

AR 1915

TASMANIA

REPORT

OF THE

SECRETARY FOR MINES

FOR

YEAR ENDING DECEMBER 31

1915

Including Reports of the Inspectors of Mines, Government
Geologist, Mount Cameron Water-Race
Board, &c.



Tasmania:

JOHN VAIL, GOVERNMENT PRINTER, HOBART

1916

1s. 6d.]

B70526

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Report of the Secretary for Mines.

Mines Department,
Hobart, 12th May, 1916.

SIR,

I HAVE the honour to submit my report upon the Mines Department and the Mining Industry for the year ending 31st December, 1915.

GENERAL REMARKS.

The aggregate value of minerals raised during the year was £1,225,575, being an increase of £218,537 on the value of the output of the previous year.

The value of the gold won is about £32,700 less than the previous year. The decrease is principally owing to the closing down of the Tasmania Gold Mine at Beaconsfield. There was a slight decrease in the output of silver-lead, but the value exceeds that of last year owing to the increase in price of metals.

The average output of tin has been maintained, while the demand for wolfram has increased, with the result that the output has been more than doubled.

Since the outbreak of the war the local market for osmium has been closed, consequently only very few miners

have been engaged searching for the metal. The value of the output was, approximately, £8500 less than last year.

AID TO MINING.

The following is an account of the work carried out by the Engineer-in-Charge of the works provided for by "The Aid to Mining Act, 1912":—

In the office the usual routine work was carried out, and special reports compiled on several of the mines and prospecting shows of the Western Mining Division.

In the assay department 870 samples were treated; the privilege of cheap assays being freely availed of by tributers and prospectors.

The scheme of State advances on ore was brought to a termination at the end of April through the establishment of a market for silver-lead ores by the Sulphide Corporation Limited. While in operation the scheme proved an unqualified success, not only preventing a dislocation of the mining industry at a critical time, but eventually enabling producers to sell their ores at high prices. No financial obligation was entailed by the State, the interest charged on the advances more than compensating for the working expenses of the scheme.

FIELD WORK.

Zeehan.—Extensive developmental work under the assisted tribute system has been done in the Zeehan district, totalling 5618 feet of driving and 120 feet of sinking, for a State expenditure of £2450 12s. 10d., or 8s. 6½d. per foot.

Though no discoveries of large productive ore-bodies have been made, several payable lodes have been cut, and quite a number of tribute parties are meeting with a fair measure of success; while the prospects of others are encouraging. Altogether mining on the field has steadily revived, while indications are such that a continuance of the improvement may be anticipated.

The amount repaid to the State in royalties on sales of ore equalled £550 1s. 10d.

PROSPECTING.

Prospecting has been carried out over a very wide area by the effective and economical system of granting a State subsidy of £5 per month to each approved prospector. By this method it was possible to send a well-equipped party to the Port Davey district early in the month of February to search for minerals in that unexplored region. The party returned to Hobart about the middle of June, and reported that discoveries of gold, copper, osmiridium, and tin had been made, but not in payable quantities.

Some large pieces of asphaltum were discovered in places along the sea-coast and in several of the bays in Port Davey harbour, especially on the eastern side from Hannant's Inlet to the mouth of Davey River.

A number of extended prospecting claims were pegged off by members of the party, but these have now lapsed.

Messrs. Walter Windred and party appear to have been the first to discover asphaltum on the beaches at Port Davey, and they afterwards applied for leases of land in the vicinity, but these have since been withdrawn.

Other smaller parties operated in the vicinity of Preolenna, the Mainwaring, Wilson, and Henty Rivers; while several parties worked out from the State store at Corinna.

In nearly all cases encouraging results, and a fair knowledge of the potentialities of the various localities traversed, were obtained.

" THE MINING AND PUBLIC WORKS APPROPRIATION ACT, 1913."

Expenditure during the year ended 31st December, 1915:—

Purpose.	Amount Provided.	Expenditure previous to 1915.	Expenditure during 1915.	Total Expenditure to 31st Dec., 1915.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Item—				
1. For carrying out all or any of the purposes of "The Aid to Mining Act, 1912"	7000 0 0	...	4487 7 6	4487 7 6
	<i>Cr.</i> 751 17 7			
2. For carrying out all or any of the purposes of "The Mining Development Act, 1912"	6000 0 0	194 13 0	3944 6 1	4138 19 1
3. Assisting prospectors to further develop their discoveries, &c.	1000 0 0	100 0 0	150 15 0	250 15 0
4. For defraying the expenses incurred or to be incurred in connection with the State Argent Flat Mine, Zeehan	10,000 0 0	3891 16 8	7317 3 2	11,208 19 10
	<i>Cr.</i> 1208 19 10			
5. For defraying the expenses incurred or to be incurred in carrying on the operations of the Tasmania Gold Mine at Beaconsfield	2000 0 0	9314 19 2	135 16 6	9450 15 8
	<i>Cr.</i> 7450 15 8			
6. Making advances upon the security of ore produced from any mine in the State—Payment of expenses generally in connection with the foregoing, &c. ...	40,000 0 0	13,558 5 10	7714 16 4	21,273 2 2
	<i>Cr.</i> 20,480 13 7			
	£66,000 0 0			
	<i>Cr.</i> 29,892 0 8	27,059 14 8	23,750 4 7	50,809 19 3

"THE PUBLIC WORKS APPROPRIATION ACT, 1913."

Expenditure during the year ended 31st December, 1915:—

Purpose.	Amount Provided.	Expenditure previous to 1915.	Expenditure during 1915.	Total Expenditure to 31st Dec., 1915.
Item—	£ s. d.	£ s. d.	£ s. d.	£ s. d.
11. For carrying out all or any of the purposes of "The Mining Development Act, 1912"	6000 0 0	4372 3 2	1044 7 5	5416 10 7
12. Assisting prospectors to further develop their discoveries, &c.	2000 0 0	1037 3 0	536 5 2	1573 8 2
	£8000 0 0	5409 6 2	1580 12 7	6989 18 9

"THE MINING APPROPRIATION ACT, 1915."

Purpose.	Amount Provided.	Expenditure previous to 1915.	Expenditure during 1915.	Total Expenditure to 31st Dec., 1915.
1. For defraying the expenses incurred or to be incurred in connection with mining and mining operations in respect of State Argent Flat Mine at Zeehan	£ s. d.	£ s. d.	£ s. d.	£ s. d.
	8000 0 0	...	6607 12 2	6607 12 2
	<i>Cr.</i> £2623 2 8			

" THE AID TO MINING ACT, 1912. "

Expenditure to 31st December, 1915:—

Purpose.	Amount Provided.			Expenditure previous to 1915.			Expenditure during 1915			Total Expenditure to 31st Dec., 1915.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
(A)— <i>Mining, Prospecting, and Development Work, &c., undertaken by or under the Direction of the Department of Mines.</i>												
1. To provide for salaries of supervising engineers, and office charges, travelling expenses, printing and advertising, and any miscellaneous charges connected with the purposes of this Act	2000	0	0	2000	15	3				2000	15	3
<i>Cr.</i>		0	15	3								
2. In prospecting or mining for gold or any other metal or mineral or developing mines at or near Zeehar.	4000	0	0	4002	4	1	15	6	2	4021	10	3
<i>Cr.</i>		21	10	3								
3. In the equipment, salaries, wages, &c., of four Government prospecting parties	1500	0	0	1525	9	6	32	13	7	1558	3	1
<i>Cr.</i>		58	3	1								
4. In prospecting for gold by means of diamond-drill or otherwise at Beaconsfield	1000	0	0	1000	0	0				1000	0	0
5. In prospecting for gold or any other metal or mineral at Lefroy, Mathinna, and in the North-Eastern mining division	2000	0	0	1131	5	0	18	5	0	1150	0	0

6. In the purchase and erection or hiring of a State battery or other plant for the examination or treatment of ores in a locality on the West Coast deemed suitable by the Minister, and the cutting, construction, and formation of races, dams, and other works deemed necessary by the Minister in connection with the same, pursuant to Part IV of "The Mining Development Act, 1912"	6000	0	0	47	10	0			47	10	0	
* (1)				701	10	8	107	4	4	809	18	0
* (2)				2299	4	4	223	5	0	2522	9	4
* (3)				821	8	6	380	11	0	1201	19	6
* (4)				83	12	5				83	12	5
* (7)				35	9	3				35	9	3
* (9)				1298	10	0				1298	10	0
7. In opening up old tracks	500	0	0	500	0	0				500	0	0
8. In cutting and constructing tracks in the Heemskirk District, and from Macquarie Harbour to Port Davey	1400	0	0	1399	1	1				1399	1	1
9. In obtaining reports upon sites for conservation of water	350	0	0	350	0	0				350	0	0
(B)— <i>Advances in Aid of Mining and Prospecting.</i>												
10. Advances to miners for prospecting, pursuant to "The Mining Development Act, 1912"	750	0	0	539	10	2				539	10	2
11. Assistance towards boring not exceeding one-half the total cost, pursuant to Part V. of "The Mining Development Act, 1912"	500	6	0	136	13	8				136	13	8
	£20,000	0	0	17,872	8	11	781	5	1	18,655	2	0
	£80	8	7									

* The amount provided in Schedule under Item 6 not being required for the purpose specified, has been applied, as provided by Section 10 of the Act, for the purpose of augmenting the amounts provided for these items.

ADVANCES ON ORES.

Under Item 6 in the schedule to "The Mining and Public Works Appropriation Act, 1914," a sum of £40,000 was provided for making advances upon the security of ore produced from any mine in the State, and for the payment of expenses connected therewith, for so long as the Minister thinks fit whilst a state of war exists between Great Britain and any foreign State, such advances not to exceed 50 per centum of the Tasmanian value of ore, based on the London market price of metals on the 23rd day of July, 1914.

The necessity for making advances was owing to the closing of the London market and there being no market for disposing of the ores.

The amount expended up to the 31st December, 1915, was £21,273 2s. 2d.

The amount repaid to the vote up to the 31st December, 1915, was £20,480 13s. 7d.

The interest paid to the 31st December amounted to £481 15s. 6d., and has been paid to "Interest of Public Accounts." All advances have since been repaid, with the exception of £450 owing by the Dundas-Cuni Company. The Company has not been able to find a market for its complex ore (copper and nickel), and the amount may not be refunded for some time. In the meantime the amount is accruing interest at the rate of 5 per cent.

There are no outstanding accounts against the vote, and while there is a market for the ores no further advances are likely to be made.

The vote enabled a great many mines to be kept going which otherwise would have closed down and thrown a large body of men out of employment.

The expenses in connection with the administration of the vote amounted to £389 13s. 1d., the principal items being for sampling and assaying, cartage, and the employment of a typiste at Zeehan; but this amount is more than compensated for by the interest received.

ARGENT FLAT STATE MINE.

The main shaft has been sunk and timbered 88 feet, making a total of 238 feet. It is proposed to continue the sinking to 300 feet, and then crosscut for the various lodes which have been worked at No. 1, or the 150-foot, level. The west crosscut was extended 362 feet, and, as a great amount of water had made in this end, it was decided to cease operations and dam the water back. The north drive on Flaherty's lode was extended 612 feet. In the first 200 feet a seam of ore was encountered and stoped out. This seam produced £2800 worth of ore. The last 400 feet of this drive was barren. The east crosscut was extended 549 feet. Three lodes were cut in this crosscut, called Nos. 1, 2, and 3. Nos. 1 and 2, on being prospected for a short distance, proved barren. A little ore was showing in No. 3 workings, and a rise was put through to connect with same. A fair amount of stoping-ore was encountered, the lode averaging 3 feet 6 inches in width of fair milling-ore. This lode should turn out a fair amount of metal. A crosscut was driven 116 feet from the north drive to cut what is known as Fulton's lode, and this lode, on being cut, was driven on 66 feet north from the crosscut and 157 feet 6 inches south. The lode averaged between 4 and 5 feet in width for the full distance, and was payable for 70 feet in length. Thirteen stopes were worked on this lode, of which the first six produced good metal, and the remainder got poorer as they approached the surface. Other short crosscuts were driven to cut No. 4 lode, but no ore was met with where the lode was penetrated.

Outside the work just mentioned 293 feet of rising, 36 feet of sinking, 225 feet of crosscutting, 331 feet of driving on branch seams, and 1922 feet of stoping has been carried out, making the totals—

Crosscutting	1252 feet.
Driving	943 feet.
Rises	293 feet.
Sinking	124 feet.
Stoping	1922 feet.

Output.—The mine has produced 311·6 tons of marketable ore. The tributers have sold 154 tons of ore which realised £1724. It was found necessary to instal a second 15-inch lift in the shaft to cope with the water in No. 1 Argent workings and any extra water that might be tapped as the east crosscut is extended. The pumps are capable of lifting 40,000 gallons of water per hour. At present they are pumping 18,000 gallons. The prospects of the mine at present are distinctly favourable, as the No. 3 lode is opening up well, and the east crosscut, on being extended 150 feet, should cut three lodes which proved metal-bearing on the surface. The first was formerly worked by Kestle, and produced a fair quantity of ore. His workings are 500 feet south of the crosscut, the second lode is the one McCarthy is at present winning rich gossan on, and the third one produced metal down to 18 feet, that being the deepest one could go without a plant. Outside these lodes the north drive is within a few feet of the No. 1 Argent workings, and is expected to unwater this mine at any time. Judging from the number of applications for tributes in this mine, a fair amount of ore should be produced.

The receipts for the year were:—

	£	s.	d.
Ore sold	3561	6	9
Royalty paid by tributers	241	11	8
Material supplied to tributers ...	73	13	4
	<hr/>		
	£3876	11	9
	<hr/>		

APPENDICES.

Appended will be found the following reports:—

The Annual Report of the Mt. Cameron Water-race Board.

Report of the Government Geologist.

Reports of the Assistant Government Geologists.

Report of the Government Assayer.

Report of the Chief Inspector of Mines.
 Report of the Chief Inspector of Explosives
 Report of the State Mining Engineer.
 Reports of the Inspectors of Mines

GOLD MINING.

The following return shows the quantity and value of fine gold won during the year:—

	Quartz.	Alluvial.	Cyanide.	Blister Copper	Silver- lead Ful lion	Totals.
	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Beaconsfield .	26·21	5·93	4689·76	...	...	4721·9
Mathinna ...	3647·31	...	...	...	...	3647·31
Mt. Victoria .	501·49	43·48	...	...	...	544·97
Warrentinna .						
Mt. Cameron .	7·456	75·465	...	...	...	82·861
Lefroy						
Lisle.....	21·25	205·332	...	...	...	226·612
Golconda. ...						
Litydale						
West Coast...	19	66·718	...	9869	...	9954·718
Totals ...	4222·716	396·895	4689·76	9869	...	19,178·371

Value, £78,784, equal to 18,547·338 oz. fine gold.

Beaconsfield.—The Tasmania Gold Mine Limited obtained 4688 oz. of fine gold, valued at £19,913, from accumulated tailings, slimes, and concentrates treated at the Battery Reduction Works. It was estimated at the beginning of the year that 130,000 tons of slimes valued at 12s. per ton, and 9000 tons of concentrates worth 80s. per ton, still remained to be treated. Two extra roasting furnaces erected in addition to the four in use have greatly facilitated the treatment of the concentrates and of some of the dry slimes. A travelling plant on rails, constructed during the year, elevates and mixes the slimes at the dump heap, from whence it is pumped direct to the cyanide plant, about 200 yards distant. This will considerably reduce the cost of handling as compared with the former method.

North Tasmania Gold Mine.—Dally and party, to whom Government aid was granted to enable them to deepen the "Beacon" shaft and connect for air purposes, were obliged to give up early in the year on account of bad air.

The Rising Sun Syndicate erected a 10-head battery to test a big quartz formation at Salisbury, 5 miles from Beaconsfield. The stone crushed proved to be too poor to be payable.

Lefroy.—The New Pinafore Gold Mining Company.—Deep alluvial work on the main gutter coming south from the rise was continued for a month or so in the early part of the year, but the wash proved unpayable owing mainly to the immense boulders and sandstone blocks jammed in the gutter, and work ceased altogether in February.

Lefroy Deep Leads Gold Mining Company.—No attempt has been made to resume shaft-sinking since operations ceased at the commencement of the war. It is a pity this Company did not complete what they commenced with so much enthusiasm; their prospects of success were certainly good.

Back Creek Deep Leads Gold Mining Company.—This company had, at the close of the year, just about completed the sinking of its main shaft. A plat is cut at 245 feet from the surface, and the sinking of a 15-foot well is in hand. Considerable loss of time and expense was caused in the early part of the year owing to the inadequacy of the 10-inch draw lift pump to cope with the water, which had increased to 12,500 gallons per hour. A 14-inch plunger pump had to be procured and installed. A main reef drive is now commenced, and will be extended easterly to tap the wash at No. 1 diamond-drill bore, a distance of about 535 feet from the main shaft. This bore (one of four put down by the Government boring plant many years ago) is supposed to be somewhere about the junction of the "white" and "red" leads gutters. The main shaft is in the "V" between the two leads, and is, as already stated, 535 feet from the supposed intersection. This company has received Government aid to the extent of £1000, or

about one-fourth of its total expenditure on the mine to date.

Lisle.—The Lisle Hydraulic Gold Mines has put in a tail-race into the terrace ground on the eastern side of the main creek, and has treated 13,076 cubic yards of ground for a yield of 20 oz. 17 dwt. of gold; 22,351 yards in the flat (old ground) were also treated by gravitation for a yield of 87 oz. 11 dwt. Total, 108 oz. 8 dwt., valued at £414 2s. 6d.

Test shafts were put down on the new leases on the western side of the valley to check the value of other shafts, and also to prove the value of the ground for treatment. The company has an 18-horsepower engine and a 10-inch gravel pump, and has erected 3 chains of gold-saving boxes, &c.

Golconda.—The Lebrina Gold Mining Company did some work in shallow adit-levels. The project of deepening the main shaft could not be carried out owing to the want of sufficient funds, and the mine is now idle. Some prospecting is going on in the vicinity of the old "Enterprise" Mine on Lone Star Creek.

The "Queensland" lode is receiving some attention from a small syndicate. Government aid was sought for this, as also for the old mine, but could not be recommended as the applicants in either case could not show sufficient capital to be subsidised with any hope of success. The past history of the old Enterprise warrants an attempt being made to prove the value of the lode at a depth, but this will require a fair amount of capital, as the "sink" will be a wet one.

Warrentinna.—New Golden Mara Gold Mining Company.—The erection of a 12-head battery was completed, and crushing commenced in July. The first clean-up took place after a six weeks' run, but the result was not at all satisfactory. It was not anticipated that this first crushing would exceed 10 dwt. per ton, as a good deal of mullock from developmental work was mixed with the stone,

but when only a third of this value was obtained, it caused surprise. Subsequent crushings show a slight improvement.

Golden Mara North Mine.—This company did a lot of crosscutting and driving during the year, but has not discovered anything payable so far. The small veins cut at the bottom (200-feet) level do not compare favourably with the results stated to have been obtained from the same lodes where worked at shallower depths in years gone by; probably the present company has not gone far enough, although some hundreds of feet have been driven.

Mathinna.—New Golden Gate Syndicate.—Work has been carried on steadily and profitably at levels Nos. 1, 2, 3, and 4, driving and stoping north of the main shaft at No. 1 level. Loan's Reef has been followed into the old "Consols." Here, as in the succeeding levels down to 1000 feet, there is unexplored country and plenty of room for the continuation northward of both "Loan's" and the main New Golden Gate lodes. During the year 2137 tons of stone were crushed, yielding 2774 oz. of gold.

New Jubilee Gold Mine.—During the first quarter of the year the erection of a 10-head battery and concentrating machinery was completed and crushing commenced. The stone treated was of fair average quality, and with more enlarged mine development and under skilful and economical management should prove payable.

The working of such a flat lode, twisted and contorted as it is, is difficult, as numerous passes have to be constructed to get the stone to the levels. The stone recently broken at the bottom (260-feet) level is of good quality, and leads to the belief that better results will be attained at a greater depth. The flat nature of the lode, with a dip from the horizontal of only 32 degrees, will greatly increase its distance from the present working shaft at each succeeding level, and make working more costly in cross-cutting, transit of stone, &c. Against this, the flat lode has the advantage of giving more stone for each 100 feet of shaft-sinking than if it were vertical.

Upper Scamander.—Trafalgar Consolidated Gold Mining Company.—Developmental work has been going on at both main shaft levels—105 and 180 feet respectively. The lode cut in the sinking of the shaft has been driven on both north-easterly and south-westerly at each level. A rise put up at the south-western side of No. 1 level connects with a winze coming down from an old adit. At the bottom level a crosscut going south-east cut a lode 1 foot in width, giving assay values of 1 oz. 6 dwt. This crosscut, as also the one at the No. 1 level, is being driven south-easterly to cut lodes Nos. 8 and 9, supposed to be no more than 200 feet distant. A good deal of stoping has been done at No. 1 level on the "shaft lode."

The erection of the battery has been a slow process. It was commenced at the beginning of the year, and was only finished and ready for work by the beginning of November. It was then discovered that there was insufficient steam power, and another boiler had to be procured.

Alluvial and Gold-dredging Companies.—Gold was obtained by the following companies in streaming their tin-drifts:—

	Oz.
South Mt. Cameron Tin Mining Company ...	18·25
Briseis Tin and General Mining Company ...	18·23
	<hr/>
Total	36·48
	<hr/>

West Coast.—With the assistance granted by the Government, the McDowell Prospecting Association has endeavoured to establish the continuity of the remarkable "makes" of gold which have been intermittently met with, but, so far, without success. The association proposes to erect a crushing plant for the treatment of the stone.

SILVER-LEAD MINING.

The quantity of silver-lead ore produced was 10,382·95 tons, valued at £91,689, being a decrease in quantity of 1182·59 tons, and a decrease in value of £4536.

The principal producers were:—

	Tons.	Value £
<i>Zeehan Mines.</i>		
Zeehan-Montana	106'55	2413
Zeehan-Western	29	528
Zeehan-Queen	178	2688
Mt. Zeehan (Tas.)	366	7324
Oonah	1550'25	1445
Broken Hill Propy. Block 10 ...	711'50	409
Nike	157'75	2632
Queensberry	89'50	465
State Mine	458'15	5674
Renison Bell	16'15	263
Tasmanian Copper	260	6727
Adelaide	25'80	147
Wallace	2'55	28
Hamilton	28'10	130
Zeehan-Dundas	22	491
Penzance	13'45	322
<i>Mt. Farrell Mines.</i>		
North Mt. Farrell	2418'2	23,582
<i>Magnet Mines.</i>		
Magnet	3636	31,352
<i>Mt. Claude Mines.</i>		
Round Hill	314	5069

Zeehan District.—With the exception of the Argent Flat State Mine, all the mines in this district are now let on tribute. The high prices for silver and lead, together with the assistance granted by the Department, has induced many of the miners who were thrown out of employment through the closing-down of the mines to work on tribute, and many of them are doing very well, and keeping up a regular output of ore, which is being sent to the Cockle Creek works of the Sulphide Corporation Limited for treatment.

Mt. Read District.—The Hercules Gold and Silver Mining Company.—No ore has been sold during the year, but some 270 tons of ore, representing an average grade sample of mine product, were broken from various parts of the mine and sent away. No details of the assay or value of the shipment are available.

Average number of men employed, two to three monthly.

Underground Works.—The only works carried on were those in connection with the necessary constant maintenance and upkeep of the mine generally. Numerous timber-renewals and other repairs have been effected, and all the main drives, crosscuts, and stopes are in fair working order.

Surface Work.—No work of any kind has been attempted, but all the mine works and buildings have been maintained in good order. The haulage tramway was operated three or four times, as required, and worked well. All the plant and gear is in good condition.

The mine at the present time is in a good state of preservation and repair, especially considering that practically all active operations have been discontinued for over two years.

Lyell District.—The Tasman and Crown Lyell Company's shaft has been cut down to the 700-foot level of the North Lyell Mine workings, from which point it is being extended to the deeper levels, and will eventually afford means for entering and leaving the mine, so that the present main shaft may be solely devoted to ore-hoisting purposes.

Mt. Farrell District.—The North Mount Farrell Mining Company.—During the year 15,047 tons of crude ore have been mined and dressed, resulting in the production of 2417.85 tons of marketable ore, containing 136,434 oz. of silver and 1361 tons of lead, of a net cash value at the mine of £32,683. The total production to date amounts to 33,457 tons, of a cash value of £331,111.

Early in the year a market was secured for the mine's product, and the ore which had accumulated since the closing of the metal market on the outbreak of the war has been disposed of to the Sulphide Corporation Limited, to whom the current production is now being regularly shipped.

Ore-production, which during the latter half of the previous year had been carried out on restricted lines, has, during the term under review, been increased to the fullest

extent permitted by the inadequate supply of skilled labour available. Notwithstanding the heavy increase in smelting and other realisation charges, and the increased cost of mine stores and supplies, the high market prices ruling for lead have enabled a satisfactory profit to be shown on the year's operations.

The bulk of the output has been drawn from the bottom shaft levels, Nos. 2 and 3, the latter being sufficiently developed to permit of ore-breaking to be commenced there during the latter half of the year. The No. 3 or main lode at this level has been opened up for a length of 350 feet, and a large tonnage of good-grade ore made available for extraction. With the present drive on this lode still in good ore, and two other lodes yet to be exploited, substantial accessions to the ore reserves are expected during the coming year. The grade of the milling ore mined has been well maintained; but the proportion of "prill" or hand-picked first-class ore won still remains much below what it was in the upper adit levels of the mine.

Fair progress has been made with the extension of the low level being driven under the joint arrangement between the Mt. Farrell Mining Company and this company. This has been extended 412 feet, making the total distance driven to date 742 feet. The drive is now in the Mt. Farrell Company's ground, and is about 200 feet below the level of that company's old workings. The lode channel has been well defined, but so far no ore of any importance has been disclosed.

Prospecting operations on the northern or "Mackintosh" leases have disclosed promising bodies of milling ore, which will be exploited as soon as tramway communication can be provided for the purpose of conveying the ore to the mill at the North Farrell Mine for treatment.

The mine is employing about 100 men, but is short of its full complement. As has been the case for some years past, the North Farrell Mine is the sole mainstay of the township of Tullah, there being no work carried out on the other mines in the district at the present time.

North-Western Mining Division.—The Magnet Silver Mine. Mining operations have been carried on at Nos. 6, 9, 10, and 11 levels, and crosscutting for the main lode at No. 12 level.

The stopes at No. 6 level have produced a small quantity of high-grade ore, which occurs in bunches, but is payable.

Nos. 9, 10, and 11 Levels.—The stopes over these levels have produced practically the whole of the output, and the faces are still showing good ore.

At No. 12 level the crosscut was driven 279 feet, when a splendid body of ore was met with, which promises to be of a permanent character.

The following are the quantities of ore won, &c.:—Output, 3636 tons; silver, 207,166 oz.; lead, 884 tons. Gross value £31,352.

Average men employed, 138.

Owing to the winding-engine breaking down in November, ore-production ceased until the end of the year.

Prospecting.—An adit to cut the lode south of the main slide is being driven, and is now in 360 feet. When the lode is cut a connection will be made to the present workings as another means of escape.

Northern and Southern Division.—The Round Hill Silver and Lead Mining Company produced 314 tons of ore, valued at £5069. During the first half of the year, and while the mine was still worked by the tributer, Mr. Gabbidy, fresh development and enhanced silver values took place, both at the bottom or creek tunnel level and at the upper adit level. The lead contents still maintained its usual very high percentage, while silver increased from 30 to 40 oz. to as high as, in some instances, 600 oz. per ton. Not much was done in the way of extending the two levels, the tributer paying more attention to stoping with a view of making the most of his occupancy of the mine, which would terminate in October. The improved prospects of the mine, however, soon attracted the attention of capitalists; shares hitherto slow of sale at 1s. 6d. to 2s. jumped to 5s., 8s., and eventually to 10s.

This enabled the company to dispose of its 10,000 reserved shares at a good price. A further issue of 20,000 shares was arranged for in order to provide the necessary capital to thoroughly equip and develop the mine. Mr. John Craze, late of the Montana Mine, Zeehan, was appointed general manager, and took charge of the mine and workings in August. Much had to be faced to commence with. The mill and concentrating plant (of moderate dimensions, operated by water power) had to be overhauled, repaired, added to, and enlarged so as to double its former capacity. In the mine the main tunnel level had to be retimbered, ore-shoots repaired, and mullocking of large stopes attended to. The tramline, about 30 chains in length, connecting the mine and the mill, has been regraded and improved to increase its carrying capacity. Buildings, assay, and business offices have been erected; also engine workshop and smithy.

The work carried out consists of developmental, constructional, and general repairs.

No. 1 Tunnel (Developmental).—This tunnel has been advanced 120 feet, including a drive of about 70 feet under the late tributers' workings. The lode in the drive for the distance driven has been fairly productive, the ore being of high silver values. The end of this tunnel is now in 400 feet from the approach, and has been enlarged and retimbered for the whole distance—size of tunnel, 8 feet high by 6 feet wide in clear of timber. A new tramline has been laid from the face of tunnel to the mill-site of 20-lb steel rails, being 2-feet gauge. The trucks are side-tips, and carry 1 cubic yard of material. These trucks are worked by horses, which take them to the end of the tunnel. The whole of the openings left by the tributers have been securely timbered and filled with waste rock brought down from the surface through rises put up for that purpose.

No. 2 Tunnel.—This tunnel is 70 feet above No. 1 tunnel, and has been extended a distance of 120 feet. This drive for the last 70 feet has been driven on a good lode.

The tunnel has also been retimbered for a considerable distance, and the old stopes filled and made secure.

Surface.—The approach to No. 1 tunnel has been excavated out of solid rock for storehouse, machinery, and blacksmith's shop; also for air-compressor plant. The material from these excavations has been utilised to build up walls on each side of the gorge, and this has been covered with timber. We have thus reclaimed about one-half acre of level space for yard and mining purposes.

Concentrating Plant.—The construction of the additional concentrating plant has entailed considerable excavation, and the building of high and strong retaining walls. The necessary excavations and wall buildings, and the framework of the mill proper, including ore-bins, have been completed.

Ore Produced.—The company has not attempted to produce any special output of ore. As stated above, the work has been developmental and general repairs. While this work was being carried out, the following ore was obtained:—

13 tons hand-picked ore, approximate value	£270	0	0
95 tons concentrates, approximate value	1614	0	0
Total	£1884	0	0

The average number of men employed has been 50

An excavation is now being made for a rock-drilling plant of the Ingersoll Rand type, two-stage compressor, the compressor to be driven by a National Suctional gas-engine of 120 h.p. The whole plant will be erected and put into commission as soon as it arrives from England. This will enable the company to push on much faster with the mining development work.

The Round Hill Extended Silver and Lead Mine.—This company only started active operations on the 2nd October last, and has built a manager's residence, workmen's huts, smithy, and other surface works. The main crosscut

has been driven 80 feet, besides shaft-sinking and trenching. A good lode of clean ore has been opened up, which is said to be a parallel lode to the Round Hill Company's lode. The prospects of the mine are very encouraging.

COPPER MINING.

The quantity of blister copper and copper ore produced was 7967 tons, valued at £709,534, being an increase in value of £213,493 on the previous year.

The Mt. Lyell Mining and Railway Company Limited.—The ores and metal bearing fluxes treated by the company were as follow:—

Ore—	Tons.
From the Company's Mt. Lyell Mine ...	210,707
Ditto, North Lyell Mine	129,847
Ditto, Lyell Comstock Mine	167
Purchased ore (from other mines)	134
Metal-bearing flux	Nil
	<hr/>
Total	340,855

Blister copper produced, 7901 tons, containing:—Copper, 7814 tons; silver, 452,645 oz.; gold, 9870 oz. Approximate value, £742,312.

Average number of men employed:—

Mining Department—

At the company's Mt. Lyell Mine ...	403
At the North Lyell Mine... ..	469
At the Lyell Comstock... ..	4
At the Crotty Leases	16
	<hr/>
	892

Reduction Works Department (including

Lake Margaret)	684
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Railway Department—

Mt. Lyell Railway	119
North Lyell Railway	26
	<hr/>
	145

1721

The dividends paid during the year amounted to £145,034 8s. 9d.—2s. 3d. per share.

Dividends paid from the inception of the company to the 31st December, 1915, £3,056,492.

Copper produced from the inception of the company to the 31st December, 1915, 141,063 tons, fine.

Silver produced from the inception of the company to the 31st December, 1915, 11,434,345 oz., fine.

Gold produced from the inception of the Company to the 31st December, 1915, 333,654 oz., fine.

The usual ore-extraction and developmental work was carried out at the Mt. Lyell and North Mt. Lyell Mines.

The production of pyritic ore from the open-cut and the stopes of the parent mine was augmented by despatches from the South Lyell workings. These workings are now connected at the Nos. 5 and 8 levels of the Mt. Lyell Mine, and a connecting drive is also in hand at the No. 7 level.

The exploratory work at the new No. 9 level comprised the driving north and south from the main shaft crosscut and a crosscut from the South Lyell shaft. The main pyritic mass has been located, and stopes are now being opened up. The South Lyell deposit was located by the crosscut, but the full width has not yet been determined, but it is already showing for a distance of 40 feet.

During the year this mass at the No. 8 level has opened up very favourably, and will directly become a large producer of pyritic material.

The various working faces in the Mt. Lyell Mine have yielded large tonnages, and the stopes are in good productive condition. The yield of ore from the open-cut was maintained, and the customary large tonnages of material for filling purposes were obtained in process of removing the overburden—principally at the southern end of the cut.

At the North Lyell Mine the usual productiveness of the various levels operated was maintained. In addition to

exploratory work to determine ore-extensions, a considerable amount of diamond-drilling was effected.

The prolongation of the ore-bodies in a northward direction at the 1000- and 1100-foot levels was well maintained, and the limits of the payable zones are not yet determined. At the 1200-foot level, which has lately been reached by the No. 2 engine winze, the ore-body was located, and the rill stope is already supplying its quota to the mine's output.

Timbering and stope-filling operations have been kept up to the usual pitch, and, generally speaking, the mines are in excellent condition.

At the Lyell-Comstock Mine preparatory work for open-cutting the lode outcrop has been in hand, in anticipation of the completion of the flotation mill.

The reduction works plant has been kept continually in operation with three furnaces under blast, and the converter plant was worked as required.

Plans are now in hand for the erection of a new converter plant containing all recent improvements suitable for local conditions.

Experimental work on the manufacture of crude sulphur from pyrites is now in hand.

A flotation plant capable of dealing with 600 tons of Comstock ore weekly in one daily shift was erected during the year, and is about to be put into commission.

This flotation unit, which is regarded as an experimental effort to treat successfully the lower-grade ores of the field, comprises the usual minerals separation boxes, dorr-thickeners, tube-mills, jaw-crushers, &c.

The Lake Margaret hydro-electric plant was put into complete active use early in the year, and has continued to give every satisfaction. The natural storage capacity of the lake has been determined to exceed the average draw-off of the present installation. Additional data are now being compiled covering the possible ultimate scope of the scheme. A trial survey for a transmission line from the power-station to Zeehan was made during the year.

A new reinforced concrete dam for the storage of 54,000,000 gallons of water was constructed in the west branch of the Queen River.

The limestone quarry, at Queenstown supplied the amount of flux required for the smelters. This quarry is nearing the limit of economical production, and a new quarry, situated near Lynchford, is being opened up, and a siding from the main line laid down.

The Mt. Lyell Railway and the North Lyell line were operated without any interruption, excepting one due to a landslide, which carried away a viaduct of the main line.

The substitution of an earthen embankment for the high timber trestle bridge at the 10½-mile on the North Lyell Railway is in progress.

The rainfall at Queenstown was 122·94 inches, and at Lake Margaret 164·03 inches, for the year.

The Mt. Lyell Blocks Copper Mines, No Liability.—This company has persistently endeavoured to discover ore-bodies similar to those which abound in the North Lyell Mine adjoining. The air-compressing plant, which was unfortunately destroyed by fire, has been replaced, and the prospecting drives at the 1200- and 1300-foot levels have been put out 200 and 275 feet respectively in conglomerate.

Mts. Jukes and Darwin.—The only work of note in these districts is that done by Messrs. Soutar and Bocking, who have advanced their prospecting adit a total distance of 340 feet. This leaves about 50 feet of driving to be done to reach the winze from which the early proprietors are stated to have obtained their best prospects.

Zeehan.—The Ring Valley Mine has been closed down since the war started. Some prospecting was done on the southern end of the section. The tunnel south of the main shaft was extended 46 feet, and a crosscut put in east from the face for a distance of 29 feet, but no payable results were obtained.

The Colebrook Prospecting Association extended No. 1 adit 213 feet, making a total of 580 feet, and still has about 32 feet to drive to cut the lode. No ore was won during the year.

The Copper Nickel Prospecting Syndicate.—Beyond a little prospecting, no work was done by this syndicate. No results of any value were obtained.

Mt. Balfour Field.—Owing to the European war the contract for the sale of copper ore was suspended, and no copper ore was sold during the year. Twenty-five tons, valued at £200, was bagged and sent to Whale's Head for shipment.

A winze was sunk below No. 3 (220-feet) level north of main crosscut, and connected with No. 4 level. No. 4 (300-feet) level was driven north to 128 feet and south to 293 feet on the lode, which was copper-bearing all the way. Crosscuts were put in east and west through the lode. Underground mining ceased on 27th March, but the pump was kept going until 16th October. Since then the enlarging of the engine-shaft from 6 by 4 to 12 by 4 feet has been in hand from the 120-foot level to the surface, so as to work two cages. Below the 120-foot level the shaft was originally sunk 12 feet by 4 feet.

All the ore-dumps on the surface have been sampled for the purpose of investigating their suitability for treatment by modern methods. Some tin-mining was done and preparations made for working the tin ground on a larger scale on more economic lines. Seven acres of button-grass land has been ploughed. This will be further worked up and scooped into the sluicing-race with horses, and necessary puddling done with horses and harrows. By this means it will be proved whether the remaining surface areas of tin ground can be worked at a profit or not. The richest patches have already been worked by the miners.

TIN MINING.

The quantity of tin ore raised was 2599·234 tons, valued at £292,306; an average value of £112 9s. 2·04d. per ton.

The statistics for the year are:—

	Ore won, tons.	Value. £	Miners Employed.	
			Euro.	Cui.
Northern and Southern Division	72·75	6485	41	—
North-Eastern Division	1253·504	152,786	439	30
Eastern Division	397·005	45,471	244	13
North-Western Division	673·660	70,077	320	—
Western Division	202·315	17,487	134	—
Total	2599·234	292,306	1178	43

North-Eastern Division.—The output of tin ore was 1253·504 tons, obtained as follows:—

	Tons.	Tons.
<i>Pioneer and Gladstone Districts.</i>		
Pioneer Tin Mine	434·5	
Aberroe	3·66	
South Mt. Cameron	64·55	
Clifton Creek	67·10	
Yee Gee	11·05	
Other claims	139·65	
		726·51
<i>Ringarooma District</i>		25·10
<i>Derby District.</i>		
Briseis Tin Mines	261	
Other claims	53·39	
		314·39
<i>Branxholm District.</i>		
Arba Tin Mine	90·97	
New Ruby Flat	36·60	
Other claims	17·35	
		144·92
<i>Moorina District.</i>		
Weld Tin Mine	23·80	
Other claims	13·85	
		37·65
<i>Straits Islands</i>		4·934
Total		1253·504

Eastern Division.—The output of tin ore was 397·005 tons, obtained as follows:—

Weldborough, Lottah, and Blue Tier Mines.

Anchor Mine	25·65	
Other claims	104·20	
		<hr/> 129·85

St. Helens Mines

108·855

Avoca Mines.

South Esk	7	
Royal George	97·55	
Storey's Creek	43·05	
Foster's	9·45	
Others	11·25	
		<hr/> 168·30

Total

397·005

North-Western Division.—The output of tin ore was 673·66 tons, obtained as follows:—

	Tons.
Mt. Bischoff	446
Mt. Bischoff Extended	166·46
Weir's Bischoff Surprise	7·50
Mt. Cleveland	17·50
Ringtail	21·60
Waratah Alluvial	7·85
Mt. Balfour	4·50
New Wombat	2·25
	<hr/> 673·66

Total

673·66

Western Division.—The output of tin ore was 202·315 tons, obtained as follows:—

	Tons.
Dreadnought Boulder Mine	73·59
Renison Bell Mine	22·86
Montana Tin Syndicate	15·79
Central	25·15
Heemskirk, Stanley River, and others	64·925
	<hr/> 202·315

Total

202·315

Northern and Southern Division.—The total output was 72.75 tons, of which the Shepherd and Murphy Syndicate produced 70.4 tons, and the Iris Mine 2.35 tons. This industry has progressed more favourably during the past year, owing to more copious rainfalls during the autumn, winter, and spring than have been experienced for many years past. There was, however, no change from the unprecedented drought of 1914 until April of this year, and many of the tin mines were practically idle for the first quarter of the year. When rain did come it was noticeable that the number of men formerly engaged in the industry had greatly diminished owing to so many having enlisted and gone to the front.

The Shepherd and Murphy Mines.—The main shaft has been sunk to a depth of 170 feet below the level of No. 3 adit, and connected with the surface by rising 100 feet. The total depth of the shaft from surface is 270 feet, including 20 feet for well. Levels are opened at 75 feet and 150 feet below the main adit level. Winding machinery is fixed at the surface brace of the shaft, and will be operated by steam power when the water-supply is sufficient for the purpose. The ore will be hoisted in the shaft to the adit level. A crosscut is being extended south from the bottom of the shaft to cut lodes Nos. 5 and 4. No. 6 lode, quite close to the shaft, is being driven on east and west.

The mine is well equipped with machinery, and can be operated by steam, so far as the winding and air-compressor plant is concerned, if there is not sufficient water for the "Pelton" wheels.

The mill and concentrating machinery is operated by water-power.

North-Eastern Mining Division.—The Arba Tin Mine.—Operations at this mine were suspended until April, partly owing to the slump in the metal market after the war broke out, but mainly owing to the shortage of water during the summer. With the arrival of the rain mining operations

were carried on with energy and a considerable amount of success.

Sluicing was carried on at the main workings, the yardage treated being well up to the average.

From 137,259 cubic yards treated, 81 tons 19 cwt. of black tin was won, the average contents per cubic yard being 1.33 lb.

At the Easement property work was commenced on the 4th of April, and proceeded continuously up to the end of the year, and during that period 61,646 cubic yards were dealt with, producing 29 tons of black tin. The average tin contents of the ground worked was 1.05 lb. per cubic yard.

The total output of black tin for the period under review was 113 tons. The average number of men employed was 57 on the mines, and 21 engaged in the bush cutting firewood and carting for contractors.

The plant and machinery was maintained in its usual condition, renewals being somewhat heavier than usual.

Given a satisfactory price for the tin raised and a plentiful water-supply, there is every indication of 1916 being a profitable year for the company.

Arba Extended Tin Mining Company.—A 4-inch gravel pump, operated by a small oil engine, is in use for lifting the tin-wash 23 feet. Only two men employed.

Briseis Mine, Derby.—Output, 370 tons of black tin. Estimated value, £42,292. Number of men, 113.

Mutual Hill Mine.—Output, 12 tons 16 cwt. black tin. Estimated value, £1462. Number of men, 9.

During a portion of the first quarter the men could only work half-time at the Briseis Mine.

At the Mutual Hill Mine there was insufficient water to do any work during the first five months of the year. The men employed each quarter were:—First quarter, 1 man; second quarter, 4 men; third quarter, 17 men; and fourth quarter, 16 men.

The usual work of removing overburden and treating tin drifts was going on regularly so far as the water-supply

permitted, the first five months of the year being very dry. Greater use of water-driven machinery is being made, as the bed of the lead goes northward at an increasing depth below the river.

The heavy shingle in portions of the wash is screened out by a trommel with $1\frac{1}{4}$ -inch holes, and is conveyed to dump by a belt-conveyor 300 feet long. This plant is driven by Pelton wheels, through rope and spar gearing.

A conveyor, fed by bucket elevation and driven by Pelton wheels, dumps sand from sluices. The same pumps are driven by turbines and Pelton wheels, as previously reported.

A new series (S stage) turbine 350 h.p. is being erected, and will drive two-stage gravel pump for lifting drift from the lower faces to the main sluice.

The Pioneer Tin Mining Company Limited.—The two electric barges working as independent units sluiced 797,800 cubic yards at a cost of 4.051 pence, for a yield of 360.85 tons of stream-tin.

The increased yardage over previous terms was due to the good rainfall from April, which, being well distributed throughout the remainder of the year, enabled both plants to be kept steadily at work.

On the company's Argonaut Mine at St. Helens 148,000 cubic yards were sluiced for a yield of 67.35 tons of stream-tin, at a cost of 5.608 pence per cubic yard. The payable portion of the creek flats having been worked out, the plant was floated up on to the terrace ground, where it was worked for the last few months of the term.

At the South Pioneer leases, which are worked with the overflow water from the Frome Dam, 8000 cubic yards were sluiced for a yield of 2 tons 1 cwt. of stream-tin.

The total yardage sluiced on the company's mines for the year was 953,800 cubic yards for a yield of 430.75 tons of stream-tin, of an approximate value of £48,000. Seventy-three men have been employed. In addition to the above, a party of tributers working this company's Cream Creek

leases on the Blue Tier have won 18·25 tons of stream-tin with a small battery driven by water-power.

North Mount Cameron.—From 80 to 90 men, nearly all Europeans (some single-handed, but generally in parties of from 2 to 4 men each), are tin-getting round Gladstone, Mussel Roe, and North Mt. Cameron. About 55 work on small leases and miner's right claims, and obtain their supplies from storm-water, partly conserved in small reservoirs or dams. Several mine-owners obtain their water from the Mt. Cameron Water-race; these employ from 27 to 30 men.

The Aberoe Tin Mining Company, whose operations are at Aberfoyle, have their own water-supply, derived from the Boobyalla River. They employ 8 men. The water-supply for nine months of the year was fairly good.

O'Halloran and Fleming's Tin Lode.—This was prospected a little further east. The small vein still continues and maintains its favourable prospects of tin. Work was discontinued early in the year, the owners turning their attention to tin-getting from alluvial when the wet season set in.

South Mt. Cameron.—Clifton Creek Tin Mine (McDonald Limited, proprietors).—The output of tin ore obtained was 67 tons 2 cwt., valued at £6710, an average of 23 men being employed. The barge was floated to a new position about the middle of the year, since which time sluicing operations have been going on regularly.

Two or three small claims are working at Campbell's Creek and Pioneer Extended. Pitchford and Pointing are doing very well with their hydraulic plant.

Yee Gee's South Argus Mine was idle for a time during the winter. A new boiler had to be procured and installed on the gravel-pump barge. The mine is now working again.

Weld Tin Mine (Jas. Thompson, proprietor).—The usual useful sluicing operations have been successfully carried on at the old mine, south of the Ringarooma River.

On the north side the deep lead ground, in what is known as the "Echo Mine," is improving in value as the face advances to the north-west on the dip of the gutter. This is probably the ancient channel of the Weld River, trending to the north-west to join the Derby main lead.

Messrs. Bryce Bros. and Dickenson, employing five men, obtained 8 tons 8 cwt. 3 qr. 2 lb. of tin ore, valued at £753 9s. 8d., and paid £466 4s. 10d. in wages.

The T.P.C. Company have fixed up a balance hoist at top of 50-foot shaft, connecting with main lode adit. An elevated tram is constructed across the gully to the battery; this will facilitate matters in giving the tin lode another trial.

The Guiding Star Tin Mining Company completed additions to the concentrating plant in connection with their 10-head battery, but were unable to resume development of their tin-lode owing to want of funds.

Eastern Mining Division.—Weldborough.—The Fancy Creek Tin Mine and a few small claims have been working, but there is not much doing in this locality now.

At Cream Creek a couple of small milling plants are doing very well on soft-lode formations.

The Anchor Tin Mine Limited.—The tribute party did fairly well during the second half of the year, making a little over wages for their last clean-up. The water-supply was good, and about 40 stamps were kept going. The mill and concentrating plant is in a bad state of repair, and the loss of tin must be very considerable.

St. Helens.—With the exception of the Pioneer Company's Argonaut Mine on the Golden Fleece Rivulet already referred to, very little work is being done.

Avoca District.—Royal George Tin Mining Company.—After being idle for several months, work was resumed in April. The 30-head battery is putting through about 2400 tons per month. The lode in the main adit level, at 600 feet in from the entrance, opened out to a width of 30 feet, and a large body of tin-rock is making behind what was supposed to be the true hanging-wall. In August, the tin

market having dropped to £150, work on the wages system was no longer possible, and the mine was let on tribute to the late employees of the company, who, at the close of the year, appeared to be getting on satisfactorily.

Ben Lomond.—The Great Republic Tin Mine is to be given another trial. A winding-plant has been erected by the new company, and the lode has been tested by prospecting and sampling at the different levels and stopes down to the bottom, or 400-feet, level. It is understood that the result of this work is of a satisfactory nature, and that development work will follow. The lode in this mine is unique as compared with other tin-lodes in the State, inasmuch as the tin oxide values live to a much greater depth than has so far been proved elsewhere. The payable ore-shoot is apparently short, but further exploration may show an improvement in this respect.

The Storey's Creek Tin Mining Company.—Two strong parallel lodes 2 to 5 feet in width, and dipping at an angle of about 23 degrees from the horizontal, are being worked by means of adit levels, and with highly payable results considering the crude method of treatment. The contents are higher in wolfram than in tin values.

The company is now about to construct roller-mill and concentrating machinery. The output was 42 tons 7 cwt. of tin-ore, valued at £3040, 33 men being employed.

The South Esk Tin Mine obtained 8 tons of tin-ore, valued at £784. The ground tested yielded from 1½ to 2 lb. per cubic yard.

Western Mining Division.—The Renison Bell Prospecting and Mining Company.—At the time of the outbreak of war in August, 1914, owing to the metal market falling, the mine was closed down and except for the completion of the constructional work for the additional plant which was then in progress, no further productive work was done until March in the year under review, and then only in a limited way on oxidised ore, and a quantity of accumulated tailings from the former sluicing works. This was done in order to give the additional plant a trial run and get all parts

into thorough working order before recommencing the treatment of the pyritic ore which was commenced at the end of May and continued for approximately one month.

In consequence of the trouble experienced in obtaining a satisfactory recovery of tin from the calcined ore, all work was discontinued until such time as the company is in a position to make further necessary increases in the milling plant, to ensure thereby a reasonable recovery of the tin and make the work profitable.

In all, 5056 tons of pyritic and oxidised stone were treated, from which were obtained 22·86 tons of tin oxide, valued at £1883, the average number of men employed being 22.

The small amount of work done on the pyritic ore-bodies proved these to be very extensive deposits of payable stone, the greater quantity of which can be mined cheaply by open-cut work. The ore-bodies being, on the whole, low-grade, will require adequate mining and milling machinery to make their exploitation a successful economic undertaking. A comparatively small expenditure in this direction is required to ensure this.

By-product.—The ores in the mine contain a fairly high percentage of sulphur, and with the ever-growing demand for the latter in the manufacture of fertilisers, this constituent alone will in the not distant future be a valuable asset to the company.

Mining operations being temporarily suspended on the pyritic ore, attention was again directed to the development of the oxidised portions of the ore-bodies, with very encouraging results. In June last a discovery of payable oxidised ore was made a few chains north of what is known as the "Blow" workings. Since then development has proceeded steadily, and a nice body of payable stone has been opened up, and which has more recently been further developed by tunnelling at a deeper level.

More recent work has revealed the existence of a hitherto undeveloped ore-body situated on the eastern side of the main northerly spur from the Renison Bell hill. The

latest development is situated at a slightly higher elevation than the "Blow" workings, which are situated on the western side of the main spur. The eastern lode is developing very satisfactorily, and gives promise of yielding a large quantity of oxidised stone of good payable grade.

With the developments spoken of, the mine's future outlook is most promising for a continuation of profitable returns for a long time to come.

North-Western Mining Division.—The Mount Bischoff Tin Mining Company.—The output of ore from the mine totalled 115,264 tons, of which 110,522 tons were delivered at the mills for crushing and concentration, and 4742 tons, being very low-grade, were rejected. Four hundred and seventy-nine tons of concentrates were obtained, at an approximate value of £56,043.

The co-operative system of working introduced last year was terminated on 15th March this year, and the company then resumed operations on its own account. The number of men employed before March and since has averaged 132.

Surface Workings.—Mining operations on the various faces and benches on the southern slope are becoming more costly and difficult, owing to the depletion of much of the detrital matter; and large bodies of ore, rendered profitable through the interspersed minor points of enrichment, have hitherto been worked to the greatest advantage as a whole, but, unfortunately, this is becoming impossible, as they are now greatly reduced and more scattered.

Prospecting.—Encouraging results were obtained from further development work on the North Valley flats. In arriving at the tonnage and tin-content of these deposits, every precaution was taken to ensure accuracy. A complete survey of the flats was made, and shafts were put down as nearly as possible at the corners of 2-chain squares. Excluding the first 4 feet of recent sandy river deposit, and figuring the average return for all the shafts sunk, the result shows a percentage of 0.33 per cent. tin.

These alluvial deposits are connected with No. 2 aerial ropeway system by an electrical hoist. Owing to boisterous

weather conditions experienced during the latter half of the year, the plant was not installed until late in December. The trial runs proved that it fulfilled all the conditions specified. When the hoist is in full running, a considerable increase in the output may be anticipated.

Milling and Concentrating Plant.—The economic aspect of the milling and concentrating problem is now a study of some complexity, involving a careful balancing between technical and financial considerations. The ore, being low in grade, does not permit of very elaborate appliances or refinements of treatment, and consideration has been given to attaining the maximum output per stamp and the economic limit of concentration.

Hydro-Electric Power Plant.—All the machinery in connection with this installation has been in continuous service.

The output since the inception of the company in 1873 to 31st December last was 74,286 tons of tin oxide, valued at £5,015,076, and the total amount paid in dividends to that date was £2,455,500.

COAL MINING.

The total quantity of coal raised amounted to 64,536 tons, valued at £30,418; being an increase of 3742 tons on the previous year.

The raisings at the different collieries were:—

Colliery.	Tons Raised.	Men Employed.
Cornwall	25,470	72
Mt. Nicholas	37,431·25	79
Spreyton	270	1
York Plains	691	2
Illamatha	188	1
Mt. Cygnet	16	—
Cardiff	118	1
Sandfly	52	1
Dalmayne	300	1
Total	64,536	158

The Mt. Nicholas Company, working on the long-wall method, have their mine well opened up to produce coal in larger quantities should an increase in the present rather limited trade demand warrant such a course.

At the Cornwall Colliery the old pit (4-feet seam) was abandoned about the middle of the year, owing to the breaking up of the seam going west by numerous faultings. Work is now confined solely to the 6-feet seam in No. 3 pit, which is being worked on the "pillar and stall" system, and is well opened up for extensive working should a better trade demand for the coal arise.

Dalmayne Coal Mine.—The main heading has been extended a total distance of 400 feet from the entrance. Some cross-roads have been put in, and a connection for air made with the old prospecting tunnel. The survey for an aerial ropeway for transit of the coal to the seaboard at "Picanini Point" (a distance of $2\frac{3}{4}$ miles) is now complete. The contract for supplying and constructing the plant is let to Gibson-Battle & Co., of Sydney; contract price, about £9000. The first project for the construction of a railway from the mine to the old Seymour jetty was abandoned owing to length of line that would be required and the difficult nature of the country for construction.

It is claimed that, apart from the difference in cost of construction of the transit line, Picanini Point can be made a better shipping-place than Seymour. A lot yet remains to be done in the way of jetty-construction, building hoppers, screens, &c., before the company will be in a position to send coal to the market.

TASMANITE SHALE.

The Railton-Latrobe Shale Oil Company raised 600 tons of shale, and produced approximately 24,000 gallons of crude oil, of a gross value of £600.

An average of 10 men were employed during the year.

OSMIRIDIUM.

The quantity and value of osmiridium obtained from the Wilson and Savage Rivers has fallen off owing to the difficulty of disposing of the metal and the low prices offered.

The quantity obtained was 247·048 oz., valued at £1581, as against 1018·83 oz., valued at £10,076, last year.

BISMUTH.

The Shepherd and Murphy Mine at Middlesex obtained from its tin-ore 5·125 tons of bismuth, valued at £1154.

The Squib Mine obtained 0·375 tons, valued at £49.

WOLFRAM.

The output of Wolfram ore was as follows:—

	Tons.	Value. £
Avoca	49·63	6068
Shepherd and Murphy Mine at Middlesex	35·65	3692
Iris Mine	70	119
Squib	5·455	657
All Nations	3·250	579
Total	94·685	11,115

The Storey's Creek Tin Mine at Avoca is the principal producer of wolfram in the State. Other small lodes are being worked by owners or tributers at Gipp's Creek (10 miles west from Storey's Creek). The lodes are very flat.

The old All Nations Mine, more recently known as the "Lady Barron," was refloated a year ago. Great developments were anticipated, but the new company has contented itself with employing a few men—not more than five or six at most—in driving on the lode from the creek about 25 feet below the old adit levels.

Squib Mine.—This is situated at Middlesex, and is owned and worked by Mr. Benjamin Gurr, who has erected a small mill and concentrating plant, operated by an oil-engine. The lodes are small and erratic both in size and values. Wolfram mining at best is difficult, owing to the uncertain depositing of the mineral, which occurs in bunches, sometimes with blanks for considerable distances.

RUTILE.

A sample of rutile was forwarded to London, to be tested at the Imperial Institute, and I received the following report, dated 23rd April, 1915, from Mr. Wyndham R. Dunstan, through the Agent-General:—

“ With reference to your letter No. 541/1915, dated 26th March, 1915, I have to inform you that the sample of rutile sent therewith appears to be of good and salable quality.

“ Only two firms in the United Kingdom appear to be in a position to use rutile at present. According to these firms, the total consumption of rutile in the United Kingdom is very small, amounting to only a few tons per annum. A high-grade rutile, containing over 90 per cent. titanium dioxide, has been sold recently at about £20 per ton delivered at Liverpool.

“ One firm mentioned that they had used ilmenite (titaniferous iron ore) from Norway and from Canada to some extent as a source of titanium, and that this material is now worth about 20s. to 25s. per ton. It is, of course, much inferior to rutile as a source of titanium.

“ This latter firm were of opinion that it would not be worth while to consider the working of a rutile deposit unless ore of high grade, such as that represented by your sample, could be produced.”

KIESELGUHR.

A sample of Kieselguhr (diatomaceous earth) was obtained from near Oatlands, and was also forwarded to London for examination at the Imperial Institute, and I received the following replies from the Director of the Institute through the courtesy of the Agent-General:—

“ With reference to your letter, 45/15, of the 17th September last and enclosures, I have to say that the sample of kieselguhr from Tasmania has now been examined.

“ The kieselguhr is of a dark-cream colour and poor texture, and consists of diatoms which appear to be in a pulverised condition and contaminated with clay. Kieselguhr of better quality than this sample is readily obtained in Great Britain.

“ Owing to the high cost of freight from Australia it would be impossible to sell this Tasmanian product in Great Britain in competition with the kieselguhr obtainable here.

“ It is probable that only kieselguhr which is nearly white in colour, is practically free from impurities, and consists of long narrow diatoms, can be exported to England from Australia at a profit under present conditions.

“ Promising samples of kieselguhr have been received from Victoria and New South Wales, and are now under trial.”

“ With reference to your letter, No. 2147/1915, of the 11th November on the subject of the use of diatomaceous earth (kieselguhr) for the manufacture of explosives, I now send you the following information:—

“ Kieselguhr is still largely employed as an absorbent for nitroglycerine in the preparation of ordinary dynamite, but many special forms of nitroglycerine explosives (dynamites) have been introduced for mining purposes in which the kieselguhr is replaced by other substances. Full particulars regarding these different varieties of dynamite and their special uses will be found in text-books on explosives, or in the article on ‘Explosives’ in Thorpe’s Dictionary of Applied Chemistry. The following summary may, however, be of interest:—

“ The bases now used in making dynamites may be divided into the following groups:—(1) Inert bases; (2) combustible bases; and (3) explosive bases.

“ Kieselguhr is by far the most important of the inert bases employed, and kieselguhr dynamite No. 1

contains 70 to 80 per cent. (usually 75 per cent.) of nitroglycerine and 20 to 30 per cent. of kieselguhr. The suitability of kieselguhr for dynamite manufacture depends upon its capacity for absorbing nitroglycerine, and many forms of the material will not serve for the purpose on account of their deficient absorptive power. Aberdeen kieselguhr, which is largely used for making dynamite in the United Kingdom, will absorb from three to four times its weight of nitroglycerine.

"It is not possible to state the quantity of kieselguhr used in the manufacture of dynamite, as the material is also utilised extensively for other purposes. Thus, it is employed as a mild abrasive for polishing metals; as a filtering medium for syrups in sugar manufacture; as a non-conducting packing for coating steam-boilers, &c.; and for the manufacture of light fireproof bricks.

"The imports of kieselguhr into the United Kingdom in recent years are given in the following table, only the values being available since the year 1910:—

Year	Tons.	£
1909	1487	5465
1910	2166	8377
1911		9324
1912		6544
1913		16,800
1914		12,844

"The imported kieselguhr has been hitherto obtained mainly from Germany. In addition, considerable quantities are mined in the United Kingdom, but no figures showing the home-production are available.

"Other inert bases which have been used to a limited extent in the manufacture of dynamite are powdered mica and magnesia alba. Special modifications of kieselguhr dynamite, which have been introduced for use in fiery mines, have been made by adding

various substances (generally salts with water of crystallisation) for the purpose of reducing the temperature of the explosion.

“ Among the combustible bases which are used instead of kieselguhr for the manufacture of dynamite are cork charcoal, wood-meal or pulp, and unnitrated gelatinised cotton. The explosives known as carbodynamite, cork charcoal base), grisoutite (wood-meal base), and some forms of forcite (unnitrated gelatinised cotton base) are examples of this class of dynamite.

“ The most important group of dynamites, however, is that in which the kieselguhr is replaced by an explosive base, such as nitrocellulose or a mixture containing nitrates.

“ Kieselguhr dynamite is unsuitable for many mining purposes, as it gives an intense but very local effect, precisely the opposite of that desired in many mining operations. Although this undesirable property of dynamite can be remedied by increasing the proportion of the inert base, the difficulty of detonation is thereby also increased, and at the present time ordinary kieselguhr dynamite has been largely replaced for mining purposes by other varieties containing an explosive base.

“ The explosive base chiefly employed for this purpose is nitrocellulose, and the products thus made form the well-known blasting gelatines. As usually made in the United Kingdom, blasting gelatine contains about 93 per cent. of nitroglycerine and 7 per cent. of nitrocellulose, whilst in Europe 5 to 10 per cent. of nitrocellulose may be used. A large number of forms of blasting gelatine have been introduced under various names, such as gelatin, dynamite, gelignite, coronite, &c.

“ The explosive mixtures that are also used in combination with nitroglycerine generally consist of absorbent combustible substances, mixed with nitrates of potassium, sodium, or ammonium. In some foreign

countries potassium chlorate is used instead of, or in addition to, a nitrate."

SLATE.

Mr. D. Stubbings, who has been supervising the cutting of the track from Recherche to Cox's Bight, reports having discovered a bed of slate on the southern side of Bathurst Range, about a mile and a half from the water's edge and 3 miles north of Deadman's Bay. He states there is a face of 40 to 50 feet, and the slate can be split to any thickness. It appears to be of good quality, neither too brittle nor too soft, easily split in lengths of 8 to 10 feet.

Return showing the Quantity and Value of Mineral Products for the State of Tasmania during the Year ending 31st December, 1915.

Mineral.	Quantity.	Value.
		£
Gold*..... ozs.	18,547·338	78,784
Silver-lead Ore tons	10,382·950	91,689
Blister Copper † "	7901	709,167
Copper and Copper Ore... "	66	367
Tin Ore "	2599·234	292,306
Coal "	64,536·250	30,418
Wolfram "	94·685	11,115
Bismuth "	5·500	1203
Osmiridium..... ozs.	247·048	1581
Shale..... tons	...	...
Iron Pyrites "	12,835·590	8945
Total.....	...	£1,225,575

* Fine gold, including gold contained in blister copper.

† Value of gold deducted.

GEOLOGICAL SURVEY BRANCH.

A report on the work done by this branch of the Department by the Government Geologist is appended.

INSPECTORS OF MINES.

The office of the Chief Inspector of Mines, Mr. J. O. Hudson, has been removed from Launceston to Hobart,

where he is in close touch with the Minister and the Department.

The three Inspectors of Mines have continued to perform their duties satisfactorily. Their reports are appended.

MINING MANAGERS' EXAMINATION.

One candidate only presented himself for examination for a metal mining manager's certificate, but failed to obtain the necessary number of marks for a pass.

REVENUE.

The revenue for the year amounted to £17,679 3s. 6d., being an increase of £3592 3s. on the previous year.

The sum of £1670 4s. 1d., deposited as survey fees with applications for leases, is not included in the above.

DEPARTMENTAL STAFF.

The following changes in the staff of the Department have been made during the year:—

H. R. Driscoll was appointed clerk, *vice* J. Wardrop, transferred, 8th March, 1915.

Nora A. Cronly appointed clerk (probationary) in the Chief Inspector of Mines' Office, 1st July, 1915.

W. D. Kirkham appointed Registrar of Mines, Waratah, 1st September, 1915.

CONCLUSION.

In conclusion, I desire to thank the officers of the Department and the officers of the Mines Drafting Branch of the Survey Department for the loyal and efficient manner in which they have performed the various duties allotted to them through what has proved to be a very busy and trying year.

I have, &c.,

W. H. WALLACE, Secretary for Mines.

The Hon. the Minister for Mines.

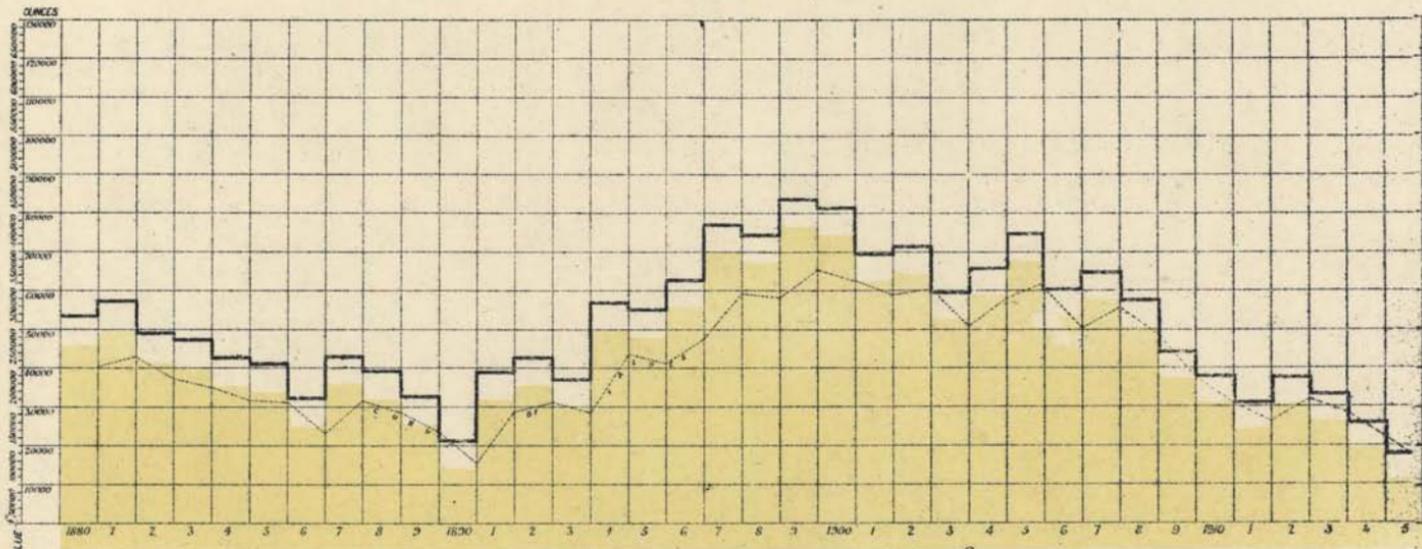
No. 1.

RETURN showing the Quantity and Value of Gold won during the Years 1880 to 1915 inclusive.

Year.	Quantity.	Value.
	ozs.	£
1880.....	52,595	201,297
1881.....	56,693	216,901
1882.....	49,122·3	187,337
1883.....	46,577·5	176,442
1884.....	42,339·95	160,404
1885.....	41,240·95	155,309
1886.....	31,014·5	117,250
1887.....	42,609·15	158,533
1888.....	39,610·95	147,154
1889.....	32,332·65	119,703
1890.....	20,510	75,888
1891.....	38,789	145,459
1892.....	42,378	158,917
1893.....	37,687	141,326
1894.....	57,873	217,024
1895.....	54,964	206,115
1896.....	62,591	237,574
1897.....	77,131	296,660
1898.....	74,233	291,496
1899.....	83,992	327,545
1900.....	81,175	316,220
1901.....	*69,491	295,176
1902.....	*70,996	301,573
1903.....	*59,891	254,403
1904.....	*65,921	280,015
1905.....	*73,540·5	312,380
1906.....	*60,023·4	254,963
1907.....	*65,354·25	277,607
1908.....	*57,085·1	242,482
1909.....	*44,777·366	190,201
1910.....	*37,048·053	157,370
1911.....	*31,100·873	132,108
1912.....	*37,973·252	161,300
1913.....	*33,400·457	141,876
1914.....	*26,243·453	111,475
1915.....	*18,547·338	78,784
	1,816,851·992	7,246,267

* Fine Gold.

Diagram showing Total Quantity Value of Gold won in Tasmania during the years 1820-1915



GRAND TOTALS - Quantity 1,816,851 OZS: Value £7246,267

Photo Mygraphed by John Vail Government Printer Hobart Tasmania.

5 cm

No. 2.

RETURN showing the Quantity and Value of Silver-Lead Ore produced during the Years 1888 to 1915 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1888	417	5838
1889	415	7044
1890	2053	26,487
1891	4810	52,284
1892	9326	45,502
1893	14,302	198,610
1894	21,064	293,043
1895	17,980	175,957
1896	21,167	229,660
1897	18,364	200,167
1898	15,320	188,892
1899	31,519·5	250,331
1900	26,564	279,372
1901	28,774	207,228
1902	46,480	218,864
1903	42,422	192,492
1904	51,138	203,702
1905	75,270·5	246,888
1906	87,117·7	462,443
1907	89,762·5	572,560
1908	63,116·9	322,007
1909	80,378·35	298,880
1910	51,226·91	247,576
1911	61,501·195	253,361
1912	90,123·868	309,098
1913	83,289·268	319,997
1914	11,565·54	96,225
1915	10,382·95	91,689
	1,055,851·231	5,996,197

No. 3.

RETURN showing the Quantity and Value of Blister Copper produced during the Years 1896 to 1915 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1896	41·5	1245
1897	4700	322,500
1898	4955·5	409,668
1899	8598	735,305
1900	9449	907,288
1901	9981	879,625
1902	7745	*462,151
1903	6684	*478,023
1904	8371	*582,540
1905	8610	*704,287
1906	8708	*862,444
1907	8247	*832,691
1908	8833	*603,063
1909	8638	*586,419
1910	8193	*553,822
1911	6022	*385,797
1912	5136	*430,965
1913	4569	*364,732
1914	7509	*477,361
1915	7901	*709,167
	142,891	11,280,093

* Value of Gold contents deducted.

No. 4.

RETURN showing Quantity and Value of Copper Matte exported during the Years 1902, 1903, and 1904 to 1915 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1902	2500	50,112
1903	3727	83,624
1904-1915	—	—
	6227	133,736

No. 5.

RETURN showing the Quantity and Value of Copper Ore produced during the Years 1896 to 1915 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1896	94	1020
1897	75	2250
1898	394	8128
1899	1695	26,833
1900	4221·5	63,589
1901	11,221	130,412
1902	5994	65,270
1903	102	790
1904	104	1640
1905	1150·75	52,939
1906	2234·5	72,480
1907	788·25	36,975
1908	1185	6588
1909	1587·8	21,619
1910	671·27	13,150
1911	2286	22,852
1912	1391·6	9479
1913	1966·8	10,932
1914	3287·75	18,680
1915	66	367
	40,456·22	565,993

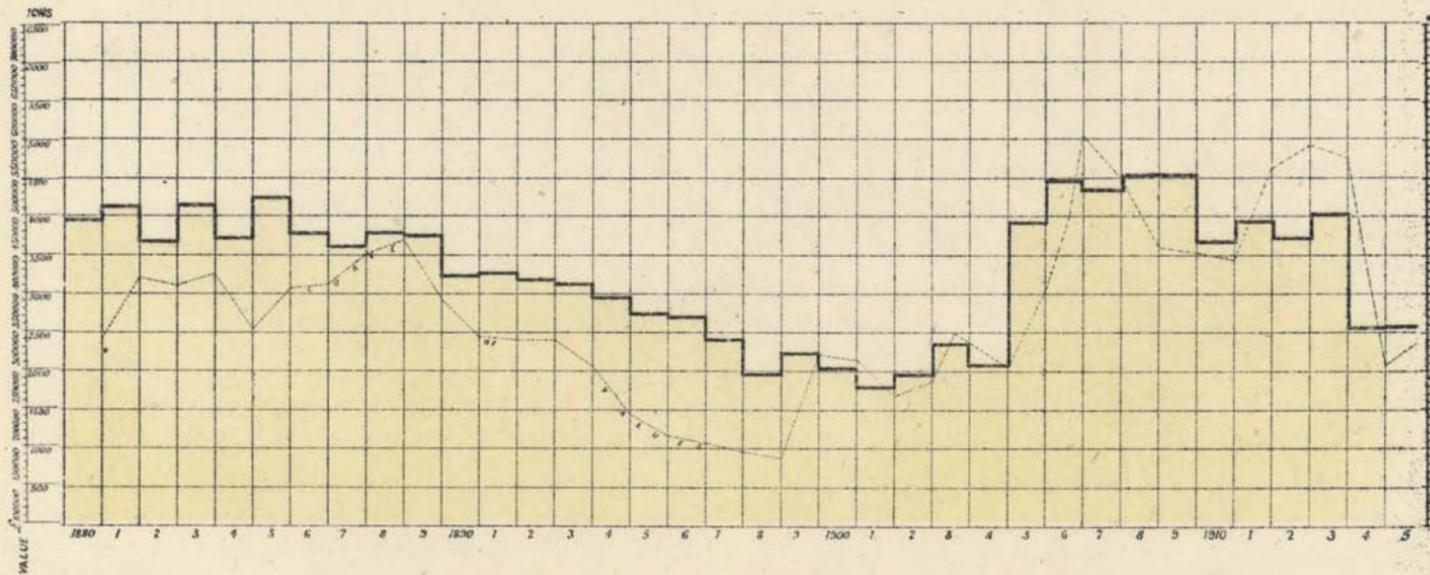
No. 6.

RETURN showing the Quantity and Value of Tin exported from Tasmania during the Years 1880 to 1904 (compiled from Customs Returns only), and Tin Ore produced during the Years 1905 to 1915 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1880	3954	341,736
1881	4124	375,775
1882	3670	361,046
1883	4122	376,446
1884	3707	301,423
1885	4242	357,587
1886	3776	363,364
1887	3607·5	409,853
1888	3775·25	426,321
1889	3764	344,941
1890	3209·25	296,368
1891	3235	291,715
1892	3174	290,083
1893	3128·5	260,219
1894	2934	198,298
1895	2726·75	167,461
1896	2700	159,036
1897	2423·5	149,994
1898	1972	142,046
1899	2239·25	278,323
1900	2029	269,833
1901	1789·5	212,542
1902	1958·25	237,828
1903	2376·15	300,098
1904	2171·5	255,228
1905*	3891·5	362,670
1906*	4472·75	557,266
1907*	4342·75	501,681
1908*	4520·8	421,580
1909*	4511·2	418,165
1910*	3701·01	399,393
1911*	3953·05	513,500
1912*	3713·825	543,103
1913*	4010·41	531,983
1914*	2572·713	259,300
1915*	2599·234	292,306
	119,097·642	11,968,511

* Tin Ore produced : Customs having ceased to issue Returns.

Diagram showing total Quantity & Value of Tin exported from Tasmania during the years 1880-1904 and Tin produced during the years 1905-1915



GRAND TOTALS—Quantity 119097 Tons Value £11,968,511

Photo Algraphed by John Vail Government Printer Hobart Tasmania

5 cm

No. 7.

RETURN showing the Quantity and Value of Wolfram produced during the Years 1899 to 1915 inclusive.

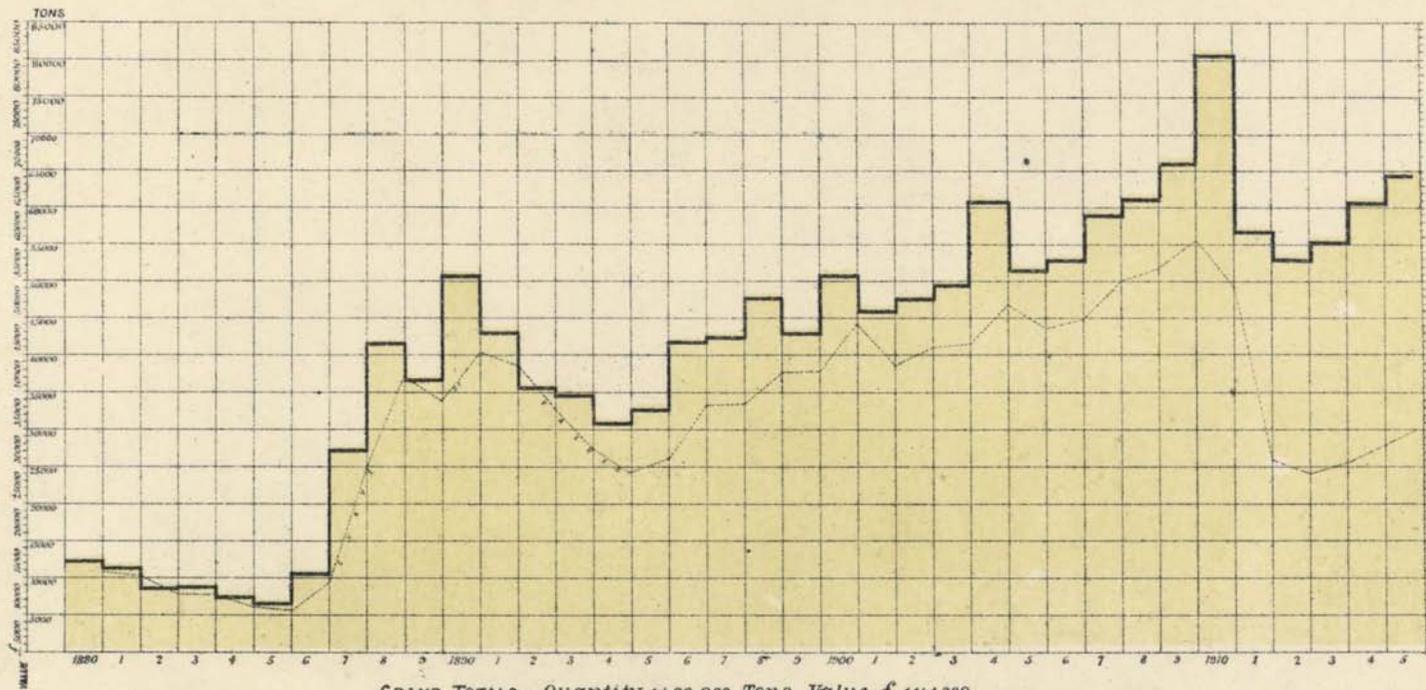
Year.	Quantity.	Value.
	Tons.	£
1899	3·5	99
1900	53·75	2058
1901	—	—
1902	—	—
1903	—	—
1904	15·5	1147
1905	32·25	2371
1906	19·75	1465
1907	40·75	4411
1908	4·5	398
1909	28·35	2494
1910	67·35	7280
1911	69·96	7769
1912	66·49	6601
1913	68·07	7040
1914	46·873	4327
1915	94·685	11,115
	611·778	58,515

*RETURN showing the Quantity and Value of Coal raised during
the Years 1880 to 1915 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1880	12,219	10,998
1881	11,163	10,047
1882	8803	7923
1883	8872	7985
1884	7194	6475
1885	6654	5989
1886	10,391	9352
1887	27,633	24,870
1888	41,577	37,420
1889	36,700	33,030
1890	50,519	45,467
1891	43,256	38,930
1892	36,008	32,407
1893	34,693	27,754
1894	30,499	24,399
1895	32,698	26,159
1896	41,904	33,523
1897	42,196	33,757
1898	47,678	38,256
1899	42,609	38,349
1900	50,633	44,227
1901	45,438	38,451
1902	48,863·5	41,533
1903	49,069	41,709
1904	61,109	51,942
1905	51,993	44,194
1906	52,895·75	44,962
1907	58,891	50,057
1908	61,067·75	51,907
1909	66,161·75	56,237
1910	82,445	48,609*
1911	57,067	26,214*
1912	53,560	24,568*
1913	55,043	25,367 ^c
1914	60,794	27,853*
1915	64,536·25	30,418*
	1,492,833	1,141,338

* Value at pit's mouth.

Diagram showing Total Quantity & Value of Coal mined in Tasmania during the years 1880-1915



GRAND TOTALS - Quantity 1,492,833 TONS Value £1,141,338

Photo Arranged by John Vail Government Printer Hobart Tasmania.

5 cm

No. 9.

RETURN showing the Quantity and Value of Iron Ore produced during the Years 1897 to 1915 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1897	894	812
1898	1598	1598
1899	3577	3474
1900	5375	5995
1901	612	417
1902	2386	1075
1903	5980	2905
1904	6840	2975
1905	6300	2600
1906	2600	1100
1907	3000	1150
1908	3600	1600
1909-1915.....	—	—
	42,762	25,701

No. 10.

RETURN showing the Quantity and Value of Asbestos produced during the Years 1899 to 1915 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1899	200	363
1900	128	113
1901	46·5	45
1902-1915.....	—	—
	374·5	521

No. 11.

RETURN showing the Quantity and Value of Bismuth produced during the Years 1904 to 1915 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1904	·3	15
1905	3·5	800
1906	·3	24
1907	·175	27
1908	3·75	462
1909	2·9	980
1910	10·70	4249
1911	14·395	5758
1912	7·59	2646
1913	5·08	1627
1914	5·619	1666
1915	5·5	1203
	59·809	19,457

No. 12.

RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 to 1915 inclusive.

Year.	Quantity.	Value.
	Ozs.	£
1910	120	530
1911	271·88	1188
1912	778·77	5742
1913	1261·65	12,016
1914	1018·83	10,076
1915	247·048	1581
	3698·178	31,833

No. 13.

RETURN showing the Quantity and Value of Shale produced during the Years 1910 to 1915 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1910	364	214
1911	500	250
1912	—	—
1913	130	130
1914	75	75
1915	—	—
	1069	669

No. 14.

RETURN showing the Quantity of Silver-Lead and Copper Ore smelted for period 25th June to 31st December, 1896, and 1st January, 1897, to 31st December, 1914.

Year.	Ore Smelted.	Products.			Yield.			
		Silver-Lead Bull'n.	Blister Copper.	Matte.	Copper.	Silver.	Gold.	Lead.
		Tons.	Tons.	Tons.	Tons.	Ozs.	Ozs.	Tons.
1896	26,028 $\frac{13}{10}$	—	—	2417 $\frac{6}{10}$	1235 $\frac{1}{10}$	75,951	4707	—
1897	90,773 $\frac{1}{2}$	—	3476 $\frac{2}{10}$	257 $\frac{1}{10}$	3583 $\frac{1}{10}$	334,349	16,485	—
1898	170,933	—	4992	—	4783	606,123	24,418	—
1899	275,239	2295	8463	89 $\frac{8}{10}$	8362	1,089,657	27,615	—
1900	363,113	4817	9440	50	9341	1,215,036	26,255	—
1901	355,528	1839	9982	—	9880	800,317	21,717	—
1902	411,736	6825	7727	2882	8841	1,674,816	24,719	6654
1903	399,032	7560	6683	3413	8094	1,855,158	25,238	7529
1904	433,366	—	8371	—	8265	1,896,134	26,809	7754
1905	466,578	9422	8611	—	8596	2,075,431	26,469	9086
1906	479,775	9380	8708	—	8613	2,150,405	24,986	9300
1907	472,658	10,590	8248	—	8145	2,147,120	24,531	10,060
1908	440,145	7181	8834	—	8723	1,654,350	22,008	6850
1909	429,549	6960	8640	—	8534	1,534,780	18,812	6696
1910	386,679	—	8192	—	8093	656,793	11,851	—
1911	284,038	3328	6022	—	5951	747,748	10,565	3204
1912	331,182	5293	5136	—	5073	958,541	12,809	5123
1913	319,833	3812	4568	—	4511	765,137	11,983	3691
1914	338,957	—	7510	—	7419	471,931	9899	—

No. 15.

RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 to 1915 inclusive.

Year.	Number.	Year.	Number.
1880.....	1653	1898.....	6052
1881.....	3156	1899.....	6622
1882.....	4098	1900.....	7023
1883.....	3818	1901.....	6923
1884.....	2972	1902.....	5934
1885.....	2783	1903.....	6017
1886.....	2681	1904.....	6194
1887.....	3961	1905.....	6581
1888.....	2989	1906.....	7005
1889.....	3141	1907.....	7516
1890.....	2868	1908.....	6466
1891.....	3219	1909.....	6054
1892.....	3295	1910.....	5770
1893.....	3403	1911.....	5247
1894.....	3433	1912.....	5566 ^a
1895.....	4062	1913.....	6107
1896.....	4350	1914.....	4741
1897.....	4510	1915.....	3908

No. 16.

RETURN showing the total Number and Area of Leases issued during the Year ending 31st December, 1915.

Mineral.	No. of Applications.	No. of Sluiceheads.	Area.
			Acres.
Asbestos	1	...	40
Baryta.....	1	...	80
Bismuth	2	...	150
Coal.....	14	...	3808
Copper	4	...	197
Chrysotile .....	...	...	...
Gold	25	...	386
Guano .....	...	...	...
Iron	1	...	10
Limestone	3	...	159
Machinery Sites	6	...	29
Minerals	53	...	3478
Molybdenite	1	...	40
Osmiridium .....	...	...	...
Shale .....	...	...	...
Silver	7	...	346
Tin'	89	...	1958
Wolfram .....	...	...	...
Dredging Claims	5	...	122
Water-rights	67	248	154
Mining Easements	10	...	13
	289	248	10,970

No. 17.

RETURN showing the total Area of Land and Number of Sluice-heads of Water applied for during the Year ending 31st December, 1915.

Mineral.	No. of Applications.	No of Sluiceheads.	Area.
			Acres.
Asbestos.....	1	...	80
Bismuth.....	...	...	...
Coal.....	15	...	3912
Copper.....	1	...	15
Cobalt.....	1	...	80
Dredging Claims.....	6	...	87
Gold.....	31	...	520
Iron.....	1	..	10
Limestone.....	...	...	...
Mining Easements.....	4	..	39
Machinery Sites.....	5	...	35
Minerals.....	59	...	3178
Manganese.....	1	...	63
Nickel.....	1	...	80
Shale.....	7	...	2120
Silver-Lead.....	18	...	856
Serpentine.....	1	...	50
T n.....	142	...	2169
Water-rights.....	65	156	114
Wolfram.....	11	...	476
Zinc Sulphide.....	1	...	40
	371	156	13,924

No. 18.

RETURN showing the Number and Area of Leases held under "The Mining Act," in force on 31st December, 1908 to 191 inclusive.

Nature of Lease.	In force on 31st Dec., 1908.		In force on 31st Dec., 1909.		In force on 31st Dec., 1910.		In force on 31st Dec., 1911.		In force on 31st Dec., 1912.		In force on 31st Dec., 1913.		In force on 31st Dec., 1914.		In force on 31st Dec., 1915.	
	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
For Minerals, Silver, Tin, &c.	1269	Acres. 44,099	1143	Acres. 41,637	1141	Acres. 44,001	1025	Acres. 41,311	960	Acres. 36,157	926	Acres. 36,271	1129	Acres. 37,785	907	Acres. 36,437
For Coal, Slate, Shale, &c.	45	8745	51	10,590	50	10,608	58	13,049	37	8854	23	5660	26	6405	45	11,522
For Gold	111	1344	87	1265	76	1159	73	1220	73	1344	54	988	95	2130	94	2026
Dredging Claims	64	916	47	712	35	441	42	647	42	489	30	329	36	403	29	351
Mining Easements	88	453	92	464	84	484	99	606	133	606	105	603	110	611	102	553
Machinery Sites	33	133	32	129	33	121	37	145	39	149	36	153	43	180	40	183
Water-rights Mineral and Gold	511	1003 & 2000 sluice-heads	550	1022 & 2210 sluice-heads	511	1094 & 1751 sluice-heads	502	1060 & 1845 sluice-heads	550	1640 & 2043 sluice-heads	546	1909 & 2034 sluice-heads	605	2449 & 2160 sluice-heads	568	1988 & 2135 sluice-heads

No. 19.

*RETURN showing the Total Number of Leases in force on
31st December, 1915.*

Mineral.	Number.	Sluicheads.	Area.
			Acres.
Asbestos	2	...	80
Baryta	1	...	80
Bismuth	2	...	150
Chrysotile	3	...	160
Clay	1	...	10
Coal	37	...	9273
Copper	39	...	1782
Gold	94	...	2026
Guano	1	...	2
Iron	4	...	212
Limestone	7	...	761
Minerals	169	...	14,112
Molybdenite	1	...	40
Nickel	2	...	61
Osmiridium	19	...	381
Phosphate of Lime	3	...	8
Silver-lead Ore	36	...	3021
Slate .....	...	...	...
Shale	1	...	1488
Tin	618	...	16,316
Wolfram	6	...	22
Machinery Sites	40	...	183
Mining Easements	102	...	533
Dredging Claims	29	...	351
Water Rights and Dam Sites	568	2135	1988
	1785	2135	53,060

No. 20.

RETURN showing the Average Number of Miners employed during the Year ending 31st December, 1915.

	Europeans.	Chinese.
Northern and Southern Division	201	...
North-Eastern Division.....	466	30
Eastern Division.....	461	13
North-Western Division	496	...
Western Division	2241	...
	3365	43

No. 21.

RETURN showing the Amounts paid in Dividends by Mining Companies during the Year ending 31st December, 1915.

Mines.	Dividends.	
	£	s. d.
Copper	57,653	0 0
Gold .....	...
Tin	27,095	14 0
Silver	3612	3 0
Coal.....	2698	0 0
TOTAL	£91,058	17 0

No. 22.

RETURN showing the total Amount of Rents, Fees &c., received by the Mines Department during the Year ending 31st December, 1915.

Head of Revenue.	Amount.	
	£	s. d.
Rent of Auriferous and Mineral Land.....	16,812	19 9
Fees, ditto ditto	866	3 9
Survey Fees	1670	4 1
TOTAL	£19,349	7 7

No. 23.

RETURN showing Quantity and Value of Minerals and Metal raised in Tasmania from 1880 to 1915 inclusive.

Mineral or Metal.	Quantity.	Value.
		£
Gold	1,816,851·992 ozs.	7,246,267
Silver-lead ore	1,055,851·231 tons	5,996,197
Blister Copper.....	142,891 "	11,280,093
Copper Matte	6227 "	133,736
Copper and Copper Ore...	40,456·220 "	565,993
Tin Ore.....	119,097·642 "	11,968,511
Iron Ore	42,762 "	25,701
Coal	1,492,833 "	1,141,338
Wolfram	611·778 "	58,515
Bismuth	59·809 "	19,457
Asbestos	374·5 "	521
Shale	1069 "	669
Iron Pyrites.....	12,835·590 "	8945
Osmiridium	3698·178 ozs.	31,833
Unenumerated prior to 1894...	...	31,988
Total .....	...	£38,509,764

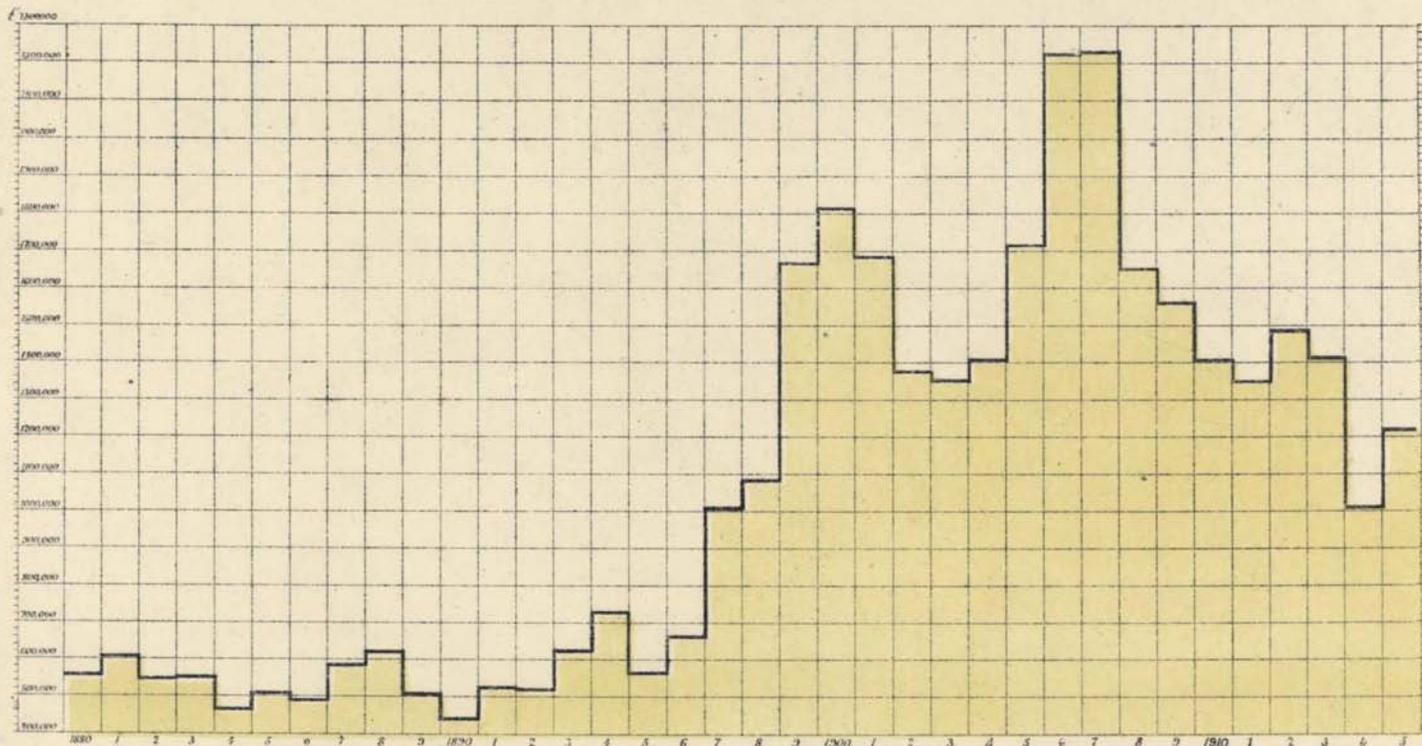
No. 24.

RETURN showing the Mining Companies registered during the Year ending 31st December, 1915.

Number of Companies.	Capital.
9	£54,890

In addition to the above, 5 Agents for Foreign Companies, and 1 Syndicate, under Part Va of the Act, were registered.

Diagram showing the Annual Value of Minerals & Metals raised in Tasmania from 1880-1915



GRAND TOTAL - Value £ 38,509,764

Photo Algraphed by John Veil Government Printer Hobart Tasmania

5 cm

No. 25.

RETURN showing the Annual Value of Mineral Products for the State of Tasmania from 1880 to 1915 inclusive.

Year.	Value.	Year.	Value.
	£		£
1880.....	554,031	1900.....	1,888,695
1881.....	602,723	1901.....	1,763,896
1882.....	556,306	1902.....	1,378,406
1883.....	560,873	1903.....	1,354,044
1884.....	468,302	1904.....	1,379,204
1885.....	518,885	1905.....	1,729,129
1886.....	489,966	1906.....	2,257,147
1887.....	593,256	1907.....	2,277,159
1888.....	616,733	1908.....	1,650,027
1889.....	504,718	1909.....	1,574,995
1890.....	444,210	1910.....	1,432,193
1891.....	528,388	1911.....	1,349,497
1892.....	526,909	1912.....	1,493,502
1893.....	627,909	1913.....	1,415,700
1894.....	732,764	1914.....	1,007,038
1895.....	575,692	1915.....	1,225,575
1896.....	662,058	Unenumerated	
1897.....	1,006,140	prior to 1894	31,988
1898.....	1,071,084		
1899.....	1,660,622		
			£38,509,764

No. 26.

COMPARATIVE Statement of Revenue from Mines, being Rents, Fees, &c. (exclusive of Survey Fees) paid to the Treasury for the Years ending 30th June, from 1881 to 1903, and for Six months ending 31st December, 1903, and for the Years ending 31st December, 1904, to 1915 inclusive.

Year.	Amount.	Year.	Amount.
	£ s. d.		£ s. d.
1881.....	20,936 5 5	1899.....	24,696 10 5
1882.....	23,077 1 9	1900.....	28,380 11 10
1883.....	15,439 14 5	1901.....	21,569 5 2
1884.....	6981 11 10	1902.....	19,471 0 1
1885.....	11,070 5 7	1903.....	17,776 14 3
1886.....	12,523 10 4	1903, 1 July to 31 Dec.	14,758 17 1
1887.....	14,611 11 5	1904, Jan. to Dec.	16,631 8 2
1888.....	23,502 8 4	1905.....	20,208 17 0
1889.....	17,254 9 0	1906.....	24,136 12 5
1890.....	26,955 4 9	1907.....	24,794 7 7
1891.....	37,829 16 5	1908.....	20,311 3 0
1892.....	17,568 18 4	1909.....	22,804 1 5
1893.....	16,971 9 2	1910.....	22,221 18 0
1894.....	16,732 7 7	1911.....	20,556 15 10
1895.....	15,323 1 9	1912.....	17,639 19 11
1896.....	20,901 13 2	1913.....	19,410 17 8
1897.....	25,631 0 3	1914.....	14,087 0 6
1898.....	33,661 13 9	1915.....	17,679 3 6

The above Statement does not include Stamp Duties upon Transfer of Leases and Registration of Companies, nor the Tax payable upon Dividends, from which sources large sums are derived,

MINE MANAGERS' EXAMINATION.

MARCH, 1915.

METALLIFEROUS.

SUBJECT—MINING.

1. What precautions are necessary when—
 - (1) Removing explosives from surface magazine to the underground workings for use therein?
 - (2) Placing a new cage in the shaft for men-haulage?
 - (3) Extending a drive to connect with an old mine which is inaccessible from surface and the conditions of its workings are unknown?
2. How would you open out for and construct a working plat or chamber to serve an intermediate level where the shaft (13' by 5' in the clear) is through bad ground and has been strongly timbered? Give dimensioned sketches showing arrangement and sizes of timbering required.
3. Describe and give detail sketches showing "signal line" equipment suitable for the main shaft of a large mine.
4. Describe fully any good method of stoping which you have seen used in a mine, and state the conditions which make the method suitable for that mine.
5. A new ore body has been proved to be extensive in length and breadth, but is only payable for stoping on a large scale between the 500-foot and 1000-foot levels. What means would you devise for the obtaining and distribution of waste filling or mullock for the stopes as ore-extraction proceeds? Assume any additional particulars necessary for scheme.
6. Give your design of an elevated timber tramway from shaft-head frame at height of 45 feet to mill storage-bin, distant 4 chains, the ground traversed being stiff clay, and the live load 35 cwts. (a truck of ore). State the grade you would select, and give detail dimensions of the structure.
7. Describe and illustrate the construction of (1) the hand-windlass, (2) the whip, and (3) the horse-whim, and state under what conditions you would apply them for hoisting in shafts.
8. Given an ore-body 800 feet long and 40 feet wide, with good walls and fairly compact ore, describe, with illustrations, a suitable method of exploitation with levels 100 feet apart.
9. What is the standard rate of burning of safety-fuse as in general use? Given a number of various makes to test, how would you test them for general mine requirements?
10. Describe the construction of, (1) safety-cage, and (2) safety-hook. Explain their mode of operation, and give arguments for and against the use of the former in shafts.

11. Give dimensioned diagrams of the following:—
- (a) Ladder-road to stope (through filling);
 - (b) Ore-chute;
 - (c) Door to ore-chute.
12. Discuss the merits of the hammer and piston rock-drills. To what class of work would you put each?

SUBJECT—ORE-DRESSING AND SAMPLING.

1. Shortly describe a jaw-breaker and a gyratory-breaker, and compare their relative advantages and disadvantages.
2. Write a concise reply on mechanical screening of material 1 mm. and under.
3. Describe fully mill sampling, and illustrate your answer with sketches.
4. State principles of flotation. Give flow-sheet of a flotation plant known to you.
5. Give short account of several of the various methods of elevating wet products in a lead-concentrating plant.
6. Describe fully—
 - (a) The Luhrig table;
 - (b) The Wilfley table.

For what classes of material would you use each machine?

SUBJECT—SURFACE WORK.

1. A dynamo gives an output of 200 ampères at 210 volts. What is the resistance of the circuit?
2. The above machine is driven by a single-cylinder high-pressure steam-engine, direct, at 800 revolutions per minute, with steam at the stop-valve at 100 lbs. pressure by the gauge. What diameter of cylinder and what stroke should the engine have?
3. A Cornish boiler is 28 feet long, 6 feet 6 inches in diameter, and the flue is 3 feet 6 inches in diameter. What is its nominal horse-power?
4. The shell of the above boiler is its weakest part, and is made of steel plates $\frac{3}{8}$ inch thick; the longitudinal seams are lap-jointed and double-chain riveted, rivets $\frac{3}{4}$ -inch, steel, pitch $2\frac{1}{2}$ inches, and the rows are $1\frac{1}{2}$ inch apart. What working pressure should this boiler have?
5. Make a sketch fit to work from and fully dimensioned for a set of points and a crossing for a railway-line 3 feet 6 inches gauge, 60 lbs. rails, the angle of turn-out being 15 degrees.
6. Give a sketch of a Babcock and Wilcox or other standard water-tube boiler, adding brief notes on the main features. What is a superheater, and what advantages does it offer?
7. Give a sketch of an ore-bin to hold 200 tons of limestone, to be erected on level ground and deliver into trucks at 5 feet from the surface. Give dimensions of the timber and stays.
8. A concrete foundation resting on solid ground is required 12 feet by 12 feet by 6 feet deep. State clearly how you would construct this, giving details of the mixture, the mode of mixing and placing. To what extent would

- you use "plums," and what would influence your decision in regard to these?
9. Describe, with sketches, what head-gear and other appliances you would advocate for sinking a prospecting-shaft 200 feet with whim (whim is not to be described). Give sizes of rope and pulley, and show what provision you would make for safety of men and tipping of dirt. Due regard must be had of the temporary nature of the work.
 10. A supply of water is available of 240 cubic feet per minute. A race 2 miles long is required to bring it in. Part of the intervening country is clay soil, part rock, and part requires fluming. State what fall you would allow in your race and give cross-sections at the different parts, including sketch of flume.
What horse-power would a Pelton wheel of 75 per cent. efficiency develop with the above water and an effective head of 100 feet?

SUBJECT—MINING ARITHMETIC, MENSURATION, AND MINE ACCOUNTS.

1. Simplify $\frac{2\frac{1}{2}}{2\frac{1}{2}} \div \frac{4\frac{1}{2}}{2\frac{1}{2}}$.
2. Find quantity of water in gallons which can be contained in a cylindrical tank 6 feet 4 inches in diameter and 10 feet 6 inches in height.
3. An assay certificate gives, gold, 2 ozs. 15 dwts. 17 grs. per long ton. Give value in shillings for a short ton.
4. How many superficial feet of timber in a log 20 feet in length, 14 inches in width, and 10 inches in thickness?
5. Explain fully a profit and loss account.
6. Explain fully the difference between development and capital expenditure.
7. Explain fully your method of segregating the underground costs of a mine in which winding, stoping, driving, winzing, rockdrilling, diamond-drilling, shaft-sinking, and electric haulage are in operation.

SUBJECT—MINE SURVEYING.

1. Work out the co-ordinates of the following traverse of an alluvial flat in proper office book form. Plot the co-ordinates to a scale of 1 in. = 100 feet, using station 0 as datum. What is the length and bearing of the closing line 10 to 0?—

0-1	N.	83°	E.	100 feet.
1-2	S.	53°	E.	207 feet.
2-3	S.	44°	E.	200 feet.
3-4	S.	39°	E.	200 feet.
4-5	S.	35°	E.	178 feet.
5-6	S.	17°	W.	200 feet.
6-7	S.	30°	W.	200 feet.
7-8	S.	34°	W.	264 feet.
8-9	S.	22°	W.	128 feet.
9-10	S.	26°	W.	198 feet.

2. Describe either, (1) the prismatic compass; or (2) the Brunton transit. What precautions are necessary in surveys by magnetic needle?
3. What method would you recommend to carry a traverse down a 6 x 4 winze 100 feet deep on the incline, the first 50 feet inclined at an angle of 15° and the second at an angle of 25° , so that direct sighting is not possible? Discuss the problem (1) with any standard instruments available; (2) with 6-inch ordinary theodolite as the only instrument.
4. To carry a survey from the surface to the 200-foot level a shaft compartment 4 feet square and two plumb lines are available. The level goes off square from the shaft, and the first station is 50 feet from it. State where you would place the plumb lines, and why. Discuss the effect of an error of line in the lateral reading of one of the lines in making connection with a shaft 2000 feet away.
5. Describe what steps you would take to obtain the true meridian of any locality.
6. Discuss the different methods for locating and measuring any deflection from the original line in a diamond-drill bore.
7. Describe what adjustments are necessary to ensure the accuracy of a level. What is meant by the line of collimation? How would you test the accuracy of the instrument in the field?
Give two examples of level booking, (1) by the ordinary method; (2) by what is known as the "height of instrument" method. In each case give booking for 4 set-ups with 2 intermediates at each station.
8. In a gold mine the quartz-lode varies in width from 2 to 12 feet, the values vary from 2 dwts. to 2 oz. Records as complete as practicable are required. Describe fully what system of stope books and assay plans you would advocate.

SUBJECT—MINING GEOLOGY.

1. What is a deep lead? Describe, with sketches, any deep lead you are acquainted with, showing especially where any enrichment of values may be expected.
2. What is meant by "secondary enrichment"? Discuss its influence on copper lodes, (1) in a mountainous country with wet climate; (2) in a dry flat country.
3. What is an outlier? The mountains on the West Coast of Tasmania are composed of conglomerate, and Silurian limestone is often found in the valleys. Hence the conglomerates have been placed as of later age than the limestone. Discuss this conclusion.
4. What is meant by "magmatic segregation"? The vicinity of intrusive igneous rock is said to be favourable to ore deposition. Discuss this statement.
5. Define the strike, dip, and pitch of an ore-body. What is the "throw" of a fault? Show by sketches the effect of an east and west fault with a downthrow of 50 feet at an angle of 60° on alternating strata of limestone and conglomerate striking north-east with dip 45° north-west.

6. What are the appearance and characteristics of the following minerals? How would you identify them in the field?—Barite, topaz, monazite, tourmaline, hematite, galena, pyrrhotite, "stream tin," wolfram, bismuthine.
7. In blowpipe analysis, how would you identify realgar, cassiterite, pitchblende, cerussite, limonite, cinnabar, siderite, malachite? What elements do they each contain?

SUBJECT—MINING LAW.

1. What penalty is an employee liable to incur for damaging misusing, or failing to use appliances provided by mine-owners for the prevention of dust, fumes, or smoke in mines?
2. State—
 - (1) The size of the spaces required to be provided in horse-roads as places of refuge;
 - (2) When such spaces are required; and
 - (3) At what intervals.
3. Where and how would you post mine signals in order that they may be clear and distinct, as required by the "Mining Act"?
4. When are safety-cages to be provided?
5. What overhead cover is required for cages used for raising and lowering men, and how should they be constructed?
6. What may not be taken up or down a shaft in which men are travelling?
7. How would you send timber down a shaft?
8. What kind of brattice cloth must be used where naked lights are employed?

MINE MANAGERS' CERTIFICATES.

The following Lists of Certificates granted since the inception of the Board of Examiners for Mining Managers' Certificates are published in accordance with a resolution passed at the Interstate Conference of Boards of Examiners held in Melbourne in March, 1906 :—

SERVICE Certificates of Competency granted by the Board of Examiners.

No. of Certificate.	Name.	Date of Certificate.
1. 92	Davies, Joseph	28 Sep. 1892
2. 92	Buffon, Geo. Donald	28 Sep. 1892
3. 92	Sinclair, George Peace	28 Sep. 1892
4. 92	Heighway, John Felton	28 Sep. 1892
5. 92	Irvine, Peter	28 Sep. 1892
6. 93	Daniel, John	29 Mar. 1893
7. 93	Marshall, John Henry	29 Mar. 1893
8. 93	Aaron, Gabriel	29 Mar. 1893
9. 93	Webb, George	29 Mar. 1893
10. 94	Payne, John Greaves	3 Apr. 1894
11. 94	Wesley, William Henry	3 Apr. 1894
12. 94	Andrews, Thomas	3 Apr. 1894
13. 95	Richards, Moses John	17 Apr. 1895
14. 95	Richards, Stephen Eddy	5 Nov. 1896
15. 98	Stubs, Joseph Thomas	20 Jan. 1898
16. 98	McCrackan, John	20 Jan. 1898
17. 98	Heery, Luke	5 Mar. 1898
18. 98	Curtain, Cornelius Henry	13 Apr. 1898
19. 98	Clerk, Frederick Malcolm	14 Apr. 1898
20. 99	Craze, John	25 Jan. 1899
21. 99	Tilley, George Reynolds	17 Apr. 1899
22. 99	Hooper, Thomas Martin	17 Apr. 1899
23. 99	Vincent, Thomas	17 Apr. 1899
24. 1900	Brown, William	9 Jan. 1900
25. 1900	Rosewarne, David Davey	4 Oct. 1900
26. 1901	Buddon, William	1 Mar. 1901
27. 1901	Yeates, Alexander	29 Apr. 1901
28. 1902	Ireland, Mark	22 Apr. 1902
29. 1902	Woolcock, John	23 Sep. 1902
30. 1903	Powell, Robert William	5 May, 1903
31. 1904	Muir, John James	27 July, 1904
32. 1904	Moyle, John	5 Dec. 1904
33. 1904	Ridley, John	12 Dec. 1904
34. 1906	Brough, Daniel	23 Apr. 1906
35. 1906	Birrell, Samuel	23 Apr. 1906
36. 1906	Barker, George	24 July, 1906
37. 1907	Wisch, John G. A.	6 Nov. 1907
38. 1910	Gullock, William	4 Mar. 1910
39. 1910	Kelly, Alcysius	24 May, 1910
40. 1913	Flight, Edward	10 Dec., 1913
41. 1914	Ferguson, Robert	16 Oct. 1914
42. 1915	McDonald, Patrick Albert	11 June, 1915
43. 1915	Gard, John Henry	17 Nov. 1915

CERTIFICATES of Competency granted by the Board of Examiners.

No. of Certificate.	Name.	Date of Certificate.	Class of Certificate.
1. 92	Dunstan, Alfred John	28 Sep. 1892	First class
2. 92	Ekborg, Benjamin Pher- son	28 Sep. 1892	Second class
3. 92	Hill, Charles	28 Sep. 1892	Second class
4. 92	Booth, John Robert	28 Sep. 1892	Second class
5. 92	Stapleton, Michael	28 Sep. 1892	Second class
6. 92	Lewis, Philip	28 Sep. 1892	Second class
7. 92	Hanlon, Christopher	28 Sep. 1892	Second class
8. 92	Williams, Luke	28 Sep. 1892	Second class
9. 92	Macandrew, Harold	28 Sep. 1892	First class
10. 92	Harris, William	28 Sep. 1892	First class
11. 93	Stapleton, Michael	29 Mar. 1893	First class
12. 93	Hanlon, Christopher	29 Mar. 1893	First class
13. 93	Potter, Joseph Matthew	29 Mar. 1893	First class
14. 93	Hilder, Alfred	29 Mar. 1893	Second class
15. 93	Matthews, Peter	29 Mar. 1893	Second class
16. 93	Richards, Stephen	6 Sep. 1893	First class
17. 94	Brain, Austin Lionel Bennet	3 Apr. 1894	First class
18. 94	Thorpe, Walter	3 Apr. 1894	Second class
19. 95	Williams, Luke	17 Apr. 1895	First class
20. 96	Levings, Joseph Henry	6 May, 1896	First class
21. 99	Goodall, Thomas Charles	14 Apr. 1899	Second class
22. 1900	Schloesser, Robert	19 May, 1900	First class
23. 1900	Nicholls, Charles Berres- ford	19 May, 1900	First class
24. 1900	Sale, William Robert	19 May, 1900	Second class
25. 1900	Williams, Richard	19 May, 1900	Second class
26. 1900	McPeake, John	1 Aug. 1900	First class
27. 1901	Sawyer, Basil	20 Feb. 1901	First class
28. 1902	Provis, John	22 Apr. 1902	First class
29. 1902	Bird, Robert Chisholm	22 Apr. 1902	Second class
30. 1902	Briggs, William Albert John	22 Apr. 1902	Second class
31. 1902	Bartlett, William Henry	22 Apr. 1902	Second class
32. 1902	Phoenix, William	22 Apr. 1902	Second class
33. 1902	Wright, Herbert E.	22 Apr. 1902	Second class
34. 1902	Craze, John	30 Apr. 1902	Second class
35. 1903	Waller, Richard Fitz- arthur	5 May, 1903	First class
36. 1903	Brickhill, Hector Gordon	5 May, 1903	First class
37. 1903	Barker, Reginald Fredk.	5 May, 1903	First class
38. 1903	Vincent, Thomas Henry	5 May, 1903	First class
39. 1903	Crittendon, James Henry	5 May, 1903	First class
40. 1903	Weston, Eustace Moriarty	12 Aug. 1903	First class

CERTIFICATES of Competency—continued.

No of Certificate.	Name.	Date of Certificate.	Class of Certificate.
41. 1903	Clark, Lindsay Colin	31 Aug. 1903	First class
42. 1904	Martin, Edward Patrick	17 Feb. 1904	First class
43. 1904	Herman, Hyman	29 Apr. 1904	First class
44. 1904	Murray, Russell Mervyn	29 Apr. 1904	First class
45. 1904	More, George Allan	14 Oct. 1904	First class
46. 1905	Beamish, William Abraham	3 Jan. 1905	First class
47. 1905	Andrews, Thomas J.	1 May, 1905	Second class
48. 1905	Hitchcock, William E.	1 May, 1905	First class
49. 1905	Smith, George Oliver	18 July, 1905	First class
50. 1906	Rockett, Hildreth Peyton	23 Apr. 1906	Second class
51. 1906	Hales, Richard Chilman	23 Apr. 1906	Second class
52. 1906	Debenham, Arthur John	28 June, 1906	First class
53. 1906	Coote, Charles Edward	18 Oct. 1906	First class
54. 1907	Marks, Oscar Sidney	8 Mar. 1907	First class
55. 1907	Phelan, Bernard Fredk.	23 Apr. 1907	Second class
56. 1907	Moline, Arthur Howard Pritchard	23 Apr. 1907	First class
57. 1907	Macartney, Ross Kenneth	23 Apr. 1907	First class
58. 1907	Williams, Thomas James	8 May, 1907	First class
59. 1908	Hooke, Arthur Warner	18 Mar. 1908	First class
60. 1908	Adams, Oliver Linley	25 Apr. 1908	First class
61. 1908	Seal, Leonard Presley	19 Nov. 1908	First class
62. 1909	Watt, William Shand	20 Apr. 1909	First class
63. 1909	M ^c Intyre, William Keverall	20 Apr. 1909	First class
64. 1909	Bruschle, Conrad C.	8 May, 1909	Second class
65. 1909	Reid, William Daniel	30 June, 1909	First class
66. 1909	Brook, Reginald H. T.	5 Aug., 1909	First class
67. 1910	Martin, A. E.	17 Feb. 1910	Second class
68. 1910	McKenny, S. D.	24 Mar. 1910	Second class
69. 1910	Smith, Chas. Lonsdale	30 June, 1910	First class
70. 1910	Allen, Douglas Vernon	9 Sept. 1910	First class
71. 1910	Alabaster, Rupert Cecil	28 Sept. 1910	First class
72. 1910	Bedford, Max E.	24 Nov. 1910	First class
73. 1911	Rough, John H.	24 Apr. 1911	Second class
74. 1911	Vandean, Henry Alexander	25 May, 1911	First class
75. 1911	Garrett, James Edward	6 June, 1911	First class
76. 1912	Gudgeon, Cyril Wayth	17 Apr. 1912	Second class
77. 1912	James, Eric Lisle	17 Apr. 1912	First class
78. 1912	Jakins, George Fredk.	17 Apr. 1912	First class
79. 1912	Barkley, E.	17 Apr. 1912	First class
80. 1913	O'Brien, Arthur Ernest	1 May, 1913	Metal Mine Manager's Certificate

CERTIFICATES of Competency—continued.

No. of Certificate.	Name.	Date of Certificate.	Class of Certificate.
81. 1913	Hardman, James Thos.	1 May 1913	Metal Mine Manager's Certificate
82. 1913	De Latour, Edward Arthur	1 May, 1913	Metal Mine Manager's Certificate
83. 1913	Le Souf, Sebert Gordon	20 May, 1913	Metal Mine Manager's Certificate
84. 1913	Reid, Alexander McIntosh	20 May, 1913	Metal Mine Manager's Certificate
85. 1913	Scott, James Balfour	25 Nov., 1913	Metal Mine Manager's Certificate
86. 1914	Vaughan, Rupert	25 Ap., 1914	Metal Mine Manager's Certificate
87. 1914	Coulter, Leslie J.	30 Ap., 1914	Metal Mine Manager's Certificate
88. 1914	Andrew, John J.	30 Ap., 1914	Metal Mine Manager's Certificate
89. 1914	Moore, Leslie St.	8 July, 1914	Metal Mine Manager's Certificate
90. 1915	Gudgeon, Cyril Wayth	13 Aug. 1915	Metal Mine Manager's Certificate
91. 1915	Mackay, Alexander Dudley	1 Dec. 1915	Metal Mine Manager's Certificate

COLLIERY Certificates of Competency granted by Board of Examiners.

No. of Certificate.	Name.	Date of Certificate.	Class of Certificate.
1. 1902	Brain, Austin Lionel Ben- net	28 Sep. 1902	First class
2. 1907	Wallace, Archibald Camp- bell	23 Apr. 1907	Second class
3. 1907	Williams, Thomas James	8 May, 1907	First class
4. 1910	Ledger, William	6 Sept. 1910	First class
5. 1911	Griffin, Daniel Martial Counsel	24 Apr. 1911	Second class
6. 1911	Dawson, Samuel Joseph	13 July, 1911	Second class
7. 1914	Hill, Henry David	29 Oct., 1914	

REPORT OF THE MOUNT CAMERON WATER-
RACE BOARD FOR THE YEAR ENDING 31st
DECEMBER, 1915.

Gladstone, 15th February, 1916.

SIR,

WE have the honour to submit the report of the Board for the year ending the 31st December, 1915.

Repairs.—The only repairs necessary during the year were caused through slips occurring during the winter in some of the deep cuttings owing to the heavy rains. These were repaired at a cost of £43 13s., and are now standing well.

Syphons.—The iron pipes are in good condition, and have been kept well covered with paint wherever they show signs of corrosion. The wooden pipes are covered with earth, and have been examined from time to time, but so far show no signs of decay.

Revenue.—The revenue for the year amounted to £1106 13s. 9d., being an increase of £85 9s. 9d. on the previous year.

Expenditure.—The expenditure amounted to £690 10s., being a decrease of £41 19s. 6d. as compared with the previous year.

The statistics for the year are as follow:—

Average per week of claims supplied, 12.	
Greatest number supplied in any one week, 15.	
Total number of heads supplied—	
Under fixed or cash scale	1695 ⁵ / ₁₃
Under royalty or credit scale	1172
Total	2867⁵/₁₃

Tin ore raised for the year:—Fixed scale, 41 tons 15 cwt. 2 qr. 16 lb.; royalty scale, 15 tons 17 cwt. 3 qr. 3 lb. Total, 57 tons 13 cwt. 1 qr. 19 lb.

Average number of men employed per week, 25.

Total receipts for the year:—Water sold, fixed scale, £718 13s.; water sold, royalty scale, £388 0s. 9d. Total, £1106 13s. 9d.

Expenditure. Cost of Maintenance and Management.

	£	s.	d.
Salaries and wages	607	16	0
Insurance	6	3	0
Travelling expenses	18	9	8
Stationery and printing	4	1	10
Stores and tools	10	6	6
Race-repairs	43	13	0
Total... ..	£690	10	0

Paid to Public Debts Sinking
Fund for the year ending 30th
June, 1915 (including moiety of
rents of mineral land served by
the race, £14 16s. 3d.) £412 9 11

Rainfall.—The registered rainfall for the year was as follows:—Main intake, 46 inches 13 points; Little Mussel Roe intake, 39 inches 79 points.

We have the honour to be,

Sir,

Your obedient Servants,

W. H. WALLACE, Chairman.

CECIL G. RYAN,	} Members.
JOHN SIMPSON,	
CHAS. BARNES,	
J. O. HUDSON,	

The Hon. the Minister for Mines.

REPORT OF THE STATE MINING ENGINEER.

State Mining Engineer's Office,
Hobart, Tasmania, April 18, 1916.

SIR,

I HAVE the honour to submit for your information my report for the year 1915.

A considerable amount of attention was given to prospecting in isolated places. A party of ten men were sent to Port Davey fully equipped. The country was found to be very rough, which made prospecting very difficult and slow. Nothing of a payable nature was discovered, but it was demonstrated that tin, gold, and copper existed, and no doubt at a later date payable discoveries of these metals will be located. Other parties were assisted to prospect in the vicinities of Preolenna, Little Henty and Badger Rivers, Pieman River, Wilson River and Mt. Ramsay, Whyte River, Junction Range, and Brown's Plains. Several parties located promising discoveries, which should receive attention in the future.

The store at Corinna has been maintained, and has greatly assisted prospecting in the vicinity. This district gives great promise, and the prospectors are continuing their operations. It is the intention to further assist parties of prospectors during the present year, but not on such a large scale as in the case of the Port Davey party.

The war having closed the metal market, it was found necessary to make advances on ore. The market having reopened, the ore was disposed of at a satisfactory price, with the exception of a small amount of nickel ore, for which there is yet no market. The advances entailed a large amount of extra work on all those concerned, which was carried out in a willing and most satisfactory manner.

The advances caused a number of mines to continue operations, and found employment for a large number of men at a very critical period.

A large amount of development work was carried out in the Zeehan district—5618 feet of driving and 120 feet of sinking, for an expenditure of £2450 12s. 10d., or 8s. 6½d. per foot.

The work has not located any discoveries of large ore-bodies, but has located a number of small veins which are proving profitable to small parties. The royalty received from these assisted parties was £538 5s. 9d. for the year.

In other localities £337 6s. 11d. was expended under the provisions of "The Aid to Mining Act."

Although the work for the year has not proved as successful as could be desired, it is to be hoped that the expenditure will be continued. The discovery of one good mine would more than compensate the State for the expenditure. The sampling of the Heemskirk district by State officers has demonstrated that large ore-bodies exist which would prove payable concerns if worked on economical lines. The introduction of cheap assays

at Zeehan has been continued, and has been freely taken advantage of by prospectors, 870 assays having been made.

The administration of the Act is being carried out in the most economical manner possible. The total expenditure for the year was £4767 10s. 10d., which includes all charges incurred in advances on ore, sampling, equipping and sending out prospectors, wages, and office expenses; also a report on a water scheme.

I have, &c.,

J. O. HUDSON, State Mining Engineer

Secretary for Mines, Hobart.

GEOLOGICAL SURVEY OF TASMANIA.

REPORT OF THE GOVERNMENT GEOLOGIST.

Geological Survey Office,
Launceston, 11th May, 1916.

SIR,

I BEG to present my report for the year ending 31st December, 1915.

During the year the following publications have been either prepared or issued:—

Bulletin No. 20.—The Catamaran and Strathblane Coal-fields and Limestone and Coal at Ida Bay, Southern Tasmania, by W. H. Twelvetrees. February 6, 1915.

Bulletin No. 21.—The South Heemskirk T'nfieid, by L. Lawry Waterhouse, B.E. October 15, 1915.

Bulletin No. 22.—Catalogue of Publications issued by the Government of Tasmania relating to the Mines, Minerals, and Geology of the State to 31st December, 1914, compiled by W. H. Twelvetrees.

Bulletin No. 23.—The Zinc-lead Sulphide Deposits of the Read-Rosebery District: Part 2, Rosebery Group, by Loftus Hills, M.Sc. 30th August, 1915.

Bulletin No. 24.—Reconnaissance of Country between Recherche Bay and New River, Southern Tasmania, by W. H. Twelvetrees. 31st August, 1915.

Report No. 6.—Reconnaissance of the North Heemskirk Tinfieid, by L. Lawry Waterhouse, B.E. 27th February, 1915.

Report No. 7.—Preliminary Report on the Zinc-lead Sulphide Deposits of the Rosebery District, by Loftus Hills, M.Sc. 11th May, 1915.

Record No. 4.—A Monograph of Nototherium Tasmanicum, by H. H. Scott. 26th January, 1915.

Mineral Resources No. 1.—Tungsten and Molybdenum: Part 1, North-Eastern and Eastern Tasmania, by Loftus Hills, M.Sc. 22nd October, 1915.

Mineral Resources No. 1.—Tungsten and Molybdenum: Part 2, Middlesex and Mt. Claude Districts, by Loftus Hills, M.Sc. January 1, 1916.

From the above, it will be apparent that the activities of the Survey during the year have spread over the Heemskirk and Rosebery districts on the west coast and the asphaltum-carrying beaches along the south coast of Tasmania, besides including field examinations for the information of the State Munitions Committee of the molybdenum and tungsten deposits of Eastern and Northern Tasmania and King Island. The results of the work have proved exceptionally useful to those who are developing the mineral resources of the island.

Mr. Loftus Hills visited Broken Hill, and obtained useful information in connection with the question of how far any of the flotation methods in practice there are applicable to the

treatment of the Tasmanian zinc-lead ores. His conclusions will be set forth in the bulletin forming Part 3 of the discussion of the deposits of the Read-Rosebery district, to be prepared after his return from active service.

I beg to append annual reports by Mr. L. Lawry Waterhouse, B.E., Assistant Government Geologist, Mr. Loftus Hills, M.Sc., Assistant Government Geologist, and Mr. W. D. Reid, Government Assayer, dealing with their work for the period under review.

At the end of the year Mr. Hills proceeded, on leave, to the Engineers' Military Training School, New South Wales, where he qualified for his lieutenancy in the Miners' Corps preparatory to leaving for the front. His position in the Survey is to be kept open for him on his return from the war. While his patriotic spirit commands admiration, as an energetic and highly efficient member of the staff, his temporary absence is regretted.

Search for Petroleum.

In the early part of the year a reconnaissance was made of the country near Rocky Boat Harbour and New River, where indications of the existence of petroleum had been stated to exist. Pieces of native asphaltum found on the beaches in that locality has led to some search for their source, as asphaltum is known to be the residue of petroleum after volatilisation. Supposed films of oil were said to have been seen floating on the sea, and seams of perished asphaltum were reported to occur on the beach.

My investigation on the spot resulted in the occurrences of loose fragments of asphaltum on the sea-beaches being established as the only actual indication of petroleum. The source of these fragments therefore remains a vital question for those interested in the search for oil. Bulletin No. 24 deals intimately with this matter. It may be accepted as certain that the pieces of bitumen found stranded on beaches all along the west and south coasts of Tasmania were released from submarine beds and brought within the range of tidal action by the ocean currents. Consequently, the discovery of pieces on the seashore cannot be regarded as indicating the existence of the substance inland.

A limited exposure of Tertiary brown coal was seen in Rocky Plains Bay. While the most favourable strata for the presence of petroleum on the south coast would be those of Tertiary age, the outcrops structurally are unpromising. No relation could be traced between the pieces of asphaltum found on the beaches and these outcrops.

During the year a considerable number of these asphaltum "waifs" were met with at the mouth of Deep Creek, Port Davey, and some fruitless search was made for their source. The explanation of their occurrence is that given above. Similar occurrences are recorded from other beaches on the West Coast, on King Island, Hummock Island, &c.

Dr. Arthur Wade, the Commonwealth Oil Expert, examined the locality on North Bruny, where seepages of oil or tar had been reported to occur and land taken up for testing with the drill. His report has been published as a Parliamentary paper. It is to the effect that he was unable to satisfy himself that there is any likelihood of petroleum being found on the island.

A drilling test, however, is about to be carried out by those interested in the proposition.

If the existence of emanations of gas or surface seepages with the odour of petroleum can be established in Tasmania, there will be strong warrant for testing the locality wherever it may be. In the absence of these, or either of them, drilling for oil is a process of blind stabbing. Mr. Cunningham Craig, in his well-known book on Oil-finding, make an apparently sweeping statement which is apt, when taken by itself, to mislead the imperfectly instructed enthusiast. He says that many of the greatest oilfields known to-day have not a single surface indication within their length and breadth. The author is deprecating the undue valuation of surface shows, and emphasising the necessity of suitable structural conditions. The oilfields of which he is speaking have been in oil belts, and connected structurally with adjacent oilbearing areas.

Sundry indications of oil are discussed in Bulletin No. 24, and further reference to them need not be made here.

It is impossible to touch upon the question of the origin of petroleum without entering the field of controversy, for diametrically opposite views of its derivation are held; and yet the last few years, with increasing knowledge gathered from the exploration and active working of oilfields, have witnessed a closer approach to agreement among expert authors than before seemed likely.

We have on one side chemists who tell us that the action of water on deep-seated iron carbide would result in the production of hydrocarbons, and in their condensation to form petroleum. This ingenious theory, with its modifications, has been supported by experiments in the laboratory, and the possibility of reactions of this nature placed beyond doubt. But the geological facts of occurrence preclude its acceptance as adequate to account for the supplies of oil on petroleum fields generally. The sources of the petroleum won, however deep, are situate within the zone of stratified rocks, and not in the uttermost interior of the planet. Moreover, it has been discovered that petroleum behaves optically in a way which excludes an inorganic origin. The presence in it of cholesterol, which exists in all animal oils and fats, and of phytosterol, which is the cholesterol of plants, demonstrates its organic origin. The inorganic theory therefore, though its annunciation by such a high authority as Mendeleeff gained many adherents to it for a time, at present lacks support.

The controversy has now practically narrowed itself to the question of animal versus vegetable origin.

The vegetable theory ascribes the formation of petroleum to the decomposition of terrestrial or aquatic plants. It is considered that the slow distillation of vegetable matter distributed through sediments has resulted in the formation of the oil, and this conclusion is supposed to be verified by the experiments which show that identical liquid hydrocarbons can be reproduced by the chemist from similar materials.

On the other hand, the Engler-Hoefer theory, which is widely accepted, postulates an animal origin for the most part, while admitting that vegetable fats can be transformed into petroleum by dry distillation; and its authors make it embrace the lowly vegetable diatoms with fats and albumen, but no cellulose, as a source of petroleum.

Hoefler states the theory advanced by himself and his colleague (Trans. Amer. Inst. Min. Eng., 1915, p. 484), as follows:—

“According to our present knowledge, the original material of petroleum is principally fat, and, subordinately, wax, resin, and albumen. These substances, especially fat and albumen, occur chiefly in both the lower and the higher animal organisms. Petroleum therefore is mainly of animal origin, though it may have been formed here and there from fatty plants, particularly diatoms.”

Briefly, those who derive the oil from the remains of plants believe that it can be produced in a confined deposit with a limited quantity of water and under moderate pressure and at a comparatively low temperature by the elimination of nitrogenous compounds and the destructive distillation of the fats. Most of these advocates consider that the action commences as soon as the necessary pressure is attained. Those who refer the formation of the oil to animal remains generally consider that the nitrogenous parts are removed from buried material by decomposition, and that then the slow distillation of the fats results in the production of petroleum.

There is still another point in the long controversy of authors, namely, whether the formation of oil always requires a certain temperature and pressure; that is, whether its origination was long subsequent to the age of the deposits in which it was formed. Some are of opinion that the oil is contemporaneous with the enclosing sediments, and that it is not a distillation product, but simply a deposit from the fatty matter of plants and animals. This is known as the contemporaneous deposition theory as against the pressure-distillation theory.

It appears to be open to geologists to believe that oils have originated from both animal remains and aquatic plants, in short, from such a mixture of substances as form what are called sapropelic deposits. These are the organic muds which accumulate on the floors of inland seas and estuarine waters, and consist of the decomposition products of gelatinous algae, diatoms, pollen, and various animal remains. These muds frequently occur in association with coal and lignite areas, of which they are extensions, representing a deltaic, estuarine or littoral phase, while the fresh water and terrestrial phase is represented by the coal seams. No one now supports the view which obtained at one time, that petroleum, as it exists on the world's oilfields, is derived from coal (though the distillation of oil from existing seams has undoubtedly taken place occasionally to a limited extent). But it is permissible to imagine contemporaneous phases in certain coalfields. On the same geological horizon there may be areas which are coal-bearing and not petroliferous, and others which are petroliferous and not coal-bearing. The non-carbonaceous estuarine or littoral extensions of certain coalfields may therefore exhibit petroleum seepages, proceeding from the organic muds, which there is much reason to believe are a widespread source of oil.

Where, as is often the case, limestone rocks are oil-containers, the supposition is that the oil had its birth in the organic contents of the ooze of the sea-floor, and that it ascended into overlying porous beds of the limestone, in which it collected and was preserved.

In Tasmania any post-Algonkian systems are possible homes of oil, though the various systems vary greatly in their possibilities. The limestones of Silurian age are dense, non-magnesian rocks, and unfavourable for accumulation.

The succeeding Permo-Carboniferous and Trias-Jura calcareous and arenaceous strata are also possible beds of origin, but a very unfavourable circumstance is that no occurrence of seepage has been established. The sapropelic coals at Preolenna and Barn Bluff, and the tasmanite shale in the Mersey basin, may be made to yield oil by distillation, but no signs of free oil have been observed in connection with them, and the adjacent beds show no indication of an oil phase.

There remain the Tertiary and Quaternary sediments which, with their rapid succession of various lacustrine and deltaic beds, are potentially petroligenic, and are perhaps the most likely assemblage which we have for the formation of oil. These beds are well developed in the Launceston Tertiary basin. But here, again, indications are absent, though it is worth while being on the watch for them.

Without denying the possibility of the existence of native oil in Tasmania, the outlook for its discovery in economic quantities is, on the whole, not encouraging.

Munitions.

Mr. L. L. Waterhouse, B.E., Mr. Loftus Hills, M.Sc., and Mr. W. D. Reid have represented the Survey on the Northern Science Subcommittee for Munitions. It was a matter for regret that representation on the State Committee was excluded, for the absence of it evidently weakened the latter's usefulness. However, it was arranged for the Geological Survey to undertake an investigation of the resources of the island in the metals tungsten and molybdenum. In pursuance of this arrangement, Mr. Loftus Hills visited the North-Eastern and Eastern Districts and the Middlesex and Mt. Claude fields, while Mr. L. L. Waterhouse examined the scheelite deposits on King Island, and is about to visit Cape Barren Island, where some occurrences of molybdenite have been reported. The results of Mr. Hills' visits have been published in *Mineral Resources No. 1, Parts I. and II.*; those of Mr. Waterhouse's journey to King Island are in course of preparation.

Laboratory.

Mr. W. D. Reid (Government Assayer) continues in charge of this. The mining public has availed itself largely of the opportunities for assays, and the Assayer has had to respond to heavy demands on his time. The reliability of his work has inspired public confidence, and this branch is steadily expanding.

Mineral Collections.

The time available for museum work has necessarily been limited, but as opportunity has offered the rearrangement of old collections and the classification of new ones have been proceeded with. All the old unsuitable cases have now been replaced by ones of modern type, but still a large quantity of material cannot be exhibited for want of cases. The provision of these, it is recognised, must for the present be deferred.

Gratifying appreciations of the exhibits and their usefulness continue to be received from the public.

There looms in the future the further question of an addition to the museum building. This is imperative if the mineral resources of the island are to be worthily represented. Collections are at present being stored away for want, not merely of cases, but also of room-space. The Curator of the Victoria Museum, Mr. H. H. Scott, realising the need, has prepared a plan for a structural addition which can be easily made to the existing building in the form of a large mineral gallery on the side facing the river, which would accommodate our collections for a long time to come. This necessary extension of the institution will have to be kept in mind, and the earliest opportunity taken of carrying it out in the interests of both technical and general education.

Geological Map of Tasmania.

The 15 miles to the inch map is in the printer's hands, and will appear in due course. The preparation of the large scale map must be postponed for a time.

Office and Library.

During the year the correspondence and mail matter received and despatched comprised 3300 items. The library is in good order, and the exchange lists, since the declaration of war, have been scrutinised and revised. Acknowledgments for copies of papers are due to the proprietors of the Launceston "Examiner," "Daily Telegraph," "Daily Post," the "Australian Statesman," "Australian Mining and Engineering Review," Queensland Government "Mining Journal," and others.

Work of the Survey for the Coming Year.

Under the present war conditions, which have resulted in the reduction of our staff, besides necessitating curtailment of expenditure in some directions, it will not be possible to carry out the full programme originally contemplated. The present programme for the year includes:—

- (1) Examination of the Gladstone district (already made).
- (2) Examination of Cape Barren Island on behalf of the Munitions Committee.
- (3) Examination of a portion of the N.E. Dundas tinfield.

I have, &c.,

W. H. TWELVETREES, Government Geologist.

W. H. WALLACE, Esq., Secretary for Mines, Hobart.

REPORTS OF ASSISTANT GOVERNMENT
GEOLOGISTS.Geological Survey Office,
Launceston, 9th May, 1916.

SIR,

I HAVE the honour to submit my report for the year ending 31st December, 1915.

During the early portion of the year a considerable amount of my time was taken up in carrying out the office duties pertaining to the position of Government Geologist, as that officer was absent in the field from the beginning of February until the end of April. This work interfered very considerably with the preparation of my report and bulletin on the North and South Heemskirk Tinfields, which were in hand at the time.

On March 4 I forwarded for printing "Geological Survey Report No. 6: Reconnaissance of the North Heemskirk Tin Field." Copies of this report were received for distribution on July 2. The report comprises 72 pages, 2 plates, and 5 photographs.

There was a good deal of excitement early in the year concerning the possible occurrence of oil in the State, caused mainly by the discovery of pieces of asphaltum on various beaches on the west and south of the State. A discovery of apparently similar material to that found on the coast, inland near Lefroy, and possibly *in situ*, resulted in my being instructed to visit the locality and report on this find. This trip was undertaken in March, and notes on the results of this examination are appended. The conclusion arrived at was that the material was not a natural asphaltum, but tar which had been tipped out on the surface some years ago.

My complete bulletin on South Heemskirk was completed on October 15, and forwarded, with plans and sections, for printing a few days later, as "Geological Survey Bulletin No. 21: The South Heemskirk Tinfield."

Acting on instructions received, I left Launceston on October 26 for King Island, with the intention of examining the scheelite and molybdenite deposits on the island, and making a general geological reconnaissance of the island. Notes summarising the results of this examination are appended. In the limited time available, a detailed examination of the whole area of about 400 square miles, much of it being inaccessible country, was impossible, particularly in view of the fact that it was necessary to sample the scheelite mine on the south-east coast. I returned to headquarters on December 24. This trip was authorised essentially to enable a report to be prepared for the State Munitions Committee on the scheelite and molybdenite deposits of King Island.

During the year a considerable amount of time has been taken up with office routine work. A large number of

enquirers have been interviewed (as many as 70 being recorded for one month), and information supplied on various geological, mining, and metallurgical subjects. In addition, much information was supplied by letter, about 200 official letters having been written by me during the year, many of them being lengthy answers to enquiries for information on various subjects. It is a source of gratification to know that the work of the Geological Survey is being appreciated by the general public, as officers are always willing to place at the disposal of enquirers any information they may possess concerning subjects having any bearing on the mineral resources of the State.

As curator of the Geological Survey collections exhibited in the Victoria Museum, a fair amount of time has been spent during the year in this connection. The most notable addition to the collection was that of a set of over 600 specimens acquired for the Survey. This collection of representative minerals forms a very valuable addition to our exhibits, and has been widely admired, and very favourably commented upon. The unpacking and arranging of these specimens took some time, but the public is expressing its appreciation of the collection, which is of considerable educational value. The collection is being exhibited in cases generously donated by the Launceston Municipal Council. During the early part of the year the delivery of five cases purchased by the Government, of a uniform pattern with those previously supplied, enabled some of the old-fashioned cases to be dispensed with. This necessarily involved some rearrangement of exhibits, but the effect of this uniformity in cases, and of the systematic arrangement of specimens illustrative of the mineral wealth of the State, is striking, and has called forth expressions of high praise from visitors. At the present time many interesting specimens are on hand which cannot be exhibited for want of space, and it is to be hoped that the way will open for new cases to be provided, and a larger gallery to enable the collections to be exhibited to better advantage than is possible at the present time. This branch of our work is supplying an important need of the mining community, and it is essential that the work should not be allowed to stagnate.

As librarian of the Geological Survey Library, a certain amount of time has been devoted to the cataloguing and arranging of new books. We continue to receive many publications in exchange for those sent from this office. During the year 631 publications have been received, comprising 179 interstate and New Zealand, and 452 foreign, in addition to papers and various mining magazines. These publications form a valuable addition to our library, and we would tender thanks to the various donors. These books are mostly unbound, but we have also added to our library 53 volumes purchased by the Government, dealing with various subjects on which officers of the Geological Survey are from time to time asked for information. Thus, the addition of up-to-date books makes it possible for the public to be supplied with the latest information on subjects connected with the mining industry.

Notes on alleged Deposit of "Asphaltum" near Lefroy, and of "Plumbago" at Tam O'Shanter Bay.

The locality at which asphaltum was alleged to occur *in situ* was between Back Creek and Piper's River, a few miles from Lefroy. It was within about 150 yards of the junction of the road from Lefroy with that connecting with the main Lefroy-Launceston-road. The material occurred on the boundary of blocks held by C. C. Adams (charted in the name of E. Gillespie), and S. Jewkes (charted in the name of M. F. Proctor). It was black tarry material, very impure, containing a good deal of mechanically included clay and fragments of rock. The material occurs on the surface, although covered in a few places by an inch or two of soil, in which grass is growing. The patch is 29 feet long, 3 to 4 feet wide, and up to 3 inches in thickness, tapering out to nothing at the sides and lower edges; it has every appearance of being a surface flow. It rests on clayey soil, merging into a stiff clay subsoil, which apparently represents the weathered product of slate country-rock, similar to that outcropping a few yards to the south. This slate forms the bedrock of the surrounding area, and is probably of Ordovician age. Tertiary basalt appears a few yards to the east, and caps the ridge which partly surrounds the locality, forming a shallow amphitheatre. I carefully examined the immediately surrounding district, but at no other spot saw anything corresponding to this occurrence, or anything which could be regarded as indicative of the presence of oil. The geology of the district is comparatively simple; the bedrock is highly fissile Ordovician slate, dipping at high angles, covered in places by deposits of Tertiary alluvium, sometimes auriferous. The alluvium is covered in places by Tertiary basalt, and basalt tuffs, although the igneous rock appears to rest in places directly on the slate. In some places it is evident that there have been several distinct flows of basalt, alluvial material separating them.

A detailed examination of the supposed asphaltum deposit disclosed several features which gave a clear indication as to its mode of origin:—

- (1) A piece of *squared* timber and a chip, which clearly showed an axe-mark were embedded in the lowest layer of the "asphaltum."
- (2) A fragment of crockery was found embedded in the material.
- (3) Portion of a glass bottle was found in the soil several inches below the "asphaltum."
- (4) The remains of an old hut were noted a few yards above the deposit, and adjoining it was an old shed in which sheep used to be branded.
- (5) The form of the deposit, as noted above, is that of a surface flow of very limited extent.

The analysis made by the Government Assayer indicated that it was very impure tarry material, and that it did not resemble a natural asphaltum.

In view of this evidence and the geological features of the immediate neighbourhood, the conclusion arrived at was that

the material was not a natural asphaltum, but tar which had been tipped out on the surface some years ago.

Before returning to Launceston a hurried trip was made to the coast north of Lefroy, to examine a reported occurrence of plumbago. For a few miles the coastal strip is very level and sparsely timbered, about 200 feet above sea-level, and consists of white sand with occasional fragments of angular quartz, but no rock outcrops. This plain probably represents a plain of marine denudation caused by an encroachment of the sea in comparatively recent times. From Tam O'Shanter Bay to Stony Head (14-mile Bluff) the cliffs are of columnar basalt of Tertiary age, usually rising sheer from the water's edge to 100 or 150 feet. At Stony Head, however, old schists, quartzites, and slates make their appearance, and these are probably of Pre-Cambrian age; time did not permit of their extent being determined. At this point were some old workings known as Kennett's, where some coarse gold was won from Tertiary alluvium, which here rests on the Pre-Cambrian schists. This locality is worth further prospecting. The so-called "plumbago" was found to consist of soft horizontally-bedded carbonaceous shales of Tertiary age, resting on basalt, and covered by columnar basalt; the thickness appears to be about 8 feet. The only workings which could be located consisted of a shaft about 9 feet deep sunk at the base of a basalt cliff at the western extremity of Tam O'Shanter Bay. There are said to be other workings between high and low water marks. The material is of no economic value.

Notes on Geology of King Island.

The following notes are of general nature only, and the conclusions arrived at are subject to some modification when detailed petrological work is carried out.

King Island is situated at the western entrance to Bass Strait, to the north-west of Tasmania, and about midway between Cape Grim and Cape Otway. It has an area of about 400 square miles. Its greatest length is about 40 miles and width about 16 miles. The outstanding feature in the physiography of the island is the generally level surface presented to the eye whenever a panoramic view can be obtained. It is not easy to locate a vantage point owing to the level surface, but this feature is very noticeable from the sea when the land surface is seen to be monotonously level. The general height of the northern and central portions of the island is 200 feet above sea-level, but along the south-east coast the elevation attained is as much as 500 feet, the average being about 400 feet. The portion of the island represents an old peneplaned surface which has been uplifted relatively to sea-level. Since this uplift degradational forces have been active in wearing down the level surface, and the streams are still cutting down their beds, youthful V-shaped valleys being common. The extreme south of the island is comparatively low-lying. This area, together with the western coastal strip, is covered with sand-dunes, which rise to a height of 250 feet. The western portion of the island is that which has received most attention in the past from settlers. This is due to the fact that it has been proved to be eminently suit-

able for producing grass suitable for fattening cattle—the staple industry of the island. The soil which produces this grass is really a loose sand composed essentially of shell fragments. This is undoubtedly a beach sand, which owes its present distribution essentially to the prevailing westerly winds. Although this western coastal strip extends from north to south of the island its width varies from less than 1 to over 4 miles; its average width is probably about $1\frac{1}{2}$ mile.

Further inland occurs in different parts of the island a very different class of country, well called by its local name of "plain country." This country is not so fertile as that previously described. It is very level, the surface being covered frequently with white quartz sand, and occasional fragments of angular white quartz. In places the surface is boggy, and it may be covered with a variety of peat to a depth of several feet. It usually supports only a stunted vegetation. The width varies very considerably, being practically negligible at some points. These areas may represent plains of marine denudation developed prior to the most recent uplift of the island.

Portion of the central, eastern, and practically the whole of the south-eastern portions of the island are characterised by the presence of timber, and not infrequently of dense scrub. Timber is almost entirely absent from the areas previously described. The soil is usually of a clayey nature, and is derived directly from the decomposition of the rock-formations *in situ*. Rock outcrops are noticed at intervals, although it is only along the coastline that anything approaching a continuous section is obtainable.

Having touched on the broader features of the area, it remains to refer briefly to the rock-formations developed. It must be understood that in the western portion of the island only isolated rock outcrops are to be seen, excepting along the actual coast line. Generally, similar conditions prevail in the extreme north and south, while in the north-east, even along the coast, rocks are seldom encountered. On the east and south-east, coastal outcrops are common, but inland scrub usually conceals any outcrops which may be available. In this sector are found possibly the most interesting rocks, from the purely geological standpoint, and certainly the most puzzling.

Dealing first with the sedimentary rocks developed on the island, the oldest are comprised in the series of Pre-Cambrian rocks, the predominant members of which are slates, quartzites, and schists, which outcrop at various points round the coastline, and occasionally inland. These rocks strike nearly north and south, and dip at steep angles, usually to the west along the west coast, and to the east along the east coast. In places the rocks are intensely crushed and contorted. Members of the group include slates, quartzite, mica-schists, actinolite-schists, and possibly andalusite-schists; rocks of igneous origin are mentioned later. The evidence for classing the series as Pre-Cambrian is not conclusive, being based mainly on lithological resemblances to Tasmanian rocks whose age is known. Apparently later than this widely-distributed series are slates and quartzites, which, from their association

with the complex series of igneous breccias, tuffs, &c., exposed on the south-east coast are believed to be of Cambrian or Ordovician age, and are tentatively classed as Cambro-Ordovician. Probably belonging to the same period are the reddish-chocolate and green flaggy slates outcropping in the vicinity of the City of Melbourne Bay, which have been exploited as a source of commercial slates. These strike about N. 30° E., and dip east.

A very interesting formation exposed on the south-east coast is tentatively classed as belonging to the base of the Permo-Carboniferous system, viz., beds of glacial till. The thickness of the beds is uncertain, as they are covered by sand a few yards from the shore; they strike a little east of north, and dip east at about 45°. There are no fossils to enable the age to be positively fixed.

There appears to be a considerable break in the geological column, succeeding the Permo-Carboniferous, as no sedimentary rocks appear to have been formed until Tertiary times, when at least parts of the island were again submerged, as shown by the presence of Tertiary limestone. Two occurrences were noted, one in the south of the island and another on the east coast, towards the north end of the Sea Elephant Bay, both similar in general appearance, and composed essentially of marine shells and shell fragments. These patches are probably remnants of a former extensive development of similar rocks removed by subsequent denudation.

Several distinct formations of Pleistocene and Recent age have been developed. Reference has been made to the sand-dune country of the west coast. These dunes have been formed by wind action, and are composed largely of fragments of shells. The action of surface waters containing carbon dioxide in solution has resulted in the solution of some of this comminuted shell material, and its redeposition under favourable circumstances as travertine. The formation of sand-blows at the present time, resulting in the movement of the sand of some of these dunes shows that a good deal of this secondary carbonate of lime has been deposited in simple and branching pipe-like forms which are pseudomorphs after tree-roots. The sand is cemented in places by secondary carbonate of lime, and shows stratification.

Another example of recent cementation is evidenced on the cliffs in places, where recent rock talus is being cemented, largely by carbonate of lime derived from the beach sands referred to above, to form a compact rock.

Of recent formation, but at present unconsolidated, is the raised beach of Sea Elephant Bay, north of Fraser River, on which a little work has been done to try and recover some of the contained tin and gold values. Belonging to the same period are various deposits of unconsolidated shingle around the coast, at an elevation of about 15 feet above present sea-level. These formations clearly indicate that there has been a recent uplift of the island of about 15 feet.

Considering igneous rocks and their modifications, the variety developed on the island is noteworthy, and many of the rocks in their present form undoubtedly represent intensely altered forms of rocks which cannot be readily recognised at the present time.

The oldest igneous rocks noticed on the island are the amphibolite schists occurring in the Pre-Cambrian series developed at Cape Wickham in the extreme north of the island. They doubtless represent original basic rocks, perhaps diabases which have been reconstituted as a result of the intense dynamic metamorphism which the rocks have undergone.

A rock which may, perhaps, be referred to the Cambro-Ordovician era is a crushed and altered granite, which outcrops at various points along the west coast. Although it sometimes occurs in association with the newer granite (Devonian), and intruded by it, it is questionable whether the two are genetically connected.

Occurring on the south-east coast of the island, north and south of Bold Head, is an intensely altered series of basic and acid igneous rocks and igneous breccias and tuffs. Members of the group are not only crushed and contorted, but are largely epidotised, and in most cases are not easily recognisable. They are tentatively classed as Cambro-Ordovician, because it seems likely that the series may be correlated with the porphyroid series of rocks widely developed on the West Coast of Tasmania, and which are known to be earlier than Silurian. Members of this group include porphyroids, spilites, spilite tuffs, porphyrites, altered diabases, and igneous breccias. These rocks are associated with slates and quartzites.

Several outcrops of gabbro and pyroxenite were noticed in different parts of the island, and although there is no definite evidence of their age, the rock is possibly of Devonian age, and may be genetically connected with the granite referred to below, but slightly older than that rock. The gabbro is amphibolitised and saussuritised in places. Occasional masses of concretionary limonite on the surface where no solid rock outcrops indicate the presence of some such rock as that noted.

Very fresh granite, easily distinguishable from that previously referred to as of Cambro-Ordovician age, Devonian age, outcrops at various points. It is frequently porphyritic, and shows no signs of crushing. In places it appears to be intrusive into the older granite. There appear to be seven or eight distinct *massifs*—three on the east coast, and the others on the west coast of the island. The scheelite deposit at Grassy River is genetically connected with one outcrop of this granite. Although as a rule it does not appear to be stanniferous, it is probable that the rock is to be correlated with that abundant in Tasmania, which is of approximately Devonian age. Dykes of granite porphyry and aplite traverse the granite at intervals, and these are undoubtedly late products of consolidation of the granite magma itself. Dykes of pegmatite, sometimes with coarse feldspar, muscovite mica, and tourmaline, are not uncommon in the Pre-Cambrian rocks, and are believed to be final consolidation products of this Devonian granitic magma. Dykes of lamprophyric rocks, which occasionally traverse the newer granite, are believed to be genetically connected with the granite itself, and to be differentiation products of the same magma, intruded after the crust of the granite had consolidated. It is probable that various dykes

of hornblendic rocks whose nature has not yet been determined in detail, are derived from the same magma.

Dykes of diabase were noticed at several localities, and these so closely resemble both macroscopically and microscopically the Tasmanian diabase, that they are assumed to be of similar age, viz., Mesozoic, in the absence of any other criterion of age.

The newest igneous rock found on King Island is a vesicular olivine basalt, which was not seen *in situ*, but occurs in the form of abundant boulders on the shore at a point about 2 miles north of Currie Harbour. A similar rock is reported from the east coast, but the locality could not be visited. This rock is believed to be of Tertiary age, and to be contemporaneous with similar rocks in Tasmania.

Little need be said in this report concerning mining on the island. The property which has attracted considerable attention lately is the scheelite mine at Grassy River, on the south-east coast. A detailed report on this mine is being submitted very shortly. Scheelite occurs, with a small amount of molybdenite and traces of tin and bismuth in a large garnet-diopside-calcite formation in contact slate and sandstone country within a few chains of the granite contact. The richest scheelite occurs in quartz veins traversing the formation, but samples show that it is distributed through the garnet rock. The molybdenite is not of economic importance. Very little work has been done up to the present on the formation, but enough to indicate that the deposit is likely to prove a valuable one. Further prospecting is urgently needed, and should be carried out without delay, and before machinery is erected. The deposit is very favourably situated for economical working. At the present time, when scheelite is urgently needed, developmental work should be vigorously pushed on.

About 4½ miles north-east of the scheelite mine, at an inlet known as City of Melbourne Bay, an attempt was made a few years ago to work the red and green slates belonging to the Cambro-Ordovician series described above. Unfortunately, the attempt was unsuccessful. The slates are not fissile, and cannot be obtained in large slabs where exploited.

About 3½ miles due north of these old workings the old No. 1 Mine is situated, about 1 mile from the coast. Here an adit was driven for 160 feet on the course of a promising quartz vein carrying a little galena and some pyrite, and traces of arsenopyrite and sphalerite. The average width of reef is from 18 to 24 inches. Crosscuts totalling 45 feet were also driven. Assay results of samples are not to hand at the time of writing.

About 3 miles north-west of this old mine, at the mouth of the Fraser River, are the old British Flag Tin Mine workings. These are at the southern end of the Sea Elephant beach. The deposit consists essentially of ilmenite, and carries both tin and gold, the cassiterite being very finely divided, the gold fine and flakey. Monazite is also present. As a result of the small amount of work done, it is said that about 3 tons of tin oxide were sent away for treatment. The attempt to work the deposit failed, but the deposit is certainly worth further attention. The appliances used for concentrating

appear to have been crude, and skilled labour unobtainable on the island for this class of work. Values are said to have been proved for about a mile in length, and over a width of about 150 feet, but it is doubtful if the flat was ever properly prospected. The deposit forms part of a raised beach, and is about 15 feet above present sea-level. About the centre of the island, and within about 2 miles of the Pegarah-road, are some abandoned workings comprising what is locally known as McKie's Gold Mine. Little is to be seen at the present time. A shaft is said to have been sunk to about 50 feet on a gold-bearing quartz reef. The shaft is now inaccessible, being full of water, and partly collapsed. A small amount of surface trenching has been carried out. This work must have been costly at the time it was carried out, owing to the inaccessibility of the mine. The quartz carries a little pyrite. Assay values of samples from the surface are not yet available. Several other quartz reefs occur in this locality, of various sizes, some of them showing a little pyrite and arsenopyrite. The locality is favourable for the occurrence of auriferous reefs, and is worth prospecting.

With reference to the island as a whole, the opinion formed was that conditions are favourable for the occurrence of ore-deposits of economic value. Prospecting will be unsatisfactory in many parts of the island owing to the cover of recent material, but the south-eastern portion of the island is favourable, and prospecting is recommended as the surface is being gradually cleared of scrub.

I have, &c.

L. LAWRY WATERHOUSE, B.E..

Assistant Government Geologist.

W. H. WALLACE, Esq., Secretary for Mines.

Geological Survey Office,
Launceston, 1st January, 1916

SIR,

I HAVE the honour to submit my annual report as Assistant Government Geologist for the year ended 31st December, 1915.

During the year under review I have, acting on instructions received, made the following investigations and journeys:—

- (1) Completion of investigations at Broken Hill, commenced in the preceding year in connection with the applicability of the flotation processes to the treatment of the Read-Rosebery zinc-lead sulphides. (8th December to 14th January.)
- (2) The investigation of the zinc-lead sulphide deposits of the Rosebery district, being the completion of the study of the Read-Rosebery zinc-lead sulphide belt commenced in the preceding year by the study of the Mt. Read district. (1st February to 10th May.)

- (3) A visit to north-eastern and eastern Tasmania in order to investigate the deposits of wolfram and molybdenite in those districts. (15th September to 7th October.)
- (4) A visit to the Middlesex and Mt. Claude districts, also with the object of examining the wolfram and molybdenite deposits. (9th December to 21st December.)

During the same period the following reports have been prepared and submitted for publication:—

- (1) Geological survey Report No. 7: "Preliminary Report on the Zinc-Lead Sulphide Deposits of the Rosebery District." (11th May, 1915.)
- (2) Geological Survey Bulletin No. 23: "The Zinc-Lead Sulphide Deposits of the Read-Rosebery District, Part II. (Rosebery Group)." (30th August.)
- (3) Geological Survey, Mineral Resources, No. 1: "Tungsten and Molybdenum, Part I., North-Eastern and Eastern Tasmania." (29th October.)
- (4) Geological Survey Mineral Resources, No. 1: "Tungsten and Molybdenum, Part I., North-Eastern and Claude Districts." (1st January, 1916.)

A report was also submitted on the results of my investigations as to the applicability of the flotation process to the treatment of the zinc-lead sulphide ores of the Read-Rosebery district.

In addition, a report was written for the Agent-General in London in connection with the resources of the State with regard to zinc ores.

During the year, also, there have been issued from the Government Printing Department the following publications, written and prepared by me:—

- (1) Geological Survey Bulletin No. 19: "The Zinc-Lead Sulphide Deposits of the Read-Rosebery District, Part I. (Mt. Read Group)."
- (2) Geological Survey Report No. 7: "Preliminary Report on the Zinc-Lead Sulphide Deposits of the Rosebery District."

I now beg to submit a brief statement of the results obtained in the above investigations.

Investigation concerning the Treatment by Flotation of the Zinc-Lead Sulphides.

Acting on instructions received, I visited Queenstown, Melbourne, and Broken Hill for the purpose of ascertaining how far the flotation process has been, and could be, applied to the ores of the Read-Rosebery mineral belt. A brief summary of the conclusions I arrived at has since been submitted, and the whole question will be more fully discussed in Part III. of the series of bulletins dealing with the resources of this belt.

Briefly, I may state that from results shown me from actual tests witnessed by me, I have arrived at the conclusion that

the Read-Rosebery zinc-lead sulphide ores can be treated successfully by differential flotation. Further than this, we are in the fortunate position that there are at least three distinct modifications of this differential flotation process from which we can choose the one most suitable for adoption. It remains, therefore, for those directing the operations on this belt of country to consider the relative merits of each process before finally erecting a plant. Personally, I have no doubt of the ultimate success of these processes, but I hesitate at present to indicate a preference for any particular one.

The Zinc-lead Sulphide Deposits of the Rosebery District.

This examination was a continuation of that briefly described in my last annual report, and amply confirmed the conclusions arrived at after the completion of the examination of the southern half of the belt, results which are destined to play an important part in the future of this important mineral belt. Those results are clearly set out in Bulletin No. 19, and further elaborated upon in Bulletin No. 23.

The ore reserves in the three mines in this district—The Tasmanian Copper, Primrose, and North Tasmanian Copper Mines—are carefully calculated in Bulletin No. 23, and result in the following figures:—

Mine.	Blocked Ore. Tons.	Probable Ore. Tons.	Total. Tons.
Tasmanian Copper	185,000	341,000	526,000
Primrose	33,500	49,000	82,500
North Tasmanian Copper	...	15,000	15,000
Grand total	218,500	405,000	623,500

There have thus been completed Parts I. and II. of the Read-Rosebery series of publications. Part III., which was to have dealt with the metallurgy of ores and a general review of the whole problem, was just started when the demand on the services of the officers of the Geological Survey was made in connection with the investigation of the tungsten and molybdenum resources of the State. Consequently the preparation of this publication was postponed, and, owing to the reasons stated below, must remain so indefinitely.

Wolfram and Molybdenite in North-eastern and Eastern Tasmania.

The details in this connection are dealt with in the "Mineral Resources, No. 1, Part I.," mentioned above, and include descriptions of the occurrences at Mt. Stronach, Lottah, St. Helens, Upper Scamander, Gipps', and Storey's Creeks. The conclusion is arrived at that there is one occurrence at Mt. Stronach worth developing for molybdenite; one occur-

rence of tin and wolfram near the old Liberator Mine deserves attention; the wolfram lodes at the Upper Scamander, Constable's Creek, and Gipps' Creek are worth active prospecting and developing; while the Storey's Creek lodes are certainly the largest wolfram lodes in Tasmania, and are destined to supply an appreciable output of wolfram in the near future in addition to the present production.

The Middlesex and Mt. Claude Districts.

The results of the investigation of these districts are contained in Mineral Resources No. 1, Part II., mentioned above. The S. & M. Mine is still producing a regular supply of wolfram, and is likely to continue doing so for at least five years. The All Nations Mine is still being worked in the old haphazard fashion as heretofore, but there is indicated a scheme in the above report which should enable the mine to be worked systematically in conjunction with a neighbouring section, and thus to become an important and regular producer of wolfram.

Evidently Gurr's Mine is likely to become a steady producer when the present development work has proceeded further.

Ware and Smiths' section also is developing very nicely, and should be actively prospected.

Conclusion.

This report is written hurriedly just prior to my departure from Tasmania on my way to take part in the gigantic European struggle, and consequently is more or less cursory, but the salient facts have been indicated.

I take this opportunity, therefore, of bidding farewell to the officers of the Department, with the hope that before long I may be fortunate enough to return and resume my duties amongst them.

I have, &c.,

LOFTUS HILLS, M.Sc.,

Assistant Government Geologist.

W. H. WALLACE, Esq.,
Secretary for Mines.

REPORT OF THE GOVERNMENT ASSAYER AND
DRAFTSMAN.

Geological Survey Laboratory,
Launceston, 20th April, 1916.

SIR,

I HAVE the honour to submit my report on the work done in the Geological Survey Laboratory for the year ending 31st December, 1915.

During the year prospectors and others have taken full advantage of the facilities offered for having samples assayed at nominal rates, and minerals tested free of charge.

The number of samples received for assay was 422, involving 844 separate determinations. Qualitative tests of 330 minerals were made for the public free of charge.

The number of tests and determinations for the period under review totalled 1174.

The samples included coal and shale analyses, ores for the determination of gold, silver, copper, lead, bismuth, iron, osmiridium, tungstic acid, phosphoric acid, tin, titanium, arsenic sulphur, cobalt, nickel, zinc, thorium, platinum, molybdenum, and barium sulphate.

A large number of enquirers have been interviewed, and the correct methods of taking mineral and coal samples have been explained to them. Advice has also been given in connection with the concentration of ores.

The information supplied has been appreciated by the mining public, and it should lead to the more systematic prospecting and development of mineral-bearing areas.

Several requests have been made for referee samples to be assayed in the laboratory, and I would respectfully suggest that Regulation 4 be amended to allow of such work being carried out at the schedule rates charged by the Government Analyst.

In addition to the above work, a considerable amount of time has been spent in preparing maps, plans, sections, and graphs for the printer; and checking the mine plans and sections of underground workings, field notes, and calculations.

The correspondence during the year consisted of 549 letters, reports, &c., in and out.

I have, &c.,

W. D. REID,
Government Assayer and Draftsman.

W. H. WALLACE, Esq.,
Secretary for Mines, Hobart.

REPORT OF THE CHIEF INSPECTOR OF MINES.

Chief Inspector of Mines' Office,
Hobart, 22nd March, 1916.

SIR,

I HAVE the honour to submit for your information my annual report on the inspection of mines for the year 1915.

The market having remained open, the output of ore has been continuous, but owing to war conditions the tariff has been greatly in excess of that existing under normal conditions, but the prices of metals have been satisfactory, and more than compensated for the additional charges. The continuance of the war has had a marked effect on the opening up of new propositions, and it is only in very exceptional circumstances that new capital is available for the acquiring or the opening up of new mines.

The amalgamation of the Hercules, Tasmanian Copper, and Primrose Mines at Rosebery will cause considerable activity in this centre. The discovery of rich ore in the lowest levels of the North Lyell and Magnet Mines has had a reassuring effect on the industry.

Accidents.

Appended are diagram and statistical tables in connection with accidents which occurred during the year.

The total number of accidents reported during the year was 71, causing six deaths and injury to 67 persons, the average per 1000 employed being 18·679 killed and injured, 1·535 killed, and 17·144 injured. In addition, one fatal accident was reported and inquired into, which occurred on an abandoned mine while removing timber work. This accident not having occurred on a mine has not been included in the return. The fatal accidents occurred as follows:—One by a fall of ground in an open-cut; two by falls of ground underground; one by a filling pass bursting; one by the level timber of the drive collapsing while the ore was being removed from under it; and one by a log falling down a pass while being repaired.

Of the 67 serious accidents, 36 were such as caused fractures, amputations, and permanent injuries; 31 caused slight injuries, which necessitated the injured person's absence from his ordinary occupation for more than 14 days.

Two of the most serious accidents—one necessitating the amputation of a portion of a foot, and one resulting in a fractured thigh—were due to the injured persons not complying with the provisions of the Act. In the first case a workman was riding on a loaded truck on a haulage-way. When descending from the moving truck his spider or clothes became entangled, causing him to fall, the truck wheels passing over his foot. In the other case a youth endeavoured to get on moving trucks, and, falling, was struck by the locomotive. Twenty-seven of the serious accidents occurred in connection with surface workings, and 40 in connection with underground workings. There were two accidents attributable to explosions, one being caused by a miner returning to the face before a charge which he had ignited had

exploded, he being under the impression that it had done so. In the other case, a miner employed struck a small portion of explosive with a pick. In each case the injuries sustained were not of a serious character.

Quarry and other Works Accidents.

Two accidents were reported in connection with works not connected with mines. Both accidents were due to explosions.

1. A man employed on railway-construction did not move to a safe distance when warned that a shot was being fired. He was struck by the debris and killed.

2. A man employed in a quarry was assisting to charge holes. One charge exploded while being tamped, causing serious injury to the assistant, who was about 10 feet from the hole being charged.

Prosecutions.

Three prosecutions were initiated for not complying with the provisions of the Act.

1. An owner was proceeded against for failing to register a mine manager, in accordance with Section 167 of the Act. A fine of 10s. and costs was imposed.

2. A manager was proceeded against for failing to report an accident, in accordance with Section 181 of the Act. A fine of £3 and costs was imposed.

3. An owner was proceeded against for failing to register a manager, in accordance with Section 167 of the Act. This case was dismissed, owing to the information not being in order.

Three other cases were to have been taken, but were abandoned, owing to the persons committing the offences having left the State before service could be made.

Prevention of Dust.

Inspectors have given a considerable amount of attention to this very important matter, and every endeavour is being made to reduce the evil to a minimum. The introduction of water-drills is proving very satisfactory. The underground water system at the Mt. Lyell Mines has been completed, and works very satisfactorily, but it has been found that the storage capacity is insufficient during very dry weather. Provision is being made for a larger supply. This system provides each drill with a jet, and has been installed at a heavy cost. This effort on the part of the management to safeguard the health of its employees is one which is commendable.

New Legislation.

A new Mines and Works Regulation Act has been passed, and will come into force on the 1st April, 1916.

Annexed are reports from Mr. M. J. Griffin, Inspector for the Northern, Southern, Eastern and North-Eastern Divisions; Mr. J. Harrison, Inspector for the Western Division; and Mr. C. H. Curtain, Inspector for the Lyell Division.

I have, &c.,

J. O. HUDSON, Chief Inspector of Mines.

W. H. WALLACE, Esq.,

Secretary for Mines, Hobart.

COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892, to 31st December, 1915.

Period.	Number of Miners employed.	Number of Accidents.	Number of Persons.		Total Killed and Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
			Killed.	Injured.			Killed.	Injured
1 July, 1892, to 30 June 1893	3295	28	4	25	29	8·8001	1·214	7·586
" 1893 " 1894	3403	25	7	20	27	7·934	2·057	5·877
" 1894 " 1895	3789	26	4	24	28	7·300	1·058	6·332
" 1895 " 1896	4160	22	7	16	23	5·529	1·682	3·847
" 1896 " 1897	4303	36	7	31	38	8·831	1·627	7·204
" 1897 " 1898	5530	36	13	33	46	8·318	2·351	5·967
" 1898 " 1899	6180	35	9	34	43	6·957	1·456	5·501
" 1899 " 1900	6834	19	7	16	23	3·365	1·024	2·341
" 1900 " 1901	7017	29	8	23	31	4·417	1·140	3·278
" 1901 " 1902	6438	38	7	35	42	6·524	1·088	5·437
" 1902 " 1903	6484	44	6	43	49	7·557	0·925	6·632
" 1903, to 31 Dec., 1903	5604	27	8	20	28	4·977	1·428	3·569
1 Jan., 1904 " 1904	6192	73	9	65	74	11·951	1·454	10·497
" 1905 " 1905	6586	34	7	30	37	5·618	1·063	4·555
" 1906 " 1906	7004	65	4	61	65	9·280	0·571	8·709
" 1907 " 1907	7516	68	6	64	70	9·314	0·798	8·515
" 1908 " 1908	6464	60	6	58	64	9·900	0·928	8·972
" 1909 " 1909	6054	54	6	49	55	9·085	0·991	8·093
" 1910 " 1910	5770	63	8	57	65	11·265	1·386	9·878
" 1911 " 1911	5247	80	4	77	81	15·437	0·762	14·675
" 1912 " 1912	5566	60	53	53	106	13·044	9·522	9·522
" 1913 " 1913	6106	64	6	60	66	10·809	0·982	9·826
" 1914 " 1914	4741	69	9	62	71	14·977	1·896	13·081
" 1915 " 1915	3908	71	6	67	73	18·679	1·535	17·144

ANALYSIS of Statistics for the Western Division.

Division.	Average Number of Men Employed.	Number of Accidents.	Number of Persons.		Total Number Killed & Injured.	Average per 1000 Killed and Injured.	Average per 1000	
			Killed.	Injured.			Killed.	Injured.
Mount Lyell	1731	49	5	46	51	29·462	2·888	26·574
Zeehan, &c.	510	1	1		1	1·960	1·960	Nil
Total	2241	50	6	46	52	23·203	2·677	20·26

TABLE showing Rate per Thousand Killed and Injured in the different Divisions for the Year 1915

Division.	Average Number of Men Employed.	Number of Accidents.	Number of Persons.		Total Number Killed & Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
			Killed.	Injured.			Killed.	Injured.
Northern and Southern	201	3	Nil	3	3	14·925	Nil	14·925
North-Eastern	496	6	Nil	6	6	12·096	Nil	12·096
Eastern	474	2	Nil	2	2	4·219	Nil	4·219
North-Western	496	10	Nil	10	10	20·100	Nil	20·161
Western	2241	50	6	46	52	23·203	2·677	20·526
	3908	71	6	67	73	18·679	1·535	17·144

TABLE showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Year 1915.

PLACE OR CAUSE OF ACCIDENT.	INSPECTION DISTRICTS.												TOTAL.	
	Northern and Southern Division.		North-Eastern Division.		Eastern Division.		North-Western Division.		Western Division.					
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Zeehan and other Districts.		Lyell District.		Killed.	Injured.
UNDERGROUND— Falls of ground	2	...	...	3	11	3	13
Shaft Accidents— Falling down passes and shafts	1	...	1	...
Total	1	...

Diagram showing the ratio of Fatal Accidents
in Mines in Tasmania.

Rate per 1000 men employed.

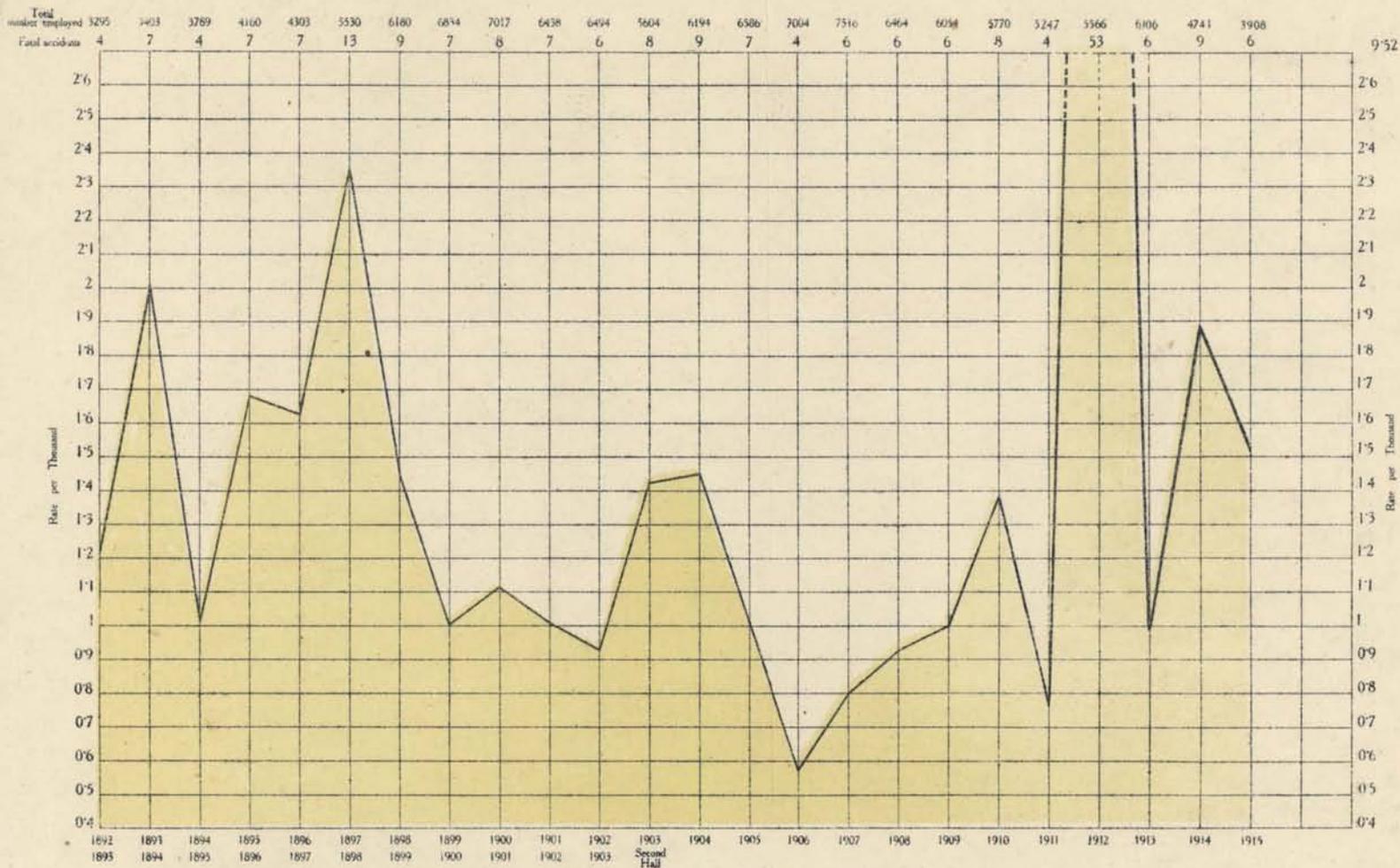


Photo Autographed by John Vial Government Printer Hobart Tasmania.

5 cm

<i>Miscellaneous (underground).</i>														
Haulage—														
Trams, &c. ....	...	1	...	...	...	1	...	...	...	...	8	...	10
Sundry accidents.....	...	...	...	...	...	1	...	6	1	...	10	1	17
Explosives .....	...	...	...	...	...	...	...	...	...	...	1	...	1
Total .....	...	1	...	...	...	2	...	6	1	...	19	2	28
<i>Total Underground</i>	1	2	...	8	1	...	4	30	5	41
ON SURFACE—														
Smelting-works.....	...	...	...	...	...	...	...	...	...	...	2	...	2
Machinery .....	...	...	...	1	...	...	...	...	...	1	2	1	3
Tramways .....	...	...	...	...	...	...	1	...	...	...	6	...	7
Falls of persons .....	...	...	...	3	...	...	...	...	...	...	2	...	5
Explosives .....	...	...	...	2	...	...	...	...	...	...	1	...	3
Miscellaneous.....	...	2	...	...	...	...	1	...	...	...	3	...	6
<i>Total Surface</i> .....	...	2	...	6	...	...	2	...	...	1	16	1	26
GROSS TOTAL, 1915	3	...	6	...	2	...	10	1	...	5	46	6	67
Total during 1914.....	2	6	...	4	...	3	1	5	3	8	3	36	9	62

REPORTS OF INSPECTORS OF MINES.

MR. INSPECTOR GRIFFIN (Newstead) reports:—

I HAVE the honour to submit my report as Inspector for the Northern, Southern, North-Eastern, and Eastern Mining Divisions for the year ending 31st December, 1915.

Accidents.—Number of accidents: 11 casualties; 11 non-fatal. Total, 11.

A fatal accident, causing the death of John Jones, was really not a mining accident within the ordinary acceptance of the term. Deceased was a bush-worker, employed temporarily by the company to assist in dismantling a wooden ore-schute erected on high trestling at an abandoned mine. The man, Carey, with whom deceased worked, and who himself was injured by the fall of the trestlework, was somewhat to blame, as he, to whom the work was entrusted, should have insisted on Jones coming out of danger sooner.

Of the other 11 casualties, three happened underground—two by coming in contact with machinery in motion at the surface; and the remainder, various mishaps in open-cut workings recorded as serious mainly by reason of the sufferer being off work for more than 14 days as a result of the injuries he received.

Ventilation of Mines.—Taken all round the ventilation of both coal and metal mines is adequate; in most of the latter it is excellent. Provision is made for destroying the dust where machine-drills are in use; also in connection with ore-mills, crushers, &c.

Health of Miners.—Pulmonary diseases are not much in evidence. Altogether it may be reasonably assumed that this is due to improved ventilation and better sanitation.

Sanitation.—Proper latrine accommodation is provided; also changing-rooms, so that miners have nothing to complain of in this way.

Equipment.—The mines are well equipped with machinery and appliances for safe working. Cages, ropes, chains, &c., receive proper attention, and are kept in good working order. Due regard is paid to the necessity of a second means of escape from all mines. This, of course, is compulsory so far as coal-mines are concerned, but is also observed in the metal mines, where, in the absence of a second shaft, there is always access to a second outlet by means of a ladderway through the stopes to the surface.

Magazines and Explosives.—All mines having on hand more than 50 lb. of explosives are provided with properly-constructed magazines, wherein the explosives can be kept in a safe condition for use when required. The nitro-compound explosives in use are generally satisfactory; some instances have occurred where explosive were received on the mine in an unsatisfactory condition, hard plugs and deterioration in strength being observed. The agent of the supplying company was promptly made aware of these defects, and in some cases another brand was tried.

Quarries' Inspection.—Two accidents have been reported, particulars of which are given in the appended tabulated form; a special investigation was made in each case. It is notable that nearly all the quarry accidents that have been reported since the inspection of works of this nature have come under the Mines Department were the result of the careless use of explosives in one form or another. Miners are careless enough in this respect, but the percentage of blasting accidents is small as compared with those occurring at quarry works. More supervision is required in connection with the latter; they are so numerous in my districts that it is impossible to give much attention to them apart from mine-inspection duties.

One complaint was made about the dust nuisance at a certain quarry, arising from the stonecrusher machinery. The owners were notified, and the defect is now remedied.

Magazines.—A few new private magazines have been added to the list during the year; the total number now licensed is 40. The latest constructed are of better design and build than those of a few years ago. One of the best is that of the Broken Hill Proprietary Company, constructed at their limestone quarry at Melrose, near Devonport; it has capacity for storage of 20,000 lb. of explosives. On the whole, the magazines both at mining and other places are kept in satisfactory order, and the high explosives stored are of good quality. In one case, however, it was found necessary to institute proceedings against the owners, who, after being refused a licence for an unsuitable building constructed by them without authority, persisted in storing a very large quantity of explosives to the danger of residents in the neighbouring town. A fairly heavy fine was imposed as a penalty for this offence.

Inflammable Oils.—Inspection of these is made when opportunity offers in visiting mining places, but less frequently in the towns apart from mining.

There are 36 registered premises holding permits to store petrol, kerosene, and carbide of calcium; also five stores licensed for petrol and kerosene in large quantities—from five to 200,000 gallons each. Stores and premises are kept in fairly good order, proper depots being provided for the storage of petrol.

It is a frequent matter of complaint by those paying licence for registered premises that non-registered persons and firms in the same town sell nearly as much as they themselves do. This is probably true; the only remedy is, however, to get the police to take up the matter, as it is impossible for the inspector to give it the required attention.

LIST of Accidents in Inspector Griffin's District for Year 1915.

Fatal, 0 ; non-fatal, 11 ; total, 11.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
24 Feb.	Tasmania Gold Mine Ltd.	Beaconsfield	Falling off a box	Dummett, Geo. Thos	Married	Broken rib	Fell from box, 6 feet, in old battery, striking iron work, breaking a rib. Was off work 26 days
15 Feb.	Briseis Tin and General Mining Co.	Derby	Falling when at work	Livingstone, John	Ditto	Wound on left leg, below knee-cap	Slipped when helping to carry stones on a hand-barrow. Stone caught him on leg, inflicting a 3-inch wound below the knee. Was off several weeks
3 May	Ditto	Ditto	Caught in conveyor belt pulley	Harris, Frederick	Single	Contusions and abrasions of right fore-arm	Was attending to conveyor belt in open-cut working ; got his arm caught in pulley of machinery ; was 19 days off work as result of accident
22 May	Pioneer Tin Mining Co (Argonaut)	St. Helen (Argonaut Mine)	Slipping off a log	Hampton, John	Ditto	Broken shoulder	Employed as caretaker on water-race ; was walking along a log, slipped, and fell, breaking his shoulder-bone
15 June	Tasmania Gold Mine Ltd.	Beaconsfield	Shifting pipes, got his hand jammed	Walker, Hy. Benjamin	Married	Top of finger and back of hand bruised	Was shifting pipes at reduction works, one slipped from his grasp, forcing his hand against wall, causing injuries described

16 June	Briseis Tin and General Mining Co.	Derby	Rake-hook slipping off a stone	Casey, Ernest	Single	Internal, not defined	Was raking down stones in O B. face; tool slipped off stone, caused him to fall backwards, the handle striking him in the stomach
27 Aug	Mt. Nicholas Colliery Co.	Mt. Nichols	Hand slipped between buffer of skips	Madden, Edward	Ditto	Fore-finger badly lacerated	Engaged as wheeler in coal pit; slipped when coupling two skips; got forefinger crushed between buffers. Was off work 33 days as result of accident
6 Aug.	Ditto	Ditto	Piece of coal getting in his eye	Manion, Hy.	Ditto	Temporary injury to eye	Was struck in the eye by fragment of coal when working underground; did not complain at time, but was subsequently off work for several weeks
13 Oct.	Arba Tin Mining Co.	Branxholm	Collapse of trestle work	Auton, James	Married	Broken arm, cuts and abrasions of head and body	Was engaged dismantling fluming on high trestle work. The whole structure collapsed. He received injuries causing him to be off work for 36 days
16 Oct.	S & M. Mine Syndicate	Moina	Handling quartz, cut finger	Leach, Rchd.	Single	Cut finger; blood poisoning	Trucking underground, got his finger cut with piece of quartz; blood poisoning supervened. Two joints of little finger had to be amputated
24 Nov.	Briseis Tin and General Mining Co	Derby	Slipping when carrying heavy weight	Webster, Alf. Thos.	Married	Left foot, instep badly crushed	Was assisting to lift a heavy valve in open-cut workings; it slipped off bar, and catching his foot, bruised it badly

LIST of Quarry Accidents in Inspector Griffin's District for the Year 1915.

Accidents, 2; 1 fatal; 1 non-fatal.

Date of Accident.	No.	Name of Quarry and Locality.	Owner of Quarry.	Cause of Accident.	Killed.	Injured.	Particulars of Accident.
1915. 4 Mar.	1	Ridgeway Reservoir Works, Hobart	Hobart Municipal Council	Explosion of powder	—	1	Thomas Gordon was, with the foreman (Michael Goram), working in the blue quarry. They were charging drill-holes; one hole which had been bulled, and allowed to stand for 15 minutes, was then washed out, and they proceeded to charge it with loose blasting powder. The depth of the hole was 6 ft. Some powder had been poured into it, when an obstruction occurred about 4 ft. down from the collar. Gordon used force with the tamping stick, and an explosion occurred. He was thrown about 10 ft. away, and sustained severe injuries to his head, also a fractured leg. The explosion probably occurred through small fragments of rock getting into the drill-hole from a joint; the powder mixing with these would be exploded by force of the tamping stick

23 Mar. 2

Ulverstone-Nietta Railway Construction Works

Tasmanian Government

Explosion of powder causing fall of rock and earth

1

—

Lionel John Wilson, employed in Regan's cutting, was killed by a fall of rock and earth. The men worked on a bench 8 ft. above formation level, and wheeled out dirt over a staging to the trucks. A misfire occurred on the previous evening in a 12-ft. hole at the top of the face, charged with 50 lbs. of powder; it was allowed to stand over-night. Next morning, William Leathley (powder-monkey), proceeded to remove the tamping, and, as he states, swab out the charge of powder, which he says, was completely removed or destroyed. He then dropped a primer, with 15 inches of fuse, into the hole, calling to the men "bull on." All the men, except deceased Wilson, left the face and took refuge. Wilson merely walked back from the face on the staging, and stood with his back to the side bank of cutting, evidently considering he was safe there, as bulled holes throw out no burden; but, unfortunately, this was no "bull," but a full charge. A great mass of rock and earth was thrown out, the stage carried away, and Wilson buried beneath it, and killed instantly. The man, Leathley, is to blame for not giving proper warning to the men. He must have known that the charge of powder (50 lbs.) was not completely destroyed, and should have made sure that all men were clear of the face before he fired the charge

MR. INSPECTOR HARRISON (Zeehan) reports:—

In submitting my annual report for the year 1915, I beg to state that the number of accidents was 11, one of which was fatal. One was through a fall of timber at the Kapi Mine, N.E. Dundas. Of the 10 serious, none of them could be considered very serious.

Safety Appliances.—Safety appliances have received attention, and alterations made where considered necessary.

Magazines and Oil Stores.—A few magazines have been closed down temporarily, but others have taken their place. Both magazines and oil stores are kept clean and in good order.

Western District.—Zeehan.—With one exception the Zeehan field is now in the hands of tributers, most of whom are doing well. The exception is the State mine. The splendid price of lead ores has caused considerable activity amongst small parties, and the output has been well maintained.

Five-mile.—The nickel mines are still idle—no market for the ore through the war. A small tribute party is working the Zeehan-Dundas blocks.

Rosebery.—With the exception of a large parcel of ore sent away from the Primrose and Tasmanian Copper Mines for experimental purposes, there is nothing doing.

Farrell.—The North Farrell Mine is still maintaining a good output of high-grade ores, the deeper levels still keeping up the values in both silver and lead.

The prospecting drive going south into the Farrell ground is in favourable country, and may strike ore at any time.

Renison Bell Field.—Renison Bell Company are crushing with a reduced staff.

Dreadnought-Boulder Company have been keeping up a decent output of tin-ore for several months past.

Central Bell is closed down for some unexplained reason, as there is a good supply of ore in sight.

Montana Tin Syndicate is working on tribute, with good returns.

Stanley River and Mt. Lindsay.—The Stanley River tributers are doing well, and would do better if they had a suitable plant on the ground. The tributers on the Lindsay are doing very well. Output about 1 ton per week; four men.

Wilson River and Savage.—The war has practically closed down these districts, as the miners can find no market for their osmiridium, and the mines are deserted for the time being.

Mt. Read.—Hercules Mine sent away a large parcel of ore for experimental purposes.

The Jupiter Mine has changed hands, and is to be worked on an extensive scale in the near future.

Waratah.—The Mt. Bischoff Mine is still going ahead. When the manager gets the North Valley workings opened up a greater output may be expected.

Bischoff Extended continues to open up well, and keeps about 100 men employed.

Magnet.—This mine is opening very well as depth is attained. Unfortunately the manager had a breakdown to his winding plant early in November, which caused mining operations to cease. A more powerful hoist has been obtained, and is now in course of erection.

Cleveland.—The Cleveland Tin Mine is the only one at work on the Whyte River. If it was properly equipped with a good mill it would prove to be a good mine.

Heazlewood.—Victoria Magnet manager still repairing drainage adit.

Jasper manager driving a main adit to get under the big blow exposed on the surface.

There is a good bit of prospecting going on in my district.

LIST of Accidents in Inspector Harrison's District for the Year 1915.

Fatal, 1; non-fatal, 10; total, 11.

Date.	Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Killed.	Injured.	Particulars.
1915. Feb. 8	Kapi	N.E.Dundas	Fall of timber	Benjamin Menzies	Married	Smothered	1	—	Menzies and his son were busy taking out the east stope of No. 2 level, when a fall of timber took place. A stone struck Menzies on the head, and shot him into the stope, where he was covered by about 6 ft. of <i>debris</i> . The son went for assistance, but Menzies was dead when the body was recovered. Just before the accident he told the son that he would get another tom to support the ground.
April 3	Magnet	Magnet	Stone rolled from face of a stope	John Slavin	ditto	Bruised foot	—	1	Stone rolled from face of stope, and bruised his foot; not serious
April 6	Bischoff Extended	Waratah	Stone fell on his leg	Thomas Butler	ditto	Bruised leg	—	1	While shovelling in stope, a piece of rock came away from face, and struck Butler on the leg; not serious

July 5	Magnet	Magnet	Fell	H. Jones	—	Hurt finger	1	While landing timber, foot slipped, and he fell, and hurt his finger
July 9	ditto	ditto	—	T. A. Frazer	—	ditto	1	Frazer's finger got poisoned by mineral water
July 13	ditto	ditto	Slipped	J. Walters	—	Bruised knee	1	Walters slipped while taking timber out of cage, and bruised his knee
Aug. 5	ditto	ditto	Finger jammed	R. Presnell	—	Hurt finger	1	Presnell was handing timber to his mate at No 1 stope, No. 10 level, when he got his finger caught between rungs of ladder and the timber
Nov. 18	Bischoff Extended	Waratah	Caustic soda	L. Dobson	Married	Injured eye	1	Dobson was doing something with caustic soda at the battery, and got a splash in the eye
Dec. 11	Magnet	Magnet	Fall of stone	Walter Brown	ditto	Hurt finger	1	While cutting out for timber a stone fell on his finger
Dec. 21	Bischoff Extended	Waratah	Fell off truck	Hector Boreham	Single	Bruised back and chest	1	Boreham was riding on truck on main haulage when he was thrown off
Dec. 24	Magnet	Magnet	Lifting timber	William Lewis	Married	Ricked back	1	While assisting to lift heavy cap-piece, ricked his back

MR. INSPECTOR CURTAIN (Queenstown) reports:—

Accidents.—Dealing with those attended by fatal and non-fatal consequences, many of the latter were of a minor degree and attributable to conditions and circumstances that came within the direction and control of the sufferers, which, apart from Johnson's and Willicombe's, may include the others. The first-mentioned, while returning for a truck of ore, came momentarily under the influence of a small fall from the roof of the stope that killed him; the other man being smothered by the bursting of a mullock-pass he was emptying.

Health of the Miners.—The medical testimony received may be summarised on the report furnished by Dr. Love, who therein states "that there has been an increase of pneumokoniosis during the past year. Some of the old cases have left the district, while new arrivals who have taken their places have brought the disease with them. Two fresh cases of old hands have come under observation who have locally contracted the complaint. In each case the men have been suffering for some time, but only recently sought medical advice. Others previously reported are still here, and their trouble more pronounced, this being the natural tendency of the disease, which need not necessarily imply that they are inhaling more dust."

Many of our best young men have enlisted and gone to the front, their places being largely filled by older and less fit men from other mining fields, amongst whom a considerable number of cases of pneumokoniosis prevails, thereby tending to increase the disease on the field, and subsequently complicate the issue as to whether it was contracted locally or brought here." He has inaugurated ambulance classes in both of the Mt. Lyell Company's mines, upon which a casualty-room and wards have also been erected.

Ventilation.—This in all our mines continues satisfactory. The temperature and quality in the deepest workings—1300 feet—being similar to those furnished in past reports.

Dust.—For combating this evil suitable water services are in evidence, and with the completion of another tank at the North Lyell Mine—whose source of supply will be perennial—it may be safely asserted that the general provisions in this direction will compare favourably with any other installation in the Commonwealth.

Changing-houses.—These in all our mines, and particularly those in the Mount and North Lyell Mines, are in the charge of caretakers, who dry the clothes and provide hot and cold water for bath and basin requirements at all reasonable working hours.

Fuse Detonators, Explosives, and Candles.—These necessities, whose local consumption exceeds that of all other parts of the State, are supplied from reputable firms, who guarantee the quality and standard of each commodity as being first-class.

Ropes and Cages.—The former are practically new, and comply with the requirements of Rule 34, Schedule I., of the "Mining Act"; also the cages, whose standard of efficiency has been maintained throughout the year.

Sanitation.—Conveniences are provided throughout the various departments that occasionally call for attention; otherwise the general service may be returned as satisfactory.

Inspections, &c.—These have been as follows—Mt. Lyell Mine, underground 56, surface 54; North Lyell, underground 50, surface 48; Lyell Blocks, surface 18, underground 10; McDowell P.A., 11; Tasman and Crown Lyell Extended, 8; Lyell Comstock, 6; Jukes Proprietary, 2; Hunn's Show, 3; Cook's Barium ditto, 2; reduction works, 30; limestone quarry, 2; silica ditto, 21; converter clay face, 12; Lake Margaret, 11; interviews and enquiries, 31; explosive magazines, 46; inflammable oil depots, 30; inquests, 5; in addition to other departmental work, including official visits to Strahan (2), Zeehan (3), and Hobart (1).

LIST of Accidents in Inspector Curtain's Lyell District for 12 months, from the 1st January to the 31st December, 1915.

Fatal, 5 ; non-fatal, 46 ; total, 51.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single	Age.	Killed.	Injured.	Remarks.
1915. Jan. 5	Mt. Lyell M. & R. Co.	Queens- town	Metal ex- plosion	James Richard Morley	Married	44	—	1	Morley, the head smelting fore- man, with another, was ad- justing the jacket-water in No. 3 furnace at the reduction works, when an explosion took place that somewhat severely burnt him. He com- pletely recovered
Jan. 21	Ditto	Gorman- ston	Ore-truck	Ralatare Abelo	Ditto	22	—	1	The injured man was freeing an ore-chute on the No. 7 level of the Mt. Lyell Mine, when a mate that was trucking past accidentally ran a truck over his instep, severely bruising it, and breaking a toe
Jan. 28	Ditto, Reduction Works	Queens- town	Aerial buc- ket left travelling rail	Thomas Dick- ens	Widower	43	—	1	Dickens was a receiver and unloader at No. 2 plant, and while pursuing his work the bucket he had charge of left the rail, and falling, severely crushed the great toe of his right foot

Jan. 30	Ditto	Ditto	Balance tank prematurely rose	Charles Coxall	Single	19	—	1	Coxall, with others, was emptying a balance or tension tank on one of the mid-stations on the aerial haulage line; when relieved of weight it rose, and the man extending his hand to balance and save himself, had it crushed against the framework of the standard, that necessitated the amputation of the first joint of his left thumb
Feb. 9	Mt. Lyell M. & R. Co.	Gormanston	Fall of small piece of spoil	Patrick Sullivan	Married	33	1	—	Sullivan, who had charge of a gang in the open-cut workings of the Mt. Lyell Mine, was picked up in a dying condition, having evidently been struck by a falling stone washed down the face by rainfall
Mar. 16	Ditto	Ditto	Piece of ore rolled down rill	William Sutcliffe	Single	22	—	1	While shovelling ore into a pass in No. 2 stope over the No. 6 level of the Mt. Lyell Mine, a piece rolled on the man's arm, cutting it severely, and incapacitating him for a month
Apr. 20	Ditto	Ditto	Piece of mullock rolled down rill	James Cahill	Ditto	48	—	1	While building an ore pass in 25 stope over the 850-ft. level in the North Lyell Mine, a piece of mullock rolled off the rill, and jamming the man's right leg against the pass timbers, broke it

LIST of Accidents in Inspector Curtain's District—continued.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Age.	Killed.	Injured.	Remarks.
1915. May 1	Mt. Lyell M. & R. Co.	Queens- town	Fell under moving trucks	John Longley	Married	41	—	1	While proceeding to his work at North Lyell Mine, quite contrary to orders, Longley attempted to mount a moving train in the vicinity of the reduction works, and falling under it had his right leg broken above the ankle, that still incapacitates him
May 3	Ditto	Gorman- ston	Fell into a pass	Thomas Maguire	Ditto.	48	—	1	Maguire, a level-boss, was pulling a truck backwards along the 700-ft. level of the North Lyell Mine when he backed into a mullock chute that had been carelessly left open by two truckers, and sustained a sprained ankle and general shaking. The men (2) answerable for this accident, were discharged
May 11	Ditto	Ditto	Fall of rock	John Charles O'Rourke	Single	54	—	1	O'Rourke, to avoid a fall in the South Lyell workings of the Mt. Lyell Mine, rushed off the first floor stopes, and after landing on the level was struck by some falling matter that broke his left leg below the knee. He made a good recovery and resumed work

May 12	Ditto	Ditto	Mounting a new cage at North Lyell Mine	Robert Smythe	Ditto	—	—	1	The injury was only an ordinary one, and the man's incapacity did not necessarily exceed 14 days
May 19	Ditto	Ditto	Struck by timber	David McDowell	Married	50	—	1	McDowell was freeing timbers in a pass over No. 1 stope in No. 7 level of the Mt. Lyell Mine, when they unexpectedly came away, and striking him severely, knocked him down the rill; that, in addition to body injuries, produced fracture of the brain, from which he recovered and resumed duty
May 30	Ditto	Queens-town	Fell from converters' tapping-floor	Frank Padreo Tipper	Single	24	—	1	Tipper's work did not take or require his presence on the floor he fell from. He was evidently sky-larking, and sustained a slight fracture, and dislocation of the right wrist
July 2	Ditto	Gormanston	Rush of mullock	William Williams	Ditto	—	—	1	While working with others mullocking 41 stope over the 1100-ft. level in the North Lyell Mine, a rush of mullock took place that, jamming Williams against the timbers, incapacitated him for three weeks
July 7	Ditto	Queens-town	Fell from a ladder	Andrew Domanic Sweeney	Married	45	—	1	Sweeney was a building contractor engaged in the erection of the "flotation plank" at the reduction works, when a plank he was assisting to hoist slipped through its sling, and the rope, being relieved of weight, permitted him to fall backwards and break his right thigh. He is still incapacitated

LIST of Accidents in Inspector Curtain's District—continued.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Age.	Killed.	Injured.	Remarks.
1915. July 8	Mt. Lyell M. & R. Co.	Gormanston	Explosion	Henry Willaton	Married	34	—	1	Willaton, a mullock-boss, with another, had "top" charged a "bull" in a "hung-up" pass on the 1000-ft. level of the North Lyell Mine, and, believing it had exploded, returned too soon, and received the effect of the charge on the sole of his right foot that incapacitated him for a month
July 13	Ditto	Ditto	Loose piece rolled off rill	Richard Mott	Single	29	—	1	Mott had a contract for filling ore on the ground floor of 40-stope on the 1000-ft. level of the North Lyell Mine, and failing to watch the conditions on the top floor directly overhead, permitted the same to become unstable, with the result a piece rolled down, and somewhat severely bruised his right hip and thigh. He was idle a month

July 21	Ditto	Ditto	Fell down a pass	James Wilson	Ditto	41	—	1	Wilson and another were engaged building an ore-pass in section 2 of 20 stope over the 850-ft. level of the North Lyell Mine, when a quantity of side mullock came away, and breaking the platform he was standing on, permitted him to fall to the bottom, a distance of 50 ft. He sustained a severe shaking. He was idle a month
July 30	Ditto	Ditto	Fall of rock	Lester George Gerald Johnson	Ditto	17	1	—	Johnson, a trucker, engaged in 44 stope at the 925-ft. level of the North Lyell Mine, met his death while following his usual employment, by a fall that took place from the roof, killing him instantaneously
Aug. 2	Ditto	Ditto	Fall of log	Robert Bell	Married	28	—	1	Bell, with others, was engaged timbering 41 stope on the 1100-ft. level at the North Lyell Mine, when the staging he assisted to erect gave way, and the piece they were lifting coming down with them, fell on his left instep, and somewhat severely bruising it, incapacitated him for a month

LIST of Accidents in Inspector Curtain's District—continued.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Age.	Killed.	Injured.	Remarks.
1915. Aug. 18	Mt. Lyell M. & R. Co.	Gormanston	Ore through chute	Arthur Burges	Single	32		1	Burges, while poking a chute, was struck, and had his right forearm broken by a piece of ore coming through from No. 1 stope over the No. 6 level of the Mt. Lyell Mine. He is again working
Sept. 1	Ditto	Ditto	Evidently struck and fell down pass	Joseph Varty	Married	58	1	—	Varty, an old and experienced miner, was, with another, sent to inspect a disused pass for the purpose of laddering it, over the 700-ft. level of the North Lyell Mine. Before entering it he made primary preparations for his safety, but from some unexplained reason a covering log fell off the top followed by a quantity of mullock, that evidently knocked him off a stage-board, and he fell 50 feet. He was dead when assistance reached him

Sept. 2	Ditto	Ditto	Jammed between truck and ore-chute	Arthur Jarvis	Single	22	—	1	While passing an ore-chute with a loaded truck, his finger got jammed and badly bruised on the No. 6 level of the Mt. Lyell Mine
Sept. 4	Ditto	Ditto	Jammed between truck and side timbers	John Wilson	Ditto	23	—	1	Whilst trucking on the 700-ft. level of the North Lyell Mine, a stone got on the rail, and "skewing" the truck against a side-leg, broke the thumb finger of Wilson's right hand
Sept. 9	Ditto	Ditto	Fall of spoil	Thomas Dunkley	Widower	50	—	1	This accident was caused by a flat piece of broken schist slipping about 14 ft. down the batter of the open-cut workings of the North Lyell Mine, and before Dunkley could get away, it caught him against the truck rails, and broke his left leg below the knee. He made a good recovery, and has returned to work
Sept. 10	Ditto	Ditto	Fall of iron bar	Charles Francis Stanton	Married	26	—	1	Stanton, while working in bench "4B" of the Mt. Lyell Mine's open cut, was struck on the head by a leg of a tripod, that slipped from a rope it was being lowered by from the top benches. He sustained a fractured skull, in addition to losing his right eye. He has resumed light work provided by the company

LIST of Accidents in Inspector Curtain's District—continued.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Age.	Killed.	Injured.	Remarks.
1915. Sept. 16	Mt. Lyell M. & R. Co.	Gormanston	Jammed between side timbers	William H. Tuttle	Married	—	—	1	Tuttle, whilst trucking mullock into section 1 of 34 stope from the 850-ft. level of the North Lyell Mine, had the top of a finger taken off by having it jammed, by an overhanging part of the load he was trundling, against a side-leg
Sept. 16	Ditto	Ditto	Cut	Michael Kearns	Ditto	50	—	1	Kearns, while assisting to timber part of 41 stope on the 1100-ft. level of the North Lyell Mine, cut the fore-finger of his right hand, and complications following, necessitated its top joint's amputation. He is at work
Sept. 17	Ditto	Ditto	Explosion	Sylvester Plummer Harris	Ditto	24	—	1	Harris, while clearing (picking) up the floor of the North Lyell open-cut workings, struck a stray piece of dynamite, that exploding, caused painful injuries to his face and eyes. He was idle for a month

Sept. 29	Ditto	Queens- town	Run over	George A. Wakeham	Ditto	39	—	1	Wakeham, to help himself out of bin M. at the reduction works, caught hold of a tram rail, when an empty truck passed over the fingers of his left hand, severely crushing them, which has since incapacitated him.
Oct. 1	Ditto	Gorman- ston	Fall of spoil	John Ring	Single	48	—	1	Ring, while working in the open-cut of the North Lyell Mine, lost the third finger of his right hand, through a piece of spoil rolling down the bat- ter, and catching him. He was a fortnight idle.
Oct. 6	Ditto	Ditto	Fall of rock	Gordon Ro- bottom	Ditto	23	—	1	Robottom was turning on the air from a pass in 25 stope, over the 850 ft. of the North Lyell Mine, when a piece of schist slipped off an adjacent "bulkhead," and catching him, broke his left leg below the knee. He is still incapa- citated.
Oct. 6	Ditto	Ditto	Caught by truck	Maurice Clif- ford Butler	Married	34	—	1	Butler, when proceeding to work at the North Lyell Mine, jumped on a travelling loaded truck at the "compressers," or mine side, and rode to the top of the "haulage," where in attempting to get off, he fell, and his right foot getting caught between the rail and truck wheel, was so severely crushed that necessitated its amputation from the instep.

LIST of Accidents in Inspector Curtain's District—continued.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Age.	Killed.	Injured.	Remarks.
1915. Oct. 22	Mt. Lyell M. & R. Co.	Gormanston	An axe	Lawrence Heerey	Single	19	—	1	Heerey, on the electrical staff, while cutting wood to warm his billy at the North Lyell Mine, let the axe he was using slip, and severed the top joint of the third toe of his left foot. He returned to work in a fortnight
Oct. 23	Ditto	Ditto	Jammed	Henry Mansfield	Ditto	19	—	1	Mansfield, while passing a chute at the 1000-ft. level of the North Lyell Mine, got his finger jammed between its lip and the truck he was shoving
Nov. 2	Ditto	Ditto	Fall of rock	John Weaving	Married	42	—	1	The official report supplied by the company's local superintendent is "that Weaving and his mate, Weston, were barring down in No. 3 stope over No. 6-level at the Mt. Lyell Mine, when a quantity of stone fell on him, inflicting serious injuries — perinæum ruptured and lacerated forearm—that still incapacitates him

Nov. 2	Ditto	Ditto	Ditto	William Weston	Single	42	1	—	Weston was with Weaving. They were the only persons in the stope, and an enquiry opened on the 3rd of Nov. has had to be adjourned, pending the convalescence of the latter, until the 19th of Jan., 1916.
Nov. 6	Ditto	Ditto	Bursting of mullock-pass	William Willicombe	11 to	29	1	—	Willicombe and a mate (Rhodes) were, late in the evening, deputed to "run" a mullock-pass over the "500ft." or "No. 4" level of the North Lyell Mine, when, during the work, a small portion of its side gave way, and permitting the mullock, composed chiefly of a slushy nature, to rapidly enter the drive or recess where the men were working, overpowered both, and covering Willicombe, while attempting to escape, smothered him.
Nov. 6	Ditto	Ditto	Ditto	William Rhodes	Ditto	23	—	1	In conjunction with the foregoing accident, Rhodes was covered to the waist, and in addition to bruised legs and feet, wore his fingers bare while keeping his body clear of the intruding mullock. He was incarcerated for 12 hours in darkness before relief, in the shape of the morning shift, came to his assistance, who were also the first to realize and report the occurrence. He was idle a month before again resuming work in the mine.

LIST of Accidents in Inspector Curtain's District—continued.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Age.	Killed.	Injured.	Remarks.
1915. Nov. 18	Mt. Lyell M. & R. Co.	Gorman- ston	Struck by piece of ore	Francis Mason	Single	19	—	1	The official particulars are that, while filling a truck in the North Lyell Mine, a piece of ore came over the chute door, and striking Mason's finger, would probably incapacitate him for a fortnight
Nov. 19	Ditto	Ditto	Ore rolled down rill	William Fer- guson	Married	31	—	1	Ferguson, while shovelling ore into a chute at the North Lyell Mine, was struck on the foot by a piece rolling or turning over on him; that would probably incapacitate him for a fortnight
Nov. 22	Ditto	Ditto	Ditto	Henry Herman Kroeger	Single	29	—	1	Kroeger, while "popping" in section IV. of 19 stope, over the 850-ft. level in the North Lyell Mine, had his right leg somewhat badly bruised by being jammed by a slab-shaped piece of schist, that rolled from the rill on to him

Nov. 24	Ditto	Queens- town	Locomotive	John Sydney Morris	Ditto	16	—	1	Contrary to prominently posted notices, the lad, while on his way to work at the Mount Lyell Mine, attempted to get on a moving train of empty trucks that were returning to the weighbridge from the smelters, and missing his footing, fell, and was caught by the back-plate of the engine, that fractured his right thigh. He is still idle.
Nov. 26	Ditto	Gorman- ston	Concussion	Robert S. Glover	Ditto	48	—	1	Glover's hand, while shoving a trolley-load of set timbers, slipped, and permitting him to bump into the butt end of a leg, started or fractured two of his ribs, that would likely incapacitate him for 14 days.
Dec. 2	Ditto	Ditto	Crowbar	Thomas Bailey	Married	30	—	1	This accident was occasioned by a piece of ore rolling on the point of the bar, at the Mt. Lyell Mine, and its opposite end "tilting," caught Bailey on the jaw, and fractured it.
Dec. 8	Ditto	Ditto	Spanner	William Pyke	Ditto	51	—	1	Pyke was tightening a machine spanner, at the North Lyell Mine, by striking it with another, when by some inadvertence he struck and bruised his fingers; that would probably incapacitate him for 14 days.

LIST of Accidents in Inspector Curtain's District—continued.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Age.	Killed.	Injured.	Remarks.
1915. Dec. 9	Mt. Lyell M. & R. Co.	Gormanston	Timber	Patrick Hefferman	Married	54	--	1	Hefferman, a contractor, while assisting to lift main timbers in section IV. of 19-stope at the North Lyell Mine, strained his back; that incapacitated him for a fortnight
Dec. 14	Ditto	Ditto	Jammed	Henry Jolly	Single	28	—	1	Jolly, while trucking ore at the North Lyell Mine, had a finger caught between the lip of a chute he was passing and a piece of ore that slipped on the truck. Probably, he would be idle for a fortnight
Dec. 13	Ditto	Ditto	Ditto	John Charles O'Rourke	Ditto	55	—	1	O'Rourke, <i>nee</i> Burns, while attempting to couple a moving loaded truck at the open-cut working of the North Lyell Mine, had his left hand and fingers bruised between the buffer plates. Probable incapacity, 14 days
Dec. 18	Ditto	Ditto	Rock-drill	Samuel J. Newton	Married	31	—	1	Newton, while assisting to lift a rock-drill in 40 stope at the North Lyell Mine, started two ribs, that incapacitated him for a fortnight

REPORT OF THE CHIEF INSPECTOR OF
EXPLOSIVES.

Chief Inspector of Mines Office,
Hobart, Tasmania, March 22, 1916.

SIR,

I HAVE the honour to submit my annual report in connection with the working of "The Explosives Act, 1900," and "The Inflammable Oils Act, 1910," for the year ending 31st December, 1915.

The following table shows the explosives imported into Tasmania during the year 1915:—

Name.	Quantity.
	Lb.
Gelignite	324,350
Blasting powder	52,500
Blasting gelatine	77,300
Ammon ligdyn	58,150
Monobel powder	10,500
Capite	94,500
Sporting powder	13,590
Total	630,890

Detonators, 320,000.

The quality of the explosives imported was generally satisfactory, and very few complaints were made which, on investigation, were found to be due not to the quality of explosives. The Government magazines have been supervised in a very satisfactory manner. The supervision in private magazines, I regret to state, has not been of a satisfactory character. Inspectors are devoting special attention to the construction of magazines, cleanliness, care in handling and storage, and insisting on the provisions of the Act being strictly adhered to.

Licences were issued for 76 magazines, being six less than the previous year. Twenty permits to convey explosives were issued, being an increase of 10 over the year 1914.

Seventy permits were issued to sell explosives, being 22 more than the number issued during 1914. Twenty-three permits to import were issued, being 15 more than were issued during 1914.

Inflammable Oils.

Ninety-six premises were registered for the storage of inflammable oils, being an increase of 12 compared with 1914.

Four stores have been licensed to store more than 5000 gallons, being an increase of one. Seven stores have been licensed

to store quantities not exceeding 5000 gallons, being an increase of two.

The total revenue derived from explosives and inflammable oils was £473 4s. 8½d., being an increase of £86 13s. 6d. over the year 1914.

		<i>Revenue.</i>		
		£	s.	d.
0191	Magazine rents	349	14	8½
	Licences to store inflammable oils	15	0	0
	Fees for private magazines	76	0	0
	Permits to import explosives	6	0	0
	Permits to sell explosives... ..	1	15	0
	Permits to convey explosives... ..	0	15	0
	Registration to store inflammable oils	24	0	0
	Total	£473	4	8½

Accidents.

The following accidents have been reported, and inquired into by the inspectors:

Date.	Locality.	Explosive.	Name of Person.	Injured.	Cause.
14.3.15	Ridgeway	Blasting Powder	Thomas Gordon	1	While assisting to charge a hole a premature explosion took place, due to the fractured condition of the rock.
18.7.15	Gormanston	Nitro	Henry Willaton	1	Returned to shot, which he had ignited, before it had exploded.
17.9.15	ditto	ditto	Sylvester Harris	1	Striking piece of explosive with pick which was lying in the broken rock.

Prosecutions.

There was one prosecution during the year. A magazine was built, and owing to its position a licence was refused. The owner, after having received warning, stored a large quantity of explosives. A fine of £5 and costs was imposed.

I have, &c.,

J. O. HUDSON,
Chief Inspector of Explosives.

W. H. WALLACE, Esq., Secretary for Mines, Hobart.