation.

“The necessary qualities of steel to constitute a good tire are two, viz., *safety* and *durability*, necessitating two modes of testing.

“The safety test:—‘A monkey, or tup,’ weighing 20 cwt., is so arranged that it can be let fall from any given height up to 33 feet, upon a tire placed in a running position on a solid foundation of cast iron, and no tire should be considered safe unless it will bear deflecting, by repeated blows, one-sixth of its internal diameter, without showing any sign of cracking—thus, a 3-foot internal diameter tire must take a permanent set of 6 inches, and a 6-foot tire must bend 1 foot without sign of fracture, and so on.

“Our ‘Australian’ tires, and every tire we now make, we guarantee to stand this test.

“2. *The test for durability* we make on a piece machined cold to a standard size, out of a tire which has already stood the safety test. This piece is tested to ascertain what tensile strain it will bear, and its elongation is also observed. We consider no tire as sufficiently durable unless it bears a strain of *at least* 48 tons per square inch (with about 10 per cent. to 15 per cent. elongation).

“The test which we consider best for axles is the safety test, as for the tires, but with some difference.

“The axle to be tested is placed on bearings 3 feet apart, on the same solid foundation as the tires, and the 20-cwt. monkey is let fall on the centre between the bearings from a clear height of 25 feet, the axle *being reversed after each blow*.

“We guarantee our carriage axles to sustain, without crack, at least ten such blows.

“A piece machined cold, from the axle, after being tested as above, will bear a strain of from 27 to 30 tons per square inch.

“Our tires and axles will generally exceed these tests (which we guarantee). The tires frequently bear 52 tons per square inch, and the axles also frequently bear sixty blows from 33 feet without fracture; but as ten blows from 25 feet give an abundantly safe axle, we fix this as our guarantee.”

Such are Messrs. Vickers' tests; and in order to ascertain if other firms could supply tires and axles of the above quality, I have, at different times, requested the following firms or makers to furnish me with specimens for testing purposes:—

Messrs. Krupp.

„ Sir John Brown & Co.

„ Cammell & Co.

„ Taylor & Co.

The Patent Shaft.

The Monkbridge Company.

I also obtained and tested tires and axles taken at random from the bulk in course of manufacture by Messrs. Vickers for the New South Wales Railways.

The results of my experiments, briefly stated, are that Messrs. Vickers' tires and axles exceeded the tests guaranteed by them; that no other makers' tires stood the said test, and that one-half of the axles also failed to stand the test; indeed, a single axle of Messrs. Vickers itself bore a greater number of blows than was sustained collectively by four axles supplied by as many different firms enumerated in my list.

With two exceptions, every maker supplied a tire which failed under the falling-weight test before the required degree of bending had been attained, and in those *two cases* the steel was soft, as compared with Messrs. Vickers', the highest tensile resistance which could have been safely guaranteed by these firms being 40·9 tons and 36·73 tons per square inch, respectively, as compared with Messrs. Vickers' 49·48 tons.

With one exception, every maker supplied axles which failed with less than half the number of blows sustained by Messrs. Vickers' axle.

I am of opinion, therefore, that the high reputation enjoyed by Messrs. Vickers' tires and axles is well justified by the results of my tests, and I am not able to submit the names of any other firms which can be relied upon to supply steel to stand the same test.

I am, &c.,
JOHN FOWLER.

The Secretary for Public Works to The Agent-General.

Sir, Department of Public Works, Railway Branch, Sydney, 6 January, 1883.
I have the honor to enclose herein an indent for steel crank axles, and shall be glad if you will obtain and forward the same to the Colony as early as possible.

I have, &c.,
HENRY COPELAND.

Indent for steel crank axles.

Six Steel crank axles as duplicates for goods engines supplied by Messrs. Beyer, Peacock, & Co., Nos. 93 to 102, and 106 to 117. Maker's Nos., 1,643 to 1,648, 1,675 and 1,676, 1,683 and 1,684, and 1,753 to 1,764. Made of Vickers' steel dimensions as per attached tracing. To be delivered in Sydney as early as possible.

Mr. James Brown to The Acting Locomotive Engineer.

Sir, Sydney, 31 January, 1883.
Referring to my letter, May 10th, 1882, addressed to the Commissioner, *re* Messrs. Cammell & Company's "homogeneous charcoal iron" for waggon and carriage axles, and my recent interview with you, I have pleasure in submitting the following prices for straight-rolled axles, 5 dia. x 7 ft. 1 in. long, with roughed-out journal, 1,000 axles, delivered in Sydney Harbour, and guaranteed for a period of twelve months:—£4 18s. 6d. each.

I should also have pleasure in quoting you a price for crank axles from the same material, guaranteed for a similar period.

Hoping to receive a favorable reply,

Yours, &c.,
JAMES BROWN.

Please write and ask Mr. Brown to supply more information respecting this material, "homogeneous charcoal iron:"—1st. Say where it is employed in England for railway axles. 2nd. Is he willing to supply an axle for me to test here in his presence? 3rd. Has he the results of any tests to give or show me?—T.M., 23/3/83.

Mr. James Brown to The Acting Locomotive Engineer.

Dear Sir, Melbourne, 4 April, 1883.
Yours of the 29th ultimo, *re* axles, has been forwarded to me here. I purpose returning to Sydney the end of this week, and will then give you a call.

I shall be able to give you particulars of the test that the axles will stand.

Yours, &c.,
JAMES BROWN.

Mr. S. Yardly to Mr. W. Scott.

Sir, Cast-steel Tires.
5, Westminster Chambers, S.W., 8 January, 1883.
Referring to the order for 1,062 cast-steel tires, which was received from the Honorable the Secretary for Public Works on the 7th December last, in which it stated that they were to be manufactured by Messrs. Vickers, Sons, & Company, or Messrs. Krupp, I now enclose, by desire of the Agent-General, a copy of a letter from Mr. Fowler on the subject, and have to request that you will be so good as to state whether, in your opinion, it would be desirable to procure the tires from Messrs. Vickers, Sons, & Co., or if you would recommend that Messrs. Krupp be allowed to tender for the supply, as well as Messrs. Vickers.

I am, &c.,
S. YARDLY,
Secy., New South Wales Government Agency.

Mr. John Fowler to The Agent-General.

Sir, 2, Queen Square-place, Westminster, S.W., 6 January, 1883.
This indent for steel tires states that they should be of Vickers' or Krupp's make. The quality, and also the price, of these two manufacturers being different, I would suggest that, as Mr. Scott, the Locomotive Superintendent, is in London, he be asked which of the two qualities he considers it would be most advantageous to order.

I am, &c.,
JOHN FOWLER,
(*per* J. D. BALDREY).

Mr.

Mr. W. Scott to The Agent-General.

Department of Public Works, Railway Branch,

Locomotive Engineer's Office, London, 9 January, 1883.

Sir,

In reply to your letter of the 8th, *re* the indent for tires for the Government Railways, New South Wales, I have had considerable experience of both Vickers & Sons' and Krupp's tires. The latter is a very good tire to wear, but is liable to fracture. We have had several of Krupp's tires broken through the tread when under vehicles, but fortunately they were discovered before any damage was done. This, however, was not the case in the late accident on the Hobson's Bay Railway, in Victoria, which was caused by a Krupp tire breaking, causing loss of life and heavy compensation. I would most strongly advise that the tires now indented for be ordered from Vickers & Sons, they being the most reliable. I have not in all my experience on the New South Wales railways ever seen one instance of a broken Vickers' tire.

Yours, &c.,

W. SCOTT.

The Agent-General to The Secretary for Public Works.

Indent for Steel Tires.

5, Westminster Chambers, Victoria-street S.W., 9 February, 1883.

Sir,

With reference to your order for 1,062 cast-steel tires, received under cover of your letter of the 27th September last, No. 3,632, I have the honor to forward herein copies of correspondence between the engineers and myself in regard thereto, from which you will perceive that Mr. Scott has recommended that the order should be placed with Messrs. Vickers & Company for the entire quantity. I have therefore acted accordingly.

I have, &c.,

SAUL SAMUEL.

Minute by Commissioner.

The recent test of the quality of steel made by Vickers and by other steel manufacturers, conducted under the personal inspection of Mr. Fowler, in England, seems to justify Mr. Scott's conclusion that it would be better to give the whole of this indent to Vickers without competition.

It will be seen by the papers that previously I had inquired into the reasons for making it optional whether Vickers' or Krupp's tires should be ordered.

At the same time, while agreeing with Mr. Scott's conclusion, I cannot concur in his reasons for it. The accident which occurred on the Hobson's Bay line in Victoria was through no defect in the tire as manufactured; it was allowed to be worn down much below the minimum, and no tire, even Vickers', could withstand the strain which, in its attenuated condition, the tyre was called upon to stand, and failed to do, on the occasion referred to.—C.A.G., 3/4/83. Locomotive Engineer.

I can with confidence repeat Mr. Scott's words. I, too, have had considerable experience of both Vickers' and Krupp's tires in England, perhaps before either were used in this Colony, and I always found the latter a very good tire to wear, and that is why I prefer them; but I never found them any more liable to fracture than Vickers' or other makers', neither can I find any records here or obtain any information about the "several" Krupp's tires which have broken through on the "tread" when under vehicles. There is an old Krupp's tire in the yard, which is $1\frac{1}{2}$ in. thick, and has a crack through it, and a Bessemer tire broke through (a bolt-hole) some time ago, pieces of which I have.

Mr. Scott has been misinformed respecting the late accident on the Hobson's Bay railway. The tire which broke at Jolimont and caused the accident was one of steel, made by Messrs. Taylor Brothers, of Leeds, and not one of Krupp's make; and when I consider that it was only $\frac{5}{8}$ of an inch thick on the tread, and was further weakened by having at least a $\frac{3}{4}$ hole in it. These facts appear to my mind in the same light as they evidently have to yours, judging from your minute of the 3/4/83, which I am now replying to, that it rather proves the good quality of the Taylor steel than the bad, to have stood so long; and I further consider, if the said tire had been properly fastened to the wheel, so that it could not have come off, the derailment would not have happened at all.—THOS. MIDELTON, 15/4/83. The Commissioner.

Mr. James Brown to The Acting Locomotive Engineer.

Sir,

Sydney, 12 April, 1883.

Replying to yours of the 29th ultimo, Messrs. Cammel & Company's axles are in use on the various English lines, including:—Manchester, Sheffield, and Lincolnshire, London, Brighton, and South Coast, Caledonian and Great Western, and large quantities have been supplied to the Great Indian, Peninsula, Bombay, Baroda, and C. J. Railway.

These axles will show a tensile strength of from 26 to 28 tons, with an elongation of from 25 per cent. to 30 per cent., and a reduction of area of 55 per cent. to 60 per cent.

In the event of the Commissioner entrusting to me an order for these, I am willing to guarantee the above result.

Yours, &c.,

JAMES BROWN.

Mr. James Brown to The Commissioner for Railways.

Sir,

Sydney, 9 February, 1883.

Understanding that an indent will shortly be passed forward to the Agent-General including carriage and waggon wheels, I take this opportunity of soliciting, on behalf of Messrs. Cammel & Company, Sheffield, that they may have the opportunity of having their tires and axles for those specified to the wheel manufacturers, from whom tenders will be obtained.

The Company are leading manufacturers in all classes of steel, employing the highest brands of Swedish irons, and they have and do supply all the leading railway Companies in the class of goods to which I refer.

Among these railways are The Great Western, Midland, North Eastern, Caledonian, London, Brighton, and South Coast railway; Great Indian, Peninsular, Oude and Rohilcund, Indian State, Odessa, &c., &c., &c.

I may mention that they have a plant equal to, and, in many instances, superior to any house in the steel trade, and whatever guarantee or test such irons as Messrs. Vickers & Company or Krupp give, the same can be given and fulfilled by Messrs. Cammell & Company.

Messrs. Cammell & Company have at times addressed themselves to the Agent-General, Mr. Fowler, and Mr. Baldry, on the matter, but it appears this rests on a recommendation being made from Sydney.

I should therefore, on behalf of Messrs. Cammell & Company, esteem it a favour if you would instruct the Agent-General to specify to the wheelmakers their make of tires and axles for some portion of the indent now in preparation, and of others that may be despatched. Hoping to receive a favourable reply.

I have, &c.,

JAMES BROWN.

Forward for report of Locomotive Engineer.—C.A.G., 28/2/83. I see no reason why Messrs. Cammell & Company should not be included with Krupp and Vickers for tires and axles. The waggon wheels are made by other firms generally, in fact always I believe.—J.M., 9/3/83. Commissioner.

I have referred to the Locomotive Engineer the result of some tests of axles and tires, by various manufacturers, which the Inspecting Engineer in England, Mr. John Fowler, has had made at our own request. Mr. Midelton may further report upon this matter when he has perused the papers I have referred to.—C.W.G., 13/3/83.

The Commissioner,— Steel Tires and Axles.

In obedience to your minute of the 13th March, 1883, on your M.P. 83-2,694 herewith, I have the honor to report as follows,—

Having very carefully read and considered all the papers on this subject, especially the report furnished by Mr. John Fowler, C.E., 83-1,725, and Mr. Scott's letter with you, 83-2,561, I confess I hardly see why Mr. Scott, in his letters to you of the 10th and 17th March, 1882, suggested that Mr. Fowler should report, &c., when he seemed so thoroughly convinced that no other but Vickers' steel should be used here for tires and axles, and he still seems to hold that view; this being the case, it is strange that the "Brunswick Steel" was introduced at all, when Vickers' steel has always been found to be the most reliable material. It is probable that Mr. Scott is not responsible for the introduction named.

I notice the first question put to Mr. Fowler is, "The test that Vickers' steel will stand for tires and axles." This, in my opinion, is virtually informing him that we accept Vickers' steel as the best procurable, and that there is no necessity for going further to obtain any better material, and that, whatever test their steel stands, we shall be satisfied with it.

I consider that, instead of asking Messrs. Vickers to name or explain the character of the tests which they guarantee their tires and axles to sustain, it would have been more satisfactory if we, or Mr. Fowler, had stated the tests we wished to apply, and the conditions, &c., under which they should be carried out. If Messrs. Vickers were asked to supply the information referred to, I think, in fairness, the other makers should also have been asked to do the same thing.

I see no reason why the "tests" laid down by Messrs. Vickers is to be considered *correct*, and with all due respect to that eminent firm, and to Mr. Fowler, I decline to accept their views. I do not either see why the other firms named, Messrs. Krupp, Brown, Cammell, Taylor, The Patent Shaft Co., and the Monkbridge Co., should supply material for testing purposes on the conditions laid down by another firm, viz., Messrs. Vickers & Sons.

I observe that Mr. Brown, in his letter to you of February 9th, 1883, states that, whatever guarantee or test such firms as Messrs. Vickers & Sons or Krupp give, the same can be given and fulfilled by Messrs. Cammell & Co.

Mr. Fowler states that with two exceptions every maker supplied a tire which failed under the falling-weight test before *the required degree of bending* had been obtained.

I really cannot accept this as satisfactory, as not a word is said about size or weights of any of the tires.

The results obtained by Mr. Fowler left him, of course, no alternative but to reply to No. 3 question by saying, "I am not able to submit the names of any other firms which can be relied on to supply steel to stand the same test."

I must here point out that I differ wholly with Messrs. Vickers' views respecting tests, as I consider them unnatural and unfair, both for tires and axles, as neither are subjected to the strains their tests impose, in practice. Tires, to be properly and consistently tested, should bear a bursting and, consequently, a tensile strain at the same time; this is exactly what they have to stand when in use, and, of course, the test can be made as great as one pleases.

Tires should not be tested with a falling weight; it is, as an author says, "A rough and ready way," and not only that, but extremely unscientific, too. The falling weight puts the material of a tire in "compression." It would, as you a few days ago remarked to me in your office, be as consistent to test a boiler with a falling weight as it is to test a tire that way. Axles should be tested with a light falling in weight on their journals (and not in the centre); this should be resisted by bearings placed where the wheel sits; they should also bear a severe "Torsional" strain at the same time, such as is put upon them when they have to traverse sharp curves, and over bad joints, crossings, &c., &c.

I send herewith, Vol. LXVII, minutes of proceedings of the I.C. Engineers, where, on page 353, may be seen a paper written by Mr. B. Baker, C.E., on "Steel for Tires and Axles."

I have read this paper over several times, and I notice that Mr. Fowler has accidentally arrived at almost exactly the same result in one or two cases as Mr. Baker has; the figures I have marked in blue pencil are exactly the same, singularly enough.

Tires stood a tensile strain of 40.9 tons and 49.48 tons per square inch respectively. I also herewith send a record of some tests recently made in Victoria, where the tensile strength of Vickers' steel axles is 13½ tons: the least, in fact, of the three makers named.

From

From all the information I can obtain here, I find that Krupp's steel (the first imported) was used in 1867, and that the steel produced by that firm is still giving great satisfaction; their crank axles and tires are certainly equal in every respect, in my opinion, to any other maker; and I know that Messrs. Cammell & Company supply many of the best English lines with their tires and axles; therefore I entirely agree with the recent letter from the Agent-General (83-3,423) herewith, in which he suggests whether it would not be desirable to allow some other brands of steel to be used in the manufacture of tires and axles in addition to that of Messrs. Vickers & Sons.

I would also respectfully suggest that pieces of steel shall be cut from old tires and axles, say 8 inches long and 1 inch square; these pieces to be marked (here), so that we shall know who is the manufacturer, and then sent Home to Mr. David Kircaldy of the Grove, Southwark, to be tested by him; and that he be requested to furnish us with a report saying which specimen he considers the best in all respects for use for tires and axles respectively, and to say whether he knows of any other better material for such purposes.

Mr. Kircaldy has the finest testing works in the world, and he has devoted his whole life to that kind of thing, therefore his report will be most valuable; it certainly cannot be biassed, as he will not know whose steel he is testing.

I am sorry Mr. Scott, who was in London when Mr. Fowler conducted the experiments he refers to, was not present to see what took place. He may have been invited by Mr. Fowler to attend, but perhaps was unable to do so.

THOMAS MIDELTON.

Mr. James Brown to The Commissioner for Railways.

Sir,

Will you kindly oblige me with a reply *re* my letter to you dated 9th February, as to indents for carriage and waggon wheels, through the Agent-General.

Sydney, 7 March, 1883.

I am, &c.,

JAMES BROWN.

The Agent-General to The Colonial Secretary.

Brand of Steel for Tires and Axles.

Sir,

5, Westminster Chamber, Victoria-street, 9 March, 1883.

In continuation of my letter of the 9th February last, in which I replied to the telegram of the Honorable the Commissioner for Public Works of the 1st idem, complaining of the delay in the execution of the order for wheels, axles, and springs, I have the honor to suggest, for your consideration, with the view to save expense in future orders for wheels and axles, whether it would not be desirable to allow some other brands of steel to be used in the manufacture of tires and axles, in addition to that of Messrs. Vickers & Sons.

There are several steel manufacturers of undoubted reputation in the United Kingdom who would give ample guarantees as to the quality of their brands, and, having in view the very high rate paid to Messrs. Vickers & Sons, it appears to me that a very considerable saving would be effected by reasonable competition, and the interests of the Government none the less observed if it were so; moreover, at present Messrs. Vickers have a monopoly, and any manufacturers who may succeed in obtaining an order from this Department for wheels and axles is entirely dependent upon that firm for the supply of the tires and axles, a condition of things not altogether desirable when quick deliveries are necessary.

I have, &c.,

SAUL SAMUEL.

Forwarded to the Locomotive Engineer in reference to conversation I had with him on this subject *re* Mr. Fowler's report that Messrs. Vickers' steel used for axles and tires was the only steel that stood the test.

While I was taken by surprise by this statement, which seemed to me, without other and rebutting testimony, to give Vickers a monopoly of our orders, I asked Mr. Midelton to furnish me with a full report on the subject.*

I also made arrangements with Mr. Scott that he should visit the Brunswick steel-works, with the view of ascertaining the quality of the steel they make for axles and tires.

I am not less surprised than pleased with this representation of the Agent-General—pleased because he seems to differ from Mr. Fowler as to the exclusive quality of Vickers' steel; and surprised,—first, because he made no comment upon Mr. Fowler's report when he forwarded it to the Colony; and, second, because, when we requested him to divide the last indent for tires between Krupp and Vickers, he sought Mr. Scott's advice in the matter, and upon it gave the whole order to Vickers.—C.A.G., 26/4/83.

Seen. I entirely agree with the views of the Commissioner and the Agent-General.—T.M., 30/4/83.

The Acting Locomotive Engineer to The Commissioner for Railways.

Department of Public Works, Railway Branch, Sydney, 26th April, 1883.

Indent for Waggon Tires, as per No. 791, tracing herewith.

KRUPP's or Cammell & Company's 700 Flanged Hoop Tires of Vickers' steel for railway waggon wheels. Internal diameter, 31½ inches. The section of tires to be exactly the same as that of 200 of same size indented for on September 27th last. The measurement given is for the tires in the "rough" state.

* See Report at page 15.

Allowance has been made for turning and boring in the Colony. Each tire to be stamped on its concave side with figures denoting its internal diameter.

Estimated cost of indent, £3,410. Code name, "Common."

THOMAS MIDELTON.

I have not received Mr. Midelton's report upon Mr. Fowler's paper *re* tests made of axles and tires. The Agent-General, in the face of Mr. Fowler's report, has recommended that the steel of other makers be taken, to widen the area of competition.

I do not desire to ignore the Agent-General's recommendations, and yet with the uncombated report of Mr. Fowler, C.E., before me, I do not see how the Department can be justified in ordering other than Vickers' axles and tires. Mr. Midelton will please report.—C.A.G., 7/5/83.

I have since read Mr. Midelton's report, and am disinclined to recommend that those tires be given exclusively to Vickers & Sons. I would prefer that tenders be invited, say from Vickers, Cammell & Co., and Krupp, and that we specify the tests which those tires shall withstand.

Will Mr. Midelton prepare a specification for the purpose.—C.A.G., 8/5/83.

Tire-testing.

The Commissioner,—

In reply to your minute of 8/5/83, on your M.P., 83/3,689, I have the honor of submitting the following specification, tracing, &c., which indicates the test I propose for steel tires in future:—

- 1st. Inspecting Engineer shall select for testing as many tires as he may think fit, say, 1 in every 100.
- 2nd. The tires selected shall be turned and bored to the minimum working thickness of $1\frac{1}{4}$ inches on the "tread-line"; this line, of course, to be distinctly marked on the periphery of the tire with a sharp-pointed tool when the tread of the said tire is being turned.
- 3rd. They are then to be heated as though they were to be shrunk on to a wheel skeleton, then taken out of the furnace and allowed to cool gradually.
- 4th. After this they are to be marked with a fine line at every foot of the circumference, such line to be truly square with the outer face of the tire, and to run across the "tread-line" so that the elongation of the material of the tire can be accurately measured and recorded. The true diameter of the tire to be taken on the tread-line, and recorded before any strain is put upon it.
- 5th. The foregoing being complete, the tire shall then be placed over the segments of the testing machine (see tracing 808), these segments being turned to exactly the size of the internal dial of the tire, pressure is then to be applied to the ram of the press until the tire fractures or elongates to such an extent that the machine will not burst it; when sufficient test has been applied, the elongation of the metal per foot, the pressure per square inch of section the metal withstood, and the total pressure applied to be duly registered. If the tire fractures, a photograph of the face of the fracture should be taken, so as the grain of the metal can be seen.
- 6th. If the tire elongates perceptibly under a pressure of from 10 to 12 tons per square inch of sectional area, the lot from which it was selected should be rejected.
- 7th. If a tire fractures under a pressure of 35 tons per square inch of sectional area, the lot to be rejected.
- 8th. The temperature of the air when a test is supplied should be about 60 degrees.
- 9th. While pressure is being applied to a tire, it would be advisable to subject it to blows on the tread if it can be done with a "flatter" and sledge-hammer without damaging the "tread-line and cross-lines."

The foregoing is a test which is as near as it is possible perhaps to apply to resemble actual daily working and the strains which tires have to undergo.

The tracing indicates the general idea of the proposed testing machine, and if placed in Messrs. Tange Bros.' hands to make, I have no doubt we should secure a good machine, well suited for the purpose it is intended; the same machine would do for any size tires up to 5 feet 6 inches diameter, by simply having segment cast for each size of tire to be tested.

I trust the Commissioner will pardon the delay herein. I have made a great many attempts to complete this work, but on account of the excessive duties I have lately had, I could not do more than I have done.

I suggest that the foregoing conditions and the tracing be sent to Messrs. Tange Bros. and to the Inspecting Engineer, and if it is decided to have a testing machine constructed, it shall become the property of the Government, and be used in England when required.—THOS. MIDELTON, 14/9/83.

I have addressed this to the Commissioner in reply to his minute to me on the subject. I trust the Locomotive Engineer will fully understand.—T.M.

Let me see the proposed conditions for testing tires in print. Draw up a paper for the printer.—C.A.G., 29/9/83.

Mr. Scott has the papers about the tests applied by Mr. Fowler, and the Agent-General's letter recommending extended area of competition for axles and tires. Will Mr. Scott report upon this?—C.A.G., 5/10/83.

Judging by the tire and axle tests of the Inspecting Engineer, and also from our own experience, I believe Messrs. Vickers & Sons to be the best makers. For obvious reasons, it is desirable to widen the field of competition. By the use of the Mansell rings the risk from fracture is reduced to a minimum, so that I consider that, in addition to Messrs. Vickers, Messrs. Krupp and Messrs. Cammell & Company should be considered eligible to tender, as I consider they are the next best makers.—W. SCOTT, 9/10/83.

Indent for Steel Tires for Engine and Tender Wheels.

Sydney, 12 September, 1883.

Weldless hoop tires of the very best quality, tracing No. 840, to be ordered from Messrs. Vickers, Krupp, or Cammell & Company.

No. required.	Internal diameter of tires.	Width of tires.	With or without Flanges.	For engines or tenders.
	Inches.	Inches.		
50	42 $\frac{3}{8}$	5 $\frac{1}{2}$	Flanged.	Engines.
20	31 $\frac{3}{8}$	5 $\frac{1}{2}$	"	"
50	54 $\frac{3}{8}$	5 $\frac{3}{8}$	"	"
100	60 $\frac{3}{8}$	5 $\frac{3}{8}$	"	"
20	63 $\frac{3}{8}$	5 $\frac{3}{8}$	"	"
50	30 $\frac{3}{8}$	5 $\frac{3}{8}$	"	"
100	37 $\frac{1}{8}$	5 $\frac{3}{8}$	"	Tenders.
34	37 $\frac{1}{8}$	5 $\frac{3}{8}$	Flangeless.	"
100	36 $\frac{3}{8}$	5 $\frac{3}{8}$	Flanged.	"
34	36 $\frac{3}{8}$	5 $\frac{3}{8}$	Flangeless.	"

Required to be of the same sections as the engine and tender tires indented for on 27th September last. The measurements given are for the tires in their rough state. Allowance has been made for turning and boxing in the Colony. Each tire to be stamped on its concave side with figures denoting its internal diameter.

Estimated cost of indent, £4,840. Required in Sydney as early as possible. W. SCOTT.

Before sending this indent I wish to have some expression of opinion from Mr. Scott as to the maker or proposed maker of these tires. There is a somewhat curious correspondence herewith, which requires explanation. I refer to Mr. Fowler's report upon Vickers' steel for axles and tires, and the steel of other manufacturers tested by him, and then to the subsequent letter received from Agent-General, in which, in the face of the conclusion which Mr. Fowler's report would lead to, he urges that the area of competition should be widened, as the prices charged by Vickers are so high, &c. This recommendation is again a curious commentary upon the Agent-General's own action in deciding to order from Vickers only an indent for tires, which we requested might be divided between Vickers and Krupp.—C.A.G., 18/9/83.

Judging by the tire and axle tests made by the Inspecting Engineer, and also from our own experience, I believe Messrs. Vickers & Sons are the best makers, but as it is, for obvious reasons, most desirable to increase the area of competition, and by the use of the Mansell rings for fastening the risk from fracture is reduced to a minimum, I would suggest that, in addition to Messrs. Vickers & Sons, Messrs. Krupp and Messrs. Cammell & Company, be considered eligible to tender, as I consider they are the next best makers.—W. SCOTT, 9/10/83.

Locomotive Engineer's Office, 1 March, 1884.

INDENT for tires for engines and tenders, to be ordered from approved makers.

No. required.	Forged size inside diameter.	Thickness of tread of tire.	Width of tire.	
2	5 feet 4 $\frac{1}{8}$ inches	3 inches	5 $\frac{3}{8}$ inches	} Tracing No. 840.
6	2 " 7 $\frac{7}{8}$ "	3 " "	5 $\frac{3}{8}$ " "	
12	3 " 6 $\frac{5}{16}$ "	3 " "	5 $\frac{3}{8}$ " "	
4	5 " 3 $\frac{3}{8}$ "	3 " "	5 $\frac{3}{8}$ " "	
12	3 " 1 $\frac{3}{16}$ "	3 " "	5 $\frac{3}{8}$ " "	
10	3 " 0 $\frac{1}{16}$ "	3 " "	5 $\frac{3}{8}$ " "	
12	3 " 0 $\frac{1}{2}$ "	3 " "	5 $\frac{3}{8}$ " "	
6	3 " 4 $\frac{5}{16}$ "	3 " "	5 $\frac{3}{8}$ " "	
36	3 " 1 $\frac{5}{16}$ "	3 " "	5 $\frac{3}{8}$ " "	
6	3 " 4 $\frac{1}{2}$ "	3 " "	5 $\frac{3}{8}$ " "	

Required at Newcastle. W. SCOTT.

Tires for Railway Rolling Stock.

WE sent away some little time ago—about a month or six weeks—an indent for tires, specifying for approved brand. The term is rather a wide one, and I fear that by open competition, unless a good test be provided, we may have indifferent tires supplied, and jeopardise the safety of the travelling public. In the matter of tires and axles we cannot be too careful.

Let me have indent.—C.A.G., 15/4/84.

In the indent which we have sent recently to England for tires we have mentioned no particular makers. I have before me an axle which looks more like cast iron, and which broke suddenly under one of our cars. I need not point out the danger the train was in by this failure. I must recommend that a cablegram be sent to England, as follows:—

“Indent 1st March, tires, confine competition to Cammell, Krupp, and Vickers, and subject to test approved by Mr. Fowler.”—C.A.G., 23/4/84.

Approved.—F.A.W., 23/4/84.

Indents for Carriage and Waggon wheels and axles.

The Commissioner,—

Herewith I forward indents for 2,900 pairs of carriage and waggon wheels and axles, and in doing so desire to point out that of the 1,100 pairs recently indented for 500 pairs were (I learn through an unofficial source) ordered from the Brunswick Steel Company. Our experience of this Company's axles shows

shows that they are not reliable, three having broken under our waggons whilst running. I would therefore suggest that, as Mr. A. Vickers is now in Sydney, you have an interview with him, with the view of inducing him to make such a reduction in price as may make it worth while placing with his firm the order for the whole of the 2,900 pairs now required.

I need scarcely add that the tires and axles hitherto supplied by Messrs. Vickers have given us entire satisfaction, not one of them having broken, and that the firm enjoys a very high reputation both in England and France.

W. SCOTT, 7/5/84.

I have communicated with Mr. Vickers on this subject, and he at first offered to supply the wheels with axles and tires complete at £18 7s. 6d. per pair. This price compares very favourably, looking to the superiority of the tires and axles, with the prices at which we have previously obtained these supplies, but there is no speciality in regard to the wheels, and I therefore wished to limit the order to Vickers & Sons to the axles and tires. He then offered to supply the latter at £22 per ton, that being the lowest price to the trade in England. They had previously charged this Government the uniform price of £26 per ton.

I pointed out to Mr. Vickers that I considered £22 a ton a high rate in view of the fact that we proposed to name his firm only for these supplies, and his letter of this date followed, offering to reduce the price to £18 per ton on certain conditions, viz., that we do not make known the price to wheel-makers and others in the trade.

I share with the Locomotive Engineer the anxiety he expresses to get the best material only for our tires and axles, and as Vickers' price has been reduced to the lowest point, I must recommend the Minister to stipulate for Vickers' axles and tires at the terms he offers.

The Inspecting Engineer (Mr. Fowler) has already reported that Vickers' axles and tires, are the best made, and our experience supports this conclusion.—C.A.G., 29/5/84.

Have Vickers' axles been subject to a trial; if not, I think they should be tested fully before any definite action is taken to limit our supply to that firm.—F.A.W., 29/5/84.

Yes; they have been subjected to the fullest trial. At the request of the Government, Mr. John Fowler wrote to all the established firms in England to make samples of their best axles and tires, and he took promiscuously from Vickers' establishment some tires and axles they were making for us to test them against those specially made. In every case Vickers' material surpassed those submitted; in fact, other tires and axles could not approach those made by Vickers. I have always contended that price—in such vital portions of the rolling-stock as axles and tires—should be only considered when other conditions were equal, and though Vickers' prices were higher than most of the other manufacturers, we nevertheless ordered Vickers' supplies.

I have taken the opportunity of Mr. Vickers being here to represent to him the necessity, if orders are to be continued to him, for his reducing his charges, and he has consented to reduce them from £26 to £18 per ton, provided that the price is not made known; the axles have recently been tested in the Colony, and the test fully bears out Mr. Fowler's tests.—C.A.G., 30/5/84. Approved.—F.A.W., 30/5/84.

Make copy of Mr. Vickers' letter, and return to him in letter accepting his terms. Send copy of letter to Agent-General, and request that the conditions of the contract in regard to the non-divulgence of prices may be observed.—C.A.G., 30/5/84.

Mr. Albert Vickers to The Commissioner for Railways.

Sir,

The Union Club, Sydney, 16 May, 1884.

In pursuance of a conversation with you this morning, I have the honor, on behalf of Vickers, Sons, & Co. (Limited), to tender for the supply of 2,900 pairs of wheels and axles to the drawing of the Department.

The tires and axles to be of Vickers' cast steel of the best quality they make, and subject to the test usually made by your Inspecting Engineer, for which purpose 2 per cent. of axles and tires shall be made and tested free of charge.

The wheels, when finished, to be also, of course, subject to the usual inspection.

2,800 pairs of 3 ft. 0½ in. diameter wheels, at £18 5s., price per pair delivered free on board in Liverpool.

2,800 pairs of 3 ft. 0½ in. diameter wheels, at £18 7s. 6d. per pair delivered f.o.b. in London.

100 pairs of 3 ft. 6½ in. diameter wheels, at £20 5s. " " Liverpool.

100 pairs of 3 ft. 6½ in. diameter wheels, at £20 7s. 6d. " " London.

The prices are the lowest at which any Company have ever tendered, and we trust the Department may favour us with an acceptance of it.

I am prepared to accept the same price for any increased number beyond 2,900 pairs, up to, but not exceeding, 5,000 pairs in all.

I have, &c.,

ALBERT VICKERS,

Managing Director of Vickers, Sons, & Co. (Limited).

Will Supt. of Stores please let me know how these prices compare with the prices for Vickers' axles obtained through Agent-General, and also the Brunswick axles.—C.A.G., 17/5/84. Urgent.

The last importations are as under—

Dec., 1883. Supplied by the Patent Shaft and Axle-tree Company.
3 ft. 0½ in. wheels (waggon) with Vickers' cast-steel axle and tyres:—
English cost.....£17 10s. per pair.
Vickers' price£18 7s. 6d. „

3 ft.

3 ft. 6½ in. carriage with Vickers' cast-steel axles and tires:—
 English cost.....£19 18s. 6d. per ton.
 Vickers' price..... £20 7s. 6d. ”
 3 ft. waggon per pair, £17 2s. No carriage received with these axles.

A.R. The Commissioner, 20/5/84.

I have seen Mr. Scott, as directed. Considerable alterations for improving and strengthening the wheels and axles were made in the specification. Mr. Scott cannot say reliably what this would amount to in increased cost, but thinks the difference would not be far short of £3 per pair of wheels and axles. The difference will not certainly be ascertained on receipt of first invoice, for 1,100 pairs ordered on Oct. 3rd, 1883, to the new design. This advice may be expected shortly.—A.R., 27/5/84.

Price paid for Vickers' cast-steel tires for carriages and waggons during last two years:—
 Date of invoice— January 31st, 1882—500—£26 per ton.
 April 19th, 1883 — 95—£26 ”
 May 11th, 1883 —440—£26 ”
 June 9th, 1883 —115—£26 ”

A. RICHARDSON.

Weight of tires—Waggon, 3 ft. 0½ in.—3 cwt. 2 qr. 23 lb.
 Carriage, 3 ft. 6½ in.—4 cwt. 1 qr. 5 lb.

Price of 3 ft. 6½ in. wheels with Vickers' tires but no axles:—
 £8 3s. 6d. each = £16 7s. per pair.
 With Vickers' tires and axles, £19 8s. 6d. per pair.
 Diff. cost of axles, £3 11s. 6d.

Price of Taylor Bros.' iron axles for carriages and waggons, £21 18s. 9d. per ton.

A. RICHARDSON, 28/5/84.

Mr. Albert Vickers to The Commissioner for Railways.

Sir,

The Union Club, 27 May, 1884.

In the event of your inserting our name alone for the tires and axles required for wheels to be indented for, I hereby undertake that we will quote no higher price to any wheelmaker than £22 per ton.

I am, &c.,

ALBERT VICKERS,

A Managing Director of Vickers, Sons, & Co., Sheffield.

The Locomotive Engineer to The Commissioner for Railways.

Dear Sir,

Locomotive Engineer's Office, 28 May, 1884.

After leaving you this morning I called upon the Superintendent of Stores, and obtained from him the prices paid for previous supplies of Vickers' cast-steel tires, which I enclose.

I am, &c.,

W. SCOTT.

Mr. Albert Vickers to The Commissioner for Railways.

Sir,

Union Club, Sydney, 28 May, 1884.

In reference to my tender of recent date for the supply of wheels and axles, in view of your expressed preference not to make a contract with my firm here in the Colony, but rather to insert our name alone on my undertaking not to charge wheelmakers tendering more than a fixed figure for the tires and axles, I have to point out to you that our general trade with wheelmakers would be injured, because we are not willing to sell tires and axles generally as low as we are willing and anxious to sell to the Government. I beg, therefore, to suggest a mode by which the Government can obtain the benefit of the utmost reduction in price we are prepared to make, and yet protect us from the anticipated injury above indicated, viz. :—

We hereby offer to sell to the Government 2,900 axles and 5,800 tires, at £18 per ton, and agree to deliver them free of freight charges at the works of any wheelmakers in England.

The Government will then be in a position to invite tenders for the wheels and axles complete, the Government delivering the tires and axles in the forged state free at the works of the wheelmakers.

The object of this offer, as far as we are concerned, will be the clearer when I state that we are constantly receiving orders from wheelmakers at much higher prices than we name above, and these wheelmakers would object to pay more for other orders than they do for yours, and so break down our general prices, whereas we desire only to make this concession to your Government.

A condition we must ask is, therefore, that all due care be asked not to have this our price divulged.

In regard to future orders we shall be glad to try to continue at same price, but we cannot bind ourselves beyond some specified number, say 5,000 axles and 10,000 tires for delivery any time during 1884–1885. Should you accept this offer, I beg you to give me, with your acceptance a copy of this letter.

I am, &c.,

ALBERT VICKERS.

The Commissioner for Railways to Mr. Albert Vickers.

Sir,

Department of Public Works, Sydney, 31 May, 1884.

I have the honor to acknowledge the receipt of your letter of the 28th instant, offering to supply to this Government 2,900 axles and 5,800 tires, and further supplies required during the years 1884 and 1885, at £18 per ton, delivered free at the works of any wheelmaker in England, and have to inform you that your offer is accepted.

I enclose copy of your letter. A copy will also be sent to the Agent-General, with a request that he will not divulge the price at which you have undertaken to supply.

I have, &c.,

CHAS. A. GOODCHAP,

Commissioner for Railways.

The

The Secretary for Public Works to The Agent-General.

Sir, Department of Public Works, Railway Branch, Sydney, 31 May, 1884.

I have the honor to inform you that Mr. Vickers' tender to supply 2,900 axles and 5,800 tires, and further supplies required during 1884 and 1885, at £18 per ton, delivered free at the works of any wheelmaker in England, has been accepted.

I enclose a copy of Mr. Vickers' letter, and shall be glad if you will observe his wish that his price may not be divulged.

I have, &c.,

F. A. WRIGHT,

Secretary for Public Works.

P.S.—The indent for wheels will follow.

Minute by Commissioner.

I wish also an explanatory letter written to Agent-General of the reasons we have taken this step about the axles and tires, and say that several axles of the Brunswick Steel Company's make (Patent Shaft Company) have failed with us, one so completely that a portion of it is being sent to him to show what wretched unreliable material it is made of,—that a test has been made here of Taylor's, Patent Shaft Company's, and Vickers' axles, and the last named have been proved to be so immeasurably superior that it has been decided to order them in future. Advantage was taken of one of the Directors of Vickers & Company being in Sydney to make a contract with him, the particulars of which have already been communicated, and that a large quantity of axles and tires sent out for the Victorian railways have been condemned as being of inferior quality; and looking at the great risk that is being run by the use of inferior axles and tires, it has been decided, though we may pay a little more for them, to obtain those which have been tested and found to be of the best quality.—C.A.G., 2/6/84.

The Secretary for Public Works to The Agent-General.

Sir, Department of Public Works, Railway Branch, 9 June, 1884.

I have the honor to enclose herein indent for fittings required under five years' contracts, ending December, 1888, for the Great Southern, Western, Richmond, and Northern Lines, and shall be glad if you will obtain and forward the same to the Colony as early as possible.

I have, &c.,

ALEX. STUART,

Secretary for Public Works.

INDENT for fittings required under five years' contract, ending December, 1888, for Great Northern Line:—

800 pairs of waggon wheels and axles to drawing No. 817 (already in possession of the Agent-General) 3'0 $\frac{1}{2}$ " diameter on tread, 6'3 $\frac{1}{4}$ " C to C journals (with new tire fastenings); code name, "Assurance."*

40 pairs of carriage wheels and axles to drawing No. 818 (already in possession of the Agent-General) 3'6 $\frac{1}{2}$ " diameter on tread, 6'4 $\frac{1}{4}$ " C to C of journals (with new tire fastenings); code name, "Precaution."*

1,200 ordinary waggon bearing springs, to drawing No. 184 (already in possession of the Agent-General), for four-wheeled goods stock; code name, "Alpha." To have wrought-iron buckles, as shown on drawing No. 879 herewith.

100 nests spiral bearing springs, for bogie passenger stock, to drawing No. 189 (already in possession of the Agent-General); code name, "Nest."

157 new standard draw and buffer springs, for passenger and goods vehicles, to drawing No. 887 herewith, code name "Spiral," or to tracing No. 892 herewith, code name "Sterne."

1,200 volute springs for side chains to drawing No. 226 (already in possession of the Agent-General); code name, "Safety."

To be delivered at Newcastle.

It should be distinctly understood that if the "Sterne" springs be supplied the price paid for them should not exceed that of the Timmins springs; code name, "Spiral."

Indent for fittings required under five years' contract, ending December, 1888, for Southern, Western, and Richmond lines.

2,000 pairs of waggon wheels and axles, to drawing No. 817 (already in possession of the Agent-General), 3'0 $\frac{1}{2}$ " diameter on tread, 6'3 $\frac{1}{4}$ " C to C of journals (with new tire fastenings); code name, "Assurance."

60 pairs of carriage wheels and axles, to drawing No. 818 (already in possession of the Agent-General), 3'6 $\frac{1}{2}$ " diameter on tread, 6'4 $\frac{1}{4}$ " C to C of journals (with new tire fastenings); code name, "Precaution."

2,000 nests of spiral bearing springs to drawing No. 189 (already in possession of the Agent-General), for bogie passenger, stock; code name, "Nest."

5,000 bearing springs to drawing No. 184 (already in possession of the Agent-General), for four-wheeled goods stock with buckles as per drawing No. 879 herewith; code name, "Alpha."

200 break-van bearing springs (fourteen plates) to drawing No. 600 (already in the possession of the Agent-General); code name, "Van."

100 break-van bearing springs (eleven plates) to drawing No. 565 (already in possession of the Agent-General); code name, "Compo."

3,000 steel volute buffer springs to drawing No. 194 (already in the possession of the Agent-General); code name, "Volute."

2,395 new standard draw and buffer springs for passenger and goods vehicles, to drawing No. 887 herewith; code name, "Spiral," or to drawing No. 892 herewith; code name, "Sterne."

3,000 volute springs for side chains to drawing No. 226 (already in possession of the Agent-General); code name, "Safety."

To be delivered at Sydney.

It should be distinctly understood that if the "Sterne" springs be supplied the price paid for them should not exceed that of the "Timmins" springs; code name, "Spiral." Engine

* Cast-steel tires and axles.

Engine and Tender Tires.

The Commissioner,—I enclose herein an indent for the supply of engine and tender tires for the Great Southern, Western, and Northern lines, and it will be observed that a "code" name has been given to each description of tire.

All our engine and tire sections and diameters are embraced therein, and future indents will be made out in the same form as the present one.

In cases of emergency cablegrams would simply indicate the number required and code name. *Vide* my M.P. 83/2,436, Commissioner's 83/6928, forwarded by Commissioner on 11/4/83, the other particulars being obtained in London from inspection of the schedule.

Two photographic blue-print *fac-similes* are also herewith.

W. SCOTT, 14/8/84.

Recommended.—C.A.G., 25/8/84. Approved.—F.A.W., 4/9/84.

The Secretary for Public Works to The Agent-General.

Sir, Department of Public Works, Railway Branch, Sydney, 16 September, 1884.

I have the honor to enclose herein an indent for engine and tender tires (for renewals), the whole to be in accordance as regards section and internal diameter with the accompanying tire schedule, tracing No. 916, and shall be glad if you will obtain and forward the same to the Colony as early as possible.

I think it would be advisable to obtain offers from the recognised good makers for these articles; but if Messrs Vickers & Son are prepared to supply them at a price which compares favourably with the others—that is, quality considered—their offer should be accepted in preference to any other, as their tires have been found to be the most reliable make we have used.

I have, &c.,
F. A. WRIGHT,
Secretary for Public Works.

The Locomotive Engineer to The Commissioner for Railways.

Locomotive Engineer's Office, 16 September, 1884.

INDENT for engine and tender tires (for renewals), the whole to be in accordance as regards section and internal diameter with the accompanying Tire Schedule—Tracing No. 916.

Where required.	Number of each required.	Code Name.	Internal diameter forged.
			ft.
Required in Sydney by sailing ship as soon as possible	350	" Camera "	42 $\frac{1}{4}$
	950	" Canton "	37 $\frac{1}{4}$
	50	" Castle "	42 $\frac{1}{2}$
	75	" Camden "	36 $\frac{1}{2}$
	100	" Cement "	42 $\frac{3}{8}$
	45	" Citron "	36 $\frac{3}{8}$
	75	" Credit "	36 $\frac{3}{8}$
	50	" Tackle "	27 $\frac{1}{4}$
	50	" Taurus "	60 $\frac{3}{4}$
	50	" Tavern "	30 $\frac{3}{8}$
	50	" Rafter "	24 $\frac{3}{8}$
	100	" Ramble "	30 $\frac{3}{8}$
	40	" Dangar "	42 $\frac{3}{4}$
	20	" Dental "	31 $\frac{3}{8}$
	10	" Depute "	67
	Required in Newcastle by sailing ship as soon as possible	20	" Landan " .....	42$\frac{3}{4}$
20		" Latent "	42 $\frac{3}{4}$
60		" Camera "	42 $\frac{1}{4}$
24		" Tackle "	27 $\frac{1}{4}$

Also the following waggon tires for renewals :—

Where required.	No. of each required.	Internal diameter forged.	Remarks.
		ft.	
In Newcastle (by sailing ship) as soon as possible	24	32 $\frac{3}{8}$	} Section to be as shown on tracing No. 791; code name, "Common"; in possession of Agent-General.
	24	32 $\frac{7}{8}$	

All the foregoing tires to be in the "rough" or forged state. Internal diameter to be stamped on inside of each tire, and code name painted on (in white) also.

I would recommend that the Agent-General be requested to obtain offers from the recognised *good makers*, but that if Messrs. Vickers & Son are prepared to supply them at a price which compares favourably with the others—that is quality considered—their offer should be accepted. I much prefer Vickers' make, and if their offer be at all reasonable I recommend its acceptance in preference to any other, as their tires have been proved to be the most reliable make we have used.

Estimated cost of whole indent, £17,035.

W. SCOTT,
Locomotive Engineer.

Recommended.—CHAS. A. GOODCHAP, 5/9/84. F.A.W., 5/9/84.

The Secretary for Public Works to The Agent-General, London.

Sir,

Department of Public Works, Railway Branch, Sydney, 2 October, 1884.

In further reference to my letter to you of the 31st ultimo, *re* order for Vickers' axles and tires, I may say that the reason which induced the Government to give the order was on account of the failure of several axles of the Brunswick Steel Company's make (Patent Shaft Company) and the proved superiority of the Vickers' manufacture over all others. One axle of the Brunswick make failed so completely that a portion of it is being sent to you to show what wretched and unreliable material it is made of.

A test was made here of Taylor's Patent Shaft Company's and Vickers' axles, and the last named have been proved to be so immeasurably superior that it has been decided to order them in future. Advantage was taken of one of the Directors of Vickers & Company being in Sydney to make a contract with him, the particulars of which have already been communicated.

I may add that a large quantity of axles and tires sent out for the Victoria railways have been condemned as being of inferior quality; and looking to the great risk which is being run by the use of inferior axles and tires, it has been decided, though we may pay a little more for them, to obtain those which have been tested and found to be of the best quality.

I have, &c.,

F. A. WRIGHT.

Crank axle required for engine No. 77.

The Commissioner,—

In consequence of the breaking of the crank axle of engine No. 77, at Macdonaldtown, on the 2nd inst., it is necessary that another should be obtained at the earliest possible date to replace it, and I recommend that the following cable be at once despatched to the Agent-General:—"Despatch one Hull," which means by the cable code in Agent-General's possession: "Despatch per first steamer one steel crank axle for engine No. 77."

W. SCOTT, 11/11/84.

Prepare cablegram.—C.A.G., 14/11/84.

The Secretary for Public Works to The Agent-General.

Sir,

Department of Public Works, Railway Branch, Sydney, 29 November, 1884.

I have the honor to confirm my cablegram to you of the 19th instant, respecting a crank axle required for engine No. 77, viz., "Despatch one Hull," which means by the cable code in your possession: "Despatch per first steamer one steel crank axle for engine No. 77."

I have, &c.,

F. A. WRIGHT.

The Secretary for Public Works to The Agent-General.

Sir,

Department of Public Works, Railway Branch, Sydney, 26 November, 1884.

I have the honor to enclose herein an indent for workshop machinery and spare engines, wheels, &c., for the Great Northern Railway, and shall be glad if you will obtain and forward the same to the Colony as early as possible.

I have, &c.,

F. A. WRIGHT.

Indent for workshop machinery and spare engines, wheels, &c., for Great Northern Railway. EIGHT pairs of Ehrhardt's patent portable steelyard weighing machines, to suit double-headed rails, and similar in all respects to those already supplied.

One pair leading wheels and axles.

" driving " "

" trailing " "

Two pair bogie " "

These wheels and axles are required for renewals for the outside cylinder bogie goods engines supplied by Messrs. Beyer, Peacock, & Co. makers' Nos., 2,073, &c. The whole to be fitted and finished, eccentrics and crank-pins included, and ready for immediate use on arrival. The tires and axles to be of Vickers' manufacture, and the workmanship and material generally to be of the highest and best standard.

One pair of outside cylinders (right and left) for the same class of engine—18 in. bore x 26 in.; stroke precisely similar to those indented for on 6/8/84.

The material and workmanship to be of the highest standard.

The wheels, axles, and cylinders to be obtained from Messrs. Beyer, Peacock, & Co., Manchester. Required at Newcastle.

Cablegram.

Vickers,

Railway Commissioner, Sydney.

"SEEN Agent-General about the 2,000 engine tires, £24 per ton, lowest possible price; if accepted, we offer make five years' contract same price, and extend to same term. Existing contract for carriage-tires and axles, although last, leaves only 30s. ton profit; can't conceive why contract for carriage-tires and leave engine-tires for open tender—latter bring ten times greater risk. Cable reply to Agent-General, who knows of this message."

Telegram from Mr. Vickers respecting tires for engines, received 10 p.m., 5/12/84.

Mr. VICKERS proposes to supply indent at £24 a ton, and to extend these terms to all engine tires required in next five years.

How does £24 compare with prices previously paid to Vickers and others?

I should like to have both axles and tires of Vickers' steel, as all authorities concur in the opinion that they are superior to any, but we may be asked to pay too much without competition, although, as I have repeatedly said, in the working parts of wheels, upon the security of which life and safety so much depend, I am not disposed to consider price as the only criterion.

As

As regards axles for carriages and waggons, we brought, by a judicious pressure, Mr. Vickers' price down from £24 a ton to £18. I am disposed to favourably entertain another bargain if one can be made.—C.A.G., 6/12/84. Mr. Scott for report.

The price asked, £24 per ton, is considerably below what we have been paying for these goods. The tires last received from Messrs. Vickers cost £32 per ton; we have not imported any other make for some years. I am not, of course, aware of the prices of the other tenders received by the Agent-General, but I do not think we can get reliable engine tires at a less price than £24 per ton, and, in view of the dependence to be placed upon those of Messrs. Vickers' manufacture, I am strongly of opinion that we should accept their offer to supply this order at £24 per ton.

It is of the utmost importance that we should obtain goods of this class, of the very best make, even when the prices are a little higher, as I believe it is more than compensated for in the greater security we ensure in running our trains, and, in my opinion, in material of this description the best article is the most economical in the end.

I much prefer Messrs. Vickers' make of tires, and strongly recommend that this order be placed in their hands, at the price quoted, viz:—£24 per ton.—W. SCOTT, 10/12/84. The Commissioner,

No doubt the appearance of competition has brought down Vickers' price; I should be loth to accept other tires even if the old price, £32 per ton, had been maintained; but £24 per ton I strongly recommend acceptance.—CH.A.G., 12/12/84. Approved.—F.A.W., 12/12/84.

Cablegram to Agent-General as under.

ACCEPT Vickers' tender for engine tires, £24, for five years.—CH.A.G., 12/12/84.

SAMUEL,—

Accept Vickers' tender for engine tires, £24, for five years.—F. A. WRIGHT. Secretary for Public Works, *per* C.A.G. London.

Mr. James Brown to The Commissioner for Railways.

Dear Sir,

Sydney, 24 December, 1884.

Referring to my interview with you last week, *re* a matter of 2,000 engine tires, for which Messrs. Cammell & Co. has quoted in London £20 per ton.

I have another cable from them intimating that they are willing to let this price stand to your Government for a period of five years.

The quality to be of their special best, suitable for the Colonial climate, and equal to any that can be submitted to you.

Hoping you will forgive my persistency in this matter, and accept the fact of my duty to the firm I represent as an apology for this letter.

I am, &c.,

JAMES BROWN.

The Locomotive Engineer has reported against the use of Cammell's tyres—their wheels have disappointed us; acknowledge receipt, and say cannot entertain proposal.—CHAS. A. GOODCHAP, 30/12/84.

The Commissioner for Railways to Mr. J. Brown.

Sir,

Department of Works, Railway Branch, Sydney, 31 December, 1884.

Referring to your letter of the 24th instant, respecting the adoption of Messrs. Cammell & Company's tires upon the railways of this Colony, I have the honor to inform you that the matter has been considered, but I am unable to entertain your proposal.

I have, &c.,

CHAS. A. GOODCHAP,

Commissioner for Railways.

Cablegram.

Vickers,

Railway Commissioner, Sydney.

"AGENT-GENERAL declines sign contract according your telegram of acceptance, because of subsequent competing offer. We beg Government instruct agent adhere our contract."—31 December, 1884.

The Agent-General to The Under Secretary for Public Works.

London.

"CAMMELLS, learning of contract from their Sydney agent, offer to supply engine-tires at £20 per ton. Vickers knows of your instructions in telegram fifteenth, but this offer not formally accepted by me. Shall I adhere to your instructions, or invite competition."

SAMUEL, 24/12/84.

Railways.—J.R., 30/12/84.

I hardly think it would be fair to alter decision simply because a rival firm having heard of Vickers' price has cut below him to the extent of £4 a ton, but still the question is one for Minister's decision, and to enable Mr. Wright to finally decide, I wish to have Mr. Scott's report, 1st, as regards the probable quality of Cammell & Company's tires at £20 per ton. (Tires can be obtained at all manner of prices, but the best tires at £30 a ton are worth more than inferior ones at £20).

In this case, after having previously paid £32 a ton for the best tires made, we are offered the same tires at £24 a ton.

2nd. If Mr. Scott considers Cammell & Company's tires will probably be good enough, what will the probable saving be on our requirements at a difference of £4 a ton?—CH.A.G., 3/1/85.

Mr. Scott.—Urgent.

Engine Tires ordered from England.

Please see your minute of 3/1/85. We have at present in store a number of Cammell's carriage and waggon tires, and we are now boring out and turning up a number of them. We find them very irregular

irregular in hardness, and quite white in colour; some of them are so hard that a tool will scarcely cut them, and others are moderately soft.

With Vickers' tires we find, in working them, that they are all of an uniform hardness, tough, and a good colour; and my opinion is that the very hard tires of Cammell & Company's make are not nearly so reliable as Vickers', and may at any time break under vehicles when running. There is much more labour in working Cammell's tires than Vickers', and this is of some consideration in fixing the first cost.

The man now turning up Cammell's tires reports that it took him sixteen hours to turn up one pair, and in other cases nine to ten hours, while Vickers' can be done in from seven to eight hours. It is impossible, when turning up very hard tires, to cut them lightly after they have been running under vehicles, and we are compelled to take off a good cut to get under the hard worn tread. In this way they are cut to waste, and when they get thin are liable to break.

With the ordinary hard tires, such as Vickers', we can take a light cut off just sufficient to turn them true, and this is done in much less time than it takes to cut hard tires, such as Cammell's, besides the saving of material, and consequent longer life of the tire.

I think it is one of the worst policies that could be pursued to purchase tires merely because they are cheap. The first consideration should be quality, and I have no hesitation in stating that Vickers' manufacture is infinitely to be preferred to that of Cammell's.

This is an article, in the equipment of a railway, which may prove dear at any price. One accident with a bad tire would no doubt eat up much more than the saving of a few pounds in first cost, and the Department would be censured—justly so, too—for purchasing cheap material at the sacrifice of safety in running. Cheapness in this case merely means, I fear, inferiority. No doubt Messrs. Vickers & Company could reduce their price below Cammell's, but it would only mean getting an inferior article. Tires, like anything else, can be got at all prices, but for a really good and reliable article we must be prepared to pay a fair price.

We know Vickers & Company's tires, and as they offer them at a greatly reduced price for a five years' contract, I not only strongly recommend, but urge, that Messrs. Vickers & Company's offer be accepted in preference to Cammell's.—W. SCOTT, 5/1/85. Commissioner.

I think the Minister should adhere to his decision to obtain these tires from Vickers.—C.A.G., 7/1/85. Approved.—F.A.W., 7/1/85.

The two enclosed cablegrams are forwarded for transmission through the usual course.—D. VERNON, per D.C.M'L., B.C., 9/1/85. Urgent.

London, Vickers & Sons. "Refer to Agent General."—CHARLES A. GOODCHAP, 9/1/85.

London, Samuel. "Adhere to instructions about engine tires."—F. A. WRIGHT, per CHAS. A. G., 9/1/85.

Mr. James Brown to The Commissioner for Railways.

Dear Sir,

Sydney, 6 January, 1885.

In reply to yours of the 31st ultimo, I wish to draw your attention to the fact that Messrs. Chas. Cammell & Company, Limited, Sheffield, are in no ways anxious to press on you the adoption of their manufactures, on any other footing than that of quality, to be submitted to testing either at Home or here, as you may desire.

Up to the present we have had no opportunity of competing for the supply of these manufactures to your Government.

All the indents so far passed Home, Messrs. Cammell & Company inform me, are either specified to a particular "house" or (irrespective of our price and the offers we make to submit tests) placed with the same firm.

You will easily understand the awkward position I occupy to the firm I represent, inasmuch as they have the confidence of your Government in the matter of steel rails, not only looked at by the quantities that have previously been supplied, but by your present contract extending over a period of three years.

They naturally wish to know how it is that while in the matter of rails, which they have hitherto often supplied, they have the confidence of the New South Wales Government, yet on the question of tires and axles they have been excluded.

Messrs. Cammell & Company write me, and that naturally, that if they are not permitted to supply the New South Wales Government in the matter of tires and axles, of course they cannot be expected ever to have the opportunity of gaining your confidence.

I trust you will look upon this letter as in no way disrespectful, but the pressure my house puts upon me compels me to ask you to kindly look into the matter before giving such a decision as your note implies.

I am, &c.,
JAMES BROWN.

P.S.—I have recently seen, from England, copy of a report submitted to the Agent-General by Mr. John Fowler; so far as this question is concerned, that report does not touch it.—J.B.

Acknowledge receipt, and put with other papers.—CHAS. A. G., 8/1/85.

Mr. James Brown to The Secretary for Public Works.

Sir,

Sydney, 7 January, 1885.

May I take the liberty of addressing you a few lines on the subject of the manufacture of tires and axles by Messrs. Charles Cammell & Company (Limited), Sheffield.

I may mention I have had repeated opportunities of seeing the Commissioner, who has at all times met me most cordially, but from some cause I am unable to understand is prevented from permitting my house the opportunity of business with your Government in the matter of tires and axles.

My letter addressed to the Commissioner, yesterday, will show you how the matter stands, and I trust you will be able to give Messrs. Cammell & Company (Limited) at least an opportunity of obtaining

the position the seek to occupy in relation to your Government in the matter of trade. Apologising for thus troubling you,—

I am, &c..

JAMES BROWN.

The Minister has had Mr. Scott's report upon the merits of Vickers' tires, and the inferiority of Cammell & Company's, and has decided that his directions for the importation of Vickers' tires for our rolling stock must be adhered to.—C.A.G., 8/1/85. Approved.—Inform.—F. A. W., 9/1/85.

The Commissioner for Railways to Mr. James Brown.

Sir, Department of Public Works, Railway Branch, Sydney, 12 January, 1885.

I have the honor to acknowledge the receipt of your letter dated 7th instant, addressed to the Secretary for Public Works, asking on behalf of Messrs. Cammell and Company, of Sheffield, for permission to tender for the supply of tires and axles. In reply, I am directed by Mr. Secretary Wright to inform you that the matter has been considered, but, under the report of the Locomotive Engineer, he is unable to approve of a compliance with your request.

I have, &c.,

CHAS. A. GOODCHAP,

Commissioner for Railways.

Mr. Albert Vickers to The Secretary for Public Works.

Sir,

London, 8 January, 1885.

We beg to address you with reference to the telegraphic communications which have already passed between us, the Commissioner for Railways, and the Agent-General, with reference to a contract for engine tires, and we do so in the belief, founded upon a long course of business with your Government, that we may rely upon receiving the most courteous attention and the fairest treatment.

We need hardly recall your attention to the many contracts into which we have entered with your Government, and the satisfactory way in which they have been performed.

We had not pressed for a contract for engine tires, thinking that the benefit which the railways of the Colony derived from the use of our manufacture was sufficient to ensure us orders for the engine tires also.

Recently, however, the Agent-General received instructions to invite tenders for engine tires, and in dealing with the tenders to give a certain preference to us, founded, no doubt, upon what we venture to think the well-grounded character for superiority which our manufactures have acquired.

In the course of an interview between Sir Saul Samuel and our Mr. Albert Vickers, the inconvenience attending such a course was a matter of discussion. We have never pretended that our tires were so cheap in the price per ton as those of other makers. We believe that our manufactures are much superior in quality to others, and we ask a price higher than that asked by them, but we believe the higher price is more than compensated for by the immunity from accidents which the use of our material ensures. Such a state of things we submit makes the ordinary course of tender quite inapplicable.

To announce in the conditions of tender that a preference would be given to a particular maker would probably prevent any tenders from being sent in.

To abstain from announcing it, and yet to give the preference, would be open to the suspicion of unfairness, which, if the preference were not given, it would be equivalent to excluding us altogether, and contrary to the instructions of the Department.

It was finally arranged with the Agent-General that Mr. Albert Vickers should send a telegram to the Commissioner for Railways on his own responsibility naming the lowest price at which we could supply the same quality of engine tires as we have hitherto sent to the Colony, a copy of which telegram should be sent to the Agent-General.

We accordingly sent him the telegram of the 4th ultimo (of which we now enclose you a copy), and we immediately sent a copy to Sir Saul Samuel.

The price we named in this telegram of £24 per ton is, we have no doubt, more than would be asked by other makers, but we repeat that the difference in price is far more than compensated for by the inestimable advantage of security from accidents to which steel of a less perfect quality is seriously liable.

There are some articles in which the usefulness and price are exactly proportioned to each other, but when the frightful consequences to which the fracture of a single engine tire may lead are considered we venture to submit to you that the question whether it is cheaper to use perfect steel or steel of an inferior kind cannot be measured by a difference in price of a few pounds per ton.

We have no doubt that these considerations were strongly felt by your Department, who are so familiar with the questions, and you therefore sent to the Agent-General on the 17th December the telegram accepting our offer for the supply of engine tires for the ensuing five years.

On the 19th December our Mr. A. Vickers called at the office of the Colony at Westminster, and the Agent-General being out, Mr. Yardly made an appointment for an interview on the 23rd December.

Mr. Albert Vickers, however, was unfortunately prevented by illness from calling until the 31st December, when he took with him the form of contract to discuss with the Agent-General, who then informed him that he could not now go on with it, as other makers had made offers subsequent to the receipt of the telegram from you on the 17th December.

We think we may fairly assume that these other offers were at a lower price, otherwise we cannot understand the Agent-General's hesitation.

Now, we cannot help thinking that it could not be your intention, after your telegram of the 17th December, to leave us open to any such competition, the possibility of an offer at a lower price was we are sure present to your mind. You are well aware that all over the world we are receiving higher prices for our steel than any other makers. Of course, upon your telegram of the 17th December being communicated to us, we began to make arrangements for the future in connection with it, for the large amount involved in it rendered that necessary.

In the remarks we have made we do not in the slightest degree imply any complaint against the conduct of the Agent-General, whose desire has been throughout to act as he considered best for the interests of the Colonial Government, but we submit that it would be neither for the advantage of the Colony, nor just to us, to recede from the determination which was conveyed in the telegram of the 17th

December,

December, and to expose us, and indeed to expose the interests of the Colony, to a competition for low-priced engine tires, a competition into which the quality of our manufacture would prevent us from entering with any hope of success.

On the 31st December we sent the Commissioner for Railways a second telegram, of which we enclose a copy, and we trust that before this letter reaches you we may have received an intimation that your telegram of the 17th December is to be adhered to, because, no matter what subsequently happened, the fact remains that as far as your own judgment and intention were concerned you have signified to London your acceptance of the offer we made you.

We have, &c.,

ALBERT VICKERS.

The Secretary for Public Works to The Agent-General.

Sir,

Department of Public Works, Railway Branch, Sydney, 13 February, 1885.

I have the honor to enclose herein an indent for Vickers' steel crank axles for engines of classes Nos. 17, 93, 14, 127, 67, and 285 respectively, and shall be glad if you will obtain and forward the same to the Colony as early as possible.

I have, &c.,

F. A. WRIGHT,

Secretary for Public Works.

Indent for Vickers' steel crank axles for engines of classes Nos. 17, 93, 14, 127, 67, and 285 respectively.

No. required for each class of engine.	Description.	No. of tracing.	Code name.	Class of engine.
6	Steel crank axles	881	Seventeen	No. 17.
*12	„	883	Nut	„ 93.
3	„	881	Fourteen	„ 14.
*3	„	883	Bolt	„ 127.
2	„	882	Brass	„ 67.
2	„	883	Leeds	„ 285.

To be obtained from Messrs. Vickers, Son, & Co. (Limited), Sheffield, and to be in accordance with the standard crank axle code tracings in the Agent-General's possession.

Three of the above for 93 class and the three for 127 class to be despatched by steamship promptly.

Required at Sydney as soon as possible.

NOTE.—If the Agent-General can arrange to substitute one of Cammell's homogeneous charcoal iron axles for one of the steel axles of the 93 class there would be no objection to give the same a fair trial on the Government railways.

THOS. MIDDLETON,

Acting Locomotive Engineer.

I really do not see why we should be at the cost of trying these experiments. We know the value of Vickers' steel axles, and it is for other manufacturers to demonstrate the superiority of theirs. I have told Mr. Wilson, who is the representative partner of the firm on a visit to Sydney, that if he will send out one of their homogeneous charcoal iron axles we will try it on our lines, and if it proves to be of value we will pay for it, and if superior to Vickers' we will order more of them. In the reasonableness of this proposal he has concurred. It is only fair that vendors of new articles should take some risk in proving the superiority of their wares, and have a right to be thankful that such good terms, as I have named can be obtained.—CHAS. A. GOODCHAP, 2/2/85.

I concur.—F.A.W., 5/2/85. Locomotive Engineer.—D.C.M'L., 5/2/85. Seen.—W. SCOTT, 10/2/85. Commissioner. Prepare indent, leaving out the note *re* Cammell's charcoal iron axles.—D.C.M'L., 10/2/85.

The Secretary for Public Works to The Agent-General.

Sir,

Department of Public Works, Railway Branch, 23 February, 1885.

I have the honor to enclose herein an indent for cast-steel tires for four-wheeled passenger stock for "Renewals," and shall be glad if you will obtain and forward the same to the Colony as early as possible.

I have, &c.,

F. A. WRIGHT,

Secretary for Public Works.

Indent for Cast-steel Tires for Four-wheeled Passenger Stock for "Renewals."

Three hundred flanged cast-steel tires (in the rough or forged state), to be in exact accordance as regards sections, internal diameter and thickness, &c., with that represented in Tire Schedule, Drawing No. 920, in the Agent-General's possession. Code name

Internal forged diameter, 37 $\frac{3}{4}$ -inches. Required in Sydney. The first fifty to be despatched by earliest steamship; the balance by sailing ship as soon as possible. The whole to be of "Vickers," manufacture.

The Secretary for Public Works to The Agent-General.

Sir,

Department of Public Works, 2 March, 1885.

Referring to my letter to you of the 9th August, 1881, on the subject of tendering in England for works and supplies being confined to a list of selected firms, I have the honor to request you will have the goodness to arrange that in future no restrictions shall be placed on tendering, as it is obvious to the interest of the Government that the field of competition should be as wide as possible.

I have, &c.

GEORGE R. DIBBS,

Secretary for Public Works.

The

The Secretary for Public Works to The Agent-General.

Sir, Department of Public Works, Railway Branch, Sydney, 27 March, 1885.
I have the honor to enclose herewith an indent for spare wheels and axles for Ashbury's bogie passenger carriages on the Great Northern, Southern, and Western Railways (Renewals), and shall be glad if you will obtain and forward the same to the Colony as early as possible.

I have, &c.,

F. A. WRIGHT,
Secretary for Public Works.

INDENT for Spare Wheels and Axles for Ashbury's Bogie Passenger Carriages on the Great Northern and Southern and Western Railways (Renewals.)

TWELVE pairs of 42 $\frac{1}{2}$ -inch wheels mounted on axles, as shown in blue print of drawing, No. 963 herewith.

The wheel bodies to be of wrought-iron, the tires and axles of Vickers' cast-steel of same quality, as recently supplied to this Government for similar purposes.

The whole of the material and workmanship to be of the highest and best standard.

The wheels to be forced on thoroughly tight to the axles, with hydraulic pressure of not less than 60 tons, and no keys to be used. Wanted as soon as possible by sailing ship. 6 pairs in Sydney; 6 pairs in Newcastle.

The Secretary for Public Works to The Agent-General.

Sir, Department of Public Works, Railway Branch, Sydney, 31 March, 1885.
I have the honor to enclose herein an indent for cast-steel engine and tender tires (for renewals), Great Northern Railway, and shall be glad if you will obtain and forward the same to the Colony as early as possible.

In connection with this indent I also forward you the enclosed fragmentary tracing, showing an alteration to be made in the engine and tender tire schedule in your possession, as follows, viz., the words "and tender" to be struck out, and the additional code name "Daring," with its accompanying particulars, interpolated, and the border bracket altered to suit; all, in fact, as indicated on the tracing.

By comparing the enclosed with the existing tire schedule this can be done easily.

I have, &c.,

F. A. WRIGHT,
Secretary for Public Works.

INDENT for Cast-steel Engine and Tender Tires for Great Northern Railway (renewals). The whole to be of Vickers' manufacture.

Number of Tires required.	No. of Engine or Tender.	Internal forged diameter.	Code Name.	No. of Plan.
		Inches.		
18	11 (tender)	36 $\frac{1}{2}$	"Camden"	Tracing No. 916.
24	23 "	36 $\frac{1}{2}$	"Daring"	Engine and Tender Tire
16	27 (engine—driving) ...	60 $\frac{3}{4}$	"Taurus"	Schedule (in Agent-
28	47 (engine—bogie)	30 $\frac{3}{4}$	"Tavern"	General's possession).

To be forwarded by steamer for Newcastle as early as possible.

Messrs. Vickers, Sons, & Co. to The Commissioner for Railways.

Sir, London, 13 February, 1885.
Since our letter to the Minister of Public Works of the 8th ultimo, we duly received on the 10th idem, the following cable message:—"Refer to Agent-General.—Wm. Bede Dalley, Secretary."

On calling upon Sir Saul Samuel, we were pleased to find that he had received the authority asked for in our cablegrams and letter above referred to and that the contract would be signed so soon as prepared by the Solicitor.

It remains for us, therefore, only to express our thanks, and to assure you that nothing shall be left undone by us in the making of the tires to ensure satisfaction to the Government.

When this letter reaches you our contract for waggon tires and axles will have only eight months still to run, and we should be glad to renew the same for five years, if the Government would increase the price of the axles from £18 per ton to £21 per ton, leaving the price of the tires still at £18 per ton.

We find that the axles we have made under the present contract actually cost us more to make than we receive for them, causing us a positive loss.

This may seem extraordinary to you, seeing the price at which other makers offer axles, but it arises from two causes, viz.:—

1st. To obtain the required quality, we can only employ the most expensive brands of iron in making the steel.

2nd. We hold that it is absolutely necessary to cut a large proportion of each ingot to waste, as we recognize the fact, which few steelmakers do, that where an ingot is cast the impurities in the steel, as well as part of the carbon, rise towards the top end until the steel ceases to be fluid—when this top end is used the result must be a dangerous axle.

We would not go thus into details were the distance between us not so great, rendering correspondence and explanation so much more difficult.

At the date of our cablegram of the 4th December we were still under the impression that we made a small profit out of the axles, but later experiences prove that we have a loss. In hope, therefore, that you will see your way to meet us as to price in the event of an extension of the contract for five years, as we propose.

We have, &c.,

Vickers, Sons, and Co. (Limited),
ALBERT VICKERS.

While

While I am of opinion that we will be better served in these lines by Messrs. Vickers than any other firm that I know of, I am disinclined to recommend this offer for approval in view of the Minister's minute of 23rd March, Commissioner's 85/2,107. in reference to open competition for our supplies.

However, the question of having the best and most reliable material in our tires and axles is of the most vital importance, and I consider the matter deserves favorable consideration.

I may state that I know the prices they are now supplying them for are very low for their quality of material.—W. SCOTT, 29/4/85. The Commissioner.

The Minister's minute was not intended, I believe, to affect special classes of material, such as axles, &c., but only to extend the area of competition generally in cases where it has been usual to limit the competition to three or four firms for material and supplies of ordinary character—in fact, in the Minister's letter to Agent-General, exemption was made of those articles, which, in the indent, were specified to be of a certain make or class.

The Minister, I am aware, shares with myself and the Locomotive Engineer an anxious desire to secure the safest and best material for axles and tires, as so much depends upon the quality of those articles in safely working the traffic. I am not, however, disposed to recommend such a large increase as £3 on £18; an increase of 10 per cent. should satisfy the manufacturers—say £1 16s.—C.A.G., 2/5/85.

I am not disposed to consent to any increase of price. The manufacture of steel is being cheapened year by year, and I fail to see anything to justify Messrs. Vickers & Son in asking for an increased price. Unless they will accept present rates, tenders must be invited.—F.A.W., 7/5/85.

Inform.—CHAS. A. GOODCHAP, 7/5/85.

The Commissioner for Railways to Messrs. Vickers, Sons, & Co.

Gentlemen, Department of Public Works, Railway Branch, Sydney, 11 May, 1885.

I have the honor to acknowledge the receipt of your letter of the 13th February last, respecting your contract for waggon tires and axles, and expressing your willingness to renew the same upon its expiry for a further period of five years, if I consent to increase the price of the axles from £18 to £21 per ton.

In reply, I have to inform you that I have laid the proposition before the Secretary for Public Works, who, after giving it careful attention, is unable to consent to any increase of price. The manufacture of steel is being cheapened year by year, and he fails to see anything to justify the request for an advanced price.

Unless, therefore, your firm accepts the present rate for supply of axles, I shall have no alternative but to invite fresh tenders.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

The Secretary for Public Works to The Agent-General.

Sir, Department of Public Works, Sydney, 7 April, 1885.

Referring to correspondence which has passed on the subject of tendering in England for works and supplies required by this Department, I have the honor to inform you that I have given the subject earnest consideration, and it seems to me that the present custom of limiting the tendering to certain firms, except when the indents specially specify it, is an unwise one, and deprives the Colony of the advantage that would be gained were full and open competition allowed. I shall be glad, therefore, if you will give effect to the desire of the Government in this matter.

I have, &c.,

F. A. WRIGHT,
Secretary for Public Works.

Mr. Edward Jeffreys to The Commissioner for Railways.

Dear Sir, Monkbridge and Iron Works, Leeds, 27 March, 1885.

I have telegraphed to-day as follows:—"Monkbridge special steel carriage tires, seventeen engine, nineteen delivered Liverpool, for contract yearly supply three or five years."

This quotation is for the very best quality of our special steel (not Bessemer) for engines and carriages, the best that can be made to suit your climate, for a quantity to be supplied during the next three or five years.

I enclose you a copy of some certificates I took with me to Australia, a copy of which I believe I left you. Should you entrust us with a share of your orders for steel tires, you may rely upon the quality being first-rate and suitable for your climate, after the knowledge I have obtained in visiting your Colony.

Yours, &c.,

(For the Monk-bridge Iron and Steel Company),

EDWARD JEFFREYS,
Partner.

Special steel carriage tires, 17s. per cwt., f.o.b.

Special steel engine tires, 19s. per cwt., f.o.b. The Locomotive Engineer, 18/5/85.—C.A.G. The prices are low, but the quality of the material in tires should be the first consideration, As I have no knowledge of the quality of the tires turned out by this firm, I cannot recommend that their offer be entertained at present. I may state, however, that I am making inquiries about them.—W. SCOTT 21/5/85. The Commissioner.

Mr. G. P. Wilson to The Commissioner for Railways.

Sir, Sydney, 27 May, 1885.

Referring to the interview I had with you this morning, resulting from a previous one in January last, relative to sample engine tires, I now wish you to be good enough to receive into your Railway Department twenty crucible steel engine tires and ten axles, manufactured by my firm, Chas. Cammell & Company, of Sheffield, for the purpose of testing upon equal terms with those of any other brand you may select. Awaiting your early reply.

I remain, &c.,

G. P. WILSON.

Minute

Minute by Commissioner.

I understand that these tires, though made of engine tire steel, are not to the dimensions of engine wheels, but to the truck wheels, I do not know whether they will be of service to us or not, but I presume the character of the steel for engine tires can be ascertained by test, and there is no objection to the test being made at Mr. Wilson's risk and cost. Also the axles, though what kind of axles they are is not stated, whether engine axles, carriage, or truck axles.

There is no objection to these samples being received, as samples, without the Department accepting any responsibility as regards purchase, &c.

Inform to-day, and ask the Superintendent of Stores to arrange for the articles being received. He might see Mr. P. Wilson at the address given. I believe the tires and axles are on board some ship. Anything done will of course be at Mr. Wilson's risk and cost.—C.A.G., 28/5/85.

Superintendent of Stores.—D.C.M'L., 29/5/85.

The Commissioner for Railways to M. G. P. Wilson.

Sir,

Department of Public Works, Railway Branch, 29 May, 1885.

Referring to your letter of the 27th instant, asking that this Department may receive twenty crucible steel engine tires and ten axles manufactured by Messrs. Charles Cammell & Company, of Sheffield, for the purpose of being tested on these railways with those of any other brand on equal terms, I have the honor to inform you that there is no objection to test the relative merits of the tires and axles, but it must be at your risk and cost, and without the Department accepting any responsibility as regards purchase, &c.

The Superintendent of Stores (Mr. Richardson) will call upon you to arrange for their delivery.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

I have now got delivery of these tires and axles at Redfern Yard, but instead of twenty tires and ten axles, twenty-five of each have been sent. I presume the Locomotive Engineer will be directed as to testing, &c.—A.R. The Commissioner, 4/6/85.

Has Mr. Scott recommended that a trial be made of Cammell & Company's charcoal homogeneous crank axles?—C.A.G., 4/6/85.

I have not recommended any trial of these axles as I know nothing of them excepting what is shown in these papers; I do not, however, see any objection to their being tried as proposed by you; I may add that Messrs. Cammell's Agent (Mr. Brown) has been very anxious to have them introduced for trial on our lines.—W. SCOTT, 10/6/85. The Commissioner. Seen.—C.A.G., 18/6/85.

Locomotive Engineer for report as to manner in which he proposes to test the tires and axles.—D.C.McL., 5/6/85.

As we have not got a proper machine for testing tires and axles, I would suggest that this matter be allowed to stand over until the machine specially ordered for the purpose arrives and is erected at Eveleigh.

The machine by means of which previous tests were carried out was not adapted for the purpose, and entailed a considerable amount of labour and time.—W. SCOTT, 10/6/85. The Commissioner.

Very well. If they are found to be as good and cheaper than those of Vickers they should be accepted in preference.—C.A.G., 13/6/85.

The Agent-General to The Colonial Secretary.

Sir,

Westminster, 5 June, 1885.

I have the honor to acknowledge the receipt of your letters of the 9th March last and 17th April respectively, covering communications from the Works Department dated the 2nd March, No. 2,270, and 7th April, No. 1,892, in which I am directed to arrange that in future no restrictions shall be placed on tendering for materials required by the Government.

I transmitted a copy of the Works Department's letter to the Inspecting Engineer (Mr. John Fowler), and I enclose for your information a copy of his reply thereto.

I may state that it has always been my practice to afford facilities to manufacturers to tender for supplies to the Government, and no instance has ever occurred where any person considered competent to fulfil a contract has been refused permission to tender; but persons are not invited to tender who, after due inquiry, I find are not likely satisfactorily to carry out a contract that may be entrusted to them, and who are not makers of the article required.

As you point out, a large proportion of the goods ordered through this Department are specified to be supplied by certain manufacturers. Even in these cases it is the practice to invite tenders from the firms indicated, who are not aware whether they are in competition with others.

A reference to the schedules of tenders forwarded to you from time to time will show you that a considerable number of manufacturers are invariably invited to tender, and that the range of competition is considerable, and, in fact, comprehends all the manufacturers of repute.

It may here be well to mention, in connection with your letter of the 16th March last, No. 1,593, that Messrs. Fowlers, of Leeds, name has been for many years on the list of tenderers for Government supplies.

If it be your desire that I shall advertise through the Press for tenders for all supplies, I will, of course, comply with your wishes, but it will lead to inconvenience, expense, and delay, and possibly to embarrassment, as all manner of persons will tender, regardless of their ability to carry out their contract.

I have, &c.,

SAUL SAMUEL.

The Secretary for Public Works.—A.S., 13th July, 1885. The Under Secretary for Public Works.—J.B., per P.N.S. B.C., 14th July, 1885. Submitted.—J.R., 16/7/85. I am perfectly satisfied with the Agent-General's explanation.—F.A.W., 16/7/85.

Mr.

Mr. John Fowler to The Agent-General.

Sir, 2, Queen Square Place, Westminster, 14 May, 1885. I beg to acknowledge the receipt of your letter of the 5th May, enclosing copy of a letter from the Secretary for Public Works, requesting that no restrictions should be placed on tendering for materials required by the Colonial Government, and that the field of competition should be as wide as possible.

The system is, as you are aware, now practically adopted. On receipt of an indent from the Colony a list of all the best manufacturers is submitted to you, and you then invite these firms to tender. Every facility is given to other manufacturers to send in tenders, and no exceptions are made, except in the case of well-known incompetent persons, who do not execute good work, or are otherwise unfit to be entrusted with important contracts, and commission agents, it being essential in the interests of the Government to deal direct with manufacturers only.

By this method we obtain, I believe, the most perfect and practically unrestricted competition, and carry out the intentions of the Government in what has been found by experience to be the best manner. I am, &c., JOHN FOWLER.

The Agent-General to The Secretary for Public Works.

Sir, Westminster, 12 June, 1885. Referring to the undermentioned telegrams from the Honorable the Colonial Secretary, of the 15th December last, "Accept Vickers' tender for engine tires, £24, for five years," I have the honor to forward herein for your information, a copy of the contract entered into with Messrs. Vickers & Company for the supply of the tires in question during the period named.

I have, &c., SAUL SAMUEL.

CONTRACT.

THIS Agreement, made the 1st day of June, 1885, between Vickers & Company, Limited, a Company incorporated under the provisions of the Companies Act, 1862, and carrying on business at the River Don Works in Sheffield (hereinafter referred to as "the Company"), of the one part, and Sir Saul Samuel, Knight Commander of the Most Distinguished Order of St. Michael and St. George, the Agent-General of the Colony of New South Wales (who, as well as any person succeeding him in the said office of Agent-General, is hereinafter referred to as "the Agent-General"), for and on behalf of the Commissioner of Railways, a corporation sole created by the Act of the Legislature of the said Colony, 22nd Victoria No. 19 (who is hereinafter referred to as "the Commissioner"), of the other part, witnesseth as follows:—

1. For the consideration hereinafter mentioned the Company promises to and agrees with the Commissioner in the manner following: The Company will for the period of five years, to be computed from the 1st day of January last, manufacture for the Commissioner, and deliver free on board such ships at London or Liverpool as the Agent-General shall from time to time direct, all such engine and tender tires in the rough or rolled state as the Agent-General or the Engineer for the time being in England of the Commissioner (who is hereinafter referred to as "the Engineer") shall, for and on behalf of the Commissioner, from time to time require the Company to manufacture.

2. All such tires shall be manufactured according to the several sections from time to time prepared by the Engineer, and shall be, as regards quality, of the highest character of steel manufactured by the Company, and known as the Australian quality, and shall be branded "Australia, Vickers & Co.," followed by the date of the manufacture, the letters "N.S.W.G.," and having the internal diameter stamped on the inside of each tire, and code name painted on in white, or such other marks and stamps as may be required by the Engineer.

3. Such tires as may be selected by the Engineer, or by any person appointed by him in that behalf (any person so appointed being included in the expression "the Engineer" whenever it hereinafter occurs), not exceeding 2 per cent. of the number of tires comprised in any one order, shall, in the presence of the Engineer, be tested by blows from a weight of one ton falling from such height as the Engineer may determine, and shall stand deflection to the extent of one-sixth of their diameters without fracture, except when the tire is 3 inches thick in the tread and less than 3 feet inside diameter, in which case a deflection to the extent of 1/8 of the diameter will be required; and after the tires have been subjected to the falling-weight test, a piece shall be machined, cold, out of each tire, the said piece of tire being tested for tensile strength without being reheated.

4. The tensile-strength tests shall be for the engine tires as near 48 tons per square inch as possible, but not less than 46 tons nor more than 50 tons; and for the tender tires, as near 42 tons per square inch as possible, but not less than 40 tons, with an elongation of not less than 10 per cent. in 10 inches.

5. If any of the tires subjected to the tests aforesaid shall, in the opinion of the Engineer (whose decision upon this, as upon all other matters, shall be binding and final), fail as regards either the falling-weight test or the tensile-strength test, the Engineer may, on behalf of the Commissioner, reject not only the tires which shall have so failed, but the whole of the tires of which those selected and tested as aforesaid formed a portion; or he may direct that the said tires, or any of them, shall be subjected to such further testing as he shall think proper.

6. The Engineer shall have power, if he shall think fit, to order any tire or portion of a tire to be sent to be tested at a public testing-place; and all the expenses of testing, whether at the works of the Company or at a public testing-place, shall be borne by the Company.

7. The Company will deliver on board, within six calendar months from the date of these presents, the number of tires comprised in the first order to manufacture given by the Agent-General or by the Engineer, in England, of the Commissioner, and will deliver on board the number of tires comprised in each subsequent order within two months from the time when such order shall have been given, provided that the number of tires comprised in such order shall not exceed 300; and if the number of tires shall exceed 300, then with a proportionately extended period.

8. In case the Company shall not deliver on board the number of tires comprised in any order within the time when the same ought to be delivered, according to the provisions hereinbefore contained, the Company will pay to the Commissioner, or to the Agent-General on his behalf, as liquidated damages, and not as a penalty, the sum of five pounds for every day which shall have elapsed from the time when the said tires ought to have been delivered until the day when they shall have been delivered; and the Company shall not be entitled to any extension of the time hereinbefore fixed for delivery on account of any of the tires comprised in any order having been rejected by the Engineer under the power hereinbefore conferred upon him.

9. None of the tires to be manufactured under the provisions of this agreement shall be delivered on board until the Engineer shall have fully examined and tested and shall have seen them weighed; the expenses of such testing, weighing, and all other such expenses to be borne by the Company.

10. The Engineer in New South Wales of the Commissioner may, within thirty days after any tires manufactured under the provisions of this agreement shall have been landed in New South Wales, reject any of them which, in his opinion, shall be faulty or defective, and the Company will, upon being informed by the Agent-General of such rejections, forthwith manufacture other tires in place of those so rejected and such extra tires as may be needed for testing at the works; and will, after the same shall have been examined, and, if necessary, tested in the manner hereinbefore mentioned, deliver them on board within such period, not being more than six weeks from the day when the Company shall have been so informed as aforesaid, as the Agent-General shall direct; and will also repay to the Agent-General, for and on behalf of the Commissioner, a sum bearing the same proportion to the total amount paid by or on behalf of the Commissioner as a premium or premiums for the insurance of the shipment of tires of which the tires so rejected formed a portion, as the value of the tires so rejected, assuming them not to have been faulty or defective, would have borne to the entire value of such shipment.

11. In consideration of the premises the Agent-General, for and on behalf of the Commissioner, and not binding himself personally, promises to and agrees with the Company in the manner following:— The Commissioner will pay to the Company at the rate of £24 per ton for the tires to be manufactured and delivered on board under the provisions of this agreement.

12. Payment will be made by the Agent-General, on behalf of the Commissioner, within fourteen days after the Agent-General shall have received the invoices and clean bills of lading for the tires delivered on board, after deducting from the price calculated at the rate aforesaid the amount, if any, which shall have become due to the Commissioner as liquidated damages under the provisions hereinbefore contained if the same shall not have been paid by the Company, and also the value of any tires which shall have been rejected by the Engineer in New South Wales, according to the power in that behalf hereinbefore conferred on him, if tires in place of tires so rejected shall not have been manufactured and delivered on board, and also the amount paid in respect of the insurance of the tires so rejected if such amount shall not have been repaid according to the provisions in that behalf hereinbefore contained.

13. Except, as next hereinafter mentioned, the Commissioner will not during the said period of five years hereinbefore mentioned obtain any engine or tender tires from any manufacturer or persons other than the Company: Provided, nevertheless, and it is hereby declared by the parties to these presents, that if the Engineer shall at any time be of opinion and shall certify that the Company is not proceeding with proper dispatch in the manufacture of any tires comprised in any order to manufacture, given by the Agent-General or the Engineer in England to the Company, it shall be lawful for the Agent-General to cancel the order so given, and to obtain from any other manufacturer or manufacturers, person or persons, and not only on that occasion, but also if he shall think proper on any future occasion or occasions, all such engine or tender tires as the Commissioner may require.

14. The Agent-General will engage freight, and will give such notice to the Company of the name or names of the ship or ships by which any tires are to be shipped as to allow a reasonable time to the Company for dispatching the tires from the place of manufacture to London or Liverpool, as the case may be, and delivering them on board.

In witness whereof the Company have hereunto caused their common seal to be affixed, and the said Sir Saul Samuel, but not so as to make himself in any way personally responsible, has signed these presents in the name and on behalf of the Commissioner, the day and year first above written.

The common seal of Vickers and Company (Limited) affixed, by order of the Board, in the presence of—

J. EDWARD VICKERS,	}	Directors.	}	of Vickers, Sons, & Co., Limited.
JOHN CROSSLEY,				
H. C. COOLEY, Secretary.				

Forward to Locomotive Engineer, who has previous papers, which should be put with this and returned. It will be observed that the contract is a very binding one. Not only are the tires subject to very severe tests in England, and to the inspection, &c., of the inspector there, but in the event of the Engineer in the Colony being dissatisfied with them on arrival they can be returned at contractors' expense and cost, and others supplied.—C.A.G., 11/8/85.

Messrs. Vickers, Son, & Co. to The Commissioner for Railways.

Sir,

London, 10 July, 1885.

We have the honor to acknowledge receipt of your valued favour of the 11th May, in reply to our letter of the 13th February, as to renewal of contract for waggon tires and axles, and we regret to find that you have not seen your way clear to agree to an increased price for the axles.

We have not found our costs cheapened in any way. The only manner in which we could reduce them would be by using inferior materials, and this we cannot do, as it is incompatible with the maintenance of the high standard of our tires and axles for safety and durability.

We are therefore reluctantly compelled to say that we are unable to accept a renewal of the contract for axles at present price, having, as already stated, no margin for profit.

The utmost that we could do would be to meet you half way, and, should you agree to this, we shall have pleasure in renewing the existing contract for five years from 31st December next, at £18 per ton for the tires, and £19 10s. per ton for the axles, delivered anywhere in England.

If you do not see it to your interest to accept this offer, we are agreeable to extend the contract for the tires only for five years from 31st December next, at £18 per ton, but we would fain hope that,

taking

taking the quality of our axles into consideration, you will see your way to meeting us in price as above proposed.

In any case we should much like to be informed of your decision by cable, addressed "Vickers, London," and for this purpose we beg to indicate two code words, viz. :—

First.—The Government accepts your offer to supply all their requirements for waggon tires and axles for five years, from 31st December, 1885, at £18 per ton for the tires, and £19 10s. per ton for the axles.

Second.—The Government accepts your offer to supply all their requirements for waggon tires for five years, from 31st December, 1885, at £18 per ton.

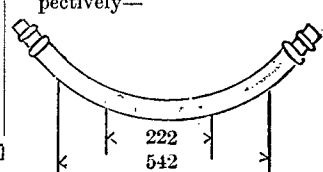
Our reason for requesting you to favour us with a cable reply is that, beyond the satisfaction of having your decision at a comparatively early date, we may ease our contract by the necessary purchases of Swedish iron, which may rise in price at any moment.

As showing the quality of our axles, it will doubtless interest your Engineering Department to peruse the enclosed record of tests which we have just received from the Inspector of the Mudi Railway, of France.

You will observe from this that the axle remained unbroken after twelve blows from a 20-cwt. tup falling from Cd. 33 feet, and eight further blows from Cd. 37 feet.

We have, &c.,
Vickers, Son, & Co. (Limited.),
ALBERT VICKERS.

Chemin de fer du Midi. PROCÈS-VERBAL D'ÉPREUVES. 3rd Division.
Exploitation. d'Essieux de Machines et de Tender. Material et Traction.
Usine de MM. Vickers, Son, & Co., Sheffield. Nature du Metal.

Destin- ation des essieux.	Nos. des Lots.	Essieux com- posant chaquelot.	Ordre des chocs.	Poids du mouton	Hauteur des chute.	Flèche.	Diamètre de l'essieu au corps.	Epreuves.		Observations.		
								Allonge- ment pour 100 milli- metres.	Resistance par millimetre carré.			
Locomoti- ve	1	25	1	1 ton	33 feet 10 mètres	Initial qr.	170	26%	50 lbs. % = 32 tons per □ inch	Elongation of the exterior fibre of the axle measured after the first blow of flexion on initials of 200 and 500 millimetres res- pectively—		
			2								175	
			3								238	
			4								295	
			5								218	
			6								155	
			7								94	
			8								180	
			9								234	
			10								287	
			11								212	
			12								150	
			13								95	
			14								182	
			15								11 70	
			16								11 79	
			17								11 86	
			18								11 92	
			19								11 30	
			20								11 37	
End of standard test.		20	11 44	162	Not broken after 20 blows. 8 blows given in excess of the specification.	Proportion of area with the initial diameter when broken —silky colour = 0,516.	The original diameter of the ten- sile, viz. 16 ^m /m was reduced to 11.5 when broken, the original area was 201 □ millimetres and when broken = 103.8. Dis- tance between the blocks sup- porting the axle = 1 ^m 560 = 61½ inches. The measurements of deflection are always taken from the top part of the axle with a beam compass, and the axle was also turned so that the figures may be always taken in the same direction.					
Extra blows.		20	11 50	106								
In addition to the tensile a square bar of 12" by 1½ is cut parallel to the tensile and is bent by one tap of 10 cwt. falling 8".												
In the present instance that bar has been bent to contact with- out signs of fracture with 26 blows.												

Sheffield, le July 4, 1885.

Le Controleur d'Usines,
J. VITRUET.

Messrs. C. Cammell & Co. (Limited) to The Commissioner for Railways.

Sir,

Sydney, 27 August, 1885.

We take the liberty of again respectfully soliciting from you an opportunity to do business with your Government in the matter of tires and axles.

We are in a position to quote you prices, either delivered in London or Sydney, such as we believe will compare favourably with any make which you may now have in use.

We ask for no favours, but only to be permitted to do business with the Government of New South Wales in the lines of trade referred to.

In the matter of quality our facilities for manufacture and the purchase of metals are such that we know we can meet your wishes in any detail you may specify, giving hardness and toughness combined, or equal mildness, as some engineers prefer.

If you will receive a price from us (conditions as to testing to be complied with, such as you may have found it necessary in your experience to adopt) we believe our figures will be such, in no way losing sight of quality, as to bear out our statement.

Moreover, we are also prepared to enter into an agreement with your Government for the supply of these articles for a period of either three or five years.

Awaiting your reply,—

We are, &c.,
CHARLES CAMMELL & Co. (LIMITED),
(Per JAMES BROWN).

Minute by Commissioner.

Axles and Tires, Carriages and Waggon.

Will Superintendent of Stores let me know if we ever obtained axles and tires (or either) from Brown, Bailey, Dixon, & Co., (Limited) of Sheffield, and if so, at what price per ton. Will Mr. Richardson please state the average price paid for steel axles per ton, for tires per ton (waggon and carriage), up to the time the last order was given to Vickers & Company at £18 a ton. If the price per ton cannot be quoted, owing to the practice of their being quoted as per axle or per tyre, please approximate it.—C.A.G., 3/9/85.

1st. We do not appear to have ever imported any tires or axles from Brown, Bailey, & Dixon.

2nd. The average cost per ton of steel carriage and waggon tires for the eight years ending 31st December, 1883, has been £26 4s. 1d. per ton, gathered as under:—

		£	s.	d.				
All from Vickers, Sons, & Co.	}	1876	...	...	26	15 0	per ton, f.o.b., London	
		1877	...	...	25	4 4	" "	
		1878	...	...	27	0 3	" "	
		1879	None imported.					
		1880	...	...	...	26	15 3	" "
		1881	...	...	...	25	13 9	" "
		1882	...	...	...	26	0 0	" "
		1883	...	...	...	26	0 0	" "

During the eight years referred to only two shipments of carriage and waggon axles were received, and both of them in 1876:—Taylor Bros. & Company, £21 18s. 9d., iron; Vickers, Sons, & Company, £35 7s. 8d., cast steel.—A. RICHARDSON.

Minute by Commissioner.

If for the eight years these be a record only of Vickers' axles and tires, I must ask Superintendent of Stores to go further back. We have had other axles and tires—Cammell & Company, I think, certainly the Patent Shaft and Axle Company's axles (Brunswick steel) and Krupp's tires, and others I believe. They may not, or some of them may not, have come out separately, but attached to wheels. If Mr. Richardson will consult with Mr. Scott he will learn how the matter stands.—C.A.G., 9/9/85.

I think Vickers & Company reduced their price about 1883, or beginning of 1884, to £22 a ton, a price which I afterwards got them to reduce to £18. I ask to have very exact information on this point.—C.A.G., 9/9/85.

Superintendent of Stores.—I shall be much obliged by your furnishing at your early convenience a statement of the several prices paid to Vickers & Company for waggon axles and tires. I would like the return to show the number of axles or tires received at each particular price, and if the several indents or orders can be distinguished it will be a convenience.—D.C.M'L., B.C., 15/9/85.

Urgent. Return herewith. The fact should be noted to which I am about to draw the Commissioner's special attention in another paper, that although Vickers & Company entered into a special contract with the Commissioner for the supply and delivery, at any wheelmakers in England, of tires and axles required during 1884 and 1885, at £18 per ton, they have charged £26 16s. 9d. per ton for 800 axles for renewals. This supply is certainly outside the letter of their contract, but the action hardly seems to me to carry equity or common fairness with it.—A.R. The Secretary, 19/9/85.

RETURN showing prices per ton, f.o.b., in England, paid Messrs. Vickers, Sons, & Co., for Carriage and Waggon Tires and Axles in satisfaction of Indents.

Date received.	Date and Particulars of Indents.	By whom supplied.	No supplied, and Price per Ton f. o. b. in England.	£	s.	d.
1876	31 July, 1875.....	250 C. & W. Tires	Vickers, Sons, & Co.....	250	26	15 0
1877	27 Oct., 1876.....	40 Bogie Carriage Tires	do	40	26	10 3
1877	21 Dec., 1876.....	700 C. and Waggon Tires	do	700	23	18 5
1878	29 Sept., 1877.....	350 Carriage Tires	do	350	27	0 3
1880	1 Jan., 1880.....	400 C. & W. Tires	do	400	26	15 3
1881	22 May, 1880.....	50 Carriage Tires	do	50	25	2 0
1881	17 June, 1880.....	400 C. & W. Tires	do	400	26	5 6
1882	19 Feb., 1881.....	80 C. & W. Tires	do	80	26	0 0
1882	16 Sept., 1881.....	150 C. & W. Tires	do	150	26	0 0
1882	27 Sept., 1881.....	500 Waggon Tires	do	500	26	0 0
1882	23 Mar., 1882.....	120 Waggon Tires	do	120	26	0 0
1883	27 Sept., 1882.....	650 C. & W. Tires	do	650	26	0 0
1885	16 Aug., 1883.....	100 Waggon Tires	do	100	26	0 0
1885	23 Feb., 1885.....	300 Waggon Tires	do	50	18	0 0
	Note			only on a/c.		
1885	13 June, 1884.....	100 Brake-van Tires	do	100	22	0 0
1876	22 Sept., 1875.....	100 C. S. Axles for Waggon.....	do	100	35	7 8
1884-5	19 June, 1884.....	800 C. S. Axles for Waggon.....	do	800	26	16 9
1885	31 May, 1884.....	*Wheels and Axles	do .....	.....	18	0 0

*Axles and Tires supplied by Vickers.

Messrs. C. Cammell & Co. to The Commissioner for Railways.

Sir,

Sydney, 16 September, 1885.

Referring to our letter of 27th August, and your reply thereto, we are now in a position to offer to the Railway Department of this Colony our crucible cast-steel tires and axles for rolling stock, at the following rates; the same guaranteed to fulfil all the conditions and tests usually imposed by you on any contractor who has been supplying you with this material.

In accordance with your letter of May 29 a number of tires and axles of our standard type and temper, for India and the Colonies, were sent to your stores, are now at Eveleigh, and the quality of those can be taken as the sample to which we guarantee any of the material that may be supplied by us.

We

We would point out that as we enjoy the privilege of supplying all the English and Indian railways, without exception, and also all the Australian Colonies except New South Wales, we are anxious that the tires and axles in question should as early as possible be subjected to test, together with, and on the same footing, as those of the brand you may now be using. This comparison of material, together with the prices we quote, we believe will place us in a position to secure some share of your orders.

The prices we here submit for the material are alternative for delivery, f.o.b., any English port, or into your stores at Eveleigh; and we are prepared in the latter case to await the approval of the goods by your engineer before receiving payment.

	In London.			Delivered Sydney.			
	£	s.	d.	£	s.	d.	
Crucible Cast Steel Carriage and Waggon Tires.....	0	16	9	0	17	6	} per cwt.
" " Axles.....	0	16	6	0	17	0	
" " Engine Tires	1	1	6	1	2	3	

We have, &c.,

JAMES BROWN,
(For Cammell & Co., Limited).

Note.—These rates would hold good for not less than two years, or for any further period that might be agreed upon.—J.B.

Locomotive Engineer for report. If Mr. Scott is satisfied that these axles are as good as Vickers' I think we might give an order for them. Vickers was offered to contract for five years for tires and axles, at £18 a ton, which compared most favourably with the price we had been paying, but they have written to say that, while they accept for the tires, they cannot take the contract for axles at £18 and keep to their standard, which they profess not to depart from.

With our experience, I certainly do not like to try a new departure in regard to axles, but I shall be guided by the Locomotive Engineer. If he thinks Cammell & Company's axles might be tried, I will recommend the Minister to give an order for them.—C.A.G., 18/9/85.

Cammell & Co.'s Axles and Tires.

Messrs. Cammell & Company's offer appears a very fair one, as the prices quoted are much lower than we are paying Messrs. Vickers, and if it were not for the great importance attached to our having the best article I would have no hesitation in recommending it to your favourable consideration. In view of the serious consequences involved in the use of inferior axles and tires, I cannot accept the responsibility of recommending that any be ordered, except upon the conditions that they be subjected to and stand an equal test in England as those supplied by Messrs. Vickers & Company.

I will not, of course, have any objection to test those sent us for that purpose as soon as we have our appliances completed, which will not I fear be for many months yet, but I would point out that even should the test prove them to be equal to those supplied by Vickers, the question would have to be considered whether they were not a special lot selected for the purpose.

As regards the statement that Messrs. Cammell & Company's axles and tires were in use on all English and Indian railways, as well as in all the Colonies except New South Wales, I consider it is not deserving of much attention. Although I am not in a position to say definitely with reference to the English and Indian railways, I think it will be found that they are not in such general use there as Mr. Brown desires we should conclude they are. As regards their use in the other Colonies, I find upon inquiry there is very little foundation for the assertion.

On the Victorian lines they have none of Cammell & Company's carriage or waggon tires in use, but they have some of their steel axles, which are not long enough in use to enable an opinion to be formed as to their quality.

On the South Australian lines none of Cammell & Company's axles are in use, and only a few tires, imported in 1881 and 1882, but their present practice is to confine orders to Krupp, Vickers, and Monk-bridge Companies.

On the Queensland railway, no axles and tires of Cammell & Company's manufacture have been received during the past ten years, but previous to that a few engine tires of their make were received, which were softer than Messrs. Vickers, which are now in use there.—9/10/85, W. SCOTT.

Minute by Commissioner.

The papers which should be placed with this are the papers from England, about four years ago, showing the results of certain tests made by Mr. Fowler, at our request, when our axles began to fail. We stipulated for certain tests, and asked Mr. Fowler, through the Agent-General, to take indiscriminately from the stocks of various steel-axle manufacturers (Cammell & Company were amongst the number) samples of their make, and to test them as prescribed. This was done, and Mr. Fowler reported that they all failed except Vickers & Company. Mr. Midelton afterwards reported upon these papers at my request.—C.A.G., 16/10/85.

I now enclose a statement, showing as far as possible, from whom the tires and axles have been obtained when supplied by the wheel-makers.

I also enclose return showing the prices paid for axles and tires respectively when imported separately.

I have found it impossible (as I verbally explained to the Commissioner) to get out with any degree of satisfaction the cost of tires and axles, when these have been supplied by the wheel-makers, and charged for together with the wheels.

It is, however, sufficiently clear that the Department has invariably got its tires and axles cheaper under these circumstances than when ordered specially for renewals.

The most noteworthy instance of this is the latest. During 1884 and 1885, Vickers & Company contracted with the Commissioner for the delivery of tires and axles at £18 per ton, at any wheel-makers in England, but have charged £26 16s. 9d. per ton for 800 axles imported during that period for renewals.—A.R., 22/9/85.

RETURN

RETURN showing prices paid, f.o.b., in England for C. & W. axles only.

Date of Receipt.	From whom purchased.	English invoice price per ton.	Remarks.
1870.....	Taylor Brothers	£ s. d. 16 8 7	Iron
1872.....	"	19 11 4	"
1876.....	Vickers, Sons, & Co.	35 7 8	Steel
1876.....	Taylor Brothers	21 18 9	Iron
1885.....	Vickers, Sons, & Co.	26 16 9	Steel
1885.....	"	18 0 0	"
	Average price per ton	23 0 6	
	Average price per ton for iron	19 6 2½	
	Average price per ton for steel	26 14 9¾	

RETURN showing prices paid, f.o.b., in England for C. & W. tires only.

Date of receipt.	From whom purchased.	English invoice price.	Remarks.
1870.....	Taylor Brothers	£ s. d. 23 12 6	Steel
1872.....	"	32 4 6	"
1876.....	Vickers, Sons, & Co.	26 15 0	"
1877.....	"	25 4 4	"
1878.....	"	27 0 3	"
1880.....	"	26 15 3	"
1881.....	"	25 13 9	"
1882.....	"	26 0 0	"
1883.....	"	26 0 0	"
1885.....	Cammell & Co.	20 0 0	"
1885.....	Vickers, Sons, & Co.	18 0 0	"
	Average price per ton	25 4 1¾	

RETURN showing prices paid, f.o.b., in England for C. & W. wheels and axles complete; also giving makers' names of tires and axles.

Date of Indent.	Date of Invoice.	From whom Purchased.	Description of Wheels.	English Invoice Price.	Description of Tires on Wheels.	Description of Axles.
14 June, 1864	20 June, 1865	Lloyds Foster & Co.	Carriage wheels and axles	£ s. d. 23 10 0	Not given.....	Not given
8 Sept., 1864	12 June, 1865	"	Wagon	17 7 6	"	Solid axles
15 Feb., 1867	12 Oct., 1867	Owen's Patent Wheel, Tire, Axle Co.	"	15 3 9	"	Solid axles
10 Mar., 1868	28 Sept., 1868	Ashbury Ry. Carriage Iron Co.	"	12 17 6	"	*Solid axles
17 June, 1868	12 Nov., 1868	"	"	12 17 6	"	Solid axles
	9 Dec., 1868	Owen's Patent, Wheel, Tire, & Axle Co.	"	13 6 3	Taylor Bros'.....	Not given
	5 Feb., 1870	Patent Shaft & Axle-tree Co.	"	14 5 9	Cooper's weldless	Not given
25 Feb., 1870	18 Nov., 1870	Owen's Patent Wheel, Tire, & Axle Co.	"	14 0 0	Bessemer	Taylor
25 Sept., 1874	20 April, 1875	Patent Shaft & Axletree Co.	"	18 15 0	Vickers'	"
25 Sept., 1875	9 Dec., 1875	"	"	18 5 0	"	"
3 May, 1876	19 Dec., 1876	"	"	16 10 0	"	"
14 Nov., 1876	5 May, 1877	Staffordshire Wheel & Axle Co.	"	16 14 9	"	"
13 April, 1877	31 Aug., 1877	Patent Shaft & Axletree Co.	Carriage	18 0 0	Krupps's	Vickers
11 May, 1877	30 Oct., 1877	"	Wagon	16 4 3	Vickers'	†Not given
9 June, 1877	30 Nov., 1877	"	Carriage	17 10 0	"	Taylor
	4 Mar., 1878	Staffordshire Wheel & Axle Co.	Wagon	16 1 9	"	"
20 June, 1878	10 Oct., 1878	Patent Shaft & Axle-tree Co.	Bogie carriage	19 0 0	"	"
21 April, 1879	29 May, 1879	"	Wagon wheels	15 7 0	"	"
16 Feb., 1880	26 June, 1880	"	Wagon	17 2 0	"	Brunswick
16 Feb., 1880	31 Aug., 1880	"	Wagon	17 2 0	"	Vickers
19 Feb., 1881	12 Nov., 1881	"	Wagon	16 14 11	Not given.....	‡Vickers or Pat. Shaft Co.
6 April, 1882	10 Oct., 1882	"	Wagon	16 11 6	Vickers'	Vickers
23 April, 1882	10 Oct., 1882	"	Carriage	19 15 0	"	"
21 June, 1882	5 Mar., 1883	Owen & Dyson	Wagon	17 15 0	"	"
1 June, 1882	8 Feb., 1883	Patent Shaft & Axle-tree Co.	Wagon	17 10 0	"	"
14 June, 1883	22 Nov., 1883	"	Special wagon	19 15 0	"	"
3 Oct., 1883	21 Oct., 1884	Owen & Dyson	Carriage wheels and axles	19 8 0	Not given.....	|| Not given
3 Oct., 1883	21 Oct., 1884	"	Wagon	17 5 0	"	§
3 Oct., 1883	21 Oct., 1814	Patent Shaft & Axle-tree Co.	Wagon	18 7 6	Vickers'	Vickers
6 Feb., 1883	12 Sept., 1883	"	Carriage	19 18 6	"	"
6 Feb., 1883	29 Aug., 1883	"	Wagon	17 10 0	"	"
9 June, 1884	12 May, 1885	"	Wagon	7 7 6	"	¶
9 June, 1884	22 June, 1885	Owen & Dyson	Wagon	7 4 0	"	"
9 June, 1884	25 May, 1885	Ashbury Ry. Carriage Iron Co.	Wagon	6 9 0	"	"

* Same description as those of Owen's Co. Indent, February, 1867.
 † Indent says to be exactly similar to those indented for May, 1876.
 ‡ Indent says half the axles to be Vickers', and half to be of Patent Shaft and Axle-tree Co.'s make.
 § Indent says as per tracings 818 and specification.
 ¶ Indent says as per tracings 817 and specification.
 ¶¶ Tires and axles supplied by Vickers & Co., £18 per ton.

Vickers & Co.'s carriage and waggon axles and tires.

VICKERS & COMPANY seem to have commenced to supply the Department with carriage and waggon wheels and axles in 1876, in which year they sent in a quantity of each at the price of £26 15s. per ton for the tires, and £35 7s. 8d. per ton for axles.

In 1881 Vickers & Company reduced the price for tires only to £26, at which price they continued to supply for some years.

On the 7th May, 1884, the Locomotive Engineer submitted an indent for 2,900 pairs of carriage and waggon wheels and axles, stated that he had learned unofficially that out of the previous indent 500 pairs had been obtained from the Brunswick Steel Company, whose axles had before proved unreliable, and recommended that arrangements should be made with Mr. Vickers, who was then in Sydney, for that and future supplies.

Commissioner accordingly saw Mr. Vickers, and, as the outcome of this interview, the latter wrote on the 16th May, stating that he was prepared to supply 2,900 pairs of wheels and axles, 3' 0½", made of Vickers' best cast-steel, and subject to all tests and inspection, at the price of £18 5s. per ton, f.o.b., at Liverpool, or £18 7s. 6d., f.o.b., at London, and 100 pairs, 3' 6½", at £2 per pair extra.

Commissioner minuted that this price was favourable, considering the superiority of the articles, but that Vickers' speciality was the axles and tires, and he wished the order to Vickers to be limited to them; that Vickers had offered to supply the tires and axles alone at £22 per ton (their lowest price to the trade in England), instead of £26, as before, and that he had pointed out to Mr. Vickers that £22 was a high price, considering they were to have the exclusive supply.

This brought another proposal from Mr. Vickers, who, on the 28th idem, wrote intimating that they would supply the 2,900 axles and 5,800 tyres at the price of £18 per ton, and deliver them free at the works of any wheel-maker in England, stipulating, however, that strict secrecy should be observed in regard to this arrangement, and stating that they would not bind themselves to this price beyond 5,000 axles and 10,000 tyres, delivered in 1884 and 1885.

In reply to an inquiry by the Minister, Commissioner minuted that Vickers' axles and tires had been subjected to the fullest trial, that Mr. John Fowler had obtained from established firms prepared specimens of their axles and tires, and had tested them against others taken at random from a quantity supplied by Vickers, and that the former could not approach those made by Vickers. Trials made in the Colony had fully borne out Mr. Fowler's test.

The Minister approved, and, under date of 31st May, 1884, Commissioner wrote to Mr. Vickers, intimating that his proposal to supply 2,900 and 5,800 tires at the price of £18 per ton, and any further quantity required during 1884 and 1885 on the same terms had been accepted.

Full particulars were also forwarded to the Agent-General.

Under date of 13th February, 1885, Vickers & Company wrote referring to the approaching termination of the period for which they had undertaken to supply the axles and tires, and stating that they could not enter into a new engagement on the same terms, but were prepared to take a five years' contract if the price of the axles were increased to £21.

Commissioner replied on the 11th May that the Minister could see no justification for an advance in price, and that if they could not continue to supply upon existing terms the only course would be to call for tenders.

Vickers & Company now (July 10th) write that present prices leave them no margin of profit, but they are prepared to meet the Commissioner half way, and supply the axles at £19 10s. per ton, and to take a five years' contract at this rate from 31st December—the tires to be £18, as at present.

Superintendent of Stores (with whom the papers have been for the last few days) directs attention to the circumstance that while Vickers & Company, in compliance with the terms of their engagement, have charged £18 per ton for tires and axles, delivered to the wheel-makers, they have charged £26 16s. 9d. for 800 axles supplied for renewals; and remarks that, although the latter supply may be outside the letter of the contract, it is hardly equitable to increase the price.

NOTE.—I venture to think that as axles, weight for weight, are admittedly a more expensive article than tires, Vickers and Company, when supplying axles alone, are entitled to some advance on the price they were to receive for the two together, with, I imagine, a very considerable preponderance of the less costly article.—C.A.B., 22/9/85.

Minute by Commissioner.

It seems that Vickers & Company have charged, through the Agent-General, about the average price which has been charged for years for axles and tires (between £26 and £27 a ton). When one of the firm was in the Colony I got him to reduce this rate to £18 a ton for tires and axles supplied by them to our wheel contractors. I do not think the Agent-General, after this arrangement, should have paid £26 16s. 9d. for the supplies ordered by him to come direct; in fact, I can see no reason why the price I secured should have been exceeded, unless extra work was done. I think £2 a ton is charged for dressing and cutting, and those sent out to the Colony separately may be dressed, &c. Please inquire.—C.A.G., 23/9/85.

Vickers & Co.'s axles.

Superintendent of Stores.—The Commissioner is under the impression that the practice has been to charge £2 per ton extra for dressing and cutting axles, and he will thank Superintendent of Stores to say if the fact is so, and if the 800 axles sent direct to the Colony, and for which Vickers charges £26 16s. 9d., were so manipulated.—G.B., 24/9/85.

I think it is the tires, and not the axles, which are so treated. Will Mr. Scott please say.—A.R.

I think it must be the axles that are referred to, as the 800 recently received were turned and finished in the bearings, and the body part left rough-turned for fitting to the wheels.—W. SCOTT, 25/9/85.

As far as the invoices are concerned, there is no special charge shown such as is referred to.

The indent for the 800 axles for renewals provides "that the journals and collars are to be finished, and the wheel-seat portions only rough-turned."—A.R.

The Secretary,—25/9/85.

Acting Secretary.—This is a reply to Commissioner's inquiry at the end of this minute—our prices within.—C.A.B., 25/9/85.

I would like to see the Minister about this matter. I think the Agent-General should be requested to explain why he paid Vickers & Company £26 16s. 9d. for axles, when we had arranged for their supply at £18. Certainly the arrangement we made was confined to axles supplied to our wheelmakers in England; and it is also true that the manufacturers have represented that they lost money by the agreement, and that they cannot continue to supply at the price; but from the fact that they now offer to go on supplying at £19 10s. per ton affords sufficient evidence that the Agent-General has submitted to a higher charge than was equitable. The charge should not have been more, I think, than £22, some £2 having to be added for extra work, turning and finishing of the journals to fit them for the wheel-seat.

Vickers' and Company's axles and tires have been used by us from the earliest times with few exceptions, and when we have used other axles and tires we have been disappointed and have had to revert to Vickers.

I do not wish the Department to make any change, but certainly we cannot consent to give £26 16s. 9d. per ton for axles which, at the outside, should not cost more than £22.

We made a good agreement when we arranged for their supply to our wheelmakers at £18 per ton, and even if we have to pay £19 10s. it will still be an infinitely better arrangement than we obtained before—for it will be seen by the prices that the average price has been over £26—but we should also get our supplies for renewals at about £22, instead of £26 16s. 9d.—C.A.G., 25/9/85.

I concur with the Commissioner.—F.A.W., 29/9/85.

See Messrs. Vickers' request in their letter of the 10th July last; send cablegram, as under:—

Commissioner of Railways to Vickers, London.

“FIRST.”

This word implies as arranged.

The Government accepts your offer to supply all their requirements for waggon tires, and axles for five years from 31st December, 1885, at £18 per ton for tires, and £19 10s. per ton for axles.

Write letter confirming this, and pointing out that it must apply to all axles or tires whether supplied to our wheelmakers in England or sent to the Colony for renewals.

Inform also Agent-General, and say that we cannot understand why £26 16s. 9d. was paid for the last imported axles. Ask him to obtain explanation, and get refund of apparently excess charge.—C.A.G., 29/9/85.

The Secretary for Public Works to Messrs. Vickers, Sons, & Co.

Gentlemen, Department of Public Works, Railway Branch, Sydney, 6 October, 1886.

I have the honour to inform you that on the 1st instant, I cabled to you “First,” which, in terms of your letter of July 10th was to be the code in the event of your offer to supply waggon tires and axles for the term of five years from the 31st December next, the tires at the existing rate of £18 per ton, and the axles at £19 10s. per ton being accepted.

I now beg to confirm the intimation conveyed to you, and to state that your offer to supply waggon tires and axles at the rates and for the period stated above has been approved and accepted, and it must be clearly understood that this arrangement is intended to embrace all waggon tires and axles supplied to the order of this Government, whether sent to wheelmakers in England or to this Colony for renewals.

I have, &c.,

CHARLES A. GOODCHAP,
Pro Secretary for Public Works.

The Secretary for Public Works to The Agent-General.

Sir, Department of Public Works, Railway Branch, Sydney, 6 October, 1885.

I have the honor to inform you that Messrs. Vickers & Co. having intimated their inability to continue to supply waggon tires and axles after the 31st December next at the rate of £18 per ton on the ground that that rate does not afford them any margin of profit, a new arrangement has been made with the firm, under which they will supply all waggon tires and axles required by this Government in the five (5) years ending 31st December, 1890, at the following rates:—

Tires	£18 per ton.
Axles... ..	£19 10s. „

Such arrangement to embrace all waggon tires and axles supplied to the order of this Government, whether sent to the wheelmakers in England or to the Colony for renewals.

I observe that the last 800 waggon axles sent out to the Colony by you are charged by Vickers & Sons at the rate of £26 16s. 9d. per ton. This charge is inexplicable, because, adding a liberal allowance for extra work done to the axles, it would not come to anything like this rate.

I shall be obliged by your making inquiries upon the point, and obtaining a refund should it turn out that there has been an overcharge.

I have, &c.,

F. A. WRIGHT,
Secretary for Public Works.

Mr. James Brown to The Commissioner for Railways.

Sir, Sydney, 4 December, 1885.

I have from Messrs. Cammell & Company (Limited), Sheffield, a few printed lists of the tests to which the 700 cast-steel tires were subjected by Mr. John Fowler. One of these lists I have pleasure in passing you.

I am, &c.,

JAMES BROWN.

P.S.—You will notice the test requirements were fulfilled.—J.B.

Messrs. Vickers, Sons, & Co. to The Secretary for Public Works.

Sir, Via Brindisi, London, 9 October, 1885.

At 3:30 p.m. yesterday we received your valued telegram, “First.—George R. Dibbs, Secretary,” for which we beg to thank you.

The word “First” we take to be the code word named in our letter of the 10th of July last to the Commissioner for Railways, meaning—“The Government accept your offer to supply all their requirements

ments for waggon tires and axles for five years, from the 31st December, 1885, at £18 per ton for the tires, and £19 10s. for the axles," and we write at once to express our sense of the favour conferred on us by the kind compliance with our request to advise us of the decision of the Government by telegraph, which enables us to make the necessary arrangements for materials, &c., and for which we are greatly obliged.

Waiting your communications by mail on the subject, we beg to assure you that our utmost endeavour shall be to supply the best tires and axles for the purpose that we know how to make.

And we have, &c.,

VICKERS, SONS, & CO. (LIMITED),
(ALBERT VICKERS).

Messrs. Vickers, Sons, & Co., to The Secretary for Public Works.

Sir,

London, 19 November, 1885.

We have the honor to acknowledge receipt of your valued favour of the 6 October, confirming the intimation, already conveyed to us by cable message of the code word "First," of the acceptance of an offer to supply the Government with all their requirements for waggon tires and axles for the five years from 31st December, 1885, at £18 per ton for the tires and £19 10s. for the axles, for which please accept our best thanks.

With reference to the last paragraph of your letter, we agree that it is clearly understood that this arrangement embraces all the waggon tires and axles which the Government may require during the said five years, whether for wheels to be made in England or elsewhere, or for repairs in New South Wales.

We have, &c.,

VICKERS, SONS, & CO.

The Agent-General to The Secretary for Public Works.

Sir,

Westminster, 4 December, 1885.

Referring to your Despatch 85/4,512, of the 6th October last, on the subject of the price charged by Messrs. Vickers, Sons, & Company for the supply of the 800 axles ordered in your letter 84/5,619, dated 20th June, 1884. I have the honor to inform you that I have been in communication with Messrs. Vickers & Company on the subject, and have been furnished with an explanation by them in regard to the price charged for the tires, copy of which is enclosed for your information.

I have, &c.,

SAUL SAMUEL.

Messrs. Vickers, Son, & Co., to The Agent-General.

Sir,

River Don Works, Sheffield, 28 November, 1885.

In further reply to your letter of the 25th instant, on the subject of the price charged for the 800 finished axles supplied by us in 1884 to the above indent, as we find that Mr. Albert Vickers will be absent from London for some days, we beg to write to you instead of Mr. Vickers calling upon you.

On referring to our books we find the following was our estimate for these 800 axles:—

	£	s.	d.
800 axle forgings 3 cwt. 1 qr. 10 lb. each, 2,671 cwt. 1 qr. 20 lb., at 18s.	2,404	5	9
16 axle forgings for testing, 53 cwt. 1 qr. 20 lb., at 18s....	48	1	9
Cost of finishing 800 axles and packing for shipment, at 20s.	800	0	0
Total	3,252	7	6

From this you will see that we based our estimate for the axles on our contract price of 18s. per cwt., a price that we have had to explain officially to the New South Wales Government we find too low to leave us a margin for profit, and to this price for the forgings we have added the cost of finishing the axles and protecting the finished parts for shipment.

The packing was carefully done, the axles being first wrapped with spun-yarn dipped in tallow, and then protected by lagging secured by iron bands.

We beg to submit that in comparing the price per ton of finished axles with that of the forgings the loss of weight in finishing them must be taken into consideration.

Hoping you will find our explanation of the price of the finished axles satisfactory,—

We remain, &c.,

VICKERS, SON, & CO. (LIMITED),
JOHN CROSSEY.

Mr. R. Waddington to The Commissioner for Railways.

Dear Sir,

Sydney, 16 March, 1886.

I am aware that recently you entered into a contract with Messrs. Vickers & Sons for the supply of tires and axles for five years, but this I understand was solely for new work, not for renewals.

I wish now to put a proposal before you that Messrs. Brown, Bayley, Dixon, & Co. should have the supply of all renewals of tires and axles.

This firm bear a high reputation for the manufacture of good material, and get their share of work on the English railways, and they will guarantee to supply you with a tire equal in every respect to that now obtained from Messrs. Vickers & Sons, at the price of £17 per ton.

Kindly give this your favourable consideration.

I am, &c.,

RICHARD WADDINGTON.

Will papers *re* Vickers' contract be put with this?

Not necessarily. Please ascertain whether the contract made with Vickers for tires and axles was for *all* tires, &c., or whether for renewals or new work. Mr. Waddington first quoted £18 a ton for tires, and

and upon my stating we paid no more to Vickers, he expressed surprise, having been under the impression we were paying £24 a ton; and he then said he would reduce his offer to £17 a ton.—CHAS. A. G., 20/3/86.

Contract for Tires and Axles.

Superintendent of Stores,—The papers relative to the contract with Vickers for tires and axles are not immediately available. The Commissioner wishes to know whether that contract was for all supplies, or for the supplies for new stock only. If you can furnish the information without reference to the papers, I shall be much obliged by your doing so; it will save time.—G.B., B.C., 22/3/86.

Please see copy of minute enclosed. I judge that the new agreement referred to covers all deliveries, whether at wheel-makers', for new stock, or f.o.b. London, for renewals. Tires, £18; axles, £19 10s.—A.R., 24/4/86. The Secretary.

Memorandum from Mr. W. Pratt to Mr. Braid.

Sir,

Locomotive Engineer's Branch, Redfern, 14 July, 1886.

I beg to report, for your information, as regards Cammell's crucible cast-steel tires, a pair of tires were bored out in the usual way, and were riveted up on Tuesday night, 13th, and on Wednesday morning my attention was called to the same tire. This tire I found burst right through the rivet-hole on one side.

Tire dated 9/84.

W. PRATT.

For the information of Locomotive Engineer. From inquiries I have made, I find that this is the first that has broken in the way mentioned.—S. BRAID, 15/7/86. Who is the maker of this tire?—W.S., 21/7/86. Mr. Cobb. Cammell's crucible cast-steel.—J.C. Loco. Engineer.—20/7/86.

Forwarded for your information. I have examined the tire, and find the material is white and hard, and the fracture coarse. It is very fortunate that the defect was discovered before the tire left the shop.—W. SCOTT, 19/8/86.

This crucible cast-steel has recently been introduced by Cammell & Company for axles and tires. What number are there in stock? Pray be careful about using them.—CHAS. A. G., 26/8/86. Locomotive Engineer.—26/8/86.

Will you please inform me the number in stock, also the number issued, and the dates of issue?—W. SCOTT, 3/9/86. Superintendent of Stores.

Number received 700
 ,, issued 623

Balance in stock 77

For dates of issue see attached list.—A.R. Locomotive Engineer, 7/9/86.

It will be seen that there are only 77 of these tires out of 700 not in use.—W. SCOTT, 8/9/86. Commissioner.

CAMMELL & CO'S TIRES RECEIVED AND ISSUED.

Date received.	Ship.	No.	Date issued.	No.	Chargeable to.
1884.			1885.		
November	Eme	98	February	20	31
1885.			August	50	31
February	Kishna	152	September	50	41
April	Port Adelaide	208	November	50	41
	Gulf of Mexico	142	February (1886)	40	41
May	Thomasina M'Lellan	100	March	40	41
			April	34	41
		700	June	40	41
			July	50	41
			August	30	41
				404	
			Tires issued but no size given.		
			1885.		
			May	126	41
			September	36	41
			March (1886)	50	41
			April	6	31
				218	
			No. of Tires in stock	77	

Minute by Commissioner.

TESTING of axles and tires sent by Cammell & Co., about June, 1885, 25 of each.

By Mr. James Brown's letter, 16th September, 1885, these waggon tires and axles seem to be offered at 17s. 6d. per cwt. for tires and 17s. per cwt. for axles delivered in Sydney.

It would seem that the tires and axles sent to be tested are made of engine-tire steel. It is not quite clear that if the test should turn out satisfactorily we shall be supplied with axles and tires of engine-tire steel at the prices named.—I fear not, as engine tires are quoted in Mr. Brown's letter at £1 2s. 3d. per cwt; but this is a matter that could be settled when the articles have been tested.

Mr. Scott proposed, in his minute of 10/6/85, to test these tires and axles when the testing machine ordered from England had arrived, and had been placed at Eveleigh.

Has this been accomplished? if so, the test should be made, and Mr. Brown afforded an opportunity of being present.—CHAS. A. G., 24/8/86. Locomotive Engineer.

The

The testing machine has not yet been erected, and consequently I have not been able to have them tested. The delay in erection has arisen through the shops not being sufficiently advanced to have the appliances fixed in connection with them.—W. SCOTT, 8/9/86.

I forward herewith, for your information, communications received from the several Locomotive Engineers of the Colonies, conveying their experience of Cammell & Company's tires and axles, in answer to inquiries made by me.—W.S., 8/9/86. The Commissioner.

The Locomotive Superintendent, Victoria, to The Locomotive Engineer.

Dear Scott,

Locomotive Superintendent's Office, Melbourne, 1 October, 1885.

In reply to yours of 28th ultimo, *re* Chas. Cammell & Co's., tires and axles.—We have no Cammell's carriages or waggon tires in use that I am aware of, but have a number of their steel axles; they have not been in use running long enough to enable me to give you the information desired, but I attach you a sheet showing impact and tensile tests of same made in June, 1882.

I have, &c.,

S. MIRLS,

Locomotive Superintendent.

The Locomotive Engineer, Adelaide, to The Locomotive Engineer, Sydney.

Dear Sir,

Locomotive Engineer's Office, Adelaide, 2 October, 1885.

In answer to your inquiry of the 28th September, I beg to inform you that we have no crank axles of Chas. Cammell & Co.'s make, and I am not aware of having any straight axles by them.

We have a few tires imported in 1881 and 1882, but our present practice is to get our tires either from Krupp, Vickers, or the Monkbridge Company.

I am, &c.,

WILLIAM SHOW,

Locomotive Engineer.

The Locomotive Engineer, Brisbane, to The Locomotive Engineer, Sydney.

Dear Sir,

Locomotive Engineer's Office, Brisbane, 6 October, 1885.

In reply to your letter of the 28th ultimo, I beg to inform you that, so far as I can ascertain, none of Chas. Cammell & Co.'s steel tires and axles have been imported for these railways during the last ten years. Previous to 1876 a few Cammell engine tires were received, which appear to be rather softer than those we now get from Vickers.

There may possibly be some Cammell steel axles in some of our old engines, but they have never come immediately under my notice in any way.

I am, &c.,

T. THORNIBLOW,

Locomotive Engineer.

The Assistant Locomotive Superintendent, Melbourne, to The Locomotive Engineer, Sydney.

My dear Sir,

Locomotive Superintendent's Office, Melbourne, 19 October, 1885.

In reference to your inquiries (No. 85-2,030) as to my experience in New Zealand with the steel tires supplied by the firm of Cammell & Co., I beg to inform you that for about nine years we used tires supplied by that firm very extensively, both for engines and rolling stock. The only fault I ever had to find with them was that they were too soft, and for this reason they were to some extent superseded by those bearing Vickers' Australian brand. My first experience of Cammell's tires dates even further back, as this was one of the firms that were always mentioned in the specifications for supplies to the North British Railway of Scotland.

I must apologise for not answering your letter sooner, but I have been away from home nearly constantly, for the last three weeks.

Yours truly,

ALLISON D. SMITH,

Assistant Locomotive Superintendent, Victoria.

Seen.—W. SCOTT, 21/10/85.

The Traffic Manager to The Commissioner for Railways.

I BEG to report, for the Commissioner's information, that the axle of the brake-van attached to "42 up," on the 13th instant broke at Springwood, about 3.30 p.m., and the leading pair of wheels went off the road.

The luggage, parcels, &c., were transferred into a carriage as far as Glenbrook, when the push-up van of No. 17 was attached to the passenger train, No. 42 up, and sent to Sydney.

The line was cleared by 12.50 a.m. on Sunday morning, 14th instant.

I will report further in a day or two.

W. V. READ (*per* N.W.), 15/11/86.

Broken axle on eight-wheel passenger brake-van, No. 13, at Springwood, 13/11/86.

The Commissioner,—I have to report, for your information, that driver Robert Baker, engine No. 306, with No. 42 "up" passenger-train (Bathurst to Sydney), on the 13th instant, when at about 75 yards west of Springwood, the leading axle of brake-van No. 13 broke. At this point the brakes would be put on to stop the train at the platform, when the axle broke. The end appears to have struck the air-pipe and broke it, thus causing the brake to go on full and stop the train suddenly, and so saved further damage, with the exception of slightly bending of some rods, &c. A van was taken from one of the goods trains, and No. 42 up-passenger was brought to Penrith about 35 minutes late.

The fracture is close to the wheel-boss in the inside, and shows an old flaw of some standing, extending nearly half through the axle-maker's name—"Cooper, Leeds, October." Only the wheels of the broken axle were off the road. The main line was blocked, and the traffic was worked through the loop, thus preventing delay to other trains.

W. SCOTT (*per* C.A.M.), 15/11/86.

To await return of papers.—I have asked certain questions thereon in connection with the subject.—C.A.G., 20/11/86. For Minister's information.—Further inquiry is being made on other papers. Seen.—W.J.L., 20/11/86.

Leading axle of brake-van, attached to No. 42 up-passenger, broke at Springwood, 13/11/86. WITH reference to my memorandum, p. 86/4,820A, 15th instant, *re* the above occurrence, it is stated that the axle had a very bad flaw in it. The Loco. Engineer will no doubt have reported this to the Commissioner. W. V. READ (*per* N.W.), 22/11/86.
The Commissioner.

Minute by The Commissioner.

Broken axle on 8-wheel passenger B van, No. 13, at Springwood, 13/11/86; maker's name, "Cooper, Leeds."

1. When was this axle ordered?
2. How long has it been in use?
3. Though the brake-van was one with eight wheels it was not, I assume, a bogie frame, or the wheels would not probably have left the rails?
4. I gather from the report that the flaw was in a position not easily detected—"close to the boss on the inside"?
5. Have we any more of the same class of axle in use?
6. Whose axles are being used with the other wheels of this brake van?

To Locomotive Engineer.—B.C.

CH.A.G., 17/11/86.

1st question.—Was delivered with the van in 1868.

2nd " —Eighteen years.

3rd " —It was not a bogie frame.

4th " —It was close to the boss, and could not easily be detected.

5th " —Yes.

6th " —Similar axles—they were all delivered with the van.

GEO. DOWNE, 25/11/86.

Seen. I assume this axle is an iron one. It had better be broken to ascertain if the iron is crystallized.—CH.A.G., 9/12/86. Locomotive Engineer.

Testing of tires and axles.

SOME time back a minute was addressed to Mr. Scott, asking him to state for Commissioner's information when it was probable that the erection of the testing apparatus would enable him to test, and report upon, the samples sent in by Cammell & Co.

I have not seen any reply to that minute.

D.C.M'L., B.C., 8/12/86.

To Locomotive Engineer. Urgent.

I shall be ready to have this put in operation as soon as the Existing Lines Branch have completed the framework, &c.—W. SCOTT, 13/12/86. The Commissioner. Mr. Cowdery, D. C. M'L., 14/12/86. The framework, &c., will be ready in about a week.—G.C. (*per* G.L.), 18/12/86. Secretary.

I AM informed by Mr. Cowdery that his part of the work in connection with the testing apparatus at Eveleigh is "about completed."

Can you now let me know when you expect to have the apparatus ready for use, and when the Commissioner may expect to receive your report "on the testing of Cammell & Company's tires and axles?"
Locomotive Engineer. A. RICHARDSON, B.C., 5/1/87.

Mr. Downe,—Will you be good enough to get the necessary information?—W. SCOTT, 11/1/87.

A test of the arrangement is ready to be made to-day, and I have written the District Engineer to make water connection to feed tank of boiler. If no alterations are required the tests can be proceeded with at once.—GEO. DOWNE, 12/1/87.

Memo. to The Assistant Locomotive Engineer.

Re Cammell & Co.'s tires and axles.

MR. JAMES BROWN, agent for Cammell & Co., is in Melbourne, and will not be back until next Wednesday.
W. SCOTT, 15/1/87.

I would suggest deferring the test until Messrs. Cammell & Co.'s agent can be present.—GEO. DOWNE, 15/1/87. Urgent. I concur. It would be well to inform Mr. Vickers also.—W. SCOTT, 17/1/87. Assistant Loco. Engineer. Noted; and Mr. Vickers being in Melbourne, I requested his representative to inform him by wire.—GEO. DOWNE, 17/1/87. Locomotive Engineer. Mr. Brown has called, and I have arranged to have the tests made on Thursday next at 11 a.m.—W. SCOTT, 21/1/87. Assistant Loco. Engineer. As the testing machine is now ready, the Commissioner's instructions can now be carried out.—W. SCOTT, 17/1/87. Mr. Downe.

The testing machine is now ready, and I intended to test the tires to-day. I find, however, that the representative of Messrs. Cammell & Co. is out of town, and would not return before Wednesday next. I have deferred the test so that he might be present.—W. SCOTT, 17/1/87. Commissioner.

Please report results of tests.—A.R., 20/1/87. Locomotive Engineer.

Mr.

Mr. J. Brown to The Locomotive Engineer.

Sir,

121 Bathurst-street, Sydney, 31 January, 1887.

The three tires I am sending in to your Eveleigh Works to-night, for testing, are of very stiff temper, being in tensile strength from 50 to 55 tons; you will probably find that only a small deflection can be obtained. This class of tire is preferred by some engineers because a more uniform and economical result can be obtained in the wearing.

Yours, &c.,

JAMES BROWN,

Representative and Agent to Charles Cammell & Co. (Limited).

To Locomotive Engineer,—Will the Locomotive Engineer be so good as to say if the tire and axle testing apparatus at Eveleigh is now ready for use, and if there is a prospect of Commissioner soon having a report upon the testing of Cammell & Co.'s samples?—D.M'L., B.C., 7/2/87.

The drop tests have been completed, but the tensile tests are now being arranged for. I hope to be able to report fully in about ten days.—W. SCOTT, 14/2/87. The Commissioner.

Report of Locomotive Engineer.

Axles and tires.

I BEG to submit the result of the tests made (*See Appendix*) which indicate in tabulated form the merits and demerits of the various tires and axles subjected to trial, from which it will be seen that those manufactured by Messrs. Vickers, Sons, & Co. were tested, as well as those by Messrs. Cammell & Co., for the purpose of instituting a comparison of their relative value.

The three axles, Nos. 1, 3, and 5, were taken from the twenty-five specially sent out by Cammell & Co. for testing. The amount of deflection at every blow indicates softness in the material, which is more of the nature of iron than steel, and unsuitable for railway rolling stock. Drop tests
(axles).

Nos. 2, 4, and 6, Vickers & Co.'s, were taken indiscriminately from a number in store, and may be considered a fair average quality of those supplied by that firm. The results were satisfactory.

These tests exceeded in severity the requirements of the "recognized" tests.

Nos. 1, 3, and 5 tires, Vickers & Co., were also taken indiscriminately from a number in store. Could be considered of an average quality, and stood more than the "recognized" test, viz., to compress one-sixth of the diameter without showing fracture, proving themselves to be of the proper degree of hardness for wear, and reliable. Drop tests
(tires).

Nos. 2, 4, and 6, Cammell & Co., were taken from the twenty-five specially sent out by that firm for testing, and proved too soft, and more the nature of iron than steel.

Nos. 7 and 8, Cammell & Co., were taken indiscriminately from a number in store. No. 7 proved too hard and unreliable; No. 8 stood the "recognized" test, and proved itself to be of the proper degree of hardness, and the only reliable tire tested of this firm's manufacture.

Nos. 9, 10, and 11, Cammell & Co., were tires which Mr. Brown, representative of the firm, requested (as per letter which is attached) to have tried, and they proved to be unreliable.

These tests were made on pieces cut from Nos. 1 and 3 tires, Vickers & Co.'s, and Nos. 2 and 8, Cammell & Co.'s previously "drop tested." Tensile tests
(tires)

In the case of No. 2, which was, as previously mentioned, supplied specially for testing, the ultimate stress is little better than the best bar iron.

The results of these tests show plainly the superiority of Messrs. Vickers, Sons, & Co.'s tires over those of Messrs. Cammell & Co., in that they possess a tensile strain and limit of elasticity exceeding them; and I am also of opinion that they would run a greater mileage at less cost, and thus prove more economical to the Department.

The Commissioner.

W. SCOTT,
28/2/87.

APPENDIX.

①

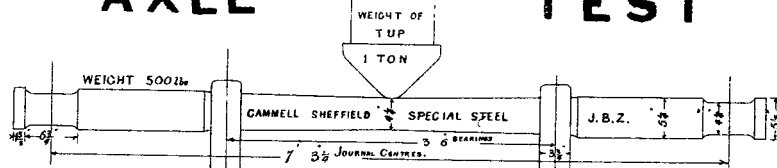
RESULT OF DROP TESTS MADE WITH STEEL AXLES & TYRES AT EVELEIGH

ON THE 28th & 31st JAN. & 1st FEB. 87.

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE SYDNEY, NEW SOUTH WALES

②

AXLE CAMELL'S TEST



Blow No.	Drop Ft.	Deflection before blow	Total deflection	Remarks	Blow No.	Drop Ft.	Deflection before blow	Total deflection	Remarks	Blow No.	Drop Ft.	Deflection before blow	Total deflection	Remarks
1	10	0"	3 3/4"	Note - Axle turned after each blow except for 11 & 12 blows	1	20	0"	7 7/8"	Note - Axle turned after each blow.	1	20	0"	7 7/8"	Note - Axle turned after each blow
2	10	3 3/4"	3 3/4"		2	20	7 7/8"	6 1/2"		2	20	7 7/8"	6 1/2"	
3	15	M 1/4"	3 3/4"		3	30	M 7/8"	8 1/2"		3	30	M 1"	7 7/8"	
4	15	4"	3 3/4"		4	30	7 1/2"	8 3/4"		4	30	6 7/8"	8 1/2"	
5	20	M 1/2"	5 1/2"		5	30	P 1"	8 3/4"		5	30	P 1 1/4"	8 1/2"	
6	20	3 3/4"	4 1/4"		6	30	7 1/2"	8 3/4"		6	30	6 7/8"	8 1/2"	
7	20	M 1/2"	5 1/2"		7	30	P 1 1/2"	8 3/4"		7	30	P 1 1/2"	8 3/4"	
8	20	5 1/4"	4 7/8"		8	30	7 1/2"	8 3/4"		8	30	7 7/8"	8 3/4"	
9	20	M 3/4"	5 3/4"		9	30	P 1 3/4"	9 3/4"		9	30	P 1 1/2"	9"	
10	20	4 3/4"	3 3/4"		10	30	8"	9 1/4"		10	30	7 1/2"	9 3/4"	
11	20	M 7/8"	5 1/2"											
12	20	4 3/4"	3 3/4"											
13	20	M 1"	5 1/2"											
14	30	4 3/4"	8 3/4"											
15	30	P 3 3/4"	8 3/4"											
16	30	4 1/4"	8 3/4"											

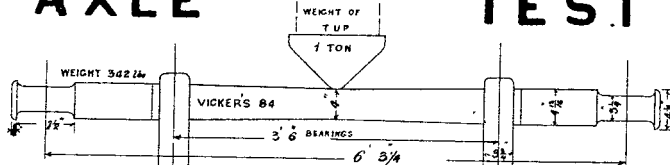
N^o 1 AXLE.

N^o 3 AXLE.

N^o 5 AXLE.

③

AXLE VICKERS TEST



Blow No.	Drop Ft.	Deflection before blow	Total deflection	Remarks	Blow No.	Drop Ft.	Deflection before blow	Total deflection	Remarks	Blow No.	Drop Ft.	Deflection before blow	Total deflection	Remarks
1	10	0"	2 1/4"	Note - Axle turned after each blow	1	20	0"	5 3/4"	Note - Axle turned after each blow.	1	20	0"	5 3/4"	Note - Axle turned after each blow.
2	15	2 3/4"	1 3/4"		2	20	5 3/4"	5 3/4"		2	20	5 3/4"	5 3/4"	
3	15	M 3/4"	3 3/4"		3	30	M 1/4"	8 3/4"		3	30	M 1/4"	8 3/4"	
4	15	3 1/2"	2 3/4"		4	30	8"	8 3/4"		4	30	8 1/2"	13 3/4"	
5	20	M 3/4"	5"		5	30	P 7/8"	8 3/4"		5	30	P 4 7/8"	8"	
6	20	4 1/4"	3 3/4"		6	30	8"	8 3/4"		6	30	3 1/2"	8 3/4"	
7	20	M 1"	5 1/2"		7	30	P 3/8"	8 3/4"		7	30	P 5 3/4"	8 1/2"	
8	20	4 1/4"	2 7/8"		8	30	7 1/2"	9"		8	30	2 7/8"	8 7/8"	
9	20	M 1 1/4"	5 1/2"		9	30	P 1 1/4"	7 1/2"		9	30	6"		
10	20	3 3/4"	2 1/2"		10	30	6 1/4"	8 1/2"						
11	20	M 1 3/4"	5"											
12	20	3 3/4"	2 3/4"											
13	20	M 1 1/4"	5 1/2"											
14	30	3 3/4"	7 3/4"											
15	30	P 4"	7 3/4"											
16	30	3 3/4"	7 3/4"											

N^o 2 AXLE.

N^o 6 AXLE.

N^o 4 AXLE.

Broken showing a fracture of two different colors, see photo.

TYRE TEST

VICKERS CAST STEEL
AUSTRALIA BRAND

Blows No.	drop ft	deflection	Remarks.
1	10	3/8"	WEIGHT 425 lbs: ①
2	15	2 1/8"	
3	20	3 3/8"	
4	25	5 1/8"	
5	30	7 1/8"	
6	30	9 1/8"	
7	30	11 1/8"		no signs of any fracture.

Blows No.	drop ft	deflection	Remarks.
1	10	1"	③
2	15	2 1/4"	
3	20	3 3/8"	
4	25	5 1/8"	
5	30	7 1/8"	
6	30	—		Broke.

Blows No.	drop ft	deflection	Remarks.
1	10	1 1/8"	⑤
2	15	2 1/8"	
3	20	4 1/8"	
4	25	7 1/8"	
5	30	9 3/8"	
6	30	12 1/8"	
7	30	14 1/8"		no signs of any fracture.

Note:- dia. of tyres inside before testing. 2 - 7 1/8"

TYRE TEST

CAMELL'S CRUCIBLE CAST STEEL

Blows No.	drop ft	deflection	Remarks.
1	10	2 1/8"	WEIGHT 408 lbs: ②
2	15	5 1/8"	
3	20	8 3/8"	
4	25	12 1/8"	
5	30	17 1/8"	
6	30	22 1/8"	
7	30	27 1/8"		no signs of any fracture.

Blows No.	drop ft	deflection	Remarks.
1	10	2 1/8"	④
2	15	4 1/8"	
3	20	8 3/8"	
4	25	12 1/8"	
5	30	17 1/8"	
6	30	22 1/8"	
7	30	26 1/8"		no signs of any fracture.

Blows No.	drop ft	deflection	Remarks.
1	10	2"	⑥
2	15	5"	
3	20	8 1/2"	
4	25	12 1/2"	
5	30	17 1/2"	
6	30	22 1/2"	
7	30	26 1/2"		no signs of any fracture.

Blows No.	drop ft	deflection	Remarks.
1	10	—	Broke.
			WEIGHT 428 lbs.
⑦			

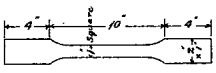
Blows No.	drop ft	deflection	Remarks.
1	10	1 1/8"	⑧
2	15	2 3/8"	
3	20	4 1/8"	
4	25	6 1/8"	
5	30	8 1/2"	
6	30	10 1/2"	
7	30	—		Broke.

Blows No.	drop ft	deflection	Remarks.
1	10	1"	WEIGHT 406 lbs: Broke.
2	15	—	
⑨			

Blows No.	drop ft	deflection	Remarks.
1	10	—	Broke.
⑩			

Blows No.	drop ft	deflection	Remarks.
1	5	1/2"	Broke.
2	6	—	
⑪			

Results of Tensile Test of Steel cut from Tyres
of
Vickers & Cammell's make

Strip cut from Tyre No.	Maker's Name	Ultimate Stress.			Fractured Section.				Elongation		Limit of Elasticity TONS	Remarks.
		Size	Area	Original Section Tons	Size	Area	difference in Area	Reduction in Area per cent	per 10"	per cent		
1	Vickers	1"	1"	41.5	875	756	244	22.4	1.125	11.25	30	 <p>Note:- All the strips tested were to the above sketch.</p>
1	Vickers	1"	1"	41.95	937	878	122	12.2	8.75	8.75	—	
3	Vickers	1"	1"	52.5	957	878	122	12.2	8.75	8.75	27.5	
3	Vickers	1"	1"	52.7	937	878	122	12.2	68.75	6.87	—	
2	Cammell's	1"	1"	27.5	656	43	57	57	2.25	22.5	12.5	
2	Cammell's	1"	1"	27.5	656	43	57	57	2.125	21.25	—	
8	Cammell's	1"	1"	48.187	937	878	122	12.2	1	10	10	
8	Cammell's	1"	1"	47.312	967	878	122	12.2	1	10	—	

(124-G)

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

IMPORTED RAILWAY MATERIAL.

(MACHINERY, &c.)

Ordered by the Legislative Assembly to be printed, 18 March, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 2nd September, 1886, That there be laid upon the Table of this House,—

“(1.) The number of sets of stock-switches, point rods, chair-slides, and lever-stands imported during the last two years, and the cost of same, per set, delivered from the store ready for use.”

“(2.) The cost of machinery imported expressly for carrying out this work and the cost of same made at permanent-way workshops.”

(*Mr. Hugh Taylor.*)

IMPORTED RAILWAY MATERIAL.

1. *Question*—

The number of sets of stock-switches, point rods, chair-slides, and lever-stands imported during the last two years, and the cost of same per set, delivered from the store ready for use?

Answer—

Total number of T. R. switches imported for extensions during the last two years, 390; average cost per set, £17 12s. 10d. Total number imported for renewals, 304; average cost per set, £17 12s. 5d. Total number of D. H. switches for renewals, 38; average cost per set, £13 9s.

2. *Question*—

The cost of machinery imported expressly for carrying out this work, and the cost of same made at permanent-way workshops?

Answer—

Hitherto the switches have been made by machines, which are used for all classes of work. Two special machines for this work were imported some time ago at a cost of £380 each. One of these machines is now being fixed. The cost of switches made at the permanent-way shops is £15 11s. 6d.; a pair of English-made switches and stock rails weigh 15 cwt. 2 qr. and 14 lb., and a pair of those made in the permanent-way workshops with stock rails weigh 13 cwt. 1 qr. and 22 lb. This extra weight, coupled with the fact that the English switches are made of specially rolled section of steel for the purpose, will account for the difference in cost. Those made in the workshops are not equal in strength to the imported ones, nor have they the wear-resisting qualities. They are made of the usual rail section, which accounts for the difference in weight, and are not used on the main line.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAYS.

(RESUMPTION OF PROPERTY OF EDWARD IRBY ON BLUFF RIVER.)

Ordered by the Legislative Assembly to be printed, 5 July, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 10th May, 1887, That there be laid upon the Table of this House,—

“Copies of all letters, minutes, reports, plans, and other documents having reference to the resumption of the land and buildings, by the Commissioner for Railways, on portion 186, Bluff River (extension Glen Innes to Tenterfield) the property of Edward Irby; also, the amount paid as compensation for the same.”

(Mr. Lee.)

NO.	SCHEDULE.	PAGE.
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2.	Letter from Mr. Irby, asking for passages for stock, with minutes. 22 January, 1883	2
3.	Minute by Land Valuer, giving particulars of claim and valuation, with offer to Mr. Irby, and his acceptance of same. 27 August, 1883.....	2
4.	Letter from Mr. Irby, asking for passage through embankment, and reply thereto. 16 October, 1883	5
5.	Letter from Mr. Irby, in reply to two from Commissioner. 6 November, 1883	6
6.	Letter from Mr. Irby, <i>re</i> abstracts of title to land resumed. 7 November, 1883	6
7.	Correspondence <i>re</i> providing passages for stock. 7 November, 1883	7
8.	Letter from Mr. Irby, <i>re</i> abstracts of title. 13 November, 1883	8
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10.	Letter from Mr. Irby, asking for a crossing, with reply. 18 October, 1884	8
11.	Letter from Mr. Irby to Crown Solicitor, <i>re</i> balance of money due, with minutes, &c. 13 November, 1884	9
12.	Letter from Mr. Irby, <i>re</i> position of crossing granted him 17 January, 1885	10
13.	Letter from Messrs. Robinson and Panton (Solicitors), <i>re</i> certain portions of the land resumed. 11 April, 1885	10
14.	Letter from Crown Solicitor, forwarding voucher for part payment of purchase money. 20 April, 1885.....	10
15.	Letter from Mr. Irby to District Engineer, asking for a crossing, with minutes. 14 September, 1885	11
16.	Letter from C. A. Lee, M.P., asking that crossing be granted Mr. Irby, at 369 m. 47 c., with minutes, &c. 23 November, 1885	11
17.	Letter from Mr. Irby, asking for private crossing, with minutes. 23 January, 1886	12
18.	Letter from Crown Solicitor, forwarding voucher for settlement of matter. 5 March, 1886	12

RAILWAYS.

No. 1.

Mr. Irby's Claim.

Great Northern Railway—Extension from Glen Innes to Tenterfield.

I HEREBY offer to accept from the Commissioner for Railways, as purchase money for the land (including buildings and fences erected thereon) of which I am the owner in fee simple, delineated on the tracing plan attached to the notice of land taken, and numbered Part No. 3 Abstract No. 3, which I hereby acknowledge to have received, containing 62 acres 1 rood and 33 perches, more or less, and as compensation for damage by severance, by the railway, or otherwise caused by the execution of the railway works, as particularly set forth in the subjoined Schedule of Claim, the sum of £7,600 5s., which sum I declare to be my full claim in respect of the matters aforesaid.

Dated this 22nd day of January, 1883.

EDWARD IRBY,
Tenterfield.

To the Commissioner for Railways, Sydney.

SCHEDULE of Claim.

Land resumed:—Reference Nos., 50, 1, 2, 3, and 4; area, 10 acres 25 perches; cultivation; estimated value, £25 per acre; total value, £251 10s. Reference Nos., 174 to 187 inclusive; area, 52 acres 1 rood 9 perches; pasture; estimated value, £3 per acre; total value, £156 10s.

Nature and description of improvements taken:—Fences, 42 rods at 4s., £8 8s.; other improvements—total destruction of No. 186 as a water mill property, for which purpose only it was purchased and improved, £7,000; damage by severance or otherwise, £183 17s.; total amount of claim, £7,600 5s.

EDWARD IRBY.

No. 2.

E. Irby, Esq., to The Commissioner for Railways.

Sir,

Tenterfield, 22 January, 1883.

I have the honor to direct your attention to the necessity of providing me with suitable passages for stock under the Great Northern Railway now in course of construction through my run.

I am given to understand that level crossings will be granted me, but I wish to point out that to take a herd of cattle from one part of the run to another over the rails will be a difficult and certainly a dangerous thing to do, and I may say I only depasture cattle on Bolivia.

In place of certain culverts it would be advisable to build larger bridges, and I respectfully apply to have a bridge placed under the line at 362 miles 26 chains; the Engineer tells me that a 20-foot culvert is to be built here, but this will not be nearly sufficient.

I would suggest that three or four timber openings of say 30 feet each should be built, the centre spans to take the water (which is a considerable stream at times), and those on the sides to be available for cattle to be driven through.

A passage for cattle would also be urgently required at 360 miles 74 chains, but a culvert of 26 feet would be sufficient there.

I have, &c.,

EDWARD IRBY.

The Engineer-in-Chief.—D.V. (*pro* Commissioner), 31/1/83. Mr. Wade.—W.H.Q., 2/2/83. This can be considered when land valuer's report on number of crossings to be allowed Mr. Irby is received.—W.B.W., 13/2/83. The land valuer has just furnished a list of crossings, Glen Innes to Tenterfield. One is recommended for Mr. Irby at 368 miles 68 chains 50 links.—W.H.Q., 14/2/83. Mr. Wade. At 360 miles 74 chains, a timber opening 10 feet wide with wings can be given.—W.B.W., 23/2/83. A 20-foot culvert will be put in at 362 miles 26 chains. A bridge is out of the question.—J.W., 23/2/83. Mr. Mayes to note.—W.F.M., 4/3/83. 20-foot culvert, at 362 miles 26 chains; level crossing, at 368 miles 68 chains 50 links; 10-foot timber opening, at 360 miles 74 chains.—W.H.Q., 10/3/83. Mr. Drewett. Noted on section.—J.W.D., 12/3/83.

No. 3.

Minute by Mr. Land-Valuer Thompson.

Great Northern Railway—Glen Innes to Tenterfield.

PARTICULARS of Claim:—Claimant and owner, Edward Irby; reference numbers, 50 to 54, 174 to 176, 179, 183, 185 to 187; area taken, 62 acres 1 rood 33 perches; amount of claim, £7,600 5s.

REPORT.

THE lands taken from Mr. Irby are situated in four separate localities, and their character and positions are shown below.

Nos. 50 to 54 are within $2\frac{1}{2}$ miles of Glen Innes, and the land from which they are taken is bounded on the east by the Great Northern Road, and on the west by Furracabad Creek. They are naturally clear of timber, and the soil is black and fertile, but rather too swampy for cultivation in wet seasons. There is water on both sides of the railway line.

Nos. 174 to 176 are situated at Bolivia, 38 miles from Glen Innes. They are heavily timbered with white box and gum. They are well grassed. The soil is light. They are unenclosed and unimproved.

No. 179 is on the Great Northern Road, 41 miles from Glen Innes. It is heavily timbered with white gum. Grass is abundant, but of inferior quality. A level crossing is necessary at 364 miles 45 chains for Mr. Irby's use.

Nos.

Nos. 183 to 187 are pasture lands of middling quality. They are heavily timbered. On No. 186 is erected a water-mill; the building is 41 ft. 6 in. long and 41 ft. wide, and consists of a central portion two stories high, with a lean-to of one story on each side. The central part is roofed with galvanized iron, and the rest of the building is shingled. It is built of a strong timber framework, and the walls of slabs, well fitted and securely fixed. It is worked by a large overshot wheel 20 ft. diameter. The site is well chosen and well adapted for its purpose. About 6 feet is taken off the corner of this building. An old cottage, in semi-ruinous condition, is also taken, and an old enclosure, not now of any value. The following proposal with regard to the mill was made to Mr. Irby, of course subject to approval, viz. :—That entrance to the mill be given by a 26-foot timber opening at 369 miles 31 chains, and exit therefrom by a similar opening at 369 miles 38 chains, and that the fence on the eastern side of the line be set as close as practicable to the foot of the embankment; and further, that compensation for depreciation of value of the mill would be recommended at 25 per cent. of that value. This proposal, which I submit was of a very liberal character, was declined by Mr. Irby. It is therefore necessary—part of the building having been taken—to compensate Mr. Irby for the full value of the mill property in accordance with the decision of the Supreme Court in the special case *Phillips v. The Commissioner for Railways*, given on the 1st September, 1876. In estimating the value of the mill, I had the assistance of the Clerk of Works, Tenterfield.

Valuation.	£	s.	d.
10 acres 24 perches, at £15 per acre (Nos. 50 to 54)	152	5	0
52 acres 1 rood 9 perches, at £3 per acre (Nos. 174 to 187)	156	18	6
12 rods fencing at 7s. 6d. per rod	4	10	0
64 rods fencing at 5s.	16	0	0
Damage by severance, £50, £5, £20, £75... ..	150	0	0
Value of mill, fixed machinery, race, &c.	1,000	0	0
Disturbance of trade... ..	250	0	0
Cottage taken	30	0	0
Forced sale at 10 per cent.	30	18	6
	£1,790	12	0

J. B. THOMPSON,
Railway Land Valuer.

27/8/83.

The Commissioner for Railways.

Amount claimed, £7,600 5s.; amount recommended, £1,790 12s.—J.B.T., 27/8/83. Approved
for schedule.—CH.A.G. Land Valuer.—B.C., 31/8/83. Scheduled.—J.B., 6/9/83. Ex. Min.
83-39, 25/9/83.—J.B. Offer made.—J.B., 10/10/83.

Sir,

Department of Public Works, Railway Branch, Sydney, 10 October, 1883.

With reference to your letter of the 22nd day of January, 1883, claiming £7,600 5s. as compensation for loss of 62 acres 1 rood and 33 perches of land, together with buildings erected thereon, taken by the Great Northern Railway, and damages occasioned thereby, I have the honor to inform you that the loss and damage has been subjected to competent valuation, and such valuation having been confirmed by His Excellency the Governor and Executive Council, I have to offer you the sum of £1,790 12s. in full satisfaction of all claims for the said loss and damage, and all injuries of every nature which may be sustained by you by reason of the taking of the said land, and of the railway works; and in case you should not accept the amount offered, I have to request that you will proceed as required by the Government Railways Act, 22 Victoria No. 19, that the matter may be settled without delay.

The offer is made subject to your producing a satisfactory title to the estate, or interest claimed by you, in the land referred to. Should the above offer be accepted, I have to request that you will be good enough to transmit an abstract of your title to this office, in order that the Crown Solicitor may be instructed to prepare the necessary conveyance.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

E. Irby, Esq., Tenterfield.

Glen Innes and Tenterfield Railway Extension.

Sir,

Tenterfield, 16 October, 1883.

I do myself the honor to inform you that I am duly in receipt of your communication of the 10th instant, apprising me of the amount—£1,790 12s.—offered me as compensation for the 62 a. 1 r. 33 p. of land resumed by the Government for railway purposes, and all losses occasioned thereby, and think it due to myself to state, that finding portion of my Bluff River water-mill building was absolutely taken, and believing the whole building would be destroyed, and the special site—a water power for a 20-ft. overshot wheel—lost to me, I made a claim in proportion to what I believed the whole loss would be to me, and which I could fairly estimate at an income of from £500 to £700 per annum; and I did so under the impression that the Government would resume the whole of the valuable property encroached upon. Finding now that such resumption is declined, it would be worse than useless my contending that point, as it must involve a law-suit. I therefore must be content to make the best of a bad job, and accept the compensation offered.

If the building and machinery are not destroyed during the progress of the works, and access is given through the embankment—which I believe is 30 ft. high at that spot—to the small plot of ground enclosed by it and the Bluff River, and upon which the mill is erected, I may be able to work it after the completion of the railway if I can get a miller to reside on such a confined spot; but it would be impossible to carry on the mill business whilst the railway works are in progress. One large piece of rock has been sent smashing through the roof, and I am told I must look to the contractor for compensation for all damage done under bombardment. So that between the contractors on one side blasting and banking, and the Government on the other forcing, as it were, a co-partnership in the building, with the avowed purpose of running a fence through it, I really may be in a worse case than you have been led to believe through those appointed as valuers; and although I prefer accepting the compensation offered to the almost

almost certain alternative of an appeal to the Law Courts, I still think I am in duty bound to myself, and you also, to place the subject as clearly before you as I can, so that should it be evident that the compensation offered is really less than strict justice demands, an amendment can be made, should such not be directly opposed to the rules of the service.

Before deciding upon the sum, I would ask for compensation. I asked my managing partner in the mill to write out his views on the subject, and I committed my own to paper, and I now enclose the two documents under a separate cover, so that you may see exactly the light we each viewed the matter in; and having photographed the mill at different times, I have printed one or two and affixed them on the other side, as they give a correct idea of the utter isolation of it through the works now carried on.

No. 1, taken some years ago, gives a very good idea of the whole position, showing from the rocky nature of the ground on the left, the fluming on to the wheel and tail race of about 18 feet in depth, that all access to the mill by drays on that side is utterly impossible, and on the right the cutting comes through the hill close to the hut on the top, and the 30-foot embankment runs through the cottage in front of the mill, making a total eclipse of the latter; and the fence will run along verandah of hut and through skillion of mill.

No. 2 shows the flume carrying the water to the wheel, and impossibility of access to mill, excepting through the embankment.

No. 3 shows skillion, fence is to run through, and nature of country on other side the mill.

No. 4, taken whilst survey was going on, shows the ground the embankment will cover, the base extending to waggon, so blocking the mill completely in, and the miller's residence—which is not seen—completely out.

Mr. Anderson, I may say, that when writing to Mr. Thompson, the valuator, said that, believing the Government would wish to act both fairly and liberally in the matter of compensation, I should abide by the offer made. I shall therefore forward abstracts of titles as soon as possible, and can only trust, should it be evident the compensation offered is not adequate to the injury inflicted, it may be increased to what is considered more in accordance with strict justice.

The Commissioner for Railways.

I have, &c.,
EDWARD IRBY.

All the circumstances connected with this resumption have been carefully considered, and no increase in the amount of the offer can be recommended by the Land Valuer.—J.B.T., 23/10/83.
Commissioner.

Dear Sir,

Waterdale, 16 November, 1882.

I beg to draw your attention to some very important facts in connection with the extension of the Great Northern Railway from Glen Innes to Tenterfield and our property on the Bluff River, Bolivia, known as the Champion Flour Mill, Bluff River, Bolivia.

Knowing you are well acquainted with the country where our mill is situated, I will not describe it, but proceed to facts.

1. The above railway passes not only through our land but through the mill, also thereby causing the destruction of part if not the whole mill. This mill cannot be removed, for being worked by water power the present position is the only one where we can secure fall enough to work the mill, and the only position where the mill would be safe from floods.
2. The railway embankment through our property and near the mill, being 30 feet high, which is higher than the mill, we can derive no benefit from the railway either in fetching wheat to the mill or taking flour from it. This would be a very serious drawback and loss to us.
3. The embankment being so very close to the mill, the mill-race and the river completely shuts the mill in, and makes it impossible for drays, carts, or teams to get up to the mill; and even should a bridge be left in the embankment for teams to pass in and out, it would be useless, for the embankment is so very close to the mill and race that the drays and teams could not come in. This is a very serious matter, and one which completely ruins the mill business.
4. The destruction caused by the railway going through our property and so close to our mill, and thereby destroying our mill business, deprives me of my chief means of support, deprives me of my livelihood, and takes from me the business which I have been partner in and manager of for the last 12 years. This, dear sir, is a very serious loss to me, and one we should not lose sight of when we apply for compensation.

The mill is a first class one and in perfect working order, everything good and strong, and with a widespread good name. The mill is able to grind 100 bushels of wheat per day, and this with only one man to work the mill, thereby showing that everything must be good and compact. Owing to the very dry weather we have had these last few seasons the mill has not been kept in full work owing to the scarcity of water, but even then after paying all expenses I am able to show a good profit. With a good dam to hold water, or with a small steam engine, a very large business can be done at our mill—a business that would turn me in not less than £500 a year. And, dear sir, another great fact is this, that the business would increase every season, for every week we see farmers selecting within a few miles of our mill; and I am fully convinced that within a few years—say four or five—enough wheat will be grown within a radius of 10 miles to keep our mill at work all the year round.

These, dear sir, are the few facts I wish to draw your attention to, that they may be a guide to you when you apply for the compensation, which should not be less than £7,000.

Trusting you will look into this business properly, and have our claims put properly before the Government.

I remain, &c.,
A. G. ANDREWS.

E. Irby, Esq., Tenterfield.

MEMO. of Edward Irby's remarks and opinion in reference to his water-mill property, at Bluff River, now doomed to destruction through the railway works connected with the extension of the Northern Line from Glen Innes to Tenterfield.

NOTICING the Commissioner for Railways' advertisement calling upon those who objected to the proposed extension of the Great Northern Line to Tenterfield, to send such, with specified reasons, addressed to him,

him, I replied to such, as an objection, on account of the probable injury or interference with the trade of my mill property, but at that time was under the impression that although the line would come inconveniently close to the building, the rails would only be a few feet higher than the surface of the ground where passing it, and referred to gates being put up to afford the necessary access and egress; but when I became alive to the fact that the property might be seriously injured I thought it my duty to obtain the inspection and report of a competent judge, and who gave his opinion according to his then knowledge and belief, that the building at all events would not be touched, but since then, he ascertaining that the line of fencing would go through the building, has sent me an amended valuation, but merely based on the intrinsic value of the building, plant, and 40 acres freehold on which it stands. Having now made a personal inspection, I find that the property as a site for the mill is totally destroyed, and I am consequently compelled to take the whole subject into my most serious consideration.

The site for this mill was chosen by myself and an engineer some 12 years ago, through the grand and exceptional natural and other advantages offered, giving a fall of water sufficient for an overshot wheel of 20 ft. diameter, its close proximity to the main stream and at same time perfect immunity from all floods, and in addition to these, its most excellent trade position, it being the only mill between Tenterfield and Glen Innes, 14 miles from the former, and 46 miles from the latter place, so being in the midst of a large agricultural district, and only about three quarters of a mile from the main road between the places mentioned.

As a whole this mill site and property is unique, and has been the admiration of all who have visited it, and the gentleman whose survey has destroyed or leads to its destruction, has spoken of it in the highest terms of commendation as a property of ever increasing value.

The mill is complete in every respect, having two pairs of stones running, silk-dressing machine, &c., &c., and with present appliances can get through 600 bushels of wheat per week, but putting it down at 400 bushels actually to be ground, and half that grist at 9d. per bushel, and the other purchased, giving the usual estimated profit of 1s. 6d. per bushel, it would give an annual return of £1,170, and allowing a deduction of £470 for expenses, it would leave an income of £700, and which sum would fairly represent a capital of £10,000, and this without taking into consideration the increased value to this property through the extension of the northern line of railway, if constructed at a reasonable distance from, instead of running absolutely into the building.

In consequence of the unusual dryness of the last two or three seasons, the mill has not been kept up to its usual work, and an engine as an auxiliary power, has been purchased, but as the railway will cut off all access to the mill it is useless to go to the expense of placing it in position, or indeed to re-engage a miller, or make any attempt to carry on the business; and it would only be common justice on the part of the Government to at once enter into possession of this 40 acres freehold, which embraces the mill buildings, water power, and other advantages combined, such as, to the best of my belief, cannot be met with in any other part of this district. The water power this spot afforded was the great inducement to me enter into the mill business; that being destroyed, I have neither the wish to, nor thought of, shifting this or putting up another building for a similar purpose at any other spot. It is not for me to express any opinion as to whether the destruction of this valuable property could have been avoided, it is only now left to me to ask for a fair, and at the same time, full compensation for the loss I have to sustain of an annual income, and which I believe I am perfectly justified in estimating at the capital already mentioned, viz., ten thousand pounds (£10,000).

Tenterfield, 20 November, 1882.

EDWARD IRBY.

Sir,

Department of Railways, Sydney, 29 October, 1883.

In reply to your letter of the 16th instant, accepting the offer made to you by the Department, for land resumed for railway purposes, but demurring to the inadequateness of the amount, I have the honor to inform you that all the circumstances in connection with the resumption in question have been carefully considered, and I am unable, under report from the land valuer, to sanction any increase in the amount already offered.

I have, &c.,

CH. A. GOODCHAP,

Commissioner for Railways.

Mr. E. Irby, Tenterfield.

No. 4.

E. Irby, Esq., to The Commissioner for Railways.

Sir,

Tenterfield, 16 October, 1883.

Having only just received notice that the Government declines resuming my mill property on the Bluff River, although absolutely taking a portion of the building, I have the honor to direct your attention to the necessity of providing me with a suitable passage through the embankment as close to the mill as the present state of the works will admit, both to give access to the mill building, and also to the water, as the 280 acres of land connected with the mill is cut off from the whole of its water frontage. I would also ask that the fencing, instead of being erected in the building, as at present marked out, should, for the length of the building and 10 rods on each side, be put up as close to the embankment as may be considered safe. With another communication I post at the same time with this, I enclose photos., showing the position of the mill, and herewith I enclose a tracing, showing the railway line as it affects the said mill.

I have, &c.,

EDWD. IRBY.

Land Valuer.—L.P.I. (*pro* Secretary), 20/10/83.

A level crossing is recommended at 369 m. 47 c. Mr. Irby has already declined a proposal to have the fence placed at the foot of the embankment, and to have timber openings constructed, which compelled the payment to him of the full value of the mill: it is therefore submitted that it is not now expedient to make the concessions asked for.—J.B.T., 23/10/83. Commr.

Reply accordingly.—D.V. (*pro* Commr.), 24/10/83.

Sir,

Sir,

Department of Railways, Sydney, 29 October, 1883.

In reply to your letter of the 16th instant, asking for a passage through the embankment close to your mill on the Glen Innes and Tenterfield Extension, I have the honor to inform you that a level crossing has been recommended at 369 m. 47 c., and I am therefore unable to comply with your request. I may add that you have already declined the proposal to have the fence erected at the foot of the embankment, and to have timber openings constructed, thereby compelling the Department to pay to you the full value of the mill.

I have, &c.,

CH. A. GOODCHAP,

Commissioner for Railways.

E. Irby, Esq., Tenterfield.

No. 5.

E. Irby, Esq., to The Commissioner for Railways.

Glen Innes and Tenterfield Railway Extension.

Sir,

Tenterfield, 6 November, 1883.

I have the honor to acknowledge the receipt of your two letters, dated the 29th ultimo, informing me in the one that you cannot sanction any increase to the amount awarded as compensation for the injury done to my mill property, and, in the other, that you refuse to allow me access to the mill or water, through the embankment on that mill property, as a consequence of my declining to accede to a hastily proposed arrangement for access to the mill; and I feel it due to myself to offer some few explanatory remarks in reference to my so declining.

Directly the tender for the railway construction was accepted, it was, I presumed, open to the contractors to commence the work at my mill at any time that might suit their convenience, and I knew it must be impossible for the mill work to go on at the same time; and directly I became aware that the line of fencing would go absolutely through the building, completely cutting off all business access to it, and the embankment would be just about the same elevation as the mill, and the base line only 8 yards from the building, I considered the property destroyed for the purpose for which I had purchased and improved it. I consequently abandoned it, but allowed a married man to live in the miller's cottage in consideration for his doing what he could to preserve the mill and machinery from wanton destruction by the navvies and their camp followers.

About four months elapsed after the contract was taken, before I was supplied with a tracing, showing what property of mine was resumed for this extension, and called upon to fill up the schedule of claim handed to me. In the meantime I had asked Mr. Andrews to draw up a statement of his view of the injury to the property, and I drew up one of my own—both of which I have transmitted to you—and in filling up the schedule I adopted Mr. Andrews' valuation, as being lower than mine.

Just about six months after sending that schedule to your Department the valuator came to make his assessment, and during that long period not a hint was given to me as to the intention of the Department in reference to this special inquiry and claim.

The mill was inspected by the valuator on his way to Tenterfield, and Mr. Andrews, who had been in charge of the mill ever since its construction, and was deeply interested in its working, accompanied him. On their arrival in Tenterfield, I was told that an offer was made by the valuator to have two timber openings constructed through the embankment for access to the mill.

The valuator was pressed for time, and I consequently had to come to a hurried determination as to whether I would agree to this or rest my claim for full compensation upon the actual resumption of the property; and as it appeared to me most doubtful whether, under all the circumstances, I should be able to work the mill even if I had access to it, and as I should receive very little compensation if I worked upon the openings as sufficient, I deemed it my wisest plan to ask for full compensation; but to prove I had not the slightest wish to act in a spirit of extortion, I handed the valuator my written intention of accepting the amount of compensation offered to me, believing the Government would wish to act not only justly but liberally; and I do not think that I should have said a word about increased compensation had not the valuator himself said that it was possible a revision might be made if I could show just and reasonable grounds for such.

It is still doubtful to me whether it would be worth my while to go to the expense of repairing the damage done to the building and machinery and try to work it again, even if I had access through the embankment granted, and I will give it another inspection before finally deciding upon removing it; but I will also transmit a separate formal letter upon the subject of an opening being left for access to water.

In conclusion, I must say I think it very hard to be reproached with a compulsory action against your Department on my part. For the benefit of the farming population as well as my own, I went to the great expense of erecting this mill and bringing the water to it, the site being nine miles from my homestead; and this was done some twelve years ago, when a railway near it was not dreamed of. And if it was even necessary, now the railway is being constructed, to bring it in the direction of the mill,—by keeping it two chains further away, and giving a right of access, my property would have been left intact and no compensation required.

I have, &c.,

EDWARD IRBY.

No. 6.

E. Irby, Esq., to The Commissioner for Railways.

Railway Extension from Glen Innes to Tenterfield.

Sir,

Tenterfield, 7 November, 1883.

On going into the matter of preparing abstracts of titles in reference to the lands resumed by the Government for railway extension, I find I have been in considerable error from the outset, as portions set out in the tracing supplied to me should have been in the names of my son, Mr. Edward L. Irby, and my son-in-law, Mr. Edward V. Carr, acting as trustees for my wife; and I also find one of these lots has since been sold by them.

Again,

Again, I cannot give titles to other portions till I receive a release from a sister in England, and which I expect by an early mail, and I find my solicitor has already forwarded these abstracts of title to your Department, so they can either be retained or returned till the necessary release is received.

My son and son-in-law are willing to accept the compensation as included in mine, and will forward their abstracts of title with mine; and they will write to purchaser of piece they sold—from which only three perches is resumed—and ask him to accept the compensation and forward abstract of title.

I would here mention that in the schedule of claim I forwarded—a copy of which I annex—I made a separate claim for distinct portions, but the compensation offered to me is included in a lump sum; might I therefore request the amounts of compensation offered should be given as they bear upon those distinct portions. Those for which the necessary titles can be at once given could then be disposed of without further delay.

I have, &c.,

EDWARD IRBY.

Railway Extension—Glen Innes to Tenterfield.

SCHEDULE of Claim.

Tenterfield, 7 November, 1883.

Land resumed:—Reference Nos., 50, 1, 2, 3, and 4; area, 10 acres 25 perches; cultivation; estimated value, £25 per acre; total value, £251 10s. Reference Nos., 174 to *187; area, 52 acres 1 rood 9 * 186 Mill. perches; pasture; estimated value, £3 per acre; total value, £156 10s.

Value and description of improvements taken:—Fence, 42 rods at 4s., £8 8s.; damage by severance or otherwise, £183 17s.; total destruction of No. 186 as a mill property, for which purpose only it was purchased and improved, £7,000; total amount of claim, £7,600 5s.

MEMO.—Compensation offered and accepted, £1,790 12s. (For explanation see correspondence).

E. I.

No. 7.

E. Irby, Esq., to The Commissioner for Railways.

Sir,

Tenterfield, 7 November, 1883.

In my letter of yesterday's date, in which I acknowledged your two letters dated the 29th ultimo, I mentioned my intention of addressing a second letter specially referring to the necessity of my being granted an opening for access to water, and I now do myself the honor of calling your attention to the facts connected with such request.

In consequence of the expensive improvements made and erected on my freehold property of 40 acres marked on the tracing supplied by your Department as No. 86, I applied for an additional 600 acres to make up the complete selection; but when the District Surveyor proceeded to measure he found that from the special natural features of the country an area of 240 acres would command a water frontage for 600 acres, and consequently I shall only be allowed the smaller quantity.

By a reference to the tracing you will observe that at Nos. 183-5 and 6 the whole of my water frontage is cut off by the railway, so that I not only have lost the 360 acres of land through having too large a frontage to the water, but now I am cut off from the whole of such frontage, and have not a single opening left for access to the water.

In your letter, as indicated by marginal number, I am informed that a level crossing has been recommended at 369 m. 47 ch., but even if such is granted at that spot, wherever it may be, I need hardly point out that a level crossing is useless as a means for depastured stock to get to water.

On referring to the tracing I find the 369 mile is marked on No. 186, and presuming the 47 chains would extend northwards, the level crossing would be far beyond the property I am referring to.

I can only point out the injustice that will be done me if no proper access to water is given in this 230 acre block, and ask you to leave it to the proper officer to recommend where such should be given.

I have, &c.,

EDWARD IRBY.

Land Valuer.—G.B., 13/11/83. Mr. Irby's cattle can get access to the severed land under the Bluff River bridge without difficulty. A level crossing was recommended for Mr. Irby's use at 368 m. 68 ch. 50 lk. on 12/2/83. This is within the 240 acres to which he refers.—J.B.T., 28/11/83. Commissioner. Is the level crossing to be given? Ask Engineer-in-Chief.—CH.A.G., 30/11/83. Yes.—W.H.Q., 8/12/83. Commissioner. Inform.—CH.A.G., 13/12/83.

Sir,

Department of Railways, Sydney, 19 December, 1883.

In reply to your letter of the 7th ultimo further respecting the facilities which you ask for, to enable you to cross the railway line, now under construction from Glen Innes to Tenterfield, for the purpose of watering your stock, I have the honor to inform you that the matter has been referred to the Land Valuer, and I find that your cattle can get access to the severed land under the Bluff River bridge without difficulty. A level crossing will also be given at 368 m. 67 ch. 50 lks. This is within the 240 acres to which you refer.

I have, &c.,

CH. A. GOODCHAP,

Commissioner for Railways.

Mr. E. Irby, Tenterfield.

Sir,

Tenterfield, 8 January, 1884.

In doing myself the honor to acknowledge the receipt of your letter dated 19 December, 1883, it is at the same time a simple duty to point out the error the Land Valuer has fallen into in reference to facility afforded by the Bluff River bridge for the watering of stock depastured on my mill property of 230 acres.

The mill property is totally distinct from the station property, and does not extend west beyond the northern road from Glen Innes to Tenterfield. A further reference to my letter of 7 November, 1883, and the railway tracing, will show that the whole of the water frontage is severed from that property.

Should

Should the "Bluff River bridge" mentioned be the new one to be erected for the railway, I may point out that that bridge will be on a freehold property purchased by trustees for my wife, and is distinct from either the mill or station property. Having from the first stated my intention of abiding by the decision of the Land Valuator, I consider that I am cut off from further contention in this matter, so apologising for the trouble I have already given your Department.

The Commissioner for Railways.

I have, &c.,
EDWARD IRBY.

Land Valuer.—G.B., 15/1/84. Seen. No further action asked for—J.B.T., 18/1/84.
Commissioner.

No. 8.

E. Irby, Esq., to The Commissioner for Railways.

Glen Innes and Tenterfield Railway Extension.

Sir, Tenterfield, 13 November, 1883.

Referring to mine of the 7th instant, on the subject of the abstracts of titles for lands resumed in above-mentioned railway extension, I have the honor to inform you that all the abstracts forwarded by my solicitor to the Department, including Nos. 50, 1, 2, 3, and 4, can be acted upon and executed as the Act requires.

The title to No. 174, from which only 3 perches are resumed, is in the hands of Mr. Barrett, of the "Bolivia Hotel," who is now in England, and about which I of course cannot interfere.

I have, &c.,
EDWARD IRBY.

£7,600 5s.
62a. 1r. 33p.
£1,790 12s.

No. 9.

E. Irby, Esq., to The Commissioner for Railways.

Northern Line—Glen Innes and Tenterfield Extension.

Sir, Tenterfield, 23 July, 1884.

I do myself the honor to ask your attention to the following, in reference to a crossing for cattle on Bolivia Run. At first I was informed that a double width underbridge would be left; then a place was marked for an overbridge at 362 miles 3 chains; now I am told it is proposed to leave a level crossing of the ordinary width at the south mouth of 92 cutting, and at the 361 m. 61 c. peg.

It is now my duty to point out that cattle and horses only are being depastured on Bolivia Run, and that during the branding and mustering season some four or five thousand head of stock will have to cross the line at this spot, and if the crossing is only made the ordinary width there will be great danger of cattle breaking on to the line; to obviate which, in a great measure, I would respectfully suggest that if such level crossing is finally decided on, it should be of double the ordinary width.

I have, &c.,
EDWARD IRBY,
Lessee of Bolivia Run.

Engineer-in-Chief.—R.J.S. (*pro* Commissioner), 29/7/84. Land Valuer.—W.H.Q., 4/8/84. Mr. Irby's request is a reasonable one, and it is recommended that it be complied with if possible.—J.B.T., 6/8/84. Commissioner. Engineer-in-Chief.—R.J.S. (*pro* Commissioner), 8/8/84. Mr. Wade.—W.H.Q., 9/8/84. Double 10-foot gates and crossing approved by Engineer-in-Chief.—W.B.W., 12/8/84.

No. 10.

E. Irby, Esq., to The Commissioner for Railways.

Sir, Tenterfield, 13 October, 1884.

I do myself the honor to call your attention to the following facts in connection with the Glen Innes and Tenterfield Railway Extension:—

I have a farm about two miles north of Glen Innes (mileage as mentioned in margin) severed by the line. When the Government Valuator was in Tenterfield he told me he would visit the farm and decide with my manager there, where communication between the severed portions should be given me; my manager, however, subsequently told me he had not seen the valuator.

Now the line is constructed, and the contractors' engine running through the farm. The only communication at present left me is a low culvert over a water-course, under which sheep and calves could pass in dry weather; but as my farm is purely agricultural, and I have no sheep, I am positively cut off not only from the whole of my water frontage, but also from communication with about 70 acres of the best of my land on the western side of the railway. As, however, a Government road runs through my farm, and the rail crosses it, I presumed, as a matter of course, that a public crossing would be made there, but being informed yesterday by a Government officer that there was no intention of so doing, I am compelled to call your attention to it, as I am completely cut off from access to that portion—nearly one-third of my farm.

I might mention there is a Government reserve joining my farm on the eastern side of the railway, and if I was allowed an acreage out of that reserve equivalent to what is cut off on the western side, there would be no necessity for the expense and danger of a crossing to connect the severed portions, and no injustice would be inflicted on the public, as I am the only land-owner on each side of that road so crossed by the line.

I have, &c.,
EDWARD IRBY.

Land Valuer L.P.I. (*pro* Secretary), 22/10/84. A level crossing is recommended at 326 miles 32 chains.—J.B.T., 27/10/84. Commissioner. Approved.—D.V. (*pro* Commissioner), 31/10/84.

Sir,

326-7 miles.

Sir,

Department of Railways, Sydney, 5 November, 1884.

With reference to your letter of the 18th ultimo, asking that a crossing may be made over the Glen Innes to Tenterfield Railway to connect the severed portions of your land, I have the honor to inform you that a level crossing will be provided at 326 miles 32 chains.

I have, &c.,

CH. A. GOODCHAP,

Commissioner for Railways.

Edwd. Irby, Esq., Tenterfield.

No. 11.

E. Irby, Esq., to The Crown Solicitor.

Sir,

Tenterfield, 13 November, 1884.

Mr. Robinson, solicitor, has handed me your communication of the 9th ultimo, to him—as noted in margin—thinking it best for me personally to submit my explanation in reference to its subject matter, and I now have the honor to say that shortly after my writing my letter to Commissioner for Railways, dated 7th November, 1883, and referred to in your said letter, I found there was no bar to my giving a clear title to the land resumed at Glen Innes, and wrote at once to the Department to say so.

The communication from the Railway Department—as noted in margin—informed me that a lump sum of £1,790 12s. was granted as compensation for 62 a. 1 r. 33 p. of my land resumed—giving me no clue as to the portions or amounts paid for each, included in such lump sum.

The next communication from the Department—as noted in margin—informed me that vouchers for £221 19s. 6d. and £1,308 18s. 10d., compensation for land, &c., resumed for railway purposes, had been forwarded to the Treasury; no intimation being given as to the resumed land these sums referred to. It was, however, evident to which the larger sum referred; but the smaller amount I believed was the compensation for the Glen Innes property.

On my return to Tenterfield after an absence of some months, and having no advice in reference to the balance—£259 13s. 8d.—still due to me, I requested Mr. Robinson to address you upon the subject, and your reply, handed to me, was the first intimation I received that such balance was the compensation for the land resumed at Glen Innes.

In conclusion, I can only repeat there is no bar to my giving a clear title for the land resumed at Glen Innes—the abstracts for which were duly transmitted by Mr. Robinson.

I have, &c.,

EDWARD IRBY.

Sir,

Crown Solicitor's Office, Sydney, 17 November, 1884.

I have the honor to forward herewith letter received from Mr. Irby, relative to the balance of compensation money due to him. I await your instructions in the matter.

I have, &c.,

JOHN WILLIAMS,

Crown Solicitor.

The Commissioner for Railways.

Land Valuer.—L.P.I. (*pro* Secretary), 22/11/84. The abstract of title has not yet been furnished for the following portions:—Portion 9, 42 acres 3 roods, parish of Bolivia, county of Clive; portion 10, 42 acres 3 roods, parish of Bolivia, county of Clive; portion 11, 42 acres 3 roods, parish of Bolivia, county of Clive; portion 96, 640 acres, parish of Bolivia, county of Clive; portion 26, 240 acres, parish of Joudal, county of Clive; portion $\frac{2}{3}$, 52 acres, parish of Joudal, county of Clive.—J.B.T., 4/12/84. Commissioner. Inform.—CHAS. A. G.

Sir,

Department of Railways, 9 December, 1884.

Referring to your letter of the 13th ultimo, addressed to the Crown Solicitor, which has been forwarded to this office, respecting balance of amount due to you as compensation for land resumed, Glen Innes to Tenterfield extension, I have the honor to inform you that the matter cannot be settled until abstract of title has been furnished for the following portions:—Portion 9, 42 acres 3 roods, parish of Bolivia, county of Clive; portion 10, 42 acres 3 roods, parish of Bolivia, county of Clive; portion 11, 42 acres 3 roods, parish of Bolivia, county of Clive; portion 96, 640 acres, parish of Bolivia, county of Clive; portion 26, 240 acres, parish of Joudal, county of Clive; portion $\frac{2}{3}$, 52 acres, parish of Joudal, county of Clive.

I have, &c.,

CHAS. A. GOODCHAP,

Commissioner for Railways.

Edward Irby, Esq., Tenterfield.

Sir,

Tenterfield, 13 January, 1885.

As instructed by Mr. E. Irby of this town, we have the honor to forward you herewith, under separate cover, abstract of the title of Messrs. Edward De Crespigny Irby and Edward Priestly Carr, as tenants in common to portions 10 and 11, parish of Bolivia, and portion $\frac{2}{3}$, parish of Tenterfield.

We are sorry the abstract should appear in the condition it does, but we are unable to procure better material here at present.

We also have the honor to enclose herewith a letter addressed to you by Mr. Irby relating to the above matter.

We have, &c.,

ROBINSON & PANTON.

The Commissioner for Railways.

Land Valuer.—D.C.M'L., 15/1/85. Description and tracing of land, abstract of title, and certificate of identity, herewith.—J.B. (*per* A.B.), 30/1/85. Commissioner.

Sir,

Tenterfield, 5 January, 1885.

Absence from Tenterfield has caused the delay in my replying to your communication dated December 9th, 1884, as noted in margin. I now beg to say that the whole of the misunderstanding in reference to the subject, arises from my never having been informed as to what portions of my property resumed, the special sums for compensation were granted.

When first communicating with your Department upon the subject of abstracts of title, it was explained that portions 9, 10, 11, and $\frac{2}{3}$, were freeholds purchased by my eldest son, Edward De C. Irby, and my son-in-law, Edward Priestly Carr, as trustees for my wife, and that portion 9 had been sold and transferred by them to Mr. Elijah Barrett, of Bolivia Hotel.

I now enclose abstracts of title to the other portions 10, 11, and $\frac{2}{3}$. but as the remaining portions mentioned in your communication—96 and 26—are free selections, the title to same rests with the Lands Department, to which I must refer you.

I have, &c.,

EDWARD IRBY.

No. 12.

E. Irby, Esq., to The Commissioner for Railways.

Sir,

Tenterfield, 17 January, 1885.

Immediately after the receipt of your communication of 5th November, 1884, informing me that a level crossing would be provided at 326 m. 32 ch., I addressed Cobb & Co. in reference to it, as the want of communication between severed portions of my land was becoming a serious matter to me, and they were ready to act as soon as they had official intimation where these level crossings in the vicinity of the town of Glen Innes were to be made. I received the following intimation from them yesterday:—“This morning we received from Mr. Wright, the District Engineer, a list of both public and private level crossings for this contract, and we find there is to be a level crossing at 326 m., but no mention of one at 326 m. 32 ch.” I may mention it is a public road the line crosses at both 326 m. and 326 m. 32 ch., but that all the land on each side of the road crossed at 326 m. 32 ch. is my private property; but as it is a public road, I presume if a level crossing is made there a gate-keeper must be kept at it; at the same time, as the public could not be injured if it was closed, the question arises whether it would not be better to give me a level crossing on my own property at about (say) 326 m. 50 ch., where the natural surface is on a level with the rails, the gates at which could be in my care, and which spot would have been pointed out to the Government Valuator had he visited the farm according to his promise, and in all probability adopted as the spot for the crossing.

I have, &c.

EDWD. IRBY.

Land Valuer.—D.C.M'L., 22/1/85. The Engineer-in-Chief should be informed that a gate is required at 326 m. 32 ch., and has been recommended by the Land Valuer. As there is no traffic on (or likely to be) this road, the keys ought to be handed to Mr. Irby.—J.B.T., 27/1/85. Commissioner. Forward to Engineer-in-Chief.—Ch.A.G., 31/1/85. Mr. Wade.—W.H.Q., 3/2/85. Mr. Wright to note remarks of Land Valuer.—W.B.W., 13/2/85. Noted.—J.W., 16/2/85.

No. 13.

Messrs. Robinson and Panton to The Commissioner for Railways.

Sir,

Tenterfield, 11 April, 1885.

With reference to your letter, No. 84/11,123, dated 9 December, 1884, and addressed to Mr. Edward Irby, we are instructed to inform you that portion 96, 640 acres, and portion 26, 240 acres, parish of Joudal, county Clive, therein referred to, are conditional purchases, upon which the balances have not yet been fully paid, and in respect of which Mr. Irby holds certificates of conformity, abstract of which we have the honor to forward you herewith, and to request that the sum of £206 19s. 4d., being the amount of compensation money due to Mr. Irby in respect of the resumed parts of the said two portions, may be paid to Mr. Irby as soon as the practice of your Department will permit.

We also have the honor to inform you that the three portions, 10, 11, and $\frac{2}{3}$, parish of Joudal, mentioned in your said letter, are freeholds, and that the transfer of the resumed parts has been forwarded by us to the Crown Solicitor; and further, that portion 9, parish of Bolivia, also mentioned in your said letter, does not belong to Mr. Irby, but to some person named Barrett.

We have, &c.,

ROBINSON & PANTON.

Land Valuer.—L.P.I. (*pro* Secretary), 14/4/85. Abstract of title, two descriptions and tracings of land, and two certificates of identity, herewith.—J.B. (*per* A.B.), 10/6/85. Commissioner.

No. 14.

The Crown Solicitor to The Commissioner for Railways.

Sir,

Crown Solicitor's Office, Sydney, 20 April, 1885.

I have the honor to inform you that this matter has been completed, and to forward herewith voucher for payment of the purchase money, £52 14s. 4d., the amount of which may be paid to Joint Stock Bank, Tenterfield, as therein authorized.

I have, &c.,

JOHN WILLIAMS,

Crown Solicitor.

Examiner.—

11

Examiner.—D.C.M'L., 21/4/85. This claim is scheduled in the name of Edward Irby, but voucher is in favour of E. De Crespigny Irby and E. P. Carr. I presume it is necessary to re-schedule.—T.S. (*pro* Examiner), 27/4/85. Secretary. Will Land Valuer please say.—D.C.M'L., 28/4/85. Must be re-scheduled.—J.B. (*per* A.B.), B.C., 29/4/85. Commissioner. For Commissioner's approval.—G.B., 30/4/85. Approved.—Ch.A.G., 1/5/85. Land Valuer.—G.B. Re-scheduled.—J.B., 8/5/85. Ex. Min. 85-14, 2/6/85.—J.B. (*per* A.B.) Pay £52 14s. 4d.—Ch.A.G. Voucher forwarded for payment.—T.S. (*pro* Examiner), 5/8/85.

No. 15.

E. Irby, Esq., to J. Wright, Esq.

Sir,

Vesuvius Farm, Glen Innes, 14 September, 1885.

I must again address you upon the necessity of my having communication across the railway line between the severed portions of my farm, about 50 or 60 acres; and the whole of the water frontage being cut off from the whole, 251 acres, comprising the farm. There is, as you are aware, a passage across the line on a public road, which also severs my farm, such road giving access to the Glen Innes creek from a public reserve, and it is utterly impossible that I can be placed in any responsibility in reference to the gate at such crossing. At the present time and for months past there are people camped on that reserve, and they are daily morning and evening driving some 14 or 16 horses through the gates at that crossing to water; and to get at my creek frontage to water my own stock I at present am compelled to drive them out of my paddocks into that public road, where they may get mixed with any other stock feeding there, and all may go across the line together. Again, the gates are so hung that when open for passage across the line they do not close the line, so that stock of whatever description can turn either to the left or right along the line, and there would be less danger to an engine and train going slick through a gate than jumping over the carcass of a beast.

In a former letter on this subject, I pointed out the ease with which access could be given across the line to my water frontage from the chief grazing portion of my farm; it is a level crossing at a cutting close to my northern boundary. At this spot, being on my own ground, I could take charge of the key, but I shall positively decline to take charge of the key of a gate on a public road.

The matter is becoming of such serious import to me that I must take legal advice how to act should my appeal be of no avail.

I have, &c.,
EDWARD IRBY.

District Engineer's Office, Bluff River, 19 September, 1885.

Memo. to The Engineer-in-Chief.

I BEG to forward herewith a letter from Mr. Edward Irby in reference to the public crossing at 326 miles 32 chains, in which he now appears to object to the proposal of the Land Valuer (memo. Engineer-in-Chief, 84/3,479), and wants a private crossing at 326 miles 62 chains.

A crossing at the latter point would undoubtedly be of more service to him than the public crossing at 326 miles 32 chains, and I would respectfully recommend his request to your favourable consideration.

JOHN WRIGHT.

Land valuer.—W.H.Q., 25/9/85. Crossing recommended at 326 miles 62 chains for Mr. Irby's private use.—J.B.T., 2/10/85. Commissioner. Engineer-in-Chief.—G.B. (*pro* Commissioner), 7/10/85. Mr. Wright.—W.H.Q., 9/10/85. Mr. Irby and contractors informed.—J.W., 12/10/85.

No. 16.

C. A. Lee, Esq., M.P., to The Commissioner for Railways.

Sir,

Legislative Assembly, Sydney, 23 November, 1885.

Referring to your letter of the 19th December, 1883, No. 83-9,583, in reply to Edward Irby's request to have access left for his cattle to get to water, and in which it is stated the intention of the Department is to make a level crossing at 368 m. 68 c. 50 l.; and also referring to yours of 29th October, 1883, No. 83-9,037, informing Mr. Irby that a level-crossing had been recommended at 369 m. 47 c., I have to direct your attention to the fact that this matter has escaped notice, and Mr. Irby is desirous that the level-crossing should be made at 369 m. 47 c., which would give ready access to the water and to the old mill property to remove the machinery therefrom. There can be no doubt that unless a crossing is left at this point Mr. Irby's cattle will, on this side, be completely cut off from the water. The proposed crossing at 368 m. 68 c. 50 l., going through the 240 acres, will not give any access to the mill property on account of the rocky nature of the intervening land.

I would suggest a gate and gatekeeper, as it will be an important crossing place.

I have, &c.,
C. A. LEE.

Land Valuer.—G.B., 26/11/85. This should be referred to the Engineer-in-Chief.—J.B.T., 27/11/85. Commissioner. Engineer-in-Chief.—G.B. (*pro* Commissioner), 28/11/85. Mr. Wright for report.—W.H.Q., 2/12/85.

District Engineer's Office, Bluff River,

7 December, 1885.

Memorandum to the Engineer-in-Chief.—
THE crossing applied for by Mr. Irby at 369 m. 47 c. is one of the least important upon the whole length, as it will only give access to a few acres of ground and a small water frontage, which could and will, I have no doubt, be as readily reached by way of the openings in the Bluff River bridge.

To

To suggest a gatekeeper at this place is most absurd and unreasonable—as well put a gatekeeper at every private crossing—and I feel assured that Mr. Lee knows nothing whatever about the place or he would not have made such an unreasonable suggestion. When this crossing is made Mr. Irby cannot utilize it for taking his machinery from the mill without going to considerable expense in making a dray road through hard granite rock, and I question if Mr. Irby will ever use it for watering stock. I shall, before giving instructions to the contractors to construct the crossing, ask Mr. Irby to meet me on the ground and give more particulars as to what he really wants.

JOHN WRIGHT.

Vesuvius Farm, Glen Innes,
14 December, 1885.

Memo. to John Wright, Esq., District Engineer, Bluff River.

Not meeting you on Friday, I felt satisfied my memo. in reply to yours had not been received. I could see plainly that a crossing at 369 m. 47 c. would be useless.

I can only quietly submit to the frightful injustice inflicted on me by the Railway Department in destroying a property that would give an income of some £400 per annum, and giving compensation based upon the official estimate of the mere value of the mill building.

EDWARD IRBY.

Bluff River, 29 December, 1885.

Memo. to the Engineer-in-Chief.

In reference to the private crossing for Mr. Irby at 369 miles 47 chains, on my showing him upon the ground that the crossing would be of no service to him for either watering his stock or removing the machinery from the mill, he requested me not to put in the crossing at all.

JOHN WRIGHT.

No. 17.

E. Irby, Esq., to Mr. District Engineer Wright.

Sir,

Tenterfield, 23 January, 1886.

Mr. Keating, my superintendent at Bolivia, has pointed out to me the necessity of private gates being left at Cobb & Co.'s Main Camp, to enable us to work amongst our cattle on Hurry's Hill country to the east of the line, so I write to ask if you will kindly take this request into your consideration, and if satisfied it is a reasonable one, recommend it to the head of your department.

I am, &c.,

EDWARD IRBY.

I saw Mr. Keating to-day in reference to the above letter from Mr. Irby, and upon making inquiries as to the reason why the application was made so late, Mr. Keating informed me that he was under the impression that the old road would not be altered; had such been the case there would have been a public crossing at 356 miles, through which they could have brought the cattle to the head station. The diversion of the old road between 355 and 357 miles, of course, renders the public crossing at 356 miles unnecessary, but the railway fence cuts $6\frac{1}{2}$ miles of the run off, and there is no access to it unless through Cadell's or Collins' properties. I really think Mr. Irby's request for a crossing is reasonable, and would most respectfully recommend that a private crossing be granted him at 356 miles 45 chains.—J. WRIGHT, 25/1/86. The Engineer-in-Chief.

Land Valuer.—W.H.Q., 27/1/86. Construction of crossing at 356 miles 45 chains is recommended by Land Valuer.—J.B.T., 3/2/86. Commissioner. Engineer-in-Chief.—G.B. (*pro* Commissioner), 10/2/86. To be carried out.—W.B.W., 12/2/86. Mr. Wright.

No. 18.

The Crown Solicitor to The Commissioner for Railways.

Sir,

Crown Solicitor's Office, Sydney, 5 March, 1886.

I have the honor to inform you that this matter has been completed, and to forward herewith voucher (for £206 18s. 1d.) for payment of the purchase money, the amount of which may be paid to the Australian Joint Stock Bank, Tenterfield, as therein authorized.

The original voucher herein was lost on being sent for signature.

I have, &c.,

JOHN WILLIAMS,

Crown Solicitor.

Voucher correct, and forwarded for payment.—T.S. (*pro* Examiner), 19/3/86.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAYS.

(CONSUMPTION OF COAL ON SOUTH-WESTERN LINE FOR 1886.)

Ordered by the Legislative Assembly to be printed, 20 April, 1887.

[Laid upon the Table of the House in accordance with promise made by the Honorable the Secretary for Public Works, in answer to Question No. 19 on Votes and Proceedings of 22nd March, 1887.]

RETURN showing:—

- “(1.) The consumption of coal in 1886 on the South-western Railway and all its branches, including that used for stationary engines and all other Government works.
- “(2.) The amount paid per ton for the coal so used on the above railway.
- “(3.) The difference in price paid for Lithgow and Newcastle coal used on the said railway.
- “(4.) The cost per ton per mile for carrying the coal consumed on the said railway.
- “(5.) The number of tons of coal which the Government carried for public use by the said railway, and the rate per ton per mile.”

(19.) Consumption of Coal on South-western Railway:—Mr. JONES's questions.

(1.) What was the consumption of coal last year on the South-western Railway and all its branches, including that used for stationary engines, and all other Government works?

Answer: 4,372 tons 11 cwt.

(2.) What did the Government pay per ton for the coal so used on the above railway?

Answer: 4s. 5d. per ton.

(3.) What was the difference in price paid for Lithgow and Newcastle coal used on the said railway?

Answer: Newcastle coal is not used on the South-western Line.

(4.) What does it cost per ton per mile for carrying the coal consumed on the said railway?

Answer: It is estimated at 18s. 6d. per ton.

(5.) What number of tons of coal did the Government carry for public use by the said railway, and at what rate per ton per mile?

Answer: 497 tons; three farthings per ton per mile.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

GAS-WORKS, RAILWAY DEPARTMENT.

(PURCHASE OF, FROM J. L. CASTNER)

Ordered by the Legislative Assembly to be printed 20 April, 1887

[Laid upon the Table of the House in accordance with promise made by the Honorable the Secretary for Public Works, in answer to Question No 3, on Votes and Proceedings of 23rd July, 1886]

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No. 1.

Minute by The Chief Clerk.

ALL papers *re* Castner's supply of gas carriages required.—G.B., 7/1/84. Very urgent.

THE particulars of the contract are as follows:—

Contract expires on 14th May, 1884, or sooner, if the Commissioner so determines, on giving one month's notice.

The Commissioner is to take over, at the termination of the contract, all buildings erected, all plant, implements, and appliances which have been in use by the contractor. The cost of such is to be determined by valuers, one to be appointed by Commissioner, and one by contractor. The two so appointed to nominate a third party. All materials required in connection with the contract to be carried free by rail. The monthly amount for the Southern and Western lines is £260, and for the Northern line £90.

The prices to be paid for fitting the different carriages, &c., are as follows:—

	South and West.			North.		
	£	s.	d.	£	s.	d.
Ordinary carriages	40	0	0	35	0	0
American „	57	15	0	50	10	0
Ashbury „	80	0	0	70	0	0
Sleeping „	80	0	0	70	0	0

D.C.M'L., 8/1/84.

Mr. Castner will send in a statement of the amount he claims for the building.

We will then make offer. If an agreement cannot be arrived at, each side will appoint a valuer, who will appoint an umpire, and the decision of the valuers, or if they fail to agree, the decision of the umpire to be final.—C.A.G. J. L. Castner, 11/1/84.

No. 2.

J. L. Castner, Esq., to The Commissioner for Railways.

Sir,

Railway Gas-works, Sydney, 15 January, 1884.

Referring to our conversation on Friday last respecting my contract with you for fitting gas apparatus and supplying gas to railway carriages, I beg to hand you herewith a statement of the amount of my claim, as provided for in contract above referred to, dated June 2/82, that is to say, for all buildings erected by me. Also, all such plant, implements, and appliances which have been in use in the performance of said contract, which I am prepared to hand over to you on the payment of the amount so claimed, or such sum as we may agree upon, or as may be awarded by valuers, as per conditions of contract.

I have, &c.,

JOHN L. CASTNER.

Sydney, 15 January, 1884.

THE Commissioner for Railways, Dr. to John L. Castner.

For the whole of my gas-works at Redfern, Bathurst, Newcastle, and Junee, consisting of buildings, retorts, scrubbers, purifiers, gas-holders, reservoirs, engines, boilers, pumps, compressor, mains, services, and material on hand, all in good working order, as now, with the right to use my Patent Regulator for railway carriages on your railway during its currency..... £35,935 12 6

No. 3.

Minute by The Commissioner for Railways.

MR. COWDERY will please make a valuation in detail when he has received from Mr. Castner a valuation in detail. I cannot accept a lump sum in this way.

Write to Mr. Castner to this effect.

C.A.G., 15/1/84.

The

The Commissioner for Railways to J. L. Castner, Esq.

Sir,

Department of Railways, Sydney, 18 January, 1884.

Referring to your letter of the 15th instant, respecting your contract for supplying gas to the railway carriages, and handing therewith a statement of your claim, as provided for in the contract in question, in the event of the Department taking over your plant, &c., I have the honor to inform you that I am unable to accept the statement in a lump sum, as tendered by you, and have therefore to request that you will be good enough to furnish me with a valuation and estimate in detail.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

No. 4.

J. L. Castner, Esq., to The Commissioner for Railways.

Sir,

Railway Gas-works, Sydney, 21 January, 1884.

As you have requested, I beg to hand to you herewith an inventory of works and plant at my several gas-works, and which I value as under :—

At Redfern	£13,875	3	3
At Bathurst	5,276	8	4
At Junee	4,535	5	4
At Newcastle	5,534	2	9
			£29,220 19 8
Right to use my Patent Regulator on your railway carriages during its currency—9 years		5,000	0 0
There is also material on hand at the following stations for use. Its present value is—			
At Redfern	£1,485	16	6
At Bathurst	29	9	11
At Junee	76	3	0
At Newcastle	123	3	5
			£1,714 12 10
			£35,935 12 6

This will vary in quantity and value according to amount added or used.

I have, &c.,

JOHN L. CASTNER.

I cannot credit that Mr. Castner's works can be worth this amount of money; depreciation must be taken into consideration, and a large amount written off on this account. Mr. Cowdery must be careful in making a valuation in detail, and employ competent mechanics and builders in all cases of doubt. This will be previous to an offer being made, and even after that we must have the valuation settled by arbitration if Mr. Castner will not accept our offer.—C.A.G., 21/1/84.

I have attended to this matter myself, and forward herewith detailed valuation of the whole of the works.—G.C., 14/2/84.

In what way has Mr. Cowdery valued the plant—at the price it would cost to replace, or at that cost with a sum for depreciation? He will remember that the buildings, machinery, and plant have been in use for some time.—C.A.G.

Let me know the exact meaning of term "right to use Mr. Castner's Patent Regulator" during currency nine years. When was it patented—what superiority has it over other regulators? Mr. Castner can have no claim for the fittings he has put on carriages for use of his gas; he has already been paid for those fittings, and if they include, as I assume they do, the regulator referred to, we have a right to their use on those particular carriages. The question of right of use will be confined to carriages not yet fitted and to be fitted by us. Shall we want this regulator for new carriages, and is it worth £5,000 for that purpose?—C.A.G., 18/2/84.

No. 5.

Departmental Valuation of J. L. Castner's Gas-works.

Castner's Gas-works.—Summary of Valuation.

	£	s.	d.
Buildings, &c., at Redfern	11,931	19	6
Do. do. Bathurst	4,764	5	6
Do. do. Junee	4,835	2	9
Do. do. Newcastle	5,573	4	6
			27,104 12 3
Right to use Patent Regulator on railway carriages during currency—9 years		5,000	0 0
			£32,104 12 3

There is also material at the above-named stations valued by Mr. Castner at £1,714 12s. 10d. The value, however, fluctuates daily, but when the buildings and plant are finally taken over a correct estimate can be made.

GEO. COWDERY, 14/2/84.

My

My valuation is for the plant as it now stands. The buildings, although plain, are all sound, and the machinery, &c., to the best of my judgment, is worth what I have put down for it. As to the Patent Regulator, it was patented about three years ago. I know of no other regulators in the colonies for the purpose. Mr. Castner has no claim for the fittings on carriages now in use, and we have a right to use them; his claim is for those not yet fitted, and which will require to be fitted by us if we continue to use gas. With regard to the value of the patent, I put the same question to Mr. Castner as you put, when he informed me that he had employed an actuary, a Mr. Durham, to work out the value, showing me the original paper at the same time, and as it was valued at nearly double what Mr. Castner asked for it I put it down.—G.C., 20/2/84.

Will Mr. Cowdery see me about this. The regulator must be an instrument for determining or regulating the quantity of gas passed from the cylinders to the gas-pipes—to reduce the pressure. There is a similar instrument used in all kindred systems. Pintsch's system, I presume, has a regulator. I should like to know the basis upon which the value of Mr. Castner's regulators is fixed. Why £5,000? Is there a recognised charge for the use of each regulator? What is the cost of the regulator without patent rights?—C.A.G., 23/2/84.

Report herewith.—G.C., 7/3/84.

This regulator is for the purpose the Commissioner states. Pintsch's system is on the same principle; but as it has not been patented in the Colony by that firm it cannot now be used, and I know of no other system. I do not know how Mr. Castner arrived at the amount of £5,000. The actuary's estimate was obtained subsequently, I understand, by Mr. Castner. In view of Mr. Durham's estimate, which was nearly double Mr. Castner's amount, and seeing that the working of the whole system is dependent for its success upon the regulator, I think it would pay the Commissioner to buy the patent right. I do not know exactly how Mr. Durham's estimate was calculated, but have an idea that it was based upon the profits of the system reckoned at 6 per cent. compound interest for the period of years which the patent has to run. If the Commissioner did not purchase the patent right, I think it would cost us more to have to purchase regulators as they were required: during this time Mr. Castner would charge us his own price.—G.C., 7/3/84.

No. 6.

Statement respecting Mr. J. L. Castner's contract.

Mr. John L. Castner's contract for supplying the railway carriages with gas. THE agreement provides that, whether the contract runs the full time or is terminated by one month's notice, the Commissioner for Railways shall and will take over from the contractor all buildings erected by the contractor, and also all plant, implements, and appliances * * * the Commissioner for Railways paying to the contractor such amount of compensation as may be determined by two valuers (arbitrators), one to be appointed by the Commissioner for Railways, and one by the contractor. Provision is also made for the appointment of a referee or umpire, termed in the agreement a "third valuer."—C.A.B., 1/3/84.

No. 7.

Minute by The Commissioner for Railways.

LEAVING out of the question for the present the purchase of Mr. Castner's interest in the Patent Regulator, estimated at £5,000, and of the cost of supplies, I think it is desirable that the value of the buildings and appliances for gas-making should be referred to arbitration, Mr. Castner naming a valuer, and the Department one, the two choosing an umpire in the usual way.

Mr. Castner estimated the value £29,221, and Mr. Cowdery's valuation is £27,105. I think it will be better that the value should be arrived at by independent valuers, the cost of the valuation to be divided equally between Mr. Castner and the Department. If the Minister approves, Mr. Castner should be called upon to name his arbitrator first.—C.A.G., 18/3/84.

Approved.—F.A.W., 19/3/84. Write at once.—D.V., 19/3/84.

The Commissioner for Railways to J. L. Castner, Esq.

Sir,

Department of Railways, Sydney, 19 March, 1884.

With reference to your letter of the 5th January last, submitting the amount you claim for the buildings, plant, implements, and appliances used by you in connection with your contract for the supply of gas to this Department, and which it is provided are to be taken over from you at the termination of the contract, I have the honor to inform you that, leaving out of the question for the present the purchase of any interest you may have in the Patent Regulator, and of the cost of supplies, it has been decided that the amount which should be paid to you as the value of the buildings and appliances is to be ascertained by arbitration. The amount is to be arrived at by two independent valuers, one to be nominated by you, the other by the Department, the two choosing an umpire in the usual way, and the cost of such proceeding to be divided equally between yourself and the Department.

If you concur in the proposal I shall be glad to be furnished with the name of the valuer you propose to appoint.

I have, &c.,

CH. A. GOODCHAP,
Commissioner for Railways.

No. 8.

J. L. Castner, Esq., to The Commissioner for Railways.

Sir,

Railway Gas-works, Sydney, 20 March, 1884.

Referring to your letter of the 19th instant, in answer to my letter of the 15th January, wherein I submitted the amount I claim for buildings, plant, implements, and appliances which have been
in

in use by me in the performance of my contract to supply gas to railway carriages, I beg to say that I have no option, but must, in terms of the contract, consent to the matter being settled by arbitrators, as it is therein stated that "the Commissioner for Railways aforesaid shall and will take over from the contractor all buildings erected by the contractor, and also all such plant, implements, and appliances which have been in use by the contractor in the performance of his said contract. The Commissioner aforesaid paying to the contractor such amount of compensation as may be fixed and determined by valuers, one to be appointed by the Commissioner for Railways aforesaid and one by the contractor, and such third valuer as the said two valuers so appointed as aforesaid may by writing under their hands before entering upon the said valuation appoint. The decision of the said valuers or any two of them to be binding in all respects upon the parties hereto." Therefore, I nominate and appoint John Yelverton Mills, Esq., of the firm of Mills & Pile, auctioneers and valuers, 130, Pitt-street, Sydney, as my valuer and arbitrator, and shall be glad to be furnished with the name of the valuer you have appointed.

I have, &c.,
JOHN L. CASTNER.

Minute of Commissioner.

I would suggest that the Gas Company be asked to allow their engineer to act as our arbitrator; he would know better than any the value of machinery used for gas-making, &c.—C.A.G., 21/3/84.

Minute of Secretary for Public Works.

Approved.—F.A.W., 25/3/84.

No. 9.

The Secretary for Railways to The Secretary, Gas Company.

Sir, Department of Railways, Sydney, 27 March, 1884.

I am directed by the Commissioner to inquire whether your Company have any objection to allow your engineer, Mr. Bush, to act as arbitrator on behalf of this Department, for the purpose of determining the amount that it is to pay to the contractor for lighting the railway premises and carriages with gas, for the plant and apparatus used in connection therewith, and which is about to be taken over by the Department.

Soliciting the favour of your early reply,—

I have, &c.,
D. VERNON,
Secretary for Railways.

No. 10.

Telegram from D. Vernon to The Commissioner for Railways.

11 a.m., 1/4/84.

DIRECTORS of Gas Company regret, owing to press of business, their inability to grant permission to their engineer to act as arbitrator. Please suggest some other name to whom I can write, and have reply by the time you arrive.

Message above received per telephone, and sent to Telegraph Office at 11 a.m.—W. V. READ, *per* W.M., 1/4/84.

No. 11.

Telegram from Commissioner for Railways to The Secretary for Railways.

THE following telephonic communication was received from the Traffic Manager at 2:40 p.m. to-day:—
1/4/84.

Please appoint Mr. Wark, junior, Bathurst, to act for me *re* Gas Valuation, but nothing is to be done after appointment is made until Crown Solicitor is communicated with.

Letter to Mr. Wark, 4/4/84.

No. 12.

The Secretary for Railways to W. Wark, Esq.

Sir, Department of Railways, Sydney, 1 April, 1884,

I have the honor to inform you that the terms of agreement made with Mr. J. L. Castner, the contractor for lighting the railway premises and carriages with gas, provides that the Department is to take over at a valuation at the termination of the contract all plant and apparatus used in connection therewith. It has been decided that the amount to be paid is to be ascertained by arbitration, and I am directed by the Commissioner to ask whether you will consent to act as arbitrator on behalf of the Department.

I have, &c.,
D. VERNON,
Secretary for Railways.

No. 13.

J. N. Wark, Esq., to The Secretary for Railways.

Dear sir, Gas-works, Bathurst, 2 April, 1884.

In reply to your letter 84-8,870 on this subject, to which I wired that the name given was that of my son who is residing at Kurrajong, I now wish to say that being resident here I would at any time be willing to be of service to the Department.

I have, &c.,
Pro J. N. WARK,
J. H. SIMSON.
Prepare

Prepare letter appointing Mr. J. N. Wark as valuer for Commissioner. He was formerly Gas Engineer to the Company here, and is the constructor and proprietor of the Bathurst and Wagga Gas-works.—D.V., 3/4/84.

No. 14.

The Secretary for Railways to The Crown Solicitor.

Sir,

Department of Railways, Sydney, 3 April, 1884.

Referring to the agreement entered into by Mr. J. L. Castner with the Commissioner for Railways for fitting and lighting the railway carriages with gas, I have the honor to inform you that it has been decided to take over the buildings and plant used in connection with this contract, in accordance with the conditions of such agreement. Mr. Castner has been called upon to nominate a valuer, and steps have been taken for the appointment of one on behalf of the Commissioner.

The Commissioner will now be glad if you will favour him with your advice as to the further and best course for the Department to adopt in bringing the matter to a settlement in accordance with the conditions of the agreement.

I have, &c.,

DONALD VERNON,
Secretary of Railways.

I recommend Mr. Wark be appointed. I have written to Crown Solicitor, who will advise me as to the best course to take in regard to the progress of the valuers with the valuation.—C.A.G., 4/4/84.

Approved.—F.A.W., 4/4/84.

The Commissioner for Railways to J. N. Wark, Esq.

Sir,

Department of Railways, Sydney, 4 April, 1884.

I have the honor to appoint you to be valuer on my behalf for the purpose of determining the amount that is to be paid to Mr. J. L. Castner under the agreement set forth in the attached paper, for the buildings, implements, and appliances used by him for fitting and lighting the railway carriages with gas.

Mr. Castner has appointed Mr. J. Y. Mills, of Pitt-street, Sydney, to be valuer on his behalf, and you should place yourself in communication with him for the purpose of making all necessary arrangements; but, before actually commencing your valuation, I have to request that you will be good enough to wait upon me at your earliest possible convenience.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

The Crown Solicitor to The Commissioner for Railways.

Sir,

Crown Solicitor's Office, Sydney, 4 April, 1884.

I have the honor to acknowledge the receipt of your letter of date 3rd April instant, with reference to your agreement with Mr. J. L. Castner for fitting and lighting the railway carriages with gas, and your taking over the buildings and plant used in connection with that contract. You request me to advise as to the further and best course for the Department to adopt in bringing the matter to a settlement in accordance with the conditions of the agreement.

By the agreement referred to you are upon the expiration of the contract on the 14th May next to take over all the buildings erected by Mr. Castner, and all plant, implements, and appliances which have been in use by him in the performance of the contract, paying for same such compensation as may be fixed and determined by valuers, one to be appointed by you, one by Mr. Castner, and a third by the two valuers so appointed, the decision of any two to be binding.

It seems to me that the question to be determined really is, whether the reference under the agreement as to the mode in which the amount to be fixed by you is to be considered as an arbitration or as a valuation. I think it must be considered as an agreement for a valuation.

The difference appears to me to be this: if the agreement was for an arbitration, you are entitled to attend before the arbitrators, and call witnesses as to value; but if it is a valuation, the valuers may, if they think fit, inspect the property, and determine its value upon their own judgment, and without taking evidence as to value; and no legal objection can be taken to their so doing.

I think, from the wording of the agreement, if the question came before the Court, it would be held that the reference was to the persons appointed as valuers only, and that it was intended that they should of their own judgment decide as to the value of the buildings and plant to be paid for by you.

An agreement apparently in somewhat similar terms to that referred to was held by the Court of Exchequer not to be for an arbitration. The case is thus referred to in "Russell's on Arbitration," page 221.

By agreement in writing, A agreed to buy of B brewery premises, and the plant, &c., at a valuation to be made by certain valuers, or their umpire. The umpire was to be chosen by the valuers before entering on the valuation. The valuers could not agree upon an umpire. It was held that the Court had no power to appoint an umpire under section 12 of the Common Law Procedure Act, 1854, as this was not an arbitration within the Act, since there had been no difference between the parties as to the price before the agreement to settle it by a valuation.

Probably no objection could be taken to the valuers assisting their own judgment by calling evidence as to value; and you may, if you think it desirable, request the valuers to allow you to produce witnesses to value; but, as I have mentioned, you have no legal right to insist upon evidence being taken; and if the valuers think fit to act upon their own judgment they have a right to do so.

I have, &c.,

JOHN WILLIAMS,
Crown Solicitor.

No. 15.

No. 15.

J. Y. Mills, Esq., to The Secretary for Railways.

Dear sir, Land Sale Rooms, 130, Pitt-street, Sydney, 10 April, 1884.
To save time, and assist the arbitrators in Castner v. Commissioner's case, will you please let me have any papers you may have bearing on the case as to buildings, plant, or any agreements.

Yours truly,
J. Y. MILLS,
Arbitrator.

Replied to, and printed copy of agreement forwarded.—D.V., 10/4/84.

No. 16.

J. L. Castner, Esq., to The Commissioner for Railways.

Sir, Sydney, 19 April, 1884.

Herewith I beg to hand you copy of award of valuers appointed in accordance with and under the authority of agreement or contract between you and myself, dated the 8th day of June, 1882, and which I have taken up, and also list of buildings, plant, &c., &c., which I now hand over to you, as instructed by the valuers.

The amount of the award, £35,966 6s. 11d., as well as one-half of costs of the valuation, £178 17s. 6d, or a total of £36,145 4s. 5d., being due to me, I shall be glad to have, in accordance with the award.

I have, &c.,
JOHN L. CASTNER.

In the matter of a certain memorandum of agreement made the eighth day of June, in the year of our Lord one thousand eight hundred and eighty-two, between John Louis Castner, of the one part, and the Commissioner for Railways of the other part, and of the valuation thereunder of the compensation for buildings, plant, implements, and appliances which have been in use by the said John Louis Castner in the performance of the said agreement or contract.

We, the undersigned, being two of the valuers appointed under and in pursuance of the above-mentioned memorandum of agreement of eighth day of June, one thousand eight hundred and eighty-two, between the above-named John Louis Castner, of the one part, and the Commissioner for Railways of the other part, do hereby fix and determine the amount of compensation payable by the said Commissioner for Railways to the said John Louis Castner in respect of all buildings erected by the said John Louis Castner, and also of all such plant, implements, and appliances which have been used by the said John Louis Castner in the performance of the said contract or agreement, at the sum of thirty thousand nine hundred and sixty-six pounds six shillings and eleven pence, if the same be paid within five days from the date of this award; and if not so paid, then we fix and determine such compensation at that sum with interest at the rate of six pounds per centum per annum from that date until paid.

The costs and charges in this valuation and award to be divided equally between the said John Louis Castner and the Commissioner for Railways, which we fix at the sum of three hundred and fifty-seven pounds fifteen shillings.

Witness our hands, this eighteenth day of April, one thousand eight hundred and eighty-four.
Signed in the presence of me, the third valuator, and } J. Y. MILLS.
I hereby approve of the same,—ALEX. DEAN. } J. N. WARK.

We hereby fix and determine the compensation to be paid to the above-named John Louis Castner for the right to use Castner's Patent Gas Regulator on the railways of the Colony during the continuance of the patent, which we understand is to be decided by us, at the sum of five thousand pounds, to be paid within the time and subject to the penalty for non-payment mentioned in the above award with reference to the compensation thereby awarded.

Signed in the presence of me, the third valuator, and } J. Y. MILLS.
I hereby approve of the same,—ALEX. DEAN. } J. N. WARK.

Mr. Castner's Gas Contract—Materials on hand, 19th April, 1884.

	Mr. Mills.			Mr. Cowdery.		
	£	s.	d.	£	s.	d.
Redfern	1,357	11	6	1,485	16	6
Newcastle	166	2	6	123	2	5
Bathurst.....	55	18	3	29	9	11
Junee	57	13	0	76	3	0
	1,637	5	3	1,714	12	10

No. 17.

Minute by The Commissioner for Railways.

It will be seen that the valuers have gone beyond the scope of the matter remitted to them. I expressly declined to remit for their consideration the value of the supplies on hand, not recognising that they came under the head of plant, implements, and appliances. The supplies are not fixed quantities, but variable, and a day's consumption would make a difference in quantity on hand and available to be taken over. Again, Mr. Castner's interest in the regulator as patentee was not to be considered. I see that the valuers have, notwithstanding, in an addendum to their valuation, taken this into account and awarded £5,000.

I have not seen the original award, but only this copy forwarded by Mr. Castner. I at first refused to receive it in this shape, but believe that Mr. Castner had a right to take up the award and furnish me with a copy, the valuers' duty being finished when one party to the valuation or arbitration has taken up the award.

Will Crown Solicitor advise me if I can ignore the award by reason of the valuation of assets in excess of those contained in the submission.—C.A.G., 19/4/84.

J. L. Castner, Esq., to The Commissioner for Railways.

Sir, Sydney, 22 April, 1884.

As I have no intimation from you as to who is to take charge of the gas-works, I, by the directions of the valuers appointed, handed over to you on the 19th instant, I write to say that I have instructed the foreman whom I have had in charge of the different works to continue the operations as usual, and to purchase supplies, if any are required, as has been the custom while the works were under my control

control, for and on your account. This I have done that the operations may continue, and to prevent disappointment. I have also kept on the same staff, subject to your option to employ them, and they remain with that understanding.

Mr. Downton, my chief clerk, who holds power of attorney from me, will keep all accounts of expenditure and wages, and render the same to you for payment, and deal with them in such way as you may direct.

There are a number of carriages in hand being fitted with gas apparatus, which I will have finished as soon as possible, and render account for them in the usual way.

I have, &c.,

J. L. CASTNER.

No. 18.

The Commissioner for Railways to J. L. Castner, Esq.

Sir,

Department of Railways, Sydney, 24 April, 1884.

Referring to your letter forwarding a copy of an award or valuation made by the valuers appointed to determine the amount due to you for the building, implements, and appliances used for fitting and lighting the railway carriages with gas, I have the honor to inform you that the question whether the valuers in their valuation have not gone beyond the scope of the inquiry remitted to them has been referred to the Crown Law Officers, and until I am advised on the matter I cannot take any action in regard to the award.

I have, &c.,

CHAS. A. GOODCHAP,

Commissioner for Railways.

Mr. Castner left for Melbourne last evening, and letter could not be served upon him. It was left at his office.—D.C.M'L., 24/4/84.

I delivered the letter to the boy in Mr. Castner's office.—P.E.R., 24/4/84.

To Secretary,—The annexed voucher has been sent to me for my signature, but I don't quite understand why I should be asked to certify for a portion of the month—J. HIGGS, 24/4/84.

Mr. Castner is proceeding in the award of the valuers. We are not bound by the contract to take over the works till some time in May. The valuers have gone out of their way to regulate that we shall pay the award from a certain day in April, or interest upon that amount, and, constructively, that we shall take over the works on the 19th April.—C.A.G.

Probably a similar account has been sent in to Traffic Manager, S. and W. Let me know at once, and submit with papers on subject of award.—C.A.G., 29/4/84.

Yes, a voucher was submitted up to the 19th April, but in the absence of the Commissioner I directed that it should stand over till the end of the month, as usual.—W. V. READ, *per* D.K., 29/4/84. Commissioner.

No. 19.

The Commissioner for Railways to J. L. Castner, Esq.

Sir,

Department of Railways, Sydney, 12 May, 1884.

As the agreement under which you have been fitting the railway carriages with appliances for burning gas will terminate on the 14th instant, I have instructed Mr. Scott, the Locomotive Engineer, that on the morning of the 15th instant he is to take over from you the buildings, plant, implements, and appliances, in terms of the agreement. The question of the validity of the award given by the valuer under the said agreement is still under the consideration of the Crown Law Officers.

You will doubtless have on hand a quantity, more or less, of the materials which are used in fitting the carriages and making the gas. These can be, if you wish it, utilised by the Department, and I shall have no objection to purchase them of you. I have intimated to Mr. Scott that he can arrange this with you; but he must do nothing which will in any way involve the Department in any dispute about the Patent Regulator, the question of the purchase of which I cannot entertain.

I have, &c.,

CHAS. A. GOODCHAP,

Commissioner for Railways.

No. 20.

The Commissioner for Railways to The Crown Solicitor.

Sir,

Department of Railways, Sydney, 12 May, 1884.

Herewith I have the honor to hand you a statement of the facts in connection with the arbitration in Mr. J. L. Castner's case.

This statement is furnished with a view to satisfy the inquiries raised by the Attorney-General in his opinion, which I now return.

I have, &c.,

CHAS. A. GOODCHAP,

Commissioner for Railways.

Mr. J. L. Castner's agreement to fit the railway carriages with appliances for burning gas, and to supply gas for the purpose.

On the 8th June, 1882, Mr. Castner entered into an agreement with the Commissioner for Railways to fit the railway carriages with appliances for lighting them with gas, and to supply gas for the purpose at a schedule of prices, the currency of such agreement to be for five years, viz., from 14th May, 1879, to 14th May, 1884. The agreement provides that all materials used in connection with the contract should be carried by the railways free of charge, that the contractor should be furnished with a free pass on the railways, that the Commissioner might at any time terminate the agreement by one month's notice in writing, and that upon the termination of the contract, either by such notice or by effluxion of time, the Commissioner should take over from the contractor all buildings, and all plant, implements, and appliances that may have been used in carrying out the said contract; and the amount of compensation to be paid to the contractor be ascertained by two valuers, one to be appointed by the Commissioner, and one by the contractor and umpire.

On the 15th January, 1884, Mr. Castner, in consequence of a conversation he had had with the Commissioner in view of the approaching termination of the contract, sent in his claim in lump for compensation under the agreement, such claim amounting to £35,935 12s. 6d., described as being for buildings, and for retorts, scrubbers, purifiers, gas-holders, reservoirs, engines, boilers, pumps, compressors, mains, and services, all of which undoubtedly belong to the category of plant, implements, and appliances as mentioned in the agreement. But it includes also materials on hand, and right to use my Patent Regulator during its currency of the patent, both of which items, it appears to the Commissioner, are altogether outside such category.

On

On the 18th January the Commissioner wrote to Mr. Castner acknowledging this letter, and intimating that he could not accept a claim in lump for compensation, and a detailed statement was thereupon furnished.

But on the 19th March, when it had been finally decided to resort to arbitration for the purpose of determining the amount to be paid as compensation for the buildings and plant, the Commissioner replied further to the above quoted letter of Mr. Castner's that "leaving out of the question for the present the purchase of any interest you may have in the Patent Regulator, and of the cost of supplies, it has been decided that the amount which should be paid to you as the value of the buildings and appliances is to be ascertained by arbitration." The letter went on to request Mr. Castner to nominate his arbitrator, which he proceeded to do without any demur or protest against the Commissioner's express exclusion of the patent right, or right of user, of the regulator, and of the materials in hand, from the proposed valuation.

Mr. J. N. Wark was appointed to arbitrate on behalf of the Department, and in giving him his instructions an inventory was handed to him of the articles to be valued, in which, for the reasons already stated, the patent right of the regulator and the materials on hand were not included.

The arbitrators in their award gave Mr. Castner the sum of £30,966 6s. 11d. as the value of the buildings, plant, implements, and appliances, in which they included the value of materials on hand, and they awarded him £5,000 for the patent right of the regulator.

They decreed, moreover, that the amount, £35,966 6s. 11d., should be paid on the 19th April, twenty-five days before the date fixed by the agreement for the termination of the contract, and that if not paid within five days of that date interest at the rate of 6 per cent. should be allowed.

The Commissioner holds that in valuing as assets the patent right of the regulator and the materials on hand (which, in his letter to Mr. Castner, and in his instructions to the arbitrator for the Department, he had specially excluded from the valuations), and in decreeing that the Commissioner shall take over the buildings and appliances, and pay the compensation before this date fixed by the agreement, the arbitrators have gone beyond the scope of the duty entrusted to them, and, more than this, that in the award they have ignored and overridden the conditions of the agreement under which Mr. Castner holds this contract.

The Commissioner is desirous to know if, by this procedure on the part of the arbitrators, the award has not been rendered invalid, and if he cannot ignore it, or, failing this, whether he has not reasonable ground for applying to a competent Court to have the award pronounced null and void.—C.A.B.

The Locomotive Engineer,—

The contract held by John L. Castner for fitting and supplying the railway carriages with gas will terminate on the 14th instant, and the Department will have to take over the buildings, plant, and appliances under the agreement.

I request, therefore, that you will be so good as to demand possession the first thing on the morning of the 15th instant of the buildings and property; and you will have to instruct your assistants at Newcastle, Junee, and Bathurst to the same effect, if necessary, by wire.

Possession will, doubtless, be given, and you will make arrangements for carrying on the business, keeping on the existing staff for the purpose, for the present at all events.

There will, doubtless, be a quantity, more or less, on hand of the materials used by Castner in fitting the carriages and in making the gas which it will be convenient for the Department to purchase, and an account of them will have to be taken for the purpose of payment; but in carrying on the operations you will no doubt have to indent upon this stock immediately, and before an account could be taken. It will be necessary, therefore, for you to keep an account of the material which you use, to be added to the general account when completed.

I shall be glad if you will favour me with your opinion as to the advisability of allowing Castner to complete the fitting of any carriages he may have on hand, should there be any such. It might be inconvenient and undesirable to take over from Castner carriages which have been partially fitted by him.

Do nothing, however, which will involve the Department in any way with the Patent Regulator.

CHAS. A. G., 2/5/84.

Will Locomotive Overseer please give this his immediate attention, and cause the necessary directions to be given for the inspectors to take over the plant, &c., and direct the staff on and after the 15th instant, as mentioned above. Copy of this paper should be sent; I attach an additional one.—W.S. (*per* D.C.M'L.), 13/5/84.

Urgent. It would be well to wire to-day.—D.C.M'L. Instructions sent.—T.M., 13/5/84. Locomotive Engineer.

No. 21.

J. L. Castner, Esq., to The Commissioner for Railways.

Sir,

Railway Gas-works, Sydney, 14 May, 1884.

I am in receipt of your letter of the 12th instant.

You appear to have overlooked the fact that you have already, under the terms of our agreement, become the purchaser of the property from me, and that for some time past I have been merely carrying on the operations at your expense and risk so as to prevent any inconvenience to you or the public, in terms of my letter of the 22nd April, 1884.

I am not prepared to enter into any fresh contract with you such as you suggest with the materials in use, as they are your property under the award, but will render you an account of supplies purchased and expenses incurred since the date of the award.

I have, &c.,

JOHN L. CASTNER.
(*Per* H.D.)

Reply to this that whether I am the purchaser or not will be decided by the Crown Law Officers, to whom I have remitted the question. It is my intention to upset the award or valuation if I can legally do so.—CH.A.G., 14/5/84.

No. 22.

The Commissioner for Railways to J. L. Castner, Esq.

Sir,

Department of Public Works, Railway Branch, Sydney, 15 May, 1884.

I have the honor to acknowledge your letter of the 14th instant, intimating that I have overlooked the fact that I have under the agreement become the purchaser of the property (presumably to the unused materials), and that you have for some time been carrying on the operations at my risk and expense.

In reply I have to inform you that I do not concur in the views which you give expression to, that whether I am the purchaser or not of the materials in question will depend upon the decision of the Crown Law Officers, to whom I have remitted the question, and that it is my intention to upset the award if I can legally do so.

I have, &c.,
CHAS. A. GOODCHAP,
Commissioner for Railways.

No. 23.

The Crown Solicitor to The Commissioner for Railways.

Crown Solicitor's Office, Sydney, 15 May, 1884.

I HAVE the honor to return the papers relating to the contract with Mr. Castner as to the supply of gas, &c., and to the valuation recently made thereunder, and to state that I have submitted a case to the Attorney-General for his opinion, and I now forward herewith copies of his advising thereon.

I have, &c.,
JOHN WILLIAMS,
Crown Solicitor.

In re Agreement between J. L. Castner and the Commissioner for Railways.

Opinion upon case originally submitted.

I DO not think that the agreement can be considered as a reference to arbitration. It is an appraisal valuation, which differs from an arbitration in this: that while the former precludes differences from arising, it does not settle difficulties which have arisen. This is the recognised distinction between cases of appraisal and cases of arbitration. (See Judgment of the Master of the Rolls in *Collins v. Collins*, L.J., Eq., vol. 28, p. 186). In order to constitute an award there must be a decision in the nature of an arbitration; and besides the submission of the parties, an intention on the part of the persons deciding to decide as arbitrators, or, in other words, there must be an *animus arbitrandi*. (Russell on Arbitrators, Title award, p. 249.)

I presume that the second matter submitted does not require answering. If I had regarded the agreement as a reference to arbitration, and if the Commissioner's statement as to the award comprehending matters not submitted to the arbitrators is accurate, on that ground (*vide* case cited at p. 668 of Russell) a motion might have been based to set it aside.

W.B.D., A.G., 24/4/84.

I APPREHEND, on a second reading of the case, that I have misconceived the exact question submitted in the second inquiry. I am asked—assuming that there is no award—how can the claim under the appraisal valuation be resisted. Before answering I would like to be informed by the Commissioner what is precisely intended by the statement that the valuation embraces matters not submitted to the valuers. I presume Mr. Castner forwarded to the Commissioner particulars of his claim, which particulars were forwarded to the valuer appointed by the Commissioner to act upon. Now it will be necessary that I should know whether the list of items on the paper accompanying the valuation differs, and in what way, from the paper submitted in the first place, or whether it is to be understood that the list forwarded to the Commissioner embraced items not contemplated by the agreement. At present I am unable to perceive any ground for claim of the patent rights of Mr. Castner.

W.B.D., A.G., 24/4/84.

Opinion on case as resubmitted.

REFERRING to the minute (without signature and undated) forwarded to the Crown Solicitor, under letter of date 12 May, I perceive that the matter of the arbitration is treated as an award. I have already pointed out that in my opinion it is not an award. If it were it might have been set aside, because the arbitrators had exceeded their authority by including in their valuation matters expressly withdrawn from them by the Commissioner, which would have been a good ground for setting aside an award. I think the best course for the Commissioner to pursue will be to refuse to receive the present valuation (as comprising matters not submitted), and to inform Mr. Castner that as the materials to hand were not to form portion of the valuation the valuation must be referred to the valuers. But as to the special valuation, what is confined to the patent right, the Commissioner absolutely declines to recognise it.

W.B.D., A.G., 14/5/84.

In the event of Mr. Castner refusing to refer the matter back, the only course open to the Commissioner is to refuse to recognise the claim, leaving Mr. Castner to such legal remedy as he may be advised to employ.

W.B.D.

No. 24.

Instructions as to use of Mr. Castner's materials.

Locomotive Engineer's Office, Sydney, 15 May, 1884.

THE following message has been received per telephone from Acting Secretary, and is forwarded for your information and immediate attention:—

Tell Mr. Scott to be sure not to take any of Mr. Castner's materials for making gas. Negotiations are now going on, and it might be fatal to our interests if we take any of the material left by Mr. Castner.

W.S. (*per* D.C.M'L.)

Gas Supply for Carriages.

The Locomotive Engineer to The Locomotive Foreman, Newcastle.

PLEASE note specially that nothing is to be done which will involve the Department with regard to the Patent Regulator used by Mr. Castner for fitting the carriages until you receive further directions in the matter.—W.S. (*per* D.C.M'L.), 15/5/84.

Noted.—J. W. BOAG, 17/5/84. Locomotive Engineer.

Telegram from Inspector Close, Junee, to The Locomotive Inspector.

16 May, 1884.

YOUR memorandum *re* not using Castner's material for gas-making. Gas was made out of Castner's material yesterday, and I must continue using them for the present until materials are supplied, or stop the supply of gas to vehicles. The materials required are kerosene shale, oil, tar, Newcastle slack coal, and oxide of iron. Please advise by wire what to do.

The

The Locomotive Engineer,—

I have just telephoned to you not to use or in any way to interfere with Mr. Castner's stock of materials used by him in fitting the carriages and making the gas. This is intended to confirm those instructions, and to obviate the risk of misunderstanding.

You will understand that the instructions in reference to the materials given to you in a recent minute are hereby cancelled.—G.B., B.C., 15/5/84.

Telephone received 3.30 p.m., 15th, when it was too late to stop the use of Mr. Castner's materials. We had been using them all day, and all the carriages had been filled. If we had not used the material the carriages would have been run in darkness until we got a supply of our own. Instructions have, however, been given for materials to be at once obtained for our own use, and when these are to hand we will discontinue using Castner's.—D.C.M'L., 16/5/84.

No. 25.

Statement in respect of Claim by J. L. Castner, Esq.

Mr. Mitchell,—

Please give bearer a statement of all material on hand this morning belonging to Mr. Castner for making gas—quantity of coal, shale, kerosene, and all other stores.

W. SCOTT,
(Per D.C.M'L.)

Government Gas-works, 15 May, 1884.

Stock on hand.

7½ tons Newcastle coal.	18 pressure gauges (assorted).
2 tons mountain coal.	16 gross assorted burners (Dunks).
3 tons shale.	5 lb. tool steel (B.D. & Co.)
20 barrels tar oil, 700 gallons @ 3d.	17 lb. English sole leather (Lassetter).
7 bags=21 cwt. oxide of iron for purifying.	9 lb. copper tubing.
1 load=1 square yard of clay luting @ 7s.	30 lb. brass castings, compressing pump repairs (W. Crane).
2 barrels English fire-clay (Milne Bros.)	6 heavy ¾ brass cocks for yard work (W. Crane).
19 lb. Tuck's patent packing (Briscoe Bros.)	6 glasses for Lady Parkes, style extra (Richardson).
7½ lb. hemp patent packing (Briscoe Bros.)	6 lamp tops for repairs (Milne Bros.)
2 drums=10 gallons lubricating oil (Fell & Co.)	30 ft. ¾ 3-plg. hose for filling carriages (B.D. & Co.)
21 lb. white lead (Keep).	1 lb. sewing twine.
20 lb. red paint (Keep).	122 lb. old brass.
10 lb. tallow.	41 sheets 6 x 4 x ½ steel for cylinders.
2½ gallons boiled oil.	82 heads for cylinders.
1 gallon kerosene.	10 3-ft cylinders to finish.
1 gallon black varnish.	14 4-ft. cylinders on hand.
11 lb. brass and copper wire.	1 6-ft. cylinder on hand.
36 files (assorted).	

No. 26

The Locomotive Engineer to Mr. Boag.

Newcastle Gas-works.

ENCLOSED is an inventory of the plant and appliances that should have been on hand on the 15th instant, when this Department took possession of the gas-works belonging to Mr. Castner at Newcastle Station.

Please have an examination made of the premises, and report how far the items and quantities mentioned in this statement agree with those actually on hand on the 15th instant.

This matter should have special and careful attention, and I shall be glad to have your report as early as possible.

W.S. (per D.C.M'L.), 17/5/84.

I have made a careful examination of the Newcastle Gas-works, and forward herewith my report thereon.—J. D. BOAG, Loco. Engineer, 26/5/84.

NEWCASTLE Material and Stock on hand :—

	£	s.	d.		£	s.	d.
22 lamp globes, 5s.	5	10	0	3 stop cocks, 3s. 6d.	0	10	6
39 wooden rings, 2s. 9d.	5	7	3	35 bends, 3d.	0	8	9
15 lamp bonnets, 8s.	6	0	0	12 tees, 7d.	0	7	0
12 iron lamp rings	0	9	0	20 to ¼ sockets, 2d.	0	3	4
10 wooden sweeps, 1s. 9d.	0	17	6	16 elbows, 4d.	0	5	4
53 wooden blocks, 6d.	1	6	6	46 sockets, 2½d.	0	10	0
3 regulator taps, 2s.	0	6	0	18 to ¼ tees, 7½d.	0	11	3
5 regulators, £5	25	0	0	24 nipples, 1d.	0	2	0
8 regulator straps, 1s. 6d.	0	12	0	44 plugs, 1¼d.	0	4	7
11 sets cylinder straps, 8s. 6d.	4	13	6	75 backnuts, 1d.	0	6	3
40 ¾ elbows, 4d.	0	13	4	16 cwt. oxide iron, £2 12s. 6d.	2	2	0
32 ¾ tees, 8½d.	1	2	8	1 ½ bend	0	0	4
20 ¾ to ¾ sockets, 3d.	0	5	0	4 ¼ regulator cocks, 3s. 6d.	0	14	0
84 feet ¾ pipe, 3½d.	1	4	6	6 ¼ lamp, 3s. 6d.	1	1	0
156 feet ¾ pipes, 2½d.	1	12	6	20 ¼ tees, 6½d.	0	10	10
224 feet ¼ pipes, 1½d.	1	8	0	70 ¼ sockets, ¾d.	0	4	0
5 ¾ service cocks, 8s.	2	0	0	14 ¼ elbows, 2½d.	0	1	9
5 ¾ water-cocks, 3s. 6d.	0	17	6	17 ¼ plugs, 1¼d.	0	2	1
8 ¾ cylinder cocks, 8s.	3	4	0	18 ¼ nipples, 1d.	0	1	6
27 ¾ sockets, 3¼d.	0	7	3	20 ¼ caps, 1d.	0	2	6
18 ¾ plugs, 2¼d.	0	3	4	2 pieces zinc, 5s.	0	10	0
9 ¾ backnuts, 1¼d.	0	1	2	8 hammer handles, 9d.	0	6	0

NEWCASTLE

NEWCASTLE Material and Stock on hand—continued.

	£	s.	d.		£	s.	d.
1 axe.....	0	5	0	5 2" to 1 1/4" red sockets, 4d.....	0	1	8
1 packet small iron rivets.....	0	3	6	1 2" bend, 1s. 8 1/2d.....	1	9	0
1 packet copper rivets.....	0	4	0	2 2" flanges, 1s. 3d.....	0	2	6
6 plunger valves, 1s. 6d.....	0	9	0	1 1 1/2" bend, 1s.....	0	1	0
35 tons small coal, 5s. 6d.....	9	12	6	2 1 1/2" sockets, 3d.....	0	6	0
2 cwt. shale, £2.....	0	4	0	2 1 1/2" sockets, 2 1/2d.....	0	0	5
4 tons coke, 10s.....	2	0	0	3 1" elbows, 7d.....	0	1	9
6 gross small screws, 8d.....	0	4	0	3 1" tees, 10 1/2d.....	0	2	8
5 sheets emery cloth, 2d.....	0	0	10	2 1" sockets, 2d.....	0	0	4
2 regulator valves, 5s.....	0	10	0	9 feet 1 1/4" pipe, 5 1/2d.....	0	4	2
56 lb. bolts and nuts, 5d.....	1	3	4	21 feet 1 1/2" pipe, 7d.....	0	12	3
42 3/8 to 1/2 brass unions, 6d.....	1	2	0	11 1 1/2" backnuts, 4d.....	0	3	8
17 doz. 3/8 to 1/2 washers, 6d.....	0	8	6	10 1 1/2" backnuts, 2d.....	0	1	8
50 lb. white lead, 35s.....	0	15	8	7 1 1/2" backnuts, 3d.....	0	1	9
55 lb. red lead, 35s.....	0	17	3	1 cwt. fireclay, 7s.....	0	7	0
1 cwt. red paint, 28s.....	1	8	0	9 lb. engine packing, 1s. 3d.....	0	11	3
4 doz. regulator springs, 10s. 6d.....	2	2	0	5 water gauge glasses, 1s.....	0	5	0
1 gallon castor oil.....	4	6	0	1/2 lb. oakum.....	0	0	4
1/2 pint turps.....	0	0	5	150 fire-bricks, 10s.....	1	10	0
1 lb. spirit salts, 4d.....	0	0	4	4 hose coupling cocks, 15s.....	3	0	0
2 yards insertion, 3s.....	0	6	0	50 common bricks, 3s.....	0	3	0
4 gross burners, 7s.....	1	8	0	22 lamps, £2 5s.....	49	10	0
12 lb. old lead, 2 1/2d.....	2	6	0				
28 lb. brass pipe, 1s. 6d.....	2	2	0				
41 feet 2" pipe, 8 1/2d.....	1	9	0				
				Total.....	£166	2	0

Mr. Boag to The Locomotive Engineer.

Sir,

Newcastle, 23 May, 1884.

In accordance with your instructions of the 17/5/84 on your M.P. 84/3,574, my 84/1,352, I have made careful examination over the whole of the buildings, machinery, and stock in connection with the Newcastle Gas-works, and beg to report that I found the building, plant, and appliances on the ground exactly as enumerated in your inventory. There are a few discrepancies in the stock of gas-fittings, &c., for fitting gas-burning apparatus in the carriages, and I attach a list showing the quantities stated in you inventory and the quantities on hand when the works were taken over on the 15th May, 1884.

THOS. BOAG,
26/5/84.

MATERIAL at Newcastle Gas-works.

Material.	As per Inventory.	On hand on 15th May, 1884.	Material.	As per Inventory.	On hand on 15th May, 1884.
Lamp glasses.....	22	22	Small copper rivets, packets.....	1	1
Wooden rings.....	34	39	Plunger valves.....	6	6
Lamp bonnets.....	15	13	Small coal, tons.....	35	23
Iron lamp rings.....	12	13	Kero. shale, cwt.....	2	3
Wood sweeps.....	10	10	Coke, tons.....	4	4
Wood blocks.....	53	55	Small screws.....	6	4
Regulator taps.....	3	3	Emery cloth.....	5	4
Regulators.....	5	4	Regulator valve.....	2	1
Regulator straps.....	8	7	Bolts and nuts.....	56	56
Sets by-under straps.....	11	10	3/8 to 1/2 brass unions.....	42	42
elbows.....	40	36	1/2 to 3/4 washers, lb.....	17	20
tees.....	32	28	White lead, lb.....	50	30
to 3/8 sockets.....	20	23	Red lead, lb.....	55	47
pipe ft.....	84	70	Red paint, cwt.....	1	28 lb.
pipe ft.....	156	100	Regulator springs.....	48	44
pipe ft.....	224	200	Castor oil, galls.....	1	1 1/2
service cocks.....	5	5	Turps, pt.....	1/2	Nil.
cylinder cocks.....	8	4	Spirits salt, lb.....	1	1
water cocks.....	5	4	Insertion, yds.....	2	2
sockets.....	27	25	Burners, gross.....	4	4
plugs.....	18	19	Old lead, lb.....	12	8
backnuts.....	9	8	Brass pipe, lb.....	28	25 ft.
stop-cocks.....	3	3	2 pipe, ft.....	41	25
bends.....	35	34	2 to 1 1/4 red g. sockets.....	5	Nil.
tees.....	12	14	2 bend.....	1	Nil.
to 1/2 sockets.....	20	21	2 flanges.....	2	2
elbows.....	16	15	1 1/2 bend.....	1	Nil.
sockets.....	46	44	1 1/2 sockets.....	2	Nil.
to 1/4 tees.....	18	3	1 1/4 sockets.....	2	3
nipples.....	24	25	1 elbows.....	3	3
plugs.....	44	45	1 tees.....	3	3
back nuts.....	75	74	1 sockets.....	2	Nil.
Oxide iron, cwt.....	16	10	1 1/4 pipe, ft.....	9	20
1/2 bend.....	1	1	1 1/2 pipe, ft.....	21	25
1/4 regulator cocks.....	4	3	1 1/2 backnuts.....	11	10
1/4 lamp cocks.....	6	3	1 backnuts.....	10	10
tees.....	20	19	1 1/4 backnuts.....	7	7
sockets.....	70	14	Fireclay, cwt.....	1	1
elbows.....	14	15	Flax packing.....	9	9
plugs.....	17	15	Water-gauge glasses.....	5	6
nipples.....	18	23	Oakum, lb.....	1/2	50
caps.....	30	30	Firebricks.....	150	150
Zinc pieces.....	2	2	Hose-coupling cocks.....	4	4
Hammer handles.....	8	8	Common bricks.....	50	50
Axe.....	1	Nil.	Lamps.....	22	Nil.
Small iron rivets, packets.....	1	1/2			

Précis.—Arrangements with Mr. G. L. Castner for lighting the railway carriages with gas.

UNDER date of 10th July, 1877, Mr. Castner wrote to Commissioner offering to supply and fit apparatus for lighting the carriages with gas for £40 per carriage, and to supply gas, and to keep apparatus in repair for five years, at £2,000 per annum. The G.N. Lines, and any distance the railway might be extended, in the same proportion, to be in working order in six months.

Under instructions from Commissioner, Traffic Manager then reported the cost of the existing mode of lighting the carriages, and a trial was made of Mr. Castner's scheme, which Mr. Mason reported had proved a success.

Mr. Castner was then informed that before adopting any new system of lighting the carriages inquiry would be made as to the most improved modes in vogue in England.

The Agent-General was accordingly written to, and he obtained and forwarded to the Commissioner two reports on the subject from Mr. John Fowler, C.E. As these reports are dealt with, and their purport stated in Commissioner's minute of 21st November, 1878, to be presently quoted, I will not further refer to them here.

On the 21st October, 1878, Mr. Castner wrote to Commissioner, referring to the intimation made by the latter, that before giving a final answer he would obtain information as to the mode of lighting adopted in England; stated that he (Mr. Castner) had visited England and America, and was now prepared to fit the carriages after the most approved method; that as lines have been increased he must re-state terms. Is prepared to fit all carriages on Southern and Western lines at £40 each, and to supply gas and to maintain apparatus for an annual payment of £2,400, and in same proportion for Great Northern lines, and any extensions; all to be ready in twelve months. Other conditions as before.

Hereon Commissioner minuted condemning the old light, and stating that there could be no doubt we must use gas, and if Castner's terms are reasonable would be disposed to accept his offer. Asked Locomotive Engineer to report.

Mr. Burnett replied that there could be no question of the superiority of gas, but that Castner was not in a position to submit plans, and that without further information he was unable to give an opinion as to the reasonableness or otherwise of Castner's offer.

On the 21st November, 1878, Commissioner wrote a minute on the subject for submission to Minister, stating that some time before Mr. Castner had made a successful experiment in lighting the railway carriages with gas; that a final decision had been postponed until inquiries had been made as to the mode of lighting adopted in England; that Mr. John Fowler, who was consulted, had recommended a postponement of the matter (Agent-General's covering letter of 4th January, 1878), promising a further communication on the subject; that subsequently Mr. Fowler wrote advocating the introduction of the system (Agent-General's covering letter of 1st July, 1878), and that in the meantime Castner (whose system was almost identical with that of Pintsch) had returned from England with all needful plans and appliances; that the terms upon which Castner would do the work were not much, if at all, in excess of cost with present appliances; that Castner's price is £40 per carriage for fitting, and £2,400 per annum for gas and repairs of fittings; the term to be for five years. Thought we could not do better than to close with Castner, and recommends the acceptance of his offer.

This Mr. Secretary Sutherland minutes "approved."

Thereupon (29 November, 1878) Commissioner wrote Mr. Castner recapitulating the terms of the latter's proposal, and referring to a recent interview stated that according to Castner's verbal undertaking he was to have carriages running lighted with gas in January, 1879; that he was to enter into an agreement that the contract was to be liable to be annulled at three months' notice, or at any time if Commissioner were dissatisfied with the quantity or quality of the gas, or with the lighting arrangements, in which case all appliances would become forfeited to the Department. On these conditions was prepared to accept Castner's offer.

On the 2nd December, 1878, Castner replied formally accepting these conditions.

Commissioner thereupon instructed Locomotive Engineer to give Castner access to the carriages for the purpose of fitting, and in reply to an inquiry by Locomotive Engineer intimated that all carriages lighted with oil were to be dealt with.

Under this arrangement the work was carried on for a considerable period, but frequent misunderstandings arose between the then Locomotive Engineer and Mr. Castner with reference to the suitability and strength of the work of the fittings, and the Locomotive Engineer refused to certify Castner's accounts for payment. This, on two occasions, led to the initiation by Castner of legal proceedings against the Department for the recovery of moneys due to him. The Department, it turned out, had no case, and in both instances the amount had to be paid with costs. How this arose is sufficiently shown by several minutes by the Commissioner to the then Locomotive Engineer, by the opinions of the Crown Solicitor and of Messrs Stephens and Salomons, who had a consultation on one of the cases, and by a minute of the Minister

In June, 1880, Castner voluntarily offered to assign the whole of his buildings and plant to Commissioner as security for the due fulfilment of his agreement on condition that a sum of money then due to him was paid to him without further demur, but on being called upon by the Crown Solicitor to execute the necessary deed he retracted his offer; and Commissioner minuted that as the plant is on the railway premises, and can only be used for railway purposes, that alone is sufficient security.

On the 23rd July, 1881, Commissioner minuted that the papers *re* Castner's gas arrangements were in such a state of confusion that he feared some matters of importance might escape attention; that Mr. Scott, on 80-1,626, stated the number of burners in a carriage was a fair index to the quantity of work in fitting up a carriage; that, on the figures supplied by Mr. Scott, Castner was informed that he would be paid £57 15s. for American carriages; that Castner was not asked to concur in the proposition, and was not informed of the basis upon which the calculation was made. It had been ascertained after the lapse of a year, and the frequent payment of accounts at that rate, that the figures upon which the calculation was based were erroneous, but Commissioner held that we could not withhold payment at that rate or recover what had been paid in excess. That if we had offered the proportionate sum which Mr. Burnett showed

showed to be due it was not certain that Castner would have accepted it, seeing that we had only allowed him, as it was, £17 15s. for work for which he claimed £40.

Referring to certain statements made by a discharged servant of Mr. Castner's, Commissioner went on to say that there now remained to be considered the allegations made by Mr. Robertson that in consequence of bad gas, bad lamps, insufficient supply of gas, and defective apparatus, the lamps frequently go out—that the gas gives off an abundance of smoke and an offensive odour. Upon the question of bad lighting Commissioner's own observations were in direct contradiction of Robertson's statement.

Subsequent investigation went to prove that the allegations made by this man were without foundation.

On 3rd January, 1882, Castner wrote to Commissioner referring to an interview he had had with him, and stated that he was prepared to enter into an agreement on the following terms, to continue to supply gas on existing terms, viz.: on South and West £260 per month, and on Great Northern Lines £90 per month, carriages on Great Northern Lines to be fitted at £35, £57 15s., and £80 respectively. Commissioner at expiration of contract to take over all buildings, plant, &c., at a valuation to be arrived at by two arbitrators and an umpire, who shall decide the amount to be for said plant and contract. All materials for said works and service to be carried free, and contractor to be furnished with a free pass on the railway.

Commissioner minuted that these were terms agreed upon between himself and Castner, to be formulated into an agreement, with general conditions contained in former agreement. Minister approved, and Crown Solicitor was instructed.

Crown Solicitor thereupon wrote that the information was not sufficient. Pointed out that on south and west Castner was to supply gas "as at present." Did not know what he was doing at present. Nothing was said of number of carriages, number of lights to each carriage, or times during which light is to be supplied. Same applied to Northern lines; was not stated what the several sums to be paid on Northern lines were for. Nothing said of duration of contract. Asked in reference to arbitration clause what was meaning of Mr. Castner in speaking of amount to be paid for plant and contract. Asked if power was to be taken to terminate contract in case of non-fulfilment of conditions.

Commissioner replied forwarding specification containing particulars required, and explaining that Castner's reference to compensation meant that compensation is to be given in the event of Commissioner taking over the contract before the time fixed for its expiration. An agreement was drawn up accordingly, and duly executed by Castner.

Under date of 15th January, 1884, in view of the approaching termination of the contract (on the 14th May) Castner, referring to a conversation he had had with Commissioner, wrote enclosing a claim amounting to £35,935 12s. 6d., purporting to be valuation of buildings, plant, implements, and appliances used in his gas-making business, and including the patent right of the regulator.

Under date of 19th March, 1884, Commissioner replied with reference to the amount claimed by him for his buildings, plant, implements, and appliances, that leaving out of the question for the present the purchase of any interest Castner might have in the regulator and of the supplies, it had been decided to refer the matter to arbitration.

Per letter of 21st January, 1884, Castner submitted valuation in detail, which includes £1,714 12s. 10d. for materials in stock, and, as stated above, £5,000 for patent right of regulator.

Hereon Commissioner minuted that he could not understand how Castner's works could be worth so large a sum of money, that a large amount should be written off for depreciation, and directed Mr. Cowdery to be very careful in making his valuation, stating that we should have to go to arbitration if Castner would not accept a reasonable sum. Mr. Cowdery to employ competent men.

Mr. Cowdery thereupon submitted his detailed valuation, amounting to £32,104 12s. 3d., and stated that he had attended to the matter himself.

Commissioner minuted asking how Mr. Cowdery had arrived at his valuation, he should bear in mind that the things have been in use for years, and that depreciation has to be taken into account. Asked to be informed of the exact meaning of the expression "right to use Mr. Castner's patent regulator." When was regulator patented, and is it superior to other regulators? Mr. Castner could have no claim to fittings on the carriages for which he has been paid, and if they include the regulator we have a right to use it on those particular carriages. Question of right of user must refer to new carriages only. Shall we want it for new carriages, and is it worth £5,000?

Mr. Cowdery replied that his valuation is for plant as it stands; that the regulator was patented three years ago, and that he knows of no other regulator in the Colony for the purpose; that Mr. Castner has no claim for fittings now in carriages, but for new carriages, if we continue to use gas; and that the value of the patent was arrived at for Mr. Castner by an actuary, who put the value at nearly double what Mr. Castner claims.

Commissioner thereupon minuted that every similar system must require a regulator. Pintsch's, for instance; would like to know basis of Castner's valuation of the regulator—why £5,000? What is cost of regulator without patent rights?

Mr. Cowdery replied that Castner's system is the same in principle as Pintsch's system, has not been patented in the Colony, and cannot be used. Does not know how Castner arrived at £5,000; but it turns out that it was not based on the actuary's estimate. Thinks it would pay to purchase patent, as it would probably cost more to purchase regulators as required. Commissioner, referring to the difference between Mr. Castner's valuation and Mr. Cowdery's, minuted that the better course would be to arrive at the amount to be paid by arbitration, and Minister approved.

On the 19th February, 1884, Mr. Castner was written to to that effect, and asked to appoint an arbitrator.

Per letter of 25th idem Mr. Castner assented to this arrangement, and nominated Mr. J. Y. Mills as his arbitrator.

After the post of arbitrator for the Department had, with Minister's consent, been offered to the Engineer for the Sydney Gas-works, through his employers, and refused by them on the ground that they could not spare his services, it was offered to Mr. J. N. Wark, who accepted it, and Minister approved his appointment.

Per letter of 4th April, 1884, Mr. Wark was appointed valuer on Commissioner's behalf to determine the amount to be paid to Mr. Castner under the agreement for "buildings, implements, and appliances" used by him in fitting and lighting the railway carriages with gas. On

On the 4th April, 1884, the Crown Solicitor, in response to an inquiry of Commissioner's, gave it as his opinion that the agreement does not provide for an arbitration, but for a valuation, and that the valuers may decide the question of value upon their own judgment, and without hearing evidence on the subject.

On the 19th idem Mr. Castner submitted copy of the valuers' award, amounting to £35,966 6s. 11d., and £178 17s. 6d., half the costs of the valuation, to be paid forthwith.

Hereon Commissioner minuted that the valuers had gone beyond the scope of the matters remitted to them; that not looking upon supplies as coming under the head of plant, implements, and appliances, he had expressly declined to remit the value of supplies for their consideration; that the value of supplies is not a fixed quantity, but variable; that the interest of Mr. Castner in the regulator was not to be considered, but the valuers had awarded £5,000 for it. Crown Solicitor to say if the award can be ignored by reason of this valuation of assets in excess of those contained in the submission. Crown Solicitor, thereupon, obtained and forwarded the Attorney-General's opinion on the case.

On the 22nd April, 1884, Castner wrote that as he had had no intimation who was to take charge of the gas-works handed over on the 19th idem, he had instructed the foreman to continue operations and to purchase supplies on Commissioner's account, and had "left on" the old staff; that Mr. Downton, his chief clerk, who holds a power of attorney, would keep accounts of all expenses and wages and hand them to Commissioner for payment, and that there are a number of carriages in hand which would be completed as soon as possible.

On the 24th April, 1884, Commissioner addressed a letter to Mr. Castner referring to the award of the valuers, and stating that the question whether the valuers had not gone beyond the scope of the inquiry remitted to them had been referred to Crown Law Officers, and until advised on matter could take no action in regard to award. (Note.—This letter was taken to Mr. Castner on the day it was written, but it was found that he had started for Melbourne the previous evening, and it was therefore left with the person in charge of Castner's office.)

On the 30th April, Traffic Manager asking what arrangements had been made for the supply of gas during Castner's absence, and stating that there is very little of the necessary material at the works.

Mr. Castner's accounts for supply of gas for April, or rather for a portion of April, are in obedience. Traffic Manager (N.) forwarded to Commissioner an account for gas supplied up to April 19, minuting that he did not know why he had been called upon to certify for a portion of a month.

Hereon "Commissioner minuted Mr. Castner is proceeding on the award of the valuers. We are not bound by contract to take over works until some time in May. The valuers have gone out of their way to regulate that we shall pay the award from a certain day in April, interest upon the amount, and, constructively, that we shall take over the works on the 19th April. Probably a similar account has been sent to Traffic Manager, South and West. Let me know at once."

Traffic Manager (South and West) replied that a similar account had been sent to him, but in Commissioner's absence he had held it over.

I may say that I have made myself acquainted with the purport of every paper on the file, and I can state without hesitation that in no stage of the negotiations with Castner was the patent right in the regulator referred to. The first intimation made directly by Castner that he claimed a property in the regulator is contained in his lump valuation submitted on the 15th January, 1884.—C.A.B.

Loco. Engineer.—Mr. J. L. Castner's gas arrangements. I request you will be good enough to prepare and submit an inventory and valuation of the stores and materials on hand on the 14th instant, or rather on the morning of the 15th instant, when you took charge of the gas-works. You will have no difficulty in speedily accomplishing this if the instructions contained in my former minute to keep an accurate account of the stores and materials used by yourself have been carried out—G.B., B.C., 30/5/84.

Loco. Overseer.—D.C.M'L., 31/5/84. Urgent. This is being attended to.—T.M., 2/6/84.

No. 28.

J. L. Castner, Esq., to The Commissioner for Railways.

Sir,

Railway Gas-works, Sydney, 30 May, 1884.

Referring to our agreement this morning *re* settlement of the gas-works award, and the arrangement for the revaluation of stores, I shall be glad if you will appoint a time, and an officer to meet me, for this purpose, with a view to an early adjustment of the matter.

I have, &c.,

JOHN L. CASTNER,
(*Per* H.D.)

Loco. Engineer.—G.B., B.C., 2/6/84. The inventory of all stores and materials on hand will be completed on Wednesday, and Mr. Castner's representative might attend at this office on Thursday morning, when the whole matter can be gone into and disposed of.—W. SCOTT, 2/6/84. Commissioner.

No. 29.

The Commissioner for Railways to J. L. Castner, Esq.

Sir,

Department of Railways, Sydney, 4 June, 1884.

In reply to your letter of the 30th ultimo, *re* settlement of the gas-works award and the arrangement for the revaluation of the stores, I have the honor to inform you that the inventory of all stores and materials on hand has been completed, and your representative can attend at the office of the Locomotive Engineer to-morrow (Thursday) morning, when the whole matter can be gone into and disposed of.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

Locomotive Engineer.—G.B., B.C., 4/6/84. Mr. Castner's representative called and exhibited authority from Commissioner to examine our statement of stock on hand, plant, &c.—D.C.M'L.

No. 30.

Arbitration in the matter of Mr. J. L. Castner's Contract for supplying Gas.

THE award of the arbitrators in this matter (made on the 19th April, 1884) was that the Commissioner should pay the sum of £36,145 4s. 5d., and that if not paid in four days, interest on the amount should be allowed at the rate of 6 per cent. The sum so awarded was made up thus:—

Buildings and plant	£29,329	1	8
Patent right of regulator	5,000	0	0
Materials on hand	1,637	5	3
Half costs of arbitration	178	17	6

£36,145 4 5

Subject to the submission of this award, Mr. Castner, by his attorneys, Messrs. J. Y. Mills and Henry G. Downton, made certain proposals for carrying on the business of supplying gas.

These proposals they now abandon, and agree to accept the amount awarded, less the £5,000 awarded for the patent right of the regulator, and the £1,637 5s. 3d., the amount at which the stores and materials were valued, which will leave £29,507 19s. 2d.

This sum they will accept without interest, and make over to the Government all right and title to the Patent Regulator without further payment beyond the said sum of £29,507 19s. 2d.

The stores and materials to be revalued, as on the 14th May, 1884, and to be paid for upon such revaluation.

Please see note from Mr. Mills of 5th instant enclosed.*

Will Crown Solicitor please prepare the release, omitting to insert amounts.

Pro Commissioner, G. B., B. C., 5/6/84.

No. 31.

The Locomotive Engineer to The Commissioner for Railways.

I HAVE had the stock of stores and materials on hand at the various gas-works on the 15th ultimo carefully taken, and enclose herein statements showing the value as per Mr. Castner's inventory and the value of the articles actually on hand on the 15th ultimo, *i.e.*, allowing Mr. Castner's prices in each case. The particulars are as follows:—

	Value claimed by Castner.			Value of goods on hand, 15/5/84.		
	£	s.	d.	£	s.	d.
Sydney	1,373	19	6	1,349	6	0
Newcastle	156	10	0	90	11	4
Bathurst	55	18	5	45	1	10
Junee	57	13	0	46	1	8
	1,644	0	11	1,531	0	10

This gives a difference in favour of the Department of £113 0s. 1d. In going through the stocks it has been found that there are a number of articles on hand which are not shown in Mr. Castner's list, and they are given in the list marked A.

There is an item in dispute of some 600 gallons of tar oil, which Mr. Castner's representative says is at Bathurst, and not accounted for in the stock list sent from there. I have written to-day to ascertain whether it is there or not.

W. SCOTT,

Per D. C. M'L., 7/6/84.

No. 32.

The Crown Solicitor to The Commissioner for Railways.

Sir,

Crown Solicitor's Office, Sydney, 6 June, 1884.

I have the honor to inform you that Mr. Mills has left the Letters of Registration granted to John Louis Castner with me, and informs me that it is not intended that the Letters of Registration shall be assigned to you, as I was informed was to be the case, by the gentleman who brought the papers from your Department; but that you are to have leave to use the patent upon all railways now, or at any time hereafter, in use in New South Wales, Mr. Castner retaining the right to use, or to license the use of, the patent in respect of all other matters.

I have, &c.,

JOHN WILLIAMS,
Crown Solicitor.

The Commissioner for Railways to The Crown Solicitor.

Sir,

Department of Railways, Sydney, 9/6/84.

With reference to your letter of the 6th instant, and the question which has been raised whether it was the absolute property of the patent of the gas regulator, or the right of user only, which, under the terms of compromise, recently arranged with Mr. Mills, Mr. Castner was to make over to the Commissioner, I have the honor to inform you that in my conversation with Mr. Mills I received the distinct impression that it was the actual patent right which Mr. Castner was to assign, and in the memorandum which I made at the time, and which Mr. Mills signed, I think that view is expressed.

As, however, Mr. Mills disclaims any intention of conveying that impression, and insists that all he had in his mind, or indeed in his power, to concede was the right to use the regulator on the railways of the Colony, I cannot, without impugning his veracity, refuse to accept his statement, believing that by a want of clearness he failed to convey what was really in his mind; and as I learn that the patent may have

a

* This note cannot now be found.

a value in the Colony outside its uses for railway and tramway purposes, I shall be satisfied if the right to use the regulator on the railways and tramways, present and future, be assigned to the Commissioner, provided such right of user be so secured that it shall not be affected by any subsequent sale or assignment of the patent by Mr. Castner.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

J. L. Castner's release.

The Acting Secretary,—

The Commissioner expressed a wish to know what were the precise words he made use of with reference to the Patent Regulator in the minute which he wrote of the terms agreed upon with Messrs. Mills and Downton.

When at the Crown Solicitor's office to-day I took the opportunity of referring to the minute, and I found that it reads thus: "Granting to the Government all right and title to the Patent Regulator without further payment."

This is the minute which is signed by Messrs. Mills and Downton in token of their acceptance of the conditions.—C.A.B., 11/6/84.

My words represented what transpired, "it was all right and title to the Patent Regulator" the Department sought and obtained for the Government.—CHAS. A.G., 12/6/84.

No. 33.

Mr. D. C. M'Lachlan to Mr. Badham.

MEMO.—Before Mr. Castner's matter is settled I desire to let you know that we have discovered a very great discrepancy in the brickwork at the Bathurst works. In Mr. Castner's list it is given at 38,270 cubic feet, while there only actually appears to be 12,764 cubic feet. This is a very large discrepancy, and represents some money.

I think you should look into it before the final statement is made. I shall be glad to hear from you *re* the matter.

In haste,

Yours truly,
D. C. M'LACHLAN.

Arrangement with Castner.

Acting Secretary,—I have just received the annexed memo from Mr. D. M'Lachlan questioning the correctness of the measurements of brickwork at Bathurst, upon which the valuation of the arbitrators was based. It therefore impeaches the valuation of the arbitrators; but I fancy that under the terms of the compromise lately agreed to that valuation cannot now be disturbed, even if a mistake be proved.—C.A.B., 11/6/84.

I think that such a serious error as this should be considered. The valuers should be communicated with, and requested to again measure this brickwork, with a view to a modification of the value.—CHAS.A.G., 4/6/84. Mr. Cowdery.—G.B., B.C., 11/6/84.

Before replying to this minute I should like to be furnished with the papers *re* valuation.—G.C., 12/6/84. Commissioner.

My estimate, 38,270 cubic feet, was the cubic contents of buildings, and not brickwork only.—G.C., 12/6/84. Seen.—CHAS.A.G., 12/6/84.

J. L. Castner, Esq., to The Commissioner for Railways.

Sir,

Railway Gas-works, Sydney, 2 July, 1884.

I shall be glad if you will kindly let the bearer have a copy of the papers *re* gas-works award, which were signed in your office by Messrs. Mills and Downton on the 30th May last.

I have, &c.,

JOHN L. CASTNER,
(*Per* H.D.)

Where is this?—G.B., 2/7/84. With Crown Solicitor, with the other papers. Shall I obtain Commissioner's minute? That is what Mr. Castner's representative wants, and it can be separated from the papers without detriment to Crown Solicitor's action.—C.A.B., 2/7/84. Acting Secretary.—Can I supply this?—G.B. Commissioner. Yes.—CHAS.A.G., 2/7/84. Copy of Commissioner's minute of 30/5/84 forwarded to Mr. Downton.—C.A.B., 3/7/84.

No. 34.

The Crown Solicitor to The Commissioner for Railways.

Sir,

Crown Solicitor's Office, Sydney, 4 July, 1884.

I have the honor to forward herewith draft release, and copy of same for execution, and the assignment of the interest in the patent so far as the railways are concerned, which I have made in triplicate. One copy you will notice is engrossed on the letters of registration, one copy to register, and the other for you to retain.

I thought it advisable to have one copy indorsed on the letters of registration in order to give notice to any future purchaser of your rights in the matter.

As the power of attorney does not contain the usual declaration of notice of non-revocation, &c., I submitted a case to Mr. Attorney-General as to whether it should be accepted. When the assignment has been executed it should be returned to me at once, as it has to be registered within three days of the date thereof.

I have, &c.,

JOHN WILLIAMS,
Crown Solicitor.
Accountant,

Goods supplied at Redfern Gas-works—*continued.*

<i>June Gas-works.</i>		£	s.	d.			£	s.	d.
9 ft. 4 in. C. I. spigot and faucet pipe, 2s.		0	18	0	9 pieces $\frac{1}{2}$ -in. gas-pipe x 3 ft. 6 in., 1s.....		0	9	0
1 bar iron, 2 x 10 ft. 4 in., 10s. 6d.		0	10	6	10 pieces $\frac{1}{2}$ -in. gas-pipe x 3 ft. 6 in., 4d.		0	3	4
2 bars flat iron, $1\frac{1}{2}$ x $\frac{1}{4}$ x 17 in., 10s. 6d.		1	1	0	18 empty casks, 5s.....		4	10	0
18 ft. C.I. flanged pipe, 6 in., 2s. 9d.....		2	9	6	46 empty oil-drums, 2s. 6d.		5	15	0
1 6-in. C.I. elbow		0	16	6			<hr/>		
1 2-bushel bag		0	1	0			£24	3	8
3 lengths 2-in. pipe, 9s. 6d.....		1	18	6			<hr/>		
6 lengths $\frac{3}{4}$ -in. gas-pipe, second-hand 3s.....		0	18	0			<i>Newcastle Gas-works.</i>		
10 lengths $\frac{3}{4}$ -in. gas-pipe, 4s. 6d.....		2	5	0	60 feet 5 ply. $\frac{3}{4}$ Martin wrapped hose, 3s. 3d. ...		10	10	0
15 lengths $\frac{3}{4}$ -in. gas-pipe, 2s.....		1	10	0			<hr/>		
23 ft. 4-in. leather belting, second-hand, 1s.....		1	3	0			£188	18	4
4 4-in. bucket leathers, 1s. 4d.		0	5	4			<hr/>		

The Commissioner for Railways to J. L. Castner, Esq.

Sir,

Department of Railways, Sydney, 14 October, 1884.

I have the honor to acknowledge your letter of the 11th instant, enclosing a duplicate copy of an account amounting to £188 18s. 4d., for gas fittings and stores found in stock by our officers on the 15th May last, but not included, you say, in the award of the 19th April, stating that, inasmuch on finding in some cases that the quantity on hand on the former date was less than the quantity called for in the award list, I deducted the value, I am bound to pay for the goods which are in excess of the amount dealt with in the award, and requesting me to pay the above sum in accordance, you allege, with an understanding between myself and your attorney when they agreed to the retaking of stock.

In reply, I beg to state that I do not concur in the views you express. The value of the stores for which you now seek to obtain extra payment was included in the lump sum which was put down for stores in the original valuation. For that sum, under the award, I was to have all the stores which were then in stock. Whether the valuers had made a detailed inventory I did not know, and I certainly never questioned the accuracy of the amount entered under this head. As you are aware, I made no objection to the valuation of the stores, and it was upon totally different grounds that I refused to accept the award of the arbitrators.

The revaluation was necessarily based upon the original valuation, and was never intended to rectify any mistakes or omissions the arbitrators may have fallen into. It had, in fact, no other object than to bridge over the period between the 19th April, when the valuation was made, and the 15th May, when I took over the works by including interim receipts and excluding interim issues. There was no such deduction of value as you assume on account of stores found less in hand on the latter date.

Under the circumstances set forth above, I cannot recognize your claim for extra payment for those stores.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

SPECIAL TRAINS USED BY AND EXPENSES OF MINISTERS.

(RETURN OF, SINCE 1883.)

Ordered by the Legislative Assembly to be printed, 9 June, 1887.

RETURN (*in part*) to an *Order* made by the Honorable the Legislative Assembly of New South Wales, dated 16th March, 1887, That there be laid upon the Table of this House, a Return showing,—

- “ (1.) The total cost of special trains used by Members of the Stuart Government whilst Sir Alexander Stuart held office.
 “ (2.) The like during the time Mr. Dibbs held office.
 “ (3.) The like whilst Sir Patrick Jennings held office.
 “ (4.) The total cost of picnics, luncheons, wines, &c., paid for out of the Public Funds whilst each of the above three Governments held office.
 “ (5.) The like in regard to special trains, luncheons, wines, &c., since Sir Henry Parkes took office, since the resignation of Sir Patrick Jennings.”

(Mr. McElhone.)

-
- (1.) The total cost of special trains used by Members of the Stuart Government whilst Sir Alexander Stuart held office:—£1,205 9s. 1d. ; 5th January, 1883, to 6th October, 1885.
 (2.) The like during the time Mr. Dibbs held office:—£173 11s. ; 7th October, 1885, to 21st December, 1885.
 (3.) The like whilst Sir Patrick Jennings held office:—£703 10s. 8d. ; 1st January, 1886, to 31st January, 1887.
 (4.) The total cost of picnics, luncheons, wines, &c., paid for out of the Public Funds whilst each of the above three Governments held office:—
 (5.) The like in regard to special trains, luncheons, wines, &c., since Sir Henry Parkes took office, since the resignation of Sir Patrick Jennings:—£43 1s. ; 1st February, 1887, to present date.
-

GREAT SOUTHERN AND WESTERN LINES.

RETURN showing the number of Special Trains used by the Ministers of the Stuart Government whilst Sir Alexander Stuart held office, from 5th January, 1883, till the 6th October, 1885:—

Date.	Name.	Stations.	
		From	To
1883.			
10 January ...	The Premier	Campbelltown ...	Sydney.
5 March ...	„	Moss Vale... ..	„
9 May ...	Ministerial	Sydney	Orange and back.
1884.			
25 January ...	Minister for Public Instruction ...	„	Parramatta and back.
28 „ ...	The Premier	„	Campbelltown.
30 „ ...	„	„	„
26 March ...	Ministers and Victorian Ministers ...	„	Emu Plains and back.
15 April ...	Ministerial	„	Windsor and back.
4 July ...	Premier and Ministers	„	Dubbo and back.
6 December ...	The Premier	South Creek ...	Sydney.
1885.			
21 January ...	Ministerial	Sydney	Tarago.
11 February ...	Colonial Treasurer	„	Emu Plains and back.
26 „ ...	Minister for Works	„	Orange and back.
12 March ...	Assistant Colonial Secretary ...	„	Dubbo.
1 May ...	Mr. Cohen and party	Wellington ...	Orange.
3 „ ...	Minister for Works	Sydney	Gerogery.
7 „ ...	„	Albury	Sydney.
17 June... ..	Minister of Justice	Cootamundra ...	„
14 August ...	Mr. Dalley and Admiral Tryon ...	Sydney	Richmond and back.
19 „ ...	Mr. Dalley and party	Wagga Wagga ...	Albury.
20 „ ...	„ „	Albury	Sydney.

RETURN showing the number of Special Trains used by the Ministers of the Dibbs Government whilst the Hon. G. R. Dibbs held office, from 7th October, 1885, till 31st December, 1885.

Date.	Name.	Stations.	
		From	To
1885.			
15 October ...	Minister for Works	Picton	Campbelltown.
15 „ ...	Colonial Secretary	Orange	Dubbo.
24 „ ...	„	Dubbo	Sydney.
25 „ ...	The Premier	Sydney	Emu Plains.
16 „ ...	Colonial Secretary	Dubbo	Nyngan and back.
1 November ...	The Premier	Wagga Wagga ...	Sydney.
7 „ ...	Minister for Works	Albury	Culcairn and back.
13 December ...	Colonial Secretary	Sydney	Camden and back.

RETURN

RETURN showing the number of Special Trains used by Ministers of the Jennings Government whilst Sir Patrick Jennings held office, from the 26th February, 1886, till 20th January, 1887.

Date.	Name.	Stations.	
		From	To
1886.			
15 February ...	Minister for Mines	Sydney	Lithgow.
21 March ...	Colonial Secretary	Parramatta	Emu Plains.
11 April... ..	„	Sydney	„
15 „	Minister for Works	Murrumburrah	Young.
21 „	Colonial Secretary	Sydney	Parramatta and back.
5 July	The Premier	„	Moss Vale and back.
31 „	„	„	Dubbo and back.
18 August ...	Colonial Secretary	„	Emu Plains and back.
8 September ...	Minister for Mines	„	Waterfall and back.
12 „	Colonial Secretary	Penrith	Emu Plains.
19 „	„	„	„
25 „	Minister for Works	Albury	Culcairn and back.
6 October ...	Colonial Secretary	Sydney	Heathcote.
20 November ...	The Premier	„	Dubbo.
21 „	Colonial Secretary	Bungendore	Goulburn and Sydney.
28 „	„	Penrith	Emu Plains.
11 December ...	Attorney-General	Cootamundra	Gundagai.
11 „	„	Gundagai	Sydney.
1887.			
14 January ...	The Premier	Moss Vale... ..	„

RETURN showing the number of Special Trains used by the Ministers of Sir Henry Parkes's Government since Sir Patrick Jennings's resignation, from the 21st January, 1887, till 16th March, 1887.

Date.	Name.	Stations.	
		From	To
1887.			
7 February ...	The Premier	Blayney	Orange and back.
7 „	„	„	Bathurst.
16 „	„	Goulburn	Bungendore and back.
17 „	„	Yass	Cootamundra.
17 „	„	Cootamundra	Gundagai and back.

GREAT NORTHERN LINES.

RETURN showing the number of Special Trains used by the Ministers of the Stuart Government whilst Sir Alexander Stuart held office, from 5th January, 1883, till 6th October, 1885.

Date.	Name.	Stations.	
		From	To
1883.			
8 August ...	Ministerial ...	Newcastle ...	Tamworth.
10 " ...	" ...	Tamworth ...	Gunnedah.
11 " ...	" ...	Gunnedah ...	Newcastle.
13 " ...	" ...	Newcastle ...	West Maitland and back.
19 " ...	Mr. G. H. Reid ...	" ...	Tamworth.
20 " ...	" ...	Tamworth ...	Newcastle.
1 September ...	Minister for Mines ...	Murrurundi ...	Quirindi.
1 " ...	" ...	Quirindi ...	Wingen.
22 " ...	Messrs. Wright and Dibbs ...	Newcastle ...	Armidale.
23 " ...	" ...	Armidale ...	Newcastle.
24 " ...	Ministerial ...	Newcastle ...	West Maitland and back.
1884.			
3 May ...	Mr. J. P. Abbott ...	Newcastle ...	Wallsend and back.
16 November ...	Ministerial ...	Uralla ...	West Tamworth.
14 December ...	" ...	Newcastle ...	West Maitland and back.
15 " ...	" ...	" ...	Bullock Island and back.
15 " ...	" ...	" ...	East Maitland.
15 " ...	" ...	East Maitland ...	Morpeth and back.
15 " ...	" ...	" ...	West Maitland.
16 " ...	" ...	Newcastle ...	Narrabri.
17 " ...	" ...	Narrabri ...	Werris Creek.
17 " ...	" ...	Werris Creek ...	Uralla.
18 " ...	" ...	Uralla ...	Glen Innes.
18 " ...	" ...	Glen Innes ...	Newcastle.
1885.			
13 January ...	Hon. J. P. Abbott ...	Armidale ...	Glen Innes and back.
13 " ...	Hons. Dalley and Cohen ...	Newcastle ...	West Maitland.
21 " ...	Hon. Dalley and others ...	" ...	Tamworth.
21 " ...	Hon. J. P. Abbott ...	Glen Innes ...	West Tamworth.
22 " ...	" ...	West Tamworth ...	Wingen.
22 " ...	" ...	Wingen ...	Murrurundi.
24 " ...	Hon. Dalley and others ...	Tamworth ...	Newcastle.

MR. DIBBS'S GOVERNMENT, 7TH OCTOBER, 1885, TO 21ST DECEMBER, 1885.

Nil.

SIR PATRICK JENNINGS'S GOVERNMENT, JANUARY, 1886, TO 31ST JANUARY, 1887.

1886.			
17 March ...	Minister for Works ...	Newcastle ...	Tamworth.
18 " ...	" ...	Tamworth ...	Newcastle.
27 " ...	Ministerial ...	Werris Creek ...	Narrabri.
28 " ...	" ...	Narrabri ...	Murrurundi.
15 May ...	Hon. J. Fletcher ...	Newcastle ...	Co-operative Pit and back.
15 August ...	Hon. W. J. Lyne ...	Narrabri ...	Newcastle.
15 " ...	Ministerial ...	Murrurundi ...	Narrabri.
5 June ...	Hon. J. Fletcher ...	Newcastle ...	Co-operative Pit and back.
31 July ...	" ...	" ...	New Lambton and back.
11 September ...	" ...	" ...	Co-operative Pit and back.
1 December ...	Hon. W. J. Lyne ...	" ...	Glen Innes.
4 " ...	" ...	Glen Innes ...	Narrabri.
4 " ...	" ...	Narrabri ...	Newcastle.
14 " ...	Messrs. Fletcher and Dibbs ...	Newcastle ...	New Lambton.

SIR HENRY PARKES'S GOVERNMENT, 1ST FEBRUARY, 1887.

Nil.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RAILWAYS.

(FREE PASSES ISSUED TO LADIES.)

Ordered by the Legislative Assembly to be printed, 8 June, 1887.

[*Laid upon the Table of the House, in accordance with promise made by the Honorable the Secretary for Public Works, in answer to Question No. 6 in Votes and Proceedings, No. 31, of the 11th May, 1887.*]

(1.) *Question—*

The names of the ladies possessed of free railway passes ?

Answer—

The only lady at present possessed of a free pass is Miss Cowper, to whom was transferred the life pass held by her late father, Sir Chas. Cowper, for distinguished services rendered to the Colony.

(2.) *Question—*

The names of the ladies who have travelled free on charitable missions ?

Answer—

From 1st January, 1879, to present time, the following ladies have received passes :—Miss St. Clair, Miss Fitzpatrick, Miss Long, Mrs. C. Fraser, Signora Steffani, Miss Newcombe, Miss Hill, Miss Stafford, Mrs. M'Donald, and Miss Kennedy.

(3.) *Question—*

What were the charitable missions ?

Answer—

The following are the purposes for which the passes were issued :—Charity concert in connection with church at Campbelltown ; charity concert in connection with St. Patrick's Church, Burrowa ; charity concerts at Lithgow ; Orphanage at Goulburn ; charity concerts, Orange ; building fund of church at Picton ; Juvenile Industrial Exhibition at Lithgow.

(4.) *Question—*

What constitutes an "artist" entitled to travel free on our railways ?

Answer—

A person professing and practising one of the liberal arts, who is giving his or her services gratuitously on behalf of some charitable object.

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

PARLIAMENTARY TRAINS AND TRAMS.
(COST OF, DURING SESSION 1885-6.)

Ordered by the Legislative Assembly to be printed, 23 March, 1887.

[*Laid upon the Table of the House in accordance with promise made by the Honorable the Secretary for Public Works, in answer to Mr. Hurley's question, No. 13, on Votes and Proceedings of 17th March, 1887.*]

PARLIAMENTARY TRAINS AND TRAMS.

RETURN showing—

- (1.) The cost of supplying and running Parliamentary Trams last Session.
- (2.) The cost of running Parliamentary Trains last Session.

ANSWERS—

- (1.) £830 9s. 3d.
- (2.) £349 14s. 8d.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

GOVERNMENT RAILWAYS AND TRAMWAYS BILL.

(MESSAGE No. 9.)

Ordered by the Legislative Assembly to be printed, 5 April, 1887.

CARRINGTON,
Governor.

Message No. 9.

In accordance with the provisions contained in the 54th section of the Constitution Act, the Governor recommends for the consideration of the Legislative Assembly the expediency of making provision to meet the requisite expenses in connection with a Bill to make better provision for the management of the Government Railways and Tramways of New South Wales.

Government House,
Sydney, 4th April, 1887.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

TRAMWAYS.

(CASES AGAINST COMMISSIONER FOR RAILWAYS FOR ACCIDENTAL INJURIES.)

Ordered by the Legislative Assembly to be printed, 18 March, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 4th June, 1886, That there be laid upon the Table of this House a Return showing,—

- “(1.) The number of cases brought, or threatened, against the Commissioner for Railways, for injuries sustained by persons from the Tram Motors or Cars.
- “(2.) The number of cases tried.
- “(3.) The number of verdicts lost by the Commissioner.
- “(4.) The number of verdicts obtained.
- “(5.) The amount of moneys paid for verdicts, and for costs respectively.
- “(6.) The number of cases settled.
- “(7.) The moneys paid on such settlements.
- “(8.) The number of cases in which a settlement was offered by plaintiffs, and the amounts which were asked on such settlements.
- “(9.) The amounts paid in excess of sums offered in settlement in cases which were continued after such offers of settlement.”

(*Mr. Thompson.*)

SUMMARY.

Questions.

1.	2.	3.	4.	5.			6.	7.	8.	9.								
				Verdict.	Costs.						No.	Amounts.						
				£	s.	d.	£	s.	d.	£	s.	d.						
130	35	24	11	13,236	19	8	3,653	18	9	38	1,983	1	0	5	See Davison's case, page 5. See Sharp's case, page 5. See Deacon's case, page 6. See Toohey's case, page 7. See Bench's case, page 8.	1,079	5	10
130	35	24	11	13,236	19	8	3,653	18	9	38	1,983	1	0	5	.....	1,079	5	10

RETURN to an Order of the Legislative Assembly, dated 4th June, 1886, relative to Claims and Actions against the Commissioner for Railways for Injuries sustained by persons from Tram Motors or Cars.

(1) The number of cases brought or threatened against the Commissioner for Railways for injuries sustained by persons from the tram motors or cars	(2) The number of cases tried	(3) The number of verdicts lost by the Commissioner	(4) The number of verdicts obtained	(5) The amount of moneys paid for verdicts and for costs respectively		(6) The number of cases settled	(7) The moneys paid on such settlements	(8) The number of cases in which a settlement was offered by plaintiffs, and the amounts which were asked on such settlements		(9) The amounts paid in excess of sums offered in settlement in cases which were continued after such offers of settlement	Remarks
				Verdict.	Costs			No	Amount		
Curtis, Thos Riordan, Jas Newlove, Jane Lonegan, D Maloney, Jas	Maloney, Jas	Maloney, Jas.		£ s d. 251 7 6	£ s d. 155 10 5	Curtis, Thos	£ s d. 10 0 0		£ s d.	£ s d.	Department declined liability Claim not entertained Department declined to admit liability. This was a claim for compensation for injuries sustained in a collision in Park street on 26/12/80. The claimant sought to recover £,000 damages. The action was tried on 8/8/81 when the jury returned a verdict for plaintiff for £250, which, with interest thereon amounted to £251 7s 6d. Claim not entertained.
Bennett, Edwin Moore and wife						Moore and wife	520 4 0				This was a claim in respect of injuries sustained in a collision between a motor and tram, in Mevic Park on 12/4/81. The correspondence and reports on the subject were transmitted to the Crown Solicitor, upon whose advice and in view of the medical testimony, it was decided to settle the claim without recourse to litigation.
Jones, Arthur	Jones, A	Jones, A		50 0 0	26 15 8			Nil			Mr Jones claimed £100 as compensation for injuries sustained in a collision on the Randwick line on 2/10/81. Subsequently (after the Department had declined to admit liability) a writ was issued and claim augmented to £200. The action was tried on 27/12/81, when a verdict for £50, by consent, was entered. Claim not entertained.
Culliton, Mary Gribbay, D Scholes, Isaac	Gribbay, D		Gribbay, D								This action was tried on 22/2/82, and a verdict for the Commissioner was entered. Claim not entertained.
O'Brien, Francis	O'Brien, F	O'Brien, F		250 0 0	124 1 3						O'Brien claimed compensation for injuries alleged to have been sustained by him in a collision between a tram motor and a horse and cart, of which he was driver. Department declined to admit liability. Subsequently a writ was received claiming £5,000 damages. The action was tried on 13/3/82 and the jury returned a verdict for plaintiff with £250 damages. Claim not entertained.
Hoare, Fl Tierney, Mcl. Spring, Wm. Finlay, Robt Palmer, Jas Watson, R. A			...			Tierney, M Spring, Wm Finlay, R	11 1 0 11 1 0 20 0 0				Claim not entertained.
Bates, Mrs Kidney, A	Kidney, A	Kidney, A.		250 0 0	118 12 3	Watson, R. A	20 0 0				Department declined to entertain claim. Mr Arthur Kidney claimed £1,000 as compensation for injuries alleged to have been sustained by him in a collision which occurred near Randwick. The Department was making inquiries into the claim when a writ was received and claim increased to £2,000. The action came on for trial on 1/4/82, when the counsel for defendant consented to a verdict for £250.
Purser, Jas Meyers, M. E Moore, S Brd, Richd.						Purser, Jas Moore, S Brd, R.	175 0 0 20 0 0 15 0 0				Claim declined.
Bowden, R.	Bowden, R.	Bowden, R.		550 0 0	127 14 7						Mr Robert Bowden claimed £1,000 as compensation for injuries alleged to have been received by him in a collision which occurred near Randwick. The matter was referred to the Crown Solicitor for advice, but before a reply could be communicated to Mr Brown what action the Department intended to adopt in the case a writ was received and claim augmented to £2,000. The action was tried on 1/6/82, when the Jury returned a verdict for plaintiff, with damages, £550.

Cooper and wife	Cooper and wife	Cooper and wife	550 0 0	212 17 6					
Daly, John					Daly, John	125 0 0			
Jones, Thos.					Roden, F.	5 0 0			
Roden, Florence									
Gilder, —	Gilder, —	Gilder							
Hennessy Edward					Williams, H. W.	21 5 0			
Williams, H. W.					Mulqueeney, E.	15 0 0			
Mulqueeney, Ellen					Hoins, C.	20 0 0			
Hoins, Castilina					Ferguson Miss.	150 0 0			
Ferguson, Miss					Compton, Mrs.	75 0 0			
Compton, Mrs. F.					Leeder, J. P.	34 9 0			
Leeder, J. P.					Holmes, G. H.	25 0 0			
Holmes, G. H.									
Landy, Mr.	Landy, Mr.	Landy, Mr.	*150 18 0	210 6 3					
Harris, W. C.									
M'Carthy, J.									
Fowler, F. W.					Fowler, F. M.	150 0 0			
M'Donnell, P.									
Kidman, J.									
M'Grath, Jas.	M'Grath, J.	M'Grath, J.	31 10 0	76 9 0					
Mitchell, D.									
Dwight, Wm.	Dwight, W.	Dwight, W.	1,500 0 0	138 19 3					
Michael, Geo.									
M'Intyre, Margaret									
Blakey, John	Blakey, J.	Blakey, J.							
Carried forward 50	12	9	3	3,583 15 6	1,191 6 2	19	1,423 0 0		

Mrs. Cooper claimed £2,000 as compensation for injuries alleged to have been sustained in a collision between a Camden tram, in which she was a passenger, and some ballast waggons which were stationary in a siding near Campbelltown. The case went to trial and resulted in a verdict for plaintiff, damages, £550.

Claim not entertained.

This was a claim for £2,000 for compensation for injuries alleged to have been sustained through having been precipitated from a tram-car when rounding the curve at the intersection of Elizabeth and Liverpool streets. The action was tried and resulted in a verdict being returned for defendant.

Claim not entertained.

This was a claim in respect of injuries alleged to have been sustained by being knocked down by a Botany tram opposite Redfern Railway Station, just after he had alighted from a tram proceeding in an opposite direction. The Department declined to admit liability on the ground that the accident was entirely attributable to Landy's own want of vigilance and care. Subsequently a writ for £1,000 damages was received. The trial was concluded on 9/3/83, when the jury brought in a verdict for plaintiff; damages, £150 and interest.

Claim not entertained.
do.

Claim not entertained.

Claim not entertained.

Mr. M'Grath claimed compensation for injuries alleged to have been sustained by being run into by a Glebe Point tram, on the Glebe Point Road, on 15/4/83. In view of the departmental reports, which were to the effect that the accident was the result of claimant's own want of care, Commissioner declined to entertain claim. Subsequently a summons was received claiming £100 damages. The action was tried on the 26/6/83, when a verdict in favour of plaintiff, with damages, £31 10s. In delivering judgment His Honor stated that there was no evidence of negligence on the part of the defendant, but in view of the decision of the Supreme Court in the case of *Toohy v. Commissioner for Railways*—for particulars of which *vide* page No. 7—he gave a verdict for plaintiff.

Claim not entertained.

This was a claim in respect of injuries sustained through being run over by a tram in Devonshire-street, opposite Railway steps, on 23/12/82, caused, the claimant alleged, by the negligence of the tramway officials. Commissioner declined to admit liability, and a writ was received claiming £1,000 damages. Subsequently, however, the claim was increased to £3,000. The action was tried when the jury returned a verdict for plaintiff, damages £1,500. A *rule nisi* for a new trial was moved for and refused.

Claim not entertained.

Department declined to admit liability.

This was a claim for £30 as compensation for injuries and loss alleged to have been sustained at Waverley by being run into by a tram while riding a horse. Commissioner declined to admit liability; a writ was then issued to recover the amount named. The case was tried on 7/8/83, when a verdict for defendant was returned.

* Inclusive of interest.

(1.) The number of cases brought or threatened against the Commissioner for Railways for injuries sustained by persons from the tram motors or cars.	(2.) The number of cases tried.	(3.) The number of verdicts lost by the Commissioner.	(4.) The number of verdicts obtained.	(5.) The amount of moneys paid for verdicts and for costs respectively.		(6.) The number of cases settled.	(7.) The moneys paid on such settlements.	(8.) The number of cases in which a settlement was offered by plaintiffs, and the amounts which were asked on such settlements.		(9.) The amounts paid in excess of sums offered in settlement in cases which were continued after such offers of settlement.	Remarks.
				Verdict.	Costs.			No.	Amount.		
				£ s. d.	£ s. d.		£ s. d.		£ s. d.	£ s. d.	
Brought forward 50 Gardner, A.	12 Gardner, A.	9 Gardner, A.	3	3,583 15 6 1,000 0 0	1,191 6 2 189 7 5	19	1,423 0 0 .....	.....	.....	.....	On the 26th May, 1882, Mr. Gardner applied for £2,000 as compensation for injuries alleged to have been sustained by being thrown off the platform of a Camden tram car, near Kenny's Hill. A writ was issued and claim laid at £1,000. The action was tried on 15/6/83, when the jury by a majority gave a verdict for plaintiff, damages £1,000.
Roberts, Jane	Roberts, J.	.....	Roberts, Jane.	.....	.....	.....	.....	.....	.....	.....	This was a claim for compensation in respect of injuries alleged to have been sustained by being precipitated to the ground while in the act of alighting from a tram-car at the Liverpool-street stopping-place. Mrs. Roberts attributed the accident to the default of the conductor, whom she alleged sounded the whistle for the tram to start before she was allowed sufficient time to properly alight therefrom. Department declined liability on the ground that claimant attempted to leave the tram while in motion, and that consequently no claim could be entertained. On 16/7/83 a writ was received claiming £200 damages. The action was tried on 1/9/83, when a verdict for defendant was entered.
Henn, Wm. ....	.....	.....	.....	.....	.....	Henn, Wm.	30 0 0	.....	.....	.....	Claim not entertained.
Ellis, Solomon .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	do.
Keen, John .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	do.
Steel, Wm.	Steel, W.	Steel, W.	.....	251 1 10	139 11 8	.....	.....	.....	.....	.....	On the 7th May, 1883, Steel applied for compensation for injuries alleged to have been sustained through the negligence of the tramway officials on the Newtown Road. Under the reports furnished the claim could not be entertained. A writ was then issued claiming £1,000 damages. The case was tried on 20/11/83, when the jury returned a verdict for plaintiff with damages £250.
Maxwell and wife...	Maxwell & wife.	Maxwell & wife.	.....	750 0 0	156 1 6	.....	.....	.....	.....	.....	Mr. and Mrs. Maxwell claimed £1,000 as compensation for injuries alleged to have been sustained through an accident which occurred on the Camden tram line on 13/3/82. In view of the medical testimony and departmental reports, the Commissioner offered to Mrs. Maxwell (whom it appeared received slight injuries only) a free pass to some country station, where she could recruit her health, and £3 3s. per week for a month with which to defray her hotel expenses. This offer, which was made without prejudice, was declined, and on 30/8/83 a writ was received claiming £2,000 damages. The action was tried on 23/11/83, when the jury returned a verdict in favour of plaintiff, damages £750.
St. Clair, N. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Claim not entertained.
Clarke, Geo. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	do.
Hoolahan, Mrs. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Department declined to admit liability.
Parkinson, E. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Claim not entertained.
Collins, Thos. ....	.....	.....	.....	.....	.....	Collins, Thos.	25 0 0	.....	.....	.....	Department disclaimed liability.
Lee, G. T. W. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	do.
Lee, J. A. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	do.
Holland, J. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Claim not entertained.
Hayes, E. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	do.
Tierney, Joseph J. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	do.
Falconer, Mrs. W.	Falconer, Mrs.	Falconer, Mrs.	.....	3,500 0 0	163 16 5	.....	.....	.....	.....	.....	On the 17/4/83, Mrs. Falconer applied for compensation for the death of her husband, who was killed on 6/4/83 by being run over by a Botany tram, near the junction of George and Pitt Streets. Mrs. Falconer was informed that the Department declined to admit liability, but that a sum of £100 would be placed on the Estimates for her as a gratuity. This offer was refused. Subsequently a writ was received claiming £5,000 damages. The action was tried on 22/11/83, when the jury brought in a verdict for plaintiff with damages £3,500. Subsequently a <i>rule nisi</i> for a new trial was moved for (13/2/84), on the ground that the damages were excessive, and that the verdict was against evidence. The rule was, however, refused.

Horgan, P. J.....										
Bourke, Annie.....										
Hawke, T. M.....						Hawke, T.M.	50 0 0			
Adams, John.....										
Davison, S. G.....	Davison, S. G.	Davison, S. G.		200 0 0	156 11 0			Davison, S. G.	200 0 0	
Lippman, C. H.....										
Hartnet, L. M.....						Hartnet, L. M.	4 0 0			
Schofield, Jno.....						Schofield, Jno.	3 0 0			
Hill, A.....	Hill, A.....	Hill, A.....		*457 0 0	283 18 3					
Rigby, Thos.....	Rigby, T.		Rigby, T.							
Dillon, Mrs. A.....						Dillon, Mrs. A.	5 0 0			
Sharpe, Robt.....	Sharpe, R.		Sharpe, R.	50 0	32 10 0			Sharpe, R.	200 0 0	
Joseph, Israel.....	Joseph, I.	Joseph, I.		122 0 0	36 14 6					
Hughes, Jno.....						Hughes, Jno.	26 5 0			
Russell, Jas.....	Russell, J.		Russell, J.							
Johnson, Joseph.....						Johnson, J...	65 0 0			
Carried forward 84	23	16	7	9,913 17 4	2,349 16 11	27	1,631 5 0	2		

Claim not entertained.
do.

do.
Mr. Davison claimed £300 as compensation for injuries alleged to have been sustained in a collision between a Newtown tram and a 'bus, on which he was a passenger, near the intersection of George-street West and Harris-street. The Commissioner offered without prejudice to defray claimant's medical expenses incurred in connection with the accident. The offer was refused, but Mr. Davison intimated his willingness to accept £200, which proposal, however, was not entertained. Subsequently, 1/9/83, a writ was received claiming £1,000 damages. The action was tried on 29/5/84, when the jury returned a verdict for plaintiff for £200.

Claim lapsed.

Mr. Hill claimed compensation for injuries alleged to have been sustained in a collision between a tram and a 'bus, in Oxford-street, on 11/2/84. Subsequently a writ was received claiming £2,000 damages. The action was tried, and the jury brought in a verdict for plaintiff, damages £900. A new trial was moved for, on the ground that the amount of verdict was excessive. The full Court directed that, unless the plaintiff consented to the reduction of the damages, which they considered excessive, from £900 to £450, a *rule nisi* for a new trial would be granted. The plaintiff consented to the reduction.

Mr. Rigby claimed compensation for injuries alleged to have been received in a collision between a tram and a milk-cart of which he was driver, on the Glebe Point Road. The Commissioner declined to admit liability, on the ground that the accident was the result of Rigby's own want of care. Subsequently a writ was received, and the damages laid at £2,000. The action was tried on 3/10/83, when the jury brought in a verdict for defendant. Plaintiff then applied for a new trial, in which he was also unsuccessful.

Mr. and Mrs. Sharp claimed £300 as compensation for injuries alleged to have been sustained in a collision near Campbelltown, between a Camden tram and some ballast waggons. The Medical Officer of the Department who examined the claimants was of opinion that the injuries were only of a light and temporary nature. In view of this testimony it was considered that a small sum would amply compensate the claimants for the injuries received. Claimants, however, refused to settle the matter for a small amount, but intimated their willingness to accept £200. This offer was not entertained, but the Commissioner stated he would give without prejudice £50 in full satisfaction. This proposal was also declined, and a writ was received claiming £300 damages. The Commissioner then paid into Court the amount he had previously offered in settlement as sufficient compensation. The action was tried on 20/9/83, when the jury returned a verdict for defendant, *i.e.*, they were of opinion that the sum paid into Court was sufficient to compensate plaintiff for the injuries sustained. This verdict rendered plaintiff liable for costs of both sides, which, claimant stated, if enforced would ruin him. Subsequently the Crown Solicitor received from Mr. Sharp the amount (£265) of taxed costs, but the then Minister for Public Works (Mr. Wright) directed that half this amount should be remitted to Mr. Sharp.

Mr. Joseph claimed £75 as compensation for injuries sustained and expenses incurred in a collision in Liverpool-street. Under reports furnished claim was declined. Subsequently a summons was issued claiming £200 damages. The action was tried on 18/9/84, when the jury brought in a verdict for plaintiff, damages £122.

This was a claim for compensation in respect of injuries alleged to have been sustained in a collision between a tram and a cab of which claimant was driver, on the Enmore Road. The damages were laid at £500. The action was tried on 25/9/84, when the plaintiff was non-suited on the ground that no evidence of negligence on the part of defendant was shown, and that plaintiff was guilty of contributory negligence.

* Inclusive of interest

(1.) The number of cases brought or threatened against the Commissioner for Railways or injuries sustained by persons from the tram motors or cars	(2.) The number of cases tried.	(3.) The number of verdicts lost by the Commissioner.	(4.) The number of verdicts obtained.	(5.) The amount of moneys paid for verdicts and for costs respectively.		(6.) The number of cases settled.	(7.) The moneys paid on such settlements.	(8.) The number of cases in which a settlement was offered by plaintiffs, and the amounts which were asked on such settlements.		(9.) The amounts paid in excess of sums offered in settlement in cases which were continued after such offers of settlement.	Remarks.
				Verdict.	Costs.			No.	Amount.		
Brought forward 84	23	16	7	9,913 17 4	2,349 16 11	27	1,631 5 0	2			
Hurley, P. J.
Jones, A. W.	Jones, A. W.	30 0 0	.....	.....	.....	Claim not entertained.
Walsh, Mr.	do.
Newman, W. H.	do.
Rose, T. M.	Rose, T. M.	105 0 0	.....	.....	.....	Mr. Marshall claimed compensation for injuries alleged to have been sustained in a collision between a tram and a dray of which he was driver, in Oxford-street, on 3/11/82. Department declined to admit liability. Subsequently a writ was issued, and the action came on for trial when the jury awarded plaintiff damages in the amount of £400.
Marshall, Geo.	Marshall, G.	Marshall, G.	.....	400 0 0	184 17 8	.....	.....	.....	.....	.....	.....
O'Hehir, Mary
Peters, S.	Peters, S. ...	25 0 0	.....	.....	.....	Claim abandoned.
Deacon, E. W.	Deacon, E. W.	.....	Deacon, E. W.	.....	.....	.....	.....	Deacon, E. W.	110 10 0	.....	This was a claim for compensation in respect of injuries, &c., sustained in a collision between a tram motor and a cart of which he was driver. The action was tried in the District Court, and the jury by a majority gave a verdict in favour of defendant.
Fahey, M.	Claim not entertained.
Thomson, Mrs.
Menser, Mrs. P.	Menser, Mrs. P.	25 0 0	.....	.....	.....	Claim lapsed.
Robbie, Mr.
Gorton, Geo.	Claim not entertained.
Ross, Henry	Ross, Hy. ...	20 0 0	.....	.....	.....	do.
Healy, Jas.	do.
Dunlop, M. J.	do.
Lawrence, Peter	Lawrence, Peter.	24 4 0	.....	.....	.....	.....
Bourke and another	Bourke & another.	Bourke & another.	.....	125 0 0	113 16 5	.....	.....	.....	.....	.....	This was a claim for compensation in respect of injuries alleged to have been sustained by a woman named Catherine Bourke, while attempting to alight from a tramcar near Boundary-street, Waterloo. To avoid litigation, the Commissioner offered, without prejudice, £20 in full satisfaction of all claims. This offer was not entertained, and a writ was received claiming £5,000 damages. The action was tried, and the jury brought in a verdict for plaintiff, damages £125.
Wilson, Richard ..	Wilson R.	.....	Wilson R.	.....	.....	.....	.....	.....	.....	.....	This was an application for compensation in respect of injuries alleged to have been sustained in a collision between a motor and a cart of which claimant was driver, in Pitt-street, on 24/12/84. Department declined to entertain claim. Subsequently a writ was issued claiming £200 damages. The action was tried on 1/5/85, when a verdict for the defendant was entered on the ground of contributory negligence on the part of plaintiff.
Alsop, C. F.
Wilce, W.	Wilce, W. ...	15 0 0	.....	.....	.....	Declined to admit liability.
Oliphant, R. C.	Oliphant, R. C.	42 12 0	.....	.....	.....	.....
Blair, Chas.	Claim not entertained.
Hough, Edwin	do.

Ryan, John, and wife.	Ryan and wife.	Ryan and wife.	.....	500 0 0	146 0 11	.....	.....	.....	.....	.....	Messrs. Slattery & Heydon claimed, on behalf of John Ryan, compensation for injuries alleged to have been received by his wife on 23/11/84 in consequence of the tram in which she was travelling having been started before she was allowed sufficient time to alight. The claim remained in abeyance until the 31/3/85, when it was revived by the receipt of a writ claiming £2,500 damages. The case was tried on 11/9/85, when the jury returned a verdict for plaintiff, damages £500.
Conyngham, Eliza, for Septimus Conyngham ...	.....	.....	.....	.....	.....	Conyngham and another	15 0 0	.....	.....	.....	Claim not entertained.
Shaw, Geo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	do.
Simpson, Hy.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	do.
Pinney, Mrs. C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	do.
Phillips, A.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	do.
Fleming, Robert	Fleming R.	Fleming R.	.....	*501 18 0	190 10 2	.....	.....	.....	.....	.....	Mr. Fleming claimed £1,600 as compensation for injuries alleged to have been sustained in a collision in Oxford-street, between a disabled motor destined to the repairing shed at Randwick and a tram in which he was a passenger. The Commissioner offered, without prejudice, £50 in full satisfaction. This offer was declined. Subsequently a writ was received claiming £2,000 damages. The action was tried on the 9/12/85, when the jury returned a verdict for plaintiff, damages £500. A new trial was applied for on the ground that the damages were excessive, but was refused.
Mills, Henry	Mills, H.	.....	Mills Hy	.....	.....	.....	.....	.....	.....	.....	This was an application for compensation in respect of injuries alleged to have been sustained in a collision between a Marrickville tram and a cart of which applicant was the driver. Commissioner declined to entertain the claim. Subsequently a writ was received claiming £500 damages. The action was tried on 19/4/86, when the jury returned a verdict for defendant.
Hill, Eugenc Annie	.....	.....	.....	.....	.....	Hill, Mrs.	40 0 0	.....	.....	.....	Claim not entertained.
M'Hugh, Terence	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stafford, Joseph	.....	.....	.....	.....	.....	Stafford, J.	10 0 0	.....	.....	.....	.....
Brown, Hy.	Brown, H.	.....	Brown H	.....	.....	.....	.....	.....	.....	.....	This was an application for compensation for injuries alleged to have been received through being knocked down by a motor at the corner of Elizabeth and Oxford Streets, Paddington. The claimant attributed the accident to the negligence of the driver of the motor. The Department repudiated liability. Subsequently a writ was issued claiming compensation for the injuries sustained in the manner indicated. The case was tried on 16th April, 1885, when a verdict for the defendant was returned. Plaintiff then moved for a new trial, which was granted on 27/4/85. The second trial is still pending.
Toohey, Michael	Toohey, M.	Toohey, M.	.....	*1,479 5 10	409 8 5	.....	.....	Toohey, M.	400 0 0	1,079 5 10	Mr. Toohey claimed compensation for injuries and loss sustained in a collision between a Waverley tram and a dray of which he was driver, at the intersection of Market and Elizabeth Streets. In view of the departmental reports Commissioner informed Messrs. Slattery & Heydon that he would be prepared without prejudice to accept a reasonable offer of settlement. Messrs. Slattery & Heydon replied that their client would accept £400, which offer the Commissioner declined to entertain. Subsequently, 17/1/82, a writ was received claiming £2,000 damages. The first trial resulted in the jury returning a verdict in favour of the defendant. Mrs. Toohey (her husband having died in the meantime), however, obtained a new trial (in which she obtained £1,350 damages), the two points raised being—1st. Whether the injury sustained by Michael Toohey was the result of negligence on the part of the persons who had the management of the motor, and whether there was negligence on the part of the unfortunate man whereby he contributed to the accident; and, 2, which His Honor called the more important question, whether the running of steam motors upon a rail or tramway in the street in which the accident occurred is not a common nuisance. The Full Court decided that His Honor Mr. Justice Fawcett, who adjudicated in the original trial, was wrong in directing the jury that there was legal power to run steam motors, and on that ground, as well as on the ground that the verdict was against evidence, granted a rule absolute for a new trial. From this decision the Commissioner appealed to the Privy Council with the result that that Tribunal confirmed the judgment of the Full Court as to the question of negligence, but ruled that the use of steam motors in the streets was legal.
Carried forward 122	32	21	11	12,920 1 2	3,394 10 6	38	1,983 1 0	4	1,079 5 10

* Inclusive of interest.

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Sydney, Charles Potter, Government Printer—1887.

(1) The number of cases brought or threatened against the Commissioner for Railways for injuries sustained by persons from the tram motors or cars.	(2) The number of cases tried.	(3) The number of verdicts lost by the Commissioner.	(4) The number of verdicts obtained.	(5) The amount of moneys paid for verdicts and for costs respectively.		(6) The number of cases settled.	(7) The moneys paid on such settlements	(8) The number of cases in which a settlement was offered by plaintiffs, and the amounts which were asked on such settlements		(9.) The amounts paid in excess of sums offered in settlement in cases which were continued after such offers of settlement.	Remarks.
				Verdict.	Costs.			No.	Amount		
Brought forw'd 122	32	21	11	£ 12,920 1 2 s. d.	£ 3,394 10 6 s. d.	38	£ 1,983 1 0 s. d.	4	£ s. d.	£ 1,079 5 10 s. d.	
Patterson, T. J. . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	This is a claim for compensation in respect of injuries sustained in a collision in Oxford street. Patterson at the time was an employe of the Department, and was acting fireman of motor No. 22, which was run into by motor No. 61, which was in a disabled condition, and which broke away from motor No. 7 in Oxford-street when being hauled to Randwick, and collided with motor No. 22, whereby Patterson received injuries which incapacitated him from resuming work until 31st March of the succeeding year, although it may be mentioned, Dr MacCulloch certified on 11/11/84 that Patterson was then sufficiently recovered to be able to perform light duties. Patterson received full pay from date of accident (30/8/84) until 31/3/85. He continued in the service until 15/11/85, when he left without giving notice. On the 11/12/85 Messrs. Cope & King, solicitors, wrote, on behalf of Patterson, claiming compensation for the injuries received in the manner related. Department declined liability, and on the 14/1/86, the solicitors named wrote asking for the appointment of a nominal defendant against whom proceedings could be taken to recover damages. Case pending.
Carey, Edwd.	Carey, E..	Carey, E..	.....	100 0 0	*5 5 0	.....	.....	.....	.....	.....	This was an application for compensation in respect of injuries and damage alleged to have been sustained by claimant in a collision between a tram motor and a day of which he was driver, near Randwick workshops, on 17/10/84. The claim was resisted, and on 1/4/86 a summons was received, claiming £100 damages. The action was tried on 5/6/86, when a verdict for plaintiff was returned for the amount claimed. Subsequently a <i>rule nisi</i> for a new trial was moved for and refused.
Fegan, T. R.	Fegan, T. R.	Fegan, T. R.	.....	†201 18 6	234 12 9	.....	.....	.....	.....	.....	Mr. Fegan claimed compensation for injuries alleged to have been sustained in a collision between a tram and a cab of which he was driver, in George street West, on the 9th July, 1885. In view of the reports furnished the claim was not entertained. A writ was issued, claiming damages, the amount of which was not stated. The action resulted in a verdict for plaintiff, with damages £200. Subsequently a <i>rule nisi</i> for a new trial was applied for and refused.
Bench, Richd.	Bench, R.	Bench, R.	.....	15 0 0	19 10 6	.....	.....	Bench..	75 0 0	.....	Mr. Bench claimed compensation for injury and loss alleged to have been sustained by him in a collision between a Newtown tram and a cart of which Bench was driver, in Elizabeth street, on 10/12/85. In view of the departmental reports, the Commissioner decided to offer, without prejudice, £25 in full satisfaction, &c. This offer was declined. Mr. Bench, however, intimated his willingness to accept £75 and legal expenses incurred by him in consequence of the accident. This offer the Commissioner declined to entertain. Subsequently a summons was received claiming £100 damages. The case was tried on 5/6/86, when a verdict for plaintiff, with £15 damages, was returned.
Coles, J. W. . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	On the 20th May last, Mr. Coles claimed compensation for injuries alleged to have been sustained by his son (Percy), though having been thrown off a Leichhardt tram, on 13/5/86, near the junction of Norton-street and Parramatta Road. Matter not yet decided.
Passmore, W. . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Decided not to entertain claim.
Purvis, F. K. . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Claim not entertained.
Wigley, W. J. . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	This was a claim in respect of injuries alleged to have been sustained by claimant through a spark emitted from the motor of a Marrickville tram in which he was a passenger. As the motor in question was fitted with an efficient spark-catcher, which was in perfect order at the time of the occurrence, the claim was not entertained.
Total.....	130	35	24	13,236 19 8	3,653 18 9	38	1,983 1 0	5	.....	1,079 5 10	

* This does not include plaintiff's costs, the taxation of which is not completed. † Inclusive of interest.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

DISMISSAL OF MR. JOHN HIGGISON.

(CLERK IN STORES DEPARTMENT AT RANDWICK TRAM-SHEDS.)

Ordered by the Legislative Assembly to be printed, 27 April, 1887.

Copies of papers relative to the dismissal of Mr. John Higgison, Clerk in Stores Department at Randwick Tram-sheds.

List of Officers employed in the Tramway Branch Store, together with name, age, date of appointment, and duties, also salary.

Name.	Age.	Date of present Appointment.	Salary, &c.	Duties, &c.
			Per annum. £	
R. J. Dobson ...	37	October 9, 1879 ...	235	Storekeeper.
T. J. Gardiner ...	32	June 1, 1883 ...	220	Balancing ledger, making out vouchers, and attending to shipping, &c.
J. Higgison ...	34	October 3, 1884 ..	150	Stock Clerk.
J. Crickard ...	33	August 13, 1885 ..	120	Clerk in charge of issues and posting ledger.
R. J. Dabois ...	20	July 1, 1882 ...	105	Requisition Check Clerk.

Minute of Mr. Secretary Sutherland.

* * * * *

It seems to me that this is a large staff to manage a branch store, the cost being £830 per annum. I should like inquiry made to see if the present officers cannot manage without further assistance, or in fact if less officers could not do the work.

J.S., 5/3/87.

Minute of Commissioner.

* * * * *

Mr. Richardson and Mr. John Vernon will please look into this. Perhaps the largeness of the staff is owing to the unnecessary keeping of details.

CHAS. A.G., 8/3/87.

Report of Board of Inquiry.

WE have inquired into this matter, and find that abandoning an amount of detail in the charging of the issues (which we consider, and the Locomotive Superintendent concurs in considering, quite unnecessary), not only will the filling up of the vacancy caused by Mr. Coleman's retirement be obviated, but it will also be possible to dispense with the services of another clerk.

Moreover, by the discontinuing of issuing stores at night, which we and the Locomotive Superintendent also consider can easily be rendered unnecessary by the placing of a small store under the control of the night foreman of the shops, the services of the night issuer may also be dispensed with.

The information with regard to the issues which it is proposed shall in future be dispensed with, is the charge of stores to each distinct car and motor by number instead of to cars generally and motors generally.

The clerks dispensed with will be—

Mr. Coleman (already retired)	£150
„ Higgison	150
„ J. Cleary, night issuer, at 8/-	146
	<hr/>
	£446

Cleary is a comparatively old hand, and a good workman, and in this scheme of retrenchment his services would not be dispensed with. He would take up day labour, and a man more recently appointed and of less use to the Department would receive notice to leave.

In the case of Mr. Higgison, there are others junior to him, but he has proved a failure as a clerk. He was sent to Bathurst in charge some years ago, and got things there into a deplorable mess, later he was placed in the telephone office, at Redfern, and on being sent to Randwick, it was on the distinct understanding that his services might only be temporarily required. There has been no particular fault to find with him there, but he is simply inefficient, and Mr. Crickard, his junior, who is to be retained and for whom an increase of salary is recommended, is able, according to Mr. Dobson's report (and as one of us, Mr. Richardson, can well imagine) to do as much work as Mr. Higgison and Mr. Coleman united.

Mr. Crickard is at present in receipts of only £120. He is a very valuable and assiduous clerk, and we recommend that he be paid at the rate of £150.

This will still leave the saving to be effected at £400 per annum.

A. RICHARDSON,
Assistant Secretary.

I concur in the above, with the exception that being unacquainted with the employees dealt with, I am unable to judge of their qualifications.

JOHN VERNON,
Assistant Accountant.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

TRAMWAY FROM KOGARAH TO SANS SOUCI.

(CORRESPONDENCE, &c.)

Ordered by the Legislative Assembly to be printed, 5 May, 1887.

RETURN to an *Order* made by the Honorable the Legislative Assembly of New South Wales, dated 16th March, 1887, That there be laid upon the Table of this House,—

“(1.) Copies of all petitions, letters, and other documents from any person to the Minister for Works, in reference to the construction of a Tramway from Kogarah to Sans Souci.

“(2.) Also, copies of all letters, minutes, and other documents which may have passed between the Minister for Works or the Commissioner for Railways to the parties applying to have the Tramway constructed, or to any other person, bearing upon the subject.

“(3.) The names of the parties so applying, and copies of all agreements entered into between the Minister for Works, or any other person in the Department, with reference to the said Tramway.”

(Mr. Fletcher.)

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No. 1.

The Council Clerk, West Botany, to The Secretary for Public Works.

Sir, Council Chambers, West Botany, 24 August, 1881.
I have the honor, by direction of the Mayor, respectfully to ask when it will be convenient for you to receive a deputation to urge upon the Government the advisability of constructing a line of Tramway from the nearest proposed Railway Station (Illawarra Railway), to be erected on the south side of Cook's River Dam, along West Botany-street, Scarborough, Sandringham, and Sans Souci.

An early reply will be esteemed a favor.

I have, &c.,

THOS. LEEDER,

Council Clerk.

Might be considered, I think, when Railway has been constructed.—CH.A.G., 29/8/81.

The Under Secretary for Public Works to The Council Clerk, West Botany.

Sir, Department of Public Works, Railway Branch, 26 August, 1881.
Referring to your letter of the 24th inst., I am directed to inform you that the Secretary for Public Works will receive the deputation on the subject of a Branch Tramway from the proposed Illawarra Railway towards Sandringham, &c., on Friday, the 2nd September next, at 12:30 p.m.

I have, &c.,

GERALD HALLIGAN,

For Under Secretary.

No. 2.

The Council Clerk, West Botany, to The Secretary for Public Works.

Sir, 167, York-street, Sydney, 11 March, 1882.
I am directed by the Mayor respectfully to ask when it would be convenient for you to receive a deputation recently appointed at a public meeting held at Sans Souci, upon the subject of construction of Tramway line from Cook's River to Sans Souci, *via* West Botany-street, Scarborough, North and South, Hastings, Scarborough Park, and Sandringham.

Be pleased when appointing the time to give me three clear days notice in order that the members of the deputation may be advised.

I have, &c.,

THOS. LEEDER,

Council Clerk.

Railways.—J.R., B.C., 16/3/82.
immediate report.—G.C., 20/3/82.

Mr. Cowdery.—G.B., B.C., 17/3/82. Mr. Hyndman, for
Engineer for Existing Lines, with plans and report.—R.A.H.,

No. 3.

Report by Engineer for Existing Lines on proposed route of Tramway.

I EXAMINED yesterday with Mr. Bowmer, Mayor of West Botany, the proposed line of Tramway extension from Cook's River to Sans Souci, following West Botany-street, to its intersection with Bay-street; thence by Bay-street about half-way to the beach; thence parallel to the beach, through private property to Frederick-street; by Frederick-street to the Sandringham Road; and then through private property to Sans Souci.

I understand that all the land-owners are willing to give what land is required for the Tramway free. The openings in Cook's River dam would require strengthening. West

West Botany-street ascends at first by a steep grade which might be improved, and then descends by easy gradients to Muddy Creek, where a bridge will be required, for which I believe £650 is already provided by the Government. This would scarcely be sufficient for Tramway purposes.

The line from here is almost level to Sans Souci and might be considered a surface line, and the country is all very light sandy soil.

Where the roadway in West Botany-street and Bay-street has been partially made only about 16 feet wide, it would be necessary to increase the width. The roads are not less than a chain wide. The distance is about 7 miles.

The greater number of inhabitants reside about West Botany-street. There are at present very few houses about Sandringham and Sans Souci.

I have had no time to make a plan of the subdivisions, but attach a copy of the plan of parish of St. George, borrowed from the Survey Department.

R.A.H., 24/3/82.

Engineer for Existing Lines,—The Illawarra Railway will run parallel with the road to Sandringham as far as Kogarah. The question is whether the Tramway to Lady Robinson's Beach, &c., should not start from the Railway line at Kogarah.—CH.A.G., 27/3/82.

No. 4.

Petition.

PETITION of the inhabitants of Kogarah to the Honorable John Lackey, M.L.A., Minister for Public Works.

THE petition of the inhabitants and landed proprietors of Kogarah humbly and respectfully sheweth:—

That a public meeting was held at the "Gardeners' Arms Hotel," Kogarah, on Thursday, the 9th day of March, 1882 (Mr. Henson, M.L.A., occupied the chair), to take into consideration the route proposed by the Municipal Council of West Botany for the construction of the proposed Tramway from Cook's River to Sans Souci, George's River; also, to take into consideration the desirableness of urging upon the Government the necessity of constructing a line of Tramway from a suitable point at the Illawarra Railway, thence along the public road *via* Kogarah Junction, Scarborough Park, and terminate at Sans Souci, George's River, was carried by a large majority.

Your petitioners are of opinion that a Tramway, constructed through the Municipality of West Botany, and terminating at Sans Souci, George's River, would prove detrimental to the interests of the inhabitants of Kogarah and the district in general.

Your petitioners consider that the interest of the inhabitants of West Botany would be served by the Tramway terminating at Sandringham instead of Sans Souci, George's River; the latter place more properly belongs to the Kogarah district, and the only place that could suitably be adopted for a terminus.

Your petitioners have toiled hard for upwards of twenty years in forming and maintaining the road between Cook's River and George's River for the purpose of improving their district when it was only a wild bush; and your petitioners consider it would be impolitic on the part of the Government to deprive their district of a Tramway and grant a Tramway to West Botany; by so doing it would divert the traffic off the Rocky Point Road, its legitimate route, and thereby cause the inhabitants of Kogarah to consider it an act of injustice towards them.

In conclusion we earnestly submit the foregoing to your earnest consideration; and your petitioners, as in duty bound, will ever pray.

Signed by R. HUGH KELLY and 101 others.

The Hon. the Minister for Public Works,—

Sir,

WE, the undersigned, do hereby agree and declare that we will surrender a portion of our land to the Government without fee or remuneration of any kind whatever, sufficient for a Tramway line to pass through from the Illawarra Railway to Sans Souci, George's River:—

WM. R. KENDALL, Cambridge-street, South Kingston.
JOSEPH WALZ, Rocky Point Road.

Railways, B.C., 19/4/82.—J.R. Mr. Cowdery, B.C., 20/4/82.—G.B. The direction of the Tramway to George's River at Sandringham and Sans Souci will depend upon how far the Railway line to Illawarra can be made use of for a portion of the route.—CH.A.G., 20/4/82.

WE, the undersigned, owners of land through which it is proposed to apply to the Government for the construction of a line of Tramway through West Botany Municipality, touching Scarborough Park, Sandringham, and Sans Souci, hereby signify our willingness to surrender to the Government, without monetary consideration, a sufficient quantity of our respective lands for the construction of such line, and we do hereby bind ourselves to execute all necessary documents under our respective hands and seals when required so to do.

Signed by JOHN ENGLAND and 13 others.

MEMO.:

Department of Public Works, Sydney, 12 November, 1885.

Proposed Tramway, Kogarah to Sans Souci and Sandringham.

MR. F. W. KING, representing the owners of certain lands, called to ask for an appointment for a deputation to place before the Government the desirability of making a Tramway as above, the owners being prepared to contribute towards the cost of the work.

J.R., 12/11/85.

Friday, 20th, at 11. Inform.—J.R., 12/11/85. Done. Railways, for the necessary information to enable the Minister to reply, B.C., 12/11/85.—J.R.

WILL

WILL Mr. Cowdery have an inspection of the route made and rough estimate prepared by this day week, when deputation is to wait upon the Minister.

As land required is promised free, the most direct route should be adopted.

Consideration should also be given to the fact that there is a private tram-line to Lady Robinson's Beach, and to the suggestion that perhaps the cheapest route would be to take the line in that direction to Sandringham and Sans Souci.

A railway line was at one time surveyed close to the beach; the pegs could probably be followed, and that route reported upon. CH.A.G., 13/11/85.

Proposed Tramway from Kogarah to Sandringham and Sans Souci.

MR. COWDERY and myself have inspected the proposed route, and after carefully examining the locality, the route shown roughly in blue on attached tracing is recommended, as being not only the most direct but also the cheapest of construction.

The tram-line would leave the main line at Kogarah station, then, for a distance of about 30 chains, pass along Belgrave and another street and through subdivided land into Rocky Point Road, which it will follow for about 25 chains; thence through private lands, and close to Scarborough Park, into Walter-street (South Scarborough), which it will follow until reaching "Sandringham Hotel"; thence through private lands for a short distance, when it can be taken on the reserve along the foreshore to "Sans Souci Hotel," where the terminus would be, either at the back of the hotel, or the line might be taken a few chains further, to a point about or near the Rocky Point Road, as required.

Except for the first half-mile about, the line would be almost level, and little or no earthworks will be required beyond forming. The grades on the first half-mile would be very easy, and consequently several cars can be drawn easily when required.

The line could be constructed without guard-rails in ordinary ballast for its whole length, except about half-a-mile at the commencement and at crossing-places, and consequently would be very cheap in cost of construction.

The length of this line will be about $3\frac{1}{2}$ miles, and the cost is estimated at £2,500 per mile, or about £8,750 in all.

The line would pass through some allotments of subdivided land in the township of Kogarah, and if these allotments are already sold probably some compensation will be required.

The line can be connected to the main Illawarra Railway, and might be used for goods traffic if required.

MAX THOMSON, 19/11/85.

Commissioner.—G.C., 19/11/85.

No. 5.

Minute by The Secretary for Public Works.

Department of Public Works, Sydney, 20 November, 1885.

Representations made by Deputation *re* Tramway, Kogarah to Sans Souci.

A DEPUTATION, introduced by Mr. Henson, Mr. Judd, and Mr. Stephen, M's.P., also present, waited upon me to-day with reference to a Tramway from Kogarah to Sans Souci, *via* Sandringham.

They stated the line would be an easy one to construct, the country being level throughout, that the distance would only be about 3 miles, and that it would create a large traffic. At the present time, with the present imperfect means of reaching the shore of Botany Bay and the gardens at Sandringham and Sans Souci, a large number of pleasure seekers visited these places, while there was a fair resident population; but if the Tramway were made the holiday traffic upon it would be very large, and the regular travellers would be much greater. In connection with this matter they pointed out that not only would this traffic make the Tramway remunerative but it would give a large additional revenue to the Illawarra line, and so prove a rich feeder to that railway.

As a further inducement to the Government to construct the line, the deputation stated the land required would be given free, and a sum of from £4,000 to £6,000 contributed towards the cost, and the guarantee in this matter is enclosed, to which further names are to be added.

A rough tracing is also enclosed showing the proposed route.

I informed them that I had given attention to the matter, and was in possession of a report speaking most favourably of the line, the report mentioning, that, in addition to the passenger traffic, which promised to be large, there would probably be a considerable quantity of fruit carried from gardens in the vicinity.

The line, as pointed out, would be an easy and economical one to construct, and it would bring directly an increase of traffic to the Illawarra line. I stated I knew something of the locality, and felt certain that no more favourable line as a "feeder" to the Illawarra railway could be proposed, and I promised to submit the matter, with my recommendation, for the consideration of my colleagues.

Their liberal offer to give the land required free, and contribute towards the cost of the line, was quite a new feature in railway proposals, and would greatly assist the object they had in view.

W.J.L., 20/11/85.

A more accurate survey should, I think, be first made, and a book of reference with plan prepared, showing the land and area that will be required.—CH.A.G., 25/11/85. For Minister's approval.—CH.A.G.

Minute of Minister:—Let survey, &c., as suggested, be made. The line should be so taken as to give access to the longest water frontage, if the distance from point to point and the cost is not materially increased.—W.J.L., 8/12/85.

Mr. Cowdery.—D.C.M'L, 9/12/85. Mr. Thomson to have survey made and submit plan with book of reference, &c.—G.C., (*per* G.L.), 10/12/85. Urgent. Mr. Halligan to carry out as soon as possible. See me first as to route.—M.T., 11/12/85. Mr. Baxter is now making survey of the route.—E.M.H., 10/2/86. A surveyor is now engaged on this line.—M.T., 10/2/86. When will the work be completed?—G.C., 11/2/86. Mr. Thomson. Survey plan and section will be completed about end of April.—M.T., 12/2/86.

No. 6.
Petition.

The Hon. the Secretary for Public Works, Sydney,—

The humble Petition of the undersigned property holders and residents of Sans Souci, Sandringham, and George's River,—

SHOWETH:—

1. That the Illawarra railway line is already opened to Kogarah, a distance of $2\frac{1}{2}$ miles from George's River, Sans Souci, and Sandringham.

2. That the districts known as Sans Souci and Sandringham are well known as favourite watering-places, and pleasure resorts for the Sydney public, being beautifully situated on the banks of George's River, and the shores of Botany and Kogarah Bays.

3. That there is already a considerable population in the said districts, and many new buildings, betokening a progress of settlement, are in course of erection.

4. The proper development of these marine suburbs is retarded, for want of good means of communication with the city, and your Petitioners desire that the same may be connected with the railway line at its nearest point, at Kogarah, by a tram line.

5. Your Petitioners believe that such a line could be inexpensively constructed, inasmuch as the route is almost a dead level free from engineering difficulties.

6. Your Petitioners believe that such a tram line would at once be remunerative, and command a large traffic, and would point out that on the 9th November last over 5,000 people visited Sandringham, Sans Souci, and the neighbourhood, despite the difficulties of transit, whilst omnibuses ply daily to and from Kogarah station.

7. The expense of construction of such a line as your Petitioners desire is estimated at about £15,000, and no more.

8. Your Petitioners are willing to give whatever land may be necessary from their holdings, for the purposes of such tram-line and stations, and to contribute the amounts set out opposite to their names as in the guarantees attached to this Petition, towards the cost of the construction of the line.

9. Your Petitioners also desire to point out that every person using the said tram-line will also use the Illawarra railway line, to which it will act as a feeder, so that consequently the revenue of that railway line will be increased.

Your Petitioners therefore pray that you will cause the necessary steps to be taken for the construction of a tram-line from the before mentioned suburbs, to the nearest point on the railway line at Kogarah.

And your Petitioners, as in duty bound, will ever pray.

JOHN B. CARROLL.

T. CLARK.

J. H. CARRUTHERS.

JAS. ARCHBOLD.

H. M'KEON.

W. E. RUST.

GEORGE WELLS.

WILLIAM PRITCHARD.

J. W. DUESBURY.

W. R. KENDALL.

IN consideration of the Government constructing a Tramway from Kogarah, at the Illawarra railway line, to Sans Souci and Sandringham, following the Rocky Point Road as a route from Mr. Carroll's fence to Sans Souci, we agree to give any of our land necessary therefor, and the following contributions, and further * * * * * If the Government, on survey, approve of any deviation in the route, we shall agree to the same, provided such tram starts at or near Kogarah, and terminates at or near Sans Souci and Sandringham:—

	£		£
B. Carroll	200	H. M'Keon	120
Reform L. I. and B. Co. ...	1,500	C. M. Berghofer... ..	20
W. E. Rust	120	J. Clark	25
Jas. Archbold	120	W. R. Kendall	400
M. Hambery	40	J. W. Duesbury	130
W. Moyse	20	George Wells	20
W. Pritchard	30		

No. 7.

Mr. F. M. King to The Chief Clerk, Department of Public Works.

Dear Sir,

Sydney, 3 May, 1886.

Re Tramway from Kogarah to Sans Souci and Sandringham, is this survey sufficiently advanced to ask for a report from the Engineer, as I wish to arrange that a deputation of the inhabitants of that district should interview the Minister for Works on the subject?

If you will kindly so arrange, and let me know as soon as possible, you will oblige

Yours, &c.,

FRANCIS M. KING.

Railways, B.C., 5/5/86.—J.R. Mr. Cowdery.—L.P.I., *per* Secretary, 6/5/86. Full report and sections, with rough plan of routes, herewith; both are practicable, but that along the main road is less costly, provided the line can be made on the side of the road.—G.C., 7/5/86. Commissioner.

If the public will subscribe £6,000, and give what land is required, upon condition that line is taken along the road, I should recommend that course, the line to terminate a little below Sandringham, or to form a loop, joining the line at Rocky Point Road again (see plan).—CH.A.G., 7/5/86.

Railway

Railway Department, Sydney, 3 May, 1886.

Kogarah to Sans Souci and Sandringham Tramway.

Memo. to the Tramway Engineer,—

I BEG to submit herewith plans and section of the proposed Tramway from Kogarah to Sans Souci and Sandringham, together with the Surveyor's report on the proposed lines.

WALTER SHELLSHEAR.

Mr. E. M. Halligan to The District Engineer.

Railway Department, District Engineer's Office, 30 April, 1886.

Sir, I have the honor to submit herewith plan and section of tramway Kogarah to Sans Souci and Sandringham. The surveys have been carried out by Mr. Licensed-Surveyor Baxter of this office.

You will observe that there are two routes shown on plan:

1st. One is along the main road from Kogarah to Sans Souci, and thence along Government reserve to Sandringham.

2nd. The second is midway between main road and Botany Bay, mostly through private land (which will have to be resumed) to Sandringham, and thence along reserve to Sans Souci.

Both routes will serve these two great watering places.

The first route (*via* main road) has been advocated by several deputations who have promised to give sufficient land free of charge to widen the road to 100 feet, as well as £6,000 towards construction of line.

This line, although along main road, could be laid on the 30 feet extra width given to road, and could be of open ballast, thus saving the permanent-way from wear and tear of vehicular traffic. It is shorter than route one, and the gradients are easy.

Route two requires a lot of land to be resumed, and no contributions towards making. The gradients are easy. At present the line could be laid open ballast, but where it passes along streets will have to be metalled. Route two has been permanently surveyed, but route one has only been sectioned. Will you please say if a survey is to be made of this route *via* main road?

I beg to suggest it to your consideration, as I think it the best both in the interests of the public and the Department.

I have, &c.,

EDWIN MOLLOY HALLIGAN.

No. 8.

Minute by The Secretary for Public Works.

Department of Public Works, Sydney, 7 May, 1886.

Tramway—Kogarah to Sans Souci.

A DEPUTATION, consisting of Messrs. Hammond, Henson, Judd (M's.P.), Soul, Carruthers, Carroll, F. King, M'Keon, Curran, Kendall, and Hogben waited upon me to-day with reference to the construction of a Tramway from Kogarah to Sans Souci. They handed in the statement enclosed, showing the amounts that the persons interested were prepared to give, viz., £5,125; in addition almost the whole of the land required would be given free, and the road along which the Tramway would run would be widened. The route they wanted to have adopted was that *via* the Rocky Point Road to Sans Souci, but if the Tramway were taken by the other route proposed (Moore's Swamp and Sandringham) their contributions would not hold good; and it was stated that should the line be taken that way the owners of land along the route would neither give the land required free nor contribute to the cost.

I stated that the offer to give the land free and to contribute to the cost was a new feature in Tramway construction, and this proposal would greatly aid the object they had in view. Personally I was in favour of the scheme, but I wished to make further inquiries as to the alternate routes before I finally decided upon any course of action.

W.J.L.

Let all available information be submitted.—W.J.L.

Mr. Cowdery *re* cost of each route.—CH.A.G., 11/5/86.

SUBSCRIPTIONS promised to the Kogarah and Sans Souci Tram Line:—

				£					£
J. B. Carroll	...	...	...	200	J. M'Pherson	...	...	...	100
Reform L. I. & B. Co.	...	...	...	1,500	H. G. Swyny	...	...	...	900
W. E. Rust	...	...	...	120	J. B. Christian	...	...	...	140
J. G. Archbold	...	...	...	120	J. W. Duesbury	...	...	...	130
Matthias Hamburger	...	...	...	40	Geo. Wells	...	...	...	20
W. Moyse	...	...	...	20	J. M'Call	...	...	...	50
W. Pritchard	...	...	...	30	— Marks	...	...	...	410
H. M'Keon	...	...	...	120	Joseph Gannon	...	...	...	60
C. M. Berghofer	...	...	...	20	Ennis	...	...	...	520
J. Clark	...	...	...	25	E. R. Cole	...	...	...	150
W. R. Kendall	...	...	...	400					
W. T. Longfield	...	...	...	10					
F. Gannon	...	...	...	40					
									£5,125

No. 9.

M. J. Hammond, Esq., M.P., to The Secretary for Public Works.

Sir,

Assembly, 8 June, 1886.

Herewith enclosed please find a letter from the Sans Souci Tramway League, containing the names of a number of persons who are ready to contribute towards the construction of the same.

I have, &c.,

M. J. HAMMOND.

[Enclosure.]

[Enclosure.]

The Hon. Secretary, Sans Souci Tramway League, to M. J. Hammond, Esq., M.P.

Dear Sir,

Tramway Reform Land and Co.'s Offices, Pitt-street, Sydney, 4 June, 1886.

A large number of your constituents, residing at or owning property at Sans Souci, have formed themselves into a League for the purpose of obtaining the Tramway from Kogarah Railway Station, or from the line thereabouts, to Sans Souci. The League now wish you to take charge of the matter as senior Member for Canterbury, inviting your colleagues to assist in the matter.

The facts regarding the Tramway are as follows:—

The line is to branch off at Kogarah, through Gray-street to the Rocky Point Road; thence along that road about 5 chains to a point where two surveys have been made, one along Moore's swamp and another along the Rocky Point Road to Sans Souci. The total distance is about 3 miles, and estimated cost about £13,000.

The landholders and residents are quite opposed to the swamp route, and will not subscribe or give land towards it; but if the road route is adopted they will subscribe £5,125, and possibly £6,000, towards construction, together with all land necessary, save in case of small allotment-holders. Further, we agree to widen the road to 99 feet width for over 2 miles. The grade is easy, and two surveys are complete, with pegs down.

There are at Sans Souci two large hotels and a third in erection, some very large residences (Mr. Rust's, Mr. Cole's, Mr. Pritchard's, Mr. Ennis'), and a number of small ones, besides a public school.

The district is a favourite one, having large water frontage to George's River, Kogarah Bay, and Botany Bay.

Two deputations have been very favourably received by the Minister on the subject, and with energetic action it is now possible to have the vote on the Estimates.

The work will cost the country only £7,000 to £8,000, and will be worth to it £13,000; that is to say, the country will benefit by the expenditure of £13,000 at a cost of £8,000.

We also desire a wharf to be erected at the end of the Rocky Point Road, where the Government have land for that purpose, and Mr. H. M'Keon agrees to lease the same for ten years at 10 per cent. on the outlay.

If you can arrange for the Minister to inspect we shall be happy to meet and entertain him for a day.

It will be necessary to watch the progress of "Ennis' Estate Bill," now before the House, with a view of inserting a clause to compel the trustees to join with the other landholders in subscribing at the rate of £10 per acre, and in widening the road. These people have 50 acres, in front of which the tram runs, but they say that being a trust estate they cannot contribute. They are applying to Parliament for power to sell, and the Bill should be amended so as to give them power or compel them to join in with other landowners in contributing.

I enclose a list of subscribers, &c., and if the Minister instructs the Crown Solicitor to prepare a more binding document, I shall be happy to get it executed.

I have, &c.,

FRANCIS M. KING,

Hon. Secretary, Sans Souci Tramway League.

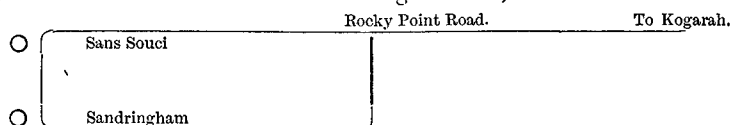
[Sub-enclosure.]

SUBSCRIPTIONS promised to the Kogarah to Sans Souci Tramway:—

		£			£
J. B. Carroll	200		J. Macpherson	100	
Reform Land Investment and Building Company ...	1,500		H. G. Swyny	900	
W. Rust	120		J. B. Christian	140	
J. G. Archbold	120		J. W. Duesbury	130	
Matthias Hamburger	40		Geo. Wells	20	
W. Moyse	20		L. J. Marks	410	
W. Pritchard	30		Jos. Gannon	60	
H. M'Keon	120				
C. W. Berghofer	20				£4,455
J. Clark	25				
W. R. Kendall	400		J. R. Ennis' Estate should give for their 51 acres		
W. Longfield	10		(and the land required)	510	
F. Gannon	40				
J. M'Call	50				£4,965

Kindly submit previous papers.—W.J.L., 8/6/86.

Has the cost of each route been prepared? Value of land by the beach route must be estimated. Please also submit estimate showing extra cost of line after passing along the Rocky Point Road *via* Sans Souci to Sandringham, instead of terminating at Sandringham carried along the road until it reaches the Rocky Point Road again—a kind of circle at the Sandringham end, thus:—



B.C., 19/6/86.—C.U.A.G. Mr. Cowdery. Mr. Thomson for estimates, and full reply to Commissioner's minute.—G.C., 21/6/86. Please furnish estimate in detail as per Commissioner's minute, also value of land required for the beach route.—M.T., 22/6/86. D.E., Sydney.

No. 10.

M. J. Hammond, Esq., M.P., to The Secretary for Public Works.

Sir,

Legislative Assembly, 4 August, 1886.

In respect of the proposed Tramway from Kogarah to Sans Souci, I should feel obliged if you would inform me whether anything has yet been decided in reference to that matter. The favor of an early reply will be thankfully received.

I have, &c.,

M. J. HAMMOND.

Please inform Mr. Hammond how matters stand, and submit papers to me.—W.J.L., 5/8/86. Mr. Cowdery.—L.P. (*pro* Secretary). Mr. Shellhear for report as to what has been done.—G.C., (*per* G.L.) 6/8/86. Very urgent. Mr. Halligan.—W.S. (*per* H.J.M.), 9/8/86.

Trial surveys have been completed and estimate is being made, but owing to pressure of work these last three weeks I have been unable to finish estimate. I hope to submit detail estimate before the 20th of this month.—E.M.H., 9/8/86. D.E.

Report herewith.—W.S., 9/8/86. The Tramway Engineer. Trial survey has been completed; two detail estimates will be ready in about a fortnight.—G.C. (*per* G.L.), 10/8/86. Commissioner. Inform Mr. Hammond and resubmit papers.—D.C.M'L., 11/8/86.

The

The Commissioner for Railways to M. J. Hammond, Esq., M.P.

Sir,

Department of Railways, 13 August, 1886.

With reference to your letter of the 4th instant, asking whether anything has yet been done in the matter of the proposed Tramway from Kogarah to Sans Souci, I have the honor, by direction of Mr. Secretary Lyne, to inform you that trial surveys have been completed and a detailed estimate will be furnished in the course of a few weeks.

I have, &c.,

CHAS. A. GOODCHAP,
Commissioner for Railways.

I should like to see estimates, &c., early.—W.J.L., 7/7/86. Mr. Cowdery.—D.C.M'L., 7/7/86. Please submit estimates as soon as possible.—M.T., 8/7/86. Estimates herewith. I recommend the land valuer submit an estimate of the value of land required.—G.C., 23/8/86. While estimating the value of the land, efforts should be made to get the owners to grant it free of cost or at any rate to make some concession.—CH. A.G., 25/8/86.

Memo. to District Engineer.

Office of District Engineer, Sydney, 20 August, 1886.

HEREWITH I forward estimate for construction of tram line Kogarah to Sans Souci, and Sandringham, as asked for on accompanying papers. The estimate is taken from the *trial, plan, and section*, and is made up of four parts as requested by Commissioner. As to the value of land to be resumed I would suggest that papers be sent to land valuer and that either Mr. Baxter or myself should accompany him through the line of route. Route No. 2 follows the Rocky Point Road, but as the petitioners have promised to widen this road 33 feet by giving the necessary land, I have estimated for an open ballast road; crossings will of course be made where necessary. The total cost will be £20,902.

E. M. HALLIGAN.

NEW SOUTH WALES RAILWAYS.

Department of Engineer for Existing Lines—Government Tramway Kogarah to Sans Souci and Sandringham.

Rough bill of estimated quantities and cost.

No.	Item.	Quantity.	Rate.	Amount.	Total Amount.
	Part I—from Kogarah to Austral-street, A to B on plan, double line,—			£ s. d.	£ s. d.
1	Excavation	6,700 cubic yards	2/6	837 10 0	
2	Concrete	30 "	40/0	60 0 0	
3	Lengthening 3 feet culvert	5 lineal yards	85/0	21 5 0	
4	Building 2 feet culvert	13 "	55/0	35 15 0	
5	12 inch pipes laid	30 lineal feet	2/6	3 15 0	
6	Building 2 feet culvert	12 lineal yards	55/0	33 0 0	
7	Laying permanent way	2,640 "	30/0	3,960 0 0	4,951 5 0
	Part II—from Austral-street to Reserve, Sans Souci, along Rocky Point Road, B to C on plan, single line,—				
1	Excavation	6,000 cubic yards	2/6	750 0 0	
2	Concrete	10 "	40/0	20 0 0	
3	Building 2 feet culvert	5 lineal yards	55/0	13 15 0	
4	Do do	5 "	55/0	13 15 0	
5	12 inch drain pipes	160 feet	2/6	20 0 0	
6	Laying permanent way	3,916 lineal yards	30/0	5,874 0 0	6,691 10 0
	Part III—from Sans Souci, end of Reserve, to Sandringham, C to D on plan, single line,—				
1	Excavation	1,500 cubic yards	2/6	187 10 0	
2	Concrete	10 "	40/0	20 0 0	
3	Building 3 feet culvert	5 lineal yards	85/0	21 5 0	
4	20-foot timber opening piles, &c.		Lump sum	110 0 0	
5	10-foot do do		"	70 0 0	
6	10-foot do do		"	70 0 0	
7	Diverting creek near Sandringham		"	50 0 0	
8	Laying permanent way	1,584 lineal yards	30/0	2,376 0 0	2,904 15 0
	Part IV—Sandringham to junction Austral-street and Rocky Point Road, D to B on plan, single line,—				
1	Excavation	4,000 cubic yards	2/6	500 0 0	
2	Concrete	20 "	40/0	40 0 0	
3	18-inch pipes	75 lineal feet	5/0	18 15 0	
4	12-inch do	150 feet	2/6	18 15 0	
5	Building 3-foot culvert	16 lineal yards	85/0	68 0 0	
6	Laying permanent way	3,806 "	30/0	5,709 0 0	6,354 10 0
	Total Estimate			£	20,902 0 0

Value of land, &c., &c., see Report.—E.M.H.

No. 11.

M. J. Hammond, Esq., M.P., to The Secretary for Public Works.

Sir, Legislative Assembly, 27 August, 1886.
 I should feel obliged to you if you would inform me whether further progress has been made in your department in reference to the proposed Tramway from Kogarah to Sans Souci; also, whether the Government, on the terms originally agreed to, will be good enough to place on the next Estimates a sum to cover the cost of its construction. If so, please instruct me as to what is the next step to be taken to facilitate the settlement of the matter.
I have, &c.,
M. J. HAMMOND.

Please inform Mr. Hammond how matter stands.—W.J.L., 30/8/86. Has any payment been offered?—W.J.L., 30/8/86.
Mr. Cowdery.—D.C.M'L., 3/9/86. Nothing has been done since estimate was forwarded to Commissioner. No payment has been made that I am aware of.—G.C., 6/9/86.
 Commissioner. Has the Minister decided that the line is to be constructed on payment of £6,000 by subscribers, and the conveyance of the land required?—CH.A.G., 8/9/86. For submission to Cabinet.—W.J.L.

No. 12.

M. J. Hammond, Esq., M.P., to The Secretary for Public Works.

Sir, Legislative Assembly, 9 October, 1886.
 I am again requested by letter to ask the Government to decide whether they are prepared to accept the promised contributions, and to proceed with the construction of the proposed Sans Souci Tramway.
 In apologising for so often writing on the subject, let me beg that the matter may be dealt with at the earliest possible convenience.
I have, &c.,
M. J. HAMMOND.

Kogarah to Sandringham.

WRITE subscribers on their representation, "£6,000 first to be paid and free conveyance of all land required," and say, directly money is paid line will be commenced; the Government wish to give the work to the unemployed.
CH.A.G., 28/10/86.

Approved.—W.J.L., 28/10/86.

The Commissioner for Railways to M. J. Hammond, Esq., M.P.

Sir, Department of Public Works, 28 October, 1886.
 Referring to your several letters of recent date, urging the construction of a Tramway from Kogarah to Sans Souci, I have the honor to inform you that directly the amount of £6,000 is contributed towards the cost of this work, as promised, and an understanding is entered into by those interested, giving free conveyance to the Department of the land required, the line will be at once commenced.
 I may add that Mr. Secretary Lyne is desirous, should the above terms be complied with, of giving the work to the unemployed, and I shall therefore be glad to know, as early as possible, what determination has been arrived at by those concerned.
I have, &c.,
CH. A. GOODCHAP,
Commissioner for Railways.

No. 13.

Mr. D. E. Blacke to The Commissioner for Railways.

Kogarah, Sans Souci, and Sandringham Tram League.

Sir, 246 Pitt-street, Sydney, 18 November, 1886.
 Herewith I have the honor to hand you cheques and promissory-notes for moneys subscribed and paid up to this date, to be paid to you in terms of the guarantee, which I also hand you herewith, in consideration of the Government constructing a Tramway from Kogarah station to Sans Souci and Sandringham, *via* the Rocky Point Road.
 The remaining subscriptions will be handed to you as soon as they are received.
Yours, &c.,
D. E. BLACKE,
Secretary and Co.-Trustee, said League.

	£
Reform Land Investment and Building Co. (Limited) ...	1,500
Australian Mutual Investment and Building Co. (Limited) ...	1,310
Holdsworth, M'Pherson, & Co.	133
J. & W. Pritchard	30
H. B. Underwood	5
A. G. Carruthers	400
J. H. Carruthers	65
W. R. Kendall (promissory-note, £411 6s. 6d., due 19 March, 1887)	400
L. I. Marks, payable 1 December	410

GUARANTEE.

In consideration of the Commissioner for Railways agreeing to construct a tram-line from Kogarah to Sans Souci and Sandringham, *via* the Rocky Point Road, we agree on demand to pay to him the several sums set opposite to our names and to do the other acts mentioned here below.—Dated this 27th day of August, 1886.

Amount of Contributions.	Will you give requisite land for the line?	Will you widen the Rocky Point Road, and how?	Signatures.
£ 1,500	Yes	Will give whatever is necessary to make road 100 feet wide along our land.	The Reform Land Investment and Building Company (Limited)—D. E. Blacke, Manager.
50	My area is too small	Does not adjoin road	J. H. Carruthers.
300	Yes	do do	A. G. Carruthers.
120	Yes	do do	H. M'Keon.
200	Yes	Will widen from land let to James Justice (now Smith) to M'Call's, from a point there to a line 33 feet wide at M'Call's grant line.	John B. Carroll.
5	Area too small	Cannot as my house is too close	C. W. Berghopher.
25	Not unless on Rocky Point Road..	Will widen road to make it 100 feet wide by giving a strip 33 feet to a point, provided tram is laid on or near the centre of road.	J. Clark.
10	Yes, if taken off frontage to Rocky Point Road.	Will give what is necessary to make road 100 feet wide, provided tram runs along Rocky Point Road.	W. F. Langfield.
400	Yes	If necessary to make the same 100 feet wide	W. Kendall.
130	Yes, unless the route is through land already subdivided.	No land fronting the road provided the route traverses the Rocky Point Road to the point.	The Haymarket Permanent Land, Building, and Investment Company (Limited).
100	.....	.....	Holdsworth, Macpherson, & Co.
40	Yes, 34 feet in width.....	Does not adjoin Rocky Point Road	Matthew Hamburger.
40	No land available .....	.....	Fred. Gannon.
235	Yes	Does not adjoin road	J. B. Christian.
£900, if line traverses Rocky Point Road to Sans Souci.	Yes	Yes, as far as our land goes.....	H. G. Swyny.

Memo. to Accountant,—I have to inform you that the Minister has approved of the construction of the tram-line to Sans Souci, on condition that those interested pay the Department the sum of £6,000. The amount is to be subscribed and cheques sent in to this office.—D.C.M'L., 19/11/86.

Sans Souci Tramway:—Please let Mr. Judd know how matter stands.—W.J.L., 16/11/86. Mr. Cowdery for particulars.—D.C.M'L., 16/11/86. Urgent.

The surveyors are now hard at work surveying and staking out the line as finally approved, which work will be completed as soon as possible. Previous papers, Commissioner's 86-5,100, were returned, 13/11/86.—M.T. (*pro* Engineer), 16/11/86. Commissioner.

Please submit at once for Commissioner's information a part plan of the proposed route from Kogarah Station to the Rocky Point Road (a tracing of the large scale plan). Then, referring to my memo., 86-132, prepare plan, section, and estimates for the line to be continued on from Sandringham, and to join the line again at the point marked H on the Rocky Point Road.—M.T., 2/11/86.

D.E., Sydney. Urgent. Mr. Halligan.—W.S., 3/11/86.

Tracing herewith. I would suggest that portion of line, from A to B on tracing, be made at foot of latter instead of alongside present railway line. The grades will be easy, and the earthwork considerably less, consequently cheaper. The municipality, I think, will have no objection.—E.M.H., 10/11/86. District Engineer,

Tracing herewith; the plan of the line is now in hand.—W.S., 10/11/86. The Deputy Engineer.

The Commissioner asked me for a tracing showing the route of this line from the railway to Rocky Point Road; tracing now herewith. As directed verbally by the Commissioner, the permanent survey and plans for this line are now in hand, and will be completed with all possible speed.—M.T. (*pro* Engineer), 13/11/86. Commissioner.

The Engineer makes no comment upon Mr. Halligan's suggestion as to the portion of line from A to B being made at foot of latter, instead of along the railway line.—Ch.A.G., B.C., 16/11/86. Mr. Cowdery. I did not refer to this matter in my minute 13/11/86 because I understood that the tracing was required by the Mayor of Kogarah with reference to the forming and metalling of Gray-street. I have since gone into the details and find that the suggestion of Mr. Halligan cannot be carried out, as it would not enable us to join the tram-line with the railway as intended. Mr. Halligan made the suggestion under the belief that the tram-line was not to join with the main line.—M.T. (*pro* Engineer), 17/11/86. Commissioner.

Those interested have paid in some portion of the contribution. The particulars had better be given in these papers, and the form of receipt also which I drew up in acknowledgment of the money.—Ch.A.G., 22/11/86. Accountant.—D.C.M'L., 23/11/86. Copy of receipt and list of contributions herewith.—W.W., 25/11/86. Secretary. Will Mr. Cowdery please say what he is doing in this matter, and whether everything is in readiness to commence the work in the event of directions being given to that effect.—D.C.M'L., 25/11/86. Please say when survey will be completed and plans, &c., ready.—M.T., 26/11/86. District Engineer, Sydney. Mr. Halligan.—W.S., 29/11/86. Plans will be ready by the 20th of this month.—E.M.H., 1/12/86. District Engineer. The Deputy Engineer.—W.S., 1/12/86. Plans, &c., will be submitted at the end of this month.—M.T. (*pro* Engr. for Ex. Lines), 1/12/86. Secretary.

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No. 14.

Mr. H. M'Keon to The Commissioner for Railways.

Re Kogarah and Sans Souci Tramway.

Sir,

Windsor Lodge, Tempe, 19 November, 1886.
 Some time ago I promised to subscribe to the cost of this Tramway. I now beg to withdraw my name from the list of subscribers and notify that it is not now my intention to subscribe thereto.

I am, &c.,

H. M'KEON.

No. 15.

Mr. D. E. Blacke to The Commissioner for Railways.

Kogarah, Sans Souci, and Sandringham Tram League.

Dear Sir,

246, Pitt-street, Sydney, 24 November, 1886.

Two of the parties who signed the guarantee given to you *re* the Tramway for above League have demurred to paying up, and in order to compel them to pay the amount subscribed for by them it will oblige if you will give me or any other person you prefer the necessary authority to procure payment by legal means, and my Company as above, and other subscribers, would be prepared to *indemnify you against loss* in the matter.

I need scarcely add, that in any event the non-payment of the abovementioned sums won't affect the case as the whole sum can be made up by the rest, but we consider it unfair to let these guarantors repudiate their engagements to the prejudice of the others.

I enclose a letter just received from Mr. H. M'Keon (£120); the other is Mr. Hamburger (£53).

I am, &c.,

D. E. BLACKE,

Secretary and Co-trustee, K., S. S., and S. Tram League.

Mr. H. M'Keon to Mr. D. E. Blacke.

Sir,

Tempe, 23 November, 1886.

In answer to your communication of yesterday, I can only inform you that I never promised to pay the Tram League or your Company any moneys; what I promised was to the Commissioner for Railways, and I informed him on the 19th inst. that it was not my intention to now contribute to the Tramway. I also intimated the same to you on the 17th instant. Circumstances have occurred that render it impossible for me to do so.

I am, &c.,

H. M'KEON.

Will Mr. Cowdery please return the papers. I do not see that we can take the step desired by the writer of this letter. Until a certain sum is subscribed we refuse to construct, and any action taken or to be taken in connection with the raising of this amount seems to be quite outside the jurisdiction of the Department.—A.R. Engineer for Existing Lines, B.C., 30/11/86.

Previous papers returned herewith.—M.T. (*pro* Engineer), 1/12/86. Secretary. Please read my minute of the 30th Nov. I do not think the Department can intervene as requested by Mr. Blacke.—A.R., 2/12/86. I am of same opinion. We simply cannot commence until conditions are fulfilled.—D.V., 2/12/86. Inform.—D.C.M'L., 2/12/86.

The Commissioner for Railways to Mr. D. E. Blacke.

Sir,

Department of Public Works, Railway Branch, 3 December, 1886.

With reference to your letter of the 26th ultimo, in which you state that two of the guarantors of part of the cost of the proposed Tramway to Sans Souci have declined to pay the amounts promised by them, and ask that you may be empowered to take legal proceedings against them, I have the honor to inform you that I am unable to intervene as requested, but the work cannot be commenced until their conditions of the guarantee are fulfilled.

I have, &c.,

CHAS. A. GOODCHAP,

Commissioner for Railways.

(Per A.R.)

No. 16.

Mr. D. E. Blacke to The Commissioner for Railways.

Dear Sir,

246, Pitt-street, Sydney, 7 December, 1886.

Herewith please receive a further sum of £651 1s. towards the £6,000 fund for the above referred to Tramway.

I annex copy of a receipt I had to give Messrs. Beaumont & Christian for their contribution included in the above sum (now handed to you), the terms of which are binding on the trustees, and are a condition of this payment, but agreed to by the Hon. the Minister for Works.

Those interested are willing to give you the necessary undertaking for the balance of the £6,000 so that the work may be gone on without any delay.

Yours, &c.,

D. E. BLACKE,

Secretary.

Accountant, for Cashier.—D.C.M'L., 7/12/86.

246, Pitt-street, Sydney, 25 November, 1886.

RECEIVED from Messrs. Beaumont & Christian cheque, value £347, being subscription towards the fund of £6,000, payable to the Government in consideration of the latter constructing a Tramway from Kogarah Railway Station to touch on Sandringham, and the said sum of £347 is returnable to the donors

donors should the line not go into or through the property of J. and W. Christian, now known as Sandringham, on which is the "Prince of Wales Hotel," as per the assurance given on the 22nd instant by the Minister for Works to Messrs. Carruthers, Hammond, and Blacke.

D. E. BLACKE,
Secretary and co-Trustee
Kogarah, Sans Souci, and Sandringham Tram League.

Department of Public Works, Railway Branch, Sydney, 8 December, 1886.
RECEIVED from Kogarah, Sans Souci, and Sandringham Tramway League the sum of £651 1s. sterling, being on account construction of Tramway.

J. R. NEALE,
Cashier.

No. 17.

Mr. D. E. Blacke to The Commissioner for Railways.

Kogarah, Sans Souci, and Sandringham Tramway.

Dear Sir,

246, Pitt-street, Sydney, 7 December, 1886.

Referring to our conversation this afternoon respecting matters in relation to this Tramway, I beg now to enclose for your use the sketch plan I referred to, which shows three distinct routes, every one of which would meet the approval of the Engineer, but the one suggested by me is that which goes through Concannon's land, and the acquirement of this small piece of land by the Government could be effected for a very small sum, it being mostly in gardens of Chinamen.

I have, &c.,
D. E. BLACKE,
Secy. and Co-Trustee.

Mr. Cowdery, for report, B.C., 8/12/86.—CH.A.G. Take the cheapest, if suitable. Mr. Thomson, for report.—G.C., 9/12/86. For report.—M.T., 9/12/86. District Engineer. Mr. Halligan.—W.S., 10/12/86. Route shown on accompanying tracing in green will be the cheapest, and as suitable as any, so I presume will be adopted when line is being made.—E.M.H., 3/1/87. District Engineer. The Deputy Engineer.—W.S., 3/1/87. Route shown on accompanying tracing in green will be the cheapest.—G.C., 4/1/87. Secretary. Engineer for Existing Lines.—A.R., B.C., 7/1/87. Mr. Thomson.—G.C. (*per* G.L.), 10/1/87. Please note and carry out accordingly.—M.T., 10/1/87. District Engineer, Sydney. Mr. Halligan.—W.S., 12/1/87. Mr. Shellshear has verbally informed me of some intention to adhere to old line. Will he please say?—E.M.H., 19/1/87. District Engineer.

I understand there is some difficulty in passing through Mr. Concannon's property, as he objects to the line which would pass very close to his house, and he could compel the Department to resume the house, and also to give him six months' notice before entering upon the land. Will the Engineer please say if the above difficulty can be got over, or, if not, what route is to be adopted? Mr. Concannon has no objection to the line shown in red.—W.S. (*per* H.J.M.), 20/1/87. The Tramway Engineer.

In order to avoid Concannon's land it has been decided to adopt the route shown in black ink. Please lay out the line accordingly.—M.T. (*per* Engineer), 21/1/87. District Engineer, Sydney. Noted; deviation plotted on working plan, and marked out on ground.—W.S., 29/1/87. The Deputy Engineer. Secretary.—M.T. (*per* Engr. for E. Lines), 31/1/87.

No. 18.

Mr. D. E. Blacke to The Commissioner for Railways.

Kogarah, Sans Souci, and Sandringham Tram League.

Dear Sir,

246, Pitt-street, Sydney, 9 December, 1886.

I have now the honor to hand you herewith the above Company's promissory-notes, as per memo. at foot hereof, amounting together to £849 11s. 6d, which, with Mr. L. I. Marks' £410, will make up the £6,000 contributed by the land-owners in consideration of the Government constructing the Tramway from Kogarah to Sans Souci and Sandringham, as per arrangement.

Yours, &c.,
D. E. BLACKE,
Secretary and co-Trustee.

1886.							£	s.	d.		
November	18	Amount paid Treasury	...	...	...	3,859	7	6
"	19	do	...	...	...	200	0	0
December	7	do	{	Due June 12/87—	£500 0 0	651	1	0			
"	9	do							349	11	6
"	9	do						
"	9	do	...	...	...	410	0	0
						£6,000	0	0			

D. E. BLACKE.

Accountant, for Cashier.—L.P.I. (*per* Secretary), 10/12/86.

No. 19.

Minutes by The Secretary for Public Works, &c.

Kogarah-Sans Souci Tramway.

Accountant for Cashier,—Please accept further contribution in connection with the above—£410 from Mr. Marks.—A.R., 10/12/86.

Receipt ready for Mr. Marks.		The contributions now stand—		£	s.	d.
Cheques paid to Bank	4,739	2	0
Promissory-notes held by cashier W. R. Kendall, due on 11 March, /87				411	6	6
Reform Land Investment and Building Co., do 12 June, ,,				349	11	6
Do do do 12 ,, ,,				500	0	0
				£6,000	0	0
				W.W., B.C., 10/12/86.		

Commissioner.

The Commissioner wishes stated on these papers the names of the persons signing the promissory-notes. Then send papers to Mr. Cowdery to furnish a list of the persons through whose lands the lines will pass, and to say whether in each instance we hold an unconditional guarantee to give the land free to the Department. Please deal with the matter quickly.—D.C.M'L., 14/12/86. Engineer for Existing Lines.

Please furnish list of owners of land through which the line passes.—M.T., 10/12/86. Mr. Halligan,—W.S., 17/12/86.

The line passes through the following properties:—South, Elliott, Concannon, Kendall, Knight, Christian Bros., A. G. Carruthers, and the Reform Land and Building Co. Tracing of plan will be sent to-morrow, if possible, showing all land to be given, &c.—E.M.H., 3/1/87. District Engineer.

List of names of owners herewith.—W.S., 4/1/87. The Deputy Engineer.

The line passes through the properties of South, Elliott, Concannon, Kendall, Knight, Christian Brothers, A. G. Carruthers, and the Reform Land Investment and Building Company, all of which but the first three have promised to give the land required.—M.T. (*per* Engineer for Existing Lines), 6/1/87. Secretary.

I suppose we had better write to the three first persons.—A.R., 10/1/87. Commissioner. No, Mr. Thomson will visit the locality, and I will see him with the Engineer afterwards.—CHAS. A.G., 11/1/87.

Sandringham and Sans Souci Tramway:—The Commissioner wishes to know when work can be started, or what it is that delays the matter. He would like to see the work commenced by the 10th January if it is to be done by task, as in the case of Randwick; or if tenders are to be invited, the advertisements to be in the papers by the 10th proximo.—D.C. M'L., 31/12/86. Mr. Cowdery.

Please report at once as to how this matter stands, and if work can be commenced on the 10th proximo. Previous papers, 86/1396, are with you.—M.T. (*per* Engr.), 31/12/86. District Engineer, Sydney.—Specially urgent.

The plan and section of this Tramway will be ready on Tuesday, the 4th proximo, evening, when the work could be started, if done by task-work, provided necessary permanent way material can be supplied. I may point out that this line is nearly 5 miles in length, and during the progress of the permanent survey the surveyor was considerably delayed by wet weather. The survey was only started on the 10th November, so there has been no unnecessary delay.—W.S., 31/12/86. The Deputy Engineer.

If the work is to be carried out as task-work by the unemployed, it can be commenced on the 10th instant; if to be done by contract it will take some time longer to prepare specifications, &c.; but tenders may be invited on the 10th for plans, &c., to be seen on a subsequent date.—M.T. (*pro* Engr for E. Lines), 3/1/87. Secretary.

A.R., 5/1/87. For Minister's decision as to how work is to be carried out.—CH.A.G., 6/1/87.

Minute by The Secretary for Public Works.

ARE there now unemployed to be obtained? If so this had better be carried out by task-work; if not, by contract. W.J.L., 6/1/87.

Engineer for Existing Lines,—A.R., B.C., 6/1/87. Urgent. Mr. Thomson to say if sufficient unemployed can be obtained for this work.—G.C., 7/1/87.

I dare say that there are sufficient unemployed to be had, but experience on the Randwick to Waverley Tram-line has shown that they do not care much for the work, and cannot agree amongst themselves. Altogether this is not a very satisfactory way of carrying out this kind of work; the men do not understand it, and it takes a great deal more of supervision on our part to get the work properly done. The better and more satisfactory way would be to have the work done by contract, when there would be only one party to deal with instead of a number who are always disagreeing amongst themselves, and consequently cause increased trouble.—M.T., 8/1/87. Tramway Engineer.

I recommend this work be carried out by contract.—G.C., 8/11/87. Commissioner. For Minister's decision.—CH.A.G., 11/1/87.

Minute by The Secretary for Public Works.

THERE are a number of unemployed now requiring work, and they have informed me they are prepared to take pick and shovel work. Under these circumstances the work should be carried out as on the Waverley to Randwick Tramway. I should like to know to-day when some of these men can be put on. W.J.L., 13/1/87.

Engineer for Existing Lines.—D.C.M'L., B.C., 13/1/87. Mr. Shellshear to arrange to start this work on Monday next as directed.—G.C., 14/1/87. Note!—W.S., 17/1/87. Tramway Engineer. Inform me as soon as any of these men are employed, and do not delay in employing them.—G.C., 18/1/87. District Engineer, Sydney.

Work was started this morning; about thirty of the unemployed are now at work; it was quite impossible to make the necessary preparations before as all the tools and plant had to be collected and sent to Kogarah.—W.S., 19/1/87. Tramway Engineer.

For Commissioner's information.—G.C. (*per* G.L.), 20/1/87.

Minute

Minute by The Commissioner.

THE tram-line from Kogarah to Sans Souci runs by Grey-street, and from Grey-street to Mr. J. B. Carroll's land. The road is only 1 chain wide. The neighbouring proprietors, however, Mr. Canham and others, are prepared to give free 10 feet, provided that the Department is at the expense of moving the fences back. Mr. Carroll will see those people and arrange to get the land; therefore lay out the line as if the road were of the required width.—CH.A.G., B.C., 31/12/86. Mr. Cowdery.

Mr. Shellshear to make arrangements accordingly.—G.C., *per* G.L., 3/1/87. Mr. Halligan.—W.S., 4/1/87. Mr. Carroll informs me that Canham or Fitzgerald, M'Call (the only owners besides himself) refuse now to give any land at all.—E.M.H., 14/1/87. District Engineer. Tramway Engineer.—W.S., 14/1/87. Commissioner to see.—G.C., 17/1/87. Let me see plan showing where this land is.—CH.A.G., 20/1/87. Engineer for Existing Lines, 20/1/87. Plans forwarded to Commissioner to-day to be transmitted to the Clerk of the Executive Council.—M.T., *per* Engr. for E. Lines, 20/1/87. Commissioner.

Office of District Engineer, Sydney, 18 January, 1887.

Tramway Engineer,—As requested by telephone this morning I forward herewith plan, section, and description of line Kogarah to Sans Souci. The book of reference has not yet been prepared.—W.S.

Plan, section, and description herewith; the book of reference will be prepared without delay.—G.C., 18/1/87. Commissioner.

Tramway from Kogarah to Sans Souci:—The Tramway commences at Kogarah Railway Station and runs parallel to the Illawarra line as far as Grey-street; thence along Grey-street; thence a short distance along Concannon-street; thence across the Emerson Junction Estate to the Rocky Point Road; thence along the Rocky Point Road to near the shores of George's River; thence for a short distance through the property of Robert Kendall; thence for a short distance through the 100 feet reserve; thence across the property of R. Kendall (owner), John Frazer (lessee); thence across the property of H. Knight; thence along the 100 feet reserve; thence across the property of James and Wm. B. Christian; thence along Clareville Avenue to a point 4 miles 5 chains from the point of commencement. It is further proposed to continue the said Tramway along Clareville Avenue, Russell Avenue to the Rocky Point Road, meeting the above-mentioned line at a point 2 miles 14½ chains from the point of commencement.—G.C., 18/1/87.

No. 20.

Mr. D. E. Blacke to The Commissioner for Railways.

Kogarah, Sans Souci, and Sandringham Tram League.

Dear Sir,

246 Pitt-street, Sydney, 4 January, 1887.

Re piece of land for Tramway purposes adjoining Concannon's property at Concannon-street, Kogarah, I have now the pleasure to enclose a letter dated yesterday, from Messrs. Hardie and Gorman, containing copy of a letter from Mr. F. H. Reuss, junior, consenting to dedicate to you for Tramway purposes land as shown on sketch (also herewith handed you), which sketch I received from your engineer; this still further clears the way for running through Concannon's place. Leaving this matter in your hands for completion of the transfer,

I am, &c.,

D. E. BLACKE,

Secretary and Company's Trustee.

Engineer for Existing Lines.—A.R., B.C., 6/1/87.

[Enclosure.]

Hardie and Gorman to Mr. D. E. Blacke.

Emerson's Junction Estate.

Dear Sir,

133 Pitt-street, Sydney, 3 January, 1887.

Enclosed we have now the pleasure to hand you copy of letter received from Mr. Reuss, signifying his willingness to dedicate to the Commissioner for Railways that portion of the land required for the extension as per plans now returned to you.

We presume you will have the necessary documents prepared in terms of Mr. Reuss' letter.

Yours, &c.,

HARDIE & GORMAN.

[Sub-enclosure.]

Dear Sir,

Pitt-street, Sydney, 3 January, 1887.

I hereby consent to dedicate, for the purpose of extending and widening Concannon-street at Kogarah, so as to enable the proposed Tramway to pass through my land, the two parcels coloured red and blue on tracing herewith, on the understanding that Mr. Concannon fulfils his promise to remove his rough fence back to the correct straight boundary.

Yours, &c.,

F. H. REUSS, JUNIOR.

Please note and submit tracings showing the land at once, with bearings and dimensions, &c.—M.T. (*per* Engineer), 7/1/87. District Engineer, Sydney. Mr. Halligan.—W.S., 8/1/87. Please return plan and section of this line; nothing can be done without them. They are now with the Deputy Engineer.—E.M.H., 11/1/87. District Engineer. Will the Engineer please return plan and section of this line?—W.S., 12/1/87. The Tramway Engineer. Plan and section herewith.—G.C., 12/1/87. Mr. Shellshear. Mr. Halligan.—W.S., 13/1/87. The line at this place being now altered (see papers), this land will not be required, so I presume will not be taken. Please say.—E.M.H., 24/1/87. District Engineer. The land is not required, and will therefore not be taken.—W.S., 27/1/87. Mr. Halligan. Noted.—E.M.H., 28/1/87. District Engineer. The Tramway Engineer.—W.S., 27/1/87. A deviation having been made in the line, this land will not now be required.—M.T. (*pro* Engineer for Existing Lines), 31/1/87. Secretary. Inform.—A.R., 2/2/87.

The

The Commissioner for Railways to Mr. D. E. Blacke.
 Sir, Department of Public Works, Railway Branch, 8 February, 1887.

Referring to your letter of the 4th ultimo, with enclosures, in which you intimate that Mr. F. Reuss, junr., has consented to dedicate, for the purposes of the Kogarah, Sans Souci, and Sandringham Tramway, certain land shown on an accompanying sketch, I have the honor to inform you that a deviation having been made in the line, this land will not now be required.

I have, &c.,
 CHAS. A. GOODCHAP,
 Commissioner for Railways, per D.V.

No. 21.

Mr. D. E. Blacke to The Commissioner for Railways.

Kogarah, Sans Souci, and Sandringham Tram League.

Sir, 246, Pitt-street, Sydney, 11 January, 1887.

I have the honor to give you the following particulars of land required for the Tramway, as per sketch plan furnished by the engineer.

Commencing at K. the line turns off into Gray-street, but to suit the engineer's ideas the line has been surveyed through a very small portion of land belonging to Mr. J. South and Mr. J. W. Elliott, neither of whom have ever promised to give the land, nor did the Tram League include their promises. The strip required is infinitesimal, and if resumed its value would be under £100. A small divergence in the line would avoid this resumption, although the line might not be made so neat and correct. The line then follows Gray-street and Concannon-street until it meets Reuss & Co.'s land and Concannon's land. Messrs. Reuss & Co. are affected very slightly by the survey, and agreed to give the land.

With reference to Concannon, I have always pointed out in my correspondence from the very inception of the project that at this point it would be necessary to resume a small area of land (see my letter of 4th June, 1886, forwarded through Mr. M. J. Hammond). Mr. Concannon has been interviewed by me without success. It will be necessary to resume a strip, amounting to about one-third of an acre, for the line, and a severed portion of about an acre.

The total value of the land is about £500, and the severed portion should nearly realize that sum.

From Concannon's land to Mr. Carroll's, marked on the plan A, the difficulties in widening the road at present are insurmountable, nor did the League or the land-owners ever undertake to widen the road at that point.

Eventually, no doubt, the road will be widened by the land-owners as they subdivide. The land-owners undertaking has always been specified as commencing at the point marked A. From this point Mr. Carroll owns from A to B on one side, and Mr. F. Clarke on the other side.

These parties have agreed to widen the road to 99 feet, as I have shown on the plan in red lines.

From B to C on both sides belongs to the Australian Mutual Building Company, and that Company agrees to give the strip as shown on the plan.

From C to D belongs to Mr. J. M'Call on the western side, and to the Australian Mutual Building Company on the eastern side.

M'Call has hitherto refused to give the land.

From D to E belongs to Innes Estate, the trustees of which profess their desire to give, but state the condition of the trust precludes their doing so. It would be necessary to resume this, but no doubt no compensation would be asked.

On the eastern side of the road, E to G, are twelve small allotments, the holders of which it is difficult to find.

From G to H, owned by Mr. M'Pherson, the land will be given. From that point the remainder of the line, $2\frac{1}{2}$ miles, no difficulty whatever occurs, all the land for widening of the road for tramway purposes being given by the documents already in your possession, save and except the portion marked X.Y. on Clareville Estate Avenue, which is involved in a trust estate and cannot be given.

The line touches this portion near Y by a couple of feet, and I should recommend a survey be ordered so as to keep it free from this land.

In conclusion, I would point out that the line along the Rocky Point Road can be constructed and is surveyed along the road which is 66 feet wide at present; from Mr. M'Pherson's land no difficulty exists in widening the road, but up to that point in some cases difficulties do exist, and perhaps it would be well to let the road stand as it is at present up to that point, instead of allowing one owner here and there to mar its uniformity.

The solicitor to the League advises that no conveyances are necessary with regard to the land given along the roads; a simple document dedicating the land for road purposes is quite sufficient, but in any case the legal difficulty need not stand in the way as we undertake to carry out legally what we have proffered to do.

Yours, &c.,
 D. E. BLACKE,
 Secretary and Co. Trustee.

No. 22.

Mr. J. B. Thompson to The Commissioner for Railways.

Land Valuer's Office, Sydney, 13 January, 1887.

Estimated cost of resumptions on the Kogarah Tramway.

As verbally instructed I now beg to submit an estimate of the cost of certain resumptions on the proposed Tramway from Kogarah to Sans Souci, &c.; these resumptions are part of two allotments in Grey-street, and parts of allotments in a subdivision of the Emerson Junction Estate. The latter are upon a line suggested as an alternative to that passing through Concannon's homestead, and it is shown in blue on the annexed tracing. The cost of the allotments in Grey-street will be about £60, and of those in the subdivision about £830, being at the rate of £5 per foot frontage taken, and which will include sufficient to compensate for depreciation of allotments partly taken. I therefore estimate the cost of these resumptions at about £900. The cost by the line shown in red on tracing will be fully as much.

J. B. THOMPSON,
 Railway Land Valuer.
 Papers

Papers and tracing herewith. I recommend the blue line be taken; we shall have all the other land required free.—CH.A.G., 14/1/87. If Minister approves, the plans &c., should be submitted to the Governor and Executive Council.—CH.A.G., 14/1/87.

Minute by The Secretary for Public Works.

Approved.—W.J.L., 14/1/87.

Minute by The Secretary for Public Works.

I AM informed that work was not commenced at the Kogarah tramway this morning. I should like to have the reason for the delay in starting.

Urgent.

W.J.L.

The tools are now being conveyed on to this work, and arrangements have been made for a number of the unemployed to start on Wednesday morning.—G.C., 17/1/87. This should have been commenced this morning, as was decided. The tools might have been conveyed since Wednesday, the date I made a promise to the deputation of unemployed.—W.J.L., 17/1/87.

Minute by The Commissioner.

I BEG to point out to the Minister that the approval of the Governor and Executive Council to the construction of this line has not been obtained, as required by the Railway Act. The Minister approved of this authority being obtained a few days ago; but there has been no meeting of the Executive Council since that date. It will be illegal to proceed with the work before that authority is obtained, and I request the Minister's sanction to stop the Engineer from proceeding with it.

CH.A.G., 17/1/87, 5:40 p.m.

There have been two meetings of the Executive—one on Saturday, and one to-day.—W.J.L., 17/1/87. I did not see this paper till 5:40 p.m. to-day. Mr. Richardson will please see me the first thing to-morrow morning, with minute of Minister for Executive Council's approval.—CH.A.G., 17/1/87, 6 p.m.

The minute for approval of Governor and Executive Council has been sent to Under Secretary for Public Works, but Mr. H. M'Lachlan tells me the Minister has written a minute for the line to be proceeded with.—A.R., 18/1/87.

The Minister said he would write a minute, but I have not seen it yet.—CH.A.G., 18/1/87.

Office of District Engineer, Sydney, 15 January, 1887.

Kogarah to Sans Souci Tramway.

Memo. to Tramway Engineer,—

WILL Mr. Cowdery please inform me if it is intended to use D railway trucks on this Tramway, or is the line to be laid with the ordinary guard-rails for Tramway stock only?

WALTER SHELLSHEAR,

per H.J.M.

Will Commissioner please say if D trucks are to be used; we cannot use guard-rails, as the groove would be too wide for vehicular traffic.—G.C., 15/1/87. Commissioner.

This line has not yet been approved by the Governor and Executive Council, and cannot be proceeded with. I will see Mr. Cowdery about the use of D trucks. Is there not a proposal to use the rails of the Windsor and Richmond line?—CH.A.G., 18/1/87.

No. 23.

Minute by The Secretary for Public Works.

Department of Public Works, Sydney, 18 January, 1887.

Tramway to Sans Souci.

I AM informed that through some oversight Executive authority has not been obtained for the construction of the Sans Souci Tramway. Under ordinary circumstances I would advise delay, pending the necessary authority being obtained, but under the exceptional circumstances of this case I think the work might be commenced in anticipation of the formal authority. The matter has already been before the Cabinet, and approved by them, conditional on the greater portion of the land required being given free, and a sum of £6,000 subscribed towards the cost of the line.

The land promised has been given, and the amount referred to paid to the Government, and as a number of the "unemployed" have been gathered together to work on the Tramway, I think the work should be at once started, and the formal authority obtained at the first meeting of the Executive Council.

W.J.L.

Minute sent to Public Works for Executive, 87-268.—18/1/87. The work is being proceeded with I think, is it not?—A.R., B.C., 19/1/87. The work is being proceeded with. The plan is now with the Clerk of the Executive Council, and it is now urgently required by me for the purpose of preparing book of reference.—G.C., 20/1/87. The plan, I understand, was borrowed yesterday by Mr. Armstrong of your office from the Clerk of the Executive.—D.C.M'L., 21/1/87. Mr. Cowdery. The plan has been received and will be returned on Monday.—G.C., *per* G.L., 21/1/87. Secretary. In four days to see if Executive has approved of plan, &c. Immediately this is obtained please see that Proclamation is inserted in *Gazette* and newspapers.—D.C.M'L., 21/1/87.

No. 24.

Memo. to The Tramway Engineer.

Office of District Engineer, Sydney, 24 January, 1887.

I FORWARD herewith approximate estimate of the Tramway from Kogarah to Sans Souci.

WALTER SHELLSHEAR, *per* H.J.M.

New

New South Wales Railways—Department of Engineer for Existing Lines.
LINES, Kogarah to Sandringham Tramway—Single line, 4 miles 5 chains—Approximate estimate
Bill of Estimated Quantities and Cost.

	Item.	Quantity.	Rate.	Amount.
			£ s. d.	£ s. d.
1	Excavations	7,700 cubic yards ...	0 2 6	962 10 0
2	Ballast	5,133 do ...	0 4 0	1,026 12 0
2A	Do	2,567 do ...	0 8 0	1,026 16 0
3	Permanent-way, including sleepers, laying, &c.	7,700 lineal yards ...	0 16 0	6,160 0 0
4	Points and crossings	9 do ...	50 0 0	450 0 0
5	Alterations to culvert at Kogarah	1 lineal yard ...	60 0 0	60 0 0
6	Buffer-stops	2 do yards ...	30 0 0	60 0 0
7	Dock Walls at Kogarah	250 feet	1 0 0	250 0 0
8	Timber opening and box trenches .....	.....	.....	200 0 0
9	18-inch drain-pipes	110 lineal yards ...	0 7 6	41 5 0
10	12-inch do	500 do ...	0 5 0	125 0 0
11	24-inch do	60 do ...	0 10 0	30 0 0
	Add 10 per cent. contingencies supervision .....	.....	.....	10,392 3 0 1,039 4 4
			£	11,431 7 4

W.S., 24/1/87. M.T., 24/1/87.

Kogarah to Sans Souci and Sandringham Tramway:—There has been some modification in the plans of this line. I wish to know the cost of it to Sandringham, omitting the loop—land, construction, rolling-stock.—CH.A.G., 21/1/87. Engineer for Existing Lines.

The cost of construction is estimated at about £11,431, as per detailed estimate herewith.—M.T., 24/1/87. Tramway Engineer. The cost of construction will be about £11,431. The land valuer will give value of land, and Locomotive Engineer cost of rolling-stock.—G.C., 24/1/87. Commissioner. Land valuer, B.C., 25/1/87. Land to be resumed will cost about £900.—J.B.T., 27/1/87. Commissioner.

Construction (£2,813 per mile) ...	...	...	...	...	£	11,431
Land ...	...	...	...	...	...	900
Rolling-stock—6 cars, at £350 ...	...	...	...	...	...	2,000
Do 3 motors, at £1,000 ...	...	...	...	...	...	3,000
						£17,331

I think the permanent-way material will not cost more than £4 a ton, and the cost for permanent-way, laying, &c., will be reduced to £5,000, making the cost about £16,000
Less £6,000 subscribed by residents 6,000

£10,000

CH.A.G., 28/1/87. Mr. Cowdery to see.—A.R., B.C., 29/1/87. I wish to see the Deputy Engineer about this line, rails, &c.—CH.A.G., 3/2/87. Engineer for Existing Lines. I have seen Mr. Thomson; there will be no delay in laying in the rails; and they will be taken out of the Windsor line as fast as they are required for the Kogarah line.—CH.A.G., 7/2/87.

No. 25.

Mr. J. N. Elliott to The Secretary for Public Works.

Sir,

Kogarah, 22 January, 1887.

I have discovered that the tramway line leading through Kogarah to Sandringham, now being formed, is laid down to pass through a portion of my land, adjoining Gray-street, Kogarah. I respectfully take the earliest opportunity of protesting against this being carried out as intended.

I am led to enter this protest for many reasons. The line as laid down cuts through the *top* of my land, and consequently, in addition to the loss of land, deprives me of the *main road frontage*, thus injuring my property to a very great extent.

Trusting this matter will receive your immediate attention,—

I have, &c.,

JOHN W. ELLIOTT.

P.S.—At this particular point there is nothing whatever to prevent the tramway line being carried along the main road.

For immediate inquiry.—J.S., 24/1/87. Do not go on any private land till line is proclaimed.—CH.A.G., 25/1/87. Noted.—M.T. (*pro* E.E. Lines), 27/1/87.

Minute by the Commissioner.

It seems to me that it is not absolutely necessary to take Elliott's land. No doubt the line has a better contour by its running through Elliott's land, but it is possible, though perhaps a little less slightly, to keep the road and curve into Gray-street below Elliott's property. The fact is, the decision of the Supreme Court in Daintrey's case at Randwick, when it was held that we had not power to dedicate to road purposes land taken for railway purposes, might give a value to this taking far in excess of the real damage done.

CH.A.G., 27/1/87.

Engineer for Existing Lines, B.C. Urgent.

I find by carefully laying down the line round this corner that it cannot be done without encroaching on the footpath unless curves of a smaller radius be put in, and that would prevent the use of D trucks over the line.—G.C., 27/1/87. Commissioner.

I have seen the Minister about this, and he has promised to get the Executive sanction for construction of line expedited.—CH.A.G., 28/1/87. Everything now complete.—A.R., 29/1/87.

The Under Secretary for Public Works,—

I HAVE the honor to forward herewith for the approval of His Excellency the Governor and the Executive Council the plan of the Kogarah to Sans Souci and Sandringham Tramway.

Description:—Commencing Kogarah Railway Station; thence to near the shores of George's River; thence to a point in Clareville Avenue, 4 miles 5 chains from point of commencement; thence along Russell Avenue to the Rocky Point Road, joining the tramway line at a point 2 miles 14½ chains from the point of commencement, being a total distance of 4 miles 70 chains.

I shall be glad if you will obtain the necessary approval.

A. RICHARDSON (*pro* Commissioner for Railways).

Executive Council.

Submitted. Prepare minute.—J.R., 19/1/87.

No. 26.

Minute for The Executive Council.

Tramway from Kogarah to Sans Souci and Sandringham.

Department of Public Works, Sydney, 19 January, 1887.

I HAVE the honor to submit, for the approval of His Excellency the Governor and Executive Council, a draft notification prepared by the Commissioner for Railways in terms of the Acts 43 Victoria, No. 25, and 46 Victoria, No. 26, of the construction of a line of Tramway from Kogarah to Sans Souci and Sandringham: "Commencing at Kogarah Railway Station; thence to near the shores of George's River; thence to a point in Clareville Avenue, 4 miles 5 chains from point of commencement; thence along Russell Avenue to the Rocky Point Road, joining the tramway line at a point 2 miles 14½ chains from the point of commencement, being a distance of 4 miles 70 chains."

JOHN SUTHERLAND.

The Executive Council advise that authority be granted for the construction of the tramway line from Kogarah to Sans Souci and Sandringham.—A. C. BUDGE, Clerk of the Council.

Ministry confirmed, 27/1/87. Approved.—CARRINGTON.
Railways.—J.R., B.C., 29/1/87.

Mr. Vogel, for *Gazette*, 29/1/87. Advertisement sent to *Gazette* and Sydney daily papers, 29/1/87.

In a month, 29/1/87. The notice is incorrect—the loop-line is not to be made. Issue amended Proclamation.—CH.A.G., 4/2/87. Amended notice herewith, 4/2/87.

GOVERNMENT TRAMWAYS.

Extension—Kogarah to Sans Souci and Sandringham.

THE Commissioner for Railways appointed by Act of Council, 22 Victoria No. 19, hereby gives notice that His Excellency the Governor, with the advice of the Executive Council, deems it expedient to make and complete a Tramway between Kogarah, Sans Souci, and Sandringham; and, in pursuance of the Acts of Parliament 43 Victoria No. 25 and 46 Victoria No. 26, to erect certain works and conveniences in connection therewith: Commencing at Kogarah Railway Station; thence to near the shores of George's River; thence to a point in Clareville Avenue, 4 miles 5 chains from the point of commencement; thence along Russell Avenue to the Rocky Point Road, joining the tramway line at a point 2 miles 14½ chains from the point of commencement, being a total distance of 4 miles 70 chains; and that for that purpose certain parcels of land which are particularly set out and coloured red in the map or plan and book of reference to be seen at the Office of the Commissioner for Railways, Phillip-street, Sydney, are required to be taken by the Commissioner for Railways, and that all parties interested in the said land or affected by the said works are hereby required to set forth, in writing, to the said Commissioner, within one month from the publication of this notice in the *Government Gazette*, any well-grounded objection that may appear to them to exist to the making of the said Tramway, or to the erection of the said works.—Dated at Sydney, this 27th day of January, in the year of our Lord one thousand eight hundred and eighty-seven.

(L.S.) CHAS. A. GOODCHAP,

Commissioner for Railways.

The seal of the Commissioner for Railways was affixed hereto, at Sydney, this 27th day of January, 1887, in the presence of,—

J. E. PICKERING.

Engineer for Existing Lines.—It has been necessary to alter the Proclamation for the Kogarah-Sandringham Tramway. Will Mr. Cowdery please peruse and say if correct, according to the Commissioner's recent directions.—A.R., B.C., 7/2/87.

The Proclamation has been examined and found correct, in accordance with the Commissioner's recent directions.—M.T. (*pro* E. E. Lines), 7/2/87. Secretary. Will the Commissioner please sign? —A.R., 7/2/87.

I think that the better plan will be to let the Proclamation stand. The protest invited by it can constructively come from the Department in respect of the loop line, and the Governor and Executive Council will be asked to confirm the line without that addition to it. The confirmatory Proclamation must be worded to meet the case.—CH.A.G., 8/2/87.

Let

Let me know what the loop will cost; it may be well after all to proceed with it if the cost is not great.—CH.A.G., 15/2/87. The cost of extending the line to join in with main line at Rocky Point Road, *via* Russell Avenue, will be about £2,200.—M.T. (*pro* E. E. Lines), 15/2/87. Commissioner. To await objections to be made under the notice.—CH.A.G., 16/2/87.

Tramway to Sans Souci and Sandringham.

REFERRING to *précis* lately submitted, I shall be glad if you will ascertain what determination, if any, has been arrived at.

The prescribed number of days having elapsed since publication of the proclamation, the notice of confirmation may now be published.

Shall this be done or shall it be published?

C.A.B., 28/2/87.

Where are the papers? Urgent.—D.C.M'L., 28/2/87. Submitted with *précis*, 24/2/87.—C.A.B., 28/2/87. The papers are, I believe, before the Minister. Are we to prepare the notice of confirmation?—D.C.M'L., 28/2/87. I have seen the Commissioner, and he says that the notice of confirmation should be sent on at once—provision to be made in it for the making of the loop. The confirmation notice should be drawn on the same lines as the Proclamation.—D.C.M'L., 1/3/87. Mr. Badham. Confirmation notice herewith.—1/3/87. For Minister's consideration.—CH.A.G., 3/3/87. Approved.—J.S., 29/3/87. Notice of confirmation sent to Public Works for transmission to Executive Council.—D.C.M'L., 30/3/87.

The Under Secretary for Public Works,—

I HAVE the honor to forward, for the approval of His Excellency the Governor and Executive Council, notice of confirmation of plan and book of reference of the Kogarah to Sans Souci and Sandringham tramway.

I shall be glad if you will obtain the necessary approval.

CHAS. A. GOODCHAP,
Commissioner for Railways (*per* A.R.)

29/3/87.

Minute for the Executive Council.

Department of Public Works, Sydney, 31 March, 1887.

No valid objection having been taken to the proclaimed plan and book of reference of the line of Tramway from Kogarah to Sans Souci and Sandringham, I have now the honor to submit these documents for confirmation by His Excellency the Governor and the Executive Council, together with the usual notice for publication in terms of the Act 22 Victoria No. 19.

JOHN SUTHERLAND.

The Executive Council advise that the plan and book of reference of the proposed Tramway be now confirmed, in terms of the Act 22 Victoria No. 19.—ALEX. C. BUDGE, Clerk of the Council.

Minute, 87-24.—5/4/87. Confirmed, 13/4/87. Approved.—CARRINGTON, 5/4/87.
Railways.—J.R., B.C., 16/4/87.

GOVERNMENT TRAMWAYS.

Extension, Kogarah to Sans Souci and Sandringham.

Notice of Confirmation of Plan and Book of Reference.

WITH reference to the notice of the Commissioner for Railways, dated the 27th day of January last, relative to the taking of certain lands required for the purpose of making a Tramway between Kogarah, Sans Souci, Sandringham, and its junction with the tramway line, at a point 2 miles 14½ chains from point of commencement, being a total distance of 4 miles 70 chains, and to make and complete certain works and conveniences in connection therewith: Notice is hereby given that no valid objection having been made to the taking of the said lands or to the construction of the said works, the said plan and book of reference have been duly confirmed by His Excellency the Governor, with the advice of the Executive Council, in accordance with the Act of Council 22 Victoria No. 19.

CHARLES A. GOODCHAP,
Commissioner for Railways.

THE seal of the Commissioner for Railways was affixed hereto, at Sydney, this 5th day of April, in the year of our Lord one thousand eight hundred and eighty-seven, in the presence of,—

L. P. IREDALE.

No. 27.

Mr. T. Saywell to The Commissioner for Railways.

Sydney Investment Land and Finance Co.,
139, Pitt-street, Sydney, 3 February, 1887.

Sir,

I trust you will pardon the liberty I am taking in writing you with regard to the construction at the Government expense of the proposed Tramway to Sans Souci.

In doing so, I wish to lay before you a few facts, and if you approve of my remarks I would ask you to favour me by appointing any time that would be most convenient for you to see me, when I shall no doubt be able to convince you of the great loss such a line would be to this Colony.

I simply wish to state that I have, as you are aware, completed, and am now running a Tramway from Rockdale Station to Lady Robinson's Beach, a distance of 1½ mile, at a cost of over £10,000, and with new cars and spare engines, now nearly ready, will cost in all 13 or £14,000; this I have done single handed at my own expense and without asking one penny from the Government, and notwithstanding that I have built it as economically as possible it does not even pay working expenses.

I therefore ask, do the Government want to saddle the Colony with an outlay of at least £24,000, in addition to the £6,000 given by the land speculators for the construction of this line, which will never even pay for the wages, independent of the interest on the outlay?

Of course if the Government has guaranteed that the line shall be constructed, I suppose Parliament will be the only one to rescind same, and as I can prove what I have here asserted, I contend that the work should not be allowed to proceed unless it can be proved that it will be a profitable undertaking, which is simply absurd to suppose in the fact of the present trams with their immense traffic not paying, and I firmly believe that if the work is carried out, that six months will convince the Government of its mistake, the result of which will be the taking up of the rails.

Trusting you will favour me with an appointment for interview.

Yours, &c.,
THOMAS SAYWELL.

Mr. Saywell is wrong about the cost of the line; it will not be £24,000 in excess of the £6,000 subscribed; if worked with economy I think the line will more than pay its working expenses; it will not depend upon the passenger traffic only; a goods traffic will be conducted upon it. I will see Mr. Saywell on Wednesday morning, at 11 a.m.; simply make the appointment without saying anything of the prospects of the line.—Ch.A.G., 7/2/87. Mr. Saywell, 7/2/87.

Commissioner saw Mr. Saywell, I think.—D.C.M'L., 9/2/87. Yes. Mr. Saywell bases his estimate upon the loss he has sustained by his Tramway. I wish to see all the papers about the Sandringham Tramway, and should like to have a *précis*, I understand that two omnibuses are employed at present to run between Sandringham and the Railway Station. They must earn £10 a week to pay; a Tramway should earn at least double, *i.e.*, £20 a week; it will be run in connection with the trains only, so the expenses will not exceed that amount, and all earnings above £20 a week will be profit.—Ch.A.G., 10/2/87.

Please put papers with this quickly, and send to Mr. Badham for *précis*.—D.C.M'L., 10/2/87. Papers herewith.—J.S., 11/2/87.

Mr. T. Saywell to The Secretary for Public Works.

Dear Sir,

139 York-street, Sydney, 11 February, 1887.

I wish to draw your very serious and immediate attention to the tramway-line now being constructed from Kogarah station to Sans Souci, a distance of about 4 miles, which, in my opinion, will not cost less than £30,000, and which I understand is being constructed at Government expense, with the exception of the small item of £6,000 subscribed or promised by a few land speculators.

To show you the utter fallacy of this wild scheme, you would actually be building a line in direct opposition to your present Illawarra line, now running to that beautiful watering-place, Como, and if you compare the great advantages it already possesses over Sans Souci, and then look at your returns for Como, even in holiday seasons, you cannot but admit that that portion of the line does not attract the number of visitors that its natural beauty deserves.

In the face of this you would be creating a direct opposition to your own already constructed railway.

You are no doubt aware that I have, during the last 12 months built, and am now running, at my own expense, single-handed, and without asking one penny from the Government, a tram service, in conjunction with the Illawarra railway, the line only 1½ mile long, costing over £10,000, built as economically as possible, and notwithstanding the attractions of the sea baths (also constructed by me at a further outlay of £8,000) and Lady Robinson's Beach, the receipts for the twelve months show a clear loss of £1,370 10s. 4d.; therefore, how is it possible that a line such as the Kogarah-Sans Souci, which must cost at least £30,000, and which cannot be worked more economically than mine, can be anything else than a very serious loss to the Government of this Colony?

I would therefore suggest that the Government at once seriously consider this matter before any more money is laid out, rather than saddle the country with an outlay of at least £24,000 (in addition to the £6,000 before mentioned) for this tram line, which was never asked for by the public, and which will never pay for wages, independent of the interest upon the outlay.

I again most respectfully urge that this matter be at once looked into, and if I am allowed, can prove all I have written and urged against this unwise course.

And I would ask is it fair to private enterprise to subsidise such a line, in the place of what I have done, and that to at such a loss?

If the line is carried out I am convinced that a few months after it has been running the rails will be taken up again.

I now enclose you a copy of my tramway takings and expenditure for the twelve months, independent of office and management expenses, which shows a clear loss of £1,370 10s. 4d., added to which I have been at the loss of an action for injuries to a lad, costing me £723, making in all a total loss of £2,093 10s. 4d. for the twelve months.

After your perusal of same I leave the matter for the present in your hands, feeling assured that you will see justice done to

Yours, &c.,
THOMAS SAYWELL.

[Enclosure.]

Tramway Account—Expenditure.

Average working expenditure per week—	£	s.	d.
Driver	3	10	0
Fireman	2	5	0
Conductor	1	5	0
Ganger	2	8	0
Ganger	2	5	0
	11	13	0
Rent of ticket office	1	0	0
Coal (say)	4	0	0
Oil, waste, &c.	1	0	0
	17	13	0

Exclusive

Exclusive of management and general office expenses—		£	s.	d.
52 weeks expenses as above	... ..	917	16	0
Interest @ 6 % on capital £10,000	... ..	600	0	0
Depreciation of plant 5 %	... ..	500	0	0
Advertising, printing, &c. (say)	... ..	265	0	0
		<u>2,282</u>	<u>16</u>	<u>0</u>
Less twelve months receipts by sale of tickets	... ..	912	5	8
		<u>1,370</u>	<u>10</u>	<u>4</u>
Showing loss on working expenses	... ..	1,370	10	4
Verdict with costs against T. Saywell, for accident to boy	... ..	723	0	0
		<u>£2,093</u>	<u>10</u>	<u>4</u>

Minute by The Secretary for Public Works.

I do not see that action could now be stayed, even if it were deemed desirable to do so. The contribution of £6,000 has been accepted and the work commenced by the late Government, and nothing it appears to me can now be done. J.S., 14/2/87.

No. 28.

Minute by The Secretary for Public Works.

Department of Railways, Sydney, 17 February, 1887.

I SHOULD like to have a statement showing the progress made with the Sandringham Tramway—the estimated cost, &c. I should also like to see plans and section, and to have information to-morrow.

Urgent.

JOHN SUTHERLAND.

Mr. Thomson to see me to-morrow with statement of cost incurred, progress made, with plan and section.—CH.A.G., 17/2/87.

Memo. to Deputy Engineer,—

Office of District Engineer, Sydney, 18 February, 1887.

As per telephonic instructions of this morning, I have to report that the progress made in construction of Tramway, Kogarah to Sans Souci, is as follows:—

Formation about half completed.

Permanent way laid about half mile.

Estimated cost of construction is £11,432. The approximate cost of construction to date is £385, exclusive of surveys.

The section was forwarded to Phillip-street this morning.

W.S.

For Commissioner's information.—M.T. (*pro* Engr. for E. Lines), 18/2/87. Commissioner.

Cost—Gross construction	... ..	£12,632	Includes loop.
Land	... ..	1,000	
Rolling stock	... ..	5,000	
		<u>£19,632</u>	
Less £6,000 subscribed	... ..	6,000	
		<u>£13,632</u>	

See particulars and cost of work done on enclosed paper.—CH.A.G., 18/2/87.

I should like to have *précis*, as I would like to have full particulars showing how the work came to be undertaken.—J.S., 21/2/87. Urgent. Obtain papers and forward to Mr. Badham.—D.C.M'L., 21/2/87. Urgent. Papers herewith, 21/2/87.

No. 29.

J. H. Carruthers, Esq., M.P., to The Secretary for Public Works.

Sir,

130, Pitt-street, Sydney, 23 February, 1887.

I beg to request that you will not permit the progress of the Tramway from Kogarah to Sans Souci to be impeded by the agitation of either any persons interested in preventing its construction or of any section of the press unless upon very good cause clearly shown.

For your information I may state, that your predecessor, Mr. Lyne, received three deputations on the subject, and caused inquiries and surveys to be made during a period of over eighteen months. Finally he approved of the line, and obtained the approval of his Cabinet. The Executive Council also approved of the line, as evidenced by the *Gazette* notices in reference thereto, under the hand of the Governor.

The estimated cost of constructing the line is somewhat over £14,000 to Sandringham, and with a loop of 65 chains, about £16,000; but this estimate includes a double line for portion of the distance, which, however, I believe, is not being so constructed. Of this sum £6,000 has already been subscribed and paid to the Government by landholders and residents. Most, in fact nearly all, the land required is given, and the tram route is being widened to 100 feet mainly by voluntary gifts, but in one or two cases by resumption. The total cost to the country, all told, cannot exceed £14,000, and to make the line pay a return of 4 per cent. on that amount will not need a large traffic.

The line as now being constructed is a light railway, with curves and grades suitable for goods trains and small railway locomotives.

The question, will the line pay at once, is hardly in point, for the same question might be applied to making roads. The convenience and requirements of the public demand good roads at the State expense, and in many cases already railways have been constructed to assist in developing districts at

a loss in the running of the trains. The question is: Have the districts of Sandringham, Sans Souci, and Kogarah any advantages of position, climate, and scenery sufficient to warrant that, with better communication, they will speedily rise to be capable of making this tramway a revenue providing concern?

Three years ago there was no railway to Kogarah, and it was a mere village, with about 200 residents. Now it has its rail communication, and its population is over 3,000 souls, with churches, school, banks, school of arts, &c., &c. Sandringham and Sans Souci are far before what Kogarah was, and with a Tramway they will advance with great rapidity.

The traffic to these places is at present conducted by omnibuses, two lines of which ply daily. On holidays numbers of other omnibuses ply, together with vans, vehicles, &c. The average number of visitors at present on holidays is 2,000 to 2,500, and on Saturdays and Sundays 400 to 500. The daily traffic is also fair, but is mainly residents—from 50 to 100.

The coach-fare is 1s. from Kogarah to Sandringham—a prohibitive tariff.

I am informed by an experienced engineer that the line can be worked at a cost of £35 per week, or about £1,830 per annum. If the fares are fixed at 6d. each way, then a similar traffic to what already exists will give a return of over £5,000 per annum, without goods traffic. The expense of maintaining line, repairing stock, &c., &c., will hardly absorb the margin left by the above sums, and consequently a good revenue may fairly be expected at once. In addition to which the returns from the Illawarra line will be largely increased by the train-fares, Redfern to Kogarah.

If Saywell's tram does not pay it is simply owing to the low fares, for the tram is liberally patronised.

The work on the line has proceeded well, and the cost of construction is the lowest known in tram construction. To interfere now means an avoidance of a legal obligation with the subscribers, with possible complications regarding their claims, and an injustice to a large number of residents and others, whose fair claims to better communication were recognised.

I enclose a letter from the Mayor of Kogarah, appearing in this day's *Herald*, and I trust that the claims of my constituents concerned will be justly upheld by you.

Yours, &c.,

J. H. CARRUTHERS.

I should like to see the *précis* in this matter.—J.S., 24/2/87.

[Enclosure.]

EXTRACT from "S. M. Herald," February 23rd, 1887.

THE SANS SOUCI TRAMWAY.

(To the Editor of the Herald.)

Sir,

So that the public may not be misled by the vague and groundless rumours lately set afloat with regard to the above Tramway, I desire to place before your readers a few facts sufficient to show that all that has been done to induce the carrying-out of the work has been done openly, honourably, and with regard to the proper interests of the public. First of all, let me direct the attention of all to the source of the present opposition, as disclosed in your issue of this date. Mr. Thomas Saywell, the proprietor of a Tramway from Rockdale to Lady Robinson's Beach, has written a letter of protest to the Minister for Works, and has made some very rash statements as to the cost, &c., of the Sans Souci Tramway, concluding his letter with an appeal to the Government to see that justice is done to him. It is very clear, however, that the justice Mr. Saywell desires is to have established for his Baths, Hotel, and Land Company a monopoly of the speedy and easy steam communication by rail and tram.

The justice the public requires, however, is not identical with that of the monopolist, and the opposition of such an one must be taken at its true value.

Mr. Saywell says his tram does not pay him; *ergo*, the Sans Souci Tram will not pay, and should not be constructed. Saywell's Tram does not pay, and never will pay, until it is managed on different principles from those which prevail at present. It was constructed as part of a speculation to enable its proprietors to sell their land at a profit. This land has been sold at a large profit. Next, baths and a large hotel have been constructed, and the tram runs to make these pay. In every case Saywell's Tram has been made to subserve the greater speculations of the New Brighton Estate, the Brighton Hotel, and the baths. As a sample of the way in which the tram is worked, we find return tickets per train to Rockdale with tram passage and admission to the baths, sold by Saywell & Co. for one shilling, of which sum 7d. is for railway fare, 3d. for admission to baths, leaving 2d. per head to cover the cost of printing, and of running passengers to and from the beach. The traffic is enormous (exceeding over 8,000 on Boxing Day), but is mainly made up of holders of the above shilling tickets, but with such a ridiculous fare as above there can be no wonder that the tram ledger shows a balance on the wrong side to Mr. Saywell. Moreover, great complaint is made against the irregular manner in which the trams run, and casual visitors are often compelled to walk from the beach to Rockdale station in the absence of a tram. I think inquiry will show that whilst Mr. Saywell is deserving of great praise for his plucky enterprises at Lady Robinson's Beach, yet, as against a loss on his Tramway, he has been largely rewarded for the boldness of his ventures by the splendid sales of his land, and by the returns from his hotel and baths. He should not, however, assume that he is to be guaranteed and protected by the State in a monopoly to the injury of the rest of a large district.

As to the Sandringham or Sans Souci Tramway, everything in connection with it has been open and above board. The daily press has from time to time published full and ample reports of the depositions to Ministers, and of all other proceedings in connection with the matter. The late Minister for Works caused proper reports to be made by his officers, and three surveys were made by his engineers and their reports made public. The offers of the landowners to assist by a money contribution and by free gift of the major portion of the land—all these were matters of full publicity. Finally, the approval of the Minister was obtained on the evidence of facts before him and before the public. His approval was followed by that of his Cabinet. The assent of the Executive Council was obtained in due course, and the *Government Gazette* and daily papers contained the usual notices under the hand and seal of his Excellency the Governor "by the advice of the Executive Council."

The whole sum promised, viz., £6,000, has been actually paid to and received by the Government, and the land promised has been bound by legal documents. The work has been commenced and contracts let, so that fully one-half the expenditure necessary has been incurred. As to cost, the officers of the Department, tried, efficient, and practical men, have estimated the total as £16,000 cost to the country, and from my personal experience of the actual work done, and the easy nature of the country, I am satisfied that the estimate, if anything, is excessive.

Now, as to the expediency of constructing this Tramway: In the first place, the districts of Sans Souci and Sandringham are too well known to need description at length. They are admittedly the most beautiful around Sydney, being surrounded on three sides by the lovely and placid waters of Botany Bay, George's River, and Kogarah Bay. The climate is simply perfect, being tempered by cool sea breezes, whilst the water frontages are either clean, sandy beaches, or lawn-like shores to deep waters. The area opened up by a Tramway includes not only Sandringham and Sans Souci, but the opposite shores of the river, Towra Point, Commons Point, Sylvania, and a large portion of the Holt-Sutherland Estate. Already two large and well-conducted hotels are established there, with two first-class boarding establishments. Along the road many snug homesteads and orchards are to be seen, whilst the whole of the shores of Kogarah Bay are fringed with mansions and

villas

villas erected at large expense. Two beautiful public parks exist, Scarborough Park and Cook Park, the former a picture to look upon, with its picturesque garden, lake, and canal. Cook Park has only lately been established, but it is well worthy of being made accessible to the public. The trustees already are taking the necessary steps to cause public baths to be erected near the proposed tram terminus, in a well-sheltered bight where deep water with firm sandy bottom is to be had at all tides. Numbers of new houses are in course of erection along the tram route, and at Kogarah there is already a population of over 3,000 souls. On holidays, with the poor means of transit afforded by second-rate omnibuses, vans, &c., there is generally over 1,500 visitors to Sandringham, whilst on ordinary days two lines of 'buses are kept in full work. The benefit of the proposed tram will not be felt locally only, but by the people of Sydney, who will not fail to largely use a means of introducing them to pleasure-grounds far and above most others near to Sydney. The fares to be charged will be fixed, and must be fixed so as to bring in a fair income, and not as in Saywell's Tram at rates that cannot pay. The revenue that the Department will derive will not be from the tram alone, but from the increased number of travellers on the railway line, to which the tram will act as a feeder. That revenue is an item which Mr. Saywell has omitted to mention in his letter *re* his tram.

If this line is a speculator's line, remember, other lines, and in fact all railway lines, must be similar to the same extent; but in no other case has the Government been able to obtain a large money grant with free gift of land. I have no doubt but that the line will pay from the very first, and pay well; but, even if it does not, the Government has £6,000 as a contribution to exhaust as a first return before they have to write it off as a losing concern. The unemployed have been put to many works, cleaning roads, clearing lands, dredging rivers, &c., but none of these promise the return or justify the expense of their employment so much as this Tramway.

The Field of Mars Tramway is about to be commenced, without any outside assistance. Is it to be compared with this line for cost or prospects of return? The Camden-Campbelltown Tramway has been constructed and run for not one-tenth of the reasons that can be adduced in favour of this line.

Not only will the travelling public benefit by easy communication, not only will the Government benefit by its increased returns, but the municipalities interested will, by the increased value of property, receive larger rates, and be able better to improve their boroughs.

The people of Sandringham and Sans Souci, speculators or otherwise, have exhibited a sound public spirit in coming forward with their money and their land, and in laying out a tram route 100 feet wide; and until better authority than that of an interested opponent is shown that a public wrong has been done, public credit and praise should be awarded, and public support accorded to the enterprise of these people.

The district of which I have the honour to be Mayor, viz., Kogarah, was three years ago a mere village, of far less pretensions than the Sandringham of to-day. Three years of the benefits of easy communication with Sydney have increased its population tenfold, and have raised it to one of the most thriving of our suburbs. I look forward with great confidence to the same, and greater progress, occurring at Sandringham, with its unequalled beauties of scenery, climate, and situation.

I am, &c.,
EDWARD HOGBEN.

No. 30.

J. H. Carruthers, Esq., M.P., to The Commissioner for Railways.

Re Sans Souci Tramway.

Sir, Sydney, 130, Pitt-street, 25 February, 1887.

In our conversation a few days ago, with reference to the construction of the loop line, I pointed out several facts which I desire now to reiterate more clearly.

The length of the loop is 65 chains, and the cost of constructing, so I am informed, £1,800. The total distance by tram to Sandringham proposed terminus is 4 miles 5 chains as along the Sans Souci line. To return that way means a total journey to and from Kogarah of 8 miles 10 chains, with stoppage of 7 minutes (say) for shunting.

The distance by the loop from Sandringham to Kogarah is 3 miles, or a trifle under. Over a mile of haulage will be saved by using the loop in the return journey, and 7 minutes shunting will be saved, together with expense of shunting points and line.

The trains leaving Kogarah for Hurstville returns to Kogarah in about 35 minutes. By using the loop one single tram and engine could perform all the ordinary service, as it could run right round 7 miles in 35 minutes, there being no delay for shunting. It would be absolutely impossible for the one tram to perform the service by running to Sandringham, via Sans Souci, and returning the same way, as the distance, 8 miles 10 chains, would have to be performed in 28 minutes (35, less 7 for shunting).

There would be no necessity with the loop to erect water tanks, &c., as the engines could get enough water at Kogarah for a 35 minutes' run; but if they had to stay at Sandringham, as they would without the loop, water tanks and supply would have to be provided there.

The wear and tear of the rails, consumption of the coals, &c., all will be less owing to the less distance of the loop. In case, moreover, special trams were desired for Sandringham they could be run there direct by the loop, saving 1 mile. As to the inconvenience to people at Sans Souci having to catch the out-going tram to bring them to Kogarah, that is more than compensated for by the convenience of a tram to every train, and the time extra to them is but a couple of minutes, and that time is saved to the Sandringham people.

If it were possible, as I believe it is, to have the tram completed by the Easter holidays, then a very large traffic will be obtained at once, and the fares, if fixed at not less than 6d. the journey each way, will amount up to a large sum.

Yours, &c.,
J. H. CARRUTHERS.

Papers *re* Sandringham Tramway submitted with *précis*.—C.A.B., 2/3/87.

J. & W. Christian to The Commissioner for Railways.

Sir, Sydney, 15 March, 1887.

We herewith forward tracing showing proposed road in red to be dedicated by us at some future date to the Municipality of West Botany, and which we now agree to allow the Commissioner for Railways to use for tramway purposes, as though it were now a proclaimed road.

J. & W. CHRISTIAN.

Engineer for Existing Lines.—A.R., B.C., 18/3/87. District Engineer, Sydney, to note.—M.T., 21/3/87. Noted.—W.S., 23/3/87. The Deputy Engineer. Forwarded for Land Valuer's information.—M.T., 24/3/87. Land valuer. Information noted.—J.B.T., 28/3/87. Secretary.

No. 31.

J. H. Carruthers, Esq., M.P., to The Commissioner for Railways.

Sir,

Sydney, 130, Pitt-street, 28 March, 1887.

In view of keeping down the expense of construction of the tram-line to Sans Souci, I beg to call your attention to the great amount of cartage now necessitated there, through the non-connection of the line at two points near the station, where small lots are being resumed.

The cartage incurs an extra 1s. or 2s. per ton on all material over and above what the cost would be if trucks could be used, as would be the case if the connections referred to were made.

I believe that the sole delay in the matter is caused by the want of notices to the landowners under your signature—until these are served no entry being permitted on the land.

Under the circumstances, I beg to urge on you the necessity for the matter to be expedited so that the sections of the line may be connected, and the saving in carriage thereby effected.

Perhaps the delay is caused from the want of the confirmation notices by the Executive.

Yours, &c.,

J. H. CARRUTHERS.

This is being attended to. Minister's approval has been obtained, and it will be submitted to first Executive meeting.—A.R., B.C., 30/3/87. Engineer for Existing Lines. Mr. Shellshear to note.—G.C., 30/3/87. Noted.—W.S., 31/3/87. Tramway Engineer. Noted.—G.C. (p. G.L.), 1/4/87. Secretary.

No. 32.

Mr. D. E. Blacke to The Commissioner for Railways.

Sir,

246, Pitt-street, Sydney, 28 March, 1887.

Will you be good enough to inform me would the Government be willing to lease the Tramway, Kogarah to Sans Souci, on the terms of a ten-years lease at £4 per centum per annum on the outlay of the Government on the matter?

If so, kindly state the amount of the outlay, so that I may submit to my principals who, if everything be satisfactory, are willing to negotiate for such lease.

I have, &c.,

D. E. BLACKE.

Register, and submit.—A.R., 29/3/87. Not a very liberal offer.—A.R., 30/3/87. Inform that the question of leasing the Tramway has not yet received the consideration of the Government.—CH.A.G., 31/3/87.

The Secretary for Railways to Mr. D. E. Blacke.

Sir,

Department of Railways, 5 April, 1887.

In reply to your letter of the 28th ultimo, in which you ask whether the Government would be willing to lease the Tramway, Kogarah to Sans Souci, I have the honor, by direction of the Commissioner for Railways, to inform you that the question of leasing the Tramways has not yet received the consideration of the Government.

I have, &c.,

A. RICHARDSON,

(For the Secretary of Railways).

No. 33.

Précis.

TRAMWAY FROM KOGARAH STATION TO SANS SOUCI AND SANDRINGHAM.

THE scheme of laying down a Tramway from the Illawarra Railway to Sans Souci was first mooted in 1882, when a petition or memorial in favour of it was presented to Mr. Secretary Lackey, and a number of the landholders signed an undertaking to give the necessary land free of cost. An examination of the route was made by the Existing Lines Branch, but no further definite action was then taken.

So the matter rested until 1885, when in November of that year the Minister (Mr. Secretary Lyne) was asked to receive a deputation on the subject.

The Commissioner thereupon (13/11/85) wrote a minute, directing Existing Lines Branch to inspect the route and prepare a rough estimate in readiness for the deputation. The shortest route, he said, should be taken, and consideration should be given to the circumstance that there was already a private line to Lady Robinson's Beach. Perhaps the cheapest plan would be to take the line in that direction to Sandringham and Sans Souci. The railway line, which had been surveyed along the beach, might be followed and reported upon.

The District Engineer accordingly examined and reported upon a practicable route, stating that the line would be about $3\frac{1}{2}$ miles long, and would cost, approximately, £2,500 a mile, or £8,750 in all; it might, if desired, be connected with the Illawarra Railway and be used for goods traffic.

The proposed deputation waited upon the Minister and represented that the line was easy of construction, the country being level; that, with the present imperfect means of access, a large number of pleasure-seekers went to Sandringham and Sans Souci, and these would be largely increased on the completion of a Tramway; that the regular traffic would be considerable; and that the land required would be given free, and also from £4,000 to £6,000.

The Minister informed the deputation (in effect) that he concurred in what they had stated, their very liberal proposals would much assist the object they had in view, and he would strongly recommend the matter to his colleagues.

Hereon Commissioner minuted that before anything was done a survey of the line should be made, and a plan and book of reference be prepared.

Mr. Secretary Lyne gave directions accordingly, adding that the longest water frontage was to be taken if it would not materially increase the distance and cost.

Engineer

Engineer for Existing Lines submitted (7/5/86) a report giving particulars of two routes— (1.) Along the main road from Kogarah to Sans Souci, and thence along the Government Reserve to Sandringham. (2.) Through private land which would have to be purchased. No. 1, the report stated, was advocated by many persons who were prepared to give land to widen the road to 100 feet, and to give £6,000 towards the cost.

Commissioner minuted that if the persons interested would subscribe £6,000 and give the land on condition that the line was carried along the road he would certainly recommend that route.

On the same day a deputation waited upon the Minister to urge the construction of the line, and they stated that if it were carried along the Rocky Point Road £5,125 would be contributed and most of the land would be given free; but if any other route were adopted nothing would be given.

Mr. Secretary Lyne informed the deputation that personally he was in favour of the scheme, but he would like to make further inquiry before coming to a decision.

The Minister then called for all available information, and the papers were again submitted, but no decision was arrived at.

On the 8th June, 1886, the Hon. Secretary of the Sans Souci Tramway League wrote to Mr. Hammond, M.L.A., reviewing what had been done in the matter, and the offers which had been made, and urging him to aid them.

This letter was forwarded to the Minister by Mr. Hammond, and the Minister called for the immediate submission of an estimate.

Mr. Cowdery submitted an estimate accordingly of £20,902 without land; but the Minister did not express any determination.

On the 27th August, 1886, Mr. Hammond wrote to Mr. Secretary Lyne asking what progress had been made.

Commissioner, in reply to an inquiry from the Minister, intimated that nothing had been done, and that the matter hinged upon the Minister's decision whether the line was to be constructed upon payment of £6,000 and the conveyance of the land by the promoters.

Mr. Secretary Lyne then (16/9/86) minuted the papers "for submission to Cabinet," but there is nothing to show whether they came under the consideration of the Cabinet, and no further action is recorded until October 28th, 1886, when Commissioner minuted (with the approval of the Minister) that the Government having decided to give this work to the unemployed, the subscribers should be informed that on payment of the promised subsidy the Tramway would be commenced.

Mr. Hammond was so informed by letter of 28/10/86.

It appears by a memo. of the accountant's that soon after this a large sum of money was paid, and on the 9th December, 1886, Mr. D. E. Blacke advised, and the accountant acknowledged, receipt of the balance of the £6,000.

On the 31/12/86 Commissioner minuted that the work was to be carried on the same way as on the Randwick line, and that he would be glad to know when it could be started. Mr. Thomson reported that if the work were to be done by the unemployed it could be commenced on the 10th January, but if by contract time would be required for preparing specification.

Commissioner referred for the Minister's decision.

Commissioner minuted, that if any unemployed were available they must do the work; if not, it must be done by contract.

Mr. Thomson reported that there were unemployed, but they did not like the work, and they did not agree among themselves, and altogether the arrangement was not satisfactory.

Mr. Cowdery recommended that the work should be done by contract.

Mr. Secretary Lyne replied that a number of unemployed men had expressed their willingness to do pick and shovel work, and that they must do this work in the same way as on the Randwick line.

On the 13th January, 1887, the land-valuer, at Commissioner's request, submitted a report with reference to the land required for this tramway, and suggested that a small deviation (marked in blue on the plan) should be made.

This would involve resumptions, land-valuer stated, to the amount of about £900.

Commissioner recommended the blue line, as all the other land would be given free, and minuted that if Minister approved the plans would have to be submitted to the Governor in Council.

Mr. Secretary Lyne approved.

A few days after, Commissioner minuted that the line had not yet been approved by the Executive, adding that Mr. Lyne promised to write a minute, but he (the Commissioner) had not yet seen it.

On the 17th January the Minister asked, by minute, why the work had not been started on the Sans Souci Tramway. It ought, he said, to have been commenced that morning.

It appeared that there had been difficulty about obtaining tools, and Commissioner minuted, moreover, that the approval of the line by the Executive had not been obtained, and that it would be illegal to proceed without it. The Minister had approved of this authority being obtained, but there had been no meeting of the Executive since that date. He would be glad if the Minister would authorize him to stop the work until properly sanctioned.

The Minister replied that there had been two meetings of the Executive, viz., on the 15th and 17th January.

[It has been ascertained by inquiry at the office of the Clerk of the Council that the two meetings referred to by Mr. Lyne were special meetings, summoned for a special purpose; that ordinary business was not transacted at them, and that, being special, the Department had no knowledge of their being held.]

Per minute of 18/1/87, the Minister decided that the work should be proceeded with, without, and in anticipation of, Executive sanction, and operations were started accordingly.

An application for Executive sanction of the line was prepared by the Under Secretary, and bears date January 19th, but before Mr. Secretary Lyne could sign the minute the Ministry went out of office, and the minute in question was one of the remnants when Mr. Secretary Sutherland took office.

Mr. Secretary Sutherland signed the minute as a matter of routine, and the line was approved of by a minute of the Governor in Council, dated 25th January, 1887.

On the 21st January, 1887, Commissioner minuted that, in view of a modification which had been made in the plans, he would like to know the entire cost of the line, omitting the loop.

An estimate was furnished showing cost of construction £11,431, and land £900.

Commissioner minuted,—		
Construction	... ..	£11,431
Land	... ..	900
Six cars at £350	... ..	2,100
Three motors at £1,000	... ..	3,000
		£17,431

but he (Commissioner) did not think the permanent way material would cost more than £4 a ton, and the cost of laying, &c., would be reduced to £5,000, making the cost about £16,000 from which deduct subsidy £10,000

Under date of 3 February, 1887, Mr. Thomas Saywell addressed a letter to the Commissioner, requesting an interview on the subject of the Sans Souci and Sandringham Tramway, and stated that he, single-handed and entirely at his own expense, had constructed a Tramway $1\frac{1}{4}$ mile long, from Rockdale to Lady Robinson's Beach, at a cost of £13,000 or £14,000, and it did not even pay working expenses. Why then, he asked, should the Government saddle the Colony with an expenditure of at least £24,000, in addition to £6,000 contributed by the land speculators, for a line which would not pay the wages. The work should not be allowed to proceed unless it could be shown that it would be a profitable undertaking. The present trams even with their immense traffic were not paying, and if this line were laid six months would convince the Government of their mistake; the rails would be taken up.

Commissioner minuted that Mr. Saywell was mistaken as to the cost. It would not be £24,000 in addition to the £6,000 subscribed. Believed the line if worked economically would more than pay working expenses.

Subsequently Mr. Saywell had an interview with Commissioner, who afterwards minuted that Mr. Saywell based his estimate on the loss he had sustained by his Tramway. Two omnibuses were now running between Sandringham and the Railway Station, and they must earn £10 a week to pay; a Tramway should earn at least £20, and as it would be run in connection with the trains only, the expenses would not exceed that sum, and all earnings in excess of £20 would be profit.

Under date of 11/2/87, Mr. Saywell addressed Mr. Secretary Sutherland with reference to the "wild scheme" (as he terms it) of a Tramway to Sans Souci.

Mr. Saywell states that this Tramway would run in direct opposition to the Illawarra Line to Como, and to that beautiful place the holiday traffic returns would show an inadequate number of visitors were attracted. His (Mr. Saywell's) tramway showed a clear loss on the year's working of £1,370 10s. 4d. How then could such a line as that from Kogarah to Sans Souci, at a cost of at least £30,000, be anything but a loss to the Government? Was it fair to private enterprise to subsidise such a line after what he (Saywell) had done at his own cost? Mr. Saywell enclosed a Dr. and Cr. statement confirmatory of his assertions that his loss had been £1,370.

On the 11th February, 1887, the Minister asked for the plan and section and a statement of cost incurred to date. Commissioner submitted a statement of the probable cost of the line as under:—

Construction (including loop)	... ..	£13,632
Land	... ..	1,000
Rolling Stock	... ..	5,000
		£19,632
Less subscriptions	... ..	6,000
		£13,632

Expenditure to date was also stated to be £385.

Mr. Secretary Sutherland expressed a wish to have *précis* of the case. Mr. Carruthers, M.L.A., now (23/2/87) addressed the Minister in urgent terms in favour of this line, stating all that is herein set forth on that side of the question, and expressing a firm conviction that even with existing traffic (he gives some statistics) the line would pay. Mr. Carruthers encloses a letter (in print) from the Mayor of Kogarah on the subject. C.A.B., 24/2/87.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

RANDWICK AND WAVERLEY TRAMWAY.

(PARTICULARS RESPECTING.)

Ordered by the Legislative Assembly to be printed, 12 July, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 5th April, 1887, That there be laid upon the Table of this House,—

“(1.) Copies of all letters, minutes, and other documents relating to the construction of the Tramway between Randwick and Waverley.

“(2.) The total cost of making the said Tramway.

“(3.) The names of the parties from whom land was resumed for the said Tramway, and the sum paid, or to be paid to each.”

(*Mr. See.*)

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RANDWICK AND WAVERLEY TRAMWAY.

No. 1.

The Superintendent of Tramways to The Commissioner for Railways.

Sir,

I wish to suggest to you the advisability of continuing the Waverley line from its present terminus to connect with the Randwick line.

I think the best route would be *via* Frenchman's Road;—that matter, however, the Engineer would be able to decide.

I have, &c.,

J.R., 18/10/82.

I shall be glad to obtain Mr. Cowdery's report in this matter. It seems to me desirable that a junction should be made with the line to Coogee from Waverley, so as to give the residents the benefit of access to the sea-shore. It will also be desirable to have the line to give readier access to the workshops at Randwick. Will Mr. Cowdery have survey made and estimate of cost furnished?—CH.A.G., 21/10/82.

Mr. Hyndman for survey and estimate.—G.C., 26/10/82. Mr. Hyndman. Trial survey made; approximate estimate £24,200.—R.A.H., 30/10/82. Tramway Engineer. Commissioner.—G.C., 2/11/82. What will make this line so expensive? The distance I think is little more than a mile.—CH.A.G., 11/11/82. I should like to have estimate in general detail.—CH.A.G. Mr. Cowdery, B.C. Mr. Hyndman.—G.C., 13/11/82. Detailed estimates herewith.—R.A.H., 23/2/83. Commissioner.—G.C., 2/3/83.

Engineer for Existing Lines Office, Sydney, 1 November, 1882.

Extra Tramway to Randwick.

DETAILS of estimate line from Waverley terminus by Albion-street, Frenchman's Road, and Avoca-street, to terminus at Randwick—1 mile 50 chains; loop, by Ellison-street, to workshops, 12 chains; total distance, 1 mile 62 chains.

	£
1 mile 62 chains, double line	16,525
Forming road and kerbing, &c., guttering where needed	5,000
Points and crossings	475
	£22,000
Ten per cent. possible extras	2,200
	£24,200

Mr. Hyndman.

G. W. TOWNSEND.

If Mr. Hyndman is under the impression that he has furnished me with a detailed statement, he is mistaken. I take leave to say that the estimate submitted cannot be justified, even by making it a double line or putting in a sum of £5,000 for kerbing and guttering, an expenditure which is not required.

I am quite sure that the line could be constructed for the following:—

5,000 cubic yards excavation	£750
180 tons rails and fastenings	1,500
3,000 sleepers	750
Concreting, 30s. a yard	4,500
Metalling in tar metal	2,000
Reforming road	1,000
Points and crossings	475
Incidentals, 10 per cent.	1,097
Laying permanent-way	500
	£12,572

I should be glad to be shown in what way a single line of tramway, to connect Waverley with Randwick line (say) at junction of Cowper-street with present line, will cost more than £13,000?—CH.A.G., 6/3/83.

Mr. Cowdery. Mr. Hyndman for immediate report.—G.C., 9/3/83; urgent. 1 mile 62 chains single line, without allowing for forming, kerbing, and guttering, but with any other incidental expenses, will cost about £10,831. Please see note, 10/3/83, on paper attached.—R.A.H. Tramway Engineer. Why should it be double line? The line to Waverley is single.—CH.A.G. I estimated for double line as I was informed that no more single lines were to be laid, and all that were single now were to be doubled eventually.—GEO. WM. TOWNSEND, 10/3/83.

When the survey was made, I asked Mr. Suttor, who made it, if there would be much forming and kerbing, guttering, &c., to do. He said, "Yes; nearly the whole way." I have not seen the ground, but if Mr. Suttor's statement is correct, and I have no doubt it is, £5,000 is not an excessive estimate for (say) a mile of such work. The price given is the bare cost for double line, £16,525; incidental expenses, 10 per cent., £1,653; forming, kerbing, and guttering, £5,000:—£23,178. Please inform me what forming, kerbing, and guttering is to be charged to in making estimate.—GEO. WM. TOWNSEND, 10/3/83. Engineer for Tramways.

Commissioner.—G.C., 4/4/83. I do not consider that justice is being done the Department by estimates being made in this slipshod manner.—CH.A.G., 9/4/83.

Mr.

Mr. Hyndman says that the cost of a single line, without kerbing and guttering, will be £10,831. I do not see why the line should be a double one, nor do I see that the street should be kerbed and guttered at the expense of the Tramway Department. The roads or streets are for the most part unmade, and such drainage as is required to keep the line free from water would not cost much more than £6,000. £12,000 should be ample for the line, not £24,200.—C.H.A.G., 9/4/83. Mr. Cowdery, B.C.

Mr. Hyndman, for further report; and see me with reference to this.—G.C., 14/1/83. Estimate herewith.—R.A.H., 15/5/83. Tramway Engineer. Forwarded to Commissioner, with estimate attached.—G.C., 18/5/83. Commissioner.

Government Tramways.

Detailed estimate of single line, 142 chains, Waverley to Randwick:—

Excavation	£468	6
Concrete (Department finding everything)	2,811	6
Tarred metal do do	1,374	56
Screenings	718	52
Rails, guards, and fastenings	2,030	6
Laying rails, guards, and fastenings	390	5
Sleepers	624	8
Points and crossings	372	0
Labour	840	0
Incidental expenses	1,200	0
	£10,831	18
Forming, pitching, and metalling 1 mile 80 chains, at £50... ..	4,000	0
	£14,831	18

The road that will be traversed by this tramway is nearly entirely unformed, and generally very uneven in surface. When we make the line we shall have to form the street, when, I have no doubt, there will be some kerbing and guttering necessary, as was the case in Pymont Bridge Road. We shall in many places have to alter the level of the road, and wherever we do so, the whole of road will need reforming.
Engineer for Existing Lines. R.A.H., 15/5/83.

Commissioner.—G.C. Please have plan, section, book of reference, and specification prepared.—C.H.A.G., 27/5/83. Mr. Cowdery, B.C. Mr. Hyndman to furnish as early as possible.—G.C., 29/5/83. Mr. Townsend for survey.—R.A.H., 31/5/83. Put in hand, 10/7/83. This work has been delayed through surveyors being all engaged on other urgent work. Mr. Davidson has now started on permanent staking of this line.—R.A.H., 12/7/83. Engineer for Tramways. Commissioner.—G.C., 13/7/83. Seen.—D.O. (*pro* Commissioner), 16/7/83.

No. 2.

Mr. Surveyor Davidson's Report on Trial Survey.

Sir,

Tramway Survey Camp, Randwick, 23 July, 1883.

I have the honor to report upon the proposed line of tramway between Waverley and Randwick as follows:—

I have surveyed an alternative route near the Randwick end, diverging from the original trial line at the corner of Avoca-street and Frenchman's Road, and thence through reserves principally to junction with existing line at the corner of Allison and Belmore Roads.

The adoption of this line would entail but 30 chains of ordinary railway construction from the point of divergence (with easy grades), as against some 56 chains of street construction by original line, thus also shortening the total distance by about 26 chains.

I have further ascertained that there would be no objection to carrying the line through the reserves, but there is one small portion of unimproved Church property which would probably require to be purchased.

At the Waverley end, the route over Albion-street is the shorter, and would require no sharp curves.

I would, therefore, recommend that the proposed line commence at the Waverley terminus, Albion-street; thence along Albion-street and Frenchman's Road to corner of Avoca-street, Randwick; thence across reserves, *via* recreation ground, to connect with existing line at the junction of Albion and Belmore Roads.

I may add that the adoption of this line would obviate the necessity for an additional loop to the Randwick Workshops.

The Engineer for Tramways, Sydney.

I have, &c.,

PERCY DAVIDSON.

Plan of trial survey herewith.—R.A.H., 24/7/83. Tramway Engineer. I recommend the adoption of the trial line surveyed by Mr. Davidson, if approved; I will then have it staked out, and forward estimate of cost, plan and section herewith.—G.C., 31/7/83. Commissioner.

I think the cost of this line should be ascertained, with a view to the consideration of the question whether it should be adopted. It would afford the people of Waverley direct access to Coogee, and remove in a great measure the demand for an outlet at Bondi, which will be a most difficult route. In addition to the advantage the line will be to the public, it will be of considerable advantage to the Department, enabling it to return the rolling stock to the sheds at Randwick by a very short route, saving a large amount of running. It will make a circular line, which, I think, would be largely availed of by excursionists.—C.H.A.G., 20/8/83. Resubmit in a month.—F.A.W., 31/8/83.

No. 3.

The Mayor of Randwick to The Secretary for Public Works.

Sir,

Randwick, 12 June, 1884.

I have the honor, by direction of the Randwick Municipal Council, to forward herewith a petition from a large number of the residents and land owners of this borough praying that "the Waverley and Randwick lines of tramway may be connected."

The Council fully endorse the object of the petition, and beg to urge upon you the desirability of carrying out this work.

I have, &c.,

WALTER BRADLEY,
Mayor.

[Enclosure.]

To the Mayor and Aldermen of the Borough of Randwick.

Gentlemen,

We, the undersigned owners of property and occupiers of houses in the borough of Randwick, respectfully request that the Municipal Council will be pleased to urge upon the Government the desirableness of connecting the Waverley and Randwick lines of tramway.

The chief ground upon which we base this request, is that many of us who reside in the northern part of the borough, including St. Mark's, Bishopscourt, and Grand View Estates, are at present much inconvenienced by the distance we have to travel to reach the tram. Moreover, the proposed junction of the two lines of tramway would greatly benefit the borough generally by inducing the settlement of a large population on the route; and, we have reason to believe, would facilitate the working of the lines mentioned by enabling the Tramway Department to establish a circular or continuous line from Sydney through Randwick and Waverley and *vice versa*.

The question of forming the junction we advocate has already engaged the attention of the officers of the Tramway Department, as evidenced by the fact that one or more routes have been surveyed, and we think that an expression of the wishes of the residents, forwarded through the Council, would go far towards securing a favourable decision at the hands of the Minister for Works.

[Signed by ALFRED SYDNEY and sixty-four others.]

Railways, B.C., 17/6/84.

I believe this line, as a loop-line, would pay well. It will cost £14,000, the interest upon which, at 5 per cent., is £700 a year. It will be a great convenience to the Department, and working expenses will benefit to fully half the amount stated by the saving effected in running. Where are the plans and books of reference?—CH. A.G., 21/6/84; urgent.—Mr. Cowdery, B.C.

Mr. Townsend for plan, section, and book of reference and specification. Mr. Hyndman was requested to furnish these in May, 1883.—G.C., 24/6/84. Mr. Townsend; urgent. This work is in hand, and being pushed forward as quickly as possible.—R.T., 2/7/84. Tramway Engineer. When will plans, &c., be ready?—G.C., (*per G.L.*), 4/7/84. Mr. Townsend. Plan and section are ready. Proof of specification not yet received from Government Printer. All will be forwarded as soon as corrected copy is received from printer.—R.T., 7/7/84. Tramway Engineer.

No. 4.

Minute by The Assistant Engineer for Existing Lines.

Tramway—Waverley to Randwick.

Existing Lines Office, Sydney, 25 February, 1885.

THE plan, estimate, and specification for a tramway from Waverley to Randwick were submitted by Mr. Townsend, District Engineer for Tramways, about August or September last.

The forwarding of these for Commissioner's sanction was not carried out, because at the time a new style of permanent-way for tramways was being schemed, and it was thought that it might be tried on this Waverley to Randwick line. This occupied some time; finally the permanent-way shown on drawing No. 4 was worked out, and the estimate and specification revised to suit. The specification was then put in the printer's hand, but on receiving the proof from the printer it was discovered that the forming of the streets had not been provided for. This had to be gone into, and the schedule and specification again revised. No. 3 drawing was also made.

The subject is now complete with one exception, that the specification does not mention from what place or places 2,697 cubic yards of side cutting is to be obtained. I think the papers had better be returned to Mr. Thomson and registered in his office, and resubmitted to you in the regular way.

FRED. M. AVERN.

Engineer for Existing Lines.

Mr. Thomson for section, and prepare specification ready for tendering without delay. Read Mr. Avern's minute with reference to filling required.—G.C., 20/3/85. Plans have been corrected, specification prepared and printed, and everything is now ready to invite tenders. The extra filling required can be obtained from the streets and reserve through which the tram passes.—M.T., 29/3/85. Engineer for Existing Lines.

No. 5.

Minute by The Commissioner for Railways.

Tram-line—Waverley to Randwick.

I AM not aware that this line has been approved of yet.

CH. A.G.

Mr. Cowdery, B.C., 5/6/85. Instructions were given on Commissioner's M.P., 82/4,860, to prepare plan, section, book of reference, and specification. The cost of this line exclusive of land will be about £8,750.—G.C., 16/6/85. Commissioner. For Minister's decision. The line would be of great advantage

advantage to the Department, and would enable us to work a circular traffic *via* Waverley, Randwick, and Sydney. The outlay is less than I expected.—CH.A.G., 18/6/85. Please submit plan, &c. Mr. Cowdery, B.C. Plans and section herewith, also six tracings of land required to be resumed.—G.C., 30/6/85.

Commissioner.—There are only two pieces of land which will have to be taken and paid for, viz., 1 rood 9 perches from trustees of Presbyterian Church, and a small piece of 38 perches from James Monaghan. We do not take the land through the reserve, the Act gives us power to run through it.—CH.A.G., 1/7/85.

The whole cost should be under £10,000. It will be a very convenient line to the Department, and a popular line forming a circle, including Waverley, Coogee, and Randwick.—CH.A.G., 1/7/85. Papers returned by Minister without action.—D.C.M'L., 10/10/85.

No. 6.

Minute by The Secretary for Public Works.

Tramway—Charing Cross to Randwick.

LET me have papers.

W.J.L., 12/11/85.

Papers herewith. For Cabinet.—W.J.L., 12/11/85. Cabinet approves.—G.R.D., 15/12/85. Call for tenders.—CH.A.G. See whether we have rails, &c.; urgent. Mr. Cowdery, B.C., 16/12/85.

No. 7.

Minute by The Commissioner for Railways.

Extension of Tramway from Waverley to Randwick.

I HAVE the honor to forward for the approval of the Governor and Executive Council, the plan, section, and book of reference of the proposed extension of the tramway from Waverley to Randwick.

Description :

Commencing at the present terminus at Waverley and terminating at Allison Road, Randwick, being a distance of 1 mile 26 chains.

Draft proclamation herewith together with papers.

I shall be glad if you will obtain the necessary approval.

Under Secretary for Public Works.

CH.A.G., B.C., 22/12/85.

Government Tramways—Extension Waverley to Randwick.

THE Commissioner for Railways, appointed by Act of Council 22 Victoria No. 19, hereby gives notice that His Excellency the Governor, with the advice of the Executive Council, deems it expedient to make and complete a tramway between Waverley and Randwick, and in pursuance of the Acts of Parliament 43 Victoria No. 25, and 46 Victoria No. 26, to erect certain works and conveniences in connection therewith: Commencing at the present tramway terminus at Waverley, and terminating at Allison Road, Randwick, being a distance of 1 mile 26 chains; that for that purpose certain parcels of land which are particularly set out and coloured red in the map, or plan and book of reference to be seen at the office of the Commissioner for Railways, Phillip-street, Sydney, are required to be taken by the Commissioner for Railways, and that all parties interested in the said land or affected by the said works are hereby required to set forth in writing to the said Commissioner within one month from the publication of this notice in the Government Gazette, any well-grounded objection that may appear to them to exist to the making of the said tramway, or to the erection of the said works. Dated at Sydney, this 22nd day of December, in the year of our Lord one thousand eight hundred and eighty-five.

CH. A. GOODCHAP,
Commissioner for Railways.

The seal of the Commissioner for Railways was affixed hereto, at Sydney, }
this 22nd day of December, 1885, in the presence of,—

L. P. IREDALE.

No. 8.

Minute for The Executive Council.

Tramway Extension from Waverley to Randwick.

Department of Public Works, Sydney, 22 December, 1885.

I HAVE the honor to submit, for the approval of His Excellency the Governor and the Executive Council, plan, section, and book of reference of the proposed extension of the tramway from Waverley to Randwick, commencing at the present terminus at Waverley and terminating at Allison Road, Randwick, being a distance of 1 mile 26 chains, in accordance with law.

A draft notification, for publication in the Gazette, is also submitted for the approval of His Excellency the Governor and Council.

WILLIAM JOHN LYNE.

The Executive Council approve of the proposed extension of tramway from Waverley to Randwick, as set forth in the plans and book of reference herewith submitted.—ALEX. C. BUDGE, Clerk of the Council. Minute 85-54, 22/12/85; confirmed, 22/12/85.—CARRINGTON. Railways.—J.R., B.C., 30/12/85. Advertisements sent to Sydney daily papers, 30/12/85.

No. 9.

Minute by The Engineer for Existing Lines.

I FORWARD herewith duplicate tracings of land required to be resumed, as also book of reference. Please say if work is now to be advertised. G.C., 7/1/86.
Commissioner.

Yes.—CH.A.G., 8/1/86. Engineer for Existing Lines, 9/1/86. Draft advertisement inviting tenders herewith.—G.C. (*per* G.L.), 11/1/86. Commissioner.

Department of Public Works, Railway Branch, Sydney, 11 January, 1886.
TENDERS will be received at this office, until 11 o'clock on Tuesday, the 16th February, from persons willing to contract for the construction of a single line of tramway from Waverley to Randwick, being a distance of 1 mile 26 chains about.

Plans may be seen and copies of specification, form of tender, schedule of quantities, and further particulars obtained at the office of the Engineer for Tramways, 44, Phillip-street, Sydney.

Tenders are to be endorsed "Tender for Construction of Tramway—Waverley to Randwick."

The Commissioner does not bind himself to accept the lowest or any tender.

CH. A. GOODCHAP,
Commissioner for Railways.

Insert.—CH.A.G. Advertisement sent to *Gazette*, Public Works, and Sydney daily papers.—D.C.M'L., 13/1/86. Have notices been served?—CH.A.G., 13/1/86. Land valuer. No; tracings have only just been received. Notices will be prepared at once.—J.B., B.C., 13/1/86. Commissioner.

No. 10.

Minute by The Commissioner for Railways.

I do not think there is any pressing necessity for this line of tramway.

I believe it would pay very well, even in the direction of saving working expenses; but since I advocated the line the question of leasing the lines generally has been brought prominently forward, and has assumed an air of reality. Till it is finally decided I should not recommend the construction of any new line of tramway.

CH.A.G., 13/2/86.

Resubmit with tenders, when received for the reason given. I shall not recommend the acceptance of a tender for this work.—CH.A.G., 13/2/86.

No. 11.

Minute by The Under Secretary for Public Works.

Sir,

Department of Public Works, Sydney, 16 February, 1886.

The tenders, fifteen in number, for the work specified in the margin are referred to you for report, and you will have the goodness, as early as possible, to return them to me direct for submission to the Minister.

The Commissioner for Railways.

I have, &c.,

JOHN RAE.

Construction of
single line of
tramway—
Randwick to
Waverley.

Construction of single line of tramway—Waverley to Randwick:—Mr. Cowdery may report upon these tenders, but no information is to be given to tenderers nor prospect held out of any tender being accepted. The question of acceptance of a tender for this work, or indeed of the carrying out of the work at all will have to be considered; circumstances have changed in regard to tramway extensions since it was determined to invite tenders for this work. Please state cost of the work complete, supply of rails, gravel, &c.

CH.A.G., 16/2/86.

Analysis of tenders herewith. The cost will be as follows:—

Cowie & Duncan's tender	...	...	...	...	...	£5,277	3	9
Rails and guards, 136 tons, at £8	...	...	...	...	...	1,088	0	0
10,900 wood screws, 2.5 tons, at £20	...	...	...	...	...	30	0	0
10,350 blocks, 8 tons, at £12	...	...	...	...	...	96	0	0
10,350 bolts, 2.3 tons, at £20	...	...	...	...	...	46	0	0
1,210 fish-plates, 2.2 tons, at £15	...	...	...	...	...	33	0	0
2,420 fish-bolts, 0.8 tons, at £20	...	...	...	...	...	16	0	0
2,420 ferrules, 0.2 tons, at £15	...	...	...	...	...	3	0	0
Points and crossings, 3 sets	...	...	...	...	...	120	0	0
Carting material to site, 155 tons, at 5s.	...	...	...	...	...	38	15	0
Gravel, 1,300 tons, at 10s.	...	...	...	...	...	650	0	0
Total	...	...	...	...	...	£7,397	18	9

This does not include the cost of any land that may require to be resumed.
Commissioner.

G.C., 24/2/86.

CONSTRUCTION

CONSTRUCTION of Tramway—Waverley to Randwick—Analysis of tenders:—

Cowie & Duncan	...	...	...	...	...	...	...	£5,277	3	9
Paisley & Morgan	...	...	...	...	...	...	...	5,381	12	8
Nightingale & Co.	...	...	...	...	...	...	...	5,397	0	11
Angus & Co.	...	...	...	...	...	...	...	5,885	0	0
M'Ardle & Thomson	...	...	...	...	...	...	...	5,975	8	6
Willmott & Morgan	...	...	...	...	...	...	...	5,988	15	4
Forster & Taylor	...	...	...	...	...	...	...	6,087	6	2
Badams Sons & Co.	...	...	...	...	...	...	...	6,116	8	10
Thomas Quilty	...	...	...	...	...	...	...	6,193	14	1
Salmond & Denne	...	...	...	...	...	...	...	6,237	3	0
Rutherford, Metcalfe, & Lackey	...	...	...	...	...	...	...	6,529	13	6
Ferris, Wilson, & Co.	...	...	...	...	...	...	...	6,630	14	9
Andrew Duxbury	...	...	...	...	...	...	...	7,101	11	3
Michael M'Namara	...	...	...	...	...	...	...	7,117	10	0
John George Gatty & Co.	...	...	...	...	...	...	...	7,461	0	0

No. 12.

Extract.

Extract from *Evening News*, 18th February, 1886.

The Trams—Proposal to destroy Randwick Reserve.

IN the face of the large sums of money which have recently been allotted for reserves in the several suburbs, and the numbers of applications for the resumption of land for parks, &c., now in the hands of the Government, the Tramway Department, it is said, proposes to break up the Randwick Reserve, a valuable block of land, on which a considerable sum of money has been spent in converting it into a recreation ground and park for the use of residents and visitors. At the Randwick Council meeting on Tuesday night, a petition was received from the Randwick and Coogee Cricket Club, praying the Mayor and aldermen to exert their influence to prevent the Government from resuming a large portion of the Randwick recreation ground for tramway purposes, and to urge the Government to so deviate from its plans as not to interfere with the already limited area available for the use of the residents, and the cricket and football clubs in the borough. The aldermen unanimously expressed their indignation at the proposal of the Government to destroy the reserve, and it was decided that a deputation, consisting of the Mayor and Aldermen Wilson and Pearce, should wait on the Minister for Works to urge upon him to have the plans altered in order to leave the reserve intact. It was mentioned that the portion of the park proposed to be resumed included the pavilion and a fine avenue of trees, which separated the park from a portion of the tram-line, and on which over £300 had already been spent in effecting improvements.

I believe there is a street running along the back of the reserve. Could not the tram-line (if it be constructed) be taken along that street, if it exists, as I believe it does?—CH.A.G., 21/2/86. Mr. Cowdery, B.C. Mr. Thomson to say.—G.C., 22/2/86.

There is a line 33 feet wide along the back of the reserve, but the line could not be taken along that, as we would not be able to make a junction with the Randwick line. By resuming a strip of land, however, 33 feet wide, as shown on tracing attached, the line can be diverted so as to leave the recreation reserve intact, except a small piece of the corner. I think this would be the preferable course to adopt.—M.T., 1/3/86. Tramway Engineer.

I have examined this on the ground, and approve of tracing attached.—G.C., 3/3/86. Commissioner.

The line is objected to by many of the residents, and I promised Mr. See that nothing final should be done till the question had been thoroughly considered. Could not the line be located without going through the recreation reserve? Please submit plan of route, and show how deviation of line could best be made with the least possible expense.—CH.A.G., 3/3/86. Mr. Cowdery, B.C.

Tracing herewith, showing deviation.—G.C., 4/3/86. Commissioner. Ask Mr. See, M.P., to call and inspect the plan showing deviated course.—CH.A.G., 6/3/86.

The Commissioner for Railways to J. See, Esq., M.P.

Sir,

Department of Railways, Sydney, 10 March, 1887.

With reference to your personal interview respecting the objections entertained by many residents of Randwick to the proposed route of the Waverley-Randwick tramway through the recreation reserve, I have the honor to inform you that a plan has been prepared showing the deviation which will be necessary to avoid encroachment upon the reserve in question, and I shall be glad if you will call at this office at your early convenience and inspect the plan.

I have, &c.,

CH. A. GOODCHAP,

Commissioners for Railways.

J. See, Esq., M.P., to The Commissioner for Railways.

Dear Sir,

Sydney, 16 March, 1886.

I send herewith a map of Randwick. Cook-street, as you will notice, intersects Francis-street, and is close to the Belmore-street tram shed. This really should be the route of the tram-line, and will save the resumption of much land. Kindly let me have the map back, as it is the property of the Borough Council.

JOHN SEE,

Mayor of Randwick.

Minute

Minute by The Commissioner.

MR. COWDERY for further report. I wish to curtail the expense of this work, and must ask Mr. Cowdery to say if a line can be run through the streets rather than through land which will have to be taken and paid for at a high rate.

Could not a line be run from the Frenchman's Road, curving into Avoca-street, through the piece of land in possession of the Crown formerly set apart for a Roman Catholic School; thence by Avoca-street to Francis-street, curving into that street by making use of the corner shown as a reserve; and then by Francis-street to Cook-street (taking a small corner to curve into Cook-street); and then by Cook-street to a junction with the Randwick line. CH.A.G., 19/3/86.

Mr. Thompson for report.—G.C., 22/3/86; urgent.

No. 13.

Messrs. Cowie and Duncan to The Commissioner for Railways.

Waverley and Randwick Tramway.

Sir,

58, Derwent-street, Glebe, 25 March, 1886.

We are anxious to know the delay in accepting our tender *re* the construction of the above line of tramway. We have, &c.,

COWIE & DUNCAN.

Was their tender the lowest.—D.C.M'L., 26/3/86. Have we returned their deposit? Yes; they are the lowest tenderers, and their deposit has not been returned.—J.S., 26/3/86. The deposit, £75, made by Duncan & Cowie with their tender for construction of tramway—Randwick to Waverley—may be returned to them.—G.B. (*per* Commissioner), 16/4/86. Under Secretary for Public Works. Deposit returned.

No. 14.

W. J. Trickett and R. Butcher, Esq's., M.P., to The Secretary for Public Works.

Dear Sir,

Sydney, 30 March, 1886.

We have the honor to ask that you will receive a deputation on Friday next to consider the following matters. Kindly name an hour that will be convenient:—

- (1.) Extension of tramway from Waverley to Randwick.
- (2.) Extension of twopenny section tram-fare beyond Begg-street, Paddington.

We are, &c.,

W. J. TRICKETT.
R. BUTCHER.

I have arranged to see the deputation at 12.45 p.m. on Friday.—W.J.L., 31/3/86.

Minute by The Secretary for Public Works.

THE deputation, Messrs. Trickett and Butcher, with representatives of the Paddington Council, waited upon me to-day with reference to the proposed tramway from Waverley to Randwick. They urged that, as tenders had been received and the people were expecting the work, the extension might be gone on with.

I informed them that tenders had been received, as they stated; but, owing to the cost, the tenders had been declined. The matter was, however, having attention, and inquiries were now being made to ascertain whether, by adopting a new route, the probable cost of the line could not be much reduced. I stated it was expected the Engineer's report would be ready in a few days.

W.J.L., 3/4/86.

Mr. Cowdery.—G.B., B.C., 7/4/86; urgent. Mr. Thomson for full reply to Commissioner's minute of 19/3/86 on attached papers.—G.C. (*per* G.L.), 9/4/86; very urgent. Report herewith.—M.T. (*per* W.S.), 27/4/86. Commissioner.

Memo. to The Engineer for Existing Lines.

Waverley to Randwick Tramway—proposed deviation.

Office of District Engineer, Sydney, 27 April, 1886.

IN order to avoid the necessity for resuming private land in the construction of the tramway from Waverley to Randwick there are two possible alternate routes.

The first is along Avoca-street, Francis-street, and Cook-street to a junction with the present Randwick line in Belmore-street.

In the first case the line will be about 13 chains longer than the original line; and it will be necessary to resume a little land at the corner of Francis-street and Cook-street. The junction will be in the direction of Coogee, and if the line is to be used as a circular one between Sydney, Waverley, Randwick, and back to Sydney, it will be necessary to shunt in Belmore-street, Randwick.

The second line will be about 7 chains longer than the original line, but 6 chains shorter than the deviation by way of Francis-street and Cook-street, and, as Avoca-street joins Allison Road at an angle, no land will require to be resumed, and, as the junction is in the direction of Sydney, no shunting will be necessary in working the traffic on the circle between Sydney, Waverley, Randwick, and back to Sydney.

The cost of the line along Francis-street and Cook-street, exclusive of land resumption, will be about £1,200 more than the original line, as the streets are not formed, and there will have to be a large amount of excavation and filling to bring the streets up to the requisite levels.

The

The cost of the line along Avoca-street and Allison Road will be about £500 more than the original line. Avoca-street and Allison Road are both formed and metalled, and there is, therefore, a good bed for the tramway without any extra excavation or filling.

On the Francis-street line the grades are steeper, and there are two sharp curves. On the Avoca-street and Allison Road line the grades are flatter, and there is only one sharp curve.

MAX THOMSON.

No. 15.

Minute by The Commissioner for Railways.

Tramway—Waverley to Randwick.

WHAT is being done about the survey of suggested route? When can tenders be invited for new route?
CH.A.G., 27/4/86.

Mr. Cowdery; urgent.

Will Commissioner please decide, on report attached, which route is to be taken, so that permanent plan and section may be made.—G.C., 29/4/86. Commissioner. Please submit plan showing the two routes.—CH.A.G., 30/4/86. In estimating cost of original line was the value of the land to be taken included?—CH.A.G., 30/4/86. Mr. Cowdery; urgent. Mr. Shellshear for plan showing both routes, and also for reply to latter part of Commissioner's minute.—G.C., 3/5/86. Mr. Shellshear.

THE two alternative routes have been plotted on the working plan herewith. The section of the Avoca-street, Francis-street, and Cook-street line is attached to the papers, from which it will be seen that there is a large amount of earthwork required to form the streets before the tramway can be constructed.

A section along Avoca-street and Allison Road is forwarded with the working plan. These streets being formed, there will be no extra earthwork, and the grade is much easier than in the case of the Avoca-street, Francis-street, and Cook-street route.

The estimated cost of the original line as per lowest tender, including rails, &c., is £7,397 18s. 9d. The estimated cost of the line *via* Avoca-street, Francis-street, and Cook-street, including rails, &c., is £8,597 18s. 9d. The cost of the line *via* Avoca-street and Allison Road, including rails, &c., is £7,897 18s. 9d.

The above estimates are exclusive of land resumptions. The original line passes through several valuable blocks of private land, the resumptions of which would add largely to its cost. The Francis-street and Cook-street line would require a corner to be resumed, which would add to its cost. The Avoca-street and Allison Road line would be constructed throughout on the public streets, and there would be no item for resumption of land.

The Tramway Engineer.

W.S., 25/5/86.

Plan herewith showing the two routes, of which the one *via* Avoca-street and Allison Road (shown in blue) is recommended, being the cheapest, and of easy gradient, as well as passing along streets already formed. In the estimated cost of original line, the value of land to be resumed was not included.—G.C., 28/5/86. Commissioner.

There are grave objections to the route by Avoca-street and Allison Road. The objections are taken by the residents. The route by Cook and Francis Streets must be adopted (if any). Please ascertain what the cost of the land will be.—CH.A.G., 29/5/86.

Mr. Cowdery, B.C. Mr. Thompson.—G.C., 31/5/86.

Please show on plan the extent and area of land to be resumed at corner of Francis-street and Cook-street, and if this route is adopted it will be necessary to have a junction with the present line leading towards Sydney, as indicated on plan in pencil, for which purpose the corner between Cook-street and the present line will also have to be resumed. Please plot this on the plan also, and furnish approximate value of all land to be resumed.—M.T., 1/6/86. Mr. Shellshear.

Mr. Halligan.—W.S., 5/6/86. Plan and section will be ready this week. If this route is adopted, the revised specification can be prepared in a few days.—W.S., 23/6/86. The Tramway Engineer. Commissioner.—G.C., 24/6/86.

No. 16.

J. C. Neild, Esq., M.P., to The Under Secretary for Public Works.

Dear Sir,

Sydney, 22 June, 1886.

Re arrangement made with you verbally for a deputation to the Minister for Friday, *re* Randwick tramway. Kindly let me know to-morrow (Wednesday morning) at my office, 26, Bridge-street, at what hour Mr. Lyne will receive the said deputation.

Very truly yours,

JNO. C. NEILD.

Friday, 25th, at 12:30; Mr. Neild informed.—J.R., 23/6/86.

Minute by The Secretary for Public Works.

Tramway—Waverley to Randwick.

A DEPUTATION consisting of Messrs. Neild, Garrard, Hawthorne, Davies, M's.P., Allen, and Griffiths, waited upon me to-day, relative to the above proposed tramway.

They represented the matter had been in abeyance for a considerable time, and urged that the work should be carried out without delay. It would prove not only a convenience to the people in the locality, and prove a remunerative extension, but it would be of great advantage to the Department in giving a direct line between the Randwick running sheds and Waverley terminus, &c. I informed them

that I had been so occupied in another place (listening to a nine-hours speech by Mr. Neild), during the last few days, that I had had no opportunity of looking through the papers and examining the reports sent in relative to this matter, and I was therefore unprepared to give them an answer. I would lose no time in going through the papers and deciding what action should be taken, and I had little doubt the line would ultimately be constructed.

W.J.L., 25/6/86.

No. 17.

W. J. Trickett, Esq., M.P., to The Secretary for Public Works.

Sir,

Legislative Assembly, Sydney, 28 June, 1886.

I notice by the *Sydney Morning Herald* of Saturday, that a "deputation" is reported to have waited on you relative to the continuation of the tramway line from Waverley to Randwick. I am at a loss to know what public meeting or what body of persons deputed the gentlemen who waited on you to do so, as my constituents have always done Mr. Butcher and myself the honor to advise us of any public meetings; and one of the deputation (Mr. Jones) now tells me that the only request he had to attend was from Mr. J. C. Neild.

My object in now writing is to urge the construction of the line—a work I have always advocated—as the Commissioner and the records of the Department can prove, and I shall be glad to be advised how the matter is progressing, and to hear that, what was long ago promised me, is carried out.

It is convenient for gentlemen to come in at the last moment (when a matter is near completed) and try and get the credit of it, and I therefore now (while protesting against the attempt to ignore Mr. Butcher and myself), ask for the carrying out of the promise made me.

Yours, &c.,

W. J. TRICKETT.

Please acknowledge and submit report as to present position of this matter.—W.J.L., 30/6/86. Receipt acknowledged, 30/6/86. State on this paper what the last proposal is; what stage it is in; estimated cost of construction, land, &c.—CH.A.G., 3/7/86. Mr. Badham, B.C.

The last proposal as approved by Commissioner's minute of 29/5/86, was to carry the line by way of Francis-street and Cook-street. Plans will be ready in a day or two. Estimate of cost not yet prepared. Nothing yet done as regards land by this route, very little land, however, will be required.—C.A.B., 5/7/86.

See tracing. Commissioner. Are plans now ready.—CH.A.G., 13/7/86. Mr. Cowdery.

Memo. to the Tramway Engineer,—

District Engineer's Office, Sydney, 8 July, 1886.

I forward herewith plan and sections of deviations, Waverley to Randwick tram-line. Please have route decided so that specification may be prepared. Papers returned to you on 23/6/86 (86-458), with original plan and section.

Commissioner.

WALTER SHELLSHEAR (*per* H.G.M.)

No. 18.

The Council Clerk, Waverley, to The Under Secretary for Public Works.

Sir,

Borough Council Chambers, Waverley, 10 August, 1886.

I have the honor by direction of the Borough Council of Waverley, respectfully to request that you will have the goodness to inform me at earliest opportunity as to when the proposed tram-line from Waverley to Randwick will be started. The reason for the inquiry is, that portion of the route is along Albion-street within this borough, and this street is now in an impassable condition. In view of the early construction of the tram-line, this Council has not considered it right to expend any large sum of public money upon a work which might immediately be destroyed, but the public compelled to travel on the street are growing so impatient at the delay that the Council must make some improvement in the thoroughfare, and beg that with your usual courtesy you will afford the fullest information in your power.

I have, &c.,

ROBERT T. ORR.

I am not satisfied that this tram-line is absolutely necessary just now. I submit, however, the plans for the Minister's decision.—CH.A.G., 16/8/86.

No. 19.

Minute by The Engineer for Existing Lines.

It has been decided by the Commissioner that from corner of Avoca and Cowper Streets the route of the line is to pass through the reserve into Francis-street (as shown in blue pencil); thence as shown in green till junction with present line. Please have new plan and section of the whole line prepared accordingly, and submit without delay, with estimate of cost. The usual style of permanent-way (not longitudinal sleepers) is to be adopted, the part through the reserve being ballasted only.—G.C., 1/9/86.

District Engineer; urgent. Plan now in hand, and will be submitted with estimate as soon as possible.—W.S., 10/9/86. Tramway Engineer.

LEGISLATIVE ASSEMBLY, WEDNESDAY, 8 SEPTEMBER, 1886.

(4) Tramway between Randwick and Waverley:—Mr. Neild, for Mr. Trickett, asked the Secretary for Public Works,—Referring to answer given to Mr. Trickett on 18th August, what decision has been come to with regard to the tramway from Randwick to Waverley?

MR. WANT answered,—Pressure of other business has prevented the consideration of this question, but it will be decided upon an early day.

MR. THOMPSON promised to visit the locality and to lay out the line across the reserve (gravel reserve) in the way I pointed out.—CH.A.G., 14/9/86. Engineer for Existing Lines.

Mr. J. See, M.P., was to appoint a day to go over the route with me, but has not yet done so. Irrespective of this, however, I have gone over the proposed route of the line which is now being laid out, and plans, &c., prepared as directed by the Commissioner.—M.T., 16/9/86. Commissioner. There

There must be no unnecessary delay in view of the Minister's answer to question asked in House.—
 CH.A.G., 17/9/86. Mr. Cowdery. Mr. Thomson.—G.C. (*per G.L.*), 20/9/86. Please hurry on this
 work as quickly as possible. When will plans and section be ready?—M.T., 27/9/86. District Engineer.
 Plan and section will be ready in a fortnight.—E.M.H., 23/9/86. Plans and estimate, &c., will be sub-
 mitted in about two weeks.—G.C., 28/9/86. Commissioner. Submit plans on the 7th instant.—
 CH.A.G., 2/10/86. Mr. Cowdery. Plan and section herewith; estimate and detail drawings are in
 hand. It will be necessary to resume a small piece of land corner of Cook and Francis Streets, and also a
 part of the Wesleyan Church land, corner of Cook-street and Allison Road.—G.C., 6/10/86. Commissioner.
 Why take the Wesleyan Church land? A siding at the junction with existing line would enable
 an engine to change ends of tram, and to go to workshops by present route.—CH.A.G., 7/10/86. Mr.
 Cowdery. Mr. Thompson for report.—G.C., 11/10/86. A siding or two cross-over roads in present
 line will answer the purpose, only more time will be occupied in shunting the engine round and blocking
 the traffic on the main Randwick line.—M.T., 11/10/86. Tramway Engineer. This can be arranged
 without taking the Church land.—G.C., 11/10/86. Commissioner. Submit with detailed estimate not
 later than the 20/10/86.—CH.A.G., 13/10/86. Mr. Cowdery. Mr. Thompson.—G.C., 14/10/86.

Plan, section, and detailed estimate herewith, also tracings of land to be resumed. The estimated
 cost of the line is £8,475, exclusive of the cost of land. Referring to my minute, 11/10/86, will the
 Commissioner please say whether the line is to be worked by means of a triangle as shown on plan
 (necessitating the resumption of land from the Wesleyan Church), or whether it is to be worked by means
 of over roads and shunting on the main Randwick line.—G.C., 16/10/86. Commissioner.

Mr. Thomson to see me.—CH.A.G., 21/10/86. Submit plan with cross-over road.—CH.A.G.,
 23/10/86. Please see me with reference to having alteration plotted on plan, and submitting amended
 estimate.—M.T., 25/10/86. Mr. Fisher. Amended estimate and plans herewith.—G.F., 28/10/86.
 The Deputy Engineer. Amended plan, section, and estimate herewith, also four tracings of land to be
 resumed. The cost of the line, as per amended estimate, will be about £7,535, exclusive of cost of land.—
 M.T., 29/10/86. Engineer for Existing Lines. I have received instructions to carry out this work, will
 Commissioner please arrange for land valuer to resume the land. Tracings herewith.—G.C., 29/10/86.
 Commissioner.

Submit plan and book of reference. It will be seen by the Tramway Act that we can go through
 reserves free of cost. I believe the land we go through, said to belong to Randwick Council, is a reserve.
 Is it not?—CH.A.G., 29/10/86.

I said in my minute of 16/8/86 that I was not satisfied that this tramway was absolutely necessary.
 I still hold the opinion that it will not pay as a traffic line, but it may save us some expense in returning
 motors, &c., by a shorter route to the stables. However, the expenditure on this account alone would be
 hardly justifiable.—CH.A.G., 29/10/86. Engineer for Existing Lines.

Mr. Thomson for plan and book of reference.—G.C., 1/11/86. Please submit amended plan, section,
 and book of reference at once. In the meantime nothing is to be done with regard to our arrangements for
 having this work done by the unemployed.—M.T., 1/11/86. District Engineer, Sydney. Please have survey
 and section made for deviation through the reserve, as shown in pencil on plan, and submitted with book of
 reference at once.—M.T., 4/11/86. District Engineer, Sydney. Plan and book of reference are being
 prepared as expeditiously as possible.—E.M.H., 13/11/86. District Engineer. Book of reference and
 amended plan (deviation through reserve) are now being prepared, and will be submitted without delay.—
 M.T., 13/11/86. Commissioner.

Memo. to the Deputy Engineer.

District Engineer's Office, Sydney, 9 October, 1886.

I FORWARD herewith duplicate tracings, showing land to be resumed in connection with tramway—Waverley
 to Randwick.

WALTER SHELLSHEAR.

Please say if there are any special reasons why we should resume the whole property of the
 Wesleyan Church. If there are not, it will be sufficient to resume to within 33 feet of the tramway, as
 marked by me in pencil on tracing.—M.T., 8/10/86. District Engineer, Sydney.

Mr. Halligan.—W.S., 12/10/86. New tracings herewith. It is necessary, on account of depth
 of cutting through this property, to resume 40 feet.—E.M.H., 15/10/86. District Engineer. The
 Deputy Engineer.—W.S., 15/10/86. Please see my minute, 16/10/86, attached.—G.C., 16/10/86.
 Commissioner.

NEW SOUTH WALES RAILWAYS.

Department of Engineer for Existing Lines—Waverley to Randwick Tramway (single Line).
 Rough Bill of estimated Quantities and Costs.

Item.	Quantity.	Rate.	Amount.
Excavation	7,320 cubic yards ...	£ s. d. 0 3 0 per yard	£ s. d. 1,098 0 0
Concrete	990	2 0 0	1,980 0 0
Tarred metal, 2" gauge	990	1 0 0	990 0 0
" surface	160	1 0 0	160 0 0
Sleepers	3,000	0 6 0	900 0 0
Laying permanent-way	2,952	0 2 6	369 0 0
2½ sandstone ballast	400 cubic yards ...	0 8 0 per yard	160 0 0
9" pipes	84 feet	0 2 0 per foot	8 8 0
12"	160	0 2 6	20 0 0
18"	200	0 5 0	50 0 0
Permanent-way material, 140 tons	6,000 yards	10 10 0 per ton	1,470 0 0
Points and crossings .....	.....	.....	500 0 0
			7,705 8 0
		Contingencies, 10 per cent.....	770 10 10
		Total amount.....	£ 8,475 18 10

W.S., 12/11/86. M.T., 16/10/86.

No. 20.

Minute by The Commissioner for Railways.

Tramway—Randwick to Waverley.

THE Minister wishes this line prepared, so that it may be commenced at once by the unemployed by task-work. It should be cut up into sections, so that parties of eight or twelve can do it by task.

CH.A.G., 28/10/86.

Will Mr. Cowdery please give this his earliest and best attention. The Minister is anxious to have the matter arranged with the utmost expedition.—D.C.M'L., 28/10/86. Mr. Thomson to make the necessary arrangements.—G.C., 29/10/86. I wish to see Mr. Waring to-morrow morning, at your office, with reference to this matter.—M.T., 29/10/86. District Engineer. Mr. Waring.—W.S., 30/10/86. Seen Mr. Thomson, and arranged to go over this line, 1/11/86. I have just returned from there, having been over the work.—J. WARING, 1/11/86. District Engineer.

No. 21.

Minute by The Commissioner to The Engineer for Existing Lines.

PLEASE make arrangements for accompanying me to Randwick to-morrow, at 2 p.m., to see route of tram-line, to meet the Minister for Education, Mr. Sec, and others.

B.C., 2/11/86.

CH.A.G.

Mr. Cowdery,—

Plan to be taken—proposal to make use of Cowper-street and Cross-street, instead of going across reserve, which has been resumed for educational purposes.—CH.A.G. I met the Commissioner on the ground yesterday, and arranged to deviate the route of the line through the reserve in order to keep clear of the land required for educational purposes. Amended plan, &c., is now being prepared.—G.C., 4/11/86. Commissioner.

Is the work going on?—W.J.L., 12/11/86. Engineer for Existing Lines.—D.C.M'L., 12/11/86. No; the amended plan and section referred to in my 4/11/86 are now being prepared.—M.T. (*pro* Engineer), 12/11/86. Commissioner. I expected the pick and shovel work to be in full swing long before this; this can, surely, be carried on along the section of the line not affected by the alteration.—W.J.L., 12/11/86. Engineer for Existing Lines.—A.R., B.C., 12/11/86. Previous papers are with you, please return at once.—M.T. (*pro* Engineer), 12/11/86. District Engineer, Sydney. Previous papers herewith.—W.S., 13/11/86. Engineer for Existing Lines. Previous papers returned herewith. Please see Commissioner's minute, 29/10/86, on Commissioner's 86-4,379. The earthworks can be carried out along the parts not affected by the deviation.—M.T., 13/11/86. Commissioner. Will the Minister say if the work is to be proceeded with.—CH.A.G., 15/11/86. Yes.—W.J.L., 16/11/86. Mr. Cowdery.—D.C.M'L., 18/11/86. Mr. Thomson to have the work proceeded with without delay.—G.C., 18/11/86. Please complete the arrangement previously made for carrying out this work by piece-work (the unemployed), and let the work be commenced at once.—M.T., 18/11/86. District Engineer, Sydney. Mr. Waring to note.—W.S., 19/11/86. Noted.—J.W., 20/11/86. District Engineer.

Noted. There are a large number of pick and shovel men who have been working at the Petersham Viaduct and the Darling Harbour sidings who have received notice on account of slackness of work. I presume these men will get the preference in connection with the work.—W.S., 20/11/86. The Deputy Engineer.

Our old hands should be given the preference, but on the same conditions as the work would be let to the unemployed. When will work be commenced?—M.T., 22/11/86. District Engineer, Sydney. Mr. Waring to note.—W.S., 23/11/86. Noted. This work will be started not later than Monday morning, the 29 November inst.—J.W., 23/11/86. District Engineer. Deputy Engineer.—W.S., 24/11/86. The work will be commenced on Monday next; tools, &c., having to be prepared, a start could not be made before.—M.T., 25/11/86. I attach duplicate tracings of land to be resumed from T. O'Sullivan in connection with this work.—M.T., 25/11/86. Tramway Engineer. The work will be commenced on Monday next, duplicate tracings attached showing land to be resumed.—G.C., 26/11/86. Commissioner. Will Minister approve of notice being served taking the land required. He will see that the Engineer proposes to start the work on Monday.—CH.A.G., 27/11/86. Approved.—W.J.L., 29/11/86. Mr. Cowdery.—D.C.M'L., 29/11/86. Seen. I presume tracings will be forwarded on to land valuer.—M.T. (*pro* Engineer for Existing Lines), 30/11/86. Secretary. Land valuer.—D.C.M'L., 1/12/86. Tracings received.—J.B.T., 1/4/87. Secretary. No plan or book of reference has been supplied to the land valuer by the Engineer for Existing Lines.—J.B.T., 16/5/87. Secretary. Engineer for Existing Lines.—A.R., B.C., 18/5/87. Mr. Shellshear,—Was any land resumed for this tramway?—G.C., 19/5/87. The only land resumed for this tramway is a corner of Mr. T. O'Sullivan's land, at the junction of Francis-street and Cook-street. Duplicate tracing sent to the Engineer on 7/10/86.—WALTER SHELLSHEAR, 21/5/87.

Memo. to The Tramway Engineer.

Waverley to Randwick Tramway.

Office of District Engineer, Sydney, 27 May, 1887.

I BEG to forward herewith book of reference for the above tramway. This was asked for by the land valuer a few days ago.

WALTER SHELLSHEAR.

Duplicate tracings have already been supplied. Book of reference herewith.—G.C., 27/5/87. Secretary. Land valuer.—A.R., B.C., 30/5/87. Received.—J.B.T., 31/5/87. Secretary.

No. 22.

Minute by The Chief Clerk.

REFERRING to Resolution of the Legislative Assembly, dated 5th April, "That there be laid upon the table of the House, a Return showing the total cost of making the tramway from Waverley to Randwick," I shall be glad if you will furnish the same as early as possible to complete full return.

Accountant.

D.C.M'L., 5/7/87.

The amount paid for this work up to date, is £7,900.—F.J.W., 7/7/87. Secretary.

No. 23.

Minute by The Chief Clerk.

REFERRING to Resolution of the Legislative Assembly, dated 5th April last, "That there be laid upon the table of the House, a Return of persons from whom land was resumed for the Waverley to Randwick Tramway, with amounts paid or to be paid to each," I shall be glad if you will furnish the same as early as possible to complete full Return.

D.C.M'L., 5/7/87.

Land valuer.

Return herewith.—J.B.T., 6/7/87. Secretary.

LAND Resumed for Waverley-Randwick Tramway.

Name of Owner.	Area.	Amount paid.	Amount to be paid
O'Sullivan, Thomas	a. r. p. 0 0 4	£ s. d.	£ s. 75 0

1887.

(SECOND SESSION.)

NEW SOUTH WALES.

ROAD TRUST ACCOUNTS.

(FOR HALF-YEARS ENDING 30TH JUNE AND 31ST DECEMBER, 1886.)

Presented to Parliament pursuant to the various Acts.

ROAD TRUST ACCOUNTS.

THE COMMISSIONERS OF THE SOUTH HEAD ROADS TRUST.
 ACCOUNT of Receipts and Disbursements, Half-year ending 30th June, 1886.

RECEIPTS.			DISBURSEMENTS.		
1885.		£ s. d.	1886.		£ s. d.
31 Dec... 1886.	To Balance from previous account	224 18 1	30 June	By Salaries—	
13 Jan...	Balance of Parliamentary grant for 1885	2,500 0 0		Secretary and Surveyor	
28 June..	Rent of toll-house, 25 weeks	15 0 0		(6 months)	75 0 0
				Miscellaneous—	
				Rent, rates, taxes, &c.	9 2 0
				Old South Head Road—	
				Blue metal	382 2 8
				Wages, ballast, &c.....	232 15 0
					614 17 8
				New South Head Road—	
				Blue metal	340 7 6
				Wages, ballast, &c.....	376 18 2
					717 5 8
				Point Piper Road—	
				Wages, ballast, &c.....	17 13 0
				Glenmore Road—	
				Blue metal	60 14 9
				Wages, ballast, &c.....	36 4 9
					96 19 6
				Watson's Bay Road—	
				Wages, ballast, &c.....	180 0 6
				Balance in Australian Joint Stock Bank	1,028 19 9
		£ 2,739 18 1			£ 2,739 18 1

For the Commissioners of the South Head Roads Trust,—

22nd July, 1886.

GERARD PHILLIPS, Secretary.
 THOS. BUCKLAND, Hon. Treasurer.

THE COMMISSIONERS OF THE SOUTH HEAD ROADS TRUST.
ACCOUNT of Receipts and Disbursements, Half-year ended 31st December, 1886.

RECEIPTS.			DISBURSEMENTS.		
1886.		£ s. d.	1886.		£ s. d.
30 June..	To Balance as per previous account	1,028 19 9	31 Dec..	By Salaries—	
22 July..	Moiety, Parliamentary Grant, 1886	2,000 0 0		Secretary and Surveyors'	
9 Dec...	Balance, " "	2,000 0 0		6 months	75 0 0
31 "	Rent, Toll-house, 26 weeks	15 12 0		Miscellaneous—	
				Tools and sundries	12 3 1
				Old South Head Road—	
				Blue metal	513 17 0
				Wages, ballast, &c.	641 7 9
				New South Head Road—	1,155 4 9
				Blue metal	278 8 6
				Wages, ballast, &c.	366 15 0
					645 3 6
				Point Piper Road—	
				Wages, &c.	13 5 0
				Glenmore Road—	
				Wages, &c.	20 12 3
				Balance in Australian Joint Stock Bank	3,123 3 2
		£ 5,044 11 9			£ 5,044 11 9

For the Commissioners of the South Head Roads Trust,—

GERARD PHILLIPS, Secretary.
THOS. BUCKLAND, Hon. Treasurer.

14th January, 1887.

ACCOUNT of Receipts and Expenditure of the Commissioners of the Windsor Road Trust, for the Half-year ended 30th June, 1886.

Dr.			Cr.		
1886.		£ s. d.	1886.		£ s. d.
1 Jan...	To Balance on hand, 31st December, 1885 ...	314 15 7	1 Feb...	By paid R. A. Pye, advertising	1 0 10 6
	" Rent of Fitzroy Bridge Tolls, for January	30 8 4		" Fuller & Co., advertising and	
1 Mar...	" " " February	30 8 4		printing	2 1 7 0
31 "	" " " March ...	30 8 4		" H. Betts, repairs to Toll-house ...	3 1 15 0
30 April	" " " April ...	30 8 4	2 Mar...	" E. Wood, repairs to Windsor	
1 June	" " " May	30 8 4		Road	4 41 6 0
30 "	" " " June ...	30 8 4		" M. Keogh, repairs to Bridge-	
				street and Richmond Road ...	5 1 19 6
			31 "	" Secretary, quarter's salary, &c. ...	6 6 12 6
			5 April	" Pickup & Commons, pipes, &c. ...	7 5 13 10
				" T. Wood, repairs, Windsor to	
				Richmond Road	8 4 11 0
				" M. Keogh, repairs, Bridge-street	9 4 16 0
				" E. Wood, repairs, Windsor Road	10 50 13 6
			6 May...	" " " " " " " " " "	11 13 12 11
			10 June	" " " " " " " " " "	12 4 4 0
			30 "	" Secretary, quarter's salary, &c. ...	13 6 10 0
		£ 497 5 7		By Balance on hand	353 13 10
					£ 497 5 7

THOMAS PRIMROSE, }
W. F. LINSLEY, } Commissioners.
WILLIAM GOSPER, }

ACCOUNT of the Receipts and Expenditure of the Commissioners of the Windsor Road Trust, for the Half-year ended 31st December, 1886.

Dr.			Cr.		
1886.		£ s. d.	1886.		£ s. d.
1 July...	To Balance on hand, 30th June	353 13 10	6 Sep ^t .	By paid J. Rogers, repairs Windsor Road	1 14 2 0
3 Aug...	" Rent of Fitzroy Bridge Tolls, for July ...	30 8 4		" M. Fitzgerald, " " " "	2 1 5 0
31 "	" " " August ...	30 8 4		" A. Rummery, " " " "	3 1 1 0
1 Oct ...	" " " September	30 8 4	30 "	" Secretary, quarter's salary, &c. ...	4 6 17 6
29 "	" " " October...	30 8 4	1 Nov.	" Borough of Windsor, for metalling	
3 Dec...	" " " November	30 8 4		George-street	5 27 0 0
			8 "	" J. Rogers, repairs, Windsor Road	
				and George-street	6 5 19 6
			6 Dec.	" T. Gough, repairs, Richmond	
				Road, on account	7 12 0 0
			31 "	" Secretary, quarter's salary, &c. ...	8 6 15 0
				By Balance on hand	6 430 15 6
		£ 505 15 6			£ 505 15 6

THOMAS PRIMROSE, }
W. LINSLEY, } Commissioners.
WILLIAM GOSPER, }

ABSTRACT of Receipts and Expenditure of the Maitland District Council, from 1st January, 1886, to 30th June, 1886.

1886. 1 Jan...	To Balance in Bank	£ s. d. 29 9 4	1886. 30 April	By Secretary's salary	£ s. d. 24 0 0
			30 June	Stamps, &c.	0 3 6
				Balance in Bank	5 5 10
		£ 29 9 4			£ 29 9 4
1 July..	To Balance in Bank	5 5 10			

JOHN BOWDEN, Warden.
WALTER CRACKNELL, Secretary.

We have examined the books of accounts and compared them with the vouchers and find same correct,—

WILLIAM E. KEATING, } Auditors.
J. GILLIS,

ABSTRACT of Receipts and Expenditure of the Maitland District Council, from 1st July, 1886, to 1st January, 1887.

Dr.			Cr		
1886. 1 July..	To Balance in Bank	£ s. d. 5 5 10	1886. 31 Nov.	By Secretary's salary (7 months)	£ s. d. 28 0 0
22 Oct..	Advances from Roads	46 4 4		Stationery	0 7 6
				Balance in Bank	23 2 8
		£ 51 10 2			£ 51 10 2
	To Balance in Bank	23 2 8			

JOHN BOWDEN, Warden.
WALTER CRACKNELL, Secretary.

We have this day examined books, &c., and find same correct,—

J. GILLIS, } Auditors.
WILLIAM E. KEATING,

ABSTRACT of the Receipts and Expenditure of the Commissioners of the Parramatta Road Trust, for the Half-year ending 30th June, 1886.

Dr.				Cr.			
RECEIPTS.				EXPENDITURE.			
1886. 30 June..	To Rental of Toll-gate at Broken Back Bridge	£ s. d. 179 6 8	£ s. d. 179 6 8	1886. 30 June..	By Cheque not presented.....	£ s. d. 11 8 0	£ s. d. 11 8 0
	Interest on fixed deposit at Commercial Bank	10 12 0	10 12 0		Salaries—		
					Clerk and Treasurer	25 0 0	
					Working Overseer	78 0 0	103 0 0
1 Jan....	To Fixed deposit at Commercial Bank	212 0 0	444 1 1		Miscellaneous—		
	Balance Cr. at Commercial Bank	232 1 1	11 8 0		Wages for labour	157 0 0	
	Cheque not presented.....	11 8 0			Blue metal	290 0 0	
					Six months' rental of office	10 8 0	
					Advertisements	2 5 0	
					Stamps	0 10 0	
					Legal expenses	2 2 0	
					Powder and fuse.....	1 19 6	464 4 6
					Bank interest upon overdraft to date	0 10 6	0 10 6
					Balance Cr. at Commercial Bank.....	66 4 9	66 4 9
		£ 645 7 9				£ 645 7 9	

ANDREW PAYTEN.
W. GOODIN.
NEIL STEWART.

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

SUBORDINATE ROADS UNDER TRUSTEES.

(SHOWING PROPOSED DISTRIBUTION OF VOTE ON ESTIMATES.)

Ordered by the Legislative Assembly to be printed, 26 April, 1887.

CLASSIFICATION AND PROPOSED DISTRIBUTION FOR 1887.

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.			
Northern Roads.						
						£
1	4	4	4	7	Road from Pemberton's to mouth of Popran Creek ...	70
2	2	2	3	7	" Kincumber to Lloyd's Wharf ...	105
3	1	1	1	15	" Mulbring to Millfield (Quarrybylong Road) ...	750
4	2	2	2	8	" Gosford to Kincumber ...	200
5	3	3	3	5	" Gosford and Maitland Road to Government Reserve at head of Ourimbah Creek ...	75
6	4	4	4	20	" Gosford to the Blood Tree ...	200
7	2	2	2	15	" Tuggerah Beach Lake to Erina Creek ...	375
8	3	2	2	9	" Bumble Hill to foot of Olney Reserve ...	225
9	2	2	2	11	" Wollombi Road to Congewai ...	275
10	1	1	1	4	" Wollombi Road to Ellalong ...	200
11	2	2	2	29	" Laguna to Railway at Morrisset ...	725
12	2	2	2	8	" Mandelong to Cooranbong Wharf ...	200
13	2	2	2	27	" The Broken-back Gap to Wyong Creek ...	675
14	1	1	1	13	" Wyong Creek to Gosford ...	650
15	3	3	3	8	" Murray's to North Road at 10-mile post ...	120
16	4	4	4	6	" Blue-Gum Flat to Chittaway ...	60
17	3	3	3	27	" Railway at Wyong to Mangrove Creek, at Pemberton's ...	405
18	4	4	4	25	" Bullock Wharf to upper part of Mangrove Creek ...	250
19	...	3	3	8	" Bullock Wharf, down Western side of Mangrove Creek ...	120
20	4	4	4	20	" Wollombi to Broke ...	200
21	4	4	4	18	" Broke to Warkworth ...	180
22	4	3	3	10	" Wollombi to Yango ...	150
23	2	3	3	50	" Wollombi to Wiseman's Ferry ...	700
24	4	4	4	3	" Wollombi up Narone Creek ...	30
25	2	2	2	15	" Millfield to Wollombi ...	375
26	3	2	2	12	" Wiseman's Ferry to St. Albans ...	300
27	2	2	2	22	" St. Albans to Mount Manning ...	550
28	4	3	3	15	" St. Albans, up the M'Donald River, and Melon Creek ...	225
29	2	2	2	7	" Stockton and Raymond Terrace Road to Saltash ...	175
30	5	5	5	6	" Raymond Terrace and Stroud Road to Raymond Terrace and Clarencetown Road (Caswell's Road) ...	42
31	5	5	5	12	" Raymond Terrace and Stroud Road, <i>via</i> the Duck-hole Swamp, to the Parading Ground ...	84
32	3	3	3	11	" Seaham, by east side of Williams River, to Clarencetown ...	165
33	2	2	2	9	" Clarencetown, <i>via</i> Glen William, to Brookfield ...	225
34	3	3	2	10	" Clarencetown towards Thalaba ...	250
				472	Carried forward ...	£ 9,331

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.			
Northern Roads—continued.						
				472	Brought forward	£ 9,331
35	2	2	2	4	Road from Raymond Terrace to Mount Kanwary	100
36	2	2	2	4	" Mount Kanwary to Hinton	100
37	3	3	3	4	" Raymond Terrace and Hinton Road to Seaham	60
38	4	2.	2	5	" Alwick to Hexham	125
39	3	2	2	5	" Junction of Morpeth Road with Raymond Terrace and Maitland Road to East Maitland	125
40	2	1	1	4	" Pitnacree Bridge to Dunmore Bridge	200
41	2	2	2	16	" Paterson Punt to Gresford	400
42	4	4	4	5	" Vacy Bridge to Summer Hill	50
43	2	2	2	17	" Gresford to Eccleston	425
44	2	2	2	12	" Gresford to Lostock	300
45	4	4	4	13	" Lostock to Carraboler	130
46	2	2	2	4	" Penshurst to Alleyn River	100
47	4	4	4	8	" Eccleston to Upper Alleyn River	80
48	2	2	2	6	" Largs to Tocal	150
49	2	2	2	2	" Tocal to Paterson	50
50	4	3	3	10	" Rutherford to Scotch Corner	150
51	3	3	3	3	" Rutherford and Scotch Corner Road, <i>via</i> Hillsborough, to the Luskintyre Road	30
52	3	3	3	3	" West Maitland, <i>via</i> Glenarvon, to Dunmore and Paterson Road	45
53	2	2	2	8	" Blackwater Hole, <i>via</i> Cessnock, to Dividing Range	200
54	1	1	1	5	" West Maitland up the right bank of Hunter River (Oakhampton Road)	250
55	2	2	2	5	" Morpeth to Four-mile Creek	125
56	3	3	3	3	" Morpeth to Largs	45
57	4	4	4	4	" Morpeth and Largs Road, through Phoenix Park and Abbotsford, to M'Clymont's Swamp	40
58	2	2	2	4	" Morpeth Punt, through Phoenix Park, to Largs	100
59	2	2	2	4	" Morpeth, <i>via</i> Hinton Punt, to Dunmore and Seaham Road	100
60	1	1	1	3	" West Maitland, <i>via</i> Louth Park, to East Maitland and Brisbane Water Road	150
61	5	5	5	15	" West Maitland to Mulbring Creek	105
62	3	3	3	17	" Maitland and Paterson Road, within L. Harris's 1,114 acres, to Luskintyre	255
63	3	3	3	10	" Lochinvar, <i>via</i> Windermere, to Pritchett's, and loop-line to same place, <i>via</i> Kaloudah	150
64	...	4	4	4	" Branxton to Dalwood Ford (Tangorin Road)	40
65	3	3	3	5	" Branxton, <i>via</i> Dalwood Ford, to Irishtown	75
66	3	3	3	2	" Branxton and Irishtown Road to Greta	30
67	3	3	3	12	" Branxton, <i>via</i> Elderslie Bridge and Glendon Brook, to junction with Paterson and Gresford Road... ..	180
68	...	...	4	4	" Main North Road to Hunter River (M'Mullens' Road)	40
69	4	4	4	4	" Anvil Creek and Glendon Brook Road to Stanhope	40
70	3	3	3	7	" Main Northern Road, near Black Creek, to Rathburg Public School	105
71	3	3	3	13	" Pokolbin Hills to Cessnock Road	195
72	3	3	3	11	" Main North Road, near Black Creek, <i>via</i> Glendon, to Main North Road, near Singleton	165
73	4	4	4	20	" Singleton to Boyce's, at Glendon Brook	200
74	4	4	4	17	" Boyce's to Gresford	170
75	4	4	4	9	" Cooper's Flat Road to Karakoora Creek and up that creek... ..	90
76	4	4	4	10	" Camberwell to Goorangoola Road... ..	100
77	4	4	4	15	" Goorangoola Road to Carrow Brook	150
78	5	5	5	7	" Goorangoola Road to Bowman's Creek	49
79	4	4	4	17	" Singleton, <i>via</i> Redbournebury, to Dyrning... ..	170
80	3	3	3	14	" Singleton, <i>via</i> Abbey Green, to Bulga Bridge	210
81	3	3	3	15	" Singleton, <i>via</i> Wittingham Reserve, to Broke	225
82	4	3	3	10	" Singleton to Brandy Creek... ..	150
83	4	3	3	15	" Brandy Creek, <i>via</i> Goorangoola, to Dry Creek	225
84	4	4	4	10	" Broke, <i>via</i> Nine-mile Creek, to the Munnimba and Warkworth Road	100
85	3	3	3	20	" Singleton to Jerry's Plains... ..	300
				916	Carried forward	£ 16,480

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.			
Northern Roads—continued.						£
				916	Brought forward	16,480
86	3	3	3	6	Road from Singleton and Jerry's Plains Road to Warkworth..	90
87	5	4	4	8	„ Broke Road, <i>via</i> Warkworth Road, to the Jerry's Plains Road	80
88	6	4	4	16	„ Scone, <i>via</i> Dartbrook and Kayugah, to Muswellbrook	160
89	4	4	4	15	„ Blandford, <i>via</i> Box-tree, to Timor	150
90	6	6	6	4	„ Kangaroo Flat to Quirindi	20
91	4	4	4	7	„ Quirindi to Warrah Ridge	70
92	3	3	3	10	„ Underbank to Upper Chichester	150
93	4	3	3	9	„ Underbank to Upper Williams	135
94	...	3	3	3	„ Dungog and Gloucester Road to western boundary of L. Myles' grant	45
95	6	4	4	21	„ Wingham and Nowendoc Road to Upper Manning	210
96	...	...	3	7	„ Wingham, <i>via</i> Bungay, to Bobo Creek	105
97	3	3	3	4	„ Tinonee and Bohnock Road to south channel of the Manning River (Redbank Road)	60
98	4	2	2	9	„ Innis, <i>via</i> Morton's Creek, to Papenborough Creek and J. Gurney's	225
99	4	3	3	5	„ Copmanhurst to Stockyard Creek	75
100	5	3	3	35	„ Smith's Flat Road to the Solferino Road	525
101	...	3	3	3	„ Copmanhurst to Smith's Creek	45
102	4	4	4	10	„ Brush Grove to Rocky Mouth	100
				1,088	Total miles. Total	£ 18,725
Western Roads.						
103	2	2	2	3	Road from Main Western Road to Canterbury	75
104	2	2	2	2	„ Main Western Road to Rookwood Railway Station	50
105	3	3	3	6	„ Main Western Road, near Parramatta, to Main Southern Road (Woodville Road)	90
106	2	2	2	2	„ Main Western Road, <i>via</i> Newington, to the Parramatta River	50
107	3	3	3	2	„ Pennant Hills Road to Shepherd's	30
108	2	2	2	4	„ Broken-back Bridge to Pennant Hills (Governor's Arms Road)	100
109	2	2	2	1	„ Pennant Hills, at Duggan's Corner, to Parramatta and Ryde Road	25
110	3	3	3	6	„ Mobbs' Hill to Rogan's Hill	90
111	1	1	1	1	„ Parramatta and Ryde Road to Pennant Hills Wharf	50
112	2	2	2	3	„ Ryde to junction of Parramatta and Pennant Hills Road	75
113	4	4	4	2	„ Main North Road at Castle Hill to Government Reserve (Old Castle Hill Road)	20
114	5	5	5	2	„ Old Castle Hill Road to Government Reserve	14
115	2	2	2	1	„ Castle Hill to the Old Parramatta Road	25
116	3	3	3	2	„ Seven Hills Road to Vardy's Grant	30
117	2	2	2	4	„ Seven Hills Railway Station to Windsor Road	100
118	2	2	2	4	„ Rooty Hill Railway Station to Blacktown Road	100
119	6	6	6	4	„ Main Western Road, near Fox-under-the-Hill, to the Seven Hills Road (Toongabbee Road)	20
120	4	4	4	5	„ Toongabbee Creek to Windsor Road	50
121	3	3	3	8	„ Main Western Road to Breakfast Creek (Blacktown Road)	120
122	3	3	3	11	„ Breakfast Creek to Richmond (Blacktown Road)	165
				73	Carried forward	£ 1,279

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.			
					Western Roads—continued.	£
					73	Brought forward 1,229
123	4	3	3	3	Road from Main Western Road, <i>via</i> Bungarribee, to Blacktown Railway Station (Fluscombe Road)	45
124	3	3	3	8	" Penrith to Dr. Clarke's Bridge	120
125	3	3	3	18	" Main Western Road, near Penrith, to Bringelly Cross Roads	270
126	4	4	4	11	" Parramatta to Rouse Hill	110
127	3	3	3	5	" Penrith to Clemson's	75
128	3	3	3	5	" Clemson's to Richmond	75
129	4	4	4	10	" Blaxland's Crossing to Werombi Post Office	100
130	2	2	2	6	" Emu Plains to Wascoe's	150
131	2	2	2	11	" Parramatta and Windsor Road, at Baulkham Hills, to G. Acre's at Dural (Great North Road)	275
132	6	6	6	15	" G. Acre's at Dural to its junction with Pitt Town and Wiseman's Ferry Road (Great North Road)	75
133	2	2	2	5	" Dr. Clarke's Bridge to Richmond	125
134	4	4	4	5	" Rouse Hill and Dural Road to Little Dural	50
135	5	5	5	9	" Round corner at Dural to Rouse Hill	63
136	4	4	4	9	" Rouse Hill to Clarendon	90
137	4	4	4	6	" Clarendon to Richmond Bridge	60
138	4	4	4	3	" Wiseman's Ferry Road into parish of North Colah	30
139	4	4	4	3	" Colah to Dural (North Colah Road)	30
140	3	3	3	2	" Nelson to Rouse Hill	30
141	2	2	2	3	" Windsor Road to Huxley's	75
142	2	2	2	3	" Huxley's to Pitt Town Punt	75
143	2	2	2	1	" Windsor Road to Mulgrave Railway Station	25
144	2	2	2	5	" Pitt Town Common, at E. M'Guire's, through Pitt Town Bottoms	125
145	4	4	4	12	" Pitt Town to Maroota	120
146	3	3	3	3	" Windsor to Blacktown Road	45
147	2	2	2	7	" Windsor, <i>via</i> Cornwallis, to Richmond	175
148	2	2	2	2	" Richmond to Cornwallis Road (Benson's Lane)	50
149	3	3	3	4	" Blacktown Road, <i>via</i> Dight's Hill, towards Richmond Bridge	28
150	5	5	5	9	" Enfield and Wood's Falls Road, opposite Belmont, <i>via</i> Box Hill, to Bell's Line, North Kurrajong	90
151	1	1	1	4	" Windsor Bridge to top of Gorrick's Hill	200
152	2	2	2	2	" Nicholl's Corner, <i>via</i> Hibbert's Lane, to Enfield Road	50
153	5	5	5	6	" Sackville Road, near Ebenezer, <i>via</i> Page's Ferry, to Maroota	42
154	5	5	5	4	" Churchill's Wharf, <i>via</i> Sackville Post Office, to Page's Ferry Road	28
155	6	6	6	14	" Bulga Road to West Portland (Wheelbarrow Road)	70
156	2	2	2	5	" Queen's Road, Mt. Wilson	125
157	4	4	4	25	" Mudgee Road to Glen Alice	250
158	3	3	3	3	" Gulgong to Martin's Crossing	45
159	...	4	4	5	" Gulgong to Jackson's Crossing	50
160	6	6	6	12	" Rylstone to Narengo	60
161	6	6	6	30	" Rylstone, <i>via</i> Bogie, to Capertee	150
162	4	4	4	16	" Cudgong to Merrendee	160
163	4	4	4	4	" Peel to Junction of Kelso and Sofala Road	40
164	3	3	3	12	" Sofala to Palmer's Oakey Creek	180
165	3	3	3	5	" Kirkconnell to Mitchell's Creek	75
				408	Total miles.	Total £ 5,385

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.			
Southern Roads.						
166	2	2	2	4	Road from Sydney to Banks Meadow (Botany Road) ...	100
167	1	1	1	3	" Banks Meadow, <i>via</i> Lord's and Handcock's, to the Botany Road, near the Tannery ...	150
168	2	3	3	4	" Banks Meadow to Botany Road (Whisker's Road) ...	60
169	2	2	2	3	" Undercliff Bridge to George's River Road ...	75
170	4	4	4	5	" Main Southern Road, near Burwood, over Cook's River, into Parish of St. George ...	50
171	3	3	3	5	" Upper Bankstown, <i>via</i> Auburn Park, to Rookwood Road ...	75
172	...	...	3	2	" Kerr's Road to Auburn Railway Station ...	30
173	2	2	2	10	" George's River Punt, to Bottle Forest ...	250
174	2	2	2	5	" Canterbury, to Saltpan Creek Bridge ...	125
175	2	2	2	5	" Saltpan Creek Bridge to George's River ...	125
176	3	3	3	3	" Bankstown to George's River (Chapel Road) ...	45
177	3	2	2	3	" Druitt Town, to Punchbowl Road (Rolland-street) ...	75
178	2	2	2	2	" Main Southern Road to Punchbowl Creek ...	50
179	2	2	2	4	" Punchbowl Creek to Saltpan Creek ...	100
180	1	1	1	1	" Woodville Road to Guildford Railway Platform ...	50
181	2	2	2	2	" Woodville Road to Fairfield Railway Station ...	50
182	2	2	2	4	" Fairfield Railway Station, <i>via</i> Smithfield, to Prospect Creek Municipality ...	100
183	2	2	2	2	" Kenyon's Bridge, towards Cabramatta, to Liverpool ...	50
184	3	3	3	10	" Liverpool to Penrith and Bringelly Road (part of Orphan School Road) ...	150
185	3	3	3	8	" Liverpool, <i>via</i> Holdsworthy, to Illawarra Road ...	120
186	4	4	4	5	" Liverpool to Old Cowpasture Road (Bernera Road) ...	50
187	3	3	3	2	" Liverpool to Fairfield Railway Station ...	30
188	3	3	3	6	" Carne's Hill to Junction of Bringelly Road ...	90
189	4	4	4	18	" Carne's Hill, <i>via</i> Greendale, towards Penrith ...	180
190	2	2	2	4	" Menangle to Main South Road, at foot of Razorback ...	100
191	5	5	5	7	" Menangle to Stoney Creek ...	49
192	5	5	5	7	" Stoney Creek to Picton ...	49
193	4	4	4	4	" Camden to Road from Menangle to Main Southern Road ...	40
194	3	3	3	3	" Main South Road, near Camden Bridge, to Glenlee ...	45
195	3	3	3	2	" Great Southern Road, near Raby, to the Campbelltown Road at Minto ...	30
196	3	3	3	10	" Main Southern Road to Cobbitty ...	150
197	3	3	3	2	" Narellan, through Orierton, to Liverpool and Cobbitty Road ...	30
198	2	2	2	7	" Main South Road, near Camden, to Mulgoa Forest and Vanderville ...	175
199	5	5	5	3	" Main South Road, at Cawdors, to Westbrook Bridge ...	21
200	2	2	2	10	" Lefevre's Corner, <i>via</i> the Bridge across Mount Hunter Creek, to Mulgoa Forest ...	250
201	4	4	4	8	" Oaks, <i>via</i> Mulgoa Forest, towards Penrith ...	80
202	4	4	4	2	" Camden and Mulgoa Road to Glendarual and Brownlow Hill ...	20
203	4	4	4	9	" Broughton's Pass, <i>via</i> Wilton and Stonequarry Creek, to the Railway ...	90
204	2	2	2	9	" Appin and Mount Keira Road, <i>via</i> Douglas Park Railway Station, to Soapy Flat Creek ...	225
205	2	2	2	4	" Appin to Broughton's Pass ...	100
206	4	4	4	17	" Wollongong and Kiama Road to Mount Keira, towards Appin ...	170
207	6	6	6	10	" West Bargo, <i>via</i> the Pot-holes, to Main Southern Road ...	50
208	2	2	2	4	" Old South Road, near P. H. Throsby's, <i>via</i> Pigott's, to Bowrall ...	100
209	5	5	5	7	" Well's Creek to Paddy's River ...	49
210	5	5	5	15	" Berrima, <i>via</i> Soapy Flat, towards Bulli ...	105
211	3	3	3	3	" Throsby Park and Kiama Road, at M'Cullum's, to the Mittagong and Illawarra Road, at Simpson's ...	45
212	2	2	2	5	" Kiama Road, at Bunter's, to Cedar Mountain Road ...	125
213	4	4	4	5	" Throsby Park and Robertson Road, at Cotton Company's Reserve, to Lake's and Wakeford's farms ...	50
				273	Carried forward ...	£ 4,328

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.				273	£
Southern Roads—continued.						
					Brought forward	4,328
214	3	3	3	8	Road from Kangaroo River Bridge, along north side of river, to Wallanderry	120
215	5	4	4	8	„ Nowra Bridge to Illaroo	80
216	5	5	5	9	„ Nowra to Burriar	63
217	3	3	3	2	„ Nowra, through Terrara, to Greenwell Point Road	30
218	3	3	3	15	„ Collector and Gundaroo Road, <i>via</i> marked tree line, to Main Road Gunning to Queanbeyan	150
219	5	5	5	10	„ Foxlow to Molonglo	100
220	5	5	5	10	„ Araluen and Moruya Road, <i>via</i> Kiora, to Moruya...	70
221	4	5	5	10	„ Araluen, <i>via</i> Bettowynd, to Back Creek	70
222	3	3	3	6	„ Moruya to the Heads	90
223	5	5	5	8	„ Eurobodalla	56
224	5	5	5	8	„ Eurobodalla to Nerrigundah	56
225	2	2	2	4	„ Panbula to Merimbula	100
226	3	3	3	10	„ Delegate, <i>via</i> Corrowong, to Wollondibby	150
227	4	4	4	13	„ Bombala, <i>via</i> Maharatta, to Mila	130
228	4	4	4	15	„ Ginindera to Gundaroo	150
229	5	5	5	21	„ Queanbeyan, <i>via</i> Lanyon Ford, to Naas	147
				430	Total miles. Total	£5,890

SUMMARY OF PROPOSED DISTRIBUTION:—						£
Northern Roads	...	...	1,099	miles	...	18,725
Western Roads	...	...	403	„	...	5,885
Southern Roads...	...	...	430	„	...	5,890
Total	...	...	1,932	„	Total	30,000

NOTE.—The amount per mile proposed to be expended on each class of Roads is as under:—

1st Class	...	...	£50 per mile	4th Class	...	...	£10 per mile
2nd Class	...	...	25 „	5th Class	...	...	7
3rd Class	...	...	15 „	6th Class	...	...	5 „

Note.—All votes for roads within Municipal limits have been excluded from this Schedule. No sum herein contained is, therefore, to be expended within the boundaries of any Municipality.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

SUBORDINATE ROADS.

UNDER OFFICERS OF ROADS DEPARTMENT—SHOWING PROPOSED DISTRIBUTION OF VOTE ON ESTIMATES.

Ordered by the Legislative Assembly to be printed, 26 April, 1887.

CLASSIFICATION AND PROPOSED DISTRIBUTION FOR 1887.

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.			
Northern Roads.						
						£
1	1	1	1	3	Road from St. Leonards, <i>via</i> Balgowlah, to Manly ...	150
2	1	1	1	7	„ Military Road, St. Leonards ...	350
3	1	1	1	15	„ Manly Cove to Pittwater ...	750
4	3	2	2	3	„ Manly and Pittwater Road to M'Garr's Creek ...	75
5	1	1	1	4	„ Pittwater to Barrenjuey ...	200
6	2	2	2	3	„ Balgowlah to Pittwater Road ...	75
7	2	2	2	14	„ Lane Cove, <i>via</i> Stony Creek, to Pittwater ...	350
8	3	2	2	2	„ Lane Cove to Cowan Creek, at Bobbin Head ...	50
9	2	1	1	5	„ Pearce's Corner to Pennant Hills... ..	250
10	2	2	2	17	„ Pearce's Corner to Peat's Ferry ...	425
11	4	4	4	6	„ Peat's Ferry Road to Berowra Creek ...	60
12	1	1	1	18	„ Wallsend to Gosford Road, at Cooranbong ...	900
13	1	1	1	8	„ Wallsend to Lake Macquarie ...	400
14	5	5	5	43	„ Warkworth Road to Putty ...	301
15	1	1	1	3	„ Plattsburg to Minmi ...	150
16	3	1	1	13	„ Waratah to Maitland ...	650
17	2	1	1	13	„ Adamstown to Lake Macquarie Heads ...	650
18	...	1	1	2	„ Glebe to Adamstown ...	100
19	2	1	1	5	„ Lambton to Charlestown ..	250
20	2	1	1	4	„ Wallsend to Sandgate (Cemetery)... ..	200
21	2	2	2	8	„ Minmi to Woodford... ..	200
22	2	2	2	2	„ Lochinvar to Railway Station ...	50
23	2	2	2	3	„ Union Inn, at Rutherford, to Melville Ford ...	75
24	2	2	2	12	„ West Maitland to Blackwater Hole ...	300
25	1	1	1	6	„ Raymond Terrace to Hexham ...	300
26	2	2	2	8	„ Hexham to Fullerton Cove... ..	200
27	1	1	1	18	„ East Maitland to Broken-back Gap ...	900
28	...	3	3	4	„ Maitland and Dagworth Road to Wallis Creek ...	60
29	2	1	1	17	„ Raymond Terrace to Stockton ...	850
30	1	1	1	31	„ Raymond Terrace to Stroud ...	1,550
31	2	2	2	10	„ Raymond Terrace, by east side of Williams River, to Seaham ...	250
32	5	5	5	3	„ Raymond Terrace and Stroud Road to Raymond Terrace and Seaham Road (Misskell's Road)...	21
33	3	1	1	10	„ Raymond Terrace to Morpeth ...	500
				320	Carried forward ...	£ 11,592

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.				320	£
					Northern Roads—continued.	
					Brought forward	11,592
34	1	1	2	2	Road from Alnwick Road to Martin's Wharf	100
35	...	1	1	8	" Cessnock to south boundary of Josephson's 2,000 acres	400
36	4	4	4	6	" Cessnock to M'Donald's, at Pokolbin (Marrowbone Road)	60
37	3	3	3	7	" Cessnock to Rathbury Public School	105
38	2	2	2	6	" West Maitland to Dunmore	150
39	2	2	2	16	" Dunmore to Clarencetown	400
40	2	2	2	6	" Dunmore to Paterson Punt	150
41	1	1	1	16	" Clarencetown to Dungog	800
42	1	1	1	15	" Gostwycke to Newpark (Wallarobba Road)	750
43	2	2	2	10	" Clarencetown to Limeburner's Creek	250
44	2	1	2	2	" Harper's Hill to Allandale Railway Station	50
45	4	4	2	7	" Deep Creek to Allandale Railway Station... ..	175
46	3	3	3	31	" Singleton, <i>via</i> Newbridge, to Cooper's Flat	465
47	3	3	3	16	" North Road, near Munnimba, <i>via</i> Warkworth, to Jerry's Plains Road	240
48	3	3	3	12	" Jerry's Plains to Denman	180
49	2	2	2	20	" Denman to Merriwa	500
50	2	3	3	28	" Merriwa to Cassilis	420
51	2	2	2	22	" Muswellbrook Iron Bridge to Denman and Cassilis Road	550
52	4	3	3	12	" Main North Road to Lincoln's Creek (Muscle Creek Road)	180
53	3	3	3	94	" Denman and Cassilis Road to Mudgee	1,410
54	4	4	4	21	" Aberdeen up Rouchel Brook to Scrumlow	210
55	2	2	2	15	" Muswellbrook to Denman	375
56	4	4	4	34	" Scone to Denison Diggings, at Moonan	340
57	5	5	5	39	" Scone to Merriwa	273
58	4	4	4	17	" Blandford to Isis River	170
59	5	5	2	6	" Quirindi up Jacob and Joseph Creek	150
60	6	6	6	65	" Willow-tree to Gunnedah	325
61	2	2	2	10	" Wallabadah to Quirindi	250
62	5	5	5	33	" Wallabadah to Nundle and Swamp Creek... ..	231
63	...	5	5	63	" Quirindi, <i>via</i> Colly Blue, to Tambar Springs	441
64	6	6	6	32	" Werris Creek, <i>via</i> Currabubula, to Tamworth	160
65	6	6	6	5	" Werris Creek Gap to Railway Station	25
66	2	3	2	38	" Tamworth to Bowling Alley Point and Nundle	950
67	2	2	4	4	" Bowling Alley Point, <i>via</i> Cadell's Gap, to Dungowan	40
68	4	4	4	16	" Dungowan, <i>via</i> Cadell's, to head of Ogumbil Creek	160
69	5	5	6	5	" Dungowan Creek, on North Bank, to Cadell's Station	25
70	6	6	6	7	" Tamworth to the Forest	35
71	6	6	6	12	" Tamworth, <i>via</i> Moore Creek, to Attunga	60
72	2	3	3	48	" Tamworth to Somerton	720
73	1	1	1	26	" Tamworth to Manilla	1,300
74	1	1	1	70	" Manilla, <i>via</i> Barraba, to Bingera	3,500
75	...	5	5	30	" Barraba to Bundarra	210
76	6	4	4	47	" Nowendoc to Walcha	470
77	...	5	5	30	" Denison Town, <i>via</i> Uarby, to Cassilis	210
78	...	...	6	25	" Coolah to Cassilis	125
79	...	...	3	60	" Coolah to Malally	900
80	...	...	2	30	" Coolah to Berriwa	750
81	...	...	3	45	" Coolah to Spring Creek	675
82	...	...	2	50	" Gulgong to Coolah	1,250
83	3	4	4	42	" Coonabarabran to Malally	420
84	...	...	2	22	" Gunnedah to Malally	550
85	3	3	3	60	" Gunnedah to Black Stump	900
86	...	4	5	15	" Holder's to Baradine	105
87	3	3	4	30	" Coonabarabran to Wingidgeon	300
88	3	3	3	8	" Coonabarabran to Ulimambri	120
89	3	3	3	45	" Coonabarabran to Meregoen	675
90	2	2	2	25	" Gunnedah towards Barraba	625
91	3	5	6	61	" Gunnedah to Narrabri	305
92	3	4	4	240	" Narrabri, <i>via</i> Walgett, to Brenda	2,400
93	2	2	2	70	" Narrabri to Bingera	1,750
94	4	4	4	150	" Narrabri, <i>via</i> Moree, to Mungindi	1,500
95	5	5	5	50	" Rocky Creek to Moree	350
					Carried forward	£ 43,257
				2,357		

No.	Class.				Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.	2,357			
Northern Roads—continued.							
Brought forward						...	43,257
96	...	...	3	90	Road from Moree, <i>via</i> Goonal, to Mogil Mogil	...	1,350
97	3	5	3	20	" Old Gunnedah and Narrabri Road to Eulah Creek	...	300
98	4	4	4	26	" Cobbedah to Rocky Creek	...	260
99	4	5	5	71	" Walgett, <i>via</i> Nalgil, to Coonamble	...	497
100	4	4	3	57	" Bingera to Moree	...	855
101	4	4	3	51	" Warialda to Moree	...	765
102	...	...	4	80	" Moree to Goondiwindi	...	800
103	4	4	5	57	" Warialda to Yetman	...	399
104	...	6	6	20	" Warialda, <i>via</i> Gragin, to Reedy Creek	...	100
105	5	5	5	50	" Bingera to Bundarra, <i>via</i> Keera	...	350
106	2	2	2	28	" Bingera to Warialda	...	700
107	3	3	3	32	" Bingera to Inverell	...	400
108	4	4	4	30	" Warialda to Gunyerwarialda	...	300
109	2	2	2	38	" Warialda to Inverell	...	950
110	...	6	5	20	" Warialda to Ezzies	...	140
111	3	2	2	85	" North Road, at Uralla, <i>via</i> Bundarra, to Inverell	...	2,125
112	5	5	5	10	" Main Northern Road at Cregan's, <i>via</i> Rose Hill, to Uralla and Bundarra	...	70
113	5	5	5	25	" Main North Road at Uralla to Walcha	...	175
114	5	4	5	50	" Uralla, <i>via</i> Ballala, to Bundarra	...	350
115	1	1	1	15	" Walcha to Great Northern Railway	...	750
116	...	...	5	20	" Surveyors' Creek Railway Station to Glen Morrison	...	140
117	2	2	3	134	" Armidale to Grafton	...	2,010
118	...	...	5	15	" Uralla and Walcha Road, at Salisbury Plains, <i>via</i> Kentucky Railway Station, to the Great Northern Road	...	105
119	...	5	5	10	" Armidale and Inverell Road, up Dumaresq Creek, to Duval	...	70
120	...	5	5	12	" Pint Pot Creek to Chandler River	...	84
121	4	4	4	20	" Armidale to Yarrowick	...	200
122	5	5	4	40	" Armidale to Kangaroo Hills	...	400
123	...	5	5	10	" Rockvale Road, up Baker's Creek	...	70
124	6	6	6	45	" Armidale, <i>via</i> Mihi Creek, to Walcha	...	225
125	...	5	5	34	" Armidale to Eastern Plains	...	238
126	6	4	4	15	" Armidale to Gostwyck	...	150
127	...	4	4	10	" Armidale to Castle Doyle	...	100
128	2	1	1	58	" Guyra Railway Station, <i>via</i> Eastern Plains and Wandsworth, to Tingha and Inverell	...	2,900
129	...	5	5	15	" Mihi Creek, <i>via</i> Gostwycke, to Uralla	...	105
130	...	5	5	10	" Armidale to Long Swamp	...	70
131	4	4	4	17	" Walcha to Glen Morrison	...	170
132	3	3	3	120	" Walcha to Port Macquarie	...	1,800
133	...	5	5	12	" Walcha to Mulerindie	...	84
134	2	2	2	20	" Glen Innes, <i>via</i> Wellingrove, to King's Plains	...	500
135	2	2	2	20	" Glen Innes to Emmaville	...	500
136	2	2	2	14	" Glen Innes to Red Range and Kingsgate	...	350
137	2	2	2	11	" Yarrowford to Ranger's Valley	...	275
138	6	6	6	20	" Inverell to Reedy Creek	...	100
139	2	2	3	50	" Inverell to Emmaville	...	750
140	3	3	3	24	" Inverell, <i>via</i> Newstead and Paradise, to Kangaroo Camp	...	360
141	4	4	4	19	" Inverell, <i>via</i> Dinton Vale, to Bukkulla	...	190
142	4	4	4	26	" Inverell to King's Plains	...	260
143	4	4	3	116	" Inverell to Gramen, Yetman, and Goondiwindi	...	1,740
144	...	5	4	10	" Coolatai to Wallangra	...	100
145	4	4	4	60	" Inverell to Queensland Border, <i>via</i> Ashford	...	600
146	6	6	4	24	" Barney Downs to Poverty Point	...	240
147	1	1	1	120	" Lawrence to Tenterfield	...	6,000
148	2	2	2	30	" Newton Boyd Road to Emmaville	...	750
149	2	2	2	14	" Tent Hill to Deepwater	...	350
150	3	3	3	7	" Tenterfield and Grafton Road to Boorook	...	105
151	2	2	2	15	" Tenterfield, <i>via</i> Glen Lyon, to Queensland Border	...	375
152	4	4	4	78	" Tenterfield to Bonshaw	...	780
153	2	2	2	15	" Emmaville to Table-land	...	375
154	...	3	3	10	" Emmaville to Webb's Silver Lode	...	150
155	1	1	1	73	" Stroud, <i>via</i> Gloucester, to Tinonee	...	3,650
156	...	4	4	60	" Wilson's Downfall to Queensland Border, <i>via</i> Herding Yards	...	600
Carried forward						...	£ 82,914
				4,645			

No.	Class.			Length in Miles.	Northern Roads—continued.	Proposed Expenditure.
	1885.	1886.	1887.			
				4,645	Brought forward	82,914
157	...	...	3	15	Road from Tenterfield to Scrub	225
158	2	2	3	17	" Tinonee and Gloucester Road to Clarkin's Crossing, Wollomba River	255
159	3	3	3	9	" Burril Creek to Wingham and Black Flat Road ...	135
160	3	3	2	12	" Bullock Wharf, Wollumba River, to Larry's Flat	300
161	2	2	2	12	" Gloucester to Copeland	300
162	6	4	4	20	" Gloucester to Cobark	200
163	6	6	6	50	" Gloucester to Nowendoc	250
164	1	1	1	18	" Dungog to Stroud and Gloucester Road, at Weismantel's (Monkerai Road)	900
165	1	1	1	17	" Dungog to Underbank	850
166	2	2	3	19	" Dungog and Underbank Road to Little River ...	285
167	2	2	2	6	" Dungog and Gloucester Road to Fosterton ...	150
168	3	3	3	16	" Dungog and Monkerai Road to Stroud	240
169	2	2	2	18	" Bulladelah to the Stroud and Raymond Terrace Road	450
170	3	4	4	45	" Bulladelah, <i>via</i> Bungwall, to Forster	450
171	2	2	2	15	" Upper Myall to Bulladelah... ..	375
172	4	4	4	25	" Upper Myall to Larry's Flat	250
173	3	3	3	10	" Flyer's Creek to Dorney's, Upper Myall	150
174	4	3	3	7	" Old Bulladelah Inn to Raymond Terrace Road ...	105
175	4	3	3	20	" Ennis Punt to Glen Esk Upper Plains	300
176	5	4	4	4	" Rolland's Plains to Ballingara Wharf	40
177	...	4	4	10	" Neville's Gate, <i>via</i> Ballingarry, to Rolland's Plains	100
178	4	4	4	16	" Wilson River, <i>via</i> Bar Scrub, to Walcha Road ...	160
179	4	4	4	18	" Upper Camden Haven to Laurieton	180
180	...	4	3	10	" Coopernook, <i>via</i> Cattai Creek, to Harrington ...	150
181	3	3	3	16	" Cundle, <i>via</i> Lansdowne, to Jones's Island Road ...	240
182	...	4	4	4	" Coopernook to Upper Lansdowne	40
183	1	1	1	58	" Tinonee to Port Macquarie	2,900
184	...	3	2	5	" Port Macquarie to Tacking Point	125
185	5	5	5	14	" Tinonee to Farquhar's Inlet	98
186	3	3	2	6	" Tinonee to Wingham Ferry	150
187	2	2	2	8	" Tinonee and Cundle Road to Wingham	200
188	5	3	3	10	" Wingham up Cedar Party Creek (Cedar Party Creek Road)	150
189	4	4	4	14	" Wingham, <i>via</i> Dingo Creek, to Kelven Grove ...	140
190	...	4	4	11	" Wingham and Wherrol Flat Road, up Dingo Creek, to Bobbin Flat	110
191	...	4	4	10	" Wingham, <i>via</i> Brimbin, to Lansdowne	100
192	2	2	2	57	" Wingham on left bank of Manning River, <i>via</i> Black Flat, to Nowendoc	1,425
193	...	3	3	5	" Chalk Hill to Apple-tree Flat	75
194	3	3	3	3	" Wingham and Nowendoc Road to Karaak Flat ...	45
195	2	3	2	9	Road through Oxley Island	225
196	3	3	5	5	" Dumaresq Island	75
197	...	...	2	4	" Rawdon Island	100
198	...	4	4	10	Road from Morton's Creek to New England Road ...	100
199	2	2	2	35	" Port Macquarie to Kempsey	875
200	...	3	3	20	" Taree to North Forster	300
201	1	2	2	85	" Kempsey to Armidale and Grafton Road	2,125
202	...	3	3	4	" Blackman's Point to Ennis Ferry	60
203	2	2	2	76	" Kempsey to Fernmount	1,900
204	...	3	3	5	" Wingham, &c., near Killawarra, to Tinonee and Gloucester	75
205	2	2	2	30	" Kempsey to Trial Bay	750
206	4	4	4	20	" East Kempsey Ferry to Boggy Creek	200
207	4	4	4	20	" East Kempsey, <i>via</i> Dungay Bridge, to Sherwood ...	200
208	4	4	4	20	" Green Hills to Nelson's, Warneton	200
209	...	4	4	10	" New England Road to Head of Hickey's Creek ...	100
210	4	4	4	20	" Rolland's Plains to Yarrowell Falls, Macleay River	200
211	...	2	2	2	" New England to Turner's Flat	50
212	2	2	2	20	" Oakes Plains, <i>via</i> Klybuca, to Macleay River Heads	500
213	...	6	4	12	" Nambuccra to M'Leay Heads	120
214	2	3	6	10	" Ferry to McGuire's, along east bank, Belmore River	160
215	3	2	2	7	" Kinchela Creek to Spencer's Creek	175
216	...	...	2	2	" Long Reach to Clybuca	50
217	2	2	2	45	" Fernmount to Armidale Road	1,125
218	...	1	1	12	" Boat Harbour to Raleigh Mill	600
219	2	2	2	23	" Boat Harbour, <i>via</i> Spickett's Creek, to Nambucca River	575
				5,781	Carried forward	£ 106,352

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.				5,781
Northern Roads—continued.						
					Brought forward	£ 106,352
220	...	4	4	5	Road from Nambuccra to Upper Warrel Creek	50
221	5	5	5	15	" Bowravill to Broker's	105
222	2	2	2	10	" Bowravill to Congarini	250
223	3	3	3	18	" Bowravill to Lumby... ..	270
224	2	2	2	22	" Missibotti to Nambuccra Heads	550
225	...	3	4	13	" Myers' C.P. to Never Never Plains	130
226	...	...	4	6	" Boat Harbour to Little North Arm	60
227	3	3	4	9	" Newton Boyd Road to Nymboida	90
228	4	4	4	30	" Coutts' Crossing, <i>via</i> Kangaroo Creek, to Nymboida	300
229	2	2	2	80	" Fermount to Grafton	2,000
230	...	2	2	18	" Moonee Creek, <i>via</i> Woolgoolga, to Corindi	450
231	...	2	2	9	" South Bellingen School to Upper South Arm	225
232	4	4	4	30	" South Grafton to Corindi	300
233	...	2	2	34	" South Grafton to Yamba	850
234	3	4	4	55	" Grafton to Solferino... ..	550
235	4	4	3	24	" Grafton to Cross Roads towards Casino	360
236	3	3	2	24	" Grafton, <i>via</i> Copmanhurst, to Apple-tree Flat	600
237	2	2	2	22	" North Grafton to Broadwater	550
238	...	1	2	7	" Harwood to North Arm Ferry	175
239	...	...	2	5	" Brush Grove to Bluff Point Ferry... ..	125
240	3	3	2	8	" Bluff Point to South Arm Ferry, Clarence River	200
241	...	3	3	5	" Bluff Point to Tyndale	75
242	1	1	1	25	" Ballina to Cape Byron	1,250
243	2	2	2	20	" Bexhill to Tintenbar	500
244	1	1	1	12	" Bexhill to Williams's	600
245	1	1	1	40	" Cross Roads to Casino	2,000
246	4	4	4	50	" Casino to Mount Lindsay	500
247	...	3	3	36	" Cowalong, <i>via</i> Pearce's Creek and Tintenbar, to Byron Bay	540
248	2	2	2	12	" Cowalong to Staine's Mill	300
249	...	2	2	6	" Goonellabah to Chilcott's Wharf Road	150
250	3	2	2	38	" Casino, <i>via</i> Wyrallah, to Lismore and Ballina Road, at Chilcott's Wharf	950
251	1	1	1	38	" Casino, <i>via</i> Lismore, to Ballina	1,900
252	...	3	3	18	" Casino to Coraki	270
253	3	3	2	40	" Casino to Tabulam... ..	1,000
254	2	2	2	27	" Casino to Woodburn, on right bank	675
255	...	3	3	16	" Casino to Gunderimba	240
256	2	2	2	3	" East Wardell to the Beach... ..	75
257	...	3	3	12	" Lismore to Hanging Rock	180
258	1	1	1	74	" Lismore to Queensland Border	3,700
259	1	2	2	24	" Lismore to Nimbin	600
260	2	2	2	12	" Lismore to Numulgi	300
261	1	1	1	33	" Lismore to Brunswick	1,650
262	1	1	1	20	" Lismore to Woodburn	1,000
263	...	2	2	10	" South Lismore to Wyrallah	250
264	3	3	3	12	" Lismore and Ballina Road to Ballina and Cape Byron Road	180
265	...	1	1	4	" Tintenbar to Toohey's Mill	200
266	2	1	1	15	" Tintenbar, <i>via</i> Teven, to Alston Ville	750
267	1	1	1	23	" Woodburn to Selman's	1,150
268	...	...	1	7	" Possum Shoot to Cooper's Shoot	350
269	...	...	2	9	" Goonellabah to Jeswoolgen	225
270	...	...	2	5	" Boat Harbour to Cowley's	125
271	...	...	1	12	" Clunes to Byron Bay	600
272	...	...	2	6	" Clunes to Duraby Grass	150
273	1	1	1	14	" Wardell, <i>via</i> Tuckombil, to the Lismore and Ballina Road	700
274	...	1	1	6	" Wardell to Ballina Road	300
275	1	1	1	14	" Woodburn to Wardell	700
276	1	1	1	22	" Byangum, <i>via</i> Tweed Junction, to Border	1,100
277	3	1	1	26	" Tweed River to Brunswick River	1,300
278	2	2	2	10	" Cudgen, <i>via</i> Guilfoyle's C.P. and M'Leod's Ck., to Tweed Junction	250
279	2	2	2	6	" Murwillumbah to Tumbulgum	150
280	...	2	2	7	" Tumbulgum, <i>via</i> Chindera Village, to Terranora Creek	175
281	2	2	2	9	" Bilambil, <i>via</i> Sebastopol, to Tweed River Heads... ..	225
282	...	...	2	9	" Kynnumboon to Mudgenquin	225
					Carried forward	£ 142,102
				7,012		

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.				7,012	£
Northern Roads—continued.						
					Brought forward	142,102
283	...	...	2	6	Road from Road up Middle Arm	150
284	...	...	2	6	" Brunswick Road to Condong	150
285	...	...	2	12	" Lismore Road, <i>via</i> Mulimbimbi, to Tweed and Brunswick Road	300
				7,036	Total	£ 142,702
Western Roads.						
286	2	2	2	4	Road from Parramatta to Pennant Hills	100
287	2	2	2	3	" Blacktown Road to Seven Hills Railway Station... ..	75
288	2	2	2	8	" Western Road, St. Mary's, to Orphan School Road	200
289	2	2	2	8	" Western Road, St. Mary's, to Blacktown Road	200
290	1	1	1	3	" Rouse Hill to Schofield's Platform... ..	150
291	2	2	2	36	" Richmond Bridge to King's Road	900
292	1	1	1	5	" Blacktown Road, <i>via</i> Riverstone, to Box Hill	250
293	...	2	2	2	" Clarendon to Cornwallis	50
294	4	4	4	16	" Windsor to Penrith	160
295	4	4	4	16	" Yarramundi, <i>via</i> Enfield and Wilberforce, to Pitt Town Ferry	160
296	1	1	1	30	" Windsor, <i>via</i> Sackville Ferry, to Wiseman's Ferry	1,500
297	4	4	4	8	" Sackville to East Portland	80
298	4	4	4	10	" Churchill's Wharf to West Portland	100
299	5	5	5	16	" West Portland Road, <i>via</i> Moran's Rock, to Bulga Road, Upper Colo	112
300	1	1	3	55	" Bell's Line to Putty... ..	825
301	3	3	3	9	" Springwood to The Hawkesbury	135
302	3	3	3	14	" Bowenfels to King's Road	210
303	3	3	3	10	" Little Hartley to Gambenang	150
304	1	1	1	6	" Hartley to Lithgow	300
305	5	5	5	30	" Hartley to Oberon	210
306	3	3	3	18	" Oberon to Jenolan	270
307	1	1	1	6	" Mount Victoria to Mount Wilson Platform	300
308	2	2	2	10	" Bowenfels to Marsden's Swamp	250
309	1	1	1	6	" Little Hartley to Hartley Vale Platform	300
310	3	3	3	16	" Four-mile Tree to Rockley	240
311	2	2	2	13	" Mutton's Falls Public School to Oberon	325
312	...	5	5	10	" Tarana to O'Connell... ..	70
313	3	...	3	10	" Sidmouth Valley to Tarana... ..	150
314	2	3	3	17	" O'Connell to Oberon	255
315	3	3	3	24	" O'Connell to Swatchfield Road	360
316	3	5	5	20	" Oberon to Swatchfield	140
317	...	...	3	5	" Main Western Road, <i>via</i> Bonnyblink, to Cox's River	75
318	4	4	4	12	" Bowenfels to Wallerawang... ..	120
319	3	3	3	14	" Middle River to Meadow Flat	210
320	3	...	5	13	" Little River to 50-mile Tree on Swatchfield Road	91
321	...	...	4	14	" Rydal to Off Flats	140
322	...	...	4	14	" Oberon to Shooter's Hill	140
323	3	3	3	9	" Lidsdale to Wolgan	135
324	3	4	5	36	" Sofala to Rylstone	252
325	1	2	3	40	" Cudgegong to Hill End	600
326	2	2	3	52	" Cudgegong to Cassilis	780
327	...	3	3	14	" Cudgegong Village to Rylstone	210
328	5	4	4	26	" Cudgegong to Rylstone	260
329	...	4	4	31	" Rylstone to Bylong	310
330	4	3	3	8	" Cudgegong to Home Rule	120
331	1	1	1	8	" Cudgegong, <i>via</i> Cullenbone, to Gulgong	400
332	4	4	4	14	" Windeyer, <i>via</i> Campbell's Creek, to Raynor's	140
333	4	4	4	30	" Grattai, <i>via</i> Windeyer and Pyramul, to Sally's Flat	300
334	3	3	3	10	" Walls' Junction to Botobalar	150
335	2	2	3	19	" Monkey Hill to Hill End	285
336	4	4	4	44	" Guntawang to Wellington	440
337	4	5	5	29	" Tabrabucca, <i>via</i> Crudine, to Monkey Hill... ..	203
338	1	1	1	11	" Bathurst to O'Connell's Plains	550
339	1	1	1	2	" Bathurst and O'Connell's Plains Road, at Cox's Hill, to Cooper's Bridge... ..	100
340	5	5	5	4	" Kelso to Kellosiel	28
				898	Carried forward	£ 14,566

No.	Class.				Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.	898			
Western Roads—continued.							
						Brought forward	£ 14,566
341	2	2	2	5	Road from Kelso to White Rock	125	
342	3	3	3	22	„ Kelloshiel, <i>via</i> White's Crossing, to Little Forest...	330	
343	2	2	2	15	„ Limekilns Road to Palmer's Oakey Road and Upper Turon	375	
344	2	2	2	28	„ Kelso, <i>via</i> the Limekilns, to Sofala Road	700	
345	3	3	3	9	„ Kelso and Sofala Road, at Cheshire Creek, to Upper Turon	135	
346	3	3	2	15	„ Mitchell's Creek Reefs towards Palmer's Oakey...	375	
347	1	1	1	5	„ Mitchell's Creek to Western Road at Meadow Flat	250	
348	...	2	2	8	„ Mitchell's Creek to Piper's Flat Railway Station...	200	
349	...	2	2	7	„ Meadow Flat to Tarana Station	175	
350	6	6	6	5	„ Macquarie Plains to Bloom Hill	25	
351	...	3	3	8	„ O'Connell's Plains, <i>via</i> Spicer's, to Campbell's Lagoon	120	
352	3	3	3	11	„ O'Connell's Plains Road, <i>via</i> Dirty Swamp, to Road from Mutton's Falls to O'Connell's Plains	165	
353	1	1	2	30	„ Bathurst, <i>via</i> Kelloshiel, to near Monkey Hill	750	
354	3	3	3	34	„ Bathurst to Ophir	510	
355	1	1	1	29	„ Bathurst to Sofala, <i>via</i> Peel and Wyagdon	1,450	
356	2	2	2	6	„ Peel to Duramana	150	
357	1	1	1	12	„ Sofala, Cockatoo Hill, at Monkey Hill	600	
358	3	3	3	16	„ Rockley to Caloola and Tuena Road	240	
359	1	1	1	18	„ Mount Lawson, <i>via</i> Judge's Creek, to Burranga Copper Mines	900	
360	2	2	2	5	„ Evans Plains, <i>via</i> the Bald Hill, to Trunkey Road	125	
361	2	2	2	9	„ Rockley, <i>via</i> Campbell's River, to the Dog Rocks	225	
362	...	1	1	5	„ Rockley to Charlton	250	
363	4	4	2	20	„ Rockley to the Isabella River	500	
364	1	1	1	16	„ Bathurst and Caloola Road to Rockley	800	
365	4	4	4	3	„ Rockley Road to Camping Reserve, Vale Creek	30	
366	4	4	4	13	„ Bathurst and Caloola Road to Tea-pot Swamp	130	
367	4	4	3	30	„ Bathurst, <i>via</i> Gorman's Hill, to Campbell's River	450	
368	2	2	2	5	„ Bathurst, Campbell's River Road, Perth	125	
369	1	1	1	6	„ Caloola Road, <i>via</i> Limekilns, to Rockley Road	300	
370	2	3	3	38	„ Bathurst to Caloola and Trunkey Gold-field	570	
371	1	1	1	5	„ Newbridge Station to Caloola	250	
372	2	2	2	12	„ Arthur Town to Tuena	300	
373	1	1	1	17	„ Newbridge, <i>via</i> Hobbey's, to Arthur Town	850	
374	...	2	2	5	„ Newbridge towards Evans' Swamp	125	
375	2	4	4	36	„ Hill End, <i>via</i> Bragg's, to Main Western Road	360	
376	4	4	4	10	„ Mallow Grove towards Trunkey	100	
377	1	1	1	12	„ Tea-pot Swamp, <i>via</i> Five Islands, to No. 1 Swamp	600	
378	1	1	1	14	„ Blayney to Shaw and No. 1 Swamp	700	
379	2	2	3	14	„ Blayney, <i>via</i> Graham's Town, to Millthorpe	210	
380	2	2	2	8	„ Blayney, <i>via</i> Hood's, to Tea-pot Swamp	200	
381	4	4	4	13	„ Tea-pot Swamp, <i>via</i> Mallow Grove, to Carcoar	130	
382	1	1	1	25	„ Orange to Carcoar	1,250	
383	3	3	3	14	„ Cargo to Canowindra	210	
384	5	5	5	12	„ Cargo Road, <i>via</i> Paling Yard Creek, to Cudal	84	
385	1	2	3	50	„ Orange, <i>via</i> Cargo, to Nanima	750	
386	4	4	4	12	„ Lewis Ponds to Orange	120	
387	4	4	4	10	„ Orange to Mullion	100	
388	...	2	3	10	„ Mullion Railway Station to Ophir... ..	150	
389	2	2	2	12	„ Orange to Conoblas	300	
390	3	3	3	8	„ Orange to the Pinnacle at Renshaw's	120	
391	2	2	2	5	„ Spring Terrace to Long Swamp	125	
392	2	2	2	5	„ Blayney, <i>via</i> Parker's, to Five Islands	125	
393	3	3	3	5	„ Marten's to Spring Hill Railway Station	75	
394	2	2	2	12	„ Cargo to Cudal	300	
395	2	2	2	16	„ Orange to Cadia	400	
396	4	4	4	16	„ Orange to Ophir	160	
397	2	2	2	5	„ Spring Terrace to Forest Reefs	125	
398	4	4	4	15	„ Orange and Cadia Road to Four-mile Creek	150	
399	2	2	2	11	„ Forest Reefs to Blayney	275	
400	1	1	1	4	„ Matthews' to Brown's Creek Mine... ..	200	
401	2	2	3	10	„ Blayney to Guyong	150	
402	2	2	2	10	„ Spring Grove, <i>via</i> Guyong, to Byng	250	
403	2	2	2	6	„ Western Road, at Faviell's, to Byng	150	
404	3	3	3	14	„ Icely to Spring Grove Railway Station	210	
1,764						Carried forward	£ 35,250

No.	Class.			Length in Miles.	Western Roads—continued.	Proposed Expenditure.
	1885.	1886.	1887.				1,764
					Brought forward ...	£ 35,250
405	2	2	2	12	Road from Orange to Icely ...	300
406	1	1	1	12	" Spring Grove Railway Station to Cadia ...	600
407	2	2	2	6	" Spring Hill Station to Hennessy's, on Cadia Road ...	150
408	2	2	2	10	" Lucknow, <i>via</i> Spring Hill, to the Carcoar Road ...	250
409	...	4	4	12	" Molong to Boree ...	120
410	3	3	2	28	" Molong, <i>via</i> Toohey's Inn, to Toogong ...	700
411	2	2	2	40	" Molong to Obley ...	1,000
412	3	3	3	22	" Molong to Warne Railway Station ...	330
413	6	6	6	20	" Burrawong Cross Roads to Bolderogery ...	100
414	4	4	4	16	" Stony Creek to Burrendong ...	160
415	1	1	1	4	" Springs Railway Station to Newrea Bridge ...	200
416	2	2	2	35	" Wellington, <i>via</i> Buckinbah to Balderogery ...	875
417	3	3	3	22	" Wellington to Burrendong ...	330
418	4	4	4	18	" Wellington to Arthurville ...	180
419	...	...	2	8	" Village to Dairy Creek ...	200
420	1	1	4	5	" Carcoar to Village of Shaw ...	50
421	3	3	3	40	" Boga Bogalong to Marsden ...	600
422	4	4	5	30	" Grenfell to Goolagong ...	210
423	4	4	4	50	" Grenfell, <i>via</i> Piper's, to Morangarell ...	500
424	..	...	3	20	" Piper's to Williams's ...	300
425	...	3	3	8	" Grenfell to Eualdrie ...	120
426	5	5	3	22	" Cowra to Hovell's Creek, <i>via</i> Darby's Falls ...	330
427	6	6	6	47	" Cowra to Young ...	235
428	3	5	5	20	" Cowra to Canowindra ...	140
429	...	3	3	17	" Cowra, <i>via</i> Binni Creek, to Walli ...	255
430	5	5	4	56	" Cowra to Forbes, south bank of Lachlan ...	560
431	5	5	5	20	" Cowra to Milburn Creek ...	140
432	4	4	4	30	" Cowra, <i>via</i> Morongola and Neilar, towards Frogmore ...	300
433	...	4	4	24	" Cowra, <i>via</i> Neilar and Gudgebong, towards Burrowa ...	240
434	2	4	4	8	" Carcoar to Flyer's Creek ...	80
435	2	2	3	30	" Mandurama to Canowindra ...	450
436	...	...	4	10	" Mandurama to Burnt Yards ...	100
437	2	2	2	10	" Mandurama to Galley Swamp ...	250
438	...	3	3	8	" Walli to Sheet of Bark or Burley Jacks ...	120
439	2	2	2	12	" Sheet of Bark, <i>via</i> Wood's Flat, to Mount McDonald ...	300
440	4	4	4	30	" Biggar to Mount McDonald ...	300
441	3	3	3	30	" Lyndhurst, <i>via</i> Cobb's, to the Abercrombie ...	450
442	3	4	4	22	" Canowindra to Eugowra ...	220
443	1	2	2	48	" Boree to Parkes ...	1,200
444	2	2	3	19	" Forbes to Parkes ...	285
445	3	3	3	57	" Forbes to Condobolin ...	855
446	3	3	3	28	" Forbes to Bogan ...	420
447	3	3	4	68	" Parkes to Condobolin ...	680
448	...	4	4	32	" Parkes to Balderogery ...	320
449	3	4	4	42	" Grenfell to Forbes ...	420
450	4	4	4	62	" Forbes to South Condobolin ...	620
451	...	4	4	52	" The Lachlan at Murrans to Mount Hope ...	520
452	5	5	5	50	" Wellington to Cobborah ...	350
453	3	3	3	70	" Faulkner's, <i>via</i> Cobborah, to Gilgandra ...	1,050
454	3	3	3	70	" Cullenbone to Dubbo ...	1,050
455	2	3	3	104	" Dubbo to Coonamble ...	1,560
456	4	4	4	40	" Obley to Dubbo ...	400
457	...	2	2	6	" Cobar towards Hillston ...	150
458	4	5	5	80	" Cobar to Nyngan ...	560
459	...	4	5	135	" Cobar to Wilcannia ...	945
460	6	6	5	60	" Nymagee to Nyngan ...	420
461	...	2	2	5	" Mount Hope Tank to Euabalong Road ...	125
462	...	...	6	100	" Cobar to Bourke ...	500
463	6	6	6	150	" Bourke to Ford's Bridge and Hungerford ...	750
464	6	6	6	125	" Bourke, <i>via</i> Wanaaring, to Milparinka ...	625
465	3	3	6	90	" Bourke to Barringun ...	450
466	6	6	6	180	" Wilcannia to Thackaringa ...	900
467	6	6	6	100	" Wilcannia towards Tibboburra ...	500
468	6	6	6	100	" Wilcannia towards Wentworth ...	500
469	5	5	5	130	" Hulong Station to Lachlan, at Lake Cudgellico ...	910
470	...	3	3	40	" Euabalong to Mount Hope ...	600
471	3	5	6	40	" Lachlan at Whealbah to Gunbar ...	200
472	6	6	6	50	" Booligal to Hillston ...	250
473	6	6	6	210	" Booligal to Wilcannia ...	1,050
474	...	...	6	100	" Silvertown, <i>via</i> Purnamoota, to Polamacca and Tarella ...	500
				5,021	Total ...	£ 66,660

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.			
Southern Roads.						
475	...	...	1	2	Old Botany Road	100
476	1	1	1	8	Road from Randwick Toll-gate to La Perouse...	400
477	1	1	1	1	" La Perouse Road to Little Bay (Sanatorium Road)	50
478	1	1	1	3	" Half-way House to Rocky Point (Rocky Point Road)	150
479	1	1	1	2	" Half-way House, Botany Road, <i>via</i> Ricketty-street, towards Botany Bay	100
480	1	1	1	1	" Banks Meadow to Whisker's Road	50
481	1	1	1	5	" Tom Ugly's Point, <i>via</i> West's Forest Road and Kingsgrove, to Canterbury Road, and Croydon Park to Main Southern Road, near Croydon...	250
482	2	1	1	3	" Bankstown to Rookwood Railway Station	150
483	1	1	1	10	" Rocky Point Road to George's River (Forest Road)	500
484	3	3	3	5	" Illawarra Road to Bond's Road (Broad-arrow and Stony Creek Road)	75
485	4	4	4	6	" Bringley Cross Roads to the Cobbitty Road	60
486	2	2	2	4	" Campbelltown to Narellan	100
487	1	1	1	23	" Picton, <i>via</i> Vanderville, to foot of Burragorang Mountain	1,150
488	3	3	3	4	" Appin to Brooke's Point	60
489	3	3	3	8	" Foot of Burragorang Mountain to Cox's River	120
490	3	3	3	8	" Foot of Burragorang Mountain up the Wollondilly	120
491	3	2	2	18	" Bottle Forest to Main South Coast Road, at Westmacott's Pass	450
492	1	1	1	12	" Bulli, <i>via</i> Coal Cliff, to Blue-gum Forest	600
493	6	6	4	7	" Bulli Pass to Cataract River	70
494	1	1	1	38	" Moss Vale, <i>via</i> Kangaroo Valley, to Nowra	1,900
495	1	1	1	30	" Moss Vale and Nowra Road, <i>via</i> Robertson, to foot of Jamberoo Mountain... ..	1,500
496	1	1	1	21	" Old South Road, from Cross Roads, <i>via</i> Moss Vale, to Little Forest	1,050
497	1	1	1	17	" Bowral, <i>via</i> Alcorn's, to Robertson... ..	850
498	1	1	1	2	" Fitz Roy Iron Mines to Bowral	100
499	3	3	3	2	" Old South Road, Mittagong, to Southern Road, near Fitz Roy Inn	30
500	...	...	4	14	" Mittagong to Joadja Creek	140
501	1	1	2	5	" Main Southern Road near Berrima to Bowral	125
502	1	1	1	1	" Bowral Road to Burradoo Platform	50
503	...	...	1	3	" Bowral, <i>via</i> B. M. Osborne's, to Main South Road	150
504	1	1	1	5	" Berrima to Railway Station at Moss Vale... ..	250
505	1	1	1	3	" Kangaroo Ground Road at Byrnes's, <i>via</i> C. Throsby's, to Old South Road at Moss Vale...	150
506	2	2	2	18	" Moss Vale and Shoalhaven Road, <i>via</i> Meryla Creek, to Wallanderry Road	450
507	2	2	2	3	" Sutton Forest to Main South Road, near Cowley's	75
508	2	2	2	7	" Sutton Forest to Bundanoon	175
509	4	4	4	10	" Cross Roads towards Taralga	100
510	3	3	3	12	" The Kangaloon Road, at Robertson Park, to near Mount Murray	180
511	3	3	3	6	" Near Wallaby Creek, <i>via</i> Macquarie Pass, to Central Illawarra	90
512	1	1	1	1	" Alcorn's Store to the Macquarie Pass Road	50
513	2	3	2	9	" Kiama Road, at Blenkinsop's, <i>via</i> Wild's Meadows, to Barrangarry Road	225
514	1	1	1	2	" Burrawang to Robertson Road	100
515	2	2	2	4	" Wild's Meadows to Robertson Road	100
516	4	4	4	7	" Main South Coast Road to Jervis Bay	70
517	5	5	4	75	" Nowra, <i>via</i> Narriga, to Braidwood... ..	750
518	3	3	3	20	" Nowra to Yalwal	300
519	1	1	1	43	" Nowra, <i>via</i> Tomerong, to Milton	2,150
520	2	2	2	12	" Kangaroo Valley to Broughton's Creek	300
521	3	3	3	9	" Kangaroo Mountain, <i>via</i> Brogher's Creek, to Kangaroo Valley	135
522	2	2	2	12	" Marulan to Greenwich Park	300
523	3	3	3	14	" Greenwich Park to Towrang	210
524	4	6	6	18	" South Road, at Towrang, <i>via</i> Lockyersleigh, to Paddy River	90
525	1	1	1	6	" Marulan to the Limekilns	300
				559	Carried forward	£ 17,000

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.				559
Southern Roads—continued.						£
					Brought forward . . .	17,000
526	1	2	2	25	Road from Marulan, <i>via</i> Bungonia and Jacqua, to Windellama	625
527	2	2	2	3	„ Bungonia to Inverary Park	75
528	4	4	4	25	„ Gurrunda Road, near Kippielaw, <i>via</i> Gurrunda, to Bealla	250
529	3	3	4	8	„ Kippielaw, <i>via</i> Parkesbourne, to Breadalbane Railway Station	80
530	...	...	4	6	„ Parkesbourne to Parker's Run of Water	60
531	...	...	3	9	„ Goulburn and Binda Road, at Carter's, to Goulburn and Wheeo Road, near Wollondilly (Middle Creek Road)	135
532	...	...	5	15	„ Wheeo Post Office, <i>via</i> Byalla, to Gunning	105
533	2	2	2	17	„ Goulburn to Bungonia	425
534	4	3	3	22	„ Goulburn to Windellama	330
535	1	1	1	28	„ Goulburn to Taralga	1,400
536	1	1	3	10	„ Taralga to Currameela	150
537	...	5	5	15	„ Richlands to the Wombeyan Caves	105
538	2	2	3	23	„ Goulburn to Upper Tarlo and Roslyn	345
539	4	4	4	9	„ Campbell's Lane, Middle Arm Road, to Rhyanna	90
540	3	3	3	5	„ Goulburn and Tuena Road, <i>via</i> Limekilns, to Goulburn and Tarlo Road	75
541	1	1	1	42	„ Goulburn, <i>via</i> Crookwell, to Binda	2,100
542	1	1	2	39	„ Goulburn, <i>via</i> Gullen, to Wheeo	975
543	2	2	2	15	„ Goulburn, <i>via</i> Mummell, to Pomeroy	375
544	2	2	3	10	„ Collector to Main Southern Road, at Breadalbane	150
545	3	3	4	17	„ Collector to Gunning	170
546	2	3	3	15	„ Collector towards Goulburn	225
547	2	3	3	24	„ Collector, <i>via</i> Currawang, to Tiranna	360
548	3	3	3	12	„ Wheeo to Binda	180
549	2	2	2	10	„ Wheeo towards Crookwell	250
550	5	5	5	26	„ Crookwell, <i>via</i> Grabben Gullen, to Gunning	182
551	4	4	5	24	„ Binda to Bigga	168
552	...	...	5	16	„ Binda and Bigga Road, <i>via</i> Junction Point, to Tuena	112
553	...	2	2	2	„ Goulburn and Crookwell Road, near Marsden's, <i>via</i> Ravensworth, to Goulburn and Tarlo Road, near Confoy's	50
554	2	2	2	57	„ Goulburn and Binda Road, at Mount Wayo, <i>via</i> Tuena, to the Abercrombie River	1,425
555	5	5	5	5	„ Goulburn and Wheeo Road, at Hawthorn's Tree, to the Wheeo and Crookwell Road	35
556	5	5	6	15	„ Bigga to the Abercrombie	75
557	3	3	5	12	„ Goulburn and Tuena Road, <i>via</i> Fullerton, to Sherwood	84
558	3	3	3	18	„ Taralga to Laggan	270
559	3	3	2	6	„ Taralga to Stonequarry	150
560	5	5	5	10	„ Stonequarry to Leighwood	70
561	4	4	4	12	„ Taralga, <i>via</i> Bannaby, towards Swallowtail	120
562	5	5	5	12	„ Laggan, <i>via</i> Golspie, to Leighwood	84
563	3	3	4	8	„ Golspie to Taralga and Rockwell Road	80
564	3	3	3	36	„ Wheeo to Burrowa	540
565	2	2	2	15	„ Gullen, <i>via</i> Crookwell, to Laggan	375
566	4	4	3	6	„ Crookwell, <i>via</i> Red Ground, to Laggan and Binda Road	90
567	3	3	4	13	„ Laggan to Binda	130
568	5	5	5	16	„ Binda to Peelwood	112
569	3	3	3	7	„ Cotta Walla to road Mount Wayo to Peelwood	105
570	2	2	2	15	„ Bungendore to Doughboy Hill	375
571	3	2	2	20	„ Bungendore, <i>via</i> Molonglo, to Queanbeyan and Bungendore Road	500
572	6	5	5	10	„ Bungendore and Molonglo Road to Black Range	70
573	1	1	1	32	„ Braidwood to Nelligen—Clyde Road	1,600
574	3	3	3	6	„ Nelligen to Bateman's Bay	90
575	3	3	3	9	„ Nelligen to Bateman's Bay and Milton Road at M'Millan's	135
576	2	1	1	75	„ Milton, <i>via</i> Bateman's Bay and Moruya, to Bodalla	3,750
577	4	4	4	36	„ Milton and Bateman's Road, near Woodburn, <i>via</i> Brooman's Ford, to Nelligen	360
578	1	1	1	16	„ Braidwood, <i>via</i> Dirty Butter Creek, to Araluen	800
579	4	4	4	27	„ Braidwood to Molonglo (Cole's Line)	270
				1,525	Carried forward . . .	£ 38,242

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.			
Southern Roads—continued.						
					Brought forward...	£ 38,242
580	3	3	2	12	Road from Trunkatabella Bridge to Reedy Creek Cutting ...	300
581	2	1	1	36	" Araluen to Moruya	1,800
582	2	2	2	10	" Braidwood to Elrington	250
583	2	2	2	9	" Braidwood to Sergeant's Point (Little River) ...	225
584	6	6	6	8	" Sergeant's Point (Little River) to Clyde River ...	40
585	6	6	6	15	" Braidwood and Tarago Road, <i>via</i> Larbert, to Lower Boro	75
586	3	3	3	7	" Elrington to Ballalaba	105
587	3	3	3	12	" Braidwood, <i>via</i> Reidsdale, to Bell's Creek... ..	180
588	5	5	5	5	" Reidsdale to Warnumbucca (Tudor Valley Road)... ..	35
589	3	3	3	8	" Elrington to Araluen	120
590	2	2	3	12	" Monga to Major's Creek, "Elrington"	180
591	3	3	3	22	" Major's Creek to Fairfield	330
592	...	...	5	10	" Hoskingtown to Saw-mills and Harold's Cross	70
593	...	...	4	6	" Mogo to Tomakeen	60
594	1	1	1	7	" Cathcart to Bibenluke Junction	350
595	2	2	2	18	" Candelo to Mogila and Brown Mountain Road	450
596	3	3	3	18	" Candelo, <i>via</i> Wyndham, to Burrowgate	270
597	3	3	3	24	" Brown Mountain, <i>via</i> Kameruka, to Finger-post ...	360
598	2	2	2	2	" Candelo to Kameruka	50
599	3	3	3	8	" Burrogate to Honeysuckle	120
600	3	3	3	12	" Towamba to New Buildings	180
601	5	2	2	15	" Towamba to Bondi	375
602	2	2	2	38	" Cathcart Junction, <i>via</i> Wyndham, to Panbula ...	950
603	2	2	2	6	" Panbula to Wolumla... ..	150
604	3	2	2	13	" Wolumla Junction to Cross Roads... ..	325
605	4	4	4	10	" Wolumla, <i>via</i> Lithgow Flat, to Candelo and Wyndham Road... ..	100
606	4	4	4	12	" Merimbula to Jellatt Jellatt	120
607	4	4	4	6	" Briandairy to Bega	60
608	1	1	1	9	" Bega, <i>via</i> Jellatt Jellatt, to Tathra... ..	450
609	1	1	1	10	" Bega to Wolumla	500
610	2	2	2	55	" Bega to Bodalla	1,375
611	...	6	6	7	" Wallaga Lake to Bermagui... ..	35
612	3	2	2	16	" Cobargo to Bermagui	400
613	4	4	4	23	" Cobargo, <i>via</i> Wandellow and Yaurie, to Wadbilliga	230
614	2	2	2	16	" Bega to Numbugga and Bembooka	400
615	2	2	2	32	" Bega, <i>via</i> Wapangue, to the Murrumbidgee ...	800
616	3	3	2	30	" Bodalla to Dignam's Creek, <i>via</i> Cowderoy's and Hawdon's... ..	750
617	3	3	3	18	" Pitman's Bridge, <i>via</i> Wagonga Heads, to Bodalla... ..	270
618	2	2	2	23	" Eden to Sturt	575
619	1	1	1	12	" Eden to Panbula	600
620	3	3	3	38	" Cooma to Jindabyne... ..	570
621	4	4	4	12	" Cooma and Jindabyne Road near Coolingdon to Middlingbank	120
622	3	3	3	20	" Cooma and Jindabyne Road to Buckley's Crossing	300
623	2	2	2	52	" Cooma and Jindabyne Road to Kiandra	1,300
624	1	1	1	52	" Cooma to Bombala	2,600
625	...	5	5	20	" Cooma, <i>via</i> Myalla, to Bobundarah and Nimity- belle Road	140
626	4	4	4	26	" Cooma to Count-a-guinea, <i>via</i> the Big Badger ...	260
627	3	4	3	80	" Cooma to Braidwood	1,200
628	3	3	3	20	" Cooma to Bobundarah	300
629	...	...	5	30	" Cooma, <i>via</i> the Peak, to Bolari	210
630	...	...	5	14	" Cooma to Green Hills	98
631	...	...	4	19	" Nimitybelle to Bobundarah	190
632	...	...	5	10	" Ballybugra, <i>via</i> the Gap, to Murrumbucca ...	70
633	...	5	5	12	" 13-mile Post on Bombala and Delegate Road, <i>via</i> Craigie, to Border	84
634	3	4	4	25	" Buckley's Crossing, <i>via</i> Boloco, to Jindabyne ...	250
635	4	4	4	38	" Bibenluke to Bobundarah	380
636	...	5	5	7	" Delegate to the Border	49
637	5	5	5	45	" Bobundarah to Seymour	315
638	2	2	2	18	" Holt's Flat to Railway Bridge	450
639	2	2	2	22	" Bombala to Delegate	550
640	3	3	3	14	" Bombala, <i>via</i> Bukalong, to Gunningrah North ...	210
641	4	4	4	20	" Old Burra Road to Michelago	200
642	2	3	3	41	" Queanbeyan, <i>via</i> Gundaroo, to Gunning	615
				2,772	Carried forward ...	£ 62,718

No.	Class.			Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.				2,772	£
Southern Roads—continued.						
					Brought forward	62,718
643	2	3	3	44	Road from Yass to Bungendore	660
644	2	2	2	31	" Queanbeyan to Murrumbateman	775
645	3	3	3	24	" Yass, <i>via</i> Mundoonen, to Fairfield Bridge	360
646	1	1	1	7	" Gunning to Dalton	350
647	3	3	3	43	" Dalton to Burrowa	645
648	3	3	3	17	" Bowning to Binalong	255
649	3	3	3	26	" Sharpening Stone Creek to Burrowa and Binalong Road near Burrowa	390
650	2	2	2	13	" Yass to Woolgarlo	325
651	3	3	3	25	" Dalton to Nawawa	375
652	3	3	3	15	" Dalton, <i>via</i> Jerrawa Platform, to Yass Municipality	225
653	3	3	3	9	" Gunning and Burrowa Road to Yass	135
654	5	5	5	18	" Dalton and Narrawa Road, near Roche's, to junction of Pudman Road	126
655	2	2	2	2	" Sharpening Stone Creek and Burrowa Road, near Walls, to Bowning	50
656	4	4	4	5	" Ginindera to Weetangra	50
657	4	4	4	22	" Queanbeyan, <i>via</i> Yarrolumna, to Uryarra Post Office	220
658	4	4	4	15	" Bloomfield Road at Warro Creek, <i>via</i> Boambalo Ford, to Mullion	150
659	...	4	4	55	" Bloomfield, <i>via</i> Weajasper, to Tumut	550
660	4	4	4	15	" South Road, near Bookham, to the Cooradigbee Junction	150
661	4	4	4	14	" Ginindera and Gundaroo Road, <i>via</i> Mac's Reef, to Bungendore Road	140
662	4	4	4	8	" Bookham to Bowning and Binalong Road at Illalong	80
663	...	4	4	12	" Bookham to Chidowla	120
664	2	2	2	11	" Yass to Bloomfield	275
665	4	4	5	11	" Canberra, <i>via</i> Weetangra, to junction of Uriarra Road	77
666	4	4	4	3	" Yass to Black Range	30
667	3	3	3	7	" Frogmore to Wheeo and Burrowa Road	105
668	5	5	4	12	" Wallanbeen to Murrumburrah	120
669	2	2	2	28	" Burrowa to Young	700
670	...	4	4	22	" Burrowa to Kenya	220
671	3	3	3	51	" Young to Temora	765
672	3	2	2	44	" Morangarell to Young	1,100
673	4	4	4	20	" Young and Cowra Road, near Young, to Jerry Bang	200
674	5	5	5	14	" Young, <i>via</i> Irish Jack's Creek and Black Ranges, to Moppity	98
675	1	1	1	20	" Binalong to Burrowa	1,000
676	1	2	2	18	" Murrumburrah, <i>via</i> Wombat, to Young	450
677	1	2	2	31	" Young to Grenfell	775
678	3	3	3	7	" Cullinga to Wallendbeen	105
679	...	3	3	25	" Jugiong to Murrumburrah	375
680	5	4	4	10	" Murrumburrah to Harden	100
681	1	1	1	20	" Gundagai to Tumut	1,000
682	2	2	2	14	" Gundagai to Brungle	350
683	2	3	3	48	" Gundagai to Wagga Wagga, "north side of River"	720
684	3	3	3	16	" Gundagai to Bongongolong	240
685	2	2	2	11	" Tumut to Brungle	275
686	...	3	3	12	" Brungle Bridge to Wagra	180
687	3	3	3	10	" Tumut to Lacmalac	150
688	5	5	4	60	" Tumut to Kiandria	600
689	1	1	1	14	" Tumut to Adelong	700
690	...	3	3	22	" Temora to Barmedman	330
691	2	2	2	7	" Gilmore Creek to Reily's Crossing, Adelong Creek	175
692	3	3	2	8	" Reily's Crossing to Reedy Flat	200
693	3	2	2	30	" Middle Adelong to Tumberumba	750
694	3	3	3	20	" Adelong to Main South Road, at Hillas Creek	300
695	1	1	1	24	" Main Southern Road to Middle Adelong	1,200
696	3	3	3	23	" Coolac to Cootamundra, <i>via</i> M'Leod's	345
697	2	2	2	33	" Cootamundra to Temora	825
698	3	3	3	12	" Cootamundra to Stockinbingal Bridge	180
699	...	...	2	8	" Coolac to Gobarralong	200
700	...	...	3	12	" Glenroy to Munderoo	180
701	...	...	3	12	" Tumberumba to Upper Burra	180
702	2	2	2	7	" Upper Tumberumba to Tumberumba	175
3,949					Carried forward	£ 84,599

No.	Class.				Length in Miles.		Proposed Expenditure.
	1885.	1886.	1887.	3,949			
Southern Roads—continued.							
Brought forward						84,599	
703	1	1	1	30	Road from Tumberumba, <i>via</i> Munderoo, to Jingellic...	1,500	
704	2	2	2	30	" Welaregang to Tumberumba Road	375	
705	2	2	2	100	" Bowna Station to Welaregang	2,500	
706	...	3	3	30	" Welaregang, <i>via</i> Greg Greg, to Kancoban	450	
707	2	1	1	40	" South Road, at Little Billabong, to Tumberumba	2,000	
708	1	1	1	10	" Carabost to Kiamba... ..	500	
709	5	5	5	77	" Wagga Wagga to Murrumburrah and Grenfell Road	539	
710	2	2	2	33	" Main Southern Road, at Kiamba, to Wagga Wagga	825	
711	5	5	5	60	" Wagga Wagga to Narrandera	420	
712	3	3	3	5	" Wagga Wagga to Lake Albert	75	
713	3	3	3	28	" Wagga Wagga to Bullenbong	420	
714	2	2	2	15	" Main Southern Road, at Tarcutta, to Alfred Town	375	
715	6	6	6	100	" Conargo to Narrandera, <i>via</i> Cuddel	500	
716	6	6	6	40	" Wagga Wagga to Cowabee	200	
717	2	4	4	60	" Rock Railway Station to Urana	600	
718	1	1	1	20	" Culcairn Railway Station, <i>via</i> Morven, to Germanton	1,000	
719	4	3	4	18	" Germanton to Cookindina	180	
720	3	3	3	81	" Albury to Wagga Wagga	1,215	
721	2	2	2	100	" Albury to Turner's Inn, south of Tocumwall	2,500	
722	3	3	2	80	" Albury to Urana	2,000	
723	2	2	3	50	" Albury and Corowa Road to Urana	750	
724	6	6	5	80	" Corowa, <i>via</i> Sandy Ridges and Bull's Plains, to Jerilderie... ..	560	
725	3	3	3	34	" Corowa to Piney Range	510	
726	3	2	2	22	" Howlong to Walbundrie	550	
727	3	3	3	20	" Walbundry to Culcairn Railway Station	300	
728	3	3	3	20	" Gerogery Railway Station, <i>via</i> Jindera, to Bungo-wannah	300	
729	1	2	2	27	" Gerogery Railway Station, <i>via</i> Bethel, Burrumbuttock, to Howlong	675	
730	5	5	3	20	" Walla Walla to Gerogery Railway Station	300	
731	...	...	5	60	" Balranald to Ferry Swan Hill	420
732	...	...	4	20	" Mathoura to Bunaloo	200
733	...	...	6	60	" Moulamein to Wangonville	300
734	...	...	5	20	" Germanton to Mountain Creek	140
735	4	4	4	40	" Jerilderie to Tocumwall	400	
736	1	1	2	10	" Coonong Railway Station towards Urana	250	
737	4	4	4	20	" Coonong Railway Station towards Goolgumbula	200	
738	4	4	3	112	" Deniliquin to Balranald	1,680	
739	3	3	3	86	" Deniliquin to Urana	1,290	
740	4	4	4	30	" Tocumwall to Deniliquin	300	
741	4	4	6	72	" Deniliquin to Hay	360	
742	6	6	6	21	" Deniliquin to Mathoura Old Road... ..	105	
743	4	4	3	24	" Mathoura to Moama, west side of Railway	360	
744	5	5	4	90	" Moama to Moulamein	900	
745	2	2	2	22	" Moama to Caloola, Mars, and Womboota... ..	550	
746	...	6	6	60	" Wentworth to South Australian Border	300	
747	6	6	6	116	" Balranald towards Hay	580	
748	...	6	6	100	" Balranald to Wentworth	500	
749	4	4	6	100	" Carathoul, <i>via</i> Gunbar, to Hillston	500	
750	3	4	6	50	" Hay to Gunbar	250	
751	6	6	6	80	" Hay to Narrandera	400	
752	2	3	6	49	" Hay to Booligal	245	
				6,421	Total miles.	Total	£ 116,948

NOTE.—The amount per mile proposed to be expended on each class of Roads is as follows:—1st class, £50; 2nd class, £25; 3rd class, £15; 4th class, £10; 5th class, £7; 6th class, £5.

	Miles.	£
Northern Roads	7,036	142,702
Western Roads	5,021	66,660
Southern Roads	6,421	116,948
Total	18,478	326,310

N.B.—No sum herein contained is to be expended within the boundaries of any Municipality. The whole of the Roads contained in this Schedule are subject to a reduction of 5 per cent. in order to bring the amount within the reduced Estimate of £310,000.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

BOTANY ROAD.

(REMOVAL OF TOLL-BAR—PROCLAMATION OF ROAD.)

Ordered by the Legislative Assembly to be printed, 28 April, 1887.

RETURNS to *Orders* made by the Honorable the Legislative Assembly of New South Wales, dated 25th March, 1887, That there be laid upon the Table of this House,—

- “(1.) Copies of all papers, documents, and correspondence, in connection with the removal of the Toll-bar from the Botany Road.
“(2.) Copies of all papers, correspondence, and documents in connection with the proclamation of the Botany Road as a Main Road of the “Colony.”

*(Mr. Stephen.)***SCHEDULE.**

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No. 1.

Mr. W. H. Head to The Secretary for Public Works.

Deputation—Abolition of Tolls, Botany Road

Hon Sir,

Beaconsfield-terrace, Botany Road, 14 September, 1885

I am instructed to inform you that a meeting of the Alexandria Council and the Botany Road Toll Abolition League took place at the Alexandria Town Hall, on the 11th instant, when the following resolution was duly passed—'That a deputation consisting of the aforesaid Council and League wait upon the Hon the Minister for Works to ascertain his views in removing the toll from the Botany Road'

I am instructed to most respectfully ask could you make it convenient to receive the aforesaid deputation And we will, as in duty bound, ever pray

Yours, &c,

W H HEAD,

Secretary to the League

Mr Rae will please fix a date—F A W, 15/9/85 Friday, 18th, at 12. Inform—J R, 15/9/85.
Mr W H Head informed, 15/9/85 Roads—J R, B C, 15/9/85. Previous papers—W C B, 16/9/85.

No. 2.

The Under Secretary for Public Works to Mr. W. H. Head.

Sir,

Department of Public Works, Sydney, 15 September, 1885.

In reply to your letter of the 14th instant, I am directed to inform you that the Secretary for Public Works will receive the deputation, not to exceed six in number, from the Alexandria Council and the Botany Toll Abolition League, on the subject of the removal of the toll-bar from the Botany Road, on Friday, the 18th inst, at 12 o'clock

I have, &c,

JOHN RAE

No. 3.

Minute Paper.

Roads Department, Sydney, 17 September, 1885.

Deputation

UPON inquiry at the Department of Public Works, I am informed that the only deputation fixed for to-morrow on any business connected with this Department is the following—

W H. Head, 12 o'clock—Abolition of tolls, Botany Road

No. 4.

Minute by Commissioner for Roads.

Abolition of Tolls, Botany Road

17 September, 1885

THE Trust Acts under the 4th VICTORIA No 72—the Parish Roads Act If all the road were within municipal limits, I would advise the resignation of the Trust, if the municipalities undertook to keep the road good; but this is not the case, 5 miles of the road not being within any municipality I cannot recommend the course taken with respect to the Cook's River Road—that is, to proclaim it as one of the main roads of the

the Colony, and that the Department take it over. Legal complications might arise out of that course; and I am of opinion that the best course will be to allow matters to remain as they are, for the short time that may elapse pending the passing of Local Government Act, which will, no doubt, provide for such cases, and the abolition of tolls where objected to.
Act herewith. W.C.B., 17/9/85.

No. 5.

Minute by The Secretary for Public Works.

Sydney, 18 September, 1885.

Deputation—Abolition of Tolls, Botany Road, 12 o'clock.

THE deputation introduced by Mr. J. Sutherland, M.P., waited upon me to-day, and represented the injury occasioned by the retention of the toll-bar in Botany Road, while tolls in almost every other instance had been abolished. The principal sufferers were a number of persons, van-men, and others, who had made their residences just outside the toll-bar, and, consequently, had to pay each time they passed through. I informed them that I recognised the disability under which they laboured, and was ready to admit that their case was somewhat of a hard one; at the same time a remedy could be afforded if the trustees resigned their positions, and the municipalities took over the road so far as it lay within their boundaries. The Alexandria Council, through the Mayor who was present, was against this, pointing out that the road within their boundary passed through, for some distance, vacant land; but I asked him to endeavour to arrange with the Waterloo Council to take over the maintenance of the road so far as the population extended, and I would then endeavour to arrange with the Road Trusts, as to the abolition or removal of the toll outside the municipal boundary. The Mayor promised to communicate with me in the matter after calling a meeting of those interested.

F.A.W., 19/8/85.

Roads.—J.R., B.C., 22/9/85. Resubmit with reply.—W.C.B., 23/9/85.

No. 6.

The Council Clerk, Alexandria, to The Secretary for Public Works.

Sir,

Town Hall, Alexandria, 29 September, 1885.

Adverting to a deputation that waited upon you some little time ago relative to the abolition of the toll-bar on the Botany Road, I have the honor by direction of the Mayor to inform you that a conference was held at the Town Hall here on the 25th instant, between the Alexandria and Waterloo Councils, for the purpose of considering the advisability of accepting the control of that portion of the Botany Road, extending from Boundary-street to the toll-bar in question. After considerable discussion, in which it was pointed out that the Councils were not in a position, financially, to bear the increased expenditure, a resolution was moved, and carried to that effect.

I have, &c.,
NELSON VAUGHN,
Council Clerk.

Acknowledge, 3/10/85. The paper herewith show action taken, and opinion of the late Minister (Mr. WRIGHT).—W.C.B., 28/10/85. Under Secretary.—B.C. Inform Council Clerk.—J.R., 2/11/85.

No. 7.

Mr. W. H. Head to The Secretary for Public Works.

Hon. Sir,

Beaconsfield-terrace, Botany Road, 13 October, 1885.

I am instructed to inform you that a meeting of the Botany Road Toll Abolition League, took place at the "Empress of India Hotel," Botany Road, on the 12th instant, when the following resolution was duly passed:—That a deputation consisting of the aforesaid League wait upon the Honorable the Minister for Works to ascertain his view in removing the toll from the Botany Road.

I am instructed to most respectfully ask, could you make it convenient to receive the aforesaid deputation.

And we will, as in duty bound, ever pray, &c., &c.

W. H. HEAD,
Secretary to the League.

Inform deputation, advisable to wait till my successor is appointed.—H.S.B., 21/10/85. W. H. Head, informed, 21/10/85. Roads.—J.R., B.C., 22/10/85/. Previous paper.—W.C.B., 26/10/85, 859,218, herewith, 27/10/85. The Councils of Waterloo and Alexandria were asked to take over the road from Boundary-street to the toll-bar, but they have declined to do so. The Government have no power without an Act. The Local Government Bill will abolish the bar. Inform that a deputation under the circumstances, is unnecessary, 3/11/85. Put all the papers together. This toll-bar has been abolished.—W.J.L., 15/12/85.

No. 8.

The Under Secretary for Public Works to Mr. W. H. Head.

Sir,

Department of Public Works, Sydney, 21 October, 1885.

In reply to your letter of the 13th instant, requesting an appointment to wait upon the Secretary for Public Works in regard to the abolition of the toll-bar on the Botany Road, I am directed to inform you that the matter must stand over until a successor to the present Secretary for Public Works has been appointed.

I have, &c.,
JOHN RAE.

No. 9.

No. 9.

Mr. T. Leeder to The Principal Under Secretary.

Sir,

438 George-street, Sydney, 8 November, 1885.

I have the honor by direction of the trustees of the Botany Road toll-bar to enclose herewith a scale of tolls, which the trustees propose to be levied and taken at the toll-bar on the Botany Road, in lieu of those now levied and taken, as shown by scale also enclosed, under the Parish Roads Act, 4 Vic. No. 12.

It will be noted that the revised scale of tolls is considerably lower than the existing scale.

And I am respectfully to request that you will be pleased to have the necessary proclamation published in the Government Gazette, as required by the 21st section of the Act above referred to, and to take effect from the 1st January next; and as the trustees desire to let the tolls early in December, for the ensuing year, I am to ask you to be kind enough to expedite issue of the proclamation.

I have, &c.,

THOS. LEEDER,

Secretary to Trustees.

The Under Secretary for Public Works — C.W., B.C., 16/11/85 Roads.—J.R., B.C., 16/11/85.
Mr. Hiles,—See me with the Act.—W.C.B., 16/11/85. Act submitted, 16/11/85. Letter to Secretary,
Botany Road Trust. I recommend that the reduced rates be proclaimed.—W.C.B., 16/11/85. Under
Secretary.—B.C. Submitted.—J.R., 18/11/85, approved. Mr. Hiles,—Has proclamation gone on?
W.C.B., 2/12/85.

This proclamation is at present with the Executive Council.

Botany Road Toll-bar.

Existing Scale of Tolls.

For every sheep, lamb, or goat	d.
For every ox or head of neat cattle	0½
For every horse, mare, or gelding, ass or mule	2
For every cart, dray, or vehicle with two wheels, drawn by one horse or other animal	3
For every additional horse or other animal	6
For every wain, waggon, or other carriage with four wheels, drawn by one horse or other animal	3
For every additional horse	8
	3

Proposed Scale of Tolls.

For every sheep, lamb, or goat	d.
For every ox or head of neat cattle	0½
For every horse, mare, or gelding, ass or mule	1
For every cart, dray, or other vehicle with two wheels, drawn by one horse or other animal	2
For every additional horse or other animal	3
For every wain, waggon, or other carriage with four wheels, drawn by one horse or other animal	2
For every additional horse	6
	2

No. 10.

The Commissioner for Roads to Mr. T. Leeder.

Department of Public Works, Office of Commissioner for Roads.

Sir,

Sydney, 16 November, 1885.

Referring to your letter of the 5th instant, addressed to the Principal Under Secretary, respecting the reproclaiming of the Botany Road Toll-bar, I have to request that you will have the goodness to furnish to this office a copy of the last proclamation, or the date of the Gazette in which it was published, in order that the necessary action may be taken.

I have, &c.,

WILLIAM C. BENNETT,

Commissioner and Engineer for Roads.

No. 11.

T. M. Williamson, Esq., M.P., to The Under Secretary for Public Works.

Sir,

Temple Court, King-street, Sydney, 19 November, 1885.

A short time back a deputation waited upon Mr. Wright, the then Minister for Works, in reference to the removal of the toll-bar on the Botany Road (a parish road), and within the boundaries of the boroughs of Waterloo and Alexandria. Mr. Wright on the occasion referred to promised that action would be taken in the matter, but up to the present nothing has been done. I may state, for your information, that the Government tramways occupy the greater portion of this road, and that the residents south of the toll-bar are, in addition to paying toll dues, compelled to pay rates to the boroughs before-mentioned. This must appear to you a great injustice to these people. The trustees of the road contemplate putting up the toll-bar for auction sale within a week or so, and if allowed so to act will cause a further delay of twelve months in settling this question. In order to save expense, I would suggest the trustees being served with a notice not to let the toll for more than one month. Hoping you will cause that portion of the road before-mentioned to be proclaimed a main road.

Yours, &c.,

THOS. M. WILLIAMSON.

Acknowledged, 20/11/85. Roads — J.R., B.C., 20/11/85. Previous papers (urgent) — W.C.B.,
23/11/85. Werk—state all papers are now before the Minister, 23/11/85. I have to apply for the
papers. Most likely the minute on same will apply, but it is of importance the Trust should be asked
not to lease bar for 1886. They are about to do so at once.—W.C.B., 23/11/85. Under Secretary.—
P.W.O., B.C., 25/11/85.

No. 12.

Mr. T. Leeder to The Commissioner for Roads.

Sir,

438, George-street, Sydney, 25 November, 1885.

In reply to your letter dated 16th instant, requesting to be furnished with the date of Gazette of last proclamation, relative to collection of tolls at the Botany Road toll-bar (formerly called Mudbank and Cook's River Road), I have the honor to inform you that the proclamation containing the scale of such tolls was published in the Gazette, No. 124, dated 18th November, 1853, and that a further proclamation (which is the last one) was published in Gazette, No. 37, dated 3rd March, 1863. May I ask you to kindly expedite issuing of the fresh proclamation for the reasons stated in my letter of 5th instant, addressed to Principal Under Secretary.

I have, &c.,

THOS. LEEDER,

Secretary.

Mr. Hiles.—W.C.B., 26/11/85. Papers asking for Minister's approval of reproclamation are now before the Minister, 26/11/85. It is important this should not be delayed, or the public will have the additional toll to pay all the year.—W.C.B., 26/11/85. Under Secretary.—B.C. Submitted.—J.R., 27/11/85. There is a minute for Executive Council approving of this. Send letters on, informing Council and Mr. Beaumont, 1/12/85. Put with papers. Roads for proclamation.—J.R., B.C., 1/12/85.

No. 13.

Question in Legislative Assembly.

THURSDAY, 26 NOVEMBER.

2. DR. RENWICK to ask the Secretary for Lands,—

- (1.) Has there been an election of trustees for the year 1885 for the parish road leading from Sydney to Botany, known as the Mudbank and Cook's River Road?
- (2.) By what authority are tolls collected on this road?

Answers given in the House by MR. ABBOTT,—

- (1.) Trustees were elected in the beginning of 1885, for three years.
- (2.) By authority of trustees, under Parish Roads Amendment Act, 4 Vic. No. 12.

No. 14.

Minute by Commissioner for Roads.

Question in House for Tuesday, 1st December.

19. MR. WILLIAMSON to ask the Secretary for Public Works,—Will he cause notice to be at once served on the trustees of Mudbank and Cook's River Road (called Botany Road) toll-bar, requesting that, pending the abolition of such toll-bar, the lease of same be not disposed of for a longer period than one month.

Minute by Commissioner for Roads.

This matter should be arranged. The papers are with the Under Secretary, recommending proclamation to reduce tolls, as proposed by trustees. It will take some weeks for the formalities. Mr. Beaumont, the Chairman of the Trust, was here the other day and stated they should be obliged to lease the bar at the old high rates if the proclamation was not issued without delay. I think the Trust should be written to, as suggested in the above question, and informed that they might assume that the reduction in rates would be made before 1 January, and that they might let bar at the reduced rates, as proposed by them. Immediate action should be taken as there will be loud complaints if rates are not reduced when it is known that trustees advised reduction.—W.C.B., 28/11/85. Under Secretary.—B.C. Urgent.

Approved. Let proclamation be submitted at to-morrow's Executive, and advise Mr. Williamson, and the writer of letter of 28 November.—G.R.D., 30/11/85. T. M. Williamson, Esq., M.P., Mr. Beaumont, informed, 30/11/85. Prepare proclamation.—J.R., 30/11/85. Done, 1/12/85.

No. 15.

The Under Secretary for Public Works to T. M. Williamson, Esq., M.P.

Sir,

Department of Public Works, Sydney, 30 November, 1885.

Referring to your representations on the subject of the lease of the toll-bar, on the Botany Road, I am directed to inform you that the proclamation reducing the rates to be charged at the toll-bar in question will be issued without delay.

I have, &c.,

JOHN RAE.

No. 16.

The Under Secretary for Public Works to Mr. Beaumont.

Sir,

Department of Public Works, Sydney, 30 November, 1885.

Referring to your personal representations on the subject of the toll-bar on the Botany Road, I am directed to inform you that the proclamation reducing the rates to be charged at the toll-bar in question will be issued without delay, and the bar might be let at the reduced rates, as proposed by the trustees.

I have, &c.,

JOHN RAE.

No. 17.

No. 17.

Question in Legislative Assembly.

TUESDAY, 1 DECEMBER, 1885.

19. MR. WILLIAMSON to ask the Secretary for Public Works,—Will he cause notice to be at once served on the trustees of the Mudbank and Cook's River Road (called Botany Road) Toll-bar, requesting that pending the abolition of said toll-bar, the lease of same be not disposed of for a longer period than one month.

MR. LYNE answered,—A proclamation is being prepared, reducing the tolls, and a letter has been written to the trustees requesting them to lease the tolls from month to month at reduced rates.

No. 18.

Minute for the Executive Council.

Department of Public Works, Sydney, 1 December, 1885.

Reduction of Rates, Botany Road Toll-bar.

I HAVE the honor to submit, for the approval of His Excellency the Governor and the Executive Council, a draft proclamation amending the rates to be charged at the toll-bar on the Botany Road, in accordance with law.

WILLIAM JOHN LYNE.

The Executive Council advise that the reduced rates proposed for the Botany Road Toll-bar be approved as herein recommended.—ALEX. C. BUDGE, Clerk of the Council. Min. 85-48, 1/2/85. Confirmed, 8/12/85. Approved.—A.L., 1/12/85.

No. 19.

As to sale of lease of Toll-bar.

MONDAY, 14 DECEMBER.

Lease of Botany Toll-bar for the year 1886.

ANDREW Allan has received instructions from the trustees to sell by auction, at the toll-bar, near Waterloo Mills, on Monday, the 14th December, at half-past 3 o'clock,—

The lease of the dues and tolls of the above for 1886, from 1st January to 31st December.

Terms at sale.

N.B.—Botany Road Toll-bar—Scale of fees:—

	Present scale.	New scale.
For every sheep, lamb, or goat	0½d.	0¼d.
For every ox or head of cattle	2d.	1d.
For every horse, mare, or gelding, ass or mule	3d.	2d.
For every cart, dray, or other vehicle with two wheels drawn by one horse or other animal	6d.	3d.
For every additional horse or other animal	3d.	2d.
For every van, waggon, or other carriage with four wheels, drawn by one horse or other animal	8d.	6d.
For every additional horse	3d.	2d.

Office, 143 King-street.

Department of Public Works, Sydney, 4 December, 1885.

ACCORDING to the above advertisement, the lease of the tolls *re* Botany Toll-bar, for twelve months, is to be sold on the 14th instant. I shall be glad to hear if this is correct; and, if so, why the arrangements made, or to be made, are not for a monthly lease.

W.J.L.

Mr. Beaumont explained to me that the lease, though for twelve months, would contain a proviso that it can be put an end to at any time by giving one month's notice.—J.R., 4/12/85.

No. 20.

Memo. by The Secretary for Public Works.

Removal of Toll-bar to Ricketty-street.

MR. Williamson desires that the Botany Road Toll be moved to Ricketty-street, which is just outside the municipalities of Waterloo and Alexandria. W.J.L., 2/12/85.

Report. Roads for report.—B.C., 3/12/85. This can only be done by proclamation, taking days, and there is now a proclamation reducing the toll in train. I do not think this second proclamation could be got ready in time. In addition, there will most likely, as in all such cases, be found ways of evading bar at new site, and there will be the cost of shifting or building toll-house. I think it is better to wait and try to arrange for abolition.—W.C.B., 4/12/85. Under Secretary.—B.C.

No. 21.

Minute by The Commissioner for Roads.

Proclamation of Main Roads.

11 December, 1885.

I BEG to submit herewith, for the approval of the Minister, an amended proclamation of main roads, and have to request that the usual steps be taken for the proclamation and publishing of the same.

W.C.B., 11/12/85.

Under Secretary, Public Works. Put with papers *en route* to Executive Council.

No. 22.

No. 22.

T. M. Williamson, Esq., M.P., to The Secretary for Public Works.

Sir,

Temple Court, King-street, Sydney, 7 December, 1885.

Having promised, on last Friday night, to abolish the Cook's River and Mudbank (now called the Botany) Road Toll-bar, if you had power so to do, I deem it my duty to bring under your notice the proceedings of a similar case. The Cook's River Road (a Trust road) was declared a main road by His Excellency Sir Hercules Robinson, on 2nd November, 1875. All the papers relating to such proclamation are now with Colonel Wells, of the Roads and Bridges Department, and who will undoubtedly furnish you with all information in relation thereto. Upon a perusal of the papers in question, I am satisfied that you will be convinced that you have full authority to give effect to your said promise.

Would you therefore exceedingly oblige by directing the immediate issue of the proclamation necessary for the purpose before referred to, as the trustees contemplate disposing, by public auction, the right to collect tolls, &c., on next Monday.

Yours &c.,

T. M. WILLIAMSON,
(per M.A.)

No. 23.

Memo. by The Secretary for Public Works to T. M. Williamson, Esq., M.P.

Department of Public Works, 8 December, 1885.

I SPOKE to Mr. Bennett yesterday, *re* the Botany Road Toll-bar, and shall be glad if he will take the necessary action to do away with the same. W.J.L.

Mr. Bennett.—J.R., B.C., 8/12/85. Colonel Wells.—As I have pointed out this is not a desirable precedent to follow on the eve of the introduction of local Government Act, in addition, the cases are not parallel.—W.C.B., 8/12/85. Minute herewith.—F.W., 8/12/85.

No. 24.

Minute by Assistant Engineer Wells.

Sydney, 8 December, 1885.

I NOTE the Commissioner's minute, and in the main concur therewith, particularly as in the case of two municipalities adjoining a toll-bar established by them, still exists. I would, however, point out that there is so far a parallelism between the Cook's River and Botany Road Trusts, in that the total moneys received at a very remunerative toll-bar, are expended solely on a very few miles of road to a great extent, within municipal limits I believe, and that the extension and feeding roads do not derive any contribution therefrom. The case merely shows what I have frequently adduced, is correct, *viz.*, that the time has come, Botany should establish a municipality. The papers relating to the proclamation of the Cook's River Road and tributaries, as main roads of the Colony, are forwarded herewith. Does the Commissioner wish to have the necessary steps for proclamation taken?

F. WELLS.

On the distinct understanding that the respective municipalities take charge of road within their limits, and with a view to the proclamation of a municipality at Botany, by which arrangement the maintenance of this road will be divided between the Tramway Department and the municipalities without any subsidy, I recommend that the road be proclaimed a main road, and the toll to be abolished from 1st of January; the proclamation reducing tolls to be stopped, a new proclamation of main roads made, and the portions within existing municipal limits to be proclaimed out of the Main Roads Schedule, under clause 17 in that Act, and in the municipal control as in clause or section 118 of Municipalities Act.—W.C.B., 9/12/85. Under Secretary.—B.C.

Let the necessary steps be taken at once to abolish this toll, the proclamation referred to, to be stopped.—W.J.L., 9/12/85. Roads.—J.R., B.C., 9/12/85. Mr. Flynn, urgent.—W.C.B., 9/12/85. The Trust should be informed at once as they are about to sell on Monday.—W.C.B., 10/12/85.

No. 25.

Memo. by Chief Clerk, Roads Department.

Toll, Botany Road.

THE Works have taken steps to stop proclamation. The trustees should be written to at once as the sale of tolls takes place on Monday, informing them that it is intended to proclaim the road a main road of the Colony; and to take steps for withdrawal from sale of tolls on the road. Should not this letter be written by Works. P.F., 10/12/85.

Commissioner, Yes. Done, 10/12/85.

No. 26.

Minute for The Executive Council.

Department of Public Works, Sydney, 11 December, 1885.

Proclamation of Botany Road and Parramatta and Windsor Road as Main Roads.

I HAVE the honor to submit for the approval of His Excellency the Governor and the Executive Council, a draft proclamation amending the schedule of the main roads of the Colony, so as to include the road, Sydney to Banks' Meadow (Botany Road), and the road Parramatta to Windsor, in terms of the Main Roads Management Act. WILLIAM JOHN LYNE.

The Executive Council advise that the roads referred to be proclaimed as main roads in terms of the Act specified.—ALEX. C. BUDGE, Clerk of the Council. Minute 85/52, 15/12/85. Confirmed, 18/12/85. Approved.—CARRINGTON, 15/12/85. For His Excellency's signature and the seal of the Colony.

Colony. The Principal Under Secretary.—J.R., B.C., 23/12/85. Sealed and submitted for His Excellency's signature. The Private Secretary.—C.W., B.C., 29/12/85. The Under Secretary for Public Works.—C.W., B.C., 31/12/85. P.W.O., 4/1/86. Roads.—J.R., B.C., 5/1/86. Mr. Airey got all the papers.—W.C.B., 6/1/86.

No. 27.

Proclamation amending Schedule of Main Roads.

NEW SOUTH WALES, } Proclamation by His Excellency the Right Honorable CHARLES ROBERT, BARON
to wit. } CARRINGTON, Knight Grand Cross of the Most Distinguished Order of Saint
(L.S.) } Michael and Saint George, Governor and Commander-in-Chief of the Colony of
CARRINGTON, } New South Wales and its Dependencies.
Governor.

WHEREAS by the Main Roads Management Act Amendment Act of 1871, it is enacted that the schedule of the Act 21 Victoria No. 8, and so much of the said Act as limits the provisions and operations thereof to the three main roads described in the said Schedule, shall be repealed from and after the publication of the first proclamation under the said Main Roads Management Act of 1871; and whereas it is further enacted by the said last-mentioned Act, that it shall be lawful for the Governor, with the advice of the Executive Council, to proclaim from time to time, as occasion shall require, a schedule of Roads, which, on the publication thereof in the Government Gazette, shall be the schedule of main roads within the meaning, and under the operation of the Main Roads Management Act. Now, I, the Right Honorable CHARLES ROBERT, BARON CARRINGTON, the Governor aforesaid, with the advice of the Executive Council, in pursuance of the power and authority vested in me by the Main Roads Management Act Amendment Act of 1871, do, by this my proclamation under the said Act, hereby declare that the following is the schedule of roads, which, on the publication of this proclamation in the Government Gazette, shall be the schedule of main roads within the meaning, and under the operation of the Main Roads Management Act, that is to say:—

Schedule of Roads.

Great Western Road—Sydney to Warren.
Great Southern Road—Ashfield Cross Roads to Albury.
Great Northern Road—Morpeth to Maryland.
Road—Goulburn to Cooma.
" Tarago to Braidwood.
" Bombala *via* Tantawangalo to Merimbula.
" Bathurst to Cowra.
" Orange, by Boree to Forbes.
" Wallerawang to Mudgee.
" Glen Innes to Grafton.
" Milson's Point, *via* Lane Cove Road to Peat's Ferry Road.
" Sydney, *via* the Dam at Cook's River to Half-way House.
" Rocky Point Road, to the Road from Tom Ugly's Point to the Burwood Railway Station.
" Stanmore Road, from the Enmore Road to the Canterbury Trust Road.
" Newtown Railway Bridge to the Undercliffe Bridge.
" Main South Coast Road, from Campbelltown, *via* Wollongong and Kiama to Nowra.
" Balmain, over Iron Cove Bridge, and Parramatta Bridge to Ryde.
" Sydney to Banks' Meadow (Botany Road.)
" Parramatta to Windsor.

Given under my hand and Seal, at Government House, Sydney, this thirtieth day of December, in the year of Our Lord one thousand eight hundred and eighty-five, and in the forty-ninth year of Her Majesty's Reign.

By His Excellency's Command,
WILLIAM JOHN LYNE.

GOD SAVE THE QUEEN!

No. 28.

Minute for The Executive Council.

Department of Public Works, 11 December, 1885.

Abolition of Toll-bars, Botany Road—Parramatta to Windsor.

IN accordance with the 14th section of the Main Roads Management Act, 21 Victoria No. 8, I have the honor to request the authority of His Excellency the Governor and the Executive Council to the abolition of tolls levied and taken at the following toll-bars, *viz.*:—The Botany Road (Sydney to Banks' Meadow), and the road from Parramatta to Windsor, to take effect from the 1st proximo, such roads having been included in the amended schedule of the proclaimed main roads of the Colony.

WILLIAM JOHN LYNE.

The Executive Council advise that the toll-bars on the roads referred to, be abolished.—ALEX. C. BUDGE, Clerk of the Council. Min. 85/52, 15/12/85. Confirmed, 18/12/85. Approved.—CARRINGTON, 15/12/85. Botany Road Proclamation published as a main road. Notice sent to papers that tolls will not be collected after to-morrow. Roads.—J.R., B.C., 29/12/85.

No. 29.

Minute by The Under Secretary for Public Works.

Department of Public Works, Sydney, 21 December, 1885.

ALTHOUGH the proclamation as a main road has had the effect practically of abolishing the toll-bar hitherto leased by the trustees, I submit that it is desirable to publish a notice that tolls will not be levied and taken on the road after 31st instant.

J.R.

Submitted,

Submitted, 21/12/85. The notice referred to would be advisable; but as a matter of courtesy it would be well to write to the Trust, and add something complimentary as to the way that Trust has performed its duties for over thirty years.—W.C.B., 21/12/85. The Secretary, Botany Road Trust informed, 21/12/85. Get the proclamation through, and send the within notices out, the day of publication, 22/12/85. If published send out notices, 29/12/85. Notices sent to daily papers, 30/12/85. These notices have been sent to-day. The proclamation will appear to-morrow, so that both will appear on same day.—J.R. Roads.—B.C., 30/12/85.

The road from Sydney to Banks' Meadow, Botany Road, having been proclaimed a main road under the Act 21 Vic. No. 8, the papers are now transferred to the Department for future action. The Botany Road Trust have been informed by the Works Department. Copy of proclamation herewith.—C.B.A., 5/1/86. Mr. Flynn.—B.C.

Notice in daily papers, 31/12/85.

It has been notified for public information by the Department of Public Works, that after 31st instant, tolls will not be levied or collected at the Botany Toll-bar, Meadow Bank Road.

No. 30.

The Under Secretary for Public Works to Mr. T. Leeder.

Sir,

Department of Public Works, Sydney, 21 December, 1885.

In reference to the change in the administration of the Botany Road, which has now become a main road of the Colony, I am directed to inform you that tolls will not be levied or taken at the bar on the road after the 31st instant. I am to request that you will be good enough to convey to the members of the Trust, the appreciation of the Government of the manner in which that body has performed the functions during the past thirty years.

I have, &c.,

JOHN RAE.

No. 31.

J. Sutherland, Esq., M.P., to The Secretary for Public Works.

Sir,

Sydney, 11 January, 1886.

In reference to the proclamation recently published abolishing the collection of tolls on the road, Meadow Bank, I have the honor to request that you will inform me what steps you propose to take in reference to making good the loss that will be sustained for the maintenance of the roads recently provided for by the tolls in question.

I have, &c.,

JOHN SUTHERLAND.

Acknowledged, 12/1/86. Roads, for immediate report.—J.G., 11/1/86. J.R., B.C., 12/1/86. Previous papers.—W.C.B., 14/1/86. 86/31, herewith, 15/1/86.

Mr. Sutherland might be informed that road was proclaimed a main road on condition that the respective municipalities took charge of the lengths within their limits, and that a municipality was to be formed at Botany to take charge of that part. A proclamation, transferring to municipalities, as provided for in Act, will be issued in a few days.—W.C.B., 16/1/86. Under Secretary.—B.C.

Submitted.—J.R., 19/1/86. Inform.—J.G., 19/1/86. John Sutherland, Esq., M.P., informed, 21/1/86. Roads.—J.R., B.C., 22/1/86. File.—W.C.B., 23/1/86.

No. 32.

The Under Secretary for Public Works to John Sutherland, Esq., M.P.

Sir,

Department of Public Works, Sydney, 21 January, 1886.

In reply to your letter of the 11th instant, inquiring as to what provision it is proposed to make for the maintenance of the Botany Road in lieu of the tolls lately collected at Meadow Bank, I am directed to inform you that the road in question was proclaimed a main road on the condition and assurance that the respective municipalities through which it passes, would take charge of the lengths within their limits, and that a municipality was to be formed at Botany to take charge of the portion in that vicinity; I am to add that a proclamation transferring the portions of this road to the municipalities interested, as provided for in Act, will be issued in the course of a few days.

I have, &c.,

JOHN RAE.

No. 33.

Mr. T. Leeder to The Secretary for Public Works.

Sir,

438 George-street, Sydney, 29 January, 1886.

Adverting to your Under Secretary's letter of 21st ultimo, that the Botany Road had now become a main road of the Colony, and that tolls would not be levied and taken at the bar on this road after the 31st ultimo.

I have the honor by direction of the Board of Trustees of such road to inform you, that pursuant to the direction contained in the above letter, they ceased to collect the tolls at the said bar on the 31st ultimo.

At a meeting of the trustees, held this day, the subject of the road being kept in good repair was discussed, and I was directed to ask whether the Government would be willing to set apart an adequate sum for such purpose, and hand the same over to the trustees for expenditure in the maintenance of the road.

The revenue derived last year from the sale of the tolls amounted to £2,899, which, added to the Government mileage money, £175, made a total revenue of £3,074; but the trustees had determined upon reducing the scale of toll, which they estimate would have reduced the revenue this year had the tolls been let, to about £2,100, inclusive of the mileage money.

The revenue derived from the toll enabled the trustees to keep the road in thorough good condition (the distance being 7 miles), and as they are anxious that the road should henceforth be maintained in the like good order, I am directed to state that they are quite willing to give their time and attention for

for that purpose, if the Government favourably consider this application by granting them an adequate sum for the purpose. It may here be added that the trustees have all the necessary tools and appliances for carrying on the work of maintaining the road.

The favour of an early reply is respectfully solicited.

I have, &c.,
THOS. LEEDER,

Secretary to Trustees.

Roads, for report.—J.G., 30/1/86. J.R., B.C., 4/2/86. Previous papers.—W.C.B., 5/2/86. 86/185, herewith, 6/2/86.

Might be informed that the bar was abolished on the distinct understanding given by Mr. Williamson, M.P., that no expense whatever should be caused to the Government thereby; that the municipalities of Redfern, Waterloo, and Alexandria would take charge of their respective portions, and that a new municipality would be formed at Botany to take charge of that portion not now within municipal limits.—W.C.B., 8/2/86.

Under Secretary.—B.C. Submitted.—J.R., 10/2/86. Approved.—J.G., 11/2/86. Mr. Thomas Leeder informed, 12/2/86. Roads.—J.R., B.C., 12/2/86. File.—W.C.B., 23/2/86.

No. 34.

The Under Secretary for Public Works to Mr. T. Leeder.

Sir,

Department of Public Works, Sydney, 12 February, 1886.

In reply to your letter of the 29th ultimo, expressing the willingness of the late trustees of the Botany Road (now a main road) to continue the supervision of necessary repairs, provided a sum of money is granted in lieu of the tolls collected at the bar, at Meadow Bank, abolished on the 31st December last, I am directed to inform you that the toll-bar was abolished on the distinct understanding given by Mr. Williamson, M.P., that no expense for future maintenance should be borne by the Government; the municipalities of Redfern, Waterloo, and Alexandria taking charge of the lengths passing through their respective boundaries, and a municipality was to be formed at Botany which would have the care of the remaining portion of the road in question. Therefore the offer of the gentleman referred to cannot be entertained.

I have, &c.,
JOHN RAE.

No. 35.

The Mayor of Waterloo to Mr. T. Leeder.

Sir,

Municipal Council, Waterloo, 30 March, 1886.

In reply to your communication of the 3rd instant (and its enclosure from the Works Department of the 12th ultimo), having reference to the abolishment of the tolls on the Botany Road, which states that the three Councils interested would be expected to take charge of the lengths passing through their respective boundaries, I have the honor to inform you that, by resolution passed at an adjourned conference representing the three boroughs held here yesterday, this Council, for itself and the other Councils represented, "declined to take over the said road, which they considered should be maintained in the same manner as other main roads of the Colony, and that a sum of money should be placed on the Estimates for that purpose."

This conference also protested against the mode adopted in "the abolishment of the tolls collected for its maintenance," inasmuch as the Councils represented at this conference received no intimation from the Government of their intention to abolish the same.

Under the circumstances, the conference thinks it desirable that a deputation should wait upon the Chief of the Department, to reconsider their decision, and give effect to the views of this conference.

I have, &c.,

GEO. ANDERSON,
Mayor of Waterloo, and Chairman of Conference.

No. 36.

Mr. T. Leeder to The Secretary for Public Works.

Sir,

438 George-street, Sydney, 6 April, 1886.

I have the honor, by direction of the trustees of the Botany Road, to acknowledge receipt of your letter of 12th instant, intimating that the toll-bar on the Botany Road was abolished on the distinct understanding given by Mr. Williamson, M.P.—that no expense for future maintenance should be borne by the Government; the municipalities of Redfern, Waterloo, and Alexandria taking charge of the lengths passing through their respective boundaries, and that a municipality was to be formed at Botany which would have the care of the remaining portion of the road in question. And, in reply, I am to inform you that the trustees are in receipt of a communication from the chairman of a conference (George Anderson, Esq., Mayor of Waterloo) of the three municipalities before-named, held upon the subject of the abolishment of the tolls, and intimating that the conference protested against the mode adopted in the abolishment of the tolls collected for the maintenance of the road, inasmuch as the Councils represented at that conference received no intimation from the Government of their intention to abolish the same, and, further, that they declined to take over the said road, which they considered should be maintained in the same manner as other main roads of the Colony.

I have, &c.,

THOS. LEEDER,

Secretary to Trustees.

Acknowledged, 8/4/86. I would like to have a special report from Mr. Bennett on this matter.—W.J.L., 7/4/86. Urgent. Roads.—J.R., B.C., 9/4/86. Previous papers this day.—W.C.B., 10/4/86. 86/1,285, herewith, 10/4/86. My

My minute, 9/12/86, states the conditions on which the bar was recommended to be abolished. The proposal was most strongly urged by Mr. Williamson, M.P., and also hastened, as the lease of the bars was about being sold. There was no time to confer with the municipalities, and it was understood that Mr. Williamson was the exponent of their views, as the representative of the district. If the municipalities definitely decline to take over the road, I would recommend that the main road be again proclaimed, omitting this, and that the bars, at the old rates, be reproclaimed, and handed over to the trustees. It is very desirable that some special legislation be enacted, repealing all these trusts, and making it imperative on the Councils to take charge of all roads within their limits.—W.C.B., 13/4/86.

Under Secretary.—P.W.O., B.C., 14/4/86. Submitted.—J.R., 14/4/86.

No. 37.

Mr. C. Harris to The Secretary for Public Works.

Sir,

Town Hall, Waterloo, 15 May, 1886.

At a conference held here a few weeks since, the question of the future maintenance of the Botany Road was mooted.

Referring to a letter from your office, 83/893, some doubt was thrown upon the liabilities of Redfern, Waterloo, and Alexandria in the matter; and by a resolution passed at the conference, the representatives declined to take over the road, which they considered should be maintained in the same manner as the Cook's River and other main roads of the Colony; and a deputation was directed to be formed to interview you on the subject. In accordance with this, I have to ask the favour of an interview, and shall feel obliged by your naming a time when it will be convenient to receive it.

A reply will oblige.

I have, &c,

C. HARRIS (*pro* Mayor),

Secretary.

Please arrange for Friday next. Meantime I should like to have full report on this matter.—W.J.L., 17/5/86. Inform Friday, 21st instant, at 11.30.—J.R. C. Harris, Esq., informed, 17/5/86. Roads.—J.R., B.C., 17/5/86. Previous papers.—W.C.B., 18/5/86.

No. 38.

The Under Secretary for Public Works to Mr. C. Harris.

Sir,

Department of Public Works, Sydney, 17 May, 1886.

In reply to your letter of the 15th instant, I am directed to inform you that the Secretary for Public Works will receive the deputation, not to exceed six in number, from the Borough Councils of Redfern, Waterloo, and Alexandria, on the subject of the maintenance of the Botany Road, on Friday, 21st instant, at 11.30 a.m.

I have, &c.,

JOHN RAE.

No. 39.

Minute by The Secretary for Public Works.

Department of Public Works, Sydney, 21 May, 1886.

Re abolition of Toll-bar, Botany Road.

A DEPUTATION representing Redfern, Waterloo, and Alexandria, consisting of Messrs. Anderson, Lander, Jesson, Geddes, Bowman, and Leeder, with Messrs. Sutherland and Williamson, M's P., waited upon me to-day with reference to the abolition of the Botany Road Toll-bar, and the question of the maintenance of the road; and submitted the following resolutions arrived at, at a conference between the municipalities, regarding the responsibility of maintaining the road. They stated that they had not been consulted with reference to the abolition of the toll, nor had they agreed to become responsible for the maintenance of the road. It was understood that when the toll was abolished the road was proclaimed a main one, and that its control was therefore taken over by the Government in the same way as the Newtown and South Head Roads, which they looked upon as standing on similar grounds. They did not think the Government should call upon them to undertake the control of the road, and in fact they could not afford to do so; while moreover, the road was in a sense, a Military one, as it lead to the Botany Head Forts. The Government by the Tramways, already kept one-third of the road in order, and they thought the Roads Department should maintain the other two-thirds. I informed them that through Mr. Williamson's exertions and energetic endeavours in bringing the matter forward, the Government had decided to abolish the toll, at the same time understanding that it was agreed the municipalities through which the road passed, would take over the maintenance of the same. It was impossible that they had no knowledge of the matter, for it had been frequently referred to in the Press, and in reply to a question put by Mr. Williamson in the House, I had stated that the toll was to be abolished. It was distinctly understood the road would be taken over by the municipalities, and it was scarcely fair now for them to attempt to repudiate that arrangement; further, they were not asked to keep the whole of the road in repair, but simply two-thirds, as the Tramway had already controlled one-third. It seems to me the municipalities should show a better feeling of self-help and self-reliance, not only in this, but in connection with local works generally; and I stated, if they adhered to their proposal not to take over the road, I would have to consider whether I would re-establish the toll, although I would regret to have to adopt that course, but I had been strongly recommended to take it. It seemed to me their action was hardly honest, and the point they took, that they had not been officially informed, untenable, as the decision was made public and must have been made known to them. I could say nothing further, but trusted they would reconsider their decision and carry out the agreement come to with Mr. Williamson, rather than attempt to throw the whole responsibility upon the general revenue, as in that case I would have to consider seriously the re-establishment of the toll.

W.J.L.

Mr. Bennett.—J.R., B.C., 25/5/86. Seen; file—W.C.B., 26/5/86.

No. 40.

No. 40.

T. M. Williamson, Esq., M.P., to The Secretary for Public Works.

Dear Sir, Sydney, 10 June, 1886.
Enclosed please to find copy resolutions *re* maintenance of the Botany Road. I shall feel obliged by your giving this your earnest attention.
Yours, &c.,
T. M. WILLIAMSON,
(*per* G.M.)

The Council Clerk, Waterloo, to T. M. Williamson, Esq., M.P.

Sir, Waterloo, 9 June, 1886.
At a meeting held here yesterday, representing the Boroughs of Redfern, Alexandria, and Waterloo, the following resolutions passed unanimously. I need not dilate, but call your attention to the spirit of them, in order to arrive at a just and satisfactory conclusion. According to the opinion of an expert, if the road is not quickly repaired in two months hence, it will require double the amount.
I have, &c.,
CHARLES HARRIS.

[Copy of Resolutions].

Moved by Alderman Sharp (Redfern), seconded by Alderman Geddes (Waterloo):—

1. That this Meeting, and the Councils represented here, decline to take over the said road, which they consider should be maintained in the same way as other Main Roads of the Colony.

Moved by Alderman White (Waterloo), seconded by Alderman Cole (Waterloo):—

2. That the Government be respectfully requested to take immediate action to put the said road in a proper state of repair, as further delay will entail a much greater outlay.

By the Mayor of Redfern, seconded by the Mayor of Alexandria:—

3. That a copy of the foregoing resolutions be sent to the Minister for Works and to the representatives of the district, and that the latter be respectfully requested to use their best endeavours to obtain a sum of money for its maintenance.

Considering all the circumstances connected with this matter, I must decline to accede to the request.—W.J.L., 11/6/86. Informed.—T. M. Williamson, Esq., M.P., 12/6/86. Roads.—J.R., B.C., 12/6/86.

As the municipalities now decline to carry out understanding under which road was proclaimed a main road, and rely on clause in their Act exempting such roads, I now recommend that proclamation be issued under 17th clause, Main Roads Act, herewith, excepting the portions of this road within municipal limits from the operation of the Act. This is the only safe alternative to rescinding proclamation of main roads, and re-establishing toll-bar.—W.C.B., 12/6/86.

Under Secretary.—B.C. Submitted, 14/6/86. Ask Mr. Williamson, M.P., to see me.—W.J.L. T. M. Williamson, Esq., M.P., 22/6/86. Roads.—J.R., B.C., 30/6/86. File.—W.C.B., 30/6/86.

No. 41.

The Under Secretary for Public Works to T. M. Williamson, Esq., M.P.

Sir, Department of Public Works, Sydney, 12 June, 1886.
In reply to your letter of the 10th instant, forwarding a copy of the resolutions passed at a meeting held by the Borough Councils of Redfern, Alexandria, and Waterloo, urging the maintenance by the Government of the Botany Road, I am directed to inform you that the Secretary for Public Works, having already considered this matter, cannot advise a compliance with the request.
I have, &c.,
JOHN RAE.

No. 42.

The Under Secretary for Public Works to T. M. Williamson, Esq., M.P.

Sir, Department of Public Works, Sydney, 22 June, 1886.
I am directed to inform you that the Secretary for Public Works will be glad to see you at any time with reference to the maintenance of Botany Road.
I have, &c.,
JOHN RAE.

No. 43.

The Council Clerk, Waterloo, to The Secretary for Public Works.

Sir, Council Chambers, Town Hall, Waterloo, 9 June, 1886.
I have the honor, by desire of this meeting, to convey to you the following resolutions unanimously passed at a meeting held here yesterday, representing the Boroughs of Redfern, Alexandria, and Waterloo, and to call your attention to provision contained in the 117th section of the Municipalities Act of 1867, which expressly exempts main roads from the operation of the Act.
I have, &c.,
CHARLES HARRIS,
Council Clerk.

Roads.—J.R., B.C., 11/6/86 See minute on paper of 18 June herewith. Minute dated 12 June.—W.C.B., 12/6/86.

Maintenance of Botany Road.

Moved by Alderman Sharp (Redfern), and seconded by Alderman Geddes (Waterloo):—

1. That this meeting, and the Councils represented here, decline to take over the said road, which they consider should be maintained in the same way as the other main roads of the Colony.
Moved

Moved by Alderman White (Waterloo), and seconded by Alderman Cole (Waterloo):—

2. That the Government be respectfully requested to take immediate action to put the said road in a proper state of repair, as further delay will entail a much greater outlay.

Moved by Mayor of Redfern, and seconded by Mayor of Alexandria:—

3. That a copy of the foregoing resolutions be transmitted to the Minister and the representatives for the district.

N.B.—All these resolutions passed unanimously.

No. 44.

T. M. Williamson, Esq., M.P., to The Secretary for Public Works.

Dear Sir,

Sydney, 2 July, 1886.

Your letter of 29th June last to hand, and I may state that Mr. Bennett's minute was not written in my presence, but was apparently endorsed on the papers before I saw him, and when perusing it I distinctly stated that "I could not attempt to bind the municipalities to any arrangements, knowing that when interviewing Mr. F. A. Wright, late Minister for Works, the municipalities distinctly declined to take over the road." Mr. Bennett then replied "that having made the minute it would be for the Minister to decide." I subsequently saw you, when it was decided to abolish the toll without any conditions.

During our interview in reference to the road, you will recollect that I always denied giving the assurance as mentioned by Mr. Bennett, and if the papers are perused it will be noticed that no letter of mine refers in any way to the municipalities taking charge of the road, even after the decision to abolish the toll; my letters do not endorse the minute of Mr. Bennett.

I regret very much that a misunderstanding should have arisen in reference to this matter, and I hope that you will deem it expedient to place a sum of money on the Estimates for the repair of the road.

I have, &c.,

T. M. WILLIAMSON,
(per G.M.)

Please put with papers referring to Botany Road Toll.—W.J.L., 3/7/86. Acknowledged, 5/7/86.
Roads.—J.R., B.C., 6/7/86. Previous papers.—W.C.B., 7/7/86. 86/5,891, herewith, 7/7/86.

Minute by The Commissioner for Roads.

WHAT I have stated is correct, that the minute was made in Mr. Williamson's presence, and that he most distinctly stated, more than once, and at more than one interview, that the Government should be at no cost by the abolition of the tolls. He was himself the suggestor of the new municipality to take in the portion of road not included in existing municipalities, and stated that the present or the then existing Trust was an impediment to the establishment of such municipality.

There is no misunderstanding on my part, it was clear, distinct, and precise that the Government were not to be put to any expense by the change.

The *status quo ante* can be restored by another proclamation, and then the Trust can re-establish the bar. W.C.B., 7/7/86.

Under Secretary.—B.C. Submitted.—J.R., 8/7/86.

No. 45.

Report by Mr. J. M. Smail.

Sewerage Office, Botany, 17 July, 1886.

Subject:—Present state of Botany Road.

THE late wet weather has caused the road outside the limits maintained by the Tramway Department to cut up very much. The water channels and pipe-crossings are becoming blocked with *debris*, &c., and require cleaning out.

It would be advisable to have the road attended to as soon as possible, as a continuance of wet weather will increase the evil.

It would be a pity to have this road, which has been a very good one, fall into disrepair, as it is doing at present.

A short time back two of the culverts had to be repaired to prevent accident to the public.

The branch road (Lord's Road) which was maintained by the Trust out of toll fees, is also in bad repair, and requires metalling.

The general opinion of residents who use the road is that it would be better to reinstitute the toll, and keep the road good, than to have a bad road without the toll.

J. M. SMAIL.

I recommend that the toll be re-proclaimed, as the municipalities will not take charge, and that the old rates be maintained. I also recommend that the late Trust be asked to resume charge, and that a proclamation rescinding the one making this a main road should be issued.—W.C.B., 17/7/86.

Under Secretary.—B.C. Submitted.—J.R., 19/7/86.

No. 46.

Mr. T. Leeder to The Under Secretary for Public Works.

Sir,

438 George-street, Sydney, 21 September, 1886.

The Botany Road, as you are aware, having been declared a main road of the Colony, and the tolls abolished from 1st January last, the trustees of the road in question have resigned their respective offices.

Under

Under these circumstances, I have the honor, by direction of Mr. Beaumont, late Chairman of the Trust, to return to the Government, through you, the enclosed letter from the Treasury Department, dated 16th August last, addressed to the Botany Road Trust, notifying payment into Union Bank to credit of trustees, of £100 for repair of the road from Sydney to Banks' Meadow (Botany Road); also blank form of voucher annexed, the receipt of which I would ask you to kindly acknowledge.

I have, &c.,

THOS. LEEDER.

Acknowledged, 24/9/86. Roads.—J.R., B.C., 24/9/86. Mr. Airey to see me at once, on his return, on this.—W.C.B., 5/10/86. £100 was issued in general issue on the 11 August, which might be transferred to the Department.—C.B.A., 18/10/86.

I do not think the Department should assume charge of any part of this road, though proclaimed a main road. Mr. Williamson undertook that it should be taken charge of by Municipal Councils; that a new body be made to take over all outside present limits, now in no one's charge.—W.C.B., 19/10/86. Under Secty.—B.C.

P.W.O., 20/10/86. Submitted, 21/10/86. Minister will see Mr. Bennett.—J.R. I will wait on the Minister when advised that he is disengaged.—W.C.B., 28/10/86. Under Secty.—B.C. On Monday.—W.J.L., 13/11/86. Mr. Bennett.—J.R., 15/11/86.

Please have proclamation prepared, vesting the portion of this road within municipal limits, in the Municipal Councils, and the portion outside municipal limits will have to be taken over by the Department, or handed over to trustees.—W.J.L., 15/11/86.

Roads.—J.R., B.C., 15/11/86. Mr. Flynn, very urgent.—W.C.B., 16/11/86. Proclamation vesting charge in municipalities prepared, and sent to Crown Solicitor for opinion.—F.W.

No. 47.

The Under Secretary for Finance and Trade to The Botany Road Trust.

Gentlemen,

The Treasury, New South Wales, Sydney, 16 August, 1886.

I beg to inform you that there has been this day paid to the credit of your public account, at the Union Bank, in an account termed "Road Account, No. 152," the sum of one hundred pounds (£100), for the purpose of enabling you to pay for the repair of the road from *Sydney to Banks' Meadow (Botany Road)*.

I have to request that you will be so good as to draw against this account on the Public Cheque Forms only, and to insert in the body of the cheques drawn the words above (*in italics*), as well as the number of your road account, as above stated, in order that they may be identified by the bank, otherwise they will not be honored; and that, should your signatures not be already known at the bank, you will, as a precautionary measure, furnish specimens thereof to the manager before any cheques are drawn.

I have also to request that no cheques may be issued without the signatures of the whole of the trustees, unless an authority, signed by all members of the Trust, be forwarded to the bank, requesting the manager to honor cheques drawn on the account signed by one or more of the trustees, as may be found most convenient.

A further supply of the accompanying forms can be obtained from the Government Printer.

I have, &c.,

J. D. CRONIN,

For the Under Secretary for Finance and Trade.

No. 48.

Draft Proclamations.

Roads Department, Sydney, 29 November, 1886.

Proclamation of Charge of Botany Road to be vested in Municipalities.

HEREWITH are three draft forms of "proclamation" to except portions of the Sydney and Banks' Meadow Road (old Botany Road) from the operation of the Main Roads Act, under the provisions of clause 17 of the Main Roads Act, 21 Victoria No. 8, and clause 118 of the Municipalities Act, 31 Victoria No. 12. I would suggest that these proclamations be submitted to the Crown Solicitor for opinion as to form and legality.

F. WELLS,

Assistant Engineer for Roads.

Under Secretary.—W.C.B., B.C., 29/11/86.

The Crown Solicitor.—J.R., B.C., 2/12/86.

No. 49.

T. M. Williamson, Esq., M.P., to The Commissioner for Roads.

Dear Sir,

Sydney, 1 December, 1886.

Would you kindly inform me if any steps are to be taken with a view of remedying the defective state of Botany Road? I expect daily to hear of a serious accident occurring through the present bad state.

Re Bay-street, Botany, could you give any information in respect of improving the bad state of the road?

Yours, &c.,

THOS. M. WILLIAMSON.

Inform, proclamation has been issued transferring charge to Municipal Councils; that steps will be taken as to remainder of road, but the Government are not responsible. Inquire from Col. Wells, about Bay-street, or refer papers to me.—W.C.B., 2/12/86. Inform, in addition, that local officer reports no work wanting in Bay-street. Inform, Mr. Logan, 2/12/86. T. M. Williamson, Esq., M.P., informed, 4/12/86.

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No. 50.

The Commissioner for Roads to T. M. Williamson, Esq., M.P.

Sir,

Department of Public Works,
Office of Commissioner for Roads, 4 December, 1886.

With reference to your letter of the 1st instant, asking whether any steps are to be taken with a view of remedying the defective state of Botany Road, I have to inform you that a proclamation has been issued transferring charge to Municipal Councils. Steps will be taken as to remainder of road, but Government is not responsible.

The local officer states that no work is wanting in Bay-street.

I have, &c.,

WILLIAM C. BENNETT,
Commissioner and Engineer for Roads.

No. 51.

T. M. Williamson, Esq., M.P., to The Secretary for Public Works.

Dear Sir,

Sydney, 7 December, 1886.

I have just received a letter from the Commissioner for Roads (a copy of which is enclosed) in answer to my inquiries as to when Botany Road was to be repaired. He states that a proclamation has been issued, transferring the charge to the Municipal Councils. This, I believe, has been done within the last two or three weeks, and without repairing the road. I presume you are aware that the Council did not give their consent to this course of procedure, but on the contrary, refused to accept the control of the road; and for the guidance of the Department, I may state that I will advise the municipalities not to interfere with the Road, and treat the action of the Commissioner as *ultra vires*, in consequence of the blundering manner in which he has transacted all matters in reference to the road. It is clear to me and to many of the peoples' representatives, that the time has arrived when some reformation should be made in this Department; a person has only to glance at the formation of Bay-street, Botany, and the new road from Ryde to Parramatta, to be satisfied that incompetency exists in the Department, and it is to the interest of the public that a searching investigation should be made, with a view of preventing a loss of thousands of pounds to the country.

In conclusion, I desire to call your attention to the fact that this is the only road in the Metropolitan District of Sydney, in respect of which such a high-handed course has been pursued.

Hoping the above will receive your immediate attention.

Yours, &c.,

THOS. M. WILLIAMSON.

How does this matter (Botany Road) stand?—W.J.L., 15/12/86. Roads.—J.R., B.C., 15/12/86.

Mr. Williamson stated the Councils would take charge of the road, and that a municipality would be established at Botany, when the Trust was removed, as that was the only obstacle.

I admit the blunder of not having the arrangement in writing, but it was done very hurriedly at Mr. Williamson's instance, to prevent sale of bar. I am quite prepared for any searching investigation as to my competency, but it should be conducted by persons competent to judge. In letter herewith, 86/14895, the allegation as to work on Ryde and Parramatta Road is withdrawn; the allegation as to Bay-street is equally groundless.—W.C.B., 16/12/86.

Under Secretary.—B.C. Under Secretary.—P.W.O., B.C., 18/12/86. Submitted.—J.R., 20/12/86. Inform in terms of Mr. Bennett's minute.—W.J.L., 20/12/86. T. M. Williamson, Esq., M.P., informed, 21/12/86. Roads.—J.R., B.C., 21/12/86. File.—W.C.B., 23/12/86.

No. 52.

The Under Secretary for Public Works to T. M. Williamson, Esq., M.P.

Sir,

Department of Public Works, Sydney, 21 December, 1886.

In reply to your letter of the 7th instant, with respect to the Botany Road, I am directed to inform you that the toll-bar on this road was abolished on the distinct understanding given by you verbally, that the Municipal Councils on the line of road would maintain the portions within their respective boundaries, and that a municipality was to be established at Botany, which would take charge of the portion outside limits of boroughs already formed. The Department, therefore, is not responsible for the maintenance of the road in question.

I have, &c.,

JOHN RAE.

No. 53.

The Crown Solicitor to The Under Secretary for Public Works.

Sir,

Crown Solicitor's Office, Sydney, 15 December, 1886.

I have the honor to return herewith the memo. of the Assistant Engineer for Roads, forwarding three drafts of proclamations excepting portions of roads from the operation of the Main Roads Act, and to state that I think that such drafts may be adopted.

Of course, I am not aware whether the Mayor and Council of the several municipalities have agreed to accept charge of these roads, and that these proclamations are issued with their concurrence.

I have, &c.,

JOHN WILLIAMS,
Crown Solicitor.

Executive Minutes (3), 18/12/86.

No. 54.

No. 54.

Minute for Executive Council.

Department of Public Works, Sydney, 18 December, 1886.

I HAVE the honor to submit, for the approval of His Excellency the Governor and the Executive Council, a draft proclamation vesting in the Mayor and Council of the Municipality of Alexandria, the care and maintenance of that portion of the road from Sydney to Banks' Meadow (Old Botany Road), within the limits of the Municipality in question.

WILLIAM JOHN LYNE.

The Executive Council advise that a proclamation be issued, vesting the care of the portion of road referred to in the Municipal Council of Alexandria.—ALEX. C. BUDGE, Clerk of the Council. Min. 86/60, 21/12/86. Confirmed, 24/12/86. Approved.—CARRINGTON, 21/12/86. For the Governor's signature. The Principal Under Secretary.—J.R., B.C., 30/12/86. Sealed and submitted for His Excellency's signature. The Private Secretary.—C.W., P.U.S., B.C., 31 December, 1886. The Under Secretary for Public Works.—C.W., P.U.S., B.C., 3 January, 1887. Gazette No. 10, dated 7 January, 1887. Roads.—J.R., B.C., 8/1/87. Papers.—W.C.B., 10/1/87. 86/15511 herewith, 11/1/87. Submitted, 12/1/87.

No. 55.

Proclamation.

NEW SOUTH WALES, } Proclamation by His Excellency The Right Honorable CHARLES ROBERT BARON
to wit. } CARRINGTON, a Member of Her Majesty's Most Honorable Privy Council, Knight
(L.S.) } Grand Cross of the Most Distinguished Order of Saint Michael and Saint George,
CARRINGTON, } Governor and Commander-in-Chief of the Colony of New South Wales and its
Governor. } Dependencies.

WHEREAS it is deemed expedient to vest the entire control, maintenance, and management of such portion of the main road from Sydney to Banks' Meadow, known as the Old Botany Road, as is situate within the limits of the Borough of Alexandria, in the Mayor and Council of the said Borough or Municipality: Now, I, CHARLES ROBERT, BARON CARRINGTON, as such Governor as aforesaid, with the advice of the Executive Council of the said Colony, do hereby declare that from and after the publication of this proclamation in the Government Gazette, the said portions of the road from Sydney to Banks' Meadow (Old Botany Road) shall be exempted from the operation of the Main Roads Management Act, and the charge and maintenance thereof shall be vested in the Mayor and Council of the Borough of Alexandria.

Given under my Hand and Seal, at Government House, Sydney, this thirty-first day of December, in the year of our Lord one thousand eight hundred and eighty-six, and in the fiftieth year of Her Majesty's Reign.

By His Excellency's Command,
WILLIAM JOHN LYNE.

GOD SAVE THE QUEEN!

No. 56.

Minute for the Executive Council.

Department of Public Works, Sydney, 18 December, 1886.

I HAVE the honor to submit, for the approval of His Excellency the Governor and the Executive Council, a draft proclamation, vesting in the Mayor and Council of the Municipality of Waterloo, the care and maintenance of that portion of the road from Sydney to Banks' Meadow (Old Botany Road), within the limit of the municipality in question.

WILLIAM JOHN LYNE.

The Executive Council advise that a proclamation be issued, vesting the care of the portion of road referred to, in the Municipal Council of Waterloo.—ALEX. C. BUDGE, Clerk of the Council. Min. 86/60, 21/12/86. Confirmed, 24/12/86. Approved.—CARRINGTON, 21/12/86. For the Governor's signature. The Principal Under Secretary.—J.R., B.C., 30/12/86. Sealed and submitted for His Excellency's signature. The Private Secretary.—C.W., P.U.S., B.C., 31 December, 1886. The Under Secretary for Public Works.—C.W., P.U.S., B.C., 3 January, 1887. Gazette No. 10, dated 7 January, 1887. Roads.—J.R., B.C., 8/1/87. Copies should be sent to the Municipal Council.—W.C.B., 10/1/87. Under Secretary.—B.C.

No. 57.

Proclamation.

NEW SOUTH WALES, } Proclamation by His Excellency The Right Honorable CHARLES ROBERT, BARON
to wit. } CARRINGTON, a Member of Her Majesty's Most Honorable Privy Council, Knight
(L.S.) } Grand Cross of the Most Distinguished Order of Saint Michael and Saint George,
CARRINGTON, } Governor and Commander-in-Chief of the Colony of New South Wales and its
Governor. } Dependencies.

WHEREAS it is deemed expedient to vest the entire control, maintenance, and management of such portion of the main road from Sydney to Banks' Meadow, known as the Old Botany Road, as is situated within the limits of the Borough of Waterloo, in the Mayor and Council of the said borough or municipality: Now, I, CHARLES ROBERT, BARON CARRINGTON, as such Governor as aforesaid, with the advice of the Executive Council of the said Colony, do hereby declare that from and after the publication of this proclamation in the Government Gazette, the said portions of the road from Sydney to Banks' Meadow (Old

(Old Botany Road) shall be exempted from the operation of the Main Roads Management Act, and the charge and maintenance thereof shall be vested in the Mayor and Council of the Borough of Waterloo.

Given under my Hand and Seal, at Government House, Sydney, this thirty-first day of December, in the year of our Lord one thousand eight hundred and eighty-six, and in the fiftieth year of Her Majesty's Reign.

By His Excellency's Command,

WILLIAM JOHN LYNE.

GOD SAVE THE QUEEN!

No. 58.

Minute for the Executive Council.

Department of Public Works, Sydney, 18 December, 1886.

I HAVE the honor to submit, for the approval of His Excellency the Governor and the Executive Council, a draft proclamation, vesting in the Mayor and Council of the municipality of Redfern, the care and maintenance of that portion of the road from Sydney to Banks' Meadow (Old Botany Road), within the limits of the municipality in question.

WILLIAM JOHN LYNE.

The Executive Council advise that a Proclamation be issued, vesting the care of the portion of road referred to in the Municipal Council of Redfern.—ALEX. C. BUDGE, Clerk of the Council. Min. 86/60, 21/12/86. Confirmed, 24/12/86. Approved.—CARRINGTON, 21/12/86. For the Governor's signature. The Principal Under Secretary.—J.R., B.C., 30/12/86. Sealed and submitted for His Excellency's signature. The Private Secretary.—C.W., P.U.S., B.C., 31/12/86. The Under Secretary for Public Works.—C.W., P.U.S., B.C., 4/1/87. Gazette, No. 10, dated 7 January, 1887. Roads.—J.R., B.C., 8/1/87. Copies should be sent to Municipal Council.—W.C.B., 10/1/87.

No. 59.

Proclamation.

NEW SOUTH WALES, } Proclamation by His Excellency The Right Honorable CHARLES ROBERT, BARON
to wit. } CARRINGTON, a Member of Her Majesty's Most Honorable Privy Council, Knight
(L.S.) } Grand Cross of the Most Distinguished Order of Saint Michael and Saint George,
CARRINGTON, } Governor and Commander-in-Chief of the Colony of New South Wales and its
Governor. } Dependencies.

WHEREAS it is deemed expedient to vest the entire control, maintenance, and management of such portion of the main road from Sydney to Banks' Meadow, known as the Old Botany Road, as is situate within the limits of the Borough of Redfern, in the Mayor and Council of the said borough or municipality: Now, I, CHARLES ROBERT, BARON CARRINGTON, as such Governor as aforesaid, with the advice of the Executive Council of the said Colony, do hereby declare that, from and after the publication of this proclamation in the Government Gazette, the said portions of the road from Sydney to Banks' Meadow (Old Botany Road), shall be exempted from the operation of the Main Roads Management Act, and the charge and maintenance thereof shall be vested in the Mayor and Council of the Borough of Redfern.

Given under my Hand and Seal, at Government House, Sydney, this thirty-first day of December, in the year of our Lord one thousand eight hundred and eighty-six, and in the fiftieth year of Her Majesty's Reign.

By His Excellency's Command,

WILLIAM JOHN LYNE.

GOD SAVE THE QUEEN!

No. 60.

T. M. Williamson, Esq., M.P., to The Secretary for Public Works.

Dear Sir,

Sydney, 23 December, 1886.

I have just received a letter dated 21st instant, from the Under Secretary, and I beg to state that no such promise was made by me, and this I am prepared to support in any Court of Law; in fact there is not one word in any correspondence from me that can justify such a conclusion. If Mr. Bennett makes this assertion he is labouring under an hallucination. I have therefore to request that the road be immediately repaired in order to save any unpleasantness.

I have, &c.,

THOS. M. WILLIAMSON.

Forward to Mr. Bennett.—W.J.L., 23/12/86. Roads.—J.R., B.C., 29/12/86. I am confident that such promise was made. I do not usually labour under hallucinations.—W.C.B., 29/12/86. Under Secretary.—B.C. Submitted.—J.R., 3/1/87. Inform.—W.J.L., 6/1/87. T. M. Williamson, Esq., M.P., informed, 7/1/87. Roads.—J.R., B.C., 7/1/87. File.—W.C.B., 8/1/87.

No. 61.

The Under Secretary for Public Works to T. M. Williamson, Esq., M.P.

Sir,

Department of Public Works, Sydney, 7 January, 1887.

In reply to your letter of the 23rd ultimo; in further reference to the maintenance of the Botany Road, I am directed to inform you that the Commissioner for Roads adheres to the statement that a verbal promise was given by you, that the various municipalities through which the road in question passes, would maintain the portions within their respective boundaries upon the abolition of the toll-bar.

I have, &c.,

JOHN RAE.

No. 62.

The Municipal Council, Waterloo, to The Under Secretary for Public Works.

Sir,

Waterloo, 8 January, 1887.

In reply to yours of the 4th instant, forwarding a copy of the proclamation of the 31st ultimo, vesting in the Mayor and Council of this Borough the charge of the Botany Road within its limits, I am to call your attention to the 18th section of the Municipalities Act of 1869, under which this power is exercised; that it also contains a proviso that all existing accounts must be settled before doing so, as the road has been in a notoriously bad condition for some time past "and when a main road of the Colony." The Council must decline to take the responsibility implied by the proclamation till this condition has been fulfilled.

I have, &c.,

CHAS. HARRIS,

Council Clerk.

Roads.—B.C., 11/1/87.
Thursday.—W.C.B., 18/1/87.

Acknowledged.—J.R., 12/1/87.

Mr. Dyson to see me on this on

No. 63.

The Council Clerk, Redfern, to The Secretary for Public Works.

Sir,

Town Hall, Redfern, 11 January, 1887.

I have the honor, by direction, to ask you to be good enough to appoint a time when it will be convenient for you to receive a deputation, consisting of representatives from the Councils interested, in reference to the maintenance of old Botany Road.

I have, &c.,

R. W. GRIERSON,

Council Clerk.

Better arrange for Friday week.—W.J.L., 12/1/87.
Clerk, Redfern, informed, 12/1/87. Roads.—J.R., B.C.

Friday, the 21st, at 11 o'clock. Council

No. 64.

The Under Secretary for Public Works to The Council Clerk, Redfern.

Sir,

Department of Public Works, Sydney, 12 January, 1887.

In reply to your letter of the 11th instant, I am directed to inform you that the Secretary for Public Works will receive the deputation, not to exceed six in number, from Borough Councils interested on the subject of maintenance of Old Botany Road, on Friday, the 21st instant, at 11 o'clock a.m.

I have, &c.,

JOHN RAE.

No. 65.

Memo. by The Secretary for Public Works.

Department of Public Works, Sydney, 17 January, 1887.

PLEASE have a letter written to Mr. Williamson, M.P., explaining how matters stand with regard to the Botany Road.

W.J.L.

Done.—J.R., 19/1/87.

Roads.—B.C., 20/1/87.

No. 66.

The Under Secretary for Public Works to T. M. Williamson, Esq., M.P.

Sir,

Department of Public Works, Sydney, 19 January, 1887.

Referring to your personal representations on the subject, I am directed to inform you that the portions of the Botany Road passing through the municipalities of Redfern, Waterloo, and Alexandria, have been, since the 1st instant, vested in the respective Councils.

I have, &c.,

JOHN RAE.

No. 67.

Memo. *re* postponing Deputation.

[Urgent.]

THE Minister would like to see all papers referring to the question of the Botany Road.

H. McL., 20/1/87.

A Deputation was fixed for to-morrow with reference to the Botany Road. The Minister wishes it postponed till Friday week next, viz., the 28th instant, at 11 a.m.—H. McL., 20/1/87. Postpone accordingly.—J.R., 20/1/87. Done, 20/1/87.

No. 68.

Précis.

Department of Public Works, Sydney, 21 January, 1887.

Botany Road.

IN December, 1885, in compliance with the urgent representations made by Mr. Williamson, M.P., and others, Mr. Secretary Lyne directed that a proclamation should be issued abolishing the Botany toll-bar, and constituting the road in question, a main road of the Colony. This course was taken on the recommendation of the Commissioner for Roads, whose minute on P.W., 85/10,275, is to the following effect:—

"On the distinct understanding that the respective municipalities take charge of road within their limits, and with a view to the proclamation of a municipality at Botany, by which arrangement the maintenance of this road will be divided between the Tramway Department and the municipalities, without any subsidy, I recommend that the road be proclaimed a main road, and the toll to be abolished."

The understanding referred to has been the result of interviews between Mr. Williamson, M.P., and Mr. Bennett. No steps appear to have been taken to provide for the maintenance of the road, and on the

the 20th May, 1886, a deputation from the municipalities interested, waited upon the Minister in reference to the matter. They stated that they had not been consulted with respect to the abolition of the toll, nor had they agreed to become responsible for the maintenance of the road. Mr. Secretary Lyne informed the deputation of the understanding upon which the tolls were abolished, and stated that if the municipalities refused to take charge of the road, the question of the re-establishment of the toll would have to be considered.

Considerable correspondence has since taken place, but nothing has been done towards the repair of the road; and by minute of 15/11/86, Mr. Lyne directed that a proclamation be prepared, vesting the portion of this road within municipal limits, in the Municipal Councils,—the portion outside to be dealt with by the Department.

The Borough of Waterloo decline to take charge unless the road is first placed in repair, and a deputation in reference to the whole question is to wait upon the Minister on the 28th instant at 11 a.m.

All papers are enclosed herewith.

J.R.

Append list of correspondence.—J.R. Done, 24/1/87.

SCHEDULE of Papers respecting Botany Road.

No.	Date.	From whom received.	Subject matter.
1885- 304...	6 May, 1885	Trustees of road	Respecting reduction of grant.
7,837 ..	14 September, 1885	W. H. Head	Requesting an interview for a deputation respecting abolition of toll-bar.
7,949...	18 ,, 1885	Minister	Reply to above deputation.
8,375..	29 ,, 1885	Council Clerk, Alexandria	Notifying that the Councils of Waterloo and Alexandria are not in a position to take charge of portions of road.
8,869...	13 October, 1885	W. H. Head	Application for a further deputation respecting abolition of toll-bar.
9,469...	6 November, 1885	Road Trustees.....	Enclosing revised list of tolls, and requesting proclamation of same.
9,825...	25 ,, 1885	.....	Urging that issue of proclamation be expedited.
9,621...	19 ,, 1885	T. M. Williamson, M.P.	Respecting removal of toll-bar.
10,047...	2 December, 1885	Minister	Minute respecting removal of bar.
10,275...	9 ,, 1885	Commissioner for Roads...	Recommending abolition of toll-bar; also, minute of Mr. Lyne directing issue of proclamation.
10,747...	30 ,, 1885	.....	Proclamation abolishing tolls.
10,809...	30 ,, 1885	.....	Proclamation of road as main road.
10,919...	21 ,, 1885	.....	That a notice be issued respecting abolition of toll-bar.
1886- 893...	29 January, 1886	Road Trustees.....	Stating that the trustees are willing to continue their duties if the Government grant sum for maintenance.
273...	11 ,, 1886	J. Sutherland, M.P.	Requesting that provision may be made for maintenance of road.
3,475...	6 April, 1886	Road Trustees.....	Respecting maintenance of road.
4,623...	15 ,, 1886	Mayor of Waterloo.....	Deputation respecting maintenance of road, requesting interview.
4,775...	21 ,, 1886	Minister	Reply to deputation.
5,279...	10 June, 1886	T. M. Williamson, M.P.	Forwarding resolutions of conference of municipalities respecting maintenance of road.
5,255...	10 ,, 1886	Council Clerk, Waterloo	Forwarding copies of resolutions.
6,007...	2 July, 1886	Mr. Williamson, M.P. ...	Respecting minute written by the Commissioner for Roads.
6,309...	17 ,, 1886	Commissioner for Roads	Report by Roads Department Officer respecting condition of road.
8,613...	21 September, 1886	Trustees of Road.....	Respecting return of amount placed to their credit.
9,761...	29 October, 1886	Mr. Williamson, M.P. ...	Respecting state of road.
14,163...	1 December, 1886	..	..
11,469..	7 ,, 1886	..	..
11,763...	23 ,, 1886	..	..
1887- 105...	31 ,, 1886	.....	Proclamation vesting portion of road in charge of Borough Council of Redfern.
107...	.....	.....	Proclamation vesting portion of road in charge of Borough Council of Waterloo.
109...	.....	.....	Proclamation vesting portion of road in charge of Borough Council of Alexandria.
245...	8 January, 1887	Council Clerk, Waterloo	Application from deputation respecting maintenance of road.
471...	17 ,, 1887	.....	Minute by Mr. Secretary Lyne.
529...	20 ,, 1887	.....	Deputation—Appointment for.
.....	21 ,, 1887	Under Secretary.....	Précis of Papers.

No. 69.

Minute by The Secretary for Public Works.

Department of Public Works, Sydney, 19 January, 1887.

Maintenance of Botany Road.

I UNDERSTAND that the municipalities wish the road, as far as it lies within their limits, to be put in order before the road is handed over to them. The papers do not disclose what amount will be required to have this done, but it seems to me that in view of all the circumstances connected with this matter, the Government might pay to the respective Councils the amount that would be required to put the road in fair repair, and the Councils to do the necessary work. With regard to the portion outside municipalities, I do not see any other course open but that the Government will keep it in repair either directly or by handing an annual vote over trustees.

It has been suggested that the road from Redfern-street to the old toll-bar might be wood-blocked, the cost to be divided between Railway, the Roads Department, and the municipalities, the latter paying one-fourth or one-fifth the cost, and if the work could be done reasonably it would appear to be the wiser course, as the maintenance charges at present are very heavy.

W.J.L.

Roads.—J.R., B.C., 18/1/87. Resubmit when Mr. Dyson is in office.—W.C.B., 19/1/87.

No. 70.

No. 70.

Deputation to The Secretary for Public Works.

Roads, Sydney, 27 January, 1887.

UPON inquiry at the Department of Public Works, I am informed that the only deputation fixed for to-morrow on any matter connected with this Department is the following:—At 11 a.m.—Maintenance of Old Botany Road.

Not having the papers, I am not able to give dates, but they will show that some months ago this road was made a main road at the most pressing instance of Mr. Williamson, M.P., on his undertaking, that the respective municipalities took over charge, and that a new municipality to be formed at the Botany end, so that the Government should not be at any expense. As the municipalities declined to take charge, a proclamation transferring charge to them was made some few days ago (dates with papers).

In the mean time a claim was made by Commissioner for Railways for extra metal, said to have been used on the road. This was replied to by a minute that the road was not in charge of this Department, which it never was.

Now there is a movement to get the road wood-paved at the cost of the Government, or to give the Councils a sum to take over road.

The cost of doing the portions of road within each municipality is stated below; that is, 1st, putting metal sides in order, so that road could be taken over; 2nd, estimated cost of wood-paving road, exclusive of tramway:—

						Metal Road.	Wood-paving.
Redfern...	...	...	...	...	...	£600	£10,800
Waterloo	...	...	...	...	...	400	21,600
Alexandria	...	...	...	...	...	400	21,600
						£1,400	£54,000

The Botany Road Trust Act is still in existence, the steps taken to set Trust aside and abolish bar, were similar to those advised by the Crown Law Officers in the case of the Cook's River Road, but the entire can be set aside by a further proclamation, and re-establishing the bar, paying road trustees an equivalent to the rent lost. This, I think, would be a retrograde step, as toll-bars are an obsolete means of collecting revenue.

Or if the Minister thinks fit, the Councils might be given £1,400 between them, if they agree to take over road.

The timber paving is, I think, out of the question in the present state of the finances.

W.C.B., 27/1/87.

Under Secretary—B.C.

No. 71.

Minute by The Secretary for Public Works.

Department of Public Works, Sydney, 28 January, 1887.

A DEPUTATION consisting of the Mayors of Redfern, Waterloo, and Alexandria, with several of the Aldermen waited upon me to-day, with reference to the state of the Botany Road. There has been some misunderstanding in this matter in connection with the abolition of the toll-bar on the Botany Road; the Department believing that when this step was taken the municipalities would take over the road, and thus relieve the Department of further responsibility. The Councils contend, however, that they gave no such undertaking, and contend that the Department should fully maintain the road, as it is essentially a main road, and that, with one exception, the Department maintain the leading roads out of Sydney. Owing to the dispute as to maintenance the road has fallen into a bad state of repair, and is in fact dangerous, and they urged that immediate steps should be taken to have the road put in order. I informed them that I was aware the maintenance of this road had been a vexed question for some time, and I was personally aware the road was now in a very bad condition; in fact, as a representative of Redfern, I had written to the Department before I became a Minister, urging that provision should be made for the repair of this road. Since the matter had come officially before me, I had called for the papers and reports, and I found the cost of putting the road in repair would be, for the portions within the boundary of Redfern, £600; within the boundary of Alexandria, £400; and Waterloo, £400; and I promised that immediate steps would be taken to have the road put in order. A large quantity of metal—broken by the unemployed—being available, and when this was done, the question of the future maintenance of the road would have to be settled, and they would then be asked to take it over.

With reference to the question of wood-blocking, I found no direct recommendation was made by the late Minister; but a suggestion had been made to him to have the work done. I have called for a report and estimate in the matter, and found that the estimated cost of the work was £54,000, for the portion between Redfern-street and the old toll-bar, and in view of the state of the public finances I could not for one moment consent to entertain the proposal.

I shall be glad if Mr. Bennett will take immediate steps to have the road put in order.

JOHN SUTHERLAND.

Roads.—J.R., B.C. 29/1/87. Mr. Dyson to at once carry out the Minister's instructions; note and return this paper.—W.C.B., 7/2/87. Mr. Dyson.—B.C. Noted.—E.D.D., 9/2/87. File.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

MANLY BEACH AND PITTWATER ROADS.

(PETITION FROM INHABITANTS OF MANLY AND SURROUNDING DISTRICTS.)

Received by the Legislative Assembly, 28 April, 1887.

To the Honorable the Legislative Assembly of New South Wales, in Parliament assembled.

The Petition of the undersigned, inhabitants of Manly, Manly Vale, Balgowlah, Middle Harbour French's Forest, Pittwater, and the surrounding districts,—

HUMBLY SHOWETH:—

That your Petitioners beg to bring under the notice of your Honorable House the deplorable and almost impassable state of the Government Roads leading from Manly Beach, Manly Vale, Middle Harbour to Pittwater, the head of Middle Harbour, French's Forest, the Government Reserves, and the neighbourhood.

That no public money has at any time been used towards making such roads, the only improvements on these roads have been done at the private cost of the inhabitants, who are in humble circumstances, and cannot afford to make and maintain the public roads of their district.

That on several previous occasions representations have been made to the Government as to the necessity which exists for your Petitioners to have reasonable means of travelling and carrying on their usual avocations, so that your Petitioners may not be put to the present great hardship and inconvenience, loss, and delay, by the absence of proper roads.

Your Petitioners therefore humbly pray your Honorable House will be pleased to take their petition into favourable consideration, and grant such relief to your Petitioners as the urgency of the case deserves.

And your Petitioners, as in duty bound, will ever pray, &c.

[Here follow 61 signatures.]

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

ROAD, MOUNT VICTORIA TO JENOLAN CAVES.

(REPORT OF MR. NARDIN, ENGINEER.)

Ordered by the Legislative Assembly to be printed, 12 May, 1887.

Mr. Assistant Engineer E. A. Nardin to The Commissioner and Engineer-in-Chief.
Road to the Jenolan Caves.

Sir,

Lithgow, 16 March, 1887.

I got back from Jenolan last night, having throughout the trip experienced very rough weather.

The work now stands in this position, viz., completed road 21 feet wide 106 chains, 18 feet wide 50 chains, and 57 chains in progress to be made 18 feet wide also; in all, 2 miles and 53 chains.

The expenditure to date has been £1,318 16s. 1d., and the further sum of £640 will be required to finish to the distance above mentioned. This gives an average of about £9 4s. per chain.

Of the remaining 211 chains it is not intended at present to carry out the bottom part (where the work is the most costly in character), nor can the erection of a bridge over the Caves River, or the continuation of the road through the Grand Arch be carried out with present funds.

Beyond the point to which under existing arrangements the work will be carried, the cuttings will be made only 16 feet wide, and rough box culverts put in, excepting at Fern Creek, where an 8-foot culvert will be required.

An examination of the whole line does not suggest any modification of it that would avoid rock; here and there a possible small saving in this respect could be made by introducing frequent alterations of grade, but I would not advocate the adoption of such a course. The character of the country is very changeable, some portions of the work, which before being opened out seemed to contain most rock, have turned out better shifting than others which showed scarcely any; and while much of the rock is very bad to shoot, some can be worked without powder. Under such conditions it is impossible from only surface indications to select the line which, while fulfilling other conditions, has the least rock in its course.

The £2,000 odd still available will be expended in continuous work, and it is possible that it will suffice to do another 2 miles, and make a pathway for the remainder of the distance. This, however, greatly depends upon the quantity of rock which is uncovered, and also upon the batter it will be needful to give the banks. In any case, Mr. Cummins has instructions to wind up the work when the expenditure has reached £4,000.

With regard to letting the rest of the work by contract, I am doubtful whether, as we have gone so far under the present system of task-work, and as far better men apply for employment, it would be advantageous to do so. This is a question which should be at once decided, as upon it depends the necessity or otherwise of forwarding larger supplies of explosives and more tools. The requisition for steel bars and dynamite has been cut down one-half. There are ninety-one men now at work, most of them being in rock, and there are other good men applying daily. If the present system is to continue, then in my opinion, the number of men employed should at once be largely increased, in order to take advantage of the time remaining before the winter fairly sets in. The altitude at the top of the range is about 3,800 feet, consequently the rainfall is considerable, and much time would be lost through wet weather, should the work be extended through the winter months.

Commissioner's Minute:—
It is evident the high price is appreciated.

In the first consignment of tools $\frac{3}{8}$ -inch drills were supplied. They had already seen much service, they make too small a bore for powder, are too short, and many of them will not stand pointing any longer.

There still remains in the Magazine nearly a ton of powder; and the larger drills are required as being more suitable for powder blasting. On these grounds, and believing it would be better to adhere to the present system of task-work, I endorsed, by telegram, Mr. Cummins' requisition for explosives and steel bars.

Commissioner's Minute:—
Surely they could be made whatever bore was required by the smith keeping up point. Take care of them; they will sell for mason's points. The larger steel bars may be more allowable than I thought at first sight, on account of the decreased cost of steel since. I have been used to deal with such matters.

The level-pegs have been put in as far as 3 miles 50 chains, at the grade of 1 in 22; but, as those put in with the clinometer do not coincide, I have instructed Mr. Henschman to take flying levels to near the bottom point and equalize the grade, with due regard to certain prominent croppings of rock, which must be shunned.

Commissioner's Minute—I do not think they are sufficient; I want Mr. Henschman's services elsewhere.

The continuous wet weather, the work connected with the plan, and the constant necessity there is for verifying the levels as the work proceeds, are assigned as reasons why the longitudinal section has not yet been completed.

This being a work of considerable magnitude (a good day's journey from Mr. Cummins' headquarters), it is difficult to see how the services of Mr. Henschman can be at present dispensed with.

Mess accounts we should not be troubled with; the work may be now considered out of the relief category.

Mr. Targett's duties are to take charge of the tools and explosives and to keep the time and mess accounts. These will give him full occupation, particularly if more men are to be employed to push the work through.

I think it had better be removed first opportunity. I wish to know what the men have been earning.

While I was on the ground several men declined to complete their sections, so far as the rock was concerned; and they, after the usual grumbling, finally accepted what was offered for the amount of work done. The rock upon those sections may remain until some future time, there being room for the traffic without its being removed. The payments so made were calculated on such a basis as to leave a good margin for the work undone, and, as before stated, the road in these cases is available for traffic.

The culvert gang is no longer employed upon this work, and Mr. Cummins will arrange with the ordinary men for the rest of the timber-work required.

It would be advisable to instruct Mr. Cummins as soon as possible in regard to these matters.

I have, &c.,

E. A. NARDIN,
Assistant Engineer.

Minute by Commissioner.

MR. CUMMINS,—Carry out and supply information asked for; and state if all the dynamite is wanted, and what tools. Continue to let work as at present.

W.C.B., 18/3/87.

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

ROADS.

(CASSILIS TO MERRIWA, REEDY CREEK, AND COOLAH.)

Ordered by the Legislative Assembly to be printed, 28 June, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly, dated 7th June, 1887, That there be laid upon the Table of this House,—

“A Return showing the amount of money voted for and expended during
“the years 1884, 1885, and 1886, on each of the roads from Merriwa to
“Cassilis, Cassilis to Reedy Creek, Mudgee Road, and the road from Coolah
“to Cassilis.”

(*Mr. McElhone.*)

ROADS AND BRIDGES DEPARTMENT.

RETURN of Votes and Expenditure on Roads Merriwa to Cassilis, Cassilis to Reedy Creek, Mudgee Road, and Coolah to Cassilis, for years 1884, 1885, and 1886, in compliance with order of Legislative Assembly, dated 7th June, 1887.

Road.	Year.	Votes.		Expenditure.		Remarks.
		Annual Vote.	Total Votes.	Annual Expenditure.	Total Expenditure.	
1 Merriwa to Cassilis...	1884	£ 1,400	s. d. 0 0	£	s. d. 1,439 12 0	The expenditure of previous years' balances in the years specified makes the outlay exceed the amount voted for those years.
	1885	700	0 0	.....	387 0 0
	1886	399	0 0	.....	895 11 2
				2,499 0 0		
2 Cassilis to Reedy Creek. (Part Cudjegong to Cassilis.)	1884	500	0 0	288 3 9	
	1885	500	0 0	.....	641 6 2
	1886	485	0 0	.....	378 4 6
				1,485 0 0			1,307 14 5
3 Wallerawang to Mudgee. (Mudgee Road.)	1884	1,875	0 0	.....	2,764 18 7
	1885	1,875	0 0	.....	1,667 19 9
	1886	1,550	0 0	.....	1,184 16 2
				5,300 0 0			5,617 14 6
4 Coolah to Cassilis ... Contingent vote...	1884	240	0 0	256 5 10	
	1885	175	0 0	192 18 0	
	1886	175	0 0	40 0 0	
				500 0 0		489 3 10
			£9,874 0 0		£10,136 15 11	

[3d.]

444—

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1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

ROADS.

(CASE OF JOHN MULLEN, A MAINTENANCE MAN.)

Ordered by the Legislative Assembly to be printed, 22 June, 1887.

RETURN to an *Order* of the Honorable Legislative Assembly, dated 8th June, 1887, That there be laid upon the Table of this House,—

“Copies of all correspondence, telegrams, and minutes passed between the Minister for Works and the Road Inspectors (Messrs. Adams and Moreton), having reference to the dismissal of John Mullen, the maintenance man on the roads at Condobolin; also, copies of petition, telegrams, and letters received from the residents of Condobolin, and replies thereto, including the report of Mr. Woods, who specially reported upon the case.”

(Mr. Stokes.)

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ROADS.

No. 1.

Mr. J. Mullen to A. Stokes, Esq., M.P.

Dear Sir,

Condobolin, 20 August, 1886.

I beg to inform you that I have got what we term in colonial parlance the "sack." Yesterday the Superintendent was here and gave me my *conge*.

The reason assigned for so doing may be briefly stated thus:—The morning of the day in question the Superintendent called at my residence to ascertain why I was not at my post on the roads.

In explanation I told him that for several days previous I was suffering from a severe attack of neuralgia, and was not in a fit state to face the heavy rains then falling.

In reply to my explanation, he stated that he would discharge me for being absent, and would send, on Sunday, a man to replace me.

Now, Sir, I regard this act as being a burning injustice. When a man is ill, why should he be asked to do what he knows will seriously militate against health? Humanity shudders, and the heart sickens at the bare thought, and no one possessed of a scintilla of humanity would make such demand.

Had there been any valid reasons assigned for my discharge, and that they were truthful, I would not have troubled you with this hastily written epistle.

The roads are in good condition, and have been always honestly and faithfully maintained by me where necessary.

I may also mention that I have been in this billet now over seven years, under several superintendents, and have never before been reprimanded by any of them for lack of duty or absence.

I wish you to interview the Minister in reference to my dismissal, being fully impressed with the conviction that through him justice will be done.

I have, &c.,

JNO. MULLEN.

Mr. Morton for report. Resubmit with reply.—P.H.F., 25/8/86.

No. 2.

Memo. by The Commissioner for Roads.

Department of Roads and Bridges, Sydney, 24 August, 1886.

MR. STOKES, M.P., called on me on this day with a view to the restoration of Mullen, a maintenance man, discharged by Mr. Morton.

Mullen stated he was discharged for being off his work ill with neuralgia, and that it was raining, that Mr. Morton was arbitrary, &c.

I pointed out to Mr. Stokes that I was bound to support Mr. Morton as long as he was right. Mr. Stokes wished me to restore Mullen on condition of not being off his work again, as Mr. Innes, a Magistrate, had recommended him. I pointed out that as long as Mr. Morton was retained in his place he could not be ignored. He objected to Mr. Morton, a boy, being placed over a man of 60. I pointed out that similar anomalies occurred throughout the Service. He objected to Morton's youth. I pointed out that no old man could do the work, that we must have young men at the pay. I offered to send the letters to Mr. Morton to report on. He said he would only justify himself, and that some one outside the Department should deal with the question. I said that if Morton's report was not in every way satisfactory another officer would be sent to report. He said that Government officers always supported each other, and that a Magistrate should be appointed to inquire, naming Mr. Innes. I pointed out that he had already taken sides, and was not neutral. He then proposed another Magistrate. I said I could not deviate from the Departmental course. He then declined further action and left.

I have sent a telegram to Mr. Morton for report.

Mr. Flynn will please file this for reference.

W.C.B., 24/8/86.

No. 3.

Telegram from Messrs. Richards and Grey Innes to A. Stokes, Esq., M.P.

Condobolin, 23 August, 1886.

Do all you can for Mullen at once; conduct of Morton most arbitrary and unjustifiable.

H. A. RICHARDS.

H. W. GREY INNES.

Urgent.—Telegraph and ask for a report in this case from Messrs. Richards and Innes, J.P. Wire Mr. Morton for a report in reference to his action in the matter and instruct him not to fill Mullen's place until investigation held.—W.G.L., 25/8/86. Wire sent yesterday, rest with reply.—W.C.B., 25/8/86. Roads.—J.R., B.C., 25/8/86.

No. 4.

Telegram from The Commissioner for Roads to Mr. Road-Superintendent Morton.

25 August, 1886.

REPORT in very full detail circumstances attending removal of Mullen at Condobolin, and if any representations were made to you in his favour, and by whom. Do so at once.

W.C.B.

No. 5.

No. 5.

Report by Mr. Road-Superintendent Morton to The Commissioner for Roads.

Re removal of maintenance man Mullen.

Sir,

Roads Office, Forbes, 25 August, 1886.

On the 19th ultimo, Thursday, I was in Condobolin, and on the following morning I was engaged about the town. I was surprised that I did not see maintenance man Mullen out on his work, it being then nearly 10 o'clock, and raining at the time very steadily. I then went to his house and found him there. When I asked him the reason of his not being out, to which he made the excuse of his not being well.

I have had on previous occasions to find fault with this man, and as I considered his excuse to be frivolous on that occasion, I told him that his services would not any longer be required after the following Saturday. When his cheques were sent by post to the C.P.S. at Condobolin to pay him, no representations have been made to me by anyone in Condobolin on behalf of this man Mullen, and I discharged him solely from the reason that he had not been attending to his work.

I have, &c.,

O. G. MORTON,
Road Superintendent.

Memo.—I have since put on another man in his place.—O.G.M. Send to Under Secretary with Minister's minute for his information. Mr. Morton appears to have only done his duty.—W.C.B., 27/8/86. Under Secretary. Instructions for M.M. attached.

[Enclosure.]

CODE OF INSTRUCTIONS FOR MAINTENANCE MEN.

Terms of engagement.

It must be distinctly understood that the engagement of the maintenance men is directly with the road officer in charge of the district, and is only from day to day; the road officer being empowered to discharge at once, on payment of wages due, and receipt, at the nearest depôt or other suitable place directed, of the tools, &c., in charge of the men.

Charge of metalled road.

The maintenance man's first duty is to keep the metalled portions of his road at all times in good order. In new metalling he will maintain the uniformity of its surface and convexity by raking or picking in the ruts, being careful in black soil not to fill in with the mixed metal and soil that has been forced up by heavy traffic; this should be put aside until dry; it may then be broken up, and the soil separated from the metal by the rake or washed by rain, when the metal may be again used in maintenance. On a road that has been a long time metalled, but which has become rutty and worn thin in places, all ruts, hollows, and depressions should be filled in with clean small gauge metal. The road, wherever darning or patching is to be done, must be well scored with the pick, and the metal spread in thin layers. No blinding to be put on darning or patching, unless in very dry weather, and then only a thin layer of silt from drains or other gritty material.

Economy of metal.

The wear and tear of the surface of road to be carefully watched, and timely notice of any weak length given to the officer in charge, in order that he may provide for a supply of maintenance material when arranging for distribution of his funds.

Great care to be taken that no metal is wasted, or put on where not required; all loose stone to be collected and applied to the widening and maintenance of road.

Unwatering road.

Particular attention is to be paid to the surface of road in wet weather, as the lodgment of the water will then show where any weakness exists, and by picking a small outlet to the tabling it can be relieved from the water before patching.

Shape of road—Forcing, logs, &c., to be moved out of danger.

In raking in ruts care must be taken not to rob the sides of the road too much; every effort should be made in a new road, by logs, or other means, to spread the traffic and get the haunches of the road consolidated. Any logs, large stones, &c., that may be used for that purpose must, however, be removed clear of the formation when consolidated, as the law only permits their use as necessary for construction of road.

Free discharge of drains, &c.

The existing drains and watertables, all inlets and outlets at culverts, pipe drains, causeways, &c., to be carefully cleaned out, and all impediments to the discharge of water removed.

Culverts, &c.

It is of the greatest importance that the junction of the metalled road with any timber decking, whether to bridges or culverts, should be kept in good order, free from dips and holes. Such structures should be frequently examined underneath, to see that the substructure is in good repair; also, that gullies or ravines are prevented from forming by the timely application of stone or bough filling.

Clear bridges and culverts from flood and fire.

The decks of all bridges and culverts must be kept quite clean, and where scupper holes exist they must be kept free. No dry dung, straw, or rubbish must be allowed to accumulate on the deck, or long grass, twigs, boughs, or flood drift anywhere within 30 feet of the bridge or culvert, for fear of accident by fire. In flood time it is imperative by night or day that the maintenance man shall be on duty to fend off trees, logs, &c., from the most important bridges in his district, and otherwise protect them, if necessary, getting any additional labour or assistance he may require, communicating particulars at once to the officer in charge.

Sunday work.

No work, except in such cases and others of a similar urgency, is to be done on Sunday.

Holidays.

The holidays allowed are—Christmas Day, Good Friday, and the Queen's Birthday; but in cases of urgency, as flood danger, total obstruction, &c., the same rule will apply as on Sunday, and the men must attend to their work.

Bridge and culvert decks.

All loose or broken planks, or holes that may occur in bridge or culvert decks or covering of drain pipes, must be instantly repaired or fenced off in the best manner the means at immediate disposal will allow, and if temporary repair only can be thus effected, the maintenance man will at once communicate with the officer in charge of the district by telegraph, if available, acquainting him with the nature and extent of the damage, and asking for instructions.

Penalty

Penalty for neglect—dismissal.

As nothing is so dangerous to life and limb as any defect in this particular, the officer in charge will punish any negligence of this instruction by immediate dismissal.

Obstructions being total stoppages.

In the event of a landslip, large fallen tree, or other obstruction, completely stopping all traffic, the maintenance man will, without waiting for instructions, obtain such assistance as may be required to open a passage at least 10 feet wide, and communicate the facts to the officer in charge, who will instruct or arrange for thorough removal.

Destruction of undergrowth, &c.

The maintenance man will cut up by the roots and burn all undergrowth, thistles, burrs, or other noxious weeds that may be found growing upon the surface of roads.

Removal of stumps, and facilitating traffic on out-turns.

In all cases where trees obstruct or overshadow the road, or fallen logs, stumps, or impediments exist that confine the traffic to one track, he will remove the same and destroy by fire; or wherever a good out-turn from an undefined road can be made practicable by a little labour, he should point it out to the officer in charge. All stumps should be cut out at least 12 inches below the surface of the road.

Attention to warning by mail-drivers, &c.

Whenever it is reported by the driver of the mail coach, or other reliable traveller, that any great inconvenience or danger is encountered in any part of the length under a maintenance man's charge, he will at once visit, and if he can do so unaided, remove the difficulty. If it is too great for him to manage single-handed, he will report to the officer in charge; unless it is a positive stoppage, when he will act at once as previously directed.

Unmetalled roads.

On unmetalled portions, or roads only partly formed, the above rules will be adhered to as far as practicable; all drains must be cleared out; water running down the face of ridges must be diverted by judiciously cut mitre drains; all bog holes should be thoroughly cleared out, and soft material or mud thrown aside off the road, then filled up with ballast or approved material; any trees, saplings, or stumps that impede or confine the traffic should be removed, and roots cut out at least 12 inches below surface; all large stones on surface should be broken up, and boulders removed.

Prevention of injury to works, &c.

Any wilful injury to the road, bridges, culverts, or pipe drains, should be immediately reported to the officer in charge of district, and every effort should be made by the maintenance man to secure evidence to bring the offenders to justice.

Prevention of fraud.

Any fraud, or attempt at fraud, on the part of contractors or their men, or hidden inefficient work, or bad material, that may come to the knowledge of the maintenance man, should be reported immediately. No excuse will be admitted for any neglect or infraction of this instruction.

Hours—rainy weather.

The hours of work for maintenance men will be from _____ to _____ during which he shall not quit his length of road for a distance that is beyond hail, and in the event of necessity compelling him to go out of sight of the road for material or any other cause he shall leave his barrow in a conspicuous place, or make such other signal as may be directed, in order that he may be hailed by the officer in charge when making his rounds. *During heavy rain is the time the maintenance man's services, as above indicated, are most required, and he should visit the whole of his length during its continuation.* He will therefore be expected to provide himself with necessary waterproof clothing or other sufficient protection to enable him to work in all seasons.

Leave of absence.

No maintenance man shall quit his length without having first obtained leave from the officer in charge, who will use his discretion as to granting it, the time of such absence being noted, will be deducted from his pay at the end of the month.

Disobedience—Terms of service.

Any man who disobeys the orders of the officer in charge, or is neglectful, impertinent, or incompetent for the duty required of him, is liable to immediate dismissal; and any man who leaves his employment without giving a week's notice to the officer in charge, will forfeit any wages that may be due to him on leaving. In any case men will only be paid up to the time of their leaving, and for such time only as they are actually at work on the road.

Drunkenness.

Drunkenness, or its effects, during the hours of duty, will on no account be overlooked by the officer in charge.

Plant, tools, &c.

Plant and tools will be found by the Government, but the men employed will be held responsible for the careful use and custody thereof. They will from time to time be inspected by the officer in charge, and any deficiency—fair wear and tear excepted—will be deducted from the maintenance man's wages at the end of the month, and noted on pay-sheet. Any man leaving the employment must deliver up his tools or other plant confided to his care under the same conditions.

Repair of tools.

The maintenance man will arrange with such blacksmith as may be directed for the repair and sharpening of his tools, keeping a correct tally, and furnishing same to the officer in charge of district, who will take his certificate on the pay-sheet at the end of every quarter that there are no amounts due for repairs beyond those handed in. In default the maintenance man will be personally liable for any excess.

Spikes.

The officer in charge will furnish a supply of spikes for repair of bridges and culverts to the maintenance man, who must take care that he keeps up a reasonable supply to meet emergencies.

Penalties.

In the event of any infraction of the above rules the Superintendent or officer in charge will summarily inflict a fine of one day's pay for the first offence, two days' pay for the second, and will dismiss for the third. Penalties to be deducted from pay at the end of month, and shall be noted on pay-sheet.

Rules to apply to all men employed.

Every maintenance man employed by the Department to sign and subscribe to these rules, of which he will receive a copy, to be returned to the Superintendent at the close of his engagement before being finally paid off.

No. 6.

Messrs. Richards and H. W. Grey Innes, J.P., to The Secretary for Public Works.

Re dismissal of John Mullen from Roads Department, Condobolin.

Sir,

Condobolin, 28 August, 1886.

We have the honor to report that we have known John Mullen ever since he has been in the employ of the Roads Department, and have always found him most attentive to his duties.

On the occasion of Mr. Morton's visit, we can prove that he was suffering from a severe attack of neuralgia, and unable to work, and on that day it was raining heavily. It is the unanimous opinion of the residents that Mr. Morton's action was hasty and unjustifiable. Mullen having a large family dependent upon him, and during the past seven years he has never had a complaint lodged against him, we would therefore respectfully request you to give this matter your careful consideration, feeling sure that our representations can be indisputably proved.

We have, &c.,

H. A. RICHARDS & Co.

H. W. GREY INNES, J.P.

Please inform of action taken.—W.J.L., 1/9/86. Roads.—J.R., B.C., 3/9/86. Mr. Wood starts on this duty on Monday night.—W.C.B., 4/9/86. Under Secretary, B.C. Submitted.—J.R., 6/9/86.

No. 7.

Memo. from A. Stokes, Esq., M.P., to The Secretary for Public Works.

THE Honorable the Minister for Works.—Kindly say have you received a reply from Richards and Innes, J.P., *re* Mullen's case from Condobolin, Mullen being dismissed from his position as maintenance man on the roads?

A. STOKES.

Yes; reply gone down.—W.C.B., 27/8/86. Did Mr. Bennett wire to Messrs. Innes, J.P., and Richards, in accordance with my minute of the 25th instant?—W.J.L., 27/8/86. I did not, having sent wire to Morton on the previous day. I noted—that fact I now see—I should have wired to Messrs. Richards and Innes as directed, but overlooked. Shall I do so now?—W.C.B., 27/8/86. Yes.—W.J.L., 27/8/86. Sent; resubmit with reply.—W.C.B., 27/8/86.

No. 8.

Telegram from the Commissioner for Roads to Messrs. H. A. Richards and H. W. Grey Innes.

Sydney, 27 August, 1886.

AM instructed by Minister for Works to ask you to wire to him, free on service, a report in reference to dismissal of Mullen by Road Superintendent Morton. Also post detailed report.

WILLIAM C. BENNETT.

No. 9.

Telegram from Messrs. H. A. Richards and H. W. Innes to The Secretary for Public Works.

Condobolin, 28 August, 1886.

WE have known Mullen ever since he has been in the employ of the Roads Department, and have always found him most attentive to his duties. On the occasion of Mr. Morton's visit we can prove that Mullen was suffering from a severe attack of neuralgia, unable to work, and on that day it was raining heavily. It is the unanimous opinion of the residents that Mr. Morton's action was hasty and unjustifiable. Mullen having a large family dependent upon him, and during the past seven years he has never had a complaint lodged against him.

H. A. RICHARDS.

H. W. GREY INNES.

Under such a report as this Mr. Morton's conduct should be inquired into, and Mullen must be reinstated. Mr. Morton's report, upon the face of it, goes far to support this one. He says it was raining steadily, and Mullen complained he was unwell. I am informed Mr. Richards and Mr. Innes are most reliable men.—W.J.L., 28/8/86.

Roads.—J.R., B.C., 30/8/86. Mr. Wood to go to Forbes and Condobolin *en route* to Marsden's, and he can then report on this case.—W.C.B., 30/8/86. Mr. Bennett's instruction to Mr. Wood is indefinite. Has he gone? His instructions should be to inquire into Mr. Morton's conduct, and Mullen should before this have been reinstated.—W.J.L., 6/9/86. Mr. Wood left on Monday night.—J.R.

No. 10.

Memo. by The Secretary for Public Works.

I UNDERSTAND that the man Mullen at Condobolin has not yet been reinstated. I have twice written minutes in reference to this man, and should like to know whether the report I have heard is correct, and why my minutes have not been carried out?

W.J.L., 13/9/86.

Mr. Bennett.—J.R., B.C., 14/9/86. Reply herewith.—W.C.B., 14/9/86. Under Secretary, B.C. Submitted.—J.R., 14/9/86.

I have already had considerable and unnecessary trouble over this matter. Mr. Bennett will please carry out my instructions. I cannot quite gather from the accompanying minute whether or not this has been done. Surely he, in the latter part of the minute, does not wish it inferred that these regulations will be followed in preference to a direct instruction from the Ministerial head of the Department.—W.J.L., 14/9/86.

Mr. Bennett.—J.R., B.C., 14/9/86. I have telegraphed to Mr. Morton to reinstate this man Mullen as instructed.—W.C.B., 15/9/86. Under Secretary, B.C. Submitted.—J.R., 15/9/86. Seen.—W.J.L., 30/9/86. Roads.—J.R., B.C., 30/9/86. Put with papers.—W.C.B., 1/10/86.

No. 11.

Telegram from The Commissioner for Roads to Mr. Road-Superintendent Morton.

Sydney, 15 September, 1886.
THE Minister's positive orders are that you reinstate Mullen at once. Proceed to Condobolin to do so.
WILLIAM C. BENNETT.

No. 12.

Telegram from Mr. A. P. Wood to The Commissioner for Roads.

Marsden's, 16 September, 1886.
HAVE been unable to report *re* Mullen, but am of opinion the man should not have been dismissed; shall be in office on Monday; Forbes to-morrow, where telegram will reach me.

It is my duty to forward this telegram for the information of the Minister. Mr. Wood should have sent a telegram to this effect from Condobolin.—W.C.B., 17/9/86. Under Secretary, B.C. Submitted.—J.R., 17/9/86. Place with other papers.—W.J.L., 20/9/86.

No. 13.

Report by The Commissioner for Roads.

Re reinstating Mullen, maintenance man.

14 September, 1886.
THE Minister directed the man to be reinstated and an inquiry held into the conduct of the officer, against whom no definite charge was made. I instructed Mr. Wood to proceed to Forbes and Condobolin to hold this inquiry. To reinstate the man Mr. Morton would have had to go to Condobolin, 57 miles and back, and would probably have missed Mr. Wood, he would have had to discharge the man appointed in this man's place and to pay him.

When the Minister's second message was received, Mr. Wood was leaving that night, so could have picked up Mr. Morton and gone on to Condobolin next day, which he did, and I expect to hear from him from Forbes this day.

To reinstate the man by telegram from this office would have been completely setting the officer, Mr. Morton, aside. He is a young man, was in the execution of his duty, travelling to Condobolin, regardless of the weather; he found this man, contrary to the printed instructions, off his work, without having given any notice, and, in accordance with the instructions, 1st paragraph, dealt with him at once.

By that paragraph of those instructions the engagement of the maintenance man is with the local officer. I never interfere between the officers and men, except to inquire when any accusation is made; then the officer, if in fault, can be punished, as he can in this instance; but I will say for Mr. Morton that he is a quiet, steady young man, who attends strictly to his duty.

I was waiting to receive result of inquiry to report on this matter to the Minister, when I should have informed him of the reasons why his orders could not be carried out.

If the Minister wishes the regulations altered I will do my best to obey, as bound to, but as long as they are in existence I have to be guided by them.—W.C.B., 14/9/86. Under Secretary, B.C.

No. 14.

Telegram from Mr. Road-Superintendent Morton to The Commissioner for Roads.

16 September, 1886.
WIRE received this morning; at present engaged with Mr. Wood at Marsden's; will put on Mullen at Condobolin as soon as I return.

For the information of the Hon. the Secretary for Public Works.—W.C.B., 16/9/86. Under Secty., B.C. Submitted for information.—J.R., 16/9/86. Inform Mr. Stokes.—W.J.L., 16/9/86. Alfred Stokes, Esq., M.P., 17/9/86. Roads.—J.R., B.C., 17/9/86. Resubmit when other papers are returned.—W.C.B., 20/9/86.

No. 15.

The Under Secretary for Public Works to A. Stokes, Esq., M.P.

Sir, Department of Public Works, Sydney, 17 September, 1886.

Referring to your personal representations with respect to the dismissal of Mullen, maintenance man at Condobolin, I am directed to inform you that employment will be given him on the return to Condobolin of the local roads officer, who is now at Marsden's.

I have, &c.,
JOHN RAE.

No. 16,

No. 16.

Mr. Assistant-Engineer Wood's Report on inquiry into Mr. Morton's conduct.

Sydney, 20 September, 1886.

I HAVE carefully inquired into the action of Mr. Morton, in the case of the maintenance man, Mullen, who was dismissed from his employment at Condobolin; and, after full consideration, can arrive at no other conclusion than that this dismissal was hasty and ill-advised.

I am led to this conclusion partly by Mr. Morton's own evidence and partly by that given by reliable informants who have had opportunities to judge of Mullen's character, all of whom agree that he was steady and attentive to his duties. I have discarded all statements based on mere surmise, and in regard to which the witnesses had no positive proof.

In accepting evidence outside the Department I am well aware that caution must be exercised and due allowance made for the ignorance of the witnesses as to the real duties of a maintenance man, of the rules under which he is bound, and of his relations to his superintending officer. It is quite possible for such a man to be steady and, as far as the public can judge, efficient, and yet be unfitted for his post, inasmuch as he may be insolent, insubordinate, and neglectful of instructions, all facts of which the outside public might not necessarily be cognizant.

In this case I am compelled to admit that I do not consider there was anything *positively* known by Mr. Morton, but unknown to the public, which could be considered to warrant summary dismissal.

It appears that Mullen has been working for over seven years as a maintenance man in and around Condobolin, and during two years of that time under Mr. Morton, whose chief ground of complaint is that he always had, when visiting that part of the district to point out work that required to be done, and this work it is admitted was always carried out by Mullen. From my experience, very few maintenance men do not require instructions, and, as in this particular case, the man had been retained so many years, during which time instructions were regularly given and acted on. I fail to see how this can be held to justify dismissal without any previous caution.

As regards Mullen's *attendance* on the roads we have the evidence of Mr. Innes, J.P. and licensing magistrate, of the sergeant of police, and of the officer of Condobolin Station, all of whom are most decided in their opinions in this man's favour and in their testimony to his conduct and attendance. On the day when Mr. Morton found him off the road Mullen was suffering, according to his own account, from an acute attack of neuralgia, and was unable to work; in this statement he is borne out by Mr. Innes, who saw him that day. There is no doubt that Mullen should have posted a letter to Mr. Morton stating that he was compelled to absent himself from work on that day; but as the man, judging by the evidence, was really ill, and as this was, as far as Mr. Morton knew, the first offence of the kind, I consider a reprimand and caution would have met the conditions of the case.

Mr. Morton, after dismissing Mullen, was evidently of a similar opinion, as he stated the same day to Mr. Jones, the stock inspector, that he intended to re-employ him.

Mr. Morton appears to have been influenced by a general feeling of dissatisfaction with Mullen, a feeling that the man was not doing his best, yet without any absolute proofs to condemn him, and it is quite possible that the feeling was correct, but Mr. Morton was unfortunate in his selection of time and reason for dismissing him.

Dealing, as I am compelled to, with the evidence before me, I am decidedly of opinion that Mr. Morton was too hasty and severe.

ARTHUR P. WOOD,
Assist. Engineer.

I think in view of the conclusion I have arrived at, and of this man's reinstatement, that it would be desirable to remove Mr. Morton to another district, and he should be advised to use more judgment in dealing with the men in his employ.—A.P.W.

Under-Secty, B.C. For the information of the Minister.—W.C.B., 20/9/86. Submitted.—J.R., 21/9/86. I think a reprimand and warning to be more careful in future should be sufficient punishment for Mr. Morton upon this occasion.—W.J.L., 22/9/86. Roads.—J.R., B.C., 23/9/86. Mr. Wood.—W.C.B., 24/9/86. Seen; but still think it would be advisable for the Commissioner to remove Mr. Morton to another district.—A.P.W., 24/9/86. Mr. Morton to be advised that he will have to move to Mudgee, and informed of Minister's minute. Mr. Adams, at Mudgee, to be advised that he will have to go to Forbes.—W.C.B., 25/9/86.

No. 17.

The Commissioner for Roads to Mr. Road-Superintendent Morton.

Sir,

Sydney, 28 September, 1886.

Referring to the recent inquiry held by Mr. Wood, Assistant Engineer, into the dismissal by you of John Mullen, maintenance man, I have to inform you that the Honorable the Minister for Works, has made the following minute on Mr. Wood's report:—

"I think a reprimand and a warning to be more careful in future, should be sufficient punishment for Mr. Morton on this occasion."

I have also to inform you that you must hold yourself prepared to move to Mudgee District when required.

I am, &c.,

WILLIAM C. BENNETT,
Commissioner and Engineer for Roads.

No. 18.

The Commissioner for Roads to Mr. Road-Superintendent Adams.

Sir,

Sydney, 28 September, 1886.

I have to inform you that it will be necessary that you should hold yourself in readiness to remove from Mudgee to Forbes, when so directed, as it has been decided to transfer Mr. Morton to the former place.

I am, &c.,

WILLIAM C. BENNETT,

Commissioner and Engineer for Roads.

No. 19.

Mr. Road-Superintendent Morton to The Commissioner for Roads.

Re maintenance man, Mullen, at Condoblin.

Sir,

Roads Office, Mudgee, 22 November, 1886.

As I have been censured by the Hon. the Minister for Works in connection with the above case, on the report furnished by Mr. Wood, Assistant Engineer, I think, in justice to myself, I might be informed in what way I have erred, so that in future the trouble connected with this case may, in similar cases, be avoided. I should have applied for this before, but was delayed through press of other business in leaving Forbes District.

I have, &c.,

O. G. MORTON.

Send the papers to Mr. Morton.—W.C.B., 23/11/86. Papers herewith. Mr. Morton, B.C., 24/11/86.

I have carefully read the Commissioner's minute, and Mr. Wood's report, *re* the dismissal of maintenance man Mullen. In closing the correspondence, I would ask to be allowed to thank the Commissioner for having sent the papers, and to express my appreciation of the manner in which he has dealt with the matter. It will be my endeavour in future to avoid being the subject of an adverse report from a superior officer, and I trust that I have not on this occasion lost the confidence which has hitherto been placed in me.—O.G.M., 26/11/86.

File.—W.C.B., 27/11/86.

No. 20.

Mr. Road-Superintendent Adams to The Commissioner for Roads.

Sir,

Roads Office, Forbes, 15 January, 1887.

Since placed in charge of this district the duties, dispositions, and qualifications of the maintenance men have received a more than ordinary share of my attention. They have, together with other particulars, been furnished each with a copy of Maintenance Men's Instructions. Regarding the manner in which these have been attended to by John Mullen, of Condobolin, it is desirable that I should make known to the Commissioner.

It will be remembered that Mullen was discharged by Mr. Morton some time ago, and for some cause or other reinstated.

Not many weeks after being reinstated he is found absenting himself from work all day on the 9th November, without asking leave of the officer in charge. This only came out through my having made an inquiry after his time for that month, otherwise it would not have been mentioned. For this he was fined in one day's pay.

About three weeks ago I had occasion to visit Condobolin, when it was found that parts of the metalled road under his charge were almost impassable, and which formed the subject for complaint by a number of the residents of Condobolin. One place in particular, near to the old public-house on the Forbes to Condobolin Road, he admitted not having visited since October, and which was a perfect quagmire. Other two pieces of macadam, in the village of Condobolin, were not being used; one was covered with rolling stones, and the other remained just as it left the hands of the contractor, over a year ago. Many of the drains had not been cleaned out for years, and the water-tables invisible in places. These he was obliged to pass day after day, which he did with the shovel over his shoulder. When defects were pointed out to him, he replied, in the most disrespectful manner, that "my predecessor did not allow it."

He has not more than three-quarters of a mile of metalled road altogether, the greater part of which is in Condobolin; so that he cannot complain of over-work. When asked what portions of road were under his charge he did not reply truthfully, as what he said does not correspond with instructions given him by Mr. Morton. In my opinion, Mullen is not capable of doing an ordinary day's work, which, combined with his unfitness, accounts in a great measure for the neglected state of the roads under him. His reinstating has been the subject of considerable comment, not only in Condobolin, but in Forbes and the surrounding district; and the position in which he imagines himself to be placed thereby may be fairly gathered from the tone of, and the matter contained in, one or two of his letters, which are herewith submitted. I refer the Commissioner specially to that dated the 7th January, which is his reply to a few necessary questions which it was my duty to put to him, and which he should in the first place have furnished had he complied with previous instructions. In the regulations furnished him for his guidance it states, that "any man who disobeys the orders of the officer in charge, or is neglectful, impertinent, or incompetent for the duties required of him, is liable to immediate dismissal."

Discipline cannot be maintained by an officer placed, as I am, over a man of this class, nor can I be held responsible for the state of the roads supposed to receive such a man's attention.

I had intended furnishing the above report soon after my visit to Condobolin, but has unavoidably been delayed through attention to more urgent duties.

I may refer the Commissioner to a paper by Mr. Morton from this office, dated 25th August, 1886, having reference to Mullen's character.

The

The Commissioner may think this report unnecessary, but I do not, and my reasons for taking the precaution may be easily inferred.

Mullen should have been discharged by me ere this, but for the liberal treatment he has already received at the hands of those who knew nothing of him.

He is at work on the road as usual, pending the execution of the Commissioner's instructions.

I have, &c.,

ALEX. ADAMS.

Previous papers.—W.C.B., 17/1/87. Minute herewith.—A.P.W., 17/1/87.

[Enclosures.]

Mr. J. Mullen to Mr. Road-Superintendent Adams.

Sir,

Your registered letter to hand with contents.

The bridge is finished according to contractor.

I direct your attention to decking to both Condobolin Bridges, neglected for nine months.

Yours, &c.,

JOHN MULLEN.

Received and replied, see letter book.—A.A., 3/12/86.

Condobolin, 1 December, 1886.

MEMO. from Mr. J. Mullen.

Condobolin, 31 December, 1886.

ENCLOSED please find saw-mill bill for 5s. ; also return for Henry Pettiford and Joseph Pritchard, one day each for selves, horses, and drays, in effecting repairs to Gulgo Bridge approach on 10th and 24th respectively.

For myself, in addition to full time for the month, I claim overtime from Saturday night, 11th, till Monday night, 20th, both nights inclusive ; also two Sundays from the above mentioned date.

The creek, about which you inquired, an embankment may be thrown across it.

JOHN MULLEN.

He stills claims this, although told he cannot get it. Received and replied, see letter book.—A.A., 3/1/87.

MEMO. from Mr. J. Mullen to Mr. Road-Superintendent Adams.

Condobolin, 7 January, 1887.

In reply to the numerous queries contained in your memo. I shall now dispose of them *seriatim*.

Imprimis.—The account rendered was done in accordance with Departmental custom under former Superintendents. Did you suppose Nicolas and Raymond would gratuitously donate the timber which you saw in use as patching on bridges, and which I plainly told you had been supplied by that firm ?

I certify that the account is correct in dimensions. I still retain in my possession, for emergency, one piece 4 feet long, 8 inches by 2 inches. In reference to horse and dray, their time as well as mine could not be returned until the last day of the month.

These returns I mailed you on 31st December. I was seen working in the main street all New Year's Day.

The creek, to which you again refer, is situated about 5 miles from Condobolin.

In future when you wish me to correspond with your office, please forward stamped envelope for reply.

JOHN MULLEN.

Mullen was personally instructed to return the time of horse and cart as soon as he had finished with them. The 24th December was the last day horse and cart was employed, and he sends in this time on the 31st, which did not reach this office until the 3rd January, after all quarterly and yearly returns were sent in.—A.A., 10/1/87. The Commissioner, B.C.

No. 21.

Report by Mr. Assistant-Engineer Wood.

Maintenance man Mullen, Condobolin District.

Roads Department, Sydney, 17 January, 1887.

I HAVE carefully read Mr. Adams' report on his maintenance man Mullen. This man was discharged by Mr. Morton in July last, and, under the instructions of the Honorable the Minister for Works, reinstated in his original position. I was at the time deputed to inquire into the particulars of the case, and on the evidence obtained reported that I did not consider that Mr. Morton had sufficient grounds for summarily dismissing this man after seven years' service, and this view was, in my opinion, strongly supported by Mr. Morton's own statement that he decided to reinstate Mullen on the same day that he dismissed him. This intention was, unfortunately, not carried out, and he was then re-employed in the manner above stated.

Mr. Adams now raises several grounds of complaint,—

- 1st. That Mullen absented himself from duty on the 9th of November without asking leave or giving any information as to his action. This is a decided breach of the rules under which he was employed, as the Prince of Wales' Birthday is not one of the holidays mentioned therein, and Mullen's conduct is the more censurable as absence from duty was the ground of his dismissal by Mr. Morton.
- 2nd. Mullen is directly charged by Mr. Adams with neglecting his roads ; his duties in this respect are clearly pointed out by the printed rules, and on the evidence of Mr. Adams as clearly neglected. When his attention is drawn to this he replies in a "most disrespectful manner."
- 3rd. Mr. Adams complains of the tone of Mullen (letters attached to report), and with just grounds ; as there can be no doubt as to the spirit in which they were written.

The escape this man has had from what was very probably a just dismissal when under Mr. Morton, has evidently failed to teach him a useful lesson ; while his reinstatement by outside influence has as evidently developed an impertinent and insubordinate spirit, and quite unfitted him for his position, under these circumstances, and to maintain proper discipline. Mr. Adams should be instructed to severely reprimand him, and finally caution him that the very next time he gives ground of complaint either as regards his work or the tone of his communications he will be summarily dismissed.

ARTHUR P. WOOD.

I got Mr. Wood's report on this, as he knew the man and the locality. Mr. Adams will read in the presence of a third person, a Government official, Mr. Wood, minute to this man, and if he is again insubordinate or disrespectful will dismiss him without further action. As a rule I never interfere between officers and maintenance men, as I consider that the officers are responsible for their work, and it only weakens the power of the officers to interfere.—W.C.B., 18/1/87. Mr. Adams, B.C.

Noted and returned.—A.A., 20/1/87. Has Mr. Adams, as instructed, read this to Mullen.—W.C.B., 24/1/87.

I have acted on the Commissioner's instructions, as near as time and circumstances would permit. Having been obliged to travel on more urgent duties in the eastern portions of district since the 20th instant, I thought it prudent to send a letter immediately to Mr. Grainger, the C.P.S. at Condobolin, embodying therein the summing up of Mr. Wood's minute, and asking him to read same in the hearing of Mullen. Same is herewith enclosed with telegram attached. If this is not sufficient a journey of 130 miles and four or five days absence will have to be undergone in order to read it in the presence of Mullen.—A.A., 31/1/87. To Commissioner for Roads.

Quite satisfactory, Mr. Adams should have explained in the first instance. See memo. on paper herewith.—W.C.B., 2/2/87. Noted.—A.A., 9/2/87.

No. 22.

Mr. Road-Superintendent Adams to Mr. J. Mullen.

Sir,

Roads Office, Forbes, 24 January, 1887.

I have to point out that the insubordinate spirit displayed in your late correspondence with this office has been of such a character as to warrant your immediate discharge. This impertinence may be attributed to the fact that you have lately been the recipient of considerable leniency, not only from outside influence, but also from the officers of this Department.

It is now my duty to finally caution you that the next time I have grounds for complaint, either as regards your work or the tone of your communications, you will be summarily dismissed.

Yours, &c.,

ALEX. ADAMS,

Superintendent of Roads.

Read by Mr. Grainger, C.P.S., in my hearing, this day of , 1887.

Witness—

I read this letter to Mullen (maintenance man here) in the presence of a witness, W. Kelly. Mullen refused to sign and subscribe to it, stating that he did not consider his late correspondence impertinent.—GRAINGER, C.P.S., Condobolin, 27/1/87. Road Superintendent, Forbes. In the presence of the C.P.S., Mullen emphatically refused to sign. He was accordingly paid off.—A.A., 10/3/87.

No. 23.

Telegram from Mr. J. Mullen to Mr. Road-Superintendent Adams.

Condobolin, 27 January, 1887.

RECEIVED your memo., did not see C.P.S. yet.

JNO. MULLENS,

Maintenance Man.

In order to save a 2d. stamp and an envelope, Mullen puts the Department to the expense of a telegram. He has already objected to correspond otherwise with this office. Other maintenance men would not be allowed to do this, why is he?—A.A., 31/1/87. The Commissioner.

Write Mullen at once not to send telegrams except on urgent matters. You cannot expect a maintenance man to correspond also. When next in this district see C.P.S., get papers from him, and if Mullen will not sign and be subordinate, pay him off; be sure to pay in presence of witness and get his receipt.—W.C.B., 2/2/87. Letter sent.—A.A., 9/2/87.

No. 24.

Memo. by The Secretary for Public Works.

Department of Public Works, Sydney, 14 March, 1887.

I SHOULD like a report on the enclosed.

J.S.

Roads.—J.R., B.C., 16/3/87. The other papers on action somewhere, I had them a day or two ago.—W.C.B., 17/3/87. Records, 17/3/87.

This man was discharged by Mr. Morton and restored before inquiry could be made by the peremptory order of Mr. Secretary Lyne. Mr. Wood however reported that the man should have been reprimanded, not dismissed. The officer, Mr. Morton, was removed; his successor, Mr. Adams, is the man referred to by Mullen in the most insubordinate letter herewith; in both cases he was absent as he states from ill-health. I cannot recommend his restoration, it would be subversion of all discipline.—W.C.B., 24/3/87. Under Secretary, B.C.

Submitted.—J.R., 26/3/87. Approved.—J.S., 6/4/87. Roads to inform.—W.F., for U.S., B.C., 7/4/87. Mr. Adams to note and return at once.—W.C.B., 7/4/87. Noted and returned.—A.A., 14/4/87. P.S.—If my treatment of this man is further questioned, I hope due notice will be given me.—A.A. Send memo. that an officer is always advised of any charges against him.—W.C.B., 16/4/87. Memo. sent.

Mr. J. Mullen to A. Stokes, Esq., M.P.

Re conduct of Road Superintendent.

Sir,

Condobolin, 20 February, 1887.

Wonderful to be said, but still more shameful to relate, are the facilities afforded the Forbes Road Superintendent, by which he is enabled to play the *role* of tyrant over his subordinates, and at the same time dupe his superiors into the belief that he is the *creme de la creme* of up-country officers.

From the enclosed papers, and my subsequent statement, it will be seen that I am the *bete noir* of this officers dire hostility. On the 22nd of December last this officer visited Condobolin for the first and only time since. On that occasion I was the recipient of not only considerable abuse, but his menacing gesticulations were provocation to the commission of a breach of the peace. In the interest of my helpless family I restrained my deeply wounded feelings, though, I confess that at the time, my capillary integument manifested a strong inclination to punch holes through the bottom of my hat. I hope this officer's pugnacious attitude, his impertinent and unofficial questions will not be further permitted by his Department else, in the plenitude of my irascible nature, I may be tempted to do something rash.

During flood time, from instructions received, I was in constant attendance on bridges day and night from the 11th to the 21st December. On Sunday night, the 19th of said month, whilst fending logs from bridge, I was bitten by some venomous reptile. In confirmation of this statement I enclose certificate of professional attendance. At the end of the month I furnished the local officer with a return of this overtime. His reply was, "Your application cannot be entertained." I think this treatment is most unjust especially when you find from the enclosed memo. that I have been fined one day's pay for taking a holiday on Prince of Wales' Birthday. Now, Sir, I may state, and memoranda will bear it out, that some fifteen days previous to issuing cheque for November wages, the officer had a return of my time. In that return I distinctly stated that I did not work on Prince of Wales' Birthday, believing it to be a general holiday. On the 22nd of December I was paid in full for November month, and believed then that I was justified in accepting cheque. On that occasion no reference was made by this officer to the 9th of November. How is it that I am fined for this day in February? Had I subscribed to the enclosed copy of letter in condemnation of the public the officers of his Department and myself, a fine for the Prince of Wales' Birthday would never have been imposed.

I have now stated my grievance *in puris naturalibus*.

I, therefore, most respectfully request that you will move for the production of all correspondence from that officer to me and my replies thereto from them, it will be seen whether I am guilty of the impertinence complained of in letter. Still further, I desire that he be called upon to state who are the officers of his Department against whom he wished me to subscribe.

He evidently thought that by his threat of dismissal I would sign anything even to the revocation of the Governor, the extinction of Australia, and the hanging of your humble servant. Have this matter thoroughly sifted in order that this tyrannical gasconading bully may be made aware that old colonists, though occupying subordinate positions, will not suffer to be treated as serfs.

Fiat justitia, ruat cælum.

I have, &c.,

JNO. MULLEN.

[Enclosures.]

Memo. from Mr. Road-Superintendent Adams to Mr. J. Mullen.

Roads Office, Forbes, 3 December, 1886.

WHAT is wrong with the decks of bridges at Condobolin, and why have they been neglected for nine months? In future please let me have a return of your time at the end of each month. Did you lose any time in November? When you correspond with this office address your letters to the Superintendent of Roads and not to me.

ALEX. ADAMS.

Memo. from Mr. Road-Superintendent Adams to Mr. J. Mullen.

20 December, 1886.

ATTACHED to voucher 234 is a cheque for your November wages. Please sign and witness as usual, and return to me as soon as possible. Your attention is also directed to the minute on letter enclosed.

ALEX. ADAMS,

Superintendent of Roads.

Memo. from Mr. Road-Superintendent Adams to Mr. J. Mullen.

Roads Office, Forbes, 24 January, 1887.

PLEASE call with the C.P.S. and receive cheque for your December wages. You will also sign and subscribe to the letter which that gentleman will read in your presence.

In future you will require to furnish this office with a report on the condition of the following roads, which are under your charge, when sending in your time, &c., at the end of each month.

The road to Forbes as far as the crossing at the old public-house; on the south side of river as far as the east end of Crampton's-lane; on all other roads leading out of Condobolin and under this Department on which bridges, culverts, or other works have been carried out for a distance of 10 miles.

All the streets in Condobolin, on cleared portions, you will simply fill up watercourses with ballast on the lines traversed by mail coach.

Please acknowledge receipt of this memo.

ALEX. ADAMS,

Superintendent of Roads, &c.

Memo. from Mr. Road-Superintendent Adams to Mr. J. Mullen.

Roads Office, Forbes, 7 February, 1887.

In your having declined to accept cheque for December wages, which is again herewith tendered, I have to point out that you did knowingly receive, retain, and make use of a cheque for more money than was your just due as wages for the month of November. You absented yourself one day from work in that month without having first obtained leave from your employer; for so offending you were fined in one day's pay. It is scarcely necessary to mention that it was only in reply to my query aent your time for November month, that you admitted your absence on that occasion.

You may employ horse and dray. Fill in gullies with earth of a binding nature, and guarded with stone facing and surface liable to be exposed to the action of water.

ALEX. ADAMS,

Superintendent of Roads.

Mr.

Mr. Road-Superintendent Adams to Mr. J. Mullen.

Sir, I have to point out that the insubordinate spirit displayed in your correspondence with this office has been of such a character as to warrant your immediate discharge. This impertinence may be attributed to the fact that you have lately been the recipient of considerable leniency not only from outside influence but also from the officers of this Department. It is now my duty to finally caution you that the next time I have grounds for complaint, either as regards your work or the tone of your communications, you will be summarily dismissed.

Roads Office, Forbes, 24 January, 1887.

Yours, &c.,
ALEX. ADAMS,
Superintendent of Roads,

Read by Mr. Grainger, C.P.S., in my hearing, this _____ day of _____, 1887.

Witness—

I hereby certify that the within letter is a true copy of the one forwarded to John Mullen by Alex. Adams.
Condobolin, 19th February, 1887. H. W. GREY INNES, J.P.

No. 26.

Medical Certificate.

I HEREBY certify that I attended John Mullen on the night of 19th December, 1886, when he was suffering from the bite of a poisonous animal, which I believe he received whilst watching the bridge across the Lachlan River at Condobolin.

Condobolin, 16 February, 1887.

HENRY DALTON, M.B., &c.

No. 27.

Petition.

The Honorable The Minister for Works, Sydney.

THE humble Petition of the undersigned, residents of Condobolin and District, for and on behalf of ex-maintenance man John Mullen. Respectfully sheweth:—

That the dismissal of the said John Mullen is a case so fraught with hardship to him and family as to demand your immediate and serious consideration. For nearly eight years he discharged the duties of maintenance man in and around Condobolin, in a manner so satisfactory to the public, that his dismissal has now evoked our sympathy. During that lengthened period his civility and strict attention to his duties warrant us in bringing under your notice the magnitude of the hardship to which he has been so unjustly subjected. He has a wife and large family solely dependent upon him for support; and your Petitioners deem it cruel in the extreme that a man, who so faithfully, honestly, and conscientiously discharged the duties incumbent on his position for such a long period should be summarily discharged at the caprice of the local officer.

Your Petitioners, therefore, respectfully request that you will give this case your most serious consideration by offering him employment in some other branch of the Service, or otherwise placing him beyond the surveillance of the officer, by whom he has been so harshly and unjustly treated, and your Petitioners, as in duty bound, will ever pray.

[Here follow 33 signatures.]

Acknowledged, 18/4/87. Roads.—J.R., B.C., 19/4/87. Previous papers.—W.C.B., 20/4/87. 87/3,155. Herewith, 21/4/87.

As a rule I never interfere between the road officers and the maintenance men. The officers are responsible for the work, and it would be quite impossible for this office to inquire into all details of this sort. No man has complained of this officer, Mr. Adams, before, but this is the second instance of a complaint by this man against the Superintendent over him—first in Mr. Morton's case, next in this. This letter is an evidence of his character.—W.C.B., 25/4/87.

Under Secretary, B.C. Submitted.—J.R., 27/4/87. Not to be reinstated, I suppose, is the purport of this minute.—J.R. I think so, but that is for the Minister to say. I think the man's own letter will show how unfit for any subordinate position he is.—W.C.B. Under Secretary, B.C., 30/4/87. Prepare papers.—J.S., 11/5/87. Roads to prepare Return.—J.R., B.C., 16/5/87. Mr. Flynn.—W.C.B., 17/5/87.

No. 28.

Mr. Road-Superintendent Adams, further *re* dismissal of Mullen.

Roads Office, Forbes, 11 May, 1887.

SINCE advised of Mr. Stokes' "notice of motion" in the Legislative Assembly, in *re* the above subject, it occurred to me that the following statement of facts should be furnished in addition to those already appearing on papers 87-713, &c.

The impertinent and insubordinate disposition displayed by this man has already been pointed out and proved. My previous assertions in reference to these developments have been borne out in the most striking manner by the glowing language used in his letter to Mr. Stokes, M.P., and dated the 20th February.

At the time he was discharged, and not for some weeks after, was I aware that such a production of unrighteousness was in existence. Mullen evidently laboured under the delusion that he was being badly used. An investigation of the local correspondence press book will reveal a different state of affairs. It will be found that his treatment has been similar to that of others, that he is not the first maintenance man discharged by me in this district for neglect of duty and insubordination, and that two or three others are "on their last legs," in consequence of similar offences.

In

In December last, a petition, signed by a number of the leading residents of Condoblin, amongst them Messrs. Stevenson and Bolton, J.'s P., was sent to this office, drawing my attention to the state of the Forbes Road, approaching Condoblin. Now, Mullen was paid for keeping this same piece of road in proper repair, and, strange to say, these are the same men who upheld Mullen, and condemned the action of Mr. Morton in discharging him.

One of the places referred to in the petition, about half a mile from the village, has just been repaired at the handsome sum of £55. Had Mullen attended to his duties as he should, and applied stakes and boughs, &c., to stop, scour, and induce deposit, this outlay could have been easily averted. Instead of being out at this kind of work in wet weather he remained at home. This has been proved beyond a doubt, for on an occasion of this kind he was found safely ensconced under the shelter of his own roof.

In addition to the above obstruction (now removed) there are three or four others of a minor nature to which his attention was directed on date of my first visit. These, on a subsequent occasion, were found in the same wretched state. He ignored my instructions.

On paper 87-713 reference was made to the state of crossing at old public-house, when I passed it on 22nd December. On that occasion, Mullen admitted not having visited it later than the month of October, a period of nine weeks. This admission, which I made a note of, he emphatically contradicted on a subsequent occasion.

When executing some repairs on the Euabalong Road he declined to inform me of a serious obstacle on that road, word reaching me from outside sources, and when asked why he did not inform, he replied that "it was not his business."

In Culugo-lane, on same road, traffic was all but interrupted, in consequence of extensive gorges, the results of his neglect in not guarding against scour. In order to keep the road open, he was authorised to employ horse and cart to execute immediate repairs, at the same time instructing him how to proceed. (*See letter with other papers, dated the 7th February.*) These instructions he completely set aside. I travelled by this road when repairs were done, in extremely wet weather, and found the material which he had deposited being swept out of sight and the gorge reforming. Note the result:—Mr. M'Lean's three-horse mail and passenger coach travelling to Euabalong broke down in this same spot a very short time after.

When discharged he objected to give up tools, &c., until threatened with legal proceedings.

This man's restoration last year has been considerably commented on throughout this district, and has had a very telling effect upon the disposition of other men in the district. One writes, a few days ago, to say that he will see the member for this district, whether through him he cannot compel the Department to refund "a day's wages," deducted from him lately for absence from duty.

ALEX. ADAMS,
Superintendent of Roads.

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

BRIDGE OVER THE RIVER DARLING AT WENTWORTH.
(CORRESPONDENCE.)

Ordered by the Legislative Assembly to be printed, 3 May, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly, dated 30th March, 1887, That there be laid upon the Table of this House,—

“Copies of all papers, petitions, correspondence, reports, and plans in reference to the erection of a bridge over the River Darling at “Wentworth.”

(Mr. Abbott.)

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BRIDGE OVER THE RIVER DARLING AT WENTWORTH.

No. 1.

Mr. J. H. Thomas to The Commissioner for Roads.

(65-138.)

In compliance with your instructions I visited Wentworth to examine the ana-branch of the Darling River, and after a careful perusal of the papers in connection with the subject, which I return herewith, beg to submit the following report:—

The site selected by Mr. Surveyor Wood is, in my opinion, the best adapted for a bridge; it is situated about 10 miles from Wentworth, and 2 from the confluence of the ana-branch with the River Murray, and is on the main road to Adelaide and the Upper Darling runs.

The sum of money voted (£500) is totally inadequate for the construction of a bridge capable of meeting the growing requirements of the traffic, although from the fact of there being but a trifling current and no timber ever coming down the creek, a very simple class of structure would be sufficient.

Hitherto this ana-branch has not been navigated, but at the time of my visit a steamer was about to make the attempt, in order to bring down a large quantity of wool, and in the event of its being successfully accomplished, of which there was little doubt, it would be followed by others; some provision should therefore be made in the bridge for allowing the boats to pass, although the navigation would be confined to three or four months in the year, as for a like period the creek has been known to be at this spot perfectly dry.

Timber (red-gum) suited for such a bridge can be obtained in the bends of the Murray, within 3 or 4 miles of the site, and the bed of the creek having about 2 feet of soft mud overlying a bed of clay, would make the pile-driving comparatively easy, but as it is not probable that any competent person would be found to tender in the immediate district, the contract would be tendered for by persons residing at a distance, and the conveyance of plant, &c., would cause them to allow of a wide margin in their estimates.

Taking all these circumstances into consideration, I do not think a bridge could be constructed to meet the requirements of the daily increasing traffic on this important road for a less sum than that named by you, viz., £4,000.

The water in the creek, which had been falling for the last two or three weeks, was at the time of my visit exactly at the level marked on Mr. Woods' section as "probable highest flood level," but I found unmistakable indications of its having been 1'35 higher.

As I could not procure a boat to take soundings with, without causing a delay of some days, I was compelled to content myself with checking the levels on either bank, and the distances, all of which agreed with section.

There are at present two punts at work at this crossing-place, but too small and inconvenient for general purposes. I think, therefore, that if the sum voted cannot be augmented, it would be as well to expend the £500 in the construction of a good serviceable punt, and in forming over the low swampy ground on the north-east approach a logged road of about 4 chains in length.

From the general geographical position of Wentworth, with reference to the three Colonies of Victoria, New South Wales, and South Australia, and its being situated at the junction of two such navigable rivers as the Darling and the Murray, I believe it will become the largest and most important town in the Riverina District, so that it is not improbable that at no distant date application may be made for a bridge over the Darling. I therefore made an inspection of its banks for some distance up; the river however being flooded, I did not feel warranted in going to any expense and delay in procuring boats to take soundings, but from the inspection made, I consider the best site for a bridge would be in a direct line with Sandwych-street. (*See lithographed plan of township.*)

It would be necessary that the bridge here should be of iron, as from what I saw of the timber there would be far greater difficulty in obtaining long lengths than even at Deniliquin, and it is of an inferior quality, quite unsuited for the construction of a large work.

The bed of the river is admirably adapted for the sinking of cylinders or screw piles.

A swing opening would have to be made, as from the lowness of the banks on either side, and the approaches being in a street, it would be impossible to get sufficient headway for the steamers.

There is some good durable stone to be procured on the banks of the Murray, 20 miles down the river, and good lime can also be obtained 8 miles up the river, at a place known as Mount Lookout, both of which could be landed at site for bridge by steamers.

Bricks are made and sold here for from £3 to £3 5s. per thousand; carpenters and other mechanics get from 12s. to 14s. per day, and labourers from 7s. to 8s.

Of course the ironwork for such a bridge could, if from England, be brought up from Adelaide by the steamers, and laid down on the spot.

JAS. H. THOMAS, 6/1/65.

Will Mr. Thomas be good enough to state if the log road proposed will give access to the punt or bridge at all levels of flood, and also if a bridge is built at a cost of £4,000, what the cost of making approaches available at all floods will be? The necessity for an opening for steamers will preclude a bridge being built at less cost, and previous to committing the Government to such an expenditure I should like to know how far it would be available at all times of flood. Is there any similar obstacle to this on the road from Deniliquin to Wentworth? Both the Darling and the Murrumbidgee have, I presume, punts. Did Mr. Thomas ascertain by enquiry what the obstacles were, if any, on the Adelaide side? My object is to ascertain if this, at Wentworth, is the greatest impediment to transit between Sydney and Adelaide; if so, the Government of New South Wales would be warranted in incurring a larger outlay than if it were a local want only. The bridge over the Darling has not been asked for, and as I presume there is a punt, must wait until the ana-branch bridge is built.—W.C.B., 17/1/65. Mr. Thomas. To be returned.

No. 2.

No. 2.

J. H. Thomas' reply to Minute on 65/138.

THE log road would give access to the proposed bridge during floods of the highest known level, and would not cost more than £100. The road to the bridge on the Wentworth side is, from the nature of the soil, very bad in wet weather, but has never been impassable.

As the necessity of an opening for steamers will of course depend upon whether the navigation of the ana-branch is practicable, I have written to know if the attempt I refer to in my report was made, and, if so, with what success.

There are several small creeks to be crossed between Deniliquin and Wentworth, but the only one that seriously impedes the traffic is the Gol Gol Creek, some 20 miles on this side of the Darling. This creek is crossed about 40 chains from its junction with the Murray River, and is often impassable for drays. At present there is being worked by the mail contractor a boat, by which light vehicles are taken over. A bridge here would not cost less than £1,200.

There is a large punt in excellent working order on the Darling at Wentworth, and another, although much inferior, on the Murrumbidgee at Balranald. The approach, for some 3 or 4 miles to the latter, is during flood times under water, white boards being fastened on the trees to indicate the line of road.

I should mention that by far the greatest amount of traffic to Wentworth is from Victoria *via* Swan Hill and Euston.

On the Adelaide side I was given to understand by the mail contractor the obstacles were but trifling.

Resubmit.—W.C.B., 10/2/65.

JAS. H. THOMAS, 4/2/65.

No. 3.

Mr. J. Higgins to The Secretary for Public Works.

Sir,

Wentworth, 30 December, 1876.

I am instructed by several clients, inhabitants of the town, to elicit information in reference to the erection of a bridge across the Darling at Wentworth. As from my own knowledge the work is of the greatest importance to the district, I have no doubt you will give the subject the attention it merits. So far as I can learn, I believe this work was contemplated, and plans prepared many years ago, which no doubt will be found deposited in the proper office, and as the parties interested are now fully determined to move in the matter, I will be glad to know what the Department may require to give effect to our wishes.

I have, &c.,

JOSEPH HIGGINS,

Solicitor.

Roads for report, B.C., 5/1/77.—J.R. There is a section of the Darling at Wentworth in the office; it is with the Wentworth punt papers; look it up.—W.C.B., 6/1/77. Cannot trace papers. There is a large batch of papers relating to this—some years old—look back.—W.C.B., 3/2/77. It may be under the head of "Bridge, Wentworth." Nothing recorded under the head of Wentworth. There are papers connected with a punt at Wellington.—J.S.W., 6/2/77. Look through Wentworth embankment and street papers. Is Mr. Philben aware of any previous action in this matter, or of any section having been taken for a bridge here; if so, please give reference; if not, send in section and report?—G.C.E., for Com. Mr. Philben, B.C., 5/3/77.

It is thought that Mr. Thomas made report and section in 1864, when surveying site for the bridge over the ana-branch. It is the opinion of most people out of Wentworth that the traffic would not warrant the erection of a bridge at Wentworth at present—an opinion with which I entirely concur. A Government punt at moderate scale of charges will suffice for many years to come.

Mr. Gunn, the present punt-owner, informed me the traffic was scarcely sufficient to pay for working his punt, and hence his high scale of charges.—G. PHILBEN, 13/3/77. The Commissioner, B.C. Look up report in question.—W.C.B., 17/3/77. Papers herewith. For Mr. Thomas' report; please see 65-138 and 65-368.—J.S.W., 19/3/77. Mr. Thomas' report herewith, by which Mr. Philben will see he did not make a section. Mr. Philben will please take section.—W.C.B., 19/3/77. Mr. Philben, B.C., 65-138 and 65-368 herewith, to be returned. Will take section and report as soon as other more important duties admit.—G. PHILBEN, 10/4/77. The Commissioner, B.C. Re-submit in a fortnight.—W.C.B., 13/4/77. Remind Mr. Philben.—W.C.B., 8/5/77. Mr. Philben, 9/5/77. File.

No. 4.

Mr. G. Philben to The Commissioner for Roads.

Sir,

Deniliquin, 25 July, 1877.

In compliance with the instructions contained in your minute on a letter from Mr. Higgins, of Wentworth, respecting the erection of a bridge over the Darling at Wentworth, I have now the honor to transmit herewith tracing section of the most suitable site, and to report that in my opinion the amount of traffic there at present would not warrant the erection of such a structure.

The traffic at present is confined to the mail coaches once a week from Menindie, from Balranald, and from Swan Hill, together with a few buggies now and then from some of the adjoining stations. There is a very good punt there at present, owned by Mr. Gunn, of Wentworth, and the only complaint I heard against it is that his charges are too high, and he states that the receipts scarcely cover the working expenses. Nearly the whole of the heavy traffic at this place is by water. Any bridge erected here should be either above high-flood level, at sufficient height to allow steamers to pass under it, or a swing or drawbridge. The former, I consider, would be unsuited to the locality, owing to the height to which the approaches would have to be raised. In my opinion a light pontoon bridge would suit best, and meet all the requirements of the case for many years to come.

Before

Before determining on the plans of a bridge, it will be necessary to sink trial shafts and make borings, as there is no knowing the depth of drift-sand through which the piers would have to be sunk. At the excavation and sinking of wells, drift sand is met about 10 to 12 feet from the surface.

The hopes entertained by Mr. Thomas as to the future of Wentworth, as set forth in his report on this matter, have not come to pass, but on the contrary, since the flood of 1870 Wentworth appears to be falling away, and in a languishing state, while other townships on the Darling have made considerable progress. After a careful consideration of the matter I am of opinion that it is not advisable to incur any great outlay in the erection of a bridge there, and that a pontoon bridge will be sufficient for the traffic for many years to come, and that the necessity for even that is not very great at present.

The portion of the streets tinted red* on the tracing† is metalled, and the dotted line from A to B is the line of the section taken. It appears to be the most suitable site. When taking the soundings the current was scarcely perceptible, as the Darling was backed up by the Murray River; the latter was rising, while the former was not, except by the backwater from the Murray.

I have, &c.,
G. PHILBEN.

Resubmit with papers.—W.C.B., 30/7/77. Papers now submitted.—J.S.W., 30/7/77. Re-submit when new schedules are being prepared.—W.C.B., 23/8/77. Noted.—G.C.E. File.

* Appendix.
† Not shown on tracing.

No. 5.

Resolution of Public Meeting, Wentworth.

EXTRACT from proceedings of a public meeting, held at the Court-house, Wentworth, on the 30th November, 1877,—Wm. Gunn, Esq., in the chair:—

Moved by Henry M'Cormack, Esq., J.P., seconded by Mr. John S. Upton, storekeeper,—“That our Member be requested to have a sufficient sum placed on the Estimates for the erection of a bridge over the Darling, at Wentworth.”

Roads for report, B.C., 3-5/1/78.—J.R. There are papers on this, and I think a section.—W.C.B., 5/1/78. Previous papers now submitted.—J.S.W., 7/1/78.

Mr. Philben reports that a bridge is not required here, and that the most they could expect would be a pontoon bridge; this I cannot recommend. The light timber in this country is worthless, and the heavy timber is unsuited for such a work. An iron bridge with steel lifting span of 60 feet, and two 85-foot spans on either side, as proposed for Balranald and Bourke, would cost £15,000. I do not think the traffic justifies the expenditure.—W.C.B., 7/1/78. Under Secretary, B.C. P.W.O., 9/1/78. Inform.—J.S., 10/1/78. Wm. Gunn, Esq., informed, 11/1/78. Roads, B.C., 12-15/1/78.—J.R. File.—W.C.B., 15/1/78.

No. 6.

The Under Secretary for Public Works to W. Gunn, Esq.

Sir, Department of Public Works, Sydney, 11 January, 1878.

Referring to your letter of 30 November last, requesting that a sum of money may be placed upon the Estimates for the construction of a bridge over the Darling River, at Wentworth, I am directed to inform you that, acting upon a report which has been received from the Commissioner for Roads, the Secretary for Public Works does not consider that the traffic would justify the expenditure that would be required for a suitable bridge at this place.

I have, &c.,
JOHN RAE.

No. 7.

The Mayor of Wentworth to C. W. Simson, Esq., M.P.

Sir, Municipal Chambers, Wentworth, 26 November, 1879.

I have the honor, at the request of the Municipal Council, to forward you a most numerous signed memorial to the Honorable the Minister for Public Works, praying that a sum may be placed on the Estimates for the erection of a bridge over the Darling, at Wentworth.

The necessity for this work has been brought to the notice of the Minister on previous occasions, and this Council trusts that the present memorial may have the effect of having the matter at once considered, and, if practicable, carried out.

I have, &c.,
WILLIAM GUNN,
Mayor.

Forwarded to the Honorable the Secretary for Public Works. This petition is the second or third application for a bridge at Wentworth, which has been reported to me from many sources as being a most necessary work. On the last occasion it was to be referred for report to the Engineer for that district, but his reply had not reached me. I have the honor to request that you will take the wishes of the petitioners into your favourable consideration, and place the necessary sum on the Supplementary Estimates for the purpose of erecting a bridge over the Darling River, at Wentworth.—C. W. SIMSON, 8 December, 1879.

Acknowledge.—

Acknowledge.—C. W. SIMSON, M.P., 10/12/79. Commissioner for Roads.—J.L., 10/12/79. B.C., 10-11/12/79. Previous papers.—W.C.B., 11/12/79. 78-130 herewith.—J.S.W., 12/12/79. Might be informed would be considered when next estimates are being prepared.—W.C.B., 13/12/79. Under Secretary.—P.W.O., B.C., 15/12/79. Approved.—J.L., 15/12/79. Colin W. Simson, M.P., 20/12/79. Roads.—G.H., B.C., 20-23/12/79. On the 7th January, 1878, I reported that the traffic would not justify the expenditure for a bridge here, which would amount to £15,000.—W.C.B., 30/12/79. Under Secretary.—P.W.O., B.C., 2/1/80. Mr. Simson, M.P., may be informed of the Commissioner's report.—J.L., 2/1/80. Colin W. Simson, M.P., 6/1/80. Roads.—G.H., B.C., 6/1/80. File.—W.C.B., 6/1/80.

No. 8.

Petition to The Secretary for Public Works.

To the Honorable the Minister of Public Works, Sydney,—

The memorial of the residents of Wentworth and the Lower Darling District,—

HUMBLY SHOWETH:—

1. That a bridge across the River Darling at Wentworth is urgently required. The number of mails (eight weekly), the traffic of stock, and the carriage of merchandise being large and constantly increasing, while the only means of crossing the river is by punt.

2. That the geographical position of Wentworth, at the junction of the two great water highways of Australia, and, being the most direct road from Sydney to Adelaide, renders facilities for crossing the river necessary.

3. That the revenue from the district is a very large one, and that the pastoral tenants, who are the principal contributors to that revenue, would be largely benefited by a bridge being erected across the Darling at Wentworth.

4. That the recent formation of a municipality at Wentworth has given a great stimulus to the prosperity of the district, which would be greatly accelerated by the erection of a bridge, tending greatly to increase traffic by giving facilities for it, and would foster settlement on the eastern side of the Darling and district generally.

5. That the portion of the township on the eastern side of the river is practically useless, as the business people, who would find desirable residences there were a bridge erected, would at present find communication with the Government offices in the township both inconvenient and expensive, viz., post and telegraph offices, custom-house, court-house, and land office, which are all on the western side of the river, and would also be practically without police protection.

6. That the greater part of the commonage for the town is on the east side of the river, and the inconvenience and expense of utilizing it is very great; also, that the supply of firewood on the west side of the river is limited, whereas on the eastern side there is abundance for the consumption of the town for many years.

7. That bridges are now being erected at Bourke and Balranald, neither of which towns have, in the opinion of your memorialists, such urgent claims to your consideration as Wentworth, which, from its being the port of entry for nearly all the merchandise consumed in the extensive Darling district, and a commercial depôt for its distribution to a large part of that district, must always command a large traffic.

8. And your memorialists therefore petition that you will cause to be placed on the Estimates such a sum as you may, in your wisdom, consider necessary for the erection of the bridge asked for.

And your memorialists, as in duty bound, will ever pray.

[Here follow 270 signatures.]

No. 9.

The Under Secretary for Public Works to C. W. Simson, Esq., M.P.

Sir,

Department of Public Works, Sydney, 20 December, 1879.

Referring to the petition forwarded by you from the Mayor and residents of Wentworth, requesting erection of a bridge over the Darling at that place, I am directed by the Secretary for Public Works to inform you that this matter has been noted for consideration, when the next Estimates are being prepared.

I have, &c.,

GERALD HALLIGAN,
Acting Under Secretary.

No. 10.

The Under Secretary for Public Works to C. W. Simson, Esq., M.P.

Sir,

Department of Public Works, Sydney, 6 January, 1880.

With reference to my letter to you of the 20th ultimo, on the subject of the erection of a bridge over the Darling at Wentworth, I am directed to inform you it appears from a report which has been received from the Commissioner for Roads, that the traffic would not justify the outlay necessary to construct the bridge in question, which would not amount to less than £15,000.

I have, &c.,

GERALD HALLIGAN,
Acting Under Secretary.

No. 11.

W. A. Brodribb, Esq., M.P., to The Secretary for Public Works.

Sir,

Buckhurst, Double Bay, 8 December, 1880.

I have the honor to bring under your notice the following resolution, passed at a meeting of the Wentworth electors, on the 17th ultimo, in the Court-house, Wentworth, the Mayor presiding.

* * * * *

2. It was proposed by Mr. Upton, seconded by Mr. Tonkin, "That a bridge over the River Darling is most urgently required. Visitors to the town, as well as residents, drovers, and others, all clamour for a bridge, it being patent to everyone that the want of a bridge is strongly felt by everyone, and that the town would have prospered far more than it has done if free traffic across the river could have been obtained in past years."

I have, &c.,

WM. A. BRODRIBB.

Ackgd., 11/12/80. Roads, B.C., 13/12/80.—J.R. Resubmit with papers, with which there is a section.—W.C.B., 14/12/80. Submitted, 14/12/80. Telegram sent Mr. Dooner; resubmit with reply.—W.C.B., 15/12/80. Mr. Dooner's report with my minute herewith.—W.C.B., 20/12/80.

No. 12.

Mr. P. Dooner to The Commissioner for Roads.

Sir,

Balranald, 16 December, 1880.

As instructed in your telegram of the 15th instant, I have to report on the proposed bridge over the Darling at Wentworth, as follows:—

I visited Wentworth in October last, and as I then heard it stated that it was the intention of the residents of Wentworth to ask the Government to bridge the Darling at Wentworth, I made general inquiries as to the traffic to be accommodated and other conveniences to the residents that accrue from a bridge being built over the Darling River at that place.

From such information as I could obtain it appears that about 150,000 sheep may cross the river in a year. The wool traffic is very small, as the wool is shipped at the sheds up the rivers. The general merchandise is brought to Wentworth by boat and landed on the town side of the river.

There is no settlement of any account in the district, and as it is a pastoral country the population is not likely to increase rapidly.

The chief traffic to be accommodated is the "up-river" mails, a few residents in the district, and the residents in the town who may desire to go up the river on business or pleasure. The traffic does not now warrant the large expenditure required to bridge the Darling River at Wentworth.

I may mention that the punt on the Darling, at this place, is private property, and the landing-places also private property, although there are good landing-places on Crown lands close by. The tolls charged on this punt are as follows:—

	£	s.	d.
Foot-passengers, each... ..	0	0	6
Saddle-horses, "	0	2	0
Lead-horses, "	0	1	6
Vehicles, per wheel	0	1	0
Sheep, per thousand	2	0	0
Cattle, each	0	1	0

The above scale of tolls is payable for every crossing; thus a buggy and pair of horses pay 7s. each crossing.

At Balranald the following tolls are charged, the punt being private property, but with landings on Crown lands:—

	£	s.	d.
Horses, each	0	1	0
Buggies, each wheel	0	0	6
Wagons, " "	0	1	0
Bullocks, each	0	1	0
Sheep, per thousand	1	0	0
Foot-passengers	0	0	6

The above toll is payable only once in twenty-four hours.

Now that a Municipality has been established at Wentworth, the Municipal Council have it in their power to license a punt, at a reasonable rate of tolls, which will meet the requirements of the traffic.

I have, &c.,

P. DOONER.

A bridge at Wentworth must be a drawbridge and very expensive. I concur with Mr. Dooner in thinking it unnecessary, as I have already reported, but I consider it advisable to build a punt here and put it to ply at the street referred to. This will compel the present owner to reduce his very exorbitant rates, the pressure of which causes the demand for a bridge.—W.C.B., 20/12/80.

Under Secretary, B.C. Approved.—J.L., 21/12/80. W. A. Brodrigg, Esq., M.P., 23/12/80.
Roads, B.C., 23/12/80.—J.R. File.—W.C.B., 29/12/80.

No. 13.

The Under Secretary for Public Works to W. A. Brodrigg, Esq., M.P.

Sir,

Department of Public Works, Sydney, 23 December, 1880.

With reference to that portion of your letter of the 8th instant, which relates to the erection of a bridge over the Darling River at Wentworth, I am directed to inform you that acting upon the report of the Commissioner for Roads to the effect that any bridge erected at the site in question must be a drawbridge, and would consequently be a very expensive structure, the Secretary for Public Works cannot authorize a compliance with your request.

I am to add however that a punt will be constructed, and will ply from the street referred to, thus compelling the owner of the present punt to reduce his exorbitant charges.

I have, &c.,

JOHN RAE.

No. 14.

No. 14.

The Under Secretary for Public Works to The Commissioner for Roads.

Sir, Department of Public Works, Sydney, 24 January, 1881.
 Referring to the extract of a letter from W. A. Brodrigg, Esq., M.P., forwarded to you by my B.C. minute of the 11th ultimo, on the subject of a bridge over the river Darling at Wentworth, also repairs of streets and roads in the vicinity of that town, I am directed by the Secretary for Public Works to request the favour of an early reply.

I have, &c.,
 JOHN RAE.

The reply was sent some days ago; Mr. Hiles to say when.—W.C.B., 25/1/81. Papers herewith, 80-7,386 bridge, 80-7,325 streets.

It will be seen by paper herewith that I replied to communication referred to of the 11th ultimo on the next day, and that Mr. Brodrigg was informed on the 23rd. I omitted to forward Mr. Dooner's telegram as to the streets now herewith, in which he states that the work in question is in progress.—W.C.B., 31/1/81. Under Secretary, B.C.

Inform Mr. Brodrigg.—J.R., 1/2/81. Done, 3/2/81. Roads, B.C., 5-7/2/81.—G.H. (for U.S.) File.—W.C.B., 8/2/81.

No. 15.

The Under Secretary for Public Works to W. A. Brodrigg, Esq., M.P.

Sir, Department of Public Works, Sydney, 3 February, 1881.
 Referring to your letter of the 8th December last, respecting works required in your electorate, I am directed to inform you
 * * * * *
 With reference to the proposal to erect a bridge over the Darling River at Wentworth, I am to state that owing to the great expense that would be necessary to provide a suitable structure, the outlay cannot be sanctioned at present, but that a punt will be provided at the place for crossing the traffic.
 * * * * *

I have, &c.,
 JOHN RAE.

No. 16.

W. A. Brodrigg, Esq., M.P., to The Secretary for Public Works.

Sir, 133, Macquarie-street, Sydney, 19 April, 1881.
 I have the honor to forward you a letter I have just received from Mr. D. Tomlinson, Honorary Secretary to the Wentworth Bridge Committee, and also the report of the proceedings of a large public meeting which took place on the 7th instant, with reference to a bridge over the Darling at the Wentworth township.

I venture to submit those documents to you in the hope that your colleagues and yourself will take into your serious consideration the unanimous resolutions passed at that meeting, and have a sum of money placed on the Estimates for the purpose of erecting the said bridge as early as possible.

I have, &c.,
 WM. A. BRODRIGB.

Acknowledged, 20/4/81. Road., B.C., 20-21/4/81.—J.R. Previous papers.—W.C.B., 21/4/81. 81-358 papers herewith, 26/4/81.

I have nothing to add to my minute on 80-7,386 herewith. A bridge here must be very expensive; it will have to be a lift or drawbridge. I think the provision of a punt to keep down the rates is all that is required at present. The railway will be here before very many years, and a road bridge would then be almost useless.—W.C.B., 26/4/81. Under Secretary, B.C.

Inform.—J.L., 6/5/81. W. A. Brodrigg, Esq., M.P., 7/5/81. Roads, B.C., 7/5/81.—J.R. File.—W.C.B., 7/5/81.

No. 17.

Mr. D. Tomlinson to W. A. Brodrigg, Esq., M.P.

Dear Sir, Wentworth, 13 April, 1881.
 I have the honor to place myself in communication with you, on behalf of the Bridge Committee, appointed by a public meeting held at Wentworth on Thursday, April 7th.

In the first place it will be necessary to give you a short outline of the methods that have been adopted for drawing the Minister for Public Works' attention to this long felt want.

Previous to the year 1879 two or three petitions from the Wentworth district were sent to the Public Works Department praying that a sum of money may be placed on the Estimates for carrying out the work in question. The answer to these petitions was always to the effect that the Minister was advised that the traffic would not warrant the expenditure.

In 1879, however, the people became more alive than ever to the fact that the absence of a bridge was materially hindering the progress of the town, and a committee was formed, which worked hard to secure for us the long wished for bridge. In communicating with Mr. Colin Simson, who was then Member for our district, he advised us to proceed by again drawing up a petition, which he promised to present to the Minister, and he held out hopes that we should be at last successful. In accordance with his advice a memorial was drawn up, which contained the arguments in favor of the expenditure we asked for. That memorial was numerously signed. I have not a record of the exact number, but I should think about 300 signatures were obtained—all signatures of men residing in the district, who would be benefited by the erection of a bridge.

That

That memorial was presented by Mr. Colin Simson to the Minister for Public Works in December, 1879, but unfortunately the only result was the old reply, which would seem to be stereotyped in the office, "that the Road Superintendent reported that the traffic was not sufficient to warrant the expenditure."

Since that nothing has been done until last week. We now respectfully ask your advice as to the best mode of renewing the agitation. Do you think it advisable for us to send in another petition? If so, would it be useful to back such petition up by a deputation to Sydney? Or would the petition sent in 1879 be available, and a deputation sent to support that be useful? Will you kindly suggest to the committee what you consider best to be done. Meanwhile I will draw up, for your information, and send by next post, an epitome of the principal arguments and reasons which make us think that we are asking for nothing that we are not justly entitled to from the Government.

I have, &c.,

D. TOMLINSON,
Hon. Sec. to Bridge Committee.

No. 18.

The Under Secretary for Public Works to W. A. Brodribb, Esq., M.P.

Sir,

Department of Public Works, Sydney, 7 May, 1881.

In reply to your letter of the 19th ult., requesting the erection of a bridge over the Darling, at Wentworth, I am directed to inform you it appears, from a report which has been received from the Commissioner for Roads, that the erection of a bridge would be a most expensive undertaking, and that the providing a punt to keep down the rates for crossing is all that is required at present, especially as a line of railway will be constructed before many years which would render a road bridge almost useless.

I have, &c.,

JOHN RAE.

No. 19.

W. A. Brodribb, Esq., M.P., to The Secretary for Public Works.

Sir,

No. 133, Macquarie-street, Sydney, 7 May, 1881.

I have the honor to enclose you a copy of a letter just received from Mr. D. Tomlinson, honorary secretary to the Bridge Committee at Wentworth, giving a list of reasons why a bridge should be erected over the Darling River at Wentworth. May I ask you, as the Member for Wentworth, to take this letter into your favourable consideration, and send your reply through me.

I have, &c.,

WM. A. BRODRIBB.

Acknowledged, 10/5/81. Roads, B.C., 11/5/81.—J.R. Previous papers.—W.B., 12/5/81.
Herewith, 12/5/81.

I have already stated that the railway question complicates this matter. At neither Bourke nor Balranald is the navigation of such importance, and at Wentworth the banks are higher and better defined than at Balranald, which makes the place more accessible by punt.—W.C.B., 13/5/81.

Under Secretary, B.C., P.W.O., 17/5/81. Inform.—J.L., 20/5/81. W. A. Brodribb, Esq., M.P., 23/5/81. Roads, B.C., 23/5/81.—J.R. File.—W.C.B., 27/5/81.

No. 20.

Mr. D. Tomlinson to W. A. Brodribb, Esq., M.P.

Dear Sir,

Wentworth, 22 April, 1881.

In accordance with the promise contained in my letter of the 13th inst., I now send you a list of some of the reasons in favour of the erection of a bridge over the River Darling at Wentworth:—

1st. The importance of our township as to geographical position, situated as it is at the junction of the two great water highways of Australia, ensures it an ever-increasing progress in direct proportion to the development of the natural resources of the Darling District. A bridge, by giving facilities for traffic, would both directly and indirectly hasten that development.

2nd. The existing traffic is very great, upwards of 138,000 sheep having crossed at the punt during the past fifteen months. Six mail coaches cross the river every week, also four coaches running in opposition to mails.

This traffic is only what is absolutely compelled to cross at Wentworth, as the present punt is not such as to entice people travelling with stock, or without, to come to Wentworth to cross. The punt is especially dangerous during the times that the river is low, owing to the steepness of the banks, and the traffic in proportion is almost prohibitory.

3rd. Therefore we feel confident that a bridge would result in an enormous increase of traffic, and would be a great benefit to both the residents in the township and to the pastoral tenants of the whole district.

4th. The township, as laid out on the eastern side of the river, is almost unoccupied, but were a bridge erected it would speedily be occupied, and in no long time would rival the western side, where the public offices and business sites are at present in prosperity.

5th. We think that our claims for a bridge are at least equal to those of Balranald or Bourke, at which places bridges are nearly completed, and we believe that a bridge here would benefit more people than those bridges.

6th. There is no bridge across the Darling from its junction with the Murray to Bourke, a distance of over 1,000 miles of settled country.

I hope that the foregoing will assist you in fighting for what the Wentworth people regard as a just claim, and what they believe will materially benefit the whole district, viz., the bridge at Wentworth.

I remain, &c.,

D. TOMLINSON,

Secretary to the Bridge Committee.

No. 21.

The Under Secretary for Public Works to W. A. Brodribb, Esq., M.P.

Sir,

Department of Public Works, Sydney, 23 May, 1881.

Referring to your letter of the 7th instant, enclosing communication from Mr. D. Tomlinson on the subject of the erection of a bridge over the river Darling at Wentworth, I am directed to refer you to my former letter to you to the effect that as the railway policy will complicate the question of the bridge it is considered desirable to defer any decision for the present.

I may point out that neither at Bourke nor Balranald is the navigation of such importance as at Wentworth; the banks being high and well defined, make the place more accessible by punt.

I have, &c.,

JOHN RAE.

No. 22.

The Council Clerk, Wentworth, to W. A. Brodribb, Esq., M.P.

Dear Sir,

Municipal Chambers, Wentworth, 26 October, 1881.

I am directed by the Municipal Council of Wentworth to request that you will, in terms of a resolution moved by the Mayor and seconded by Alderman Bowring, apply to have a sufficient sum of money placed on the present Estimates for the construction of a pontoon bridge over the Darling at Wentworth.

I have, &c.,

JOSEPH HIGGINS,

Council Clerk.

Receipt acknowledged.—J.R., 31/10/81. Roads, B.C., 3/11/81. Previous papers.—W.C.B., 4/11/81. 81/2,230 herewith, 7/11/81. Put with papers to be submitted when Mr. Dooner is in the office.—W.C.B., 8/11/81.

I do not think an expensive bridge necessary here, and it must necessarily be an expensive bridge, as a drawbridge and pontoon bridge would be most unsatisfactory; indeed little better than the punt, which I think is quite enough for the traffic.—W.C.B., 23/11/87.

Under Secretary, B.C. P.W.O., 25/11/81. Mr. Brodribb may be so informed.—J.R., 26/11/81. W. A. Brodribb, Esq., M.P., 28/11/81. Roads, B.C., 28/11/81.—J.R. File.—W.C.B., 29/11/81.

No. 23.

The Under Secretary for Public Works to W. A. Brodribb, Esq., M.P.

Sir,

Department of Public Works, Sydney, 28 November, 1881.

Referring to the letter of the Council Clerk of Wentworth, dated the 26th ultimo, requesting the construction of a pontoon bridge over the Darling River at that town, I am directed to inform you that the construction of a bridge at the place indicated would be too expensive a work, and a pontoon bridge as proposed would be most unsatisfactory, and little better than the present punt, which is considered quite sufficient for the traffic at present.

I have, &c.,

JOHN RAE.

No. 24.

The Council Clerk, Wentworth, to E. Quin, Esq., M.P.

(Extract from P.A. 83-10,409.)

Dear Sir,

Wentworth, 3 October, 1883.

I am directed by the Municipal Council to write to you in reference to the pressing wants of this locality.

That a sum of money be granted for the erection of a bridge over the River Darling at Wentworth, for ordinary traffic at such place as may be recommended by the officer representing the Harbors and Rivers Department.

I have, &c.,

JOSEPH HIGGINS,

Council Clerk.

Acknowledged, Roads, B.C., 23/10/83.—J.R. Previous papers.—W.C.B., 24/10/83. 81-4,976 herewith, 25/10/83.

Previous reports herewith point out that a bridge here must be an expensive lift or swing bridge, that the traffic does not justify outlay, and that the question is still further complicated by considerations as to railway extension.—W.C.B., 26/10/83. Under Secretary B.C., P.W.O., 29/10/83.

Submitted, 29/10/83.—J.R. Inform.—F.A.W., 30/10/83. Edward Quin, Esq., M.P., 31/10/83. Roads B.C., 31/10/83.—J.R. File.—W.C.B., 2/11/83.

No. 25.

The Under Secretary for Public Works to E. Quin, Esq., M.P.

Sir,

Department of Public Works, Sydney, 31 October, 1883.

Referring to the letter forwarded by you from the Council Clerk, Wentworth, urging the erection of a bridge over the Darling River at that township, I am directed to inform you it appears from the report which has been received from the Commissioner for Roads, that the bridge in question would be a very expensive structure, and the traffic does not justify the expenditure that would be necessary in its erection.

I have, &c.,

JOHN RAE.

No. 26.

Minute by The Secretary for Mines.

Punt over the Darling, at Wentworth.

WHEN I was in Wentworth, on the 8th of May last, a deputation of the townspeople waited upon me in reference to the erection of a bridge over the Darling, at that town. I heard all they had to urge in favor of their proposal, but to my mind they advanced no sound reasons why the Government should erect a bridge at the point indicated. It would be costly, and would serve few people, and I so informed them.

I then visited the proposed site of the bridge, where there is a Government punt. The punt is altogether unsuited for the ordinary traffic. It is old and unsafe, so rotten that it is dangerous to attempt to repair it.

I have no hesitation in stating that I think a new punt ought to be provided at this place without any delay.

I informed the deputation that on my return to Sydney I would recommend to the Government that a sum of money should be placed on the Estimates for next year for a new punt.

It is stated that the present punt is twenty years old, and that it is unsafe to place more than half a ton weight upon it.

9th July, 1885.

J. P. ABBO'TT.

The Commissioner for Roads,—Resubmit previous papers on bridge and punt.—W.C.B., 10/7/85. 83-9,138 bridge; 85-5,885 punt, herewith.—10/7/85. Will Mr. Flynn have these papers looked through, and select those proposing purchase of this punt with my report on same. I want to show circumstances.—W.C.B., 11/7/85.

No. 26A.

The Under Secretary for Public Works to The Under Secretary, Department of Mines.

Sir,

Department of Public Works, Sydney, 29 July, 1885.

In reference to the memorandum of the Honorable the Secretary for Mines, dated 9th instant, on the subject of the punt over the River Darling at Wentworth, I am directed to transmit to you herewith, for his information, copy of a minute of the Commissioner for Roads on the matter, with the decision of the Minister for Works thereon.

I have, &c.,

JOHN RAE.

EXTRACT from Report of Commissioner for Roads, referred to in foregoing letter.

WENTWORTH PUNT.

* * * * *
But the question is now complicated by the demand for a bridge, as per the newspaper extracts herewith, in which it is stated I estimated the cost at £30,000, which is an error. No estimate of the sort appears in the papers, and it could only have been in conversation that such a sum was mentioned. If so it must have been for a road and railway bridge. An iron bridge will cost about £15,000 and would involve the keeping of a man at the place, to open it for steamers, which outlay and annual cost, a traffic of about £200 a year at punt rates will certainly not justify.
* * * * *

WILLIAM C. BENNETT.

NOTE :—Minister's decision referred to in letter from Under Secretary Public Works to Under Secretary Department of Mines, dated 29/7/85, is :—That recommendation of the Commissioner for Roads, that tenders be at once called for a new punt, is approved of.

No. 27.

The Mayor of Wentworth to The Secretary for Public Works.

Sir,

Council Chambers, Wentworth, 19 August, 1885.

I have the honor, by direction of the Municipal Council, to forward you copies of resolutions passed at a public meeting, held here on July 1st, respecting the public punt and the erection of a bridge over the Darling, at Wentworth :—

Proposed by Arthur T. Brock, Esq., J.P.; seconded by William Crozier, Esq., J.P. :—“ That it is necessary for the protection of life and property that a bridge be erected over the Darling, at Wentworth, in lieu of the present punt.”

Proposed by Henry George Price, Alderman; seconded by William John Holding, Esq., J.P. :—“ That a petition to the Hon. the Minister for Works be prepared and signed by the rate-payers and property-owners of the district of Wentworth, praying that a bridge in lieu of the present punt be erected.”

A petition has accordingly been prepared, and is being numerously signed, and will, in due course, be forwarded to you.

I beg most respectfully to point out for your consideration that the takings of the Wentworth Ferry, during the year 1882, amounted to about £200 per annum. It has since steadily increased, despite
the

the bad seasons and small quantity of stock moving, and now amounts to over £300 per annum; therefore, at the same rates of increase in the year 1887, the takings of the ferry would be at least £450 per annum, without reckoning for any impulse of prosperity the town may receive (of which, as yet, it has had none) from any or either of the following causes:—

1. The return of good seasons.
2. Settlements in the district, consequent on the new Land Act.
3. With the return of confidence in pastoral pursuits improvements would go on.
4. Unforeseen developments.

The probability is that the takings of the ferry would far exceed the above estimate of £450, which of itself gives 4 per cent. on £11,250, a sum perhaps sufficient for an ordinary bridge, but as allowance has to be made for the passing of steamers, thereby considerably increasing the cost, I respectfully submit that this extra cost, which is on account of our bridge crossing a navigable highway of the Colony, should be treated as an expenditure for the benefit of the Colony at large, and not for our immediate neighbourhood.

Wentworth has been agitating during the last eight years for a bridge, and we trust that our prayer will be favourably considered and our Petition granted.

I have, &c.,

WILLIAM BOWRING,

Mayor.

Acknowledged, 25/8/85. Roads for report.—F.A.W., 24/8/85. B.C., 24–25/8/85.—J.R. Previous papers.—W.C.B., 25/8/85. Bridge papers submitted this morning with punt papers, 26/8/85.

Tenders are being invited for a punt. I think it should be proceeded with. In the event of a bridge being determined on the punt could be utilized elsewhere. The ferry revenue is only £132 per annum, not £300. I have before reported that pending settlement of the railway routes I could not advise the construction of a bridge here. It is possible a railway bridge may be necessary before very long. In any case the punt will suffice until the settlement of that question and the development referred to in this letter, will have had time to progress, so as to justify the expenditure of the large amount required for construction of bridge here, which should be an iron lifting bridge.—W.C.B., 27/8/85.

Under Secretary, B.C., P.W.O., 31/8/85. Submitted, 31/8/85.—J.R. Approved and informed.—F.A.W., 31/8/85. The Mayor of Wentworth, 1/9/85. Roads, B.C., 1/9/85.—J.R. File.—W.C.B., 2/9/85.

No. 28.

The Under Secretary for Public Works to The Mayor of Wentworth.

Sir,

Department of Public Works, Sydney, 1 September, 1885.

Referring to your letter of 19th ultimo, urging the erection of a bridge over the Darling River, at Wentworth, I am directed to inform you that tenders are being invited for a punt which will suffice pending the settlement of the railway route, and which, if a bridge be then found necessary, could be utilized elsewhere.

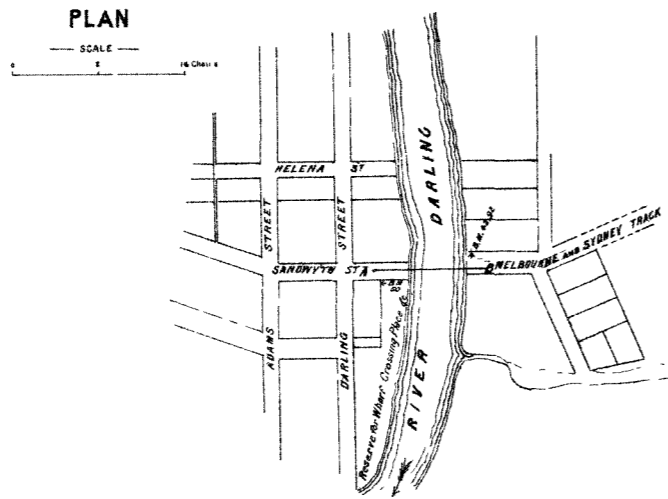
I have, &c.,

JOHN RAE.

[Plan.]

APPENDIX

Nº 29



SECTION FOR PROPOSED BRIDGE OVER
THE DARLING
AT WENTWORTH.

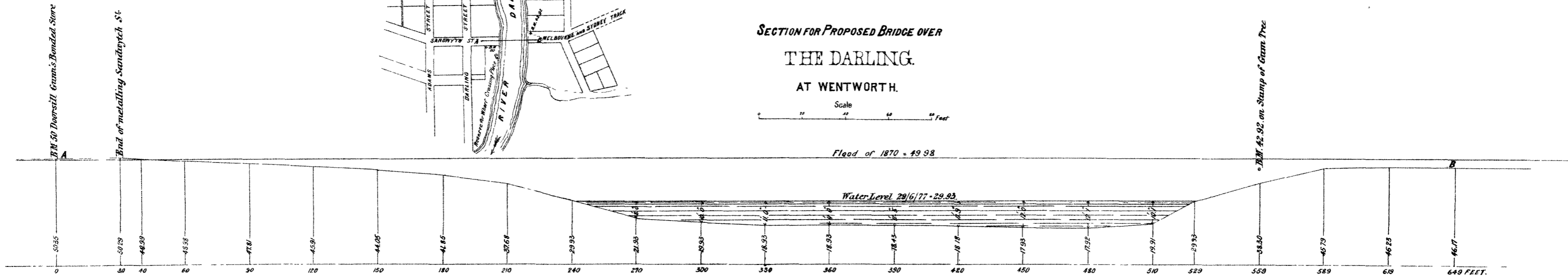
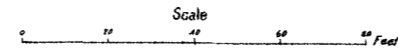


Fig. 263

PHOTO-LITHOGRAPHED AT THE GOVT. PRINTING OFFICE
SYDNEY, NEW SOUTH WALES.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

IRON COVE AND PARRAMATTA RIVER BRIDGES,
FIELD OF MARS COMMON.
(EXPENDITURE IN CONNECTION THEREWITH.)

Ordered by the Legislative Assembly to be printed, 5 July, 1887.

RETURN (*in part*) to an Order of the Honorable the Legislative Assembly of New South Wales, dated 29th April, 1887, That there be laid upon the Table of this House, a Return showing,—

“ (1.) Cost of the two bridges, known as the Iron Cove Bridge and Parramatta River Bridge, at Gladesville.

“ (2.) The cost of survey and subdivision of the Field of Mars Common, and expenditure thereon on roads and bridges, &c.”

(*Mr. McCulloch.*)

IRON COVE AND PARRAMATTA RIVER BRIDGES AND FIELD OF MARS COMMON.

1. *Cost of the two Bridges known as Iron Cove Bridge and Parramatta River Bridge, at Gladesville.*

	£	s.	d.
Original cost	101,450	1	9
Extensions, repairs, maintenance, painting, and working swing	14,129	9	1
	£115,579	10	10

2. *Expenditure, Field of Mars Common.*

	£	s.	d.	£	s.	d.
Roads—Field of Mars Roads	8,557	1	10			
Hunter's Hill and Gladesville Roads	3,996	15	2			
Hunter's Hill, by Water Dam, to Gladesville	136	16	1			
Tarban Creek and Gladesville Roads	1,434	10	7			
Pennant Hills to Field of Mars Common	160	12	4			
Iron Cove to Ryde <i>via</i> Gladesville	645	17	1			
Head of navigation Lane Cove to Lane Cove River	2,998	11	2			
Lane Cove to Bridge, Lane Cove River	175	17	6			
Lane Cove Bridge approaches	308	15	6			
				18,414	17	3
Clearing land, Field of Mars				6,292	7	6
Bridges—Bridge, Lane Cove River at Figtree—						
Original cost	42,718	6	9			
Maintenance	374	15	9			
Bridge, Keddies Creek	1,088	3	9			
Bridge, Buffalo Creek	1,011	11	6			
				69,900	2	6
Wharf, &c., Field of Mars				376	0	10
Trial surveys for tramway to Field of Mars				1,793	12	6
				£72,069	15	10

[3d.]

475—

[805 copies—Approximate Cost of Printing (labour and material), £1 4s. 1d.]

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

SAN FRANCISCO MAIL SERVICE.

(PETITION FROM WILLIAM MANDEVILLE BARKER, SOLICITOR.)

Received by the Legislative Assembly, 4 July, 1887.

To the Honorable the Speaker and the Members of the Legislative Assembly of New South Wales, in Parliament assembled.

The humble Petition of William Mandeville Barker, of Longueville Chambers, Young-street, Sydney, in the Colony of New South Wales, solicitor,—

HUMBLY SHOWETH :—

1. That your Petitioner is a solicitor of the Supreme Court of New South Wales, residing in this Colony, and is personally cognizant of the matters hereinafter set forth.

2. The Pacific Mail Steamship Company of New York for a period of eight years carried the mails between San Francisco, in the United States, and the Colonies of New Zealand and New South Wales, to the entire satisfaction of both Colonies, so that in April, in the year one thousand eight hundred and eighty-three, the Parliament of New Zealand, by resolution duly passed, authorized the renewal of the contract with the said Pacific Mail Steamship Company for the period of three years, and the Parliament of New South Wales, by resolutions unanimously carried, also authorised the renewal of such contract with the said Pacific Mail Steamship Company for two years, in the following terms :—

(1.) That, subject to the Imperial Government agreeing to continue to convey the mails to San Francisco as heretofore, the contract between the Colonies of New South Wales and New Zealand with the Pacific Mail Company be extended for a period not exceeding two years from the expiry of the present contract in November next, at an annual subsidy not exceeding fifty thousand pounds, of which the portion falling upon this Colony shall not exceed eighteen thousand seven hundred and fifty pounds and subject to the following conditions, viz. :—That it shall be optional for this Colony to withdraw from such extended contract at the end of twelve months, on giving three months previous notice, in the event of the Pacific Mail Company not having obtained from the United States Government, or from other sources, a contribution equal to one-third of the total annual subsidy for such extended contract, and in diminution of the contribution payable by the contracting colonies respectively. That the service shall be performed with the acceleration upon the present contract time of at least twenty-four hours on each voyage to and from Sydney and San Francisco during the first year, and during the second year at least forty-eight, subject to the terms, conditions, premiums, and penalties as heretofore, with this exception, that the company be relieved from keeping a fourth steamer, but that shall not absolve them from the penalties of any failure.

(2.) That the foregoing resolutions be transmitted by address to His Excellency the Governor.

3. The resolutions of the Parliaments of the two Colonies, drawn up by the Government of New South Wales and approved by the Government of New Zealand, were embodied in the contract which was drawn up by New South Wales and was accepted by the Pacific Mail Steamship Company, with the understanding that the resolutions meant that if the two Colonies made use of the service for two years they would pay the company for the two years, less any contribution which might be obtained from the United States, or from other sources, and that any such contribution would be equally divided betwixt the two contracting Colonies of New Zealand and New South Wales.

4. The contract imposed on the Pacific Mail Steamship Company that they should “endeavour to obtain” such contribution from the United States.

5. In compliance with this they faithfully used their “best endeavours to obtain” such contribution, and succeeded to a degree beyond their anticipations ; but (as usual when a Legislature makes alterations in its fiscal laws) the necessary arrangements were only to come into operation at a future date—namely, on the accession of the new President, about four months after the expiry of the first year of the renewed contract.

6. In response to the application of the Pacific Mail Steamship Company and others interested in the question that the United States should pay subsidies to foreign-going steamers carrying mails, and so that the Postmaster-General of the United States should be in a position to comply with the wish of your Honorable House in respect to contributing to subsidies, Congress enacted that, from the accession of the new President in April, one thousand eight hundred and eighty-five, the power, which the Postmaster-General of the United States possessed, of putting mails on board outgoing ships at a nominal fixed rate of payment should cease, and authorised him to agree to pay a subsidy for such services, and further placed at his disposal four hundred thousand dollars for the specific purpose of making such payments, and from which New South Wales would, so soon as the necessary arrangements were made, have received on application a fair share in diminution of any subsidy she might pay the Pacific Mail Steamship Company, or any other Company, as New Zealand now receives in diminution of her subsidy to the Union Steamship Company in virtue of these arrangements.

7. The Pacific Mail Steamship Company trusted and believed that the Government of New South Wales would accept this action of the United States as in fulfilment of the condition imposed upon them—that they should “endeavour to obtain” a contribution from the United States.

8. The Postmaster-General of New South Wales, however, declined to treat this as sufficient, and gave the notice which entitled him to withdraw at the end of three months, unless arrangements were in the meantime made for the continuance of the service.

9. Immediately after giving the notice the Postmaster-General of New South Wales entered into negotiations (as he advised the Postmaster-General of New Zealand he would do) with the Pacific Mail Steamship Company, to obtain a contribution from other sources, and the Pacific Mail Steamship Company agreed to make a contribution from their own funds of £7,000; and the Postmaster-General of New South Wales thereupon agreed to pay the Pacific Mail Steamship Company the reduced sum of eleven thousand seven hundred and fifty pounds in lieu of eighteen thousand seven hundred and fifty pounds during the second year of the contract, subject to the concurrence of New Zealand.

10. This arrangement having been made during the currency of the contract, the contribution should, in conformity therewith, and with the resolution of your Honorable House, have been shared with New Zealand.

11. Had this been done the Government of New Zealand would have had no cause of complaint against the Government of New South Wales; but the Postmaster-General proposed to keep the whole of the contribution for New South Wales alone, and in reply to a suggestion of the Pacific Mail Steamship Company, refused to share it with New Zealand.

12. The Postmaster-General of New Zealand thereupon complained that the action of the Postmaster-General of New South Wales, in retaining the whole of the contribution and leaving New Zealand to bear her whole subsidy was unfriendly, and intimated that the New Zealand Postal Act of 1881 put it in his power to prevent any such arrangement from being carried out.

13. This Act conferred the power on the Postmaster-General of New Zealand to declare any other colony a prohibited postal colony, and thereupon enabled the Post Office officials of New Zealand to go on board the mail steamers and take therefrom the mails in transit to or from such colony.

14. On the third day of December, one thousand eight hundred and eighty-four, five days after the expiry of the first year of the contract and one day before the advertised departure of the outgoing Pacific Mail Steamship Company's steamer from Sydney, the Postmaster-General of New South Wales announced in the usual course that mails would be made up for the Pacific Mail Steamship Company's steamship (no arrangement having then been made with New Zealand to divide the contribution of seven thousand pounds with her, the only arrangement being with the Pacific Mail Steamship Company to pay them eleven thousand seven hundred and fifty pounds for carrying such mails).

15. But subsequently to such announcement and on the same day (the third day of December) the Postmaster-General of New Zealand notified to the Postmaster-General of New South Wales that a prohibition order under the Postal Act of 1881 was on the point of being gazetted unless New South Wales at once agreed to pay New Zealand seven thousand pounds, being an amount equal to the whole and not a share only of the contribution which the New South Wales Government had contracted to receive from the Pacific Mail Steamship Company in terms of the resolutions of your Honorable House.

16. The same day the Postmaster-General of New South Wales agreed to pay New Zealand the said sum of seven thousand pounds.

17. In consideration of which the Postmaster-General of New Zealand did not insert the notice in the *Gazette* and did not interfere with the mails in their transit, and thus the way was left clear for the Postmaster-General of New South Wales to carry out his agreement with the Pacific Mail Steamship Company for conveying the mails for the said reduced subsidy of eleven thousand seven hundred and fifty pounds, the said Mail Company being no parties to the dispute betwixt the two colonies.

18. The Mail Company, in all good faith, and to the best of their power, had done their part in carrying out the wishes of your Honorable House, as expressed in the resolutions and in the contract based thereon, by “endeavouring to obtain,” &c., &c., and by obtaining, a recognition of the principle sought to be established by the resolutions of your Honorable House that the United States should contribute to the subsidy, and it only remained for the Government of New South Wales to enter on the necessary negotiations with the Postmaster-General of the United States, and to conclude a mutually satisfactory arrangement for contribution to the subsidy, as New Zealand has done; further, the Mail Company agreed to make a contribution from their own funds in diminution of the subsidy paid by the colonies for the second year of the contract, covering the period that must necessarily elapse before arrangements between the United States and the colonies should be completed.

19. The Postmaster-General of New South Wales announced and made up the mails for the United Kingdom, and the United States, and placed mails on board the Pacific Mail Company's steamers for conveyance to San Francisco and elsewhere, and has continued to use the Mail Company's boats precisely as he had done in the previous nine years. He further, without making any other arrangement than that to pay the company the said reduced sum of eleven thousand seven hundred and fifty pounds, instructed the Postmaster-General of London to forward to San Francisco all the letters posted in the United Kingdom addressed to New South Wales, Queensland, Victoria, and other colonies, marked via San Francisco, in order that they might be conveyed from San Francisco by the boats of the Pacific Mail Steamship Company; and the Postmaster-General of the United States, acting under instructions from the Postmaster-General of New South Wales, forwarded all such and other mails made up in the United States, by the Pacific Mail Steamship Company's boats.

20. All this was done on the sole authority of the Postmaster-General of New South Wales, who thus, so far from exercising his option of withdrawing from the service, claimed and used all the rights and benefits he possessed under the contract with the Pacific Mail Steamship Company, and for which he had agreed to pay them the reduced sum of eleven thousand seven hundred and fifty pounds, and for which, under the present mail contract, New South Wales pays considerably more, although precisely the same services, and no more, are rendered as the Pacific Mail Steamship Company performed in one thousand eight hundred and eighty-five, during which period, as previously, the mails to and fro were carried by the Pacific Mail Steamship Company with regularity, and to the entire satisfaction of the Postmasters-General of the Colonies of New South Wales and New Zealand.

21. Notwithstanding this the agreement to pay eleven thousand seven hundred and fifty pounds has never been carried out, and the Postmaster-General of New South Wales has paid nothing whatever to the Pacific Mail Steamship Company for carrying the mails for one thousand eight hundred and eighty-five, the second year of the renewed contract, although the resolutions of your Honorable House have never been rescinded, and the faith of the Colony still stands plighted to their fulfilment.

Your Petitioner therefore humbly prays that your Honorable House will take the foregoing matters into your consideration and do what your Honorable House think right under the circumstances.

And your Petitioner, as in duty bound, will ever pray, &c.

Dated this thirtieth day of June, A.D. 1887.

W. MANDEVILLE BARKER.

Witness—

JNO. PARKINSON,
Solicitor, Longueville Chambers, Sydney.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

GENERAL POST OFFICE TOWER CLOCK.

(FURTHER PAPERS RESPECTING.)

Ordered by the Legislative Assembly to be printed, 19 May, 1887.

RETURN to an *Order* made by the Honorable the Legislative Assembly of New South Wales, dated 29 March, 1887, That there be laid upon the Table of this House,—

“ Copies of all papers, together with minutes thereon, subsequent to those laid upon the Table of the Legislative Council, in connection with the erection of the Post Office Clock.”

(Mr. Frank Farnell.)

SCHEDULE.

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GENERAL POST OFFICE TOWER CLOCK.

No. 1.

The Government Astronomer to The Secretary for Public Works.

My dear Sir,

Sydney Observatory, 30 July, 1886.

When you spoke to me about the Post Office Clock, I understood it to be your wish that I should take the duty of calling for tenders and seeing the clock made, and, acting upon that, I have prepared all necessary plans and specifications, and was on the point of calling for tenders when it was pointed out to me that there was no authority for me to do so, and I confess that I am in serious doubt after reading your minute and that of the Postmaster-General. I enclose these, and should be very glad if you would tell me what I am to do. If I call for tenders I must be authorised to expend the money, I suppose.

Yours, &c.,

H. C. RUSSELL.

Please return the official paper, as all the others *re* this matter are with me.

Certainly my minute contemplated your carrying out the whole matter.—W.J.L., 30/7/86.

No. 2.

The Government Astronomer to The Under Secretary for Public Instruction.

My dear Sir,

Sydney Observatory, 4 August, 1886.

I have at last got the matter *re* clock decided. The Minister for Works says, "My minute contemplated your carrying out the whole matter." I saw Mr. Rae, and he said he thought that the Minister for Public Instruction should call for tenders for the clock, not the Works Department.

Mr. Lyne evidently thinks that I can call for tenders, but I cannot communicate with the Agent-General except as suggested in my letter herewith; and, as this kind of work is new to me, I am in doubt about it, and would have come up to see you this morning, but could not get out—hence this note. When the large telescope was purchased, I wrote, as on the present occasion, asking that the Agent-General should purchase for the Observatory, and it was done; so I suppose the same course is the right one now; if not, please let me know.

Yours, &c.,

H. C. RUSSELL.

P.S.—In the date for receiving tenders, I have contemplated the letter to the Agent-General leaving here on the 9th of this month. So, allowing tenderers four weeks at each end—Sydney and London—to study specifications, if the letter does not leave on the 9th, the date will need to be changed.—H.C.R.

No. 3.

The Government Astronomer to The Under Secretary for Public Instruction.

Sir,

Sydney Observatory, 4 August, 1886.

I have the honor to forward herewith plans and specifications for the new tower clock for the Post Office, and to request that these may be sent to the Agent-General, and that he may be instructed to call for tenders for this work in London as specified; also to call for separate tenders for the bells as specified, and that the date up to which tenders may be received be October 26th, 1886; also that advertisements be inserted in the *Sydney Government Gazette*, calling for tenders in Sydney, such tenders to be sent to the Agent-General in London; and that instructions be sent to accept no tender for the construction and erection of the clock as specified which exceeds two thousand five hundred pounds (£2,500), and no tender for making the bells which exceeds one thousand pounds (£1,000). I have retained copies of plans and specifications.

Advertisement for the *Gazette*, Sydney.—A tower clock required for the new Post Office, Sydney. Tenders to be sent in to the Agent-General in London, on or before 26th October. Plans and specifications may be seen at the Observatory, Sydney.

I have, &c.,

H. C. RUSSELL,

Government Astronomer.

Submitted.—E.J., 5/8/86. Approved.—A.R., 5/8/86. Letters to Agent-General and Principal Under Secretary, 6/8/86. Tenders invited in *Government Gazette*, Sydney, 6/8/86.

No. 4.

The Under Secretary for Public Instruction to The Principal Under Secretary.

Sir,

Department of Public Instruction, Sydney, 6 August, 1886.

I am directed by the Minister of Public Instruction to request that you will be good enough to forward the enclosed letter addressed to the Agent-General, asking him to invite tenders in London for a tower clock for the General Post Office, Sydney.

I have, &c.,

E. JOHNSON,

Under Secretary.

Forward, 9/8/86. Agent-General, 9/8/86.

[Enclosure.]

The Under Secretary for Public Instruction to The Agent-General, London.

Sir,

Department of Public Instruction, Sydney, 6 August, 1886.

I am directed to acquaint you that the Minister of Public Instruction will be glad if you will be so good as to invite tenders in London for a Tower Clock for the General Post Office, Sydney, in accordance with the accompanying plans and specifications. Separate tenders should be invited for the bells. Tenders may be received up to the 26th October next.

2. No tenders for the construction and erection of the clock which may exceed £2,500 should be accepted, nor should any tender for the bells be accepted which may exceed £1,000.

I have, &c.,
E. JOHNSON,
Under Secretary.

No. 5.

The Under Secretary for Public Works to The Under Secretary for Public Instruction.

My dear Johnson, Department of Public Works, Sydney, 5 August, 1886.
Would you be so good as to inform me what action has been taken in connection with the proposed clock for the General Post Office?
Yours, &c.,
JOHN RAE.

No. 6.

The Under Secretary for Public Instruction to The Under Secretary for Public Works.

My dear Mr. Rae, Department of Public Instruction, Sydney, 6 August, 1886.
In reply to your note of yesterday's date, I beg to state that Mr. Russell has prepared the requisite plans and specifications for the new tower clock to be placed in the General Post Office. In a letter received from him it is stated that you suggested that tenders for the work should be invited by the Minister for Public Instruction. Dr. Renwick is willing to do this. Will you kindly say whether there will be any objection to that course, inasmuch as the Post Office buildings are not in any way under the control of this Department.
Yours, &c.,
E. JOHNSON.

There will be no objection to the tenders being called for by Dr. Renwick. Mr. Lyne has already instructed Mr. Russell and desires that the work be carried out by him.—JOHN RAE, 6/8/86.

No. 7.

The Government Astronomer to The Under Secretary for Public Instruction.

Sir, Observatory, 11 September, 1886.
With reference to the enclosed copy of advertisement and minutes thereon, I have the honor to inform you that I waited upon the Honorable the Minister for Works this morning, and explained to him that, by putting the selection of the tender for the Post Office clock into the hands of the Agent-General, I thought two months' time would be saved, because it would not be necessary to send out the English tenders. But Mr. Lyne said he thought it would be better to receive all the tenders in Sydney, and if the Honorable the Minister for Public Instruction approved, that new advertisements should be inserted in the *Sydney Gazette*, extending the time for receiving the tenders in Sydney, and that they should be lodged with the Minister for Public Instruction. The English tenders cannot be here before (say) 10th December, and I would suggest that the time for receiving Colonial tenders might be extended to 10th December, and that advertisements be inserted in the *Sydney Gazette* once a week until that date. An advertisement similar to that already inserted, but with the date and place for receiving tenders changed, would serve the purpose.
I have, &c.,
H. C. RUSSELL,
Government Astronomer.

Submitted.—E.J., 15/9/86. Tenders should be received by the Agent-General in London, and forwarded here. They should also be invited in Sydney, with extended date, so that all the tenders may be opened simultaneously.—A.R., 15/9/86.

[Enclosure.]

EXTRACT from the *Government Gazette* of the 20th August, 1886.

Department of Public Instruction, Sydney, 10 August, 1886.

Tenders for Tower Clock for Post Office, Sydney.

TENDERS are invited for the erection of a tower clock at the General Post Office, Sydney.

Plans and specification may be seen at the Observatory, Sydney; on application to the Government Astronomer.

Tenders endorsed "Tender for Tower Clock, General Post Office, Sydney," must be lodged with the Agent-General, in London, at, or before, 10 o'clock a.m., on or before Tuesday, 26th October, 1886.

The Minister does not bind himself to accept the lowest or any tender.

ARTHUR RENWICK.

I submit the above advertisement for the consideration of the Minister, as I think it will be impossible for tenderers, English or Colonial, to comply with its requirements.—J.R., 8/9/86. Is there not some mistake?—W.J.L., 8/9/86.

I was instructed to call for tenders in London and Sydney, hence the Agent-General was named to receive the tenders. Four weeks was supposed to be long enough for the tenderers at either end to study the specifications, and the date was selected to suit the mails.—H.C.R., 8/9/86.

Would it not be well that some one should be named to receive tenders at this end.—W.J.L., 8/9/86.

No. 8.

The Agent-General, London, to The Colonial Secretary, Sydney.

Sir, 5, Westminster Chambers, Westminster, S.W., 21 January, 1887.

Referring to your Despatch 86-7,901, of the 9th August last, enclosing a letter from the Under Secretary of the Department of Public Instruction, together with a specification and plans for a tower clock and bells for the General Post Office, Sydney, I have the honor to inform you that on the 5th October I communicated with Lord Grimthorpe (late Sir Edmund Beckett), asking for his kind co-operation in the matter of the bells; and in reply I received his Lordship's letter of the 6th idem, suggesting that he could be most useful to your Government in revising the specifications both for the clock and bells, as the reforms that have taken place in those articles have been mainly due to his specifications; and further suggesting that he should be permitted to associate himself with the Rev. Canon Cattley, of Worcester Cathedral, respecting the bells. I therefore, on the 7th October, forwarded to Lord Grimthorpe the specifications of the clock and bells, together with the drawings, asking him whether he could suggest any alterations or improvements, and on the 9th idem he returned the specifications with so many amendments that I deemed it advisable to telegraph to you on the 11th, as follows:—

“Lord Grimthorpe (late Sir Edmund Beckett) recommends number of alterations in specifications for Post Office clock and bells. Advise you allow me to adopt his suggestions. Further time necessary for tenders. Reply.”

On the 30th October I received your telegram, informing me that the specification for the clock must stand, but that that for the bells might be altered if Lord Grimthorpe so desired. I accordingly, on the 3rd November, wrote his Lordship to that effect, to which letter he replied on the 4th, returning the bell specification with further amendment, and stating that he could not undertake to travel at the necessary time to wherever the bell foundry might be situate, consequently he would be unable to act as referee in the matter. I thereupon, on the 5th November, communicated with the Rev. Canon Cattley, asking him to be good enough to act as referee between the makers of the bells and myself, and on the 8th idem he replied, consenting to act. On the 19th I received a further communication from Canon Cattley, requesting that the Rev. C. D. P. Davies should be allowed to co-operate with him, as he did not care, owing to the state of his health, to be solely responsible.

On the recommendation of Lord Grimthorpe and Canon Cattley, I invited tenders from the following firms, viz.:—For the clock—Messrs. Lund & Blockley, London; Messrs. Potts & Co., Leeds; Messrs. Joyce & Co., Whitchurch; Messrs. Gillett & Co., Croydon; Messrs. Smith & Co., Derby; Messrs. Dent & Co., London. For the bells—Messrs. Gillett & Co., Croydon; Messrs. Taylor & Co., Loughborough.

In response to the invitations issued I have only received one tender for the clock and one for the bells, viz.:—For clock, Messrs. Joyce & Co.; for bells, Messrs. Taylor & Co.

I have also received a tender for the clock and bells from Mr. A. Tornaghi, of Sydney.

I enclose herewith the tenders referred to, together with letters from each of the undermentioned firms, who decline to tender, viz.:—Messrs. Lund & Blockley; Messrs. Potts & Co., Leeds; Messrs. Gillett & Co., Croydon; Messrs. Dent & Co., London.

Messrs. Smith & Co. have not acknowledged my invitation.

I attach for your information a copy of the specification for the clock, shewing the amendments suggested by Lord Grimthorpe, and the specifications for the bells, on which tenders were invited, as amended by his Lordship and the Rev. Canon Cattley.

Copies of the whole of the letters which have passed between the abovenamed gentlemen and myself are also attached.

I shall be glad to learn, as early as possible, the decision arrived at in regard to the tenders.

I have, &c.,
SAUL SAMUEL.

[Enclosures.]

The Agent-General to Sir Edmund Beckett.

Clocks and Bells for General Post Office, Sydney.

Dear Sir Edmund Beckett, 5, Westminster Chambers, 5 October, 1886.

I have received instructions from the Government of New South Wales to invite tenders for a clock and bells, to be placed in the tower of the General Post Office, Sydney. The drawing and specification of the clock have been furnished, and also the specification of the bells, and in the latter document I observe that it is therein stipulated that the bells are not to be shipped unless they are approved by yourself.

You would very greatly oblige the Government of the Colony if you would be pleased to aid me so far as you may be able in regard to this important matter, it being most desirable that both the clock and the bells should be of the very best description. I have therefore to ask you if you would be so good as to give me the benefit of your large experience and knowledge in these matters, in procuring what is required by my Government. They would, I am sure, very highly appreciate your good offices.

If convenient to yourself I shall be pleased to wait upon you at any time you may name. Permit me, however, to remark that my instructions are to get tenders in not later than the 26th instant. There is therefore very little time to comply with this direction.

I have, &c.,
SAUL SAMUEL.

Lord Grimthorpe to The Agent-General.

Dear Sir, Batch Wood, St. Albans, 6 October, 1886.

I shall not be in London until November, and leave here for several other places in a day or two; therefore I cannot see you now. But the bells will take some months to cast. The thing in which I could have been most useful to your Government would have been in revising the specifications, both for the clock and bells, as I have never yet seen one which did not require revision, and the reforms that have taken place in both those articles have been mainly due to my specifications compelling the makers to adopt them.

My

My musical ear is not good enough to rely on alone in judging whether bells are in tune, and I strongly advise you to associate with me for that purpose the Rev. Canon Cattley, of Worcester, who has several times acted with me in the same way. If you wish me to inspect the clock before it is finished, or (what would be better) to approve of the drawings, &c., when you have selected the maker, I will do so. Small improvements sometimes occur to one in work of that kind which a maker might not venture to introduce in the face of a rigid specification. I lately got one for a very large clock amended just in time by the maker, Potts, of Leeds (who made the great Lincoln Clock, which is second only to Westminster), writing to me for advice, which I gave to the effect that the specification was wrong, and he got it altered.

After Friday, my headquarters will be The Hall, Doncaster, till November.

I have, &c.,

GRIMTHORPE,
(late Sir E. Beckett).

The Agent-General to Lord Grimthorpe.

Dear Lord Grimthorpe,

5, Westminster Chambers, 7 October, 1886.

I beg to thank you for your letter of yesterday's date.

I venture to send you herewith copy of the specifications of the clock and bells for the Sydney General Post Office, with drawings of the former; in the hope that you will kindly favour me by saying at your earliest convenience whether you can suggest any alterations or improvements necessary to make them perfect.

I shall also be glad to hear whether you think it advisable for me to advertise for tenders, or to invite by circular the leading makers to tender. If the latter, will you kindly furnish the names of those most likely to turn out the best work.

I have, &c.,

SAUL SAMUEL.

Lord Grimthorpe to The Agent-General.

Dear Sir,

The Hall, Doncaster, 9 October, 1886.

I return these clock drawings and specification with such amendments and notes as occur to me. I do not wish (or know how if I did) to meddle with drawings. The pendulum suspension looks hardly strong enough for such a heavy pendulum. It is difficult to know what to advise about tendering, as I suppose that very few clockmakers here will undertake all the risks of sending out a competent man, which is very difficult indeed to find, under this very stringent contract. The only case that I know like it was the clock for Bombay University, made by Lund & Blockley, of Pall Mall, which I inspected. I think Lund himself went out with it. I forget how one for Adelaide (P. O. I think) was managed, for which I settled the drawings a good many years ago. Several designed by me in old Dent's time were simply sent to Turin, Toronto, and other places, and fixed there by local people. I think the best maker of very large clocks now is Potts, of Leeds. Whether one of his sons would go with it I do not know, nor whether he would undertake the turbine business. I found that any such contrivance for Westminster would cost far more than it would save, though that clock alone in England takes any considerable time in winding. You must pay a man for continually looking after it. There are a fair number of clocks here now with bells as heavy as and heavier than yours, which are wound every day or two (in the striking parts) by hand, and I hear no complaints about the cost of it.

The other good makers of large clocks are Joyce, of Whitchurch (Salop); Gillett & Co., of Croydon, who also cast their own bells; Smith, of Derby, but I know of no very large ones of his; nor do I know anything of the work of Dent & Co., Strand, of late, especially since the departure of their excellent old foreman Smith, who made the Westminster clock under me entirely, Dent being too ill to do anything then. "Dent," of Cockspur-street (whoever it really is now) has no factory of his own, or had none when I last knew anything of the shop. I know of no others at all likely to do such a job satisfactorily, if any would undertake it, under the (properly) stringent conditions as to accuracy. These will give you a sufficient competition if they will all tender. I never think it a good plan to require the clockmaker to supply large bells. Taylor's are far the best (of Loughborough), and 10 tons of bells involve more money than a clockmaker is likely to become responsible for to a bell founder, besides his own risks of the clock, especially with such enormous glass dials. I have known all the profit taken out of a job by the breaking of two dials of ordinary size.

This is all that occurs to me at present.

Yours, &c.,

GRIMTHORPE.

The Agent-General to Lord Grimthorpe.

Dear Lord Grimthorpe,

5, Westminster Chambers, 11 October, 1886.

I have duly received your letter from Doncaster, dated the 9th instant, and also the drawings and specification for the Sydney Post Office Clock.

I am indeed very greatly obliged to you for the observations you have been good enough to make, and also for the suggestions in regard to the specification.

I am to-day telegraphing to my Government in regard to the matter, and as the time is very limited to obtain tenders from good firms for such an important work, I have stated that it is necessary to extend the period during which tenders will be received.

I do not gather from your letter whether you would advise me to advertise for tenders, or simply invite a few of the most reputable manufacturers, including those whose names you have been good enough to mention to me. I am loth to trouble you with this matter while you are in the country, but if you would be kind enough to give me your opinion upon this point, I shall be greatly obliged to you.

Yours, &c.,

SAUL SAMUEL.

Lord

Lord Grimthorpe to The Agent-General.

Dear Sir,

The Hall, Doncaster, 12 October, 1886.

I meant to intimate that it is hardly worth while to go to the expense and trouble of advertising and showing the plans to clockmakers in general, if you get a sufficient competition among the best and only ones likely to undertake the work on your conditions. As you ask my opinion further, I think I should send the specification to those I mentioned, telling them you will send the drawings also (which I presume are printed in some way), if they wish it, and also if you like publish an advertisement that persons wishing to tender for the clock may apply at your office for the specification, but they must understand that you do not bind yourself to accept any tender. I really do not know what are the best papers to advertise in. I should think the *Building News*, which I understand has the largest circulation of the building newspapers, and I presume the principal daily papers.

I shall be generally here till the end of this month.

Yours, &c.,
GRIMTHORPE.

The Agent-General to Lord Grimthorpe.

Dear Lord Grimthorpe,

5 Westminster Chambers, 3 November, 1886.

Referring to previous correspondence which has passed between us in regard to the clock and bells required for the General Post Office in Sydney, I have to state that I have received a telegraphic message from my Government, in which I am directed to adhere to the specification of the clock as sent from Sydney. The Government will, however, be pleased to adopt your suggestions in regard to the specification for the bells, and I shall feel extremely obliged if you will inform me whether the specification which I now send you, is in order for issue to firms invited to tender.

I propose to advertise for tenders for the supply of the clock and bells as soon as I receive your reply.

Yours, &c.,
SAUL SAMUEL.

Lord Grimthorpe to The Agent-General.

Dear Sir,

33, Queen Anne Street, W., 4 November, 1886.

I have made a little further amendment in the bell specification where it was not quite definite enough before, and erasing my name and Canon Cattley's of Worcester (unless you have heard from him accepting the position of referee), as I cannot undertake to go to wherever the founder may live, at the time it may be necessary. I shall be interested to hear who respectively get the contracts for the clock and bells, if they are separated, as they ought to be, or for both, if any clockmaker will undertake both or either on the terms proposed.

Yours, &c.,
GRIMTHORPE.

The Agent-General to Canon Cattley.

Dear Sir,

5, Westminster Chambers, 5 November, 1886.

I beg to inform you that I have received instructions from my Government to call for tenders for the supply of a clock and bells for the General Post Office in Sydney, New South Wales, and I shall be glad to know whether you will kindly undertake to act as referee between the makers of the bells and myself in regard to their being, when completed, satisfactory both as to their notes and quality.

I have been in communication with Lord Grimthorpe on the subject, and I enclose the specification of the bells as amended by him.

I shall of course be pleased to pay any expenses which may be incurred by you, should you be so good as to undertake to act in the matter.

I am, &c.,
SAUL SAMUEL.

Canon Cattley to The Agent-General.

Dear Sir Saul Samuel,

St. Mary's Terrace, Worcester, 8 November, 1886.

In reply to your letter of the 5th instant, I beg to say that I will gladly render you any help in the matter of bells for Sydney, but I think I should prefer being associated with Lord Grimthorpe, as I have on many similar occasions of a like nature, notably for Adelaide Post Office; at all events, I will correspond with Lord Grimthorpe, and will write to you again. He and I have each had a rather serious attack of illness lately, though I am thankful to say we have both recovered. Still, for my own part, I am not anxious to undertake responsibility which would cause me travelling in winter.

Lord Grimthorpe and I are, I know, at one as to whom we should like you to employ both as to bells and clock. Perhaps you have had his Lordship's opinion. I shall be most glad if you get into the same groove as for Adelaide. That work gave most entire satisfaction. I think I had the pleasure of meeting you when you honored Worcester with a visit not long ago.

I hope to write to you again in a few days.

Believe me, &c.,
RICHARD CATTLEY.

The Agent-General to Canon Cattley.

Dear Canon Cattley,

5, Westminster Chambers, 9 November, 1886.

I thank you very much for your note of the 8th instant, in which you kindly promise me a further communication, in a few days, on the subject of the clock and bells required for the General Post Office in Sydney.

I shall feel greatly pleased if you and Lord Grimthorpe can make it convenient to act in the manner indicated in my letter of the 5th, and I am sure my Government will esteem it also a great favour.

I

I was sorry to hear that you have been so seriously indisposed, and am glad to learn that you have now recovered.

I have a pleasant recollection of our meeting at Worcester, and trust I may soon have the pleasure of again seeing you.

Believe me, &c.,

SAUL SAMUEL.

Canon Cattley to The Agent-General.

Dear Sir Saul Samuel,

St. Mary's Terrace, Worcester, 19 November, 1886.

I have had my correspondence with Lord Grimthorpe, and I gather that he does not incline to act as referee; neither do I care in the present state of my health to be solely responsible, and I would suggest that you should let me associate with myself a young cleric who is conversant with the subject of bells, and is more thoroughly versed in it than anyone I know. He has recently succeeded my venerable friend Mr. Ellacombe, the Devon clergymen who died at 93 last year, as editor of the bell column of a weekly paper, *Church Bells*. His name is Davies, he is a son of a late Vicar of Tewkesbury. If you like that arrangement I will either write to him or I will give you his address.

Lord Grimthorpe tells me he has given you the names of the firms with whom we work. There is only one bell-founder who is able to do such a job as this worthily, and I shall much regret if you get into other hands. I mean Taylor, of Loughborough. I have just completed a great work for a Worcestershire squire, by far the finest set of bells ever cast, twenty bells, the largest being 62 cwt. I have spent nearly £15,000; the whole thing has given unqualified satisfaction. Either Potts, of Leeds, or Joyce, of Whitchurch, are much the best for clocks. I rather prefer the latter. Gillett, of Croydon, good, but the head of firm has just died, and I fear there is no one to take his place. But I entirely agree with Lord Grimthorpe about your clock specification. There is far too much of it, and might lead you into any amount of law; in fact I do not see how any of the best clockmakers could tender on such a specification. I have several clocks made by Joyce in this neighbourhood, including a very grand one in the Cathedral. They are all going like chronometers. Joyce made the one for Adelaide. I think I told you I acted as referee, both for it and the five bells. I believe it continues to go admirably. It gave great satisfaction at the time.

The only remark I have to make about bell specification is section 46—"No allowance will be made," &c., &c. I know Lord Grimthorpe likes this, but I do not care to tie a man down too tightly. You allow a margin in hour bell, five to five and a quarter, in the same way I would allow a small license in the quarters. I am telling Lord Grimthorpe this when next I write to him, in a day or two.

Believe me, &c.,

RD. CATTLEY.

P.S.—I am writing close on post time, and will send back specification to-morrow.

The Agent-General to Canon Cattley.

Dear Canon Cattley,

5, Westminster Chambers, 24 November, 1886.

I am obliged to you for your note of the 19th instant, and shall be pleased if you will be so good as to associate with yourself the Rev. Mr. Davies in regard to the clock bells required for the General Post Office in Sydney, and may I trouble you to write to that gentleman as you suggest, and inquire whether he will kindly act with you in this matter.

I return herewith the specification, and shall be glad if you will make any alteration in section 46, which, in your judgment, you think desirable.

I am sorry to be of so much trouble to you, but I am anxious that the specification may be in every respect in harmony with your wishes.

Believe me, &c.,

SAUL SAMUEL.

Canon Cattley to The Agent-General.

Dear Sir Saul Samuel,

St. Mary's Terrace, Worcester, 3 December, 1886.

Lord Grimthorpe takes my view about section 46, as you can only bind a bell founder to weight of tenor bell. I would therefore suggest to omit 46, and alter section 44 to meet the case of this bell, allowing a margin of $\frac{1}{2}$ a ton instead of a $\frac{1}{4}$, which I think desirable, then you may, if you like, stipulate that bells should be cast without canons, and leave 46 accordingly. I know Lord Grimthorpe will like this. I am telling him of it. I hope it may end in your employing Taylor, of Loughborough. Your clock specification is far too elaborate and complicated. I should have liked a more simple one, and left it in the hands of two, or at least three, of the best men to tender for.

Believe me, &c.,

RD. CATTLEY.

P.S.—Mr. Davies will act with me. He wished to make other suggestions, but I tell him Lord Grimthorpe has been consulted and is satisfied, and we may well let *well alone*. His address is—REV. C. D. P. DAVIES, Redmarley, Gloucester.

Specification for Bells.

I suggest for section 44:—

The tenor bell to weigh from 5 tons to $5\frac{1}{2}$ tons, and no allowance will be made if in excess of that weight. Its diameter to be thirteen times the thickness of the sound-bow.

You cannot state any contract weight for quarter bells, and I would therefore omit section 46 as it now stands. You might substitute the following, which greatly simplifies matters when bells become worn with use:—

Section 46: The bells to be cast without canons in the same manner as the five largest bells in the Worcester Cathedral peal. This will admit of their being turned horizontally through any angle, by which means the hammers may be caused to hit upon a fresh part when one part has become worn.

Messrs.

Messrs. Lund & Blockley to The Secretary, New South Wales Government Agency.

Sir, 42, Pall Mall, S.W., 12 January, 1887.
Herewith we beg to return you the specification and drawings of the clock required for the Post Office, Sydney, New South Wales, and we regret to say that, after a very careful consideration of them, we have decided not to tender for its supply and erection at Sydney.

We are, &c.,
LUND & BLOCKLEY.

W. Potts & Sons to The Secretary, New South Wales Government Agency.

New Clock for Post Office, Sydney.

Dear Sir, Guildford-street, Leeds, 4 January, 1887.
May we enquire if any modifications in the design of the above clock would be permitted; and would venture to draw the attention of the Agent-General to the following suggestions:—

1. We would suggest that universal joints be introduced in the connections between clock and centre nest of bevel-wheels, and also between these and the dial, as we consider the present arrangement likely to cause stoppages (if omitted) from the rods binding.

2. We should also like to know if it will be insisted that the centre part of each dial be glazed with one sheet of clear glass, as, from experience, we find great liability to fracture in such large sheets.

3. That a short external counterpoise be attached to each hand, to lessen the twisting strain on the the arbors; and whether it is possible to increase the length of the inside counterpoise from 12 inches, as marked on drawings.

4. Is it imperative that the maker shall erect the clock at destination; also maintain it for the period named in specification?

5. Would the time stated for completion be likely to be extended, as eight months from signing of contract to completion seems very short, after taking into consideration the great distance from here?

Awaiting the favour of your kind reply,

We beg, &c.,
W. POTTS & SONS,
Per H.H.

The Secretary, New South Wales Government Agency, to W. Potts & Sons.

Gentlemen, 5, Westminster Chambers, 5 January, 1887.
I am desired by the Agent-General for New South Wales to acknowledge the receipt of your letter of the 4th instant; and, in reply, to state that he regrets that he has not the power or authority to alter the specification of the clock required for the General Post Office in Sydney in any particular. Will you, therefore, be so good as to send in your tender in strict accordance with the terms and conditions of the specification, which includes the cost of erection, &c., in the Colony.

Yours, &c.,
S. YARDLEY,
Secretary New South Wales Government Agency.

W. Potts & Sons to The Secretary, New South Wales Government Agency.

Clock for New Post Office Tower, Sydney.

Dear Sir, Guildford-street, Leeds, 8 January, 1887.
We are much obliged for your esteemed favour of the 5th instant.
As the conditions of your specification include the erection and maintenance of clock for a period of six months after completion, we extremely regret that the uncertainty attending the erection of work of this magnitude in such distant Colonies and the difficulty of sparing men for such lengthened periods, compel us to decline tendering.

We could make the clock all complete, ready for fixing, and would guarantee it to be perfect in every detail, if you could arrange for it being erected by local men at destination. We would also send details drawings with instructions for that purpose, if required, as usually done for clocks we have made for abroad.

Hoping to receive the favour of your further kind orders,

We beg, &c.,
WM. POTTS & SONS,
Per H.H.

Specifications and drawings returned by post.

Messrs. Gillett & Co. to The Secretary, New South Wales Government Agency.

Sydney Post Office Clock and Bells.

Steam Clock Factory, Whitehorse Road, Croydon (West),

Dear Sir, 11 January, 1887.
Whilst thanking Sir Saul Samuel for the opportunity given us to tender for the above we beg to say we do not propose to do so as there are so many points in the specification which we should not be willing to accede to.

We shall be happy to supply a clock and bells for the above according to our own specification. Specification returned herewith. Drawings per parcel post.

We remain, &c.,
GILLETT & CO.

Messrs.

Messrs. Dent to The Agent-General.

33 and 34 Cockspur-street, S.W., 1 January, 1887.

Messrs. Dent beg respectfully to acknowledge the receipt of Mr. Yardley's favour, with specification and drawings for the Sydney Post Office Clock, and to tender their best thanks to Sir Saul Samuel for his kindness, but their workmen are so fully engaged they are very reluctantly obliged to decline the competition.

They return the specification, &c. and apologise for the delay.

Messrs. J. B. Joyce & Co. to The Agent-General, London.

Sir,

Whitchurch, Shropshire, 10 January, 1887.

We enclose tender for a clock for Post Office tower, Sydney, but we could not undertake to complete a clock of this kind in less than twelve months. From the enclosed list you will see we are the makers of the great clock at Worcester Cathedral, the rate of going of this clock has been less than one second a month; also the clock for Sir E. Beckett's clock tower, the General Post Office, Adelaide, Royal Exchange, Manchester, and many other large buildings.

We can make a clock with four dials, 15 feet 8 inches diameter and 28-inch main wheel, after the design of the above clocks, for a very much less sum, if we could be allowed to send in specifications, drawings, and estimates.

We are, &c.,

J. B. JOYCE & CO.

Estimate for clock for Post Office tower, Sydney, New South Wales.

We undertake to make the clock—the dials, hammers, dial and bevel work, and all other work connected with the clock, as shown in drawings and specifications, including case for clock, wood-work, mason's and gas work, turbines, fixing clock, and bells, carriage by railway and sea, and all other work as named in specification and shown in drawings sent to us (excepting clauses 12 and 13 in general conditions, and clause 21 in specification)—for the sum of £3,825 net (three thousand eight hundred and twenty-five pounds).

J. B. JOYCE & CO.

Messrs. John Taylor & Co. to S. Yardley, Esq.

Sir,

Bell Foundry, Loughborough, 10 January, 1887.

Enclosed we have the pleasure to submit to you a tender in duplicate for the proposed bells for the Post Office clock tower, Sydney, New South Wales, and trust you will honor us with the order for the same. You will, sir, please note that we are unable to agree to clause No. 47 in the specification for the reason that, after the bells leave our works we have no further control over them whatever, and cannot tell whether they will have fair treatment or not. All we can do is to guarantee a sound casting of the proportions of metal specified.

We remain, &c.,

JOHN TAYLOR & CO.

John Taylor & Co. (successors to the ancient firms of Watts, Eayre, & Arnold, of Leicester and St. Neots),
Bell Founders, Loughborough.

ESTIMATE for five new bells for the clock tower of the Post Office, Sydney, New South Wales, to be cast according to the specifications and conditions (with the exception of clause 47) submitted to us, and marked F 1,441, which are herewith returned.

The bells to be charged for at the rate of £5 5s. per cwt., delivered on rails at Loughborough Station.

Terms: Net cash upon completion, January 10, 1887.

JOHN TAYLOR & CO.

CONDITIONS and Specification for Clock for Post Office Tower, Sydney, as amended by Lord Grimthorpe (late Sir Edmund Beckett).

(Lord Grimthorpe's amendments are shown in *italics*.)

(*These seem to have been originally intended for building, and are hardly suitable for making a clock in England.*)

GENERAL CONDITIONS.

INTERPRETATION CLAUSE.

1. The words "Superintending Officer" in these Conditions shall mean any person who may from time to time be appointed by the Government Astronomer to supervise or inspect the works or buildings, and the words "Government Astronomer" shall mean the Government Astronomer for the time being, or the Officer having charge of the Government Astronomer's Department.

ACCESS TO WORKS.

2. The Government Astronomer or any person authorized by him shall have free and uninterrupted access at all times to the works, or during working hours to any workshop or premises other than the site of the works or buildings contracted for, where materials may be in preparation for the purpose of this contract.

DISMISSAL OF WORKMEN, REMOVAL OF IMPROPER MATERIALS, &c.

3. The Government Astronomer shall have the power of immediately dismissing any agent or workman employed by the Contractor, and of having removed from the works or building (or any land belonging to the Government, or contiguous thereto) any materials, plant, or implements which in his opinion are insufficient for the purpose intended, or at variance with the meaning and intention of this

Specification. The cost of the removal of any such plant, materials, or implements to be paid by the Contractor, or may be deducted from any moneys due or to become due to him on account of the work or building.

INSTRUCTIONS TO BE OBEYED.

4. Should the Contractor refuse or neglect to carry out the instructions of the Government Astronomer or the Superintending Officer, all payments on account of this Contract will be suspended until such instructions have been complied with.

DRAWINGS, SPECIFICATIONS, &C.

5. The plans, sections, and drawings represent generally the form and dimensions of the several works. Where any discrepancy exists between the dimensions as indicated by the scale and those marked in figures, the figures are to be considered as correct, and are to be taken in all cases in preference to the measurements by the scale attached. And if there should be any discrepancy between the figures or dimensions, or the form of construction, or the material as indicated in the drawings, and the dimensions and materials given in the Specification, the directions of the Specification shall be adopted; and in all cases of defective description, or any ambiguity, the explanation given by the Government Astronomer shall be binding upon the Contractor. Also, anything contained in the drawings, and not in the Specification, or anything contained in the Specification and not shown in the drawings, shall be equally binding as if it were contained in both.

EXTRA WORKS, OMISSIONS OF WORKS, &C.

6. The Secretary for Public Works, on behalf of the Government or the Government Astronomer, shall have the power of making any deviation from, alteration of, or addition to the several works as they proceed, without invalidating the Contract. The value of such deviations, alterations, or additions, shall be ascertained and allowed for by the Government Astronomer or Superintending Officer at such rate as he shall consider to bear a due proportion to the other works in this contract; and the total value thereof shall be added to or deducted from the amount to be paid to the Contractor, as the case may be; and the fact of any deviation, alteration, or addition, having been made, shall not extend the time for the completion of the Contract.

It is to be distinctly understood that no deviation from the drawings or Specification will be sanctioned or permitted unless an order in writing, signed by the Government Astronomer, authorizing such deviation, be first obtained.

NET MEASUREMENTS.

7. All measurements of the works shall be made according to the actual dimensions, notwithstanding any general or local custom to the contrary.

LABOUR, MATERIALS, PLANT, &C.

8. The Contractor shall provide at his own costs and charges all materials, labour, tools, plant, tackle, machinery, scaffolding, &c., for the proper completion of the work. No materials provided for the work shall be removed or otherwise disposed of without the consent of the Government Astronomer.

DAMAGES, &C., TO BE PAID FOR BY CONTRACTOR.

9. All damage or injury that may happen to the works during their progress must be made good by the Contractor at his own expense, and the whole of the works must be delivered up complete in every respect, according to the drawings and specification.

SETTING OUT WORKS.

10. The works, where practicable, will be set out for the Contractor, but he must satisfy himself of their accuracy, as no work incorrectly set out or improperly executed will be paid for.

CONTRACTOR TO BE REPRESENTED.

11. The Contractor at all times during the progress of the works, when he is not personally superintending them, must have a responsible agent or overseer stationed on them to receive instructions from the Superintending Officer or Government Astronomer, and to represent the Contractor for all purposes of this Contract.

COMMENCEMENT AND PROGRESS OF WORKS.

12. The Contractor shall commence the works within fourteen days after the acceptance of Tender. And should the Government Astronomer be at any time dissatisfied with the mode of proceeding, or at the rate of progress of the works or any part thereof, the Secretary for Public Works, on behalf of the Government, shall have full power, without vacating this Contract, to take the works wholly or in part out of the hands of the Contractor, and to employ, procure, and make use of all labour and materials which he may deem necessary for completing the works, the cost of such labour and materials to be deducted from any money that may be then due, or may hereafter become due to the Contractor; and if the money then due, or thereafter becoming due, to the Contractor, shall not be sufficient for that purpose, the balance remaining unpaid may be recovered in an action for damages for breach of Contract, or as money paid for the use of Contractor.

CANCELLATION OF CONTRACT.

13. The Secretary for Public Works, on behalf of the Government, shall have the option, and full power and authority, in lieu of proceeding under the last preceding clause of these Conditions, if the Contractor fail to proceed in the execution of and to carry on the works in the manner and at the rate of progress required by the Government Astronomer, of cancelling this Contract so far as relates to the works remaining to be done, and in such case the moneys which shall have been previously paid to the Contractor on account of the works executed shall be taken by him as full payment for all works done under the Contract; and upon notice in writing under the hand of the Secretary for Public Works that he, under the authority of this Condition, cancels the Contract, being served upon the Contractor, or left at his last known place of abode, the Contract shall be cancelled, and thereupon all sums of money

money that may be due or unpaid to the Contractor, together with all implements in his possession, and all materials provided by him, upon the ground upon which the work is being carried on, or adjacent thereto, and all sums of money named as penalties for the non-fulfilment of the Contract within the time specified, shall also be forfeited and become payable to the Government, and the said implements and materials shall become and be the absolute property of the Government, and with the moneys so forfeited and payable as aforesaid shall be considered as ascertained damage for breach of Contract.

TIME OF COMPLETION TO BE NAMED IN TENDER.

14. The Contractor shall complete the whole of the works comprised in this Contract on or before the day of , one thousand eight hundred and ; and in the event of their non-completion at the specified time, should the Government not have proceeded under clauses Nos. 12 and 13 of these Conditions, or either of them, the Contractor shall forfeit and pay fifty pounds sterling per week, or for every part of a week, that shall elapse after such specified time until their completion, and which sum or sums may be deducted from any money payable to the Contractor under this or any other Contract. The Contractor to have no right to Certificate after the date specified for the completion of the Contract until the whole of the works shall have been properly completed to the satisfaction of the Government Astronomer.

COPIES OF DRAWINGS, &c.

15. All copies of drawings or specifications required by the Contractor for carrying on the works must be made at his expense, but should any copies of drawings or specifications be furnished to him at the expense of the Government, they must be returned to this office before a final Certificate for the work can be given, and the Contractor will be required to ascertain for himself that they are correct in all particulars.

LIABILITY OF CONTRACTOR.

16. The care and maintenance of all works under this Contract shall remain with the Contractor during their progress and until their completion, and also until the Government Astronomer shall, by notice in writing under his hand, have informed the Contractor that he has taken charge thereof; and until such notice shall have been given, the Contractor and his sureties shall be jointly and severally responsible for all accidents from whatever cause arising, and shall make good all damage thereto.

CONTRACTOR NOT TO SUB-LET WORKS OR ASSIGN MONEYS.

17. The Contractor shall not assign over or under-let this Contract, or any part thereof, or assign all or any of the moneys payable or to become payable under the Contract, or all or any part thereof, or any other benefit whatsoever arising, or which may arise under this Contract, to any other person, without the consent in writing of the Secretary for Public Works first obtained; and any permission to assign over or under-let works to be done under this Contract shall not discharge the Contractor from liability to see that the works so assigned or under-let are executed and completed in terms of this Contract.

BANKRUPTCY OR INSOLVENCY.

18. If the Contractor shall become insolvent, have his estate placed under sequestration, or shall make an assignment of his estate for the benefit of his creditors, the Secretary for Public Works, on behalf of the Government, may, without previous notice to the Contractor, or to the official or other assignee or assignees of his insolvent estate, or to the trustee or trustees under the assignment, take the works out of his or their hands and recontract with any other person or persons, or make any other arrangements he may think fit for the completion of the same, and may apply all materials on the land or adjacent thereto, belonging, or which, but for such insolvency, sequestration, or assignment would have belonged, to the Contractor, and all moneys then payable under this Contract, in and about the completion of the said Contract; and if the said materials and the said money shall be insufficient to complete the said works, the further cost of completing same shall be paid by the sureties to the said Bond; or the Secretary for Public Works, on behalf of the Government, may, at his option, declare the Contract to be cancelled, whereupon all money due under the said Contract shall be forfeited to, and all materials found and provided for the said works by the Contractor shall be forfeited to, and become the property of the Government, and the official assignee or trustee of the Contractor's estate shall not have any claim thereto, or in respect thereof.

SECURITY.

19. The Contractor will be required to provide two approved persons as Sureties to enter with him into a Bond to Her Majesty the Queen, in the penal sum of pounds, for the proper performance and completion of the Contract. The names of the persons proposed by him as Sureties must be stated in his Tender; the Secretary for Public Works, on behalf of the Government, having the power of rejecting such proposed Sureties should it be deemed advisable to do so.

Should the Contractor fail to procure such persons as may be deemed by the Secretary for Public Works, on behalf of the Government, to be eligible Sureties, within six days from the acceptance of the Tender, or should the Contractor fail to execute the Contract for the due performance of the works mentioned in the said Tender, or to execute and to procure the due execution by the persons so approved of as Sureties of the Bond required hereunder, for securing the due completion of the works to be done under the said Contract, within fourteen days after the acceptance of such persons as Sureties has been notified to him, the Secretary for Public Works, on behalf of the Government, will have the option of and full power and authority to declare such acceptance to be annulled.

No Tenderer shall proceed with the work tendered for until he has provided approved Sureties, has executed the required Contract, and has, with such Sureties, duly executed the Bond before-mentioned for the due performance of the said Contract—it being hereby declared that, for all or any work done or materials found and provided by the Contractor before the due execution of the said Contract and Bond, he shall not have any right of action, claim, or demand against the Government.

That no person having an interest in any work tendered for shall be eligible as sureties for the same contract.

PROGRESS

PROGRESS PAYMENT WITHOUT PREJUDICE, &c.

20. No certificate given to the Contractor for the purpose of any progress payment shall prevent the Government Astronomer from at any future time before the termination of the Contract, rejecting all unsound materials and improper workmanship discovered subsequently to the giving of the last previous Certificate; and notwithstanding the giving of any Certificate that portions or the whole of the works have been satisfactorily performed, the Government Astronomer may require the Contractor to remove and amend at any future time previously to the final payment on account of the construction or maintenance of the works, any work that may be found not to have been performed in accordance with the Contract; and the Contractor must remove and amend at his own cost all such work when so required, notwithstanding any approval made or given by the Superintending Officer; and the Government shall have power, on the report of the Government Astronomer that the work approved of as aforesaid is not in accordance with the Contract, to deduct from any moneys that may be due or that may become due to the Contractor the whole amount that has been paid on account of such work.

If, in the opinion of the Government Astronomer, further inquiry is necessary or desirable before any certificate is given, he shall have power to withhold such certificate for a period not exceeding one month from the date at which in the ordinary course the certificate would have been given.

None of the Conditions of this Contract shall be varied, waived, discharged, or released, either in law or in equity, unless by the express consent of the Secretary for Public Works, on behalf of the Government, testified in writing.

PAYMENTS.

21. The Contractor to make application in writing, not oftener than monthly, to the Government Astronomer, when he requires a payment of money on account of work done under this Contract, stating the amount required, and to accompany such application with a statement of the stage of progress which the work has reached, certified by a Magistrate, Clerk of Petty Sessions, or other Government Officer. Unless by reason of any neglect or default, which would cause stoppage or delay of payment under any of the preceding clauses, payments on account will, if practicable and desired, be made once in every month, up to the period fixed for the completion of this Contract; such payments on account will be made only on the Certificate of the Government Astronomer, at the rate of 80 per cent. upon his valuation of work actually and permanently fixed in the work or building contracted for, and the remaining 20 per cent. will be paid after the Government Astronomer has certified that the whole of the works have been completed to his entire satisfaction; and it is expressly declared that the obtaining a Certificate from the Government Astronomer that the work done by the Contractor has been satisfactorily executed or completed to his satisfaction shall be a condition precedent to the Contractor having any right or cause of action in respect of any work done or materials provided, and to the Contractor having any right of action or claim to the payments from time to time to be made hereunder, as well as to the final payment upon the whole of the work being finished.

Department of Public Works,
Colonial Architect's Office,
Sydney,

188 .

SPECIFICATION FOR A TURRET CLOCK FOR THE POST OFFICE TOWER, SYDNEY, N.S.W.

SPECIFICATION of Labour and Material required in the construction and erection of a Tower Clock, for the Sydney General Post Office, in accordance with the accompanying drawings, specifications, and general conditions of contract. To be made and erected to the satisfaction of the Government Astronomer for Her Majesty's Government of New South Wales.

1. The clock must show the time on four dials, 15 feet 8 inches (fifteen feet eight inches) in diameter, must strike the hours on a bell weighing 5 (five) tons, and the Westminster chimes on four bells weighing in the aggregate 5 (five) tons, and perform such other duties as are herein specified or shown in the drawings.

2. The frame of the clock must be of cast iron, and all in one casting, as shown in the drawings, and will not be accepted if made in several parts and bolted together. The thickness may be a little more but not less than that shown; its base must be planed and carefully fitted and bolted to the wrought iron bed-plate, which must be supplied with it, as shown. All holes must be truly bored and the brass bushes accurately fitted and secured with three equi-distant screws, so that they may be turned round when worn. The frame must be painted a dark bronze green, and worked up with the paint to a smooth surface on the outside.

3. The works of the clock must be enclosed in a glass case, as shown. All the woodwork of this must be made of well-seasoned mahogany or cedar, French polished; must be made in the parts, as shown, and fastened together with screws at the corners and top. The six upper side frames to be removable, but secured with good locks, and have two neat handles to be used in removing these side frames. The eight lower frames to be closely fitted to the openings and fastened with inside buttons, except the two end ones and that enclosing the pendulum, which must be locked, and all must be removable at pleasure. The whole case to be glazed with the best $\frac{1}{4}$ -inch (one quarter) plate glass and well finished in every respect. (*You must take care that there is proper ventilation through it and through the room, or damp will condense on the iron.*)

4. Every part of the clock must be made of good and sound materials as specified, porous or otherwise faulty castings and imperfect forgings will not be accepted. Each and every part must be of the dimensions shown in the drawings or otherwise specified, and the workmanship must be such that every part of the clock when made shall perfectly serve the purpose it is required for, and the judge of this fitness shall be the referee.

5. The teeth of all the wheels must be so formed as to secure, in the opinion of the referee, a smooth rolling* motion in which the teeth press evenly for their whole length and not at one end only, and be free from any rubbing friction.* In every wheel and pinion the teeth must be of uniform size, and all the spaces in any wheel or pinion, measured from centre to centre of the teeth, shall be uniform. (** The only teeth that roll are involute, not epicycloidal, and they are bad for the reason given in my book.*)

I should say, "The teeth are to be epicycloids of proper curvature for the size of the wheels and pinions, as defined in Sir E. Beckett's book."

6. All the wheels, bushes, and other parts of brass shall be made of metal composed of copper 8 (eight), zinc 1 (one), tin 1 (one). All axles to be of steel; all pinions to be of steel and cut out of the solid. (*I presume this is a proved composition.*)

7. Every wheel must be so made that it can be taken out without disturbing other wheels, as shown.

8. The form of escapement must be that known as the double three-legged gravity, the legs and pallet arms of brass, and the pallet faces of (*quite hard*) steel, so arranged as to reduce the risk of tripping to a minimum. All parts of the escapement to be polished and lacquered. (*Brass is heavy and weak for the long legs; I prefer steel. Some makers use Phosphor Bronze.*)

9. The pendulum must be that known as zinc and iron compensated, in which provision must be made for the free circulation of air between the acting parts. The bob must weigh 452 (four hundred and fifty-two) lb. and be made of lead. The pendulum must swing in $1\frac{1}{2}$ (one and a half) seconds, and must have a degree plate and a (*collar for small, sliding one back for several reasons*) neat movable weight(s) on the pendulum-rod for fine adjustment in addition to the motion provided for rough adjustment of rate. Two inches (*close*) under the bob (*or end of rod*) an iron shelf must be fixed to catch it if it falls. (*The bottom of the rod to be squared, to hold it while turning the nut.*)

10. The rate of the clock must not vary more than three seconds in any week, and its rate shall be determined from its automatic electric signals sent to the Observatory. These signals to be sent by 40 (60) gold pins fixed to the 60 (90) wheel on the axis of the seconds dial. (*It is impossible to make those off the train wheels accurate to a second. The pins should therefore be in the 90-wheel which divides the scape-wheel, together with the requisite contact-maker in the hour-wheel.*) (*One will do if put rightly.*)

11. To provide a second dial as shown, and on the face of the 60-wheel to insert 40 equi-distant gold pins one-eighth of an inch long and 0.06 inch in diameter, and provide a spring so adjusted that each pin on passing the spring will close an electrical circuit if required (*to make contact at the hour—see 24*)

12. The hour and quarter striking parts must be let off independently by an adjustable piece attached to the 90-wheel axis as shown, at the end of which are two pieces independently adjustable so as to let off the hour and quarter levers exactly. The first stroke of the hour bell within one second of the true time, and the quarters so that the last stroke in each case is four seconds before the completion of the minute, the long arms connecting the going and hour and quarter striking parts to be of wrought iron, faced in their working parts with hardened steel.

13. To provide (*long flies as usual—long enough to secure uniform velocity*) mechanism for governing the speed of the striking trains as shown in the drawings. These friction governors must be made with the same accuracy as if required for the driving clock of a telescope. The ratchet wheel must be made of steel; the other parts of brass and steel as shown in the drawings. The friction screws must be shod with hard and compact leather. The pieces fixed on the axis must be secured with well fitted keys. (*I doubt their use very much, and they will greatly increase the clock weight and strain. A telescope does no work in moving, indeed I am sure friction will not do for the quarters especially. (See end for further remarks.)*)

14. The winding barrels must be made of sheet iron three-sixteenths of an inch thick, joints brazed and provided with holes in which to fix the end of the wire ropes.

15. *Patent winding and maintaining gear as shown must be supplied to each winding barrel, and if necessary in the striking parts a ratchet and pawl to keep the whole from running back when wound. (*You only want maintaining to the going part.*) (**I only know of one patent winding and maintaining gear, and therefore this would be fatal to any competition. Several plans are equally good.*)

16. The cams for striking must be either of the form shown or the patent* adjustable steel-faced ones, in either case fixed as shown in the drawing. (**They have been used long ago, and I doubt if there is any real patent for them; and if once right they never want adjusting.*)

17. Winding gear as shown in the drawing must be provided so that the several barrels of the clock may be wound alternately by the same handle, either by hand or an hydraulic machine of approved form.

18. Self-acting cut-off apparatus must be supplied as shown (*or some other*) to prevent over-winding (*or straining of the ropes by stopping*).

18a. *Care must be taken that none of the ropes overlap in winding.*

19. An hydraulic machine, preferably of the turbine form, must be provided to wind the clock. Water is laid on at a pressure of 120 lb. to the square inch. (*I doubt if any clockmaker here will do that.*)

20. To provide as shown an apparatus for turning the gas on and off as required; one to serve for all four dials.

21. The whole to be completed in 8 (eight) months from the time of signing contract. (*Impossible if made here.*)

22. Contractor to receive half the contract money when the clock is erected and approved by the referee; to maintain the clock and all its parts, including the bells (see 47) in sound working order for 6 (six) months from that time; at the end of the first 3 (three) of these months to get one-quarter of the contract money on the certificate of the referee; and at the end of the 6 (six) months the balance of the money, upon producing a satisfactory certificate from the referee. (*This will be awkward for an English maker.*)

23. The well for the weights is $4\frac{1}{2}$ feet in diameter, and 80 feet deep, and will contain 7 feet of sand to receive the weights if a rope breaks. The weights must all work in this well as shown. The weights are five in number: *two on the hour striking train, one on the going train, and two on the quarter striking train. Each weight must be provided with a sufficient length of the best steel wire rope, $\frac{3}{8}$ -inch in diameter, to allow the weight to rest on the sand when run down. (**I see no use in 2.*)

24. The weights must be sufficient (*in the drawing the weights are specified, which is wrong*) to do the work required from them in each case; each weight must be provided with a sheave, as shown, and the sheave must be bushed with brass; the bar holding the weights to the sheave must be securely screwed into the bottom section of the weight, which must serve to hold the other sections (*or "shifters"*) in sufficient number to make the required weight; each of these sections must be slotted, so that it can be put on or off in the usual way, and must not exceed 50 (56) lb. in weight. The lowest or fixed section of each weight must be coned like an Armstrong shot (*Why?*), and weigh 150 lb.

25. To provide electrical contacts such that each time the lever which (*starts*) works the hour (*striking*) bell falls it shall close a circuit for one second. (*This seems to make the electrical part of paragraph 10 superfluous, or this is.*)

26. To provide a turbine with mechanism so that it will ring the fire-alarm on the treble bell, and arrange it that it may be set in operation by an electrical signal. (*No. 26 is ambiguous. I suppose you do not want every blow of the hour hammer to be telegraphed?*)

27. To make and set up four dials 15 feet 8 inches in diameter as shown in drawings and specifications.

28. The hour figures (*strong lines are much more visible*) and minute marks to be (made of the brass specified) in four parts as shown, each covering 90 degrees of the circle; these must be bolted direct to the stone by lugs and bolts shown in the drawings and fixed and supported by eight stays fixed with adjustable nuts to the angle-iron ring, which must be set in the inner ring of the stonework as shown, the screws fastening the stays to the brass frame showing hours and minutes, to be $\frac{5}{16}$ (five sixteenths) inch diameter, and put in as shown.

29. The clear space within the hour-figure ring to be glazed with one sheet (*Can that be got?*) of clear plate glass $\frac{1}{2}$ inch thick (if it is made), if not $\frac{3}{8}$ inch. This must be bedded all round in vulcanized rubber and fixed in its place by means of brass fillets. In the centre of it a hole 15 inches in diameter must be cut to receive the ring and supports for the hands. Inside the clear glass there must be a lining of opal glass $\frac{1}{8}$ (*too thin to handle in any size*) inch thick in as large pieces as it can be obtained, and these fixed in with brass clips screwed on to the brass fillets. The space behind the figures and minute marks to be glazed in the same way, except that cloth must be used instead of rubber to facilitate taking out the glass to get at the figures or hands for painting.

30. To provide and fit a central bush of brass to each dial, such bush to be screwed on the outside and fastened in with one nut, the whole to be carefully bedded in best white-lead putty; within this bush are to be fitted the friction rollers and all the parts shown in the drawing, and those necessary to make a bearing for the axis of the hands and the stays to the bush. To provide and fix for each dial four wrought-iron stays $\frac{3}{4}$ inch diameter, forked and pinned to the lugs on the nut of the brass bush, the inner ends to be screwed and fitted with double adjusting nuts to the girders.

31. To provide sheet copper (hard rolled) hands of the dimensions (*and section*) shown, made of 20 gauge copper and joints folded; hands to be riveted to brass ring, and screwed to brass bossed disc on the axis as shown.

32. To provide and fix for each dial eight Argand gas lamps with reflectors, so arranged as to make the most of the light and cast no shadows on the dials; to lay on gas to these lamps so that it may be turned on and off by the apparatus provided in the clock mechanism.

33. To provide smoke flues of No. 30 gauge copper of sufficient size to carry of all the products of combustion in the lamps, to take these through the carillon chamber to the height of 8 feet over the belfry floor, four in number, and each to be fitted with anti-down-draught cowls, copper strap, all tubing, and screw each side to lead plugs let into the stonework every 3 feet, with all necessary junctions, elbows, bends, &c.

34. To lay on gas in $1\frac{1}{2}$ -inch best gun-barrel piping, with all necessary elbows, bends, &c., from upper floor of General Post Office, with a 50-light meter in locked box to clock chamber, and distribute in copper tubing to different burners. The gas to be regulated by the clock mechanism provided for that purpose.

35. All holes required in the masonry for bolts, &c., will be cut for the Contractor.

36. The castings for the dial figures must be so made and fixed as to provide an even bed for the glass, so that in fixing the glass may not be broken.

37. To paint the hands, the dial figures and minute marks with two coats of the best black paint, and all other parts requiring painting to receive two coats of the best paint of approved colours.

38. To hang 5 (five) bells in the positions and manner shown in the drawings. All the bells to be hung in the same way.

39. To provide 6 (six) (*suitable*) necessary hammers for the bells, (*i.e., two for the fourth quarter bell*). Each hammer to have sufficient weight and lift to bring the full tone out of the bell it strikes (*and have adjustable check springs. The levers must fall on stops, not on the cams*).

40. The bell hammers to be hung and provided with sufficient means of adjusting the lift, and to be left on the lift after striking, as shown.

41. The contractor to erect the clock and all its attachments, including the bells, dials, &c., within the specified time. To provide all the scaffolding, labour, and material, except bells, required for making, erecting, and fixing.

To leave every part in working order to the satisfaction of the referee. He must also make good any damage done to the buildings by him.

42. *If any unforeseen difficulty arises in making the clock according to the specification, the maker is to communicate with the Agent-General, and to follow the instructions he may give thereon, or any person nominated by him for that purpose; or if the maker has any improvement to suggest he may do the same. If he thinks it expedient to make any part stronger than is shown in the drawings he may do so.*

43. *The whole of the work to be subject to inspection and approval before sending out of England by such person as the Agent-General may nominate as above.*

Further Remarks re par. 13 of Clock Specification.

There are times when the striking part are either not lifting the hour hammer, or when the work of lifting the quarters varies very much, and no friction will regulate that quickly enough—nothing but long flies.

At Westminster we had to alter the train and put much larger flies to get anything like uniform velocity. Too short flies are about the commonest fault in large clocks, often for want of room to put large ones. The work of driving a telescope is very nearly uniform.

The short tails of the quarter levers as drawn are too thin.

SPECIFICATION for Bells, as amended by Lord Grimthorpe and the Rev. Canon Cattley.

42. To provide five bells of the section described in Sir E. Beckett's book, and deliver them to order within four months.

43. All the bells to be made of metal composed of 13 lbs. of pure copper and 4 of pure tin, and to be perfectly sound, free from porosity and other defects, and homogenous as castings.

44. The tenor bell to weigh from 5 tons to 5½ tons, and no allowance will be made if in excess of that weight; its diameter to be thirteen times the thickness of the sound bow.

45. The four quarter bells to be of such weights as will produce the proper notes for the Westminster Chimes in accordance with the tenor bell; the treble's diameter to be twelve times the sound bow, and the others about 12½. The bells must be approved as perfectly satisfactory, both as to their notes and quality, by the Rev. Canon Cattley and the Rev. C. D. P. Davies before they are shipped.

46. The bells to be cast without canons in the same manner as the five largest bells in the Worcester Cathedral peal: this will admit of their being turned horizontally through any angle, by which means the hammers may be caused to hit upon a fresh part when one part has become worn.

47. The contractor to replace any bell broken by use within six months of erection.

No. 9.

Mr. A. Holmgren to The Under Secretary for Public Instruction.

Tender for Tower Clock, General Post Office, Sydney.

Dear Sir,

257, Kent-street, Sydney, 10 December, 1886.

I, the undersigned, hereby tender my price for the above contract (according to the conditions and specifications) for the sum of £3,934 (three thousand nine hundred and thirty-four pounds).

ADOLF HOLMGREN.

No. 10.

Mr. A. Tornaghi to The Minister of Public Instruction.

298, George-street, Sydney, 25 October, 1886.

Sir,

I beg to submit for consideration herewith.

Tender No. 1, for importing a clock for the General Post Office, Sydney, and tender No. 2 for a clock to be made in the Colony suitable to the new building, and at the same time would point out that similar tenders were sent addressed to the Agent-General, London, on the 10th September, 1886, in accordance with instructions in the *only* Gazette advertisement which appeared in Sydney.

I also forward copies of letters of 23rd and 25th March, respectively, which were sent to Colonial Architect for submission to proper authorities in support of my tenders.

I am, &c.,

A. TORNAGHI.

[Enclosures.]

Tender No. 1.

This Tender is only in competition with those who will have to import.

I herewith enclose second tender for consideration.

Sir,

298, George-street, Sydney, 25 October, 1885.

In pursuance of advertisement in the Government Gazette, I, the undersigned, do hereby tender to provide the materials and perform the works required by importation of the clock, bells, dials, &c., for the tower at General Post Office, Sydney, as nearly as can be carried out agreeably to the plan and specification for the sum of £3,750, and to complete the same within—the bells in six months, and the clock within two years.

A. TORNAGHI.

No. 2.

298, George-street, Sydney, 25 October, 1886.

I, THE undersigned, do hereby tender that I will undertake to make, supply, and erect an illuminated striking clock, to fit the tower and in harmony with the building of the General Post Office, Sydney.

The clock, bells, and dials to be of the very best material and workmanship, with all the latest known improvements.

Its functions to be performed with the greatest accuracy, and the time to be distinctly shown day and night, so as not to be surpassed by any known clock.

The weight of hour bell to be not less than 5 tons, with four chime bells for "quarters," the most suitable in weight, and tone to harmonize with the large bell.

The dials to be 15 feet 8 inches in diameter, of transparent glass, and nearly similar in construction to the clocks at Newcastle, Goulburn, &c.; to be lighted by four Argand burners to each dial (instead of twelve as specified), and so arranged with reflectors as to give equal light, and effect a saving of about £200 per annum.

To arrange for turning off and on, and lighting the gas at daylight and dusk the year round; also to switch on and off the wires connected with the light room, so as to show a flash of light at each stroke of the hour hammer, and thereby be able to distinguish the time at a great distance; also to construct apparatus (to connect with any stations) whereby certain mechanism could be set in motion from each so as to strike a rapid succession of blows on the bell, and thereby give an alarm in case of fire.

The bells to be ready to fix within six months of acceptance of tender, and the works and clock immediately the tower is ready for their reception within two years.

Hydraulic power will be arranged for the winding of the clock.

I am prepared to give a cash deposit for the due fulfilment of the work should such be necessary, and I will undertake to keep the clock in thorough going order, &c., for two years, the whole to be entirely subject to the approval and satisfaction of the Colonial Architect, for the sum of £5,480, and that no payment should be made to me if the work is not carried out as stated.

A. TORNAGHI.

N.B.—I would impress upon you the fact for due consideration, that an imported clock made to specification cannot be fixed in the tower without alteration to the inside thereof, whilst a clock made to suit the tower and building can be done in sections, and would save much expense in alterations and trouble.—A.T.

Mr.

Mr. A. Tornaghi to The Colonial Architect.

Sir,

298, George-street, Sydney, 23 March, 1886.

There is a rumour being circulated to the effect that the late Postmaster-General has recommended the acceptance of a tender sent in by a wine and spirit merchant for supplying the clock for the General Post Office. I trust this rumour is incorrect, for it would be a great injustice, as my tender for importing same is far below any sent in, whereas my tender for making clock in the Colony, erecting, and guaranteed, is only £5 in excess of the lowest tender, excepting mine for the importation of same. I may here add that the clock must be specially made to suit the tower. An imported clock would not suit, as too many alterations would be necessary.

I have the honor to call your attention to the fact that I am upwards of thirty years established in Sydney, and that during that period I have executed very many scientific, mathematical, and horological works, all of which I have given entire satisfaction.

I look upon the Post Office clock as a national undertaking, and desire to bring under your special notice that during my recent visit to Europe, I was permitted to inspect all the large clocks of any importance, both in England and on the Continent, where I had the opportunity of seeing all the latest ideas in horological inventions. This, with the practical knowledge I have acquired through long experience, makes me feel confident that if my tender is accepted, I will execute the work in a manner not surpassed by any clock known, either for its accuracy or workmanship, &c, &c.

I am also prepared to give security for the completion of the work within eighteen months from the acceptance of contract; and further, that no payment be made to me until the work gives satisfaction.

Trusting that you will be so kind as to place this communication before the authorities,

I have, &c.,

A. TORNAGHI.

Mr. A. Tornaghi to The Colonial Architect

Sir,

298, George-street, Sydney, 25 March, 1886.

With reference to my letter of the 22nd instant, *re* Post Office clock, I herewith enclose a list showing the different clocks I have erected for your Department, all of which I am pleased to say have given every satisfaction. I would especially bring under notice the Custom House Clock at Newcastle, for I feel confident that through your recent visit to Europe, you bear testimony to the effect that this clock is unsurpassed as a time-keeper, and is unexcelled for plainly showing the time either by day or night by any clock either in England or on the Continent.

It is now some years since this clock was erected, and since I have both added and gained more practical experience and knowledge (this is far above all the theory which may be brought to bear on this or any subject), and to carry out the work I feel confident beyond a doubt that I am able to make and erect the Post Office clock as tendered for, and bind myself to execute the work with all the latest known improvements, and am prepared to give a bond of security for the completion of same, as herein and as stated in my previous letter.

I would further bring under notice that if a clock is imported the great difficulty would be in erecting and fixing same, as the clock must be made to fit the tower, so that the necessary alterations, &c., which would be required would incur a lot of trouble and heavy expense, whereas if my tender is accepted no trouble whatever would arise; therefore I think that it would be rather an injustice to me, considering my long and approved of experience, and the terms upon which I offer to do the work (*viz*, that the Government shall not pay me unless the work is satisfactorily done and in the time stated); in fact it would be a disgrace to the Colony to send home such a national work when it can be executed here with more speed, guarantee, and with less expense.

Trusting that you will be so kind as to bring this before the proper authorities, I hope that they will well consider the matter and encourage colonial industry.

I have, &c.,

A. TORNAGHI.

LIST of Clocks constructed and erected for the Government of New South Wales by A. Tornaghi.

Place	Building	No of Dials	Size of Dials	Striking or Not	Other remarks.
Sydney . .	General Post Office	3	6 feet 6 inches	Striking .	Transparent dials.
"	do [2 of..	2		...	Over doors.
Young	Post and Telegraph Office	1	4 feet	Not	
Armidale	Court-house	1	6 "	Striking	
Grafton	Post and Telegraph Office	4	6 "	"	
Kiama	" "	4	6 "	"	
Wagga Wagga	" "	4	6 "	"	
West Maitland	" "	4	6 "	"	
East Maitland	Court-house	1	6 "	"	
Gundagai	"	1	6 "	"	
Bathurst	"	1	6 "	Not	
Newcastle	Custom-house	4	8 "	Striking	Transparent dials.
Goulburn	Post and Telegraph Office	4	7 " 6 inches	"	" "
"	Gaol	1	6 "	"	
Dubbo	Court house	4	5 "	"	
Orange	Post and Telegraph Office	1	6 "	"	
Albury	Court-house	4	6 "	"	
Singleton	"	1	6 "	"	
Mudgee	"	1	4 "	Not	
Morpeth	"	1	6 "	Striking	
Paddington	Post and Telegraph Office	2	2 "	"	Double clock.
Gladesville	Asylum	4	3 "	Striking	
Parramatta	"	3		"	Reconstructed.
Paddington	Barracks			"	"
Darlinghurst	Gaol			"	"
Emigration	Barracks			"	"
Sydney	Colonial Secretary's Office			"	One double clock over each of three entrances.
"	Lands Office			"	One double clock over entrance.
Forbes	Post and Telegraph Office	4	6 feet	Striking	
Tamworth	"	4	6 "	"	Transparent dials.
Sydney	Banking-room, " General Post Office.	1	2 "	Not	

No. 11.

A. Tornaghi to The Under Secretary for Public Instruction.

Tender for Tower Clock, General Post Office, Sydney.

Sir,

298, George-street, Sydney, New South Wales, 9 December, 1886.

In compliance with advertisement in Government Gazette (6077), I beg to submit tender "1," for importation of a clock, and tender "2" for making, &c, a clock in the Colony. These tenders being identical with previous tenders submitted as follows:—1st. To Public Works Department here on 24th February, 1885, which were unanimously recommended by the full Board for acceptance. 2nd. To Agent-General, London, on 10th September, 1886, in compliance with the only one advertisement which appeared in Sydney, and 3rd. To Minister of Public Instruction, Sydney, on 25th October, 1886, in reference to advertisement just quoted.

I also forward copies of letters of 23rd and 25th March last addressed to the Colonial Architect, in support of tenders, &c., previously sent in to Government—24th February, 1885.

I am, &c.,

A. TORNAGHI.

(The tenders and letters enclosed with above letter are copies of those printed on pages 15-16 of these papers.)

No. 12.

The Government Astronomer to The Under Secretary for Public Instruction.

Sir,

S.S. "Potosi," Adelaide, 7 March, 1887.

I have received and carefully read the letters and tenders referring to the new clock for the Post Office, Sydney, and I have the honor to recommend as follows:—

1. That Messrs. J. B. Joyce's tender for the manufacture and erection of the clock as per drawings and specifications of it, for the sum of £3,825, be accepted.

2. That Messrs. Taylor's, of Loughborough, tender for the manufacture of the bells, at £5 5s. per cwt., be accepted.

3. With regard to clauses 12, 13, and 21 in the specifications, objected to by Messrs. J. B. Joyce, these are the usual conditions of contract under the Colonial Architect's Department, and were inserted by me as a matter of form, and could be modified so as to meet Messrs. Joyce's objections.

4. Mr. Tornaghi's tender is slightly lower in price, but the clause "as nearly as possible in accordance with specifications" renders it, in my opinion, inadmissible, because under it any deviation from specifications is possible.

5. Messrs. Joyce's high character and success in making some of the largest and best clocks in England is a sufficient guarantee that the work will be successfully carried out.

6. I would suggest that a telegram (attached) be sent to the Agent-General, in accordance with the foregoing, and that while I am in England, I may be instructed to confer with the Agent-General in regard to any necessary modifications in the specifications for the clock, and generally under his directions to see after the due performance of the contracts.

I have, &c.,

H. C. RUSSELL.

Telegram: "Accepted Messrs. Joyce & Co.'s and Messrs. Taylor's, of Loughborough, tenders for clock and bells for new Post Office clock and bells."

Submitted.—G.M., 14/3/87.

The recommendations and suggestions of the Government Astronomer might now be forwarded for the consideration of the Secretary for Public Works, and his attention be specially drawn to the remarks of Lord Grimthorpe, Canon Cattley, and Messrs. Joyce themselves, as to the lessened cost if their own specifications were allowed.—J.I., 14/3/87. The Under Secretary for Public Works.—G.M., B.C., 14/3/87. Prepare *précis* of the whole case for the information of the Minister.—J.R., 15/3/87.

No. 13.

Précis.

Supply of Tower Clock and Bells for the General Post Office.

Department of Public Works, Sydney, 15 March, 1887.

SPECIFICATIONS and drawings for the supply of clock and bells for the tower of the General Post Office were originally prepared in the Colonial Architect's Department, and tenders invited in the Colony in accordance therewith in February, 1885. Of the tenders then received that of Mr. A. Tornaghi, for the sum of £5,480, providing for the manufacture of the clock in the Colony, was recommended by the Colonial Architect for acceptance. No tender was, however, accepted, but the matter was referred to the Government Astronomer, who offered to prepare fresh plans and specifications with the view of tenders being called in England and the Colony. The Cabinet decided this should be done, and plans and specifications were accordingly prepared by the Astronomer and forwarded to the Agent-General in London, tenders being called both in England and the Colony.

The Agent-General has now forwarded the tenders received, and other correspondence bearing on the subject.

From the accompanying schedule of the tenders received it will be seen that Mr. A. Tornaghi, of Sydney, whose tender was previously recommended for acceptance, is now the only tenderer for the supply and erection of both clock and bells. He gives two prices,—one for an imported clock, and the other for the manufacture in the Colony; and he urges the advisability of constructing the clock here.

The tender of Messrs. Joyce & Co. is for the manufacture of the clock, and the erection of clock and bells; that of A. Holmgren for clock only; and that of Messrs. Taylor & Co. for the supply of bells alone.

The Government Astronomer recommends the acceptance of the tender of Messrs. Joyce & Co. for the clock and erection, and of Messrs. Taylor & Co. for the bells; and the matter is now forwarded for the consideration of Mr. Secretary Sutherland by the Secretary for Public Instruction, who wishes attention to be specially drawn to the offer of Messrs. Joyce & Co. to supply a clock at much less cost if allowed to submit their own design.

J.R.

The Colonial Architect for report.—J.R., B.C., 17/3/87.

SCHEDULE of Tenders for Tower Clock and Bells, General Post Office.
TENDERS FOR CLOCK AND BELLS.

Name.	Amount.	Time.
A. Tornaghi, Sydney	£5,480 (to be manufactured in the Colony) ...	{ Clock—2 years. Bells—6 months. do
Do	£3,750 (to be imported)	
TENDERS FOR CLOCK ONLY.		
J. B. Joyce & Co., England.....	£3,825	{ 12 months. Not stated.
A. Holmgren, Sydney	£3,934	
TENDERS FOR BELLS ONLY.		
John Taylor & Co., England	£5 5s. per cwt. (in all, about £1,050)	Not stated.

Mr. Tornaghi being again the lowest tenderer, I see no reason to alter my report on tenders of 4th March, 1885, with the papers, and still recommend for acceptance his tender to provide and fix a clock and bells, the clock to be made in Sydney, for the reasons given in that report, and my subsequent letter of 27th March, 1886, also with the papers. The amount of Mr. Tornaghi's tender, £5,480, I consider reasonable.—J.B., 4 April, 1887.

The Colonial Architect is requested to furnish further details for the information of the Minister.—J.R., 26/4/87.

No. 14.

The Colonial Architect to The Under Secretary for Public Works.

Department of Public Works, Colonial Architect's Office,
Sydney, 9 May, 1887.

Sir,

In returning accompanying papers respecting clock, &c., for tower of the General Post Office, forwarded to me under blank cover on 26th ultimo,—

2. I do myself the honor to report that upon looking over the papers I find serious objections are raised by the English authorities—Lord Grimthorpe and Canon Cattley—to the specification prepared by Mr. Russell, which is said to require a “number of alterations,” and that “there is far too much of it; in fact, I do not see how any of the best clock-makers could tender on such a specification.”

3. Mr. Russell declines to entertain the tender of Mr. Tornaghi, because he states in it, “as near as possible,” in accordance with plan and specification; and although he undertakes to carry out the work to the approval and satisfaction of the Colonial Architect, and agrees that no payment shall be made if not carried out as stated, he recommends the tender of Messrs. Joyce & Co., which is higher than the tender of Mr. Tornaghi, also that clauses 12, 13, and 21 of specification, objected to by Messrs. Joyce & Co., be modified to meet the views of this firm; but if Messrs. Joyce & Co. are allowed to qualify their tender, why should not Mr. Tornaghi be allowed the same privilege?

4. When tenders are called for in England and the Colony, with the view of keeping the work in the Colony, it has been the practice to allow some percentage to the colonial tenderers; but Mr. Russell proposes to accept an English tender though higher than the colonial one of Mr. Tornaghi, who has, by his Government works in the Colony, proved himself quite competent to carry out in a satisfactory manner the erection of the clock and bells now tendered for by him.

5. If the recommendation of the Acting Colonial Architect on 4th March, 1885, had been accepted, the clock and bells would have been before now in use, and the long delay, through taking the work away from my Department during my absence in England, been prevented.

6. Mr. Russell, in his letter of 16th March, 1886, recommends that should the London tenders for the clock without the bells exceed £2,500 it be not accepted, but that the clock be made and erected in the Colony, and yet he now recommends a tender for £3,825, or £1,325 beyond his limit.

The tenders recommended by Mr. Russell, of Messrs. Joyce & Co., without the bells, £3,825, and T. Taylor & Co., £1,050 for the bells delivered at Loughboro' Station, amounting in all, without freight of bells, to £4,875, are £1,125 higher than the tender of Mr. Tornaghi for an imported clock, including bells and fixing; but I think, under all the circumstances of the case, the clock should be made in the Colony, and the lowest tender for the work in the Colony,—that furnished by Mr. Tornaghi, amounting to £5,480 including bells and fixing,—accepted, for the reasons given in my letter of the 27th March, 1886 (with the printed papers herewith), provided Mr. Tornaghi undertakes to carry out the work in twelve months from the date of acceptance of tender, and that he furnishes a certificate as to the satisfactory quality of the bells from Lord Grimthorpe, Canon Cattley, or other known and approved authority.

I have, &c.,

JAMES BARNET,
Colonial Architect.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

ELECTRIC TELEGRAPHS.

(CASE OF BLAKENEY V. PEGUS.)

Ordered by the Legislative Assembly to be printed, 17 March, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly, dated 30th March, 1886, That there be laid upon the Table of this House,—

“Copies of all telegrams, memoranda, and correspondence between the Superintendent of Telegraphs, or Acting Superintendent of Telegraphs, and Mrs. Pegus, relating to the case of Blakeney *v.* Pegus, respecting a mis-sent telegram; as also copies of all correspondence from Mrs. Pegus to Superintendent of Telegraphs or Acting Superintendent of Telegraphs.”

(Mr. Melville.)

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[1,005 copies—Approximate Cost of Printing (labour and material), £11 13s. 8d.]

No. 1.

Mr. E. W. Blakeney, Iluka, to The Postmaster-General, Sydney.

Sir,

8 August, 1884.

I beg respectfully to call your attention to the serious loss and inconvenience I have sustained through the negligence of an officer of the Telegraph Department.

On the 23rd June last, I received a telegram (copy enclosed), to the effect that my son James was dangerously ill; upon receipt of which I at once started on a journey of upwards of 120 miles, leaving my wife and family in a great state of alarm. Arrived at Palmer's Island I found out through the courtesy of the telegraph officer there, that the message I had received was not intended for me, but for a Mr. Walter Black of Yamba.

At a late hour in the same night a messenger arrived with a note from the operator at Yamba. (copy enclosed) asking for the return of the telegram mis-sent to me.

In consequence of the shock she received when the telegram was handed to me, my wife who has been slowly recovering from a long and painful illness suffered a relapse, and has been under medical treatment ever since, and is now forced to go to Sydney for further advice.

I may mention that two of my sons, named respectively James and Edward, are selectors in the Tweed District, and are at present felling timber, and of course I concluded that an accident had happened one of them.

I waited a considerable time for an apology to be made by the telegraph officer, Yamba, for the gross negligence displayed, but as no action was taken by that officer I wrote asking for expenses incurred by me in consequence of the mistake (I enclose copy), and received reply (copy of which I forward) a short note asking for amount of expense claimed by me in detail, but gives no answer as to whether these expenses will or will not be paid. Trusting you will give the matter your fair consideration, and will take such action as will lead to my being reimbursed for loss sustained.

I am, &c.,

EDWARD W. BLAKENEY.

Telegram from J. Hindmarsh to W. Blakeney.

Murwillumbah, 22 June, 1884.

JAMES very ill, would like to see you.

Mrs. E. H. Pegus to Mr. Blakeney.

Dear Mr. Blakeney,

The telegram sent over to you this afternoon, was for Mr. Black; please return the same to me.

Yours, &c.,

E. H. PEGUS.

Mr. E. W. Blakeney to Mrs. Pegus.

Dear Madam,

Iluka, 18th July, 1884.

I have been put to a considerable amount of expense through your error in sending me a telegram intended for Mr. W. Black, of Yamba; as this mistake was yours, I beg that you will let me know whether you are prepared to reimburse my outlay.

P.S.—An early reply will oblige.

Yours, &c.,

EDWARD W. BLAKENEY.

Mr. E. H. Pegus to Mr. E. W. Blakeney.

Dear Sir,

Clarence River Heads, 21 July, 1884.

In reply to your note *re* telegram sent to you in error, please let me know the amount of expense you were obliged to incur in this matter in detail.

Yours, &c.,

E. H. PEGUS.

Mr. Wilson for report.—E.C.C., 9/9/84.

Telegram from Manager, Sydney, to Station Mistress, Clarence River Heads.

15/9/84.

EXPLAIN please, how you came to deliver message on 22nd June, last, from Hindmarsh to Blakeney instead of Black.

Telegram from Station Mistress, Clarence River Heads, to Manager, Sydney.

15/9/84.

ON 22nd June, message to Mr. Black I took for Blakeney; instrument was marking very badly on that day. Shortly after sending message out discovered error, and I paid a messenger to go over to rectify the mistake immediately.

Submitted.—W.W., 24/9/84. This mistake was made by Mrs. Pegus, the operator at Clarence River Heads; but shortly after corrected the error which appears to have been too late to prevent Mr. Blakeney starting. She has been severely reprimanded for her carelessness. The Department cannot, of course, recognise any claim for expenses.—E.C.C., 25/9/84.

No. 2.

The Superintendent of Telegraphs, Sydney, to Mr. E. W. Blakeney, Iluka.

Sir,

26 September, 1884.

In acknowledging the receipt of your communication of the 8th ultimo, I have the honor to inform you that, upon inquiry, I find that the error in address of telegram, delivered in mistake to yourself, was caused by the Station-mistress at Clarence River Heads, and that upon discovering it, she immediately forwarded a message stating the case. I need hardly say I regret very much the annoyance and inconvenience to which you have been subjected, and in consequence the officer in fault has been severely censured; at the same time I beg to state that your claim for reimbursement of expense cannot be recognized by the department.

I have, &c.,

E. C. CRACKNELL.

No. 3.

No. 3.

The Acting Superintendent of Telegraphs to The Secretary to the Post Office.

(Urgent.)

3/2/85.

THE Station-mistress at Clarence River Heads (Mrs. Pegus) reports to me that Mr. Blakeney of Clarence River has served her with a summons claiming compensation (£200), on account of a telegram sent him in error on the 23rd June, 1884, and the case is to be proceeded with on the 13th instant. I beg to submit the matter for the information of the Postmaster-General, and to suggest that the opinion of Crown Solicitor be requested. Mrs. Pegus wishes to be advised whether she is at liberty to retain a solicitor to defend the case on behalf of the Crown.

Annexed are telegrams and letter from Mrs. Pegus.

P. B. WALKER.

Telegram from Mrs. Pegus to The Acting Superintendent of Telegraphs.

Yamba, 2/2/85.

MR. Blakeney has brought an action against me for £200, *re* telegram sent him in error 23rd June last, will be brought on 13th instant, bringing it as a test case. Kindly wire me instructions how to act in the matter.

Telegram from The Assistant Superintendent of Telegraphs to Mrs. Pegus, Yamba.

Sydney, 2/2/85.

I will submit the matter to the Postmaster-General, and let you know as soon as he sanctions matter.

P. B. W.

No. 4.

The Crown Solicitor, Sydney, to The Secretary to The Post Office.

Sir,

5 February, 1885.

I have the honor to return herewith the papers, received this morning, respecting the action brought against Mrs. Pegus, the telegraph Station-mistress at Clarence River Heads, and to state that, as it appears the case is to be tried on the 13th instant, there is not time to obtain the precise information which is required from Mrs. Pegus before the trial. I therefore beg to suggest that Mrs. Pegus should be informed that she may employ a local solicitor to defend the case on her behalf.

I have, &c.,

JOHN WILLIAMS.

No. 5.

Telegram from The Acting Superintendent of Telegraphs, to Mrs. Pegus, Yamba.

7 February, 1885.

You can employ a local solicitor. Do you require the papers? if so let me know in order that they can be returned to you by Monday's steamer.

No. 6.

Mrs. E. H. Pegus, Maclean, to The Acting Superintendent of Telegraphs.

Sir,

14 February, 1885.

In accordance with your telegram of the 7th instant, I retained Mr. R. L. Jenkins, a solicitor at Maclean, to conduct my defence in the action brought by W. Blakeney to recover damages, £200, from me for sending to him a telegram, which should have been sent to Mr. Black; the case was tried on the 13th inst., before Judge Murray, and a jury of four, at the Maclean District Court; the jury returned a verdict for Blakeney with damages £50. Mr. Fitzhardinge, my barrister, seems to think that I should appeal to the Supreme Court, as by the ruling of the Judge all those in charge of the Telegraph Offices, throughout the Colony may be cast in damages for any mistake, however caused, in sending messages.

Mr. Jenkins is writing to you this mail; will you be pleased to instruct me if I should appeal or take any other steps in the matter; I understand from Mr. Jenkins that notice of appeal must be given at once.

Mr. Fitzhardinge should be in Sydney on Monday, and has expressed his willingness to see you on the matter, if so requested.

I have, &c.,

E. H. PEGUS.

No. 7.

Telegram from Mrs. Pegus, Yamba, to The Acting Superintendent of Telegraphs.

16 February, 1885.

A nonsuit was so fully expected in my case that material evidence for the defence was not called. I sincerely trust you will not allow this matter rest, as it will make all officers in the Department liable, no matter from what cause a mistake may occur.

No. 8.

Mr. Richard Jenkins, Solicitor, Maclean, to The Acting Superintendent of Telegraphs.

Sir,

13 February, 1885.

I have the honor to inform you that in accordance with your telegram of the 7th instant authorizing Mrs. Pegus, the telegraph mistress, at Yamba, Clarence Heads, to employ a local solicitor to conduct the defence in an action brought by Blakeney against her and her husband, to recover damages for the negligent sending of a telegram, I was retained by Mrs. Pegus, and the case was tried by a jury at the Maclean District Court to-day the 13th instant.

I briefed Mr. Fitzhardinge, Crown Prosecutor, to appear for Mr. and Mrs. Pegus, who moved for a nonsuit on the ground that the action ought to have been brought against the Department; but His Honor Judge Murray held that the action was properly brought, and also ruled that Mrs. Pegus was liable, if the jury found negligence; and further that the defendants were liable for any amount Blakeney had to pay in consequence of any illness caused to his wife through the shock to her feelings upon receiving such a telegram.

The jury found a verdict for the plaintiff, damages £50.

Will you kindly advise me on behalf of Mrs. Pegus if I am to appeal to the Supreme Court against His Honor Judge Murray's ruling on these points.

Be pleased to reply by return mail or by telegram, as the memorandum of appeal must be filed within eight days from to-day.

I have, &c.

RICHARD JENKINS.

Minute of the Acting Superintendent of Telegraphs.

I beg to forward the accompanying letters from Mrs. Pegus and her solicitor in reference to the recent case of Blakeney v. Pegus, by which it will be seen that Mrs. Pegus has been found guilty of neglect in dealing with the telegram, and a verdict of £50 has been awarded by the jury. I have not the depositions before me, but from the tone of Mr. Jenkins' letter, it would appear that the verdict is not in accordance with his views, and he asks for instructions as to whether he should appeal to the Supreme Court to upset the verdict; the appeal will have to be made within the next five days, and as it is a most important case, I would recommend that the Crown Solicitor be instructed to consult with Mr. Crown Prosecutor Fitzhardinge, who acted as Counsel in the case, and advise what course should be taken.

P. B. WALKER,

16/2/85.

The Secretary to the Post Office. Perhaps the Crown Solicitor will be good enough to confer with the Crown Prosecutor, and advise as suggested,—S.H.L., B.C., 17/2/85.

No. 9.

Telegram from The Acting Superintendent of Telegraphs to Mrs. Pegus, Yamba.

17 February, 1885.

You had better appeal and give Mr. Jenkins instructions to do so at once, as he says this must be done to-day.

No. 10.

The Crown Solicitor to The Secretary to the Post Office.

Sir,

17 February, 1885.

I have the honor to return the papers relating to the action in the District Court at Grafton, Blakeney v. Pegus and another, and to state that I think it is clear that the Department is not liable, and that so far the Judge's ruling cannot be objected to; it may however, be doubted whether an action will lie against the defendant as whatever contract was entered into by the plaintiffs was with the Department, and not with the defendant personally, and on this ground probably an appeal may be made. The fact that a nonsuit was so confidently expected is no ground for applying to the Supreme Court, nor even for asking the Judge for a new trial. The defendant had the opportunity of calling witnesses, but did not think fit so to do; the fact that evidence, which might have been given, was not given, is owing to the deliberate action of the defendant. It is suggested that it is important that this judgment should be appealed against, as it establishes a precedent that officers of the Department are personally liable, this no doubt is so, but not if it is on the ground that the Department is liable. If it is admitted that the Department is liable for the neglect of a careless or incompetent officer, you may be called upon to pay heavy damages without probably being able to procure the evidence for the defence, which the postmaster, if personally sued would do.

Mr. Jenkins, in his letter of date 13th February instant, thinks the Judge's ruling should be objected to, on the ground that he held that the action should have been against the Department; I think the defence should have been that neither the Department nor the defendant was liable, and that damages might be given for the amount Blakeney had to pay in consequence of the illness caused to his wife through the shock to her feelings.

On the first point, I have before advised; as to the second, it would I think, be held that such damage did not of necessity, nor naturally arise from the defendant's action in the matter, and therefore, even if there is liability, it is not for such damage. Whether it is expedient to appeal however, is I submit, for the decision of the Hon. The Postmaster-General; if an appeal is made I would suggest that it can only be allowed on the ground that neither the Department nor the defendant was liable, and not as suggested, that the Department and not the defendant should have been sued.

I have, &c.,

J. WILLIAMS.

Submitted.—S. H. L., 19/2/85. The necessary steps for an appeal ought certainly to be taken on the grounds set out in the Crown Solicitors letter.—J. N., 19/2/85. The Crown Solicitor.—B. C., 19/2/85. Urgent.

No. 11.

The Crown Solicitor to The Secretary to the Post Office.

Sir,

20 February, 1885.

I have the honor to return the papers relating to the action Blakeney v. Pegus, and to state that the necessary steps to appeal to the Supreme Court must be taken by Mrs. Pegus's attorney, and that he should be so informed in reply to his letter of date 13th inst., to the Acting Superintendent of Telegraphs.

I have, &c.,

J. WILLIAMS.

Inform at once.—S.H.L., 20/2/85. Sent by telegraph.—E.A.O., 20/2/85.

5

No. 12.

Telegram from The Secretary to the Post Office to Mr. Richard Jenkins, Solicitor, Maclean.

20 February, 1885.

WITH reference to your communication of the 13th instant, addressed to the Superintendent of Electric Telegraphs, relative to the action, *Blakeney v. Pegus*, I am directed to inform you that the matter has been referred to the Crown Solicitor, a copy of whose reply I enclose herewith for your information; and I am to request that you will be so good as to take the necessary steps for an appeal to the Supreme Court on the grounds set out in the Crown Solicitor's letter.

S. H. LAMBTON.

(NOTE.—For copy of Crown Solicitor's letter see No. 11.)

No. 13.

Telegram from Mr. R. Jenkins, Solicitor, Maclean, to The Secretary to the Post Office.

23 February, 1885.

BLAKENEY v. Pegus.—Motion for rule *nisi* has been postponed till Friday. Please have copy of Crown Solicitor's last minute on the case forwarded to G. H. Fitzhardinge, Barrister, 79 Elizabeth-street, at once, when the grounds for appeal can be made.

Let this be done at once.—S.H.L., 24/2/85.

No. 14.

The Secretary to the Post Office to Mr. G. H. Fitzhardinge, Barrister, Sydney.

Sir,

24 February, 1885.

At the request of Mr. R. Jenkins, Solicitor, Rocky Mouth, I have the honor to forward to you a copy of the Crown Solicitor's minute in the case *Blakeney v. Pegus*.

I have, &c.,

S. H. LAMBTON.

(NOTE.—For copy see No. 10.)

No. 15.

Mrs. E. H. Pegus, Yamba, to The Acting Superintendent of Telegraphs.

Sir,

24 February, 1885.

I beg to enclose three copies of telegrams that passed through my office to Mrs. Blakeney, which would tend to upset her much more than the one that her husband received from Mr. Hindmarsh. I sent them to show you that there was no shock caused by them, and I consider it a perfect fraud and try-on to extort money. Dr. Crabbe, of Rocky Mouth, maintains that Mrs. Blakeney was a patient of his at the time, and did not go or send to him; and if she had received a shock she would have required immediate medical attention and special medicine in her complaint.

I have, &c.,

E. H. PEGUS.

Telegram from G. Goldie to Mrs. Blakeney.

Rocky Mount, 10/6/84.

YOUR brother James dangerously ill.

Telegram from J. J. Leslie to Mrs. E. W. Blakeney.

Camperdown, 10/6/84.

CHANGE for the worst. Will wire in the morning.

Telegram from J. J. Leslie to Mrs. E. W. Blakeney.

Camperdown, 10/6/84.

No hopes.

Place with other papers in Blakeney's case.—P.B.W., 27/2/85.

No. 16.

Mr. E. T. Newell, Solicitor, Sydney, to The Secretary to the Post Office.

Blakeney v. Pegus and Wife.

Sir,

Waterloo Chambers, 458 George-street, 6 May, 1885.

Owing to a decision of the full Court (Supreme Court) a few days since, it has been rendered necessary that the defendants herein should have deposited with the Registrar of the District Court, Maclean, the amount of verdict and costs, with £30 to answer costs of appeal as a condition precedent to the rule *nisi* for new trial being made absolute. This has not been done, and as I understand, the circumstances of this case are such that if a new trial should be refused the Telegraph Department would pay the amount of verdict and costs, will you kindly inform me whether the department will, in order to get over the difficulty the defendants have been placed in by the money not having been deposited, and my inability to communicate with them before the motion is made, guarantee payment of amount of verdict and costs, including costs of appeal, in case the Court should refuse to grant a new trial, which is not at all likely, as the motion may be made to-day? Will you please let me have an immediate reply?

I have, &c.

E. T. NEWELL.

Write a reply in the affirmative, and send down to me at once.—S.H.L., 6/5/85. Approved.—J.N., 6/5/85.

No. 17.

No. 17.

The Secretary to the Post Office, to Mr. E. T. Newell, Solicitor, Sydney.

Sir,

6 May, 1885.

In reply to your letter of to-day's date, I am directed to inform you that the Postmaster-General agrees to the payment of the amount of verdict and costs, including costs of appeal in the case of *Blakeney v Pegus* and wife, should the Supreme Court refuse to grant a new trial.

I have, &c.,
S. H. LAMBTON.

No. 18.

Telegram from Mrs. E. H. Pegus, Yamba, to The Acting Superintendent of Telegraphs.

6 May, 1885.

MR. JENKINS, Solicitor, communicated the following to me last night at 9 p.m.:—Got telegram to-day from Sydney solicitor, says the Supreme Court ruled yesterday in an appeal case, that the amount of verdict and costs obtained in the District Court must be lodged with the Registrar of Court, in addition to £30 to abide result of appeal before it could be heard in the Supreme Court. That means that the amount of verdict, £50, costs, £31 1s. 4d, and £30 to abide result of appeal must be paid to the Clerk of Petty Sessions here at once, or else the case will be struck out and quashed; Blakeney's Solicitor, has found out that this has not been done here, and no one knew that it was necessary until at the appeal case yesterday. Mr. Jenkins has to make affidavit by to-morrow,—Wednesday's boat that the money is deposited or else the plaintiff will get a nonsuit—that is, the case will be struck out and not heard. The question is how to get the money up here in time; there is no time to apply to the Government. Mr. Jenkins' Sydney Solicitor wired him "get this deposited at once and wire him back and he would then have case postponed till his affidavit arrived on Friday." Mr. Jenkins wired me this morning that he had obtained the loan of amount. It is very urgent that the money be paid back to Mr. Jenkins by Thursday; would you kindly have the money sent to Mr. Jenkins at once by telegraph, as he states he must have the money by to-morrow.

E. H. PEGUS.

No. 19.

Telegram from Mr. Richard Jenkins, Solicitor, Maclean, to The Acting Superintendent of Telegraphs.

6 May, 1885.

BLAKENEY *v* Pegus and wife.—The Supreme Court ruled in an appeal case, day before yesterday, that before an appeal could be heard the amount of judgment obtained in the District Court together with £30 in addition to such amount to answer the costs of the appeal would have to be lodged with Registrar, District Court. I must request you to kindly remit me the sum of £111 1s. 4d., to lodge with Registrar, District Court here, being amount of judgment £81 1s. 4d., together with £30, as I have paid same out of my own pocket to avoid appeal being struck out of the business paper; reply at once.

RICHARD JENKINS.

This is an urgent case and the Crown Solicitor should be directed to have the amount required, £111 1s. 4d., paid over to Mr. Jenkins at once, as he appears to have paid it out of his own pocket.—P.B.W., 6/5/85. The Secretary to the Post Office.—B.C., Urgent. Submitted.—S.H.L., 7/5/85.

No. 20.

Minute of The Postmaster-General on extract from *Evening News*, 12/5/85.

IF, through negligence of the solicitor for Mrs. Pegus, the proper steps for an appeal have not been taken, it is clear that I cannot sanction the repayment to him of the money paid into Court. I think the judgment would have certainly been set aside by the full Court, for I cannot conceive on what grounds the defendant was liable, and if she was, the damages awarded are excessive.—J.N., 14/5/85.

Acting Superintendent, Telegraphs.—B.C., 15/5/85., Jas. D., (*pro* Secretary). I presume Mr. Jenkins is to be advised in terms of the Postmaster-General's minute, or should the matter be held over till we receive an official intimation from him giving the result of the appeal? Perhaps it would be as well to adopt the latter course in order that Mr. Jenkins may have an opportunity of explaining why action was not taken in time.—P.B.W., 18/5/85.

The Secretary to the Post Office.—B.C. Submitted.—S.H.L., 19/5/85. Nothing need be done at present. If Mr. Jenkins should make any application the matter can then be considered.—J.N. 19/5/85. Acting Superintendent of Telegraphs.—S.H.L., B.C., 20/5/85.

No. 21.

Mr. Richard Jenkins, Solicitor, Maclean, to The Acting Superintendent of Telegraphs.

Pegus v. Blakeney.

Sir,

20 May, 1885.

I have the honor to inform you that the above named action came on in the Supreme Court, before the full Court on Wednesday last, 13th inst., in the nature of a District Court appeal.

Mr. M. H. Stephen, Q.C., and Mr. G. B. Simpson were retained by me on behalf of the appellants, Mr. and Mrs. Pegus, to move to make absolute the order *nisi* granted herein on the following grounds: 1st. That His Honor Mr. District Court Judge Murray, was wrong in not nonsuiting the plaintiff in the action on the ground that the same was not maintainable. 2nd. That no cause of action was made out. 3rd. That His Honor Mr. District Court Judge Murray wrongly admitted certain evidence.

Mr.

Mr. Salomons, Q.C., who appeared in conjunction with Mr. O'Ryan for the respondent in the appeal case, raised a preliminary objection that a Judge in Chambers had no jurisdiction to grant the order *nisi*, and this being so, that the same must be discharged.

The Full Court upheld the objection raised, and discharged the order *nisi*, but without granting the respondent his costs of the appeal. I regret the result exceedingly, as counsel for the appellants were confident of success, had the matter been argued upon its merits.

I may respectfully invite your attention to a very clear report of this appeal case published in the *Sydney Morning Herald* newspaper of the 14th inst.

I have, &c.,

RICHARD JENKINS.

It would appear from Mr. Jenkins' explanation of this case, that he is not to blame for the case being quashed, and I do not see what further can be done in the matter. Mr. Jenkins appears to have borne all the costs of the appeal to no purpose, and as he has shown clearly that he is not to blame he should be reimbursed.—P.B.W., 26/5/85. The Secretary to the Post Office.

Submitted.—S.H.L., 27/5/85. Mr. Jenkins has not shown that he is not to blame. Nothing can be done till we know more about the matter, which will probably not be till the hearing of the rule *nisi*, which appears to have been granted on 22/5/85.—J.N., 1/6/85. Read. Inform Mr. Jenkins of Postmaster-General's decision.—P.B.W., 2/6/85.

No. 22.

The Acting Superintendent of Telegraphs, to Mr. R. Jenkins, Solicitor, Maclean.

Sir,

3 June, 1885.

In acknowledging the receipt of your letter of the 20th ultimo, in reference to the action, *Pegus v. Blakeney*, I have the honor to inform you by direction of the Postmaster-General that nothing further can be done by the Government in the matter until the result of the hearing of the rule *nisi*, which has been granted, is received.

I have, &c.,

P. B. WALKER.

No. 23.

Mr. Richard Jenkins, Solicitor, Maclean, to The Secretary to the Post Office.

Pegus and Wife v. Blakeney.

Sir,

5 June, 1885.

I have the honor to inform you that a rule *nisi* for a nonsuit or a new trial has been granted by the Supreme Court in this matter, and will come on for argument next term, which commences 27th July next.

As I have paid the sum of £111 1s. 4d. into the District Court here by way of a deposit, pursuant to the 94th section of the District Courts Act, and can ill afford to wait until this action is finally disposed of, may I respectfully request that the said amount, £111 1s. 4d. be paid to me as early as possible. It is made up as follows:—

Verdict obtained by Plaintiff in District Court here	...	...	£50	0	0
Plaintiff's taxed costs	...	...	31	1	4
Costs to abide results of Appeal	...	...	30	0	0
Total	...	...	£111	1	4

I have, &c.,

RICHD. JENKINS.

Submitted.—S.H.L., 8/6/85.

Let Crown Solicitor be asked to advise whether we ought to pay the amount claimed, or any of it. From what I can see there may have been a great deal of bungling about the case, and there is quite a possibility of the rule *nisi* being discharged in consequence, the result of which would be that the money paid into Court would be entirely thrown away, and the objectionable judgment would stand.

J.N., 9/6/85.

No. 24.

The Secretary to the Post Office, to The Crown Solicitor.

Sir,

13 June, 1885.

I am directed by the Postmaster-General to transmit herewith the papers in the case of *Blakeney v. Pegus*, amongst which is an application from Mrs. Pegus's attorney, Mr. Richard Jenkins, for the sum of £111 1s. 4d., which he has paid into Court under the District Courts Act to be paid to him as soon as possible by this Department. I am accordingly, to request that you will be good enough to state whether, under the circumstances of the case, this Department would be justified in paying this amount, or any part thereof.

I have, &c.,

S. H. LAMBTON.

No. 25.

The Crown Solicitor, to The Acting Superintendent of Telegraphs.

17 September, 1885.

I have the honor to return herewith the papers relating to the case, *Blakeney v. Pegus*, and in reply to your letter of date 13th June last, asking me to advise whether under the circumstances of the case your Department would be justified in paying the amount, or any part thereof, to state that I think, under the very peculiar circumstances of the case, the cost of the defence should be borne by the Department.

No

No doubt Mrs. Pegus has been guilty of a certain amount of negligence in forwarding a telegram addressed to William Black, to William Blakeney, but the punishment of compelling her to bear the costs of the action, considering the extraordinary course the proceedings have taken, would be out of all proportion to her offence. I think, upon the appeal to the Supreme Court, the verdict given in the District Court will be set aside, and that it is probable therefore, that all the defendant will have to pay will be certain portions of the costs incurred by her in defending the action; but if such should be the case the costs will amount to a considerable sum.

The defendant being dissatisfied with the ruling of the Judge of the District Court, made application to the Supreme Court within the proper time for a rule *nisi*. This application was initiated in due time; but a copy of the Judge's notes, upon which the motion had to be grounded, had not been obtained. The usual practice in such a case is to mention the matter to the Court, and to request that the application should be considered as commenced, and that time be allowed to procure the Judge's notes. This I am told was done, but the Court suggested that the application should be proceeded with, which was done, and the rule *nisi* granted, upon motion, however, made to make the rule absolute; the objection was taken that the motion for the rule *nisi* was not grounded on the Judge's notes, and the rule *nisi* was discharged.

The matter has since been brought under the consideration of the Court, and now awaits judgment. It will be seen therefore, that a very large proportion of the costs which the defendant will have to pay do not arise directly from her mistake with respect to the telegram.

It appears from Mr. Jenkins' letter of date 5th June last, that the defendant has had to pay £111 1s. 4d., into Court; in the event however, of her succeeding in the appeal, this sum will be repaid to her, and it cannot therefore be regarded as a disbursement made by her.

I beg to suggest that a reasonable advance be made to Mr. Jenkins for counsels' fees, &c., in the defence, and that upon its being ascertained what amount these proceedings have cost Mrs. Pegus it shall be paid; but I do not think I can recommend that the £111 1s. 4d., paid into court by her to abide the appeal, should be now paid.

Mr. Jenkins states in his letter that *he* can ill-afford to wait until the action is finally disposed of, for the repayment of this sum; but this must be a mistake. The £111 1s. 4d. has no doubt been advanced by Mrs. Pegus, and not by Mr. Jenkins.

I have, &c.,
J. WILLIAMS.

With reference to last sentence of this letter I may perhaps state, that the sum in question was paid by Mr. Jenkins, and not by Mrs. Pegus. Mr. Jenkins undertakes, in the event of the appeal being successful, to refund the amount, should his application for its payment to him now be acceded to. As it was on this application from Mr. Jenkins that the Pm.-G. desired the Crown Solicitor's advice; the information now furnished may perhaps enable Mr. Williams to advise further.—S.H.L., B. C., 19/9/85.

No. 26.

The Crown Solicitor to The Secretary to the Post Office.

Sir,

24 September, 1885.

I have the honor to return herewith the papers relating to the action, *Blakeney v. Pegus*, and in reply to your minute of date 19/9/85, to state that, if as stated by Mr. Jenkins—and I have no reason to doubt his statement—he has advanced the amount paid into Court to enable the appeal to be carried on, I think the amount should be paid to him, upon his handing to you an order or authority in such a form as will enable you to receive the amount lodged in Court, in the event of the appeal being successful; this is of course upon the supposition that you intend to indemnify Mr. and Mrs. Pegus from the result of the action.

I have, &c.,
J. WILLIAMS.

Submitted.—J.A.S. D., 25/9/85. The amount may be paid, taking the precautions suggested by the Crown Solicitor.—J.N., 7/10/85. Acting Superintendent of Telegraphs. Urgent.—S.H.L., 7/10/85. Accountant to see this done at once.—P.B.W., 7/10/85. Vouchers herewith; a letter should, I think, be written to Mr. Jenkins for his authority.—C.S.G., 9/10/85. I think the Registrar of District Court, Maclean, should be informed that we hold the authority.—C.S.G., 23/10/85. Yes, this may be done, and a copy of the authority sent for his information.—P.B.W., 23/10/85.

No. 27.

Mr. Richard Jenkins, Solicitor, Sydney, to The Registrar, District Court, Maclean.

Pegus v. Blakeney.

I, THE undersigned, as solicitor for Mr. and Mrs. Pegus do hereby authorize you to pay to the Acting Superintendent of Telegraphs, the sum of £111 1s. 4d., paid into the District Court at Maclean, by me as a deposit to abide the result of an appeal in the abovenamed action, should the said appeal result in favour of Mr. and Mrs. Pegus.

Dated this 12th day of October, A.D., 1885.

RICHARD JENKINS,
Solicitor for Mr. and Mrs. Pegus,
Victoria Chambers, Phillip-street,
Sydney.

Approved.—P.B.W., 12/10/85.

No. 28.

The Acting Superintendent of Telegraphs to The Registrar of the District Court, Maclean.

Sir,

27 October, 1885.

I have the honor to forward herewith copy of authority handed to this Department by Mr. Jenkins, Solicitor, for Mr. and Mrs. Pegus, in the action *Blackeney v. Pegus*, for the Government to receive the amount lodged in Court, in the event of the appeal in the case being successful; and I shall be glad if you will cause same to be noted.

I have, &c.,

P. B. WALKER.

(NOTE.—For copy of authority mentioned see No. 27.)

No. 29.

Mr. Richard Jenkins, Solicitor, Sydney, to The Acting Superintendent of Telegraphs.

Re Pegus and wife v. Blakeney.

Sir,

29 October, 1885.

I have the honor to inform you that this matter came on yesterday, in the Supreme Court, before the full Court, in the nature of an appeal from a decision of Mr. District Court Judge Murray, given at the Maclean District Court in February last, and resulted in the Court unanimously ordering the verdict found in the said District Court for the plaintiff (*Blakeney*) to be set aside, and to be entered for the defendants (*Pegus and wife*); and it was further ordered by the Court that each party pay their own costs, both in the District Court, Maclean, and the Supreme Court. I beg most respectfully to invite your attention to a full report of the appeal as heard and decided, which you will find published in the *Sydney Morning Herald* of to-day's date.

I have, &c.,

RICHD. JENKINS.

No. 30.

The Registrar of the District Court, Maclean, to The Acting Superintendent of Telegraphs.

Sir,

27 November, 1885.

I have the honor to enclose herewith a cheque for the sum of £111 1s. 4d., being amount of verdict, costs, and security for appeal in the case *Blakeney v. Pegus and wife*. I also enclose receipt for same; and I shall feel obliged if you will kindly sign it and return to me at your earliest convenience.

J. M'KENSEY.

Acknowledge. Attach former papers. This may now be settled.—P.B.W., 30/11/85.

No. 31.

The Acting Superintendent of Telegraphs to The Registrar of the District Court, Maclean.

Sir,

2 December, 1885.

I have the honor to acknowledge the receipt of your communication of the 27th ultimo, enclosing cheque for £111 1s. 4d., amount of verdict, cost, and security, for appeal in the case of *Blakeney and wife v. Pegus and wife*, and I forward herewith receipt for same.

I have, &c.,

P. B. WALKER.

No. 32.

Mr. Richard Jenkins, Solicitor, Sydney, to The Acting Superintendent of Telegraphs.

Re Pegus et uxor v. Blakeney.

Sir,

Waterloo Chamber, George-street, Sydney, 18 November, 1885.

I have the honor to forward you herewith my bill of costs herein amounting to £158 8s., and would respectfully request payment of same at your earliest convenience.

I have, &c.,

RICHD. JENKINS.

The Acting Superintendent of Telegraphs, Dr. to Richard Jenkins, Attorney, &c.

£	s.	d.		£	s.	d.
			Instructions to defend	0	13	4
			Drawing and copy telegram to G. H. Fitzhardinge, Esq., Richmond River, to know if he would accept retainer in action and attending Telegraph Office therewith	0	4	4
			Paid for same	0	1	8
			Perusing reply that he accepted thereof and paid for same	0	1	0
			Attending Maclean District Court for copy of jury panel	0	6	8
			Attending Maclean District Court for two subpoenas and paid	0	8	8
			Copy and service	0	4	0
0	7	6	Paid Bailiff's fee for service of subpoenas on Mrs. Graham, Iluka, distant from Maclean District Court fifteen miles	0	15	0
0	3	6	Paid Bailiff's fee for subpoena on Mr. Bondfield, Palmer's Island, distance from Maclean District Court seven miles	0	7	0
			Examining and taking the minutes of evidence of four witnesses	0	12	0
4	4	0	Instructions for drawing and copying brief and attending Mr. G. H. Fitzhardinge therewith	7	7	0
1	1	0	Attending Mr. G. H. Fitzhardinge and witnesses in consultation	1	1	0
			Paid Mr. G. H. Fitzhardinge his fee (jury case)	8	8	0
1	1	0	Attending court with Counsel on hearing when verdict found for plaintiff damages £50	3	3	0
			Attending Court subsequently with Counsel applying for stay of execution for fourteen days to enable me to appeal	0	13	4
			Letter to Acting Superintendent of Telegraphs notifying result of action and to know if I should appeal against decision of Mr. District Court Judge Murray	0	5	2
			Drawing and copying telegram to Acting Superintendent of Telegraphs to wire me if I should appeal, and attending Telegraph Office therewith	0	4	4
			Paid for same	0	2	11
			Perusing reply by telegram from Acting Superintendent of Telegraphs that Mr. Pegus had been communicated with to give me necessary instructions to appeal	0	3	4
			Perusing telegram from Mr. Pegus to prosecute appeal	0	3	4
0	6	8	Attending taxation of plaintiff's costs	0	13	4

Costs of Appeal, Supreme Court.

£ s. d.		£ s. d.
	Instructions for appeal	0 6 8
	Requisition to Registrar, Maclean District Court, for copy of Judge's notes, and attending him therewith	0 6 8
	Drawing and copying affidavit of Richard Jenkins in support of motion for rule nisi	0 8 0
	Attending to swear and paid	0 5 4
0 5 2	Letter to Sydney agent therewith, and with instructions to hand same to Mr G H Fitzhardinge to move for rule nisi	0 5 2
	Agent attending on Counsel with affidavit instructing him to move	0 6 8
	Drawing and copy of telegram to Mr G H Fitzhardinge, informing him affidavit forwarded and attending Telegraph Office therewith	0 4 4
	Paid for same	0 2 0
0 3 4	Perusing telegram from Secretary, General Post Office, containing copy of letter from Crown Solicitor, and requesting me to be so guided as to take necessary steps for an appeal to Supreme Court on the ground set out in the Crown Solicitor's letter	0 6 8
	Filing affidavit of Richard Jenkins, and paid	0 4 4
0 7 8	Instructions for Brief	1 1 0
	Attending Counsel therewith	0 6 8
	Paid his fee and clerk	3 5 6
	Drawing and copying telegram in reference to Judge's notes, and attending office therewith	0 3 4
	Paid	0 1 0
	Attending Counsel in reference to motion for rule nisi	0 6 8
	Drawing and copying telegram to Judge Murray in reference to his notes, and attending Telegraph Office therewith	0 4 4
	Paid	0 1 0
	Instructions for affidavit of E T Newell in support of adjournment of motion	0 6 8
0 3 0	Drawing and fair copy	0 8 0
	Attending to be sworn and paid	0 4 10
0 6 8	Attending Counsel therewith	0 6 8
	Filing affidavit and paid	0 4 4
	Attending Court with Counsel matter adjourned for a week	0 13 4
	Drawing and copy long telegram to agent for full information as to motion for rule nisi, and to see Secretary, General Post Office, thereon, and attending Telegraph Office therewith	0 6 4
	Paid for same	0 7 1
	Perusing letter from Mr G H Fitzhardinge, Counsel to forward him his brief upon the trial of District Court Action, and all papers and exhibits	0 3 4
0 3 4	Perusing telegram from agent that matter postponed for a week, and to send him copy Judge's notes	0 3 4
0 1 0	Paid for same	0 1 0
	Attending Registrar, Maclean District Court, for Judge's notes, when informed same not yet received from the Judge	0 3 4
0 4 4	Drawing and copy telegram to agent to find out where Judge Murray was staying and to get notes from him before he posted same to Registrar, Maclean District Court, and attending office therewith	0 4 4
0 2 6	Paid for same	0 2 6
	Drawing and copy telegram to Counsel informing him that Secretary General Post Office desired me to appeal to Supreme Court upon ground suggested by Crown Solicitor, and intimating that I had wired agent to get Judge's notes, and that I had also wired to Secretary General Post Office to forward him Crown Solicitor's minute and suggesting Counsel might see Crown Solicitor after perusing same, and attending Telegraph Office therewith	0 6 4
	Paid for same	0 4 0
	Drawing and copy telegram to Secretary General Post Office to forward Crown Solicitor's minute to Counsel, and attending Telegraph Office therewith	0 4 4
0 13 4	Long letter to agent forwarding all documents and papers relative to matter	0 13 4
0 6 4	Drawing and copy telegram to agent as to Judge's notes, and if they were required upon motion to morrow (27 February, 1885), to get Counsel to apply for adjournment of matter, and attending Telegraph Office therewith	0 6 4
0 3 4	Paid for same	0 3 4
0 4 4	Drawing and copy telegram of a like nature to Counsel	0 4 4
0 3 5	Paid for same	0 3 5
	Attending Court with Counsel, matter adjourned to 6 March, and to be then made to a Judge in Chambers	0 13 4
0 3 4	Agent telegram informing me that application adjourned until next Friday (6 March), with a stay of proceedings	0 3 4
0 1 6	Paid for same	0 1 6
	Letter to respondent's solicitor informing him especially as to stay of proceedings being granted	0 5 2
	Attending Registrar, Maclean District Court, for Judge's notes and obtaining his certificate thereto	0 6 8
0 11 8	Paid for same (7 brief sheets)	1 15 0
0 5 2	Letter to agent forwarding same	0 5 2
0 3 0	Drawing and copy affidavit of E T Newell identifying same	0 8 0
	Attending to sworn and paid	0 4 10
	Attending filing and paid	0 4 4
0 3 4	Filing Judge's notes	0 3 4
0 3 4	Attending bespeaking copy	0 3 4
0 17 6	Paid for same	0 17 6
	Attending Counsel with same	0 6 8
	Attending Chambers with Counsel, rule nisi granted	0 13 4
0 3 4	Agent's telegram to me that rule nisi granted returnable first day of next term	0 3 4
0 1 1	Paid for same	0 1 1
0 3 4	Drawing and copy telegram to agent to send me rule nisi for service, and attending Telegraph office therewith	0 3 4
0 3 3	Paid for same	0 3 3
0 5 2	Letter to Agent thereon	0 5 2
0 1 0	Drawing and fair copy order nisi	0 6 0
	Attending Counsel therewith to settle	0 6 8
	Paid his fee and clerk	1 3 6
	Attending Judge for signature	0 6 8
0 7 0	Copy to file, filing, and paid	0 11 4
0 1 0	Copy for country	0 2 0
	Copy and service on respondent's attorney	0 5 4
	The like on Registrar, Maclean District Court	0 5 4
0 8 0	Drawing and fair copy affidavit of service	0 8 0
0 5 10	Attending to be sworn and paid	0 5 10
0 4 4	Filing and paid	0 4 4
	Attending	0 4 4

£ s. d.		£ s. d.
0 6 8	Attending Counsel in reference to security being given	0 6 8
0 3 4	Agent's telegram to me that security must be given to Registrar, Maclean District Court or deposit made	0 3 4
0 1 6	Paid for same	0 1 6
0 3 4	Drawing and copy telegram in reply that no occasion for same and to look at 44 Vict. No. 30, and attending Telegraph Office therewith	0 3 4
0 5 2	Paid for same	0 5 2
0 6 8	Attending Counsel thereon, who advised that same must be given.....	0 6 8
0 3 4	Further telegram from Agent that counsel advised security must be given or deposit made.....	0 3 4
0 1 0	Paid for same	0 1 0
	Drawing and copy telegram to Mr. Pegus to know if he would guarantee payment to me of amount required to deposit with Registrar, Maclean District Court, £111 ls. 4d., and attending Telegraph Office therewith.....	0 4 4
	Perusing telegram in reply from Mr. Pegus that it would be forwarded without fail	0 3 4
	Attending Crown Solicitor as to giving security	0 6 8
	Attending Secretary General Post Office thereon	0 6 8
0 8 4	Letter to Secretary, General Post Office, as to security being required and attending to deliver same	0 8 4
0 6 8	Attending Counsel with reply from Secretary, General Post Office.....	0 6 8
	Attending Registrar, Maclean District Court, handing him my cheque for £111 ls. 4d., amount required for deposit	0 6 8
	Drawing and copy notice of deposit being made and forwarding same to attorney for respondent	0 5 4
0 6 0	Drawing and copy affidavit of Richard Jenkins as to deposit of money with Registrar, Maclean District Court.....	0 6 0
0 5 10	Attending to be sworn and paid	0 5 10
0 5 2	Letter to Agent forwarding same	0 5 2
0 4 4	Drawing and copy telegram to agent that money deposited and affidavit forwarded, attending Telegraph Office therewith	0 4 4
0 2 2	Paid	0 2 2
0 4 4	Filing affidavit of Richard Jenkins, and paid	0 4 4
	Drawing and copy long telegram to Acting Superintendent of Telegraphs, and attending Telegraph Office therewith	0 6 4
	Attending Mr. Pegus explaining why deposit of moneys in hand of Registrar, Maclean District Court was necessary	0 6 8
0 4 4	Agent's telegram as to retaining Mr. Stephen, Q.C., with Mr. Simpson	0 4 4
0 2 0	Paid for same	0 2 0
0 4 4	Drawing and copy telegram to agent in reply to retain Mr. Stephen, Q.C., and attending Telegraph Office therewith	0 4 4
0 1 3	Paid for same	0 1 3
0 4 4	Drawing and copy telegram to agent that if nonsuit granted to get order made for refund money deposited with Registrar, Maclean District Court, and attending Telegraph Office therewith	0 4 4
0 1 0	Paid for same	0 1 0
	Drawing and copy telegram to Acting Superintendent Telegraphs relating to matter, attending Telegraph Office therewith	0 4 4
	Perusing telegram, in reply to mine, from Acting Superintendent of Telegraphs, that my agent advised amount verdict and costs, together with costs of appeal, would be paid by Government	0 3 4
	Drawing and copy telegram to agent that if nonsuit entered get order for costs trial Maclean District Court, costs of appeal, and refund of money deposited, and attending Telegraph Office therewith	0 4 4
	Paid for same	0 1 0
0 5 2	Letter to agent hereon	0 5 2
1 12 6	Instructions for brief to move for rule absolute	0 13 4
	Drawing and fair copy same (20 B sheets)	3 6 8
	Attending Mr. Stephen, Q.C., therewith	0 6 8
	Paid his fee and clerk	7 12 0
	Fair copy second brief (20 Bf sheets)	3 6 8
	Attending Mr. Simpson herewith	0 6 8
	Paid his fee and clerk	7 12 0
	Attending Court case in list from 27th April to 13th May (both days inclusive), when rule discharged without costs	8 13 4
0 4 4	Drawing and copy telegram to agent, to know upon what grounds rule discharged, and attending Telegraph Office therewith	0 4 4
0 1 0	Paid for same	0 1 0
0 4 4	Agent's telegram, in reply to mine, that rule was discharged without costs, upon a preliminary objection that a Judge in Chambers had no jurisdiction to grant the order <i>nisi</i>	0 4 4
0 1 8	Paid for same	0 1 8
	Letter to Mr. Pegus informing him result of appeal	0 5 2
0 5 2	Letter to Acting Superintendent Telegraphs informing him result of appeal	0 5 2
	Perusing telegram from Mr. Pegus, to know if matters were at an end, or if it could not be proceeded with further	0 3 4
	Drawing and copy telegram informing him that I would wire to my agent and ascertain, and attending Telegraph Office therewith.....	0 4 4
0 4 4	Drawing and copy telegram to agent to wire me if appeal could be proceeded with any further, or if virtually at an end, and attending Telegraph Office therewith	0 4 4
0 1 6	Paid for same	0 1 6
	Attending Mr. Stephen, Q.C., in reference to moving for fresh rule <i>nisi</i>	0 6 8
	The like attendance on Mr. Simpson	0 6 8
	Attending Mr. Stephen, Q.C., to appoint consultation with Mr. Simpson	0 6 8
	Attending informing Mr. Simpson thereof	0 6 8
0 7 8	Attending at consultation with Counsel, when it was decided to make fresh application for rule <i>nisi</i>	1 1 0
	Paid Mr. Stephen his fee and clerk	3 5 6
	Paid Mr. Simpson his fee and clerk	2 4 6
	Instructions for brief to move for rule <i>nisi</i>	1 1 0
	Attending Mr. Stephen, Q.C., therewith	0 6 8
	Paid his fee and clerk	4 6 6
0 6 8	Attending Mr. Simpson therewith	0 6 8
	Paid his fee and clerk	3 5 6
	Attending Court with Counsel rule granted by full Court on original adjourned application	0 13 4
0 4 4	Agent's telegram informing me thereof, and to give Registrar, Maclean District Court, notice not to pay money out of Court.....	0 4 4
0 2 6	Paid for same	0 2 6
	Attending giving Registrar Maclean District Court notice thereof	0 6 8
	Drawing	

£	s.	d.		£	s.	d.	
0	4	4	Drawing and copy telegram, to agent to proceed with matter, as Government intended paying all costs in the matter, and to send me rule nisi for service, and attending Telegraph Office therewith.....	0	4	4	
0	3	1	Paid for same.....	0	3	1	
0	1	0	Drawings and copy, rule nisi.....	0	6	0	
0	13	4	Attending Mr. Stephen, Q.C., and Mr. Simpson therewith to settle.....	0	13	4	
			Attending to get same signed and sealed.....	0	6	8	
0	6	0	Copy to file, filing, and paid.....	0	11	4	
			Copy and service.....	0	5	4	
0	5	0	Drawing and copy affidavit of service upon agent for respondent's attorney.....	0	5	0	
0	4	10	Attending to be sworn and paid.....	0	4	10	
			Copy rule nisi for service upon Registrar, Maclean District Court, and attending serving.....	0	5	5	
0	6	0	Drawing and copy affidavit of service, Richard Jenkins, rule nisi, upon Registrar, Maclean District Court.....	0	6	0	
			Attending to be sworn and paid.....	0	4	10	
0	5	2	Letter forwarding to agent.....	0	5	2	
0	4	4	Filing and paid.....	0	4	4	
			Letter to Secretary General Post Office for payment to me of £111 ls. 4d., amount deposited by me, Maclean District Court.....	0	5	2	
			Perusing letter from Acting Superintendent of Telegraphs that nothing further could be done by the Government in the matter until result of the hearing of the rule nisi, which had been granted, was received.....	0	3	4	
0	1	0	Drawing and copy affidavit that money deposited in Maclean District Court still remained in that Court to abide result of appeal.....	0	6	0	
			Attending to be sworn and paid.....	0	5	10	
0	5	2	Letter forwarding to agent.....	0	5	2	
			Filing and paid.....	0	4	4	
1	1	0	Instructions for brief to move for rule absolute.....	1	1	0	
			Attending Mr. Stephen, Q.C., therewith.....	0	6	8	
			Paid his fee and clerk.....	10	15	0	
			Attending Mr. Simpson therewith.....	0	6	8	
			Paid his fee and clerk.....	7	12	0	
			Attending Court matter in list 27th July, 31st July last, and 4th, 7th, 11th, 14th, 18th, 21st, and 28th August last, when same stood over until next term as a remanet.....	6	0	0	
			Numerous attendances on Crown Solicitor and Secretary General Post Office, as to payment to me of £111 ls. 4d., amount deposited in Maclean District Court by me on behalf of the Government, and subsequently attending at Treasury Department, receiving amount, and giving receipt therefor.....	2	2	0	
			Attending to pay Mr. Stephen, Q.C., Registrar's fees.....	0	6	8	
			Paid his fee and clerk.....	3	5	6	
			Attending to pay Mr. Simpson refresher fees.....	0	6	8	
			Paid his fee and clerk.....	2	4	6	
			Attending Court with Counsel matter in list form 26th October until 28th October last, both days inclusive, where rule made absolute verdict to be set aside, entered for defendant, each party to pay his own costs of District Court action and appeal.....	1	10	0	
			Drawing and copy telegram to Mr. Pegus, informing him result of appeal, and attending Telegraph Office therewith.....	0	4	4	
			Paid for same.....	0	1	3	
0	5	2	Letter to Acting Superintendent of Telegraphs, informing him result of appeal.....	0	5	2	
0	5	2	Letter to Mr. Pegus, informing him fully on result of appeal.....	0	5	2	
0	8	0	Drawing and copy rule absolute.....	0	8	0	
			Attending to get stamped and sealed.....	0	6	8	
0	6	0	Copy to file and filing paid.....	0	11	4	
			Copy to serve and serving upon agent for respondent's attorney.....	0	5	4	
			Copy to serve on Registrar, District Court Maclean, and letter forwarding same.....	0	8	2	
			Three term fees.....	3	3	0	
<hr/>				<hr/>			
29	0	3		159	6	0	
<hr/>				<hr/>			
			Attending for appointment to tax, and paid 1s. copy and service.....	0	8	4	
			Attending, taxing, and paid.....	2	2	0	
			Letters, &c.....	1	1	0	
<hr/>				<hr/>			
				162	17	4	
				Taxed off.....	29	0	3
<hr/>				<hr/>			
				Allowed.....	133	17	1
<hr/>				<hr/>			

Allowed at £133 17s. 1d.—FRED. CHAPMAN, Prothonotary, 23/12/85.

The attached amount of Mr. Richard Jenkins for costs in the case of Pegus v. Blakeney has been forwarded me to pass, but, as there are several items in the amount which appear to me have arisen through neglect on Mr. Jenkins' part, I think the papers should be forwarded to the Crown Solicitor with a request that he will look over the account, and state what he considers should be paid.

P. B. WALKER, 30/11/85.

Submitted.—S.H.L., 12/2/85. Approved.—J.S., 3/12/85. The Crown Solicitor.—S.H.L., B.C., 4/12/15.

No. 33.

The Crown Solicitor to The Secretary to the Post Office.

Re Pegus et uxor and Blakeney.

Sir,

7th January, 1886.

I have the honor to return herewith all the papers you sent me with your B.C., 4/12/85, and to state that the bill of costs furnished by Mr. Jenkins has been taxed and allowed at £133 17s. 1d., which amount you may now cause to be paid to Mr. Jenkins at your earliest convenience.

I have, &c.,

JOHN WILLIAMS.

Referred to the Superintendent of Telegraphs.—S.H.L., B.C., 8/1/86. Accountant to make out voucher.—P.B.W., 8/1/86. Voucher to Treasury.—9/1/86.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

REPORT FROM THE SELECT COMMITTEE

ON

CLAIM OF E. BLAKENEY *v.* PEGUS;

TOGETHER WITH THE

PROCEEDINGS OF THE COMMITTEE.

ORDERED BY THE LEGISLATIVE ASSEMBLY TO BE PRINTED,
7 June, 1887.

SYDNEY: CHARLES POTTER, GOVERNMENT PRINTER.

1887.

1887.
(SECOND SESSION.)

EXTRACTS FROM THE VOTES AND PROCEEDINGS OF THE
LEGISLATIVE ASSEMBLY.

VOTES No. 33. TUESDAY, 17 MAY, 1887.

12. CLAIM OF E. BLAKENEY *v.* PEGUS:—Mr. Melville moved, pursuant to Notice (*as amended by consent*),—
- (1.) That a Select Committee be appointed, with power to send for persons and papers, to inquire into and report upon the claim (if any) of E. Blakeney *v.* Pegus.
 - (2.) That such Committee consist of Mr. Roberts, Mr. Henry Clarke, Mr. Chapman, Mr. Dawson, Mr. Teece, Mr. McElhone, Mr. Ewing, Mr. McFarlane, Mr. Ferguson, and the Mover.
 - (3.) That the papers laid upon the Table of this House in reference to this case be referred to such Committee.
- Question put and passed.

VOTES No. 41. TUESDAY, 7 JUNE, 1887.

10. CLAIM OF E. BLAKENEY *v.* PEGUS:—Mr. Melville, as Chairman, brought up the Report from, and laid upon the Table the Minutes of Proceedings of, the Select Committee for whose consideration and report this subject was referred on 17th May, 1887.
- Ordered to be printed.

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1887.

(SECOND SESSION.)

CLAIM OF E. BLAKENEY v. PEGUS.

REPORT.

THE SELECT COMMITTEE of the Legislative Assembly, appointed on the 17th May, 1887,—“*with power to send for persons and papers to inquire into and report upon the claim (if any) of E. Blakeney v. Pegus,*” and to whom was referred on the same day “*the papers in reference to the case,*”—have agreed to the following Report:—

Your Committee having carefully considered the papers referred to them, together with the circumstances surrounding the case, recommend the case of Edward W. Blakeney to the favourable consideration of the Government.

NINIAN MELVILLE,

Chairman.

No. 2 Committee Room,

Sydney, 7th June, 1887.

PROCEEDINGS OF THE COMMITTEE.

WEDNESDAY, 1 JUNE, 1887.

MEMBERS PRESENT :—

Mr. Melville,	|	Mr. McFarlane,
Mr. Roberts,		Mr. Dawson,
	Mr. Ewing.	

Mr. Melville called to the Chair.
 Entry from Votes and Proceedings appointing the Committee, and referring the papers in reference to this case, read by the Clerk.
 Printed copies of the papers *referred* before the Committee.
 Committee deliberated.
 [Adjourned to Friday next at 2:30 o'clock.]

FRIDAY, 3 JUNE, 1887.

MEMBERS PRESENT :—

		Mr. Melville in the Chair.
Mr. Roberts,	|	Mr. Ewing,
Mr. Ferguson,		Mr. Henry Clarke.

Printed copies of the papers *referred* before the Committee.
 Committee deliberated.
 Resolved,—“That the Chairman prepare a draft Report, to be submitted at the next meeting of the Committee.”
 [Adjourned to Tuesday next at 3 o'clock.]

TUESDAY, 7 JUNE, 1887.

MEMBERS PRESENT :—

		Mr. Melville in the Chair.
Mr. Roberts,	|	Mr. Henry Clarke,
Mr. McFarlane,		Mr. McElhone,
	Mr. Ewing.	

Printed copies of the papers *referred* before the Committee.
 The Chairman submitted draft Report, which he read to the Committee.
 Motion made (*Mr. Henry Clarke*), and Question,—“That the Report, as read, be the Report of this Committee.”

Ayes, 4.	Noes, 1.
Mr. Henry Clarke,	Mr. Roberts.
Mr. Ewing,	
Mr. McFarlane,	
Mr. McElhone.	

And so it was resolved in the affirmative.
 Chairman to report to the House.

1887.
(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.
NEW SOUTH WALES.

IRON COLUMNS FOR TELEGRAPH LINES.

(ERECTION OF, IN GEORGE-STREET.)

Ordered by the Legislative Assembly to be printed, 29 June, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 15th June, 1887, That there be laid upon the Table of this House,—

“Copies of all papers, minutes, and other documents, relating to the erection of iron columns and lattice work in George-street for the carriage of telegraph lines, which have been forwarded or received by the Department since the order for the papers, moved for by Mr. John Davies, C.M.G., in connection with this work, on 11th May, 1886, was complied with.”

(*Mr. Wall.*)

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IRON COLUMNS FOR TELEGRAPH LINES.

No. 1.

EXTRACT from the *Sydney Morning Herald*, 15th June, 1886.

THE NEW IRON TELEGRAPH SUPPORTS.

To the Editor of the Herald.

SIR,—Is it too late to usefully protest against the disfigurement of the better parts of our city's street architecture by the extension of the system of uniform cast-iron balustrades, or whatever they should be called, for the support of cabled telegraph wires. Were the taste of its design a little better the work referred to might be considered by many as an improvement on the very heterogeneous style of awning supports to shop fronts, which it supersedes; but I think that no one can see it in front of our leading banks, &c., and of the open space containing the Town Hall and Cathedral without at least regret. A ready means of avoiding such disfigurement has I believe been for years in vogue in Europe, viz., to carry the cabled wires within a hollow iron kerbing substituted for the usual stonework, such receptacle being perhaps also available for minor gas and water pipes. The adoption of such substitute in front of the places referred to, as well as the proposed subways at street crossings, would not involve the waste of any material already supplied or contracted for, and at present the removal of but little already erected would be required. Were the George-street system continued along the west side of Pitt-street the present uninterrupted view of the "Post Office Carvings" might even be lost; surely their admirers would never consent to this.

I am, &c.,
E.W.

Seen.—F.B.S.

No. 2.

Mr. C. Binnie to The Superintendent of Telegraphs.

Dear Sir,

17 June, 1886.

In reply to yours of the 16th instant I must again draw your attention to the fact that the complaint of damage is not against the supports of the friezework, but the supports of the awning.

The frieze needs no support, as is shown by the fact that a line of (say) 200 yards of it stands unsupported by no more than its own fastenings at the foot of the posts in front of the Town Hall.

Yours, &c.,
CHAS. BINNIE.

No. 3.

The Superintendent of Telegraphs to Mr. C. Binnie.

Sir,

21 June, 1886.

In reply to your communication of the 17th instant, I have the honor to inform you that, as the ironwork in question is erected under the power given by the Electric Telegraph Act, you have no claim for compensation for alleged damage to your property.

I have, &c.,
E. C. CRACKNELL.

No. 4.

EXTRACT from *Sydney Morning Herald*, 22nd June, 1886.

THE NEW TELEGRAPH AND TELEPHONE WIRE SUPPORTS.

To the Editor of the Herald.

SIR,—Some people deem it their duty to rush into correspondence with newspapers at every opportunity, and generally write on subjects of which they are totally unacquainted. "E.W's." letter in your issue of the 16th is a sample of this style. He suggests that the iron frieze now being erected along the west side of George-street for carrying the telegraph and telephone wires should be replaced by subways, or hollow iron kerbing, and that the wires be run through these. Of course "E.W." is unaware of the fact that by placing the telephone wires in such inaccessible places as the latter, the working of the system would be seriously interfered with, and, further, the kerbing could not be made sufficiently large to accommodate the whole of the telegraph and telephone wires which the frieze is intended to carry. In Paris a very complete system of sewerage exists, and the cables, &c., are conducted within the sewers, where they can be inspected as required, and consequently there is no difficulty there; but to follow the plan here, we would require to construct subways or tunnels specially for the purpose, and as this would be a very expensive item, I feel sure the Government would not entertain such a proposal. From inquiries made I find that the telephone lines through the city number about 700, and as they must increase and extra telegraph wires must be provided for the increasing traffic, the quantity will become so great that it will be absolutely dangerous to put them overhead on the present poles.

Under the circumstances I think that the Officer-in-charge of the Electric Telegraph Department is deserving of some credit for his invention of the iron frieze for carrying these wires, and at the same time improving the appearance of our main thoroughfare, besides giving an opportunity to those who have not awnings to their premises to erect same substantially and cheaply. I am certain that when the work is completed the scheme will meet with general approval, and will need no protest.

If

If in the future the authorities should find it beneficial to adopt the electric light for illuminating the street it will be an easy matter to carry the leads for the lamps on this iron frieze, and the lamps themselves can be affixed thereto at a very low cost. The whole will form a very pleasing ornament to the city, and the proprietors of business premises especially will never regret its introduction. Numerous patents have been taken out for schemes for carrying telegraph wires, principally by subterranean passages, but not one of them has been a complete success, and therefore this new departure is entitled to a fair trial before being condemned.

I am, &c.,
ENGINEER.

No. 5.

EXTRACT from *Sydney Morning Herald*, 23rd June, 1886.

THE NEW IRON TELEGRAPH SUPPORTS.

To the Editor of the *Herald*.

SIR,—“Engineer” unfairly deals with my protest against the disfigurement of our leading architectural buildings. The suggestion was only to continue the subways, which have to be constructed at all street crossings, in front of such buildings, and of the Town Hall, Cathedral, &c., removing the portion of iron frieze so displaced to other shop fronts.

I have a reason to believe that the public companies and others who object to the vandalism of the present erection, would gladly defray the difference in the cost between the frieze and such subway along the few feet of frontage in which they are interested. The Manager of the A.J.S. Bank offered to do so before the frieze was actually in place. The size of such subway, whether in shape of kerbing or otherwise, is a matter of detail probably not alarming to other engineers.

I am, &c.,
E.W.

Read.—F.B.S., 23/6/86.

No. 6.

Mr. R. Guy to The Superintendent of Telegraphs.

Dear Sir,

128 Victoria-street, Sydney, 24 June, 1886.

Mr. Frost, electrician, of George-street, informs me that he has been credited with my opposition to the removal of my awnings.

I write to say that Mr. Frost has had nothing whatever to do with any action I may have taken in the matter.

I am, &c.,
ROBERT GUY.

Read.—E.C.C., 25/6/86.

No. 7.

EXTRACT from *Sydney Morning Herald*, 26th June, 1886.

THE NEW TELEGRAPH AND TELEPHONE WIRE SUPPORTS.

To the Editor of the *Herald*.

SIR,—I did not intend to write further upon the above subject, but would like to point out that if “E.W.’s” suggestion to place the telegraph and telephone wires in conduits where they pass buildings such as the Town Hall, Cathedral, and Australian Joint Stock Bank, were carried out, it is clear that the whole aim of the inventor of the new iron supports to secure uniformity would be defeated. There would also be claims from proprietors of business premises for similar concessions, and we would have alternate stretches of frieze and vacant spaces. I quite understand that the protest is against the disfigurement of the buildings named; but surely the purpose for which the ironwork is being erected should be first considered. The placing of the wires on racks in dry places in the open air, instead of in damp underground passages, is a considerable advantage as regards the working of the lines, and as the iron-work is designed to enable this to be done, I do not see why exception should be taken to its erection.

I have, &c.,
ENGINEER.

Read.—F.B.S., 25/6/86.

No. 8.

EXTRACT from *Sydney Morning Herald*, 1st July, 1886.

PROCEEDINGS Legislative Council, 30th June, 1886.

TEMPORARY SUPPLY BILL.

MR. MACKELLAR moved the second reading of the Temporary Supply Bill. He explained that it provided for an expenditure of £510,000 on account of the Civil Service for the month of June, of £100,000 for the Harbours and Rivers Department for water supply (in anticipation of a loan vote), and £50,000 for electric telegraph construction.

The motion was agreed to, and the House went into Committee of the Whole to consider the Bill in detail.

The clauses preceding the schedule were agreed to.

On the schedule being submitted to the Committee,—

MR. DARLEY asked whether the telegraphic friezework now being erected in George-street was included in the sum of £50,000 provided for electric telegraph construction. He believed that in regard to the erection of the friezework, the Government were going to great expense, and were acting upon a wrong principle. In all large cities telegraphic wires were now carried underground. It was very dangerous

gerous to have a large mass of wires overhead. There was not only that objection to the frieze work, but by its use the beauty of private buildings of a public nature was destroyed. He alluded particularly to the Australian Joint Stock Bank, at the corner of King and George streets. The Pitt-street front of the General Post Office had been destroyed by those horrible carvings, and now they were to have the appearance of private buildings destroyed by that frieze work.

Mr. MACKELLAR said that he believed the work mentioned by the hon. gentleman was included in the Bill.

Mr. DANGAR saw no objection to the erection of the friezework. He was glad that uniformity in that matter was to be observed.

The schedule was agreed to.

The Bill was reported without amendment, was read a third time, and was returned to the Legislative Assembly with the usual message.

No. 9.

Mr. W. Humphreys to The Superintendent of Telegraphs.

Dear Sir,

Bond-street Chambers, 15 July, 1886.

I have inspected the sewer at Goulburn-street, and have decided to cut the friezework 18 inches; this will make this bay of frieze the same as the adjoining one, and will not be noticed. To alter the sewer would entail considerable expense, and cannot be entertained, as, besides opening up George-street might cause us to have to run along Goulburn-street east for some distance.

By shortening the frieze no perceptible difference will be made, and save considerable expense.

I am, &c.,

W. HUMPHREYS.

Read.—E.C.C., 9/8/86.

No. 10.

Messrs. D. & W. Robertson to E. O. Moriarty, Esq.

Dear Sir,

Central Exchange Buildings, York-street, Sydney, 19 July, 1886.

We have the honor to apply for payment of the sum of £7 10s., which we had to disburse in connection with the inspection of telephone verandah for Telegraph Department, which was inspected by Mr. James Orr, an officer in your Department.

As the outlay was made on account of the Telegraph Department, we presume you can get the sum from them, but we have to send the application through your Department.

We enclose receipt for the sum we paid Humphreys and Cracknell for the plans.

We are, &c.,

D. & W. ROBERTSON.

No. 11.

Minute by Mr. J. Orr.

I RECEIVED tracings from Messrs. D. & W. Robertson, through Humphreys and Cracknell, on behalf of the Telegraph Department, to enable me to proceed with the inspection. The tracings (2) are now in the possession of the Telegraph Department.

JAMES ORR, 23/7/86.

No. 12.

Minute by Mr. C. W. Darley.

THIS matter belongs entirely to the Telegraph Department. Messrs. D. & W. Robertson should be referred to that Department. Mr. Orr was practically an officer of that Department while he was inspecting the castings, &c.

C.W.D., 23/7/86.

No. 13.

Minute by The Superintendent of Telegraphs.

I KNOW nothing about this matter. We could have supplied these tracings if applied to.

E.C.C., 26/7/86.

No. 14.

Minute by Mr. J. Orr.

I WAS acting for the Telegraph Department, and Mr. Walker instructed me to call on Messrs. D. & W. Robertson for tracings.

JAMES ORR, 28/7/86.

5

No. 15.

Minute by The Engineer-in-Chief for Harbours and Rivers.

AT considerable inconvenience I allowed one of my officers to put himself in connection with the Telegraph Department for the purpose stated herein, during which time he was not under my orders, nor paid by me, and that gentleman states he was sent by Mr. Walker to Messrs. Robertson for the plans charged herein. I have nothing whatever to do with the matter, and can only return this paper to the Telegraph Department.

E.O.M., 3/8/86.

No. 16.

F. Abigail, Esq., M.P., to The Postmaster-General.

Dear Sir,

30 July, 1886.

Some time ago I spoke to you, and also to Mr. Cracknell, about the shopkeepers, whose verandahs you have had removed to erect the new telegraph arrangements, about allowing them to fix under the frieze a board for the name to be on. I have not received any reply, and it is a great source of annoyance as well as loss to the business people who allowed you to remove their names and verandahs. I ask, in their behalf, that this should now be directed and the required permission given, and you will oblige

Yours, &c.,

F. ABIGAIL.

No. 17.

The Superintendent of Telegraphs to The Postmaster-General.

THERE is no objection to the signboards being suspended under the friezework, but they should be uniform, and should harmonize with the colouring of the ironwork.

E.C.C., 3/8/86.

No. 18.

The Postmaster-General to The Superintendent of Telegraphs.

I AM afraid we cannot compel tradesmen to make their signs uniform or the colour harmonize with that of the ironwork.

Mr. Abigail may be informed that signs may be suspended under the frieze, and I trust the owners will endeavour to make the signs uniform in character, and of a colour that will harmonize with that of the ironwork.

F.B.S., 5/8/86.

Read.—E.C.C., 9/8/86.

No. 19.

The Secretary, General Post Office, to F. Abigail, Esq., M.P.

Sir,

General Post Office, Sydney, 6 August, 1886.

I am directed to acknowledge the receipt of your communication of the 30th ultimo, requesting that the shopkeepers on the west side of George-street may be allowed to fix signboards under the telegraph friezework.

In reply, Mr. Suttor desires me to intimate that signs may be suspended accordingly, but he trusts the owners thereof will endeavour to make such signs uniform in character, and of a colour that will harmonize with that of the ironwork.

I have, &c.,

S. H. LAMBTON,

Secretary.

No. 20.

Messrs. D. & W. Robertson to The Secretary, General Post Office.

Dear Sir,

5 August, 1886.

We hand you herewith account for £7 10s., which we paid to Humphreys and Cracknell for a copy of the plans of the telephone verandah material, at the request of Mr. Orr, the officer from the Harbours and Rivers Department, who inspected the ironwork for your Department.

Your kind attention to the account will oblige

Yours, &c.,

(For D. & W. ROBERTSON),

A.R.M.

P.S.—We sent receipt by Humphreys and Cracknell to the Harbours and Rivers Department for the amount paid by us, but they have not returned same to us.

We have nothing to do with this account.—E.C.C., 6/8/86.

No. 21.

No. 21.

The Superintendent of Telegraphs to Messrs. D. & W. Robertson.

Gentlemen,

13 August, 1886.

With reference to your letter of the 5th instant, addressed to the Secretary, General Post Office, respecting the amount due to you for tracing of plans of telephone verandah material, I have the honor to inform you that the charge cannot be recognized by this Department, as no directions were issued from this office for the preparation of the tracings.

I have, &c.,

E. C. CRACKNELL.

No. 22.

The Secretary, General Post Office, to The Town Clerk.

Sir,

Sydney, 6 August, 1886.

I am directed to acknowledge the receipt of your letter of the 13th May last, submitting for consideration the question of the desirability of having the telegraph columns and frieze recently erected on the west side of George-street, between Druitt and Bathurst streets, removed, and in lieu thereof a subway constructed for carrying electric telegraph cables.

In reply, I am to state that the Postmaster-General, having carefully considered the matter, thinks it would not be desirable to remove the telegraph posts and frieze, as he is informed by the Superintendent of Telegraphs that a subway cable would not be suitable, and he understands there is no longer any objection to the new work.

I have, &c.,

S. H. LAMBTON.

No. 23.

EXTRACT from *Daily Telegraph*, 24th August, 1886.

TELEGRAPH STREET ORNAMENTS.

To the Editor, Daily Telegraph.

SIR,—It seems strange that, with our so-much-vaunted responsible Government certain heads of Departments are permitted to exercise such autocratic power. The Colonial Architect, for instance, can treat with indifference the opinions of the many as to his Post Office caricatures; and now the Telegraph Manager “considers it not desirable to remove his iron friezes” from disfiguring one of the finest sites and two of the most prominent public buildings in the city. If the Mayor has the power, I trust he will exercise it by informing the Government that, if these apparent commencement-iron-scaffolding supporters (for they look but nothing else from the opposite side of the street) are not removed from the front of the Town Hall and Cathedral within a specified time they will be levelled with where they should have been originally laid.

Yours, &c.,

OBSERVER.

Read.—S.H.L., 24/8/86.

No. 24.

Messrs. Biddell Brothers to The Superintendent of Telegraphs.

Sir,

507 & 505 George-street, 26 October, 1886.

Your frieze, passing our door, is now up, and our splendid verandah, calculated to last twenty years, built at great cost and approved, demolished. The front of said verandah carried a board bearing our name, which board was detached and stands in our back premises. The raising of your verandah above ours left a space on the face of our premises bare and unsightly, to which such a board as above described should be applied.

We have now respectfully to request that such a board may be supplied and affixed to the front wall of our premises of the description and in the position indicated.

We are, &c.,

BIDDELL BROTHERS.

No. 25.

The Superintendent of Telegraphs to Messrs. Biddell Brothers.

Gentlemen,

4 November, 1886.

In acknowledging the receipt of your communication of the 26th ultimo, requesting that a board may be supplied by this Department and affixed to the front of your premises in lieu of one removed during erection of iron friezework for telephone wires, I have the honor to inform you that this work cannot be carried out by the Department, but there is no objection to your firm placing the board in position if you desire it.

I have, &c.,

E. C. CRACKNELL,

Superintendent of Telegraphs.

No. 26.

Mr. T. Hawkings to The Superintendent of Telegraphs.

Dear Sir,

12 November, 1886.

Will you kindly let me know when I am likely to get a settlement for work done on awnings in George-street. It is over five months since the work was finished, and there is still over £270 due to me. As I can get no satisfaction from the Accountant, I determined to see you on the matter, and have called several times at your office with that intent, but have never yet been fortunate enough to see you, so now take the liberty of writing. Trusting you will favour me with an early reply.

I am, &c.,

THOMAS HAWKINGS.

No. 27.

Minute by The Accountant, Electric Telegraphs.

Re Mr. Thos. Hawkings' letter of the 12th November, these accounts will be paid as soon as the further authority obtained. C.S.G., 17/11/86.

No. 28.

The Superintendent of Telegraphs to Mr. T. Hawkings.

22 November, 1886.

In reply to your communication of the 12th instant, I have to inform you that payment of your account will be made immediately the Postmaster-General sanctions the expenditure.

The Minister being in Melbourne at present, there will be some delay in obtaining his authority.

E. C. CRACKNELL,
Superintendent.

No. 29.

The Superintendent of Telegraphs to The Postmaster-General.

THE attached accounts have been rendered in connection with the erection of the ironwork along George-street, to carry the telephone wires, and are in excess of the sum authorised for this work, and I now beg to request the authority of the Postmaster-General to pay them out of the Loans Vote for construction and extension of telegraph lines generally.

E. C. CRACKNELL, 17/11/86.

The above amount includes all the ascertained claims for this work. In the final settlement there may be one or two extra accounts, but they are not likely to reach any large amount.—E.C.C., 1/12/86.

PARTICULARS of accounts, in excess of sum authorised, for erection of ironwork in George-street:—

Mort's Dock and Engineering Company	...	...	...	...	...	£412	7	6
Australian Gas-light Company	...	...	...	...	...	54	10	6
W. Humphreys	...	...	...	...	...	150	0	0
T. Hawkings (plumbing, &c.)	...	...	...	...	...	217	8	11
Triggs and Marr (ironwork, awnings, &c.)	...	...	...	...	...	262	13	2
						£1,097	0	1

No. 30.

The Postmaster-General to The Superintendent of Telegraphs.

I SHALL be glad if the Superintendent of Telegraphs will explain how the original estimate has been so far exceeded. F.B.S., 11/12/86.

No. 31.

The Superintendent of Telegraphs to The Postmaster-General.

THE reason the estimate for the erection of the iron friezework has been so much exceeded is in consequence of the exceptional character of the work, nothing of the kind having been attempted before there was no basis to work upon as a guide to the actual cost for the completion of the structure, and it appears from Mr. Humphreys explanation herewith, that he did not include the re-erection of the verandah roofs in his estimate.

There was also engineering work of an expensive nature, such as drilling and fitting the girders to the standards to provide for the inequalities in the levels of the street, almost every bay requiring a special adjustment, more particularly down Brickfield Hill and on to the Railway Station this work was tedious, and cost more than was anticipated.

There were also special tools to provide for this work which are still in store, and will come in useful for other works connected with the service.

Not

Not having had any experience in a matter of this kind I had insufficient data to guide me in checking the estimates submitted, and in asking for authority to expend £1,500 I was under the impression that it would have been ample to cover everything necessary, except the footway across George-street, which was not included in the amount in question.

In any future works of the kind an exact estimate can be arrived at, and although the cost may appear high it is not half the expense of a subway, the only other substitute for the conveyance of the cables and wires along the streets in large cities, which is claiming attention at present in most parts of the world.

Similar arrangements must be made in Pitt-street without delay, as no more wires can be placed on the poles between the General Post Office and the Exchange, and the other streets are becoming blocked with wires in the same way for which provision must be made. Except for the comparatively few telegraph wires, the public who use the telephone system have to pay proportionately, so that the ironwork in question is not really a charge upon the State.

E. C. CRACKNELL, 15/12/86.

No. 32.

Mr. W. Humphreys to The Superintendent of Telegraphs.

Dear Sir,

Bond Chambers, Sydney, 15 December, 1886.

In my first estimate for the supply and erection of the iron friezework along George-street, I have the honor to inform you that my prime estimate did not include the re-erection of the verandah-roofs. To have estimated this item would have been a very difficult matter, as in almost every instance special work has had to be provided for.

The estimate that I furnished you with had only reference to the erection of the friezework, and the cost of pipes for street crossings; this amount has not been exceeded.

I have, &c.,

W. HUMPHREYS.

No. 33.

The Postmaster-General to The Superintendent of Telegraphs.

THE attached accounts, amounting to £1,097, must, I am sorry to say, be paid, but this excess of the original estimate does not reflect much credit upon those having control of this work. Before answering a question in the Legislative Assembly I was told that £1,500 had been authorised for the erection of the columns and alterations to awnings, and in the minute asking for this amount it seems to me clear that it was intended to cover all expenses of erection.

F.B.S., 21/12/86.

No. 34.

The Superintendent of Telegraphs to The Postmaster-General.

IN reference to the under estimate for the friezework along George-street, I may state that I do not hold myself responsible for the excess in question. This being purely an engineering matter, and quite outside my sphere, I requested the Government to appoint Mr. Humphreys, the well-known Engineer, to supervise the construction of the ironwork, &c., which was approved of by the late P. M. G., Mr. O'Connor, which, I consider, relieved me of all responsibility as regards the engineering work. The real cause for the estimate being exceeded was the impossibility of determining the cost of re-erecting the verandah-roofs, and there being no guide from any previous work of the kind in any part of the world, I consider it excusable if a more accurate estimate could not be arrived at. Under these circumstances I consider that Mr. Suttor's minute, 21/12/86, cannot apply to me, and I must, in justice to myself, refuse to accept it as a censure.

As I have already pointed out in my minute, 15/12/86, that any future work of this kind, which will be required in several parts of the city, can now be accurately determined.

I may add that this system is entirely new, and has overcome a very serious difficulty in providing accommodation for hundreds of wires in large cities, which, at present, are unsightly, dangerous, and impracticable. It also offers verandah accommodation to shopkeepers, if they wish to avail themselves of it, and which has met with general approval.

E.C.C., 14/1/87.

Seen by P.M.G.—S.H.L.

No. 35.

Messrs. Triggs & Marr to A. Kethel, Esq., M.P.

Dear Sir,

185, 187, and 189, Clarence-street, 3 January, 1887.

We take the liberty of writing to you, as our Member for West Sydney, stating a grievance which we have with the Electric Telegraph Department. We have erected the whole of the wrought-iron for the roofs of awnings in George-street, for the above Department, for which we cannot get a settlement. There is a balance of very near £300 standing, for which we have made several applications, and cannot get any satisfaction. If you will kindly ascertain the reason of delay you will greatly oblige us, as we are in very much want of the money just now.

Forwarded to the Postmaster-General. I shall be glad to know how the matter stands.—A. KETHEL, 7/1/87.

No. 36.

No. 36.

The Secretary, General Post Office, to The Superintendent of Telegraphs.

Sir,

7 January, 1887.

I am directed to inform you that Messrs. Triggs and Marr, of Clarence-street, complain, through Mr. A. Kethel, M.P., that an amount of nearly £300, due to them in connection with the erection of the iron friezework along George-street, is withheld, and to request that you will be good enough to explain the matter as soon as possible, so that Mr. Kethel may be replied to.

I have, &c.,

S. H. LAMBTON.

No. 37.

The Secretary, General Post Office, to A. Kethel, Esq., M.P.

Sir,

7 January, 1887.

With reference to the communication from Messrs. Triggs and Marr, of Clarence-street, respecting their claim against the Electric Telegraph Department, for certain work in connection with the erection of the "iron friezework," along George-street, which you forwarded to this office to-day, I am directed to inform you that the matter has been referred to the Superintendent of Telegraphs, with a request that he will furnish an early report on the subject.

I have, &c.,

S. H. LAMBTON;

Secretary.

No. 38.

EXTRACT from Votes and Proceedings.

LEGISLATIVE ASSEMBLY, THURSDAY, 17 MARCH, 1887.

(1.) Frieze for Telephonic System:—MR. WALL asked the Postmaster-General,—

- (1.) What was the originally estimated cost, when in complete working order, of the frieze in George-street, now partially erected for the purposes of the telephonic system of this city?
- (2.) What are the sums of money which have been authorised to be expended on this work by various Postmasters-General?
- (3.) What amount has been expended on it with or without such authorisation?
- (4.) When will it be completed, and what additional sum of money is it estimated that it will cost to put it in complete working order?
- (5.) What period of time has elapsed since its commencement?
- (6.) Is the ironwork for this frieze obtained in the original contract sufficient for the purpose; if not, how much additional ironwork will be required to complete the frieze?
- (7.) Was there any error in measurement; and, if so, who is responsible for it?

MR. ROBERTS answered,—

- (1.) £4,600.
- (2.) £4,000, £1,500, £1,097;—total, £6,597. As regards the sum by which the original estimate has been exceeded, it should be mentioned that it was caused chiefly by the expense incurred in the re-erection of verandah-roofs, which was not included in that estimate, because it would have been a difficult matter to form an idea of the probable cost, as in almost every instance special work had to be provided for.
- (3.) The amount already expended is £6,331, which is covered by the authority (6,597). (*Vide* previous question.)
- (4.) So far as the frieze work is concerned, it is now complete; but there has been a delay in running the wires upon it, owing to a difficulty which arose with the Sydney Municipal Council in connection with the construction of a subway across George-street. The difficulty having now been removed, that work will shortly be commenced. About £650 will be required to complete the whole work; but from this amount the cost of the subway (about £300) should be deducted, as it is intended not only for the purpose of carrying the wires attached to the friezework, but also all the wires running to the west side of the city.
- (5.) It was commenced on the 1st March, 1886, and finished on the 30th September following.
- (6.) Yes.
- (7.) No. In justice to the Department I may be permitted to inform the Honorable Member that tenders for supplying the material required, and for the erection of the ironwork, were called for in April, 1884. Only one tender, which was for £8,500, was received; so that the House will perceive that, although the work has been undertaken by the Department, and the estimate exceeded, nevertheless a large saving has really taken place in the execution of the work.

No. 39.

EXTRACT from Votes and Proceedings.

LEGISLATIVE ASSEMBLY, TUESDAY, 29 MARCH, 1887.

(17.) Frieze for Telephonic System:—MR. BLACK (for MR. WALL) asked the Postmaster-General,—

- (1.) What are the particulars of the expenditure of the £1,500 and the £1,097 for the frieze work referred to in the Postmaster-General's answers of 17th March?

- (2.) How was it that, in calculating the estimate for this work, the telegraph authorities omitted to include the probable cost of the verandah roofs, when submitting the scheme for the approval of the Postmaster-General?
- (3.) How many men were employed by the Department between the 1st March, 1886, and 30th September following, upon the frieze, under the telegraph overseer carrying out the work?
- (4.) Has the pay of these men, and the salary of the overseer, been included in the total cost?
- (5.) What was the gross amount paid for this work to these men?
- (6.) If all the wires running to the west side of the city are to be carried on the frieze, what will it cost to remove the present poles and wires now in use in George-street?
- (7.) Has the Superintendent of Telegraphs given any estimate of the cost of this removal?
- (8.) Is he aware that many of the wires referred to in his answers to previous questions run to the railway station, and that the frieze work is only erected a short distance beyond Christ Church?
- (9.) How is it proposed to carry the wires over this intervening space?
- (10.) What is the name of the tenderer for this frieze at £8,500, referred to by the Postmaster-General?
- (11.) Has the cable for use on this frieze been purchased; if so, what did it cost, and who supplied it?
- (12.) Was the cost of this cable included in the original estimate for the work?
- (13.) Is he assured that not more than £650 will be required to place this in complete working order for the transmission of messages?
- (14.) Is he aware that his predecessor assured the House (as reported on page 2,825 of *Hansard* for 1886) that not more than the sum of £1,500, then under discussion, would be required to complete this work?
- (15.) How does he reconcile this statement with his own answer of 17th March—that, in addition to this sum, £1,097 has been already expended, and £650 will be required?

MR. ROBERTS answered,—

- (1.) £1,500 was expended in re-erection of verandahs, tools, extra ironwork, and wages; £466 18s. for iron pipes at street crossings; £150 for engineers' supervision; and £480 2s., further sum, for erection of verandahs.
- (2.) Will be answered by No. 15.
- (3.) From ten to thirteen men, between March and June, 1886; six, from 4th to 24th July; five, from 25th July to 30th September.
- (4.) The pay of the men has been included, but the salary of the overseer was omitted, he not being wholly employed on this work.
- (5.) £773 10s.
- (6.) No estimate has yet been made of this work.
- (7.) No.
- (8.) Yes.
- (9.) At the point where the friezework now ends the wires diverge in two or three directions, so that for the present it will not be necessary to carry it any further.
- (10.) John Sutton & Sons, for the supply of the frieze and its erection.
- (11.) Yes; cost £1,218—supplied by Callender's Bitumen Telegraph and Waterproof Company (Limited), and the India-rubber, Gutta-percha, and Telegraph Works Company (Limited).
- (12.) No.
- (13.) No; it is supposed about that amount will be required; but it cannot be determined until the contract for tunnel is accepted.
- (14.) Yes.
- (15.) The original estimate, submitted by the Superintendent of Telegraphs, on the 23rd October, 1883, namely £4,600 per mile, did not include the cost of altering or renewing verandah-roofs, but merely the purchase and erection of the frieze itself. The reason for this omission is that the matter of connecting the verandah-roofs with the frieze, at the cost of the Government, had not then been determined upon. After it had been decided that this should be done at the cost of the Government, the estimate for the erection of the frieze was increased from £600 to £1,500, in the belief that most of the old iron roofing could be used again. It proved, however, that very little could be reused; and not only that, but, to suit the peculiar construction of some of the buildings (those at the south end of George-street being very old-fashioned), considerable expense had to be incurred in making special purlins. This, and the tunnelling under George-street, which was not originally contemplated, caused the excess in the estimate.

No. 40.

The Superintendent of Telegraphs to The Secretary, General Post Office.

31 March, 1887.

REFERRING to my report that £650 would be required to complete the erection of the iron frieze work along George-street, and the construction of the subway to the Post Office, of which £350 was estimated for the former, I have now to state, for the information of the Postmaster-General, that accounts for erection have been received showing that the above amount will be sufficient, and to request his sanction for the expenditure of this sum.

E. C. CRACKNELL.

Submitted.—S.H.L., 4/4/87. Approved.—C.J.R., 5/4/87.

EXTRACT from Votes and Proceedings.

LEGISLATIVE ASSEMBLY, WEDNESDAY, 13 APRIL, 1887.

(12.) Frieze for Telephonic System:—MR. A. G. TAYLOR, for MR. WALL, asked the Postmaster-General,—

(1.) Referring to his answer to Mr. Wall's question of 29th March, asking particulars of the expenditure of £1,500 on the frieze work in George-street, will he please supply the details as to the expenditure of this sum?

(2.) What salary was the overseer paid whilst he was employed (though, as is said, not wholly) upon this frieze?

(3.) What are the particulars of the other work on which it is said the overseer was employed at the same time that he was in charge of the erection of this frieze?

(4.) Was the overseer's time properly kept, so that it might be known what proportion was devoted to the frieze and what to the other work, and a just amount charged against this frieze when calculating its cost.

(5.) In the specification and contract bond for this work laid upon the Table of this House, the railway bridge in George-street West is said to be the terminal point for this frieze—how is it then, that, in the answers of 29th March, the Postmaster-General says that it is not intended to carry it further than it is at present, this point being a considerable distance short of the termination originally decided upon?

(6.) Did the contractors who agreed to supply the ironwork for the longer distance mentioned in their bond deliver more than has been erected; if so, where is it stored, and how is it contemplated to utilize it?

(7.) If not, has any demand been made to them to supply the deficiency in this ironwork which they agreed to deliver; if not, what is the reason?

(8.) It is said that it will not be necessary to carry the frieze any further beyond Christ Church; but as this is no answer to my question 9, will the Postmaster-General please to say definitely how it is proposed to carry the wires over the intervening space to the Railway Station?

(9.) What is the length of this frieze, as erected, not measuring street crossings?

(10.) Why were not the old verandah-roofs along George-street thoroughly examined and reported upon before the work was recommended and entered upon?

(11.) Who is responsible for the neglect which the Postmaster-General says cost the Government £900 in excess of the estimate?

(12.) Is the cable, which it is stated cost £1,218, all of similar character?

(13.) Was it supplied separately by each firm direct to the Department, or was it sold to the Government by an agent in this city; if so, what was his name?

(14.) Were tenders called for its supply, or was it purchased without competition?

(15.) Will the Postmaster-General please to lay upon the Table copies of the invoices of this cable when answering these questions?

(16.) What was the date upon which this cable was ordered, and upon what date was it delivered, to whom, and where?

(17.) When was it paid for, and to whom was this payment made?

MR. ROBERTS answered,—

(1.) Re-erection of verandahs, £614 3s.; tools and extra ironwork, £98 15s. 6d.; engineer's supervision, £150; wages, £624 0s. 6d.; total, £1,486 19s.

(2.) The overseer's salary is at the rate of £295 per annum.

(3.) Supervising the erection of and repairs to city and suburban telegraph and telephone lines.

(4.) The time the overseer devoted to the frieze work was not kept separate from that which he devoted to his ordinary duties.

(5.) Because, at present, it is proposed to make the termination near Christ Church the point of divergencè of the wires.

(6.) Yes; the whole of the ironwork contracted for and specified for was delivered to the Bathurst-street store. The surplus is still in store, and will be utilized for future work of the kind.

(7.) Answered by previous question.

(8.) By overhead wires.

(9.) Nearly a mile.

(10.) It was not possible to ascertain what was required until the work had actually commenced. In almost every case there were special circumstances to be considered.

(11.) It does not appear that the excess of the estimate was due to neglect upon the part of anyone.

(12.) No.

(13.) It was supplied direct to the Department through the Agent-General.

(14.) The cable was ordered direct from the patentees.

(15.) Yes.

(16.) Ordered 30th June, 1884, delivered 8th August, 1885, to the Agent-General in London.

(17.) Callender's Bitumen Co. were paid, in London, on 19th August, 1885. The Gutta-percha Co. were paid, in London, on the 18th September, 1885.

Copy of Invoice of Cable.

The Agent-General for New South Wales, 5, Westminster Chambers, bought of Callender's Bitumen, Telegraph, and Waterproof Co. (Limited),—

London, 8 July, 1885.

	£	s.	d.
F. 1,174.			
Callender's cable, 1½ mile of 50-conductor cable, each wire No. 21 gauge	600	0	0
Packed on three drums, at £5 each	15	0	0
	<hr/>		
	£615	0	0

Ordered in despatch No. B 84-7,208, dated 30 June, 1884.

Received cheque value £615 in settlement.

(For Callender's Bitumen, Telegraph, and Waterproof Co., Limited).

19 August, 1885.

S. P. LAMBERT.

Copy of Invoice of Cable.

The Agent-General for New South Wales, bought of the Indiarubber, Gutta-percha, and Telegraph Works Co. (Limited),—

	£	s.	d.
F. 1,174.			
1½ mile 50-conductor telephone cable, n. 8,093½—per mile, £394	591	0	0
Packed as follows:—			
1 drum, ¼-mile cable	2	0	0
5 drums, ¼-mile cable, at £2	10	0	0
	<hr/>		
	£603	0	0

Ordered in despatch No. B 84-7,208, dated 30 June, 1884.

Received cheque, 18 September, 1885, £603.

(For the Co.,)

F. G. BENNETT.

No. 42.

EXTRACT from Votes and Proceedings.

LEGISLATIVE ASSEMBLY, WEDNESDAY, 27 APRIL, 1887.

(7.) Telephonic Frieze:—Mr. MELVILLE, for Mr. WALL, asked the Postmaster-General,—

(1.) Will he ascertain from the storekeeper in charge the quantity and value, at invoiced prices, of the ironwork in connection with the frieze, George-street, in excess of that erected, now remaining in the Bathurst-street store?

(2.) What is the quantity and what is the value?

Mr. ROBERTS answered,—

(1.) Will be answered by No. 2.

(2.) Ten sections, each 16 feet; four sections broken; total value, £122 6s. 8d.

1887.

(SECOND SESSION.)

LEGISLATIVE ASSEMBLY.

NEW SOUTH WALES.

TELEGRAPH WIRE.

(PURCHASED IN ENGLAND DURING 1886 AND 1887.)

Ordered by the Legislative Assembly to be printed, 12 July, 1887.

RETURN to an *Order* of the Honorable the Legislative Assembly of New South Wales, dated 11th May, 1887, That there be laid upon the Table of this House,—

“Copies of all recommendations, reports, minutes, invoices, letters, and other documents relating to the ordering and purchasing in England, during 1886 and 1887, of Telegraph Wire for this Colony.”

(Mr. Wall.)

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No. 1.

Messrs. Montefiore, Joseph, & Co. to The Secretary, General Post Office.

Tender for Telegraph material.

Sir,

4 O'Connell-street, Sydney, 4 January, 1886.

As agents for Messrs. Ramsden, Camm, & Co., of London, we have the honor to tender for the supply to your Department of,—

150 tons extra best best galvanized iron charcoal annealed,—No. 6

100 „ „ „ „ „ „ „ 8

25 „ „ „ „ „ „ „ 10

2 „ „ „ „ „ „ „ 16

as per *Gazette* notice No. 7741.

We are not in a position to quote prices to-day, but we undertake to supply the wire in question at a price not exceeding that paid by Her Majesty's Post Office in London, at date of shipment, which price can be verified and invoices initialled by Mr. Preece, who would pass and test the wire on behalf of your Department.

509—

We

[1,005 copies—Approximate Cost of Printing (labour and material), £5 13s. 9d.]

We would guarantee further that the wire is the same quality as used by Her Majesty's Telegraph Office in London at date of shipment.

We do not hold stocks of wire here, but shall be prepared to deliver it in London for despatch hence within fourteen to twenty-one days from receipt of acceptance of this tender.

We have, &c.,

MONTEFIORE, JOSEPH, & CO.

WE agree to be responsible for the due performance of this contract, in the event of the tender being accepted.—Signed at Sydney, this 5th day of January, 1886.

W. H. ROWSELL.
W. C. W. BARTELS.

No. 2.

The Agent-General for New South Wales, London, to The Colonial Secretary.

5, Westminster Chambers, Westminster, S.W.,
28 May, 1886.

Sir,

I have the honor to enclose herewith for your information a copy of a letter I have received from Messrs. G. W. Share & Co. (on behalf of Messrs. Ramsden, Camm, & Co.), dated 21st instant, having reference to tenders for telegraph wire.

I have, &c.,
SAUL SAMUEL.

No. 3.

Messrs. G. W. Share & Co. to The Agent-General.

Ramsden, Camm, & Co., Iron and Steel Wire Manufacturers and Galvanizers,
72 King William Street, 21 May, 1886.

Sir,

In January last the Government of New South Wales invited tenders for the supply of best selected charcoal telegraph wire to British postal tests, and the house that represents us in Sydney cabled us over, asking us to cable back prices for same, which we accordingly did. Now the British postal specification and tests are very severe, and we understood that all telegraph wire for your Government would be properly tested before being despatched. We are therefore greatly astonished on receiving a letter from our Sydney house, giving us particulars of the prices at which this tender had been given out. We understand that the prices were as follows:—

No. 6.	No. 8.	No. 10.
£13 10s.	£13 17s. 6d.	£14 7s. 6d.

Duty paid and delivered free in Sydney.

Now these prices simply represent ordinary quality of galvanized wire, and in fact it is only very little over the price of ordinary galvanized fencing wire in England, and therefore it would be impossible for any firm to supply the class of iron which you expect within several pounds of the price accepted, and we think that the Government can see for themselves the impossibility of wire at such prices standing their tests. We are not afraid of competition when the tests are all made this side, as we then know that the best man will win, but we cannot help protesting against our being put to heavy expense for telegraphing, and then tenders should be accepted for something totally different to what is asked for. To give you an idea of the difference in prices, we may mention that our prices were as follows:—

No. 6.	No. 8.	No. 10.	No. 16.
£21 10s.	£22.	£23 5s.	£28 10s.

And these prices were without duty, and our prices were based upon the same class of wire that we are supplying to the Government here. We are sorry to trouble you with this long letter, but we beg at the same time that you will kindly understand that we are not complaining at all on the score of having lost the Tender (because this, after all, is only a matter of fair competition), but that wire should be accepted which, on the very face of it, shows to be something totally different to what is asked for.

Trusting that you will kindly on behalf of the English trade investigate this matter,

We remain, &c.,

G. W. SHARE & CO.,
(For Works).

No. 4.

Report of The Superintendent of Telegraphs.

Respecting wire supplied by local tenderers.

THE last tenders for wire were accepted in February, 1885, as follows:—Messrs. Rabone, Feez, & Co., 50 tons No. 6, at £13 10s. per ton; 50 tons No. 8, at £13 17s. 6d. per ton; 50 tons No. 10, at £14 7s. 6d. per ton; and in June, 1885, Messrs. J. Slater & Co. 100 tons No. 6, at £15 10s. per ton; 50 tons No. 8, at £14 6s. 6d. per ton, but the quality when tested did not satisfy me, and I have now submitted a paper recommending that the supply now required be tendered for in England through the Agent-General, and none but English brands should be accepted.
E.C.C., 20/7/86.

No. 5.

The Superintendent of Telegraphs to The Postmaster-General.

20 July, 1886.

I BEG to recommend, for the approval of the Postmaster-General, that the undermentioned material be ordered through the Agent-General in London for the use of this Department, viz., 100 tons No. 6 extra best best galvanised iron telegraph wire, at £22 per ton; 100 tons No. 8 extra best best galvanised iron telegraph wire, at £23 per ton; 2 tons No. 16 extra best best galvanised iron telegraph wire, at £29 per ton; 5 tons No. 14 hard-drawn copper wire, at £80 per ton; 100 cells Elwell Parker accumulators, at £5; 1 Elwell Parker dynamo for charging accumulators, at £130. The first four items to be paid out of loans.

With the confirmative standard tests for telegraph wire at the General Post Office, London.

E. C. CRACKNELL.

No. 6.

Minute by The Postmaster-General.

Is it intended to purchase these articles without calling for tenders?

F.B.S., 22/7/86.

No. 7.

Minute by The Superintendent of Telegraphs.

No; the Agent-General will call for tenders for the wire.

E.C.C., 24/7/86.

No. 8.

Minute by The Postmaster-General.

If tenders are to be invited why are prices given?

F.B.S., 29/7/86.

No. 9.

Minute by The Superintendent of Telegraphs.

As a guide for the amount required to be provided by the Agent-General.

E.C.C., 30/7/86.

No. 10.

Minute by The Postmaster-General.

THE information furnished in these minutes is so meagre that it is difficult for either the Minister or Agent-General to understand. I shall be obliged if the Superintendent of Telegraphs will prepare another letter giving more in detail what is really required.

F.B.S., 5/8/86.

No. 11.

Minute by The Superintendent of Telegraphs.

I BEG to recommend, for the approval of the Postmaster-General, that the Agent-General be requested to call for tenders for the undermentioned material, &c., for the use of this Department,—viz., 100 tons No. 6 extra best best galvanized iron telegraph wire; 100 tons No. 8 extra best best galvanized iron telegraph wire; 2 tons No. 16 extra best best galvanized iron telegraph wire; 5 tons No. 14 hard-drawn copper wire; 100 cells Elwell Parker accumulators; 1 Elwell Parker dynamo for charging accumulators. It should be stipulated that the wire supplied must be equal to the standard test of the General Post Office, London, and be finally approved by Mr. W. H. Preece, of the Postal and Telegraph Department, London.

The Elwell Parker accumulators and dynamo must also be subject to the approval of the same gentleman.

The probable cost of the items is £5,588, and the wire should be paid for out of loans.

E. C. CRACKNELL, 14/8/86.

Submitted.—S.H.L., 16/8/86.

Approved.—F.B.S., 16/8/86.

No. 12.

The Postmaster-General To the Agent-General.

Sir,

General Post Office, Sydney, 23 August, 1886.

I have the honor to request that you will be so good as to invite tenders for the supply of the undermentioned material required for the use of the Telegraph Department of this Colony, namely:— 100 tons No. 6 extra best best galvanized iron telegraph wire, 100 tons No. 8 extra best best galvanized iron telegraph wire, 2 tons No. 16 extra best best galvanized iron telegraph wire, 5 tons No. 14 hard-drawn copper wire, 100 cells Elwell Parker accumulators, 1 Elwell Parker dynamo for charging accumulators.

The quality of the wire supplied must be equal to the standard tests of the General Post Office, London, and the whole of the material approved by Mr. W. H. Preece, of that Department. The cost of these items is estimated at £5,588, and the Treasury Department has been requested to cause this amount to be placed at your disposal.

I have, &c.,

F. B. SUTTON,

Postmaster-General.

No. 13.

No. 13.

The Secretary, General Post Office, to The Principal Under Secretary.

Sir, General Post Office, Sydney, 23 August, 1886.
I am directed to forward a letter from the Postmaster-General to the Agent-General for the Colony in London, relative to the supply of a quantity of material required for the use of the Telegraph Department, and to request that you will be good enough to move the Colonial Secretary to transmit it to Sir Saul Samuel.

I have, &c.,
S. H. LAMBTON.

No. 14.

The Secretary, General Post Office, to The Under Secretary for Finance and Trade.

Sir, General Post Office, Sydney, 23 August, 1886.
The Agent-General has been requested to invite tenders for the supply of the under-mentioned material required for the use of the Telegraph Department of this Colony, namely:—100 tons No. 6 extra best best galvanized iron telegraph wire, 100 tons No. 8 extra best best galvanized iron telegraph wire, 2 tons No. 16 extra best best galvanized iron telegraph wire, 5 tons No. 14 hard-drawn copper wire, 100 cells Elwell Parker accumulators, and 1 Elwell Parker dynamo for charging accumulators.

The cost of the above is estimated at £5,588, and I am directed to request that you will be good enough to move the Treasurer to cause the necessary amount to be provided (the cost of the first four items—namely, the wire, estimated at £4,958—to be paid out of loans), and Sir Saul Samuel informed when this has been done.

I have, &c.,
S. H. LAMBTON.

No. 15.

Minute by The Acting Postmaster-General to The Secretary, General Post Office.

WITHOUT attaching undue importance to a communication made to the press, I think the system of inviting competition in England only for the wire required for the telegraphic service is open to adverse comment, and that Mr. Cracknell should, as early as practicable, furnish a report in explanation of the advantages derived by the Government from this system.

J.F.B., 12/2/87.

The Superintendent of Telegraphs, B.C.—S.H.L., 12/2/87.

No. 16.

Extract.

EXTRACT from *Sydney Morning Herald*, 10/2/87.

SUPPLY OF TELEGRAPH WIRE TO THE NEW SOUTH WALES GOVERNMENT.

To the Editor of the *Herald*.

Sir,—Through your columns I wish to call public attention to the following circumstance, which requires more explanation than is usually given to matters about which questions are asked in Parliament.

For some years past it has been the practice to call for tenders from those willing to supply the 200 or 300 tons of iron wire required for the use of the Electric Telegraph Department.

Last year this fair proceeding was departed from. I say fair, because it gave importers here an equal chance to obtain the contract.

According to all the information I can glean, but it is hard to find out anything at all on the subject, it appears that the order has been sent to some firm in England, and that the price agreed upon is very much higher than the same wire could be bought for in this market, independently of the freight and charges.

The old excuse of the wire here not standing the requisite tests has very probably been again made, but a reference to the correspondence called for by Mr. McElhone in 1879 will show that a similar attempt to baulk competition was at that time exposed, which, but for the determined action of Sir Saul Samuel, the then Postmaster-General, would have been successfully carried out.

At that time the Electric Telegraph authorities were only prevented paying a higher price than was necessary for wire by the fact that the Postmaster-General ordered an inquiry into the merits of the various samples to be made by a gentleman who was outside the influence of the Department. It was then found that the cheaper wire stood the tests better than the higher priced article recommended to the Postmaster-General for purchase as being so much the better article as to justify the cheaper one being refused in its favour.

Trusting that your influence will cause searching inquiry to be made,

I am, &c.,
IMPORTER.

No. 17.

The Superintendent of Telegraphs to The Postmaster-General.

WITH regard to the subject of calling for tenders in England for the supply of telegraph wire, referred to in a letter, published in the *S. M. Herald*, which has been forwarded for report by the acting Postmaster-General, I beg to submit a copy of my minute recommending the adoption of that course, from which it will be seen that I stipulated, as a necessary condition of the acceptance of any wire, that it should test, electrically as well as mechanically, up to the standard tests of the G.P.O., London, and be finally approved by Mr. W. H. Preece, the Chief Electrician of the Postal Telegraph Department of England. My reasons for making this stipulation will be explained further on; meanwhile I may be permitted to point out that I entered upon the matter very fully with Mr. Suttor, who approved of my recommendation (*Vide papers herewith*).

In

In matters of this kind, the usual practice of the Department is—when an article can be manufactured in the Colony, tenders for the supply of it are invited here, but when—as in the case of telegraph wire—it is known that it cannot be made in our own territory, then it becomes a question whether money can be saved by calling for tenders in England, thus dealing with the manufacturers direct; or, by asking for tenders in the Colony and dealing with the importer. My own opinion leans to the former course; but it seemed to me a question which could be definitely settled only by actual experience, and therefore I felt it my duty to test it in this case. It will be found that this wire will cost f.o.b. in London an average of about £10 9s. 6d. per ton, whereas, during the past two years the Government has paid importers an average of £14 6s. for wire of similar gauge but inferior quality. In other words by adopting the course of buying direct from the manufacturers, I believe—after deducting all charges—that there will be a saving of over £200 on the transaction as compared with the amount which we should have been called upon to pay if it had been carried out through importers.

Independently however of economic considerations I desire to point out, as forcibly as I am able, that my great object is to secure the very best material that can be got to enable the Department to meet the daily increasing demand upon its resources for speedy telegraphy, and this can only be done with wire of the best quality and conductivity. We have tried all sorts of ways to attain this end, but I believe it will eventually be found that the surest way to do so is by dealing direct with the manufacturer through the Agent-General, so that the necessary supervision can be carried on by officers of the British Postal Service during the process of manufacture.

It is suggested in the letter now under reply, that a cheaper, and consequently an inferior, wire is just as suitable for telegraph requirements as the quality I stipulate for. Those who make statements of this kind seem to me to be absurdly unacquainted with the subject upon which they venture an opinion. The electrical value of a wire depends upon its capability to convey currents at a high speed to long distances, *i.e.*, that its conductivity should be high, to be enabled to work the quick-speed instruments now in daily demand, but which cannot be done by low-class wire, very little better than that used for fencing purposes. It is a well-known law in electricity that the conductivity of a given wire is directly proportional to the square of its diameter, and to the purity of the iron, and, as an illustration of this, I may cite the case of the old No. 6 wire, between Sydney and Melbourne, which had not conducting power sufficient to work without repeaters at Albury, and which necessitated the employment of operators there day and night, to attend to the adjustment of the instruments. As the business between the two Colonies was increasing with great rapidity I found it necessary to recommend the construction of an entirely new line, of No. 4 wire, so that direct communication could be maintained between the two capitals. This was carried out, and the result has more than justified the expenditure, in the means which were thus placed at my disposal, for successfully meeting all the demands upon the Telegraph service in this direction.

In Great Britain quick-speed instruments are becoming so absolutely necessary that it has lately been determined to use copper instead of iron wire, because the former has a carrying capacity seven times greater than that of iron.

It does not appear to me to be necessary to say more in support of my recommendation in this matter, but I may conclude by adding, in special reference to "Importer's" letter,—

1. That the order was *not* sent to any firm in England. Tenders were called for by the Agent-General in the usual way, and he, no doubt, accepted the lowest.
2. That no price at all was "agreed on," and the same class of wire could certainly not be supplied cheaper by Sydney merchants, than we are getting it from England, as will doubtless be conclusively shewn, when the shipments are to hand.

E. C. CRACKNELL, 22/2/87.

No. 18.

Answers to Questions.

LEGISLATIVE ASSEMBLY—TUESDAY, 15 MARCH, 1887.

- (4.) Electric Telegraph Wire:—Mr. McELHONE asked the Postmaster-General,—
- (1.) Is it a fact that orders have been sent to England for telegraph wire required by the Department; if so, who was the order sent to, and what is the price per ton?
 - (2.) Is it not a fact that for some years tenders for supply of electric telegraph wire have been called for in the Colony; if so, what has been the price per ton paid?
 - (3.) Will he state why tenders have not been called for in the Colony for supply of wire required by the Electric Telegraph Department?

Mr. ROBERTS answered,—

- (1.) The Agent-General was requested to call for tenders in London for telegraph wire. The invoices are not yet to hand, but I am informed that the price, f.o.b. in London, is £10 9s. 6d. per ton. Upon this point, however, no authentic information is yet to hand.
- (2.) It has been the custom in the past to call for tenders in the Colony for the supply of wire; but there have been occasions previously when they have been called for in England. The price paid for wire supplied through importers during the last two years has averaged about £14 6s. per ton.
- (3.) Because it is believed that a considerable saving can be effected by purchasing direct from the manufacturer; and because such telegraphic wire is subjected to a special test, in the process of its making, by the London Postal Telegraphic authorities—wire so tested being thoroughly reliable and up to the requirements of the Department for working the quick speed instruments now employed.

No. 19.

Answers to Questions.

LEGISLATIVE ASSEMBLY—THURSDAY, 17 MARCH, 1887.

- (3.) Telegraph Wire:—Mr. WALL asked the Postmaster-General,—
- (1.) Was any telegraphic wire ordered from England during 1886 through the Agent-General or otherwise; if so, what is the quantity?
 - (2.) Were tenders called in London for the said wire?
 - (3.) What price or prices were paid for the said wire?
 - (4.) What are the names of the firms who tendered, and at what rates?

Mr.

Mr. ROBERTS answered,—

- (1.) Yes; 207 tons.
- (2.) Yes; by the Agent-General.
- (3.) The invoices have not yet come to hand; but I am informed that the price, f.o.b. in London, is £10 9s. 6d. per ton.
- (4.) The names of the tenderers are not yet known here.

No. 20.

Extract.

EXTRACT from *Sydney Morning Herald*, 18/3/87.

LEGISLATIVE ASSEMBLY—THURSDAY, 17 MARCH.

The SPEAKER took the chair at half-past 4 o'clock.

ANSWER TO QUESTIONS.

* * * * *

Mr. ROBERTS, in reply to Mr. Wall, without notice, said that the names of the tenderers for the supply of wire to the Post Office for this year could not be ascertained until the documents reached Sydney.

Mr. WALL: Will the hon. member lay the information on the table of the House as soon as received?

Mr. ROBERTS said that he did not feel inclined to make any promise of that sort, but it was open for the hon. member to move a resolution to that effect.

Mr. McELHONE asked whether the Postmaster-General was aware that for many years Mr. Jolly had the sole monopoly for the supply of wire to the Post Office.

Mr. ROBERTS said that he was not aware of any such fact.

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No. 21.

Answer to Questions.

LEGISLATIVE ASSEMBLY—TUESDAY, 29 MARCH, 1887.

(18.) Telegraph Wire:—Mr. Black (for Mr. WALL) asked the Postmaster General,—

- (1.) What are the gauges of the 207 tons of telegraphic wire ordered from England during 1886?
- (2.) Was the money for the purchase of this wire in London remitted to the Agent-General; if so, when, and what was the amount sent?

Mr. ROBERTS answered,—

- (1.) Nos. 6, 8, and 10.
- (2.) On reference to the Treasury, I find that a letter of credit was forwarded to London in September, 1886, in favor of the Agent-General, for £4,958 for telegraph wire.

No. 22.

Answers to Questions.

LEGISLATIVE ASSEMBLY—TUESDAY, 29 MARCH, 1887.

(7.) Telegraph Wire:—Mr. McELHONE asked the Postmaster-General,—

- (1.) Will he be good enough to state the dates on which the tenders for telegraphic wire have been called for in England prior to 1886?
- (2.) Will he be good enough to give the particular items making up the average of £14 6s. per ton for the wire supplied through importers during the last two years?
- (3.) What will be the freight, charges, and commission for examination in London of the wire purchased through the Agent-General—will not these charges have to be added to the £10 9s. 6d. per ton, f.o.b. in London, referred to in the Postmaster-General's former answer of 15th March?
- (4.) Has it only just been believed by the Superintendent of Telegraphs that a considerable saving could be effected by purchasing direct from the manufacturer?
- (5.) Has the Superintendent of Telegraphs only just discovered that telegraphic wire is subjected to a special test in the process of its making by the London telegraph authorities?
- (6.) Will he give the names of the maker of such telegraph wire specified as specially tested by the telegraph authorities in London?
- (7.) How many years is it since the quick speed instruments, mentioned by the Postmaster-General in his answers of 15th March, were first used in the Telegraph Department of this Colony?
- (8.) What are the gauges of the various wires now in use for telegraphic purposes for these quick speed instruments?

Mr. ROBERTS answered,—

- (1.) On the 21st March, 1883.
- (2.) Rabone, Feez, & Co., 10th February, 1885, £13 10s.; Rabone, Feez, & Co., 10th February, 1885, £13 17s. 6d.; John Slater & Co., 16th June, 1885, £15 10s.; John Slater & Co., 16th June, 1885, £14 6s. 6d.
- (3.) Not known yet.
- (4.) No.
- (5.) No.
- (6.) Not known yet.
- (7.) 1881 and 1883; but repeaters have to be used on long circuits, if the wires have not sufficient carrying capacity. This is the case on the No. 6 wires, running to Brisbane and Melbourne, repeaters having to be used on these circuits at Glen Innes, Albury, and Deniliquin.
- (8.) Numbers 4 and 6.

No. 23.

Answers to Questions.

LEGISLATIVE ASSEMBLY—WEDNESDAY, 13 APRIL, 1887.

- (11.) Telegraph Wire:—*Mr. A. G. Taylor* (for *MR. WALL*), asked the Postmaster-General,—
- (1.) Upon whose recommendation did he request the Treasury authorities to forward a letter of credit for £4,958 to the Agent-General in September, 1886, to pay for telegraph wire?
 - (2.) As by answer given by him on 17th March, the House was informed that 207 tons of this wire were purchased at the rate of £10 9s. 6d. per ton, amounting to £2,168 7s. in all, will he please to say for what reason the sum of £2,790 in excess of the amount required was sent to the Agent-General?
 - (3.) Were any special firms mentioned as a guide to the Postmaster-General when ordering this wire—what were their names?
 - (4.) Were any probable prices stated in the recommendation—what were they?
 - (5.) Have the invoices for this wire yet arrived; if not when does he expect them, and will he lay copies of them upon the Table of this House?
 - (6.) How many firms usually tender for telegraph wire when tenders are called for in the Colony, and what are their names?

MR. ROBERTS answered,—

- (1.) Upon the recommendation of the Superintendent of Telegraphs.
- (2.) Will be answered by No. 4.
- (3.) No firms were mentioned.
- (4.) Yes; it was thought that the cost of the wire required would be about as follows, viz.—For No. 6, £22 per ton; for No. 8, £23 per ton; No. 16, £29 per ton; for No. 14 (copper wire), £80 per ton.
- (5.) They have not yet arrived, but are expected shortly. I shall have no objection to lay copies of them upon the Table of the House.
- (6.) Seven firms have of late tendered in the Colony for the supply of telegraph wire, viz.:—Messrs. Rabone, Feez, & Co., J. Slater & Co., J. Dunn & Co., M'Lean Brothers & Rigg, J. M'Donald, J. M'Gregor, and G. L. Cooper.

No. 24.

Invoices.

INVOICES of wire received from the Agent-General for New South Wales.

Manchester, 14 February, 1887.

The Agent-General for New South Wales bought of Richard Johnson & Nephew, &c., &c., &c.:—

		£	s.	d.
1-2040.	2,040 coils No. 8 galvanized telegraph-wire, oiled and wrapped	...	...	100 0 3 19 } £10 9 6
	Gross	...	...	100 17 3 6 } 1,047 19 7
2041.	62 wrappers No. 16 galvanized binding-wire—			
2102.		2	0	0 0 } £17 15 0
	Gross	...	...	2 0 1 12 } 35 10 0
				£1,083 9 7
	Less 2½ per cent., on £2,131 5s. 5d.	...	...	53 5 8
				£1,030 3 11

I have duly inspected and passed the work charged for in this invoice, and I have found the quantities correct and complete.

W. H. PREECE.

Manchester, 22 December, 1886.

The Agent-General for New South Wales bought of Richard Johnson & Nephew, &c., &c., &c.:—

Order F., 1446.	2,040 coils No. 6 galvanized iron telegraph-wire, oiled and wrapped—	...	...	100 0 2 7 } £10 9 6
	Gross	...	...	100 17 2 4 } £1,047 15 10

General Post Office.

N.S.W.G. 1-2040.

The Hon. Colonial Treasurer, Sydney, N.S.W.