

AR 1916

TASMANIA



REPORT

OF THE

SECRETARY FOR MINES

FOR

YEAR ENDING DECEMBER 31

1916

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



Tasmania:

JOHN VAIL, GOVERNMENT PRINTER, HOBART

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Report of the Secretary for Mines.

Mines Department,
Hobart, 18th May, 1917.

SIR,

I HAVE the honour to submit my report upon the Mines Department and the Mining Industry for the year ending the 31st December, 1916.

GENERAL REMARKS.

The aggregate value of minerals raised during the year was £1,521,050, being an increase of £295,470 on the value of the output for the previous year.

The value of the gold won was £11,712 more than the previous year, and there was an increase of £62,107 in the value of the output of the silver-lead ore raised.

The output of tin ore showed an increase of 255·402 tons, and a corresponding increase in value of £58,526.

The quantity of wolfram ore raised was 8·92 tons less, but owing to the increase in the value of the ore the price obtained was £5795 more 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 Zeehan district the Aid to Mining Fund was applied entirely to the assisted tribute system. The work

done, mostly in hard ground, comprised 1516 feet of driving and 60 feet of sinking.

The amount received for ore sold by assisted tributers at Zeehan was £10,667 4s. 1d., which was distributed as follows:—

	£	s.	d.
Royalty paid to lessees	747	13	5
Royalty paid to State	843	14	1
Paid to tributers	9075	16	7

The result of this expenditure has been encouraging, and a considerable number of tributers are now working remuneratively.

Several of the tribute parties have now depleted their ore-shoots to water-level. In some instances small pumping-plants have been installed. The difficulty of coping with the water is a phase of the tributing question which will shortly require consideration.

PROSPECTING.

State-assisted parties of prospectors have been out in the neighbourhood of the Arthur River, Frenchman's Cap, Craycroft Range, Mt. Donaldson, Long Back Range, Meredith Range, and north of Mt. Heemskirk.

Gold, silver, lead, tin, copper, wolfram, and osmiridium were found by the prospectors; but only in two cases (and those in the Pieman River district), do the discoveries promise to be of commercial importance.

Prospecting work was undertaken on the State Coal Reserve at Preolenna. Five outcrops of good steam coal were found, and their position fixed by survey. The thickness of the seams varies from 15 to 28 inches.

In the Pieman River area the store at Corinna has enabled prospectors to obtain supplies at town prices, while the motor-boat insures the delivery of goods in the navigable portion of the river.

The full cost of the prospecting, including the upkeep of the Corinna store and a proportionate charge for assays and supervision, totalled £581.

The cheap assaying of ores was continued at the Laboratory of the Zeehan School of Mines, and samples to the number of 628 were treated for tributers and prospectors.

BORING OPERATIONS.

Acting upon the suggestion of the Government Geologist, after an extended visit to the Gladstone Tinfield, it was decided to expend a sum of £600, under the provisions of "The Aid to Mining Act, 1912," to prove the extent of the tin drifts being worked by water supplied from the Government water-race, and to put down a set of bores on Crown land recommended by the Government Geologist. The Mt. Cameron Water-race Board was asked to undertake the work, under the supervision of its manager (Mr. Henry Harvey), and the services of a competent foreman (Mr. Harry Roach) were secured to take charge of the hand-boring plant.

Up to the end of the year 167 bores had been put down on leased land, but up to that time the results obtained were not very encouraging. The work is still proceeding.

The following is a list of the bores put down on the various claims:—

For whom.	Description of Holding.	No. of Bores.
Chas. W. King	Prospecting Area	13
Chas. W. King	Ditto	17
James Galloway ...	Ditto	5
James Galloway ...	Private property (Bell's Flat)	6
D. R. Mallinson.....	Mineral Lease, No. 7298-M	5
F. C. Richards and A. C. Murray...	Mineral Leases, Nos. 7363-M, 7142-M, and 7141-M	36
G. S. and A. H. Mallinson	Mineral Leases, Nos. 7394-M and 6620-M, 44ft., and Pros- pecting Area, 41ft.	85
		167

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

Expenditure during the year ended 31st December, 1916:—

Purpose.	Amount provided.	Expenditure previous to 1916.	Expenditure during 1916.	Total Expendi- ture to 31st December, 1916.
Item	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1. For carrying out all or any of the purposes of "The Aid to Mining Act, 1912"	7000 0 0	4487 7 6	2413 8 6	6900 16 0
	<i>Cr.</i> 1990 18 7			
2. For carrying out all or any of the purposes of "The Mining Development Act, 1912"	6000 0 0	4138 19 1	1649 16 8	5788 15 9
	<i>Cr.</i> 72 17 1			
3. Assisting prospectors to further develop their discoveries, &c.	1000 0 0	250 15 0	15 2 6	265 17 6
4. For defraying the expenses incurred or to be incurred in connection with the State Argent Flat Mine, Zeehan	10,000 0 0	11,208 19 10	...	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	9450 15 8	...	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	21,273 2 2	...	21,273 2 2
	<i>Cr.</i> 20,480 13 7			
	£66,000 0 0			
	<i>Cr.</i> 31,204 4 9	50,809 19 3	4078 7 8	54,888 6 11

"THE PUBLIC WORKS APPROPRIATION ACT, 1913."

Expenditure during the year ended 31st December, 1916 :—

Purpose.	Amount provided.	Expenditure previous to 1916.	Expenditure during 1916.	Total Expenditure to 31st December, 1916.
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"	600 0 0	5416 10 7	288 10 3	5705 0 10
12. Assisting prospectors to further develop their discoveries, &c.	2000 0 0	1573 8 2	...	1573 8 2
	£8000 0 0	6989 18 9	288 10 3	7278 9 0

"THE MINING APPROPRIATION ACT, 1915."

Purpose.	Amount provided.	Expenditure previous to 1916.	Expenditure during 1916.	Total Expenditure to 31st December, 1916.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
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	8000 0 0	6607 12 2	8978 13 7	15,586 5 9
	Cr. 7741 15 5			

"THE AID TO MINING ACT, 1912."

Expenditure to 31st December, 1916 :—

Purpose.	Amount provided.	Expenditure previous to 1916.	Expenditure during 1916.	Total Expenditure to 31st December, 1916.
(A)— <i>Mining, Prospecting, and Development Work, &c., undertaken by or under the direction of the Department of Mines.</i>	£ s. d.	£ s. d.	£ s. d.	£ s. d.
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 Zeehan	4000 0 0	4021 10 3	...	4021 10 3
<i>Cr.</i>	21 10 3			
3. In the equipment, salaries, wages, &c., of four Government prospecting parties	1500 0 0	1558 3 1	...	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	1150 0 0	188 14 10	1338 14 10

9

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).....	...	809 18 0	...	809 18 0
* (2).....	...	2522 9 4	...	2522 9 4
* (3).....	...	1201 19 6	...	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
<i>(B)—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 0 0	136 13 8	55 6 0	191 19 8
	£20,000 0 0	18,655 2 0	244 0 10	18,899 2 10
	Cr. £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.

STATE ARGENT FLAT MINE.

During the year the following work was carried out at the mine:—

Surface.—Outside the usual repairs and renovations incidental to mining operations a Babcock and Wilcox boiler of 70 horsepower was installed. This is practically a new boiler, as it has been retubed throughout.

Underground.—The main shaft was sunk 67 feet, making a total depth of 317 feet 6 inches. Two flats were cut on the east and west side of the shaft at the 300 feet mark, and crosscuts were driven east and west. The eastern crosscut has been extended 548 feet, and the western crosscut 490 feet. At a point 120 feet from the shaft the eastern crosscut penetrated the No. 1 lode, which proved very rich in silver assays, yielding between 250 and 300 oz. of silver to the ton. This lode was driven on 51 feet south, and was then cut off by a slide. The same crosscut intersected the No. 3 lode, which is 508 feet from the shaft. This lode is 4 feet wide, but very poor; very little work has been done on it to prove its value.

The west crosscut at the 362 feet intersected Flaherty's lode, and is now being extended to cut Fulton's lode further west.

Flaherty's lode has been driven on for 166 feet. The lode is large, being between 3 feet and 5 feet wide, chiefly composed of iron pyrites, quartz, and carbonate of iron. A connection was made with No. 1 Argent Mine, and the latter has been drained down to the 150 feet level. This enabled several tributaries to go to work in the mine, and a considerable quantity of ore has been won from it.

A fair amount of prospecting work has been carried out at the No. 1 level, but the results so far have not been up to expectations.

The following is a summary of the work underground:—

	ft.	in.
Sinking (main shaft)...	67	6
Rises ...	219	6
Drives ...	1207	6
Crosscutting ...	1338	6
Stoping ...	1458	6

	£	s.	d.
Expenditure previous to 1916	21,119	15	5
Expenditure during 1916	13,971	19	5
<hr/>			
Total expenditure to 31st December, 1916 ...	£35,091	14	10
<hr/>			
Value of ore sold by the State previous to 1916...	3516	6	6
Ditto during 1916 (229,6920 tons)	3905	7	9
<hr/>			
Total value of ore sold by the State to 31/12/16	£7421	14	3
<hr/>			
Royalty paid by tributers previous to 1916	241	11	8
Ditto during 1916	936	1	10
<hr/>			
Total royalty paid by tributers to 31st December, 1916	£1177	13	6

The value of ore sold (573,5992 tons) by the tributers during the year was £6348 13s. 8d., of which sum £5225 3s. 10d. was paid to the tributers, £2 17s. 6d. to the Mt. Zeehan (Tas.) Silver Lead Mines Ltd., and £1120 12s. 4d. retained by the State for royalty and materials supplied.

The cash payments for materials supplied to the tributers during the year amounted to £92 12s. 8d.

APPENDICES.

Appended will be found the following reports:—

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

Report of the Government Geologist.

Report of the Assistant Government Geologist.

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 Bullion	Totals.
	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Beaconsfield .	...	...	4671	...	...	4671
Mathinna ...	1663·48	122·97	298	...	...	2084·45
Mt. Victoria .	} 322·35	56·15	...	...	...	378·50
Warrentinna						
Mt. Cameron.	} ...	21·725	...	...	...	21·725
Lefroy						
Lisle.....	} ...	235·112	...	...	...	235·112
Golconda. ...						
Lilydale	} ...	22·551	...	8803	...	8835·551
West Coast...						
Totals ...	1995·83	458·508	4969	8803	...	16,226·338

Value, £67,072, equal to 15,790·096 oz. fine gold.

Beaconsfield.—The Tasmania Gold Mine Limited obtained 4671 oz. of fine gold, valued at £19,804, from accumulated tailings, slimes, and concentrates treated at the battery reduction works.

Lefroy.—A little gold is being obtained by a few prospectors and fossickers from alluvial patches.

Back Creek Deep Leads Gold Mining Company.—Shaft-sinking, to a total depth of 260 feet, was completed in January, a plat cut at 245 feet, leaving 15 feet for well. The main reef drive was commenced in February, and the driving of this, 535 feet east to a point immediately beneath No. 2 diamond-drill bore, occupied the remaining 10 months. In December, the drive, having been extended the required distance, a rise was put up, and the wash tapped at 28 feet above the floor-level of the main drive. Where cut into the wash (which is of a coarse, sub-angular nature-quartz and sandstone tightly cemented together) it shows a thickness of about 7 feet, beneath a top layer of white pug or sediment. Some fair gold

prospects were obtained, but not enough to pay. Driving soon disclosed the fact that the deepest ground had not been reached, as the bedrock dipped, but not suddenly, to the south-east. This is evidently the northern rim-rock of the branch, called the "Red Lead." Much remains to be done before it can be definitely ascertained whether the alluvial deposits are payable or not. Work, so far, has only touched the wash on the side of one branch; the gutter of this must be reached at least, and possibly it may be necessary to go further and locate the junction of the Red and White leads, before it is known whether the mine is likely to prove payable or not.

The company has been subsidised by the Government to the extent of an additional £1000 during the year.

Golconda.—Mr. R. H. Pearson, representing Victorian capital, took up several gold leases between Lone Star and Panama Creeks, including the old Enterprise Mine. A good deal of prospecting has been done on the reefs known as Exhibition, Edwards', and Wilson's, with encouraging results.

A 10-head battery, to be operated by a suction gas-engine, is nearly completed, on a site near the old Enterprise camp. This is considered central for the mines already referred to, although the distance from the mill for most of them is considerable. Mining work at present is confined to sinking a main working shaft on the west side of the Enterprise lode, the object being to prove the value of this at about 40 feet below the old adit workings. The granite is hard at the surface, where the shaft has been sunk, but the decomposed rock is likely to be met with at a depth. Such was the case when an attempt was made to sink near the same place some years ago, but owing to an influx of water in the soft ground the mine failed.

Golden Crest Gold Mining Company.—This company has taken up and is developing the lode on the old Queensland Company's mine, a parallel lode to the Enterprise lode. A tunnel is being driven to cut the lode beneath

the south end of the old adit workings. The lode, as seen in the old level, is 6 feet in width, striking north and south, and dipping west at about 45 degrees from the horizontal; a fairly clean body of stone, said to yield over an ounce per ton. The tunnel will have to be driven a little over 500 feet to cut the lode.

Lisle.—The Lisle Hydraulic Gold Mine treated 3143 cubic yards of ground for a yield of 42.3 oz. of gold. The average value per cubic foot was about 1s. 1d.

Warrentinna.—The New Golden Mara Mine Company ceased operations altogether at the commencement of the year, as only a few dwts. of gold to the ton were obtained. It is difficult to reconcile this result with the splendid results said to have been obtained from large parcels sent to Cockle Creek and to Mt. Lyell for treatment when the company was floated.

Mathinna.—The New Jubilee Gold Mining Company.—This mine is still going, although operations during the year have not been very successful. The flat lode known as Lyons, and worked between Levels Nos. 1 and 2, is limited in length, terminating at each end against vertical walls. Some fairly good values were obtained, but the very erratic nature of the lode (pinching and making from a few inches to a **couple of feet** in width) made it very difficult to work. Some prospecting is being done north-erly from the eastern crosscut at No. 1 level, to endeavour to pick up the continuation of a payable vein known at the surface. From 731 tons of stone crushed, a yield of 358 oz. of gold was obtained.

New Golden Gate Syndicate.—Good results continue to be obtained north of the shaft at the old levels (Nos. 2 to 5). Some short sections of lode missed by the old company are now being worked, with good payable results. One of these, between levels 4 and 5, a big make of clean stone, 14 feet in width, and averaging over 1 oz. to the ton, was discovered within 6 inches of the shaft wall, while some repairs were being done. It did not persist for

a great length horizontally, being just one of the rough lens-shaped sections, which comprise the "Gate" lode system. The water has risen to No. 5 level. The owners contemplate working down to the 1000-foot level. The total quantity of gold won was 1523 oz., valued at £5166.

Upper Scamander.—The Trafalgar Consolidated Gold Mining Company.—Crushing was commenced in January, and a large quantity of stone won from the shaft and levels during developing operations was treated. The result, unfortunately, was not satisfactory. Before finally closing down, however, the directors secured the services of Mr. J. T. Stubs, of Lefroy, under whose supervision stone was taken from the different faces and stopes and crushed, but with no better result. The mine was then finally closed down.

Gladstone.—The Gladstone Gold, Tin, and Wolfram Developing Company.—This mine is situated on the west side of the Gladstone township in a large tract of slate reefing country traversed by the principal gold quartz lines, such as the "Royal Tasman," "North Tasman," "Royal Mint," "Royal Standard," and by Fleming's Tin and Wolfram lode. The gold lodes strike west of north and south of east; the wolfram lode crosses the series obliquely, a few degrees north of east.

For a full description of the gold quartz reefs of this locality, reference should be made to the Geological Survey Bulletin No. 25, published during the year, wherein Mr. Twelvetrees gives the result of his examination of the Gladstone Mineral District. The present gold discovery made by O'Halloran and Fleming is about 100 feet to the south-east of the old Royal Tasman stopes, or a new make of stone roughly parallel to the Royal Tasman reef. A shaft (No. 1) was sunk on this to a depth of 23 feet. The stone at the bottom is 1 foot wide at the north-west end and 2 feet at the south-east end. Samples sent from 10 feet down the shaft were assayed by the Government Assayer, Launceston, and yielded 8 oz. 1 dwt. 9 gr. of gold, and 1 oz. 4 dwt. 7 gr. of silver per ton. Another

sample taken by M. J. Griffin, Inspector of Mines, returned 10 oz. 9 dwt. 2 gr. gold, 4 oz. 9 dwt. of silver, per ton. This was taken 13 feet down the shaft. A sample taken by Mr. Twelvetrees from the bottom of the shaft yielded 15 dwt. 17 gr. gold and 2 dwt. of silver per ton. The reef was trenched on for about 60 feet north-west of the shaft. The company was formed to prove the length and downward persistence of the shoot, and Government aid, to the extent of £200, on the £ for £ principle, was obtained.

A tunnel driven at a level 30 feet below the collar of the shaft cut the reef at a distance of 49 feet from the entrance, and a second small vein at 73 feet. From where it was cut in the tunnel, the lode has been driven on north 66 feet; the correct bearing is 334 degrees, or N. 26 degrees W. Going south from the tunnel, a short drive connects with the bottom of No. 1 shaft. A few feet further in the same direction the stone is cut off by a wall striking roughly east and west, and dipping to the north at 50 degrees from the horizontal. Possibly there may be a displacement of the lode at this point. Further prospecting is required to show if it continues in a southerly direction. Where driven on the lode varies in width from 12 to 30 inches.

Prospecting done so far on this lode is too near the surface. Shaft-sinking will be necessary to prove its value at a depth. A little south of the Royal Mint reef, on the opposite side of the creek, Moore, O'Halloran, and party have cut a gold vein 10 to 12 inches wide, in a short cross-cut at the bottom of a 43-foot shaft; assay tests are said to be satisfactory.

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

	Ozs.
Watt and Johnson	2·50
Briseis Tin and General Mining Company ...	47·85
	—
	50·35
	—

West Coast.—At the McDonald Prospecting Association Mine the work of connecting No. 1 and No. 2 adits was completed. The erection of a water-wheel and five-head battery is nearing completion, and it is hoped that the association will be rewarded for its efforts to prove the mine to be a payable one.

The registered gold-buyer for the district purchased 13 oz. 1 dwt. 3 gr. of alluvial gold during the year, valued at £44 13s. 1d.

SILVER-LEAD MINING.

The quantity of silver-lead ore produced was 11,229·410 tons, valued at £153,796, being an increase in quantity of 846·46 tons, and a decrease in value of £62,107.

The principal producers were:—

	Tons.	Value. £
<i>Zeehan Mines.</i>		
Zeehan-Montana... ..	291	4452
Zeehan-Western	72·5	1693
Zeehan-Queen	247	3653
Mt. Zeehan (Tas.)	808·5	16,827
Oonah	251·36	1043
Nike	592	9466
State Mine	812·08	10,569
Renison Bell	21·07	419
Zeehan-Dundas	13	471
<i>Mt. Farrell Mines.</i>		
North Mt. Farrell	3322	42,651
<i>Magnet Mines.</i>		
Magnet	4477	60,660
<i>Mt. Claude Mines.</i>		
Round Hill... ..	158·75	2984

Zeehan District.—With the exception of the State Argent Flat Mine (a statement of the work done on which will be found in the earlier part of this report) nearly all the mines in this district are being worked by tribute parties with very good results. Other parties are being encouraged to take up tributes on Crown land, and are receiving Government assistance, to be repaid by royalties out of the profits of the mines.

Mt. Reid District.—The Hercules Gold and Silver Mining Company.—No ore has been sold during the year, but about 550 tons have been broken from various parts of the mine to provide down-loading for the inclined haulage tramway, but this has been added to the dump at Williamsford, but as no samples were taken it is impossible to give the approximate value.

The average number of men employed was about four monthly for the first six months, afterwards an average of 20 monthly, not including the drill crew of six, which can be counted in from September last.

The chief works carried on underground have been those in connection with the maintenance and upkeep of the mine. A large quantity of retimbering has been completed, chiefly in the No. 4 level.

The ore taken out has been obtained for the most part for the tramway from the " E " lode quarry, No. 3 level, and the south stopes, No. 4 level. The condition of the mine workings can be considered as satisfactory, and all drives, crosscuts, stopes, &c., are in fair working order.

A large amount of exploratory and prospective development work has been accomplished by diamond-drilling, with a result that the main ore-body has been proved to live down, and the probable or reserves turned into actual ones; in all, 1817½ feet of drilling was completed. A small amount of other development work was carried on in both Nos. 4 and 6 levels.

To enable drilling operations to be carried on, a compressor plant was installed at Williamsford, with a 3-inch air main up the mountain side to the mine, a distance of 8000 feet. The plant was in continuous operation, and worked most successfully. The haulage tramway was in operation intermittently, and gave no trouble whatever.

Lyell District.—After lying idle for some time operations were resumed at the Tasman and Crown Lyell Extended Mine towards the end of the year, and are now directed towards remodelling the concentrating plant by

the addition of Wilfley tables and a flotation unit, of which the patentee (Mr. Nicholson) is in charge. Sixteen men were employed.

Mt. Farrell District.—The North Mt. Farrell Mining Company.—During the year 21,380 tons of crude ore have been mined and dressed, resulting in the production of 3322.42 tons of marketable ore, containing 170,091 oz. of silver and 1756.5 tons of lead, of a net cash value at the mine of £42,789. The total production to date amounts to 36,779 tons of ore, containing 2,128,258 oz. of silver and 21,400 tons of lead, of a net cash value of £373,900.

For the greater part of the term productive operations were carried out to the fullest capacity of the mine and its equipment, and the output shows a very substantial increase on those of former years. Unfortunately, towards the end of the year a set-back occurred, through the inability to procure fuel and other supplies, on account of the coalminers' strike in November. In consequence of this, work generally was disorganised to a serious extent, and the output adversely affected. This state of affairs still existed when the year closed.

The bulk of the output was drawn from the Nos. 2 and 3 shaft levels. Further developmental work at the latter level has continued to open up fairly extensive bodies of good-grade milling ore on the No. 3, or main, lode. Although these have been drawn upon largely during the year, there are still substantial ore reserves at this level available for extraction. The shaft has been sunk a further distance of 70 feet, making a total depth of 270 feet; and at this depth opening out, for the No. 4 level is now in progress.

A little further prospecting work has been done on the northern, or Mackintosh, leases, with encouraging results. At present work here is in abeyance, pending the construction of a tramway over which to convey the ore to the mill at the North Farrell Mine for treatment. Owing

to inability to procure labour for the purpose, it has not been possible to make a start with this work.

The Mt. Farrell Mining Company's low-level drive from the south workings, No. 4 adit level, North Farrell Mine, has been extended 230 feet, making the total distance driven to date 973 feet, without meeting payable ore. It is intended now to crosscut from the end of this drive eastwards, with the object of testing at a depth the quartz lode, in which a body of high-grade galena was met with in the surface workings some years ago.

The average number of men employed at the North Mt. Farrell Mine during the year was 114. Outside this and the Mt. Farrell Mine nothing has been done on the other mines in the district.

North-Western Mining Division.—The Magnet Silver Mining Company treated 15,832 tons of ore, and obtained 4477 tons of metal, containing 1168 tons of lead and 269,807 oz. of silver, valued at £70,601, 137 men being employed.

The principal mining operations were confined to driving north and south on the footwall and south on the hanging-wall at No. 12 level. The footwall drives opened up good stoping ground, the ore improving in lead contents. The hanging-wall drive did not open up quite so well as expected, but as the shoot of ore is dipping south and makes in bunches, an improvement may be expected any time.

It is pleasing to be able to record that this is the deepest level (viz., 800 feet) at which payable galena ore has been mined in Tasmania, and the prospects for the next level are very encouraging. Stopping was carried out with payable results at Nos. 10 and 9.

South Adit.—This adit is being driven south of the present workings, with a view to testing the ground hitherto unprospected, and although it is in 600 feet nothing of value has been met with, but as the company have another 500 feet to drive to cut the main lode small

veins or shoots of ore may be met with at any time. This will also serve as a second exit.

A new dam, with a capacity of 50,000,000 gallons, is being constructed for installing a hydro-electric plant for power purposes.

The mine generally looks better than it has done for some time past, the great drawback being want of good miners, and whilst deploring this fact, the company is pleased to be able to state that 33 men have enlisted and gone direct from the mine, while 13 others who were working at the mine at the outbreak of war are now fighting for the Empire.

Northern and Southern Division.—The Round Hill Silver and Lead Mining Company produced 158.75 tons of ore, valued at £2984.

The first half of the year was devoted mainly to mine development work, completing alterations, and the retimbering of the main No. 1 haulage level, driving level-ends, rising, repairing, &c.

Underground.—No. 1 Tunnel.—This tunnel was extended 33 feet early in the year, making a total from the approach of 433 feet. Owing to the hardness of the ground, which made progress too slow, this work was discontinued until such time as the rock-drilling plant was working. Work was resumed with the rock-drills in this tunnel about the middle of December, and the company anticipate good progress being made in the future.

No. 2 Tunnel.—This tunnel was extended a further distance of 35 feet, making a total distance from the approach of 446 feet. Work was also suspended here for the same reasons as No. 1 tunnel, viz., slow progress and hardness of ground. On the starting of the rock-drilling plant driving was again commenced, and no doubt better progress will be made.

Stopes.—A little exploratory work was carried out in the stopes above No. 2 tunnel, from which a considerable quantity of second-class ore was won and sent to the mill

for treatment. These stopes were also filled with waste rock from the surface preparatory to the working of the rock-drills in the stopes.

Surface.—Rock-drilling Plant.—After waiting several months the suction gas-engine, to drive the air-compressor, was delivered on the mine and placed in position as soon as possible. The plant, which was completed in November, consists of the following:—An Ingersoll compound air-compressor, capable of supplying air to 10 rock-drills of the hammer type, the compressor being driven from a “National” suctional gas engine of 120 horsepower (English make), gas being produced from wood direct from 135 horsepower wood-producer plant. The whole of the plant is working smoothly and economically, and giving great satisfaction. At present four rock-drills are at work, two being Denver Dreadnought water-drills of the hammer type, and two telescope hammer drills, “Waugh” patent. These drills, so far, are very satisfactory.

Concentrating Mill.—After the completion of the foundations for the new mill, the old mill was pulled down and scrapped, and the new mill erected, consisting briefly as follows:—A hopper capable of holding 80 tons, from which an automatic feed-table feeds two crackers of the Blake and Dodge type, two sets of rolls (coarse and fine), nine jigs and 4 Wilfley tables (two of the Wilfley type and two of the Card type), all of which are driven by two pelton wheels, which develop each about 30 horsepower. There being water for power for quite eight months in the year, it was decided to drive the mill the remaining four months in the summer time with a 90 horsepower suction gas plant and 100 horsepower gas producer, which is of a similar type to the wood-producer and engine driving the air-compressor. This will enable the mill to run continually.

Number of men employed.—The average number of men employed was 30.

General.—The late delivery of the gas engine, together with the difficulties of getting the machinery delivered, &c., has retarded operations generally, especially underground, where work could not be successfully carried on with hand-labour. However, the plant is now running smoothly, and doing good work.

Flood.—On December 3 the company suffered great loss through the disastrous flood of that date. A cloud evidently burst beyond the mine, which brought down huge logs and a considerable quantity of old trees and *debris* with great velocity, carrying away the main bridge, upon which was placed the suction gas engine and producer plant which was to drive the mill engines. The cloud bursting at this particular time was very unfortunate, as the foundations for the mill were completed, and the company had actually started loading portion of the engine on trucks to send to the mill. The heavy portions of the engine have been recovered, but the company anticipates much trouble in finding the small parts, for which they are now sluicing the creek. However, they hope to be able to procure the missing parts in Australia, and although some time will elapse before they can go on with the erection of the engine, the work will be pushed on with all possible speed as soon as the missing parts are supplied.

The Round Hill Extended Silver and Lead Mine.—This mine is situated to the south of and adjoining the Round Hill Mine. Its lode, striking east and west, is roughly parallel to that of the big mine. A main tunnel (No. 1) is being driven south from the Mt. Claude Creek to cut the lode at a depth of about 100 feet below the surface. A second tunnel higher up the hill from No. 1 was driven a short distance. Ten men were employed in the early part of the year, but later the number was reduced to two, who were employed in the lower tunnel.

The Round Mountain Silver and Lead Mine.—A tunnel is being driven to cut the supposed continuation of

the Round Hill Company's main lode. The country is very hard, and progress is slow.

Beulah.—A Devonport syndicate had a tunnel driven 380 feet or so to cut a lode, which, where tested at the surface, is said to have given good prospects of silver and a little gold. The result obtained by tunnel driving is not known. Latterly the syndicate has expended some money in testing a barytes formation on their lease.

COPPER MINING.

The quantity of blister copper and copper ore produced was 6401·840 tons, valued at £886,454, being an increase in value of £176,920 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 ...	188,442
Ditto, North Lyell Mine	107,503
Concentrates	3371
Purchased ore (from other mines)	98
Total	299,414

Blister copper produced, 6305 tons, containing:—Copper, 6237 tons; silver, 328,700 oz.; gold, 8803 oz. Approximate value, £940,994.

Average number of men employed:—

Mining Department—	
At the company's Mt. Lyell Mine	394
At the North Lyell Mine	385
At the Lyell Comstock	23
At the Crotty Leases	16
	— 818
Reduction Works Department (including Lake Margaret)	
	671
Railway Department—	
Mt. Lyell Railway	123
North Lyell Railway	39
	— 162
	— 1651

The dividends paid during the year amounted to £269,494—3s. 3d. per share.

Dividends paid from the inception of the company to the 31st December, 1916, £3,265,986.

Copper produced from the inception of the company to the 31st December, 1916, 147,300 tons, fine.

Silver produced from the inception of the company to the 31st December, 1916, 11,763,044 oz., fine.

Gold produced from the inception of the company to the 31st December, 1916, 347,475 oz., fine.

The customary operations appertaining to ore-winning and developmental work were in continuous progress during the period at the Mt. Lyell Mine (including the South Lyell), the North Lyell (including Crown and adjacent Comstock workings), and the Lyell Comstock Mine.

At the Reduction Works the smelting and converting operations were on usual lines.

The aggregate output of ore from the mines shows a decrease compared with the previous 12 months, the shortage being due wholly to an inadequate labour supply.

At the Mt. Lyell Mine pyritic ore was won from the main stopes, the South Lyell stopes, and the open-cut. The South Lyell is now well opened up, and provides an important additional tonnage to the daily demands of the smelters. Connections to the Mt. Lyell main shaft have been made at all the working levels, and, in addition, a supplementary mullocking system for the South Lyell stopes is now in course of completion.

The No. 9 level in the south Lyell is now opened for a total length of 350 feet, and the sill stopes are being worked.

In the Mt. Lyell Mine some stoping on the main body has also been carried out at this level.

No. 2 stope, extending from No. 6 level, has been carried up to the floor of the open cut.

At No. 6 level two diamond-drill bores were put out from the South Lyell drive to locate the continuation of the ore-body to the northward.

At the surface the excavation of overburden for the supply of filling material was confined principally to the northern end of benches Nos. 4, 4A, 4B, and 5. This work also liberates a proportional amount of the pyrites occurring in the open-cut area.

The first unit of the new electrically-driven Bellis Morcom compressor plant was put into operation at the Mt. Lyell Mine towards the end of the year, and the installation of the two remaining units is now well in hand. The completion of this plant will eliminate the use of steam power (other than for railway purposes) from the operations carried out at the reduction works and mines.

Ore-winning operations at the North Lyell Mine proceeded with the usual regularity, but the tonnage extracted was less, owing to labour shortage, than that won in 1915. Exploration and development work were proceeded with when circumstances permitted, and the diamond-drill for exploration was made use of to a considerable extent. The Crown shaft is now completed and equipped to the 850-foot level, and provides a second main shaft for haulage of men and materials.

The Crown drive, from No. 40 stope at the 1000-foot level, is nearing the location of the shaft. The extension of the shaft to this level from the 850-foot level will be made during the coming year.

The new mullocking system, which was called for by the extension of the North Lyell ore-bodies into the old Comstock lease at the 1000-foot and 1100-foot levels has been completed, and gives important facilities for operating the northern lower levels of the mine. All the levels of the North Lyell Mine from the 700-foot to the 1200-foot were worked in a systematic manner for supply of ore for the smelters.

The extensions of No. 40 stope at the 1000-foot and No. 41 stope at the 1100-foot to the northward have been followed with satisfactory results. The diamond-drill at both these levels show that the occurrences are not yet completely opened up. The ore-body located by diamond-drill, No. 288, at the 1100-foot level was driven to, and stoping has been commenced on unusually good-grade ore. At the 1200-foot, further development work was carried out on the lode, and good grade ore continues to be won in No. 46 stope.

The precipitation plant was in operation on normal lines. In order to guard against a lengthy stoppage of winding operations in the event of breakdown to the North Lyell electrical winder it was decided to have on hand spare motors for the hoist and converter sets, and to instal additional lightning arresters.

At the Lyell Comstock Mine operations were confined to the winning of ore from the open-cut, the opening-up of further ore-benches, and the removal of overburden.

The smelters were in continuous operation throughout the period, but owing to a decreased output from the mines the blister copper produced was a little less than in the last year.

A Dwight-Lloyd sintering machine was installed for handling the fine concentrates from the flotation plant, and the usual accumulation of flue dust, and its operation has been very satisfactory. The capacity of the machine is being increased in order to handle a larger quantity of the mixture per shift.

The installation of the new converter plant is well in hand, and it is hoped to have it in operation about June next.

The flotation plant was put into work early in the year, and has given every satisfaction. In addition to treating all the crude ore from the Comstock Mine, this plant has also dealt with various parcels of low-grade ore from the

North Lyell workings. It has only been operated one shift per day because of the shortage of ore, due to lack of labour at the Comstock Mine.

Further experimental data regarding the production of sulphur from the crude pyrites have been obtained, and the application of electrical energy for this purpose is being carefully investigated.

The Lake Margaret hydro-electric power installation has continued to give complete satisfaction, and its maintenance requires but little attention.

Orders have been placed for an additional turbo-generator and a third high-pressure steel pipeline. It is proposed to further enlarge the scheme by impounding the maximum amount of water available at Lake Margaret.

The flux quarries yielded a plentiful supply of limestone, and are kept in good order for economical operation.

The Mt. Lyell and North Lyell railway-lines were worked as usual, and all rolling-stock and the permanent-way have been maintained in good order and condition. Work is still in progress on the earthen embankment, at the 10-mile point of the North Lyell line, for the replacement of the high-trestle bridge.

At the Lyell Blocks Copper Mine high-grade bornite has been struck at the 1300-foot level. A sample of 45 tons was despatched to the Mt. Lyell Company's smelters, and gave the following returns:—Copper, 6·4 per cent.; silver, 26 oz.; and gold, 0·05 oz. A rise put up on this make of metal 95 feet carried ore practically the whole way. A drive is being put out from the 1200-foot level to connect with the rise and provide ventilation for the further exploitation of this promising development. An average of 30 men has been employed.

Mts. Jukes and Darwin.—At the Proprietary section the present lessee, assisted by a small co-operative syndicate, has completed a long intermediate adit, 400 feet, and connected with Bean's winze, passing through appre-

cialable makes of ore, which can, with improved ventilation, be more serviceably mined and followed.

Dundas District.—The Colebrook Prospecting Association.—No. 2 adit was extended 70 feet; total, 650 feet. At 555 feet a start was made to open out north on one foot of sulphide ore, which was passed through. After driving north 32 feet the ore cut out. The company then opened on it to the south, and drove 12 feet and obtained 4 feet 6 inches of good sulphide ore. A winze was also sunk from No. 1 level to a depth of 50 feet, and a drive south from the bottom of same shows 6 feet of good sulphide ore. Two men only are employed.

Balfour Field.—The Copper Reward Mine.—The output from this mine was 75 tons 15 cwt. 3 qr. 9 lb. of copper ore, valued at £1726 6s. 2d.; and 2 tons 13 cwt. 1 qr. 20 lb. of tin ore, valued at £309 8s. 2d.; eight men being employed.

The main engine shaft has been enlarged from the 120-foot level to the surface. This portion was formerly only 6 feet by 4 feet. The present size is 12 feet by 4 feet, with two winding and a pump compartments from the surface down to the bottom, 300 feet.

TIN MINING.

The quantity of tin ore raised was 2854·636 tons, valued at £350,852; an average value of £122 18s. 1·45d. per ton.

The statistics for the year are:—

	Ore won, tons.	Value. £	Miners Employed Euro. Chi
Northern and Southern Division	67·25	7017	35 —
North-Eastern Division	1385·09	187,023	413 45
Eastern Division	399·487	46,040	220 11
North-Western Division	746·394	86,957	372 —
Western Division	256·415	23,815	100 —
Total	2854·636	£350,852	1140 56

North-Eastern Division.—The output of tin ore was 1385·09 tons, obtained as follows:—

	Tons.	Tons.
<i>Pioneer and Gladstone Districts.</i>		
Pioneer Tin Mine	416·50	
Aberroe	9·26	
South Mt. Cameron	36·26	
Clifton Creek	30·75	
Yee Gee	5·45	
Other claims	220·60	
		718·82
<i>Ringarooma District</i>		21·15
<i>Derby District.</i>		
Briseis Tin Mines	347·65	
Other claims	47·56	
		395·21
<i>Branzholm District.</i>		
Arba Tin Mine	142·15	
New Ruby Flat	16·38	
Other claims	26·23	
		184·76
<i>Moorina District.</i>		
Weld Tin Mine	29·1	
Other claims	28·8	
		57·9
<i>Straits Islands</i>		7·25
Total		1385·09

Eastern Division.—The output of tin ore was 399·487 tons, obtained as follows:—

	Tons.	Tons.
<i>Weldborough, Lottah, and Blue Tier Mines.</i>		
Anchor Mine	22·8	
Other claims	84·20	
		107
<i>St. Helens Mines</i>		81·55
<i>Avoca Mines.</i>		
Royal George	130·662	
Storey's Creek	48·125	
Others	32·150	
		210·937
Total		399·487

North-Western Division.—The output of tin ore was 746,394 tons, obtained as follows:—

	Tons.
Mt. Bischoff	476
Mt. Bischoff Extended	207,32
Weir's Bischoff Surprise	16,70
Mt. Cleveland	9,50
Ringtail	1,80
Waratah Alluvial	5,494
Mt. Balfour	26,93
New Wombat	2,35
Others	30
Total	746,394

Western Division.—The output of tin ore was 256,415 tons, obtained as follows:—

	Tons.
Dreadnought-Boulder Mine	97,80
Renison Bell Mine	20,365
Montana Tin Syndicate	9,32
Heemskirk, Stanley River, and others	128,93
Total	256,415

Northern and Southern Divisions.—Shepherd and Murphy Syndicate.—Work at this mine has been going on regularly during the year. The water-supply being good there is little or no occasion to use the steam auxiliary plant for operating the air-compressor machinery; the mill and concentrating plant are operated by water only.

Development work, in the way of extending the two shaft levels on No. 6 lode east and west, and cross-cutting south at the bottom level, has been going on. The object of this crosscutting is to reach lodes Nos. 5 and 4, the latter being the lode most extensively worked at the upper or adit levels, now nearly worked out. A rise has been put up from No. 3 main adit to the surface. This will connect with a hopper near the surface brace of the main shaft, and will serve to convey the ore to the adit level

for transit to the mill, when the time comes for hoisting to the surface.

A new air-compressor—compound steam, two-stage vertical high-speed, 380 revolutions per minute—has been installed. This machine is fitted with automatic speed and air-compression control; guaranteed output, equal to 400 cubic feet of free air per minute, at 100 lb. steam pressure. The mine is now well and fully equipped with machinery for ore-winning and for milling and reduction on a fairly large scale.

North-Eastern Mining Division.—The Arba Tin Mine.—Sluicing was carried on continually at both the main and easement workings, with an abundant water-supply, the total yardage treated for the term being as follows.—

	Cubic Yards.	Working Cost.	Plack Tin. Tons. Cwt.	Contents per Cub. Yard.
Main workings... ..	223,627	7·38d.	102 12	1·02
Easement	134,325	7·86d.	74 17	1·24

The average number of men employed was as follows:—

Sluicing	58
Tribute	3
Firewood (cutting)	20
Total	81

The estimated value of the output was £22,491 5s.

Briseis Tin and General Mining Company Limited.—The company employed an average of 97 men at the Briseis Mine, and obtained 445 tons of black tin oxide, equivalent to 317·65 tons of metallic tin, valued at £57,709; and 47·85 oz. of gold, valued at £184; and 21·05 tons of black tin oxide, equivalent to 15·03 tons of metallic tin from the Mutual Hill Mine, valued at £2719; 10 men being employed.

There has been no change of interest in the method of working during the past year. A portion of the tailings

has had to be raised 200 feet to dump. The series turbine and gravel pumps described last year have worked satisfactorily. The water-supply during the year has been very good, and a considerable quantity of overburden has been removed. The drifts treated have been of very fair value. The deepest part of the gutter from which wash has been raised is over 100 feet below flood-level in the Ringarooma River.

The prospects for the present year are satisfactory.

The Pioneer Tin Mining Company Limited.—An ample water-supply enabled both electric sluicing plants to work continuously and treat 955,200 cubic yards of drift from the Pioneer Mine, which yielded 469 tons 10 cwt. of stream tin, assaying 73·6 per cent., of an approximate gross value of £62,000; 60 men being employed.

At the company's Argonaut Mine, St. Helen's 111,300 cubic yards of drift were sluiced, for a yield of 44 tons 13 cwt. of stream tin, of an approximate gross value of £5887; 19 men being employed.

North Mt. Cameron.—A 20-acre section, owned by F Whitaker and A. Daw, on the Fly-by-Night Creek, near Gladstone, has been worked profitably in a narrow belt of greisenised rock in the granite at its junction with the slate. This belt is intersected by a network of tin-bearing veins, some mere threads, and others several feet wide. Some of the joints in the altered granite are filled with softened mica, and these are often extremely rich in tin. Rich nests of tin oxide are often met with. From one small hole in a soft formation, about 3 feet square, 2½ cwt. of tin ore were obtained; from another, 1 cwt.—in a very short time.

This tin-bearing belt of stock work goes right through the property. The ground, for the most part, is such as can be worked with the pick, or with little explosives. The present owners are crushing stone by means of a primitive spring-pole stamp. The tin-ore produced assays

74 per cent. No deep work has been done on the property. Capital is required to test the formation at a depth.

O'Halloran and Fleming's Tin and Wolfram Lode.—Nothing further has been done on this. The vein, although rich in tin and wolfram, is too small to work profitably.

Alluvial tin mining is going on much the same in the country surrounding Gladstone. The claims depending on storm-water for their supply have done fairly well, owing to a good average rainfall. Those supplied from the Mt. Cameron Government race have been enabled to work full time during the whole year. The output of tin is good as compared with pre-war years, when nearly twice the number of men were employed.

South Mt. Cameron.—The Clifton Creek Tin Mine.—The remnant of payable ground left is now being worked by a tribute party. Ore won, 46 tons 13 cwt.; 12 men employed.

South Argus (Pioneer).—Yee Gee and party have not done much. The plant was idle at the close of the year.

You Hen and Hee Sung, in the same locality, have been working portions of the river-bed by means of a gravel-pump, operated by steam.

Moorina.—Thomson's Weld River Mine has worked, with fairly good results, during the year. The old mine south of the river still yields payable tin. At the Echo, north of the township, the deep ground overburden is being removed by gravitation sluicing from a considerable area. Some tin is won by this operation, but the main bulk of the wash is underfoot.

Guiding Star Tin Mining Company.—The alluvial part of this mine is now being worked on tribute by Mr. Innes. Nothing has been done in the way of lode-mining, and the battery is idle.

T.P.C. Company (Cascade).—No output of tin, except from the alluvial, which is worked by a couple of men on

tribute. Some race cutting has been done, and a pit for erection of a water-wheel, excavated, preparatory to resuming lode-mining. Brice and Harridge have been working the old Red Hill Mine; 6 men being employed.

Eastern Mining Division.—Weldborough.—Davey and Harridge have a gravel pump plant at work on the old Weldbrook ground, east of the township, and are doing fairly well.

The Fancy Creek Mine is being worked on the eastern, or township, fall of the hill, with fairly good results.

The Frome River Syndicate commenced operations during the latter part of the year. A 10-head battery, operated by water-power, was erected. The tin lode to be worked, and on which a commencement has been made, contains copper as well as tin.

Nichols-Symons tribute party are working a tin lode formation on the Pioneer Company's section at Cream Creek. A five-head battery, operated by water-power, is in use for reducing the rather hard tin rock obtained from an open-cut 50 feet in width. The method of working is rather primitive. Good payable results, however, are obtained; six men being employed.

Yaxley and Ellings have been working their lode mine, also, on Cream Creek, but further west than the Nichols-Symon Mine. Their five-head battery is operated by a kerosene oil engine. A lot of tin has been won from the formation. The method of mining is partly by tunnelling and partly by open-cut. The battery was idle during the latter part of the year. Some sluicing on the softer portion of the formation is being done.

Lottah.—Gough, Sculthorpe, and party erected a five-head battery on their 5-acre section, situate on the old Australian Company's abandoned mine. They are working by means of tunnelling in what was known as the "Don Face," during the company's time. The rock is very hard, but fairly rich in tin, yielding an average of 1 per cent. tin oxide.

Anchor Tin Mine.—The mine has been worked by a tribute party of about 25 men. Twenty-nine tons of tin oxide were obtained, assaying, on the average, 72 per cent., valued at £3368.

Avoca District.—The Royal George Tin Mining Company.—This company has worked more regularly, and with fuller time, than in the preceding year. The work at the main adit level has been chiefly confined to the winze lode. This is a body of tin rock, running parallel to the main lode, on the west side, and only divided from it by about 8 to 12 feet of the ordinary granite. It was only when the main lode opened out to apparently double its ordinary width at 600 feet that this new make of ore was discovered. It is now opened up for a length of about 300 feet.

A main underlay shaft was commenced at a point immediately above the entrance to the main haulage tunnel at the north end of the lode. This is dipping at an angle of 50 degrees from the horizontal. It will be carried down to a vertical depth of 50 feet below the main No. 1 level, before opening on the lode. One of the difficulties this company has had to face in the past is the fuel question; good engine wood is not obtainable. It is now contemplating the installation of a suction gas plant to operate the whole of the machinery. A saving of fully 60 per cent. in cost of fuel will result from such a scheme.

Great Republic Tin Mining Company (Ben Lomond).—This company has installed a 10-head battery and complete tin-dressing plant, which is operated by an up-to-date suction gas engine. Work was resumed at Levels 3 and 4 in the main shaft during the last quarter of the year. Some very rich tin rock is also obtained from open-cut on the surface. The company has secured a lease of the old Mt. Rex Company's dam, which has a very large storage capacity, with the object of installing a plant lower down on Buffalo Creek and obtaining sufficient electric

energy to operate all the machinery at the mine and reduction works.

Western Mining Division.—The Renison Bell Prospecting and Mining Company.—The total amount of tin ore was 4989 tons net dry weight, from which was obtained 24 tons of tin oxide, containing 16.35 tons of metallic tin, the total net value being £2636. The average number of men employed at this work was 27.

In addition to tin-mining on the company's property, two men have been engaged tributing on a shoot of galena. Of this material, 21 tons net have been raised, containing—silver, 1377 oz.; lead, 11.8 tons; net value received, £362.

Operations at the mine have been on a very restricted scale. In July the men employed abruptly ceased work, while negotiations were in progress for the consideration of their demands for an increase in the rate of wages paid. As the company was not in a position to grant the increase operations were discontinued.

The portion of the mine worked was the northerly extension of what is known as the Blow workings, and the developments generally were of a most satisfactory character, and had the company been in a better financial position to enable a larger scheme of developmental work to be undertaken, the operations would have been highly remunerative.

The company has now arranged to treat at its mill the ore from the Federal Mine, and is only awaiting the construction of a light tramway to facilitate the conveyance of ore from that property to the company's mill. There is an estimated tonnage of ore opened up at the Federal Mine to keep the Renison Bell plant supplied for several years.

North-Western Mining Division.—The Mt. Bischoff Tin Mining Company, Registered.—The output of ore from the mine totalled 101,265 tons, of which 99,060 tons were delivered at the mills for crushing and concentration, and

2235 tons, being very low grade, were rejected. Four hundred and seventy-six tons of concentrates were obtained, of an approximate value of £56,000. The average number of men employed was 240.

Surface Workings on the Southern Slopes.—The difficulties in connection with the winning of crush dirt from the various benches and faces on these slopes have been increasing yearly. Many of the older faces are now almost depleted, and their exhaustion as profitable ore-producers is rapidly approaching.

Brown Face.—Mining operations in this face were confined to the lower bench. In the developmental work some small deposits of a fairly high-grade ore were opened up, characteristic of the ore-bodies of an earlier date, but unfortunately they have not proved to be extensive. Several shafts were sunk in the gossan in the floor of the face, but the results were disappointing, as the grade of the ore was extremely low. Other shafts revealed a considerable depth of pyritic material, but of too low a grade to admit of profitable working.

Don Section.—Developmental operations carried on, particularly in the western portion of this section, indicated that a run of wash might be expected below the mudstone. This was recently cut, and it is anticipated that a quantity of fair-grade material will be obtained.

Northern Slopes.—A retrospect of the year is, on the whole, satisfactory. Developmental as well as productive work has been systematically carried out, and many things done with a view of improving the economical winning of the ore.

North Valley Flats.—The crushing material is hauled, by means of an electrical hoist, up the incline tramway that connects the deposits with No. 2 loading station of aerial ropeway. The flats, which are located at the base of the northern slopes, were extensively prospected during the previous year, and consist of large deposits of assorted

waterworn quartz-porphry and a variety of metamorphic slates, associated with tin oxide varying in size from granules to large nuggets.

Milling and Concentrating Plants.—In order to deal more effectively and economically with the harder ores now being mined, the erection of an additional 20-head mill of heavy stamps was recommenced. This unit is modelled somewhat on the same lines as the previous one, but some very material alterations in the scheme of secondary grinding, and in the manner of saving the slimes, are to be introduced, which will add greatly to its efficiency. The present plant was run uninterruptedly, and the grade of concentrates produced was maintained at the usual standard.

Hydro-electric power plant.—The whole of this machinery has run satisfactorily.

Aerial ropeways.—These plants continue to transport the crush dirt economically and efficiently.

The output since the inception of the company in 1873 to 31st December last was 74,762 tons of tin oxide, valued at £5,072,896, and the total amount paid in dividends to that date was £2,461,500.

The Mt. Bischoff Extended Tin Mining Company, No Liability.—The mine worked continuously during the year, an average of 90 men being employed. In the mine a large amount of development work was carried out amounting to 2664 feet, which, with the exception of that done in No. 9 level, was all along the ore-body revealing ore of good grade and size.

A new crosscut (No. 9) was put in hand towards the end of September, and to the end of December had advanced to the 462-foot mark. This crosscut, which will have to be driven 1400 feet to cut the main lode, will be at a vertical depth of 1000 feet below Hammond's shaft, and will eventually be the main outlet for all the main lode ore to the reduction works. To facilitate and quicken

the driving of this crosscut a small steam-driven air-compressor suitable for three drills has been installed at the mill site, and is proving effective, the distance mark to-day being 630 feet.

In the mill slight additions were made to the concentrating machinery—one No. 5 Wilfley, and one round slime-table having been added. The main mill supply dam has been raised an extra 6 feet, conserving $\frac{3}{4}$ -million additional gallons of dressing water. A new ore-bin is in course of erection at the No. 9 level site, which will eventually be the crusher station, serving the mill.

The output for the year was—

Crude ore crushed	15,962 tons
Concentrate (dry weight)	207.3 tons oxide
Average assay value .. .	70.44% Sn.
Gross value	£23,370 15s. 9d.
Recovery per ton ore ...	0.914% Sn.

A considerable amount of difficulty has been experienced lately in obtaining the necessary stores and materials, the want of explosives being very acute on several occasions.

Mt. Balfour.—Copper Reward Section.—The tin-bearing ground has been tested, and portions of the button-grass land have been ploughed and sluiced. Owing to the water-supply being irregular, work was intermittent. One dam has been built, and a second dam-site has been selected, and another dam will be built during the year.

Eight horses were employed tin-sluing, and on the mine and tramway.

COAL-MINING.

The total quantity of coal raised amounted to 55,575 tons, valued at £27,736; being a decrease of 8961 tons on the previous year.

The raisings at the different collieries were:—

Colliery.	Tons Raised.	Men Employed.
Cornwall	22,839	61
Mt. Nicholas	30,624	78
Spreyton... ..	673	6
York Plains	308	3
Illamatha	512	3
Mt. John... ..	25	1
Cardiff	167	3
Mt. Cygnet	20	1
Dalmayne	117	1
Pateena	290	2
Total	55,575	159

The Mt. Nicholas Company experienced some difficulty owing to the faulting of the long wall seam, which caused delay and a shortage of coal output for a time. The colliery, however, was in good going order at the close of the year, and is capable of much larger output than the "trade" demand will warrant at present.

The working face was advanced an approximate distance of 3 chains, and is now in 49 chains from the tunnel mouth.

The seam keeps to its usual thickness, and the quality of the coal is well maintained.

Owing to a strike of the employees the mine was idle from November 3 to December 4, when the work was resumed.

The Cornwall Colliery.—Work at this company's mine is confined almost exclusively to No. 3 pit 6-foot seam, which is worked on the pillar and stall system. The mine is now well opened up, and a large output of coal could be maintained if the trade demand would warrant it, but unfortunately this is not so, and half-time has been worked during some of the summer months. A new dip

heading is being put in from near the haulage bank-top; this will greatly facilitate the working of the pit, and do away with the roundabout haulage now used.

The Dalmaine Collieries Limited.—Work, so far as the construction of the aerial ropeway for transit of coal was concerned, was suspended for the greater part of, if not for the whole, year.

A commencement with the construction of the jetty at Picanini Point was to be made at the beginning of the New Year.

Cardiff Coal Mine (St. Marys).—The owner (H. Aulich) gets a small output, sufficient for local requirements, from this mine.

The York Plains Coal Mine.—Mr. Gregg keeps his small coal mine going to supply a limited trade, as the coal is only used at breweries and hop-drying kilns.

Spreyton.—The Illamatha Mine has again been opened, and maintains a small output. Six men are employed.

A little work is being done on the Spreyton seam near the Tarleton Railway-station.

This old mine appears to be working to a finish. Only patches of the seam are now left.

TASMANITE SHALE.

The Railton-Latrobe Shale Oil Company raised 1286 tons of shale, of a gross value of £1286.

An average of 10 men were employed during the year.

OSMIRIDIUM.

The quantity 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 222·15 oz., valued at £1899, as against 247·048 oz., valued at £1581, last year.

The following is a list of refiners of platinum in the United States who are interested in Osmiridium:—

American Platinum Works, 225 New Jersey-road,
Newark, N.J.

Baker and Company, Incorporated, Newark, New
Jersey.

J. Bishop & Company, Malvern, Pa.

Thos. J. Dee & Co., 1010 Maller's Buildings, 5 So.
Wabash Ave., Chicago.

Goldsmith Bros., Smelting and Refining Company,
63 Washington-st., Chicago.

Pacific Platinum Works, 229 E. 9th-street, Los
Angeles, Cal.

Rossler & Hasslacher Chemical Co., Perth Amboy,
N.J.

L. Vogelstein & Co., 42 Broadway, New York City.

S. S. White, Dental Mfg. Co., Philadelphia, Pa.

Commercial Research Co., Jackson-av. and Honey-
wall-st., Long Island City, N.Y.

Phillip Bros., 42 Broadway, New York City.

Irvington Smelting and Refining Co., 503 Mulberry-
st., Newark, N.J.

Wildberg Bros., Pacific Bldg., San Francisco, Cal.

Hoover & Strong, Incorporated, 119 W. Tupper-st.,
Buffalo, N.J.

Miller Smelting and Refining Co., Ellastone Bldg.,
Cleveland, Ohio.

H. A. Wilson Co., 97 Chestnut-street, Newark, N.J.

Industrial Research Co., 420 Columbus Bldg., Cleve-
land, Ohio.

J. M. Ney Co., Hartford, Conn.

Chas. S. Platt Co., 59 Cedar-st., New York City.

Wm. A. Stein, 205 Clifford-st., Newark, N.J.

Joseph Radnai, 36 Fulton-st., New York City.

Emil Schneider, Inc., 298 South-st., Newark, N.J.

Weidenhoff, 1215-1219 South Ashland-av., Chicago,
Ill.

Shreve & Company, San Francisco, Cal.
 Liberty Refining Co., N. 432 Wood-st., Pittsburg,
 Pa.

Belaise & Cohn, 13 Dutch-st., New York.

People's Smelting and Refining Co., 211 South 11th-
 street, Philadelphia, Pa.

BISMUTH.

The Shepherd and Murphy Mine at Middlesex obtained from its tin-ore 3.46 tons of bismuth, valued at £1049.

The Forth Valley Mine obtained 0.05 tons, valued at £10.

WOLFRAM.

The output of wolfram ore was as follows:—

	Tons.	Value. £
Avoca	57.62	10,193
Shepherd and Murphy Mine at Middlesex	33.15	4406
Iris Mine	2.245	267
Squib	6.6	830
All Nations	5.6	1065
Others	1.05	149
Total	106.265	16,910

BARYTES.

Attention has been called to the sections charted in the names of Cook and Wesley, and others, north and adjoining, and sample parcels amounting to 6 tons have been despatched to Melbourne for experimental purposes, but so far nothing definite is obtainable regarding the result.

ASBESTOS.

The rise in the price of asbestos fibre has caused attention to be drawn once more to the asbestos field at Anderson's Creek, near Beaconsfield. A good deal of prospecting work has been done, and trial parcels have been shipped to Melbourne.

PETROLEUM.

A company formed in Hobart, called the Bruny Island Petroleum Company, for the purpose of boring for oil on Bruny Island erected a drilling plant, and commenced boring operations in June last. The machinery consisted of a 30-horsepower Jameson portable boiler and a 25-horsepower oil well supply engine. The plant is said to be capable of drilling to a depth of 4000 feet if required.

Mr. Guy R. Andrews was appointed manager, and in a report to the chairman of directors of the company he stated:—

“ For the first 50 feet the drill penetrated the loose sand and sticky grey pug formed by the degradation of the sandy limestone exposures to the east and west. At this level a running drift, composed of fine quartz sand, with showings of marine shells, was encountered, giving conclusive evidence of a sunken beach, since no breach of the ocean has been effected on the western side of the island. Hence it is permissible to conjecture that the present drift cannot continue to a much greater depth than that already penetrated. This drift, whilst making present progress rather slow, and necessitating the use of drive-pipe, will probably prove very beneficial later on, since the thickness of diabase, which is exposed to the south-west and north-east, will doubtless be materially lessened at this point, and the underlying sedimentary rocks reached with a minimum of labour.”

After boring to a depth of 429 feet, and expending about £5000, operations ceased for want of funds.

POTTERY CLAYS.

Some very fine beds of pottery clay are known to exist in the State, and during the year I have received requests from some of the large pottery works in Sydney and Melbourne for samples of clay for testing purposes. I drew

attention to the matter through the medium of the press, and asked for small samples up to 5 lb. in weight, and my request was readily responded to, and in June last I forwarded 21 samples obtained from different parts of the State to a firm in Sydney to be tested, and a reply was recently received, in the course of which it was stated that three of the samples from Beaconsfield, and one from Forcett, in the Sorell district, are all ball clays of excellent quality, while several of the other samples would be very useful in mixing with some other bodies. The remainder were considered very ordinary.

Some samples of clay from the Hagley district are very highly spoken of. They are said to be the best clays yet obtained in Tasmania, and it has been proved by the sinking of shafts and bores that the deposits are of immense thickness, and distributed over a large area. Further, as there is coal in the district, which is adjacent to railway communication, this locality would appear to be best suited for the starting of pottery works. The coal deposits are not considered suitable for ordinary purposes, but would be available for use in connection with an industry such as pottery works located on the spot.

Other tests are at present being made in Melbourne for the purpose of ascertaining if the clays are suitable for making retorts for use in smelting zinc. Should the results be satisfactory it is hoped that in the near future a new and important industry will be opened up in the State.

OCHRE.

Mr. B. P. Dyer, of Hampden-road, Battery Point, has been for some time experimenting with coloured ochres from Sorell and other places in the southern portion of the State, and has produced some excellent oil and water paints therefrom.

A deposit of ochre, near Mowbray, has recently been brought under notice, and experiments have been made, and, it is stated, satisfactory results have been obtained.

The Government Geologist has been instructed to inspect and report upon the discovery. Should the point prove to be serviceable another industry will be started, and may lead to other similar deposits being brought under notice, and worked to advantage.

OUTPUT.

Return showing the Quantity and Value of Mineral Products for the State of Tasmania during the Year ending 31st December, 1916.

Mineral.	Quantity.	Value.
		£
Gold*..... ozs.	15,790·096	67,072
Silver-lead Ore tons	11,229·410	153,796
Blister Copper † "	6305	884,689
Copper and Copper Ore... "	96·840	1765
Tin Ore "	2854·636	350,852
Coal "	55,575	27,736
Wolfram "	106·265	16,910
Bismuth "	3·510	1059
Osmiridium..... ozs.	222·150	1899
Shale.....tons	1286	1286
Barytes "	83	359
Iron Pyrites "	14,005·084	13,597
Asbestos "	15	30
Total .....	...	£1,521,050

* Fine gold, including gold contained in blister copper.

† Value of gold deducted.

GEOLOGICAL SURVEY BRANCH.

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

Early in the year Mr. Loftus Hills, M.Sc., Assistant Government Geologist, enlisted in the Miners' Corps, and is now at the front, in France.

Owing to ill-health, Mr. L. L. Waterhouse, B.E., Assistant Government Geologist, acting upon the advice of his medical adviser, resigned his position in the service of the State. Mr. Waterhouse contracted acute rheuma-

tism, owing to exposure in the field and climatic conditions on the West Coast. It is hoped that the warmer climate of New South Wales will soon restore him to perfect health. The Department has lost the services of a valuable officer, who, during his term of office, had acquired a thorough knowledge of the geology of the State, and whose reports were highly appreciated by the mining public.

INSPECTORS OF MINES.

The report of the Chief Inspector of Mines, together with the reports of the three Inspectors of Mines, are appended.

Mr. Harry Vaudeau has been appointed an Inspector of Mines for Tasmania (temporarily) to reside at Queenstown, and Mr. C. H. Curtain has been removed to Launceston to take up the duties of Mr. M. J. Griffin, who is on leave of absence, and will be retiring from the service in October.

REVENUE.

The revenue for the year amounted to £14,678 19s. 10d., being a decrease of £3000 3s. 8d. on the previous year.

The sum of £1790 19s. 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:—

Mr. F. E. Bomford, Registrar of Mines, Moorina, resigned his position on the 31st January, 1916, owing to failing health. Mr. Bomford had been connected with the Department for 33 years, during which time he did much to further the industry in the North-Eastern and Eastern Mining Divisions.

Mr. W. D. Kirkham, Registrar of Mines, Waratah, resigned his position on the 29th February, and Mr. James

H. Thorne was appointed his successor from the 16th March, 1916.

Mr. J. C. Farrell was appointed Registrar of Mines, Derby, from the 16th February, 1916.

Miss L. R. Edmunds (transferred from the Audit Department) was appointed Clerk and Typiste on the 8th March, 1916.

Mr. E. A. Fisher was appointed Clerk (on probation) at the Launceston Branch Office, from the 14th December, 1916.

Messrs. Loftus Hills, Assistant Government Geologist, H. R. Driscoll, Clerk, and L. W. Fletcher, Clerk, are on active service, having joined the Expeditionary Forces.

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.

CONCLUSION.

I desire, in conclusion, to express my sincere thanks to the officers of this Department and the officers of the Survey Department for their loyal support during the year, which, owing to the many demands made upon them, and the new conditions brought about by the war imposing extra duties upon them, has been a very strenuous one; and I sincerely hope that such conditions will be removed during the present year, and that we shall enter upon a more prosperous time in the near future.

I have the honour to be,

Sir,

Your most obedient Servant,

W. H. WALLACE,

Secretary for Mines

The Honourable the Minister for Mines.

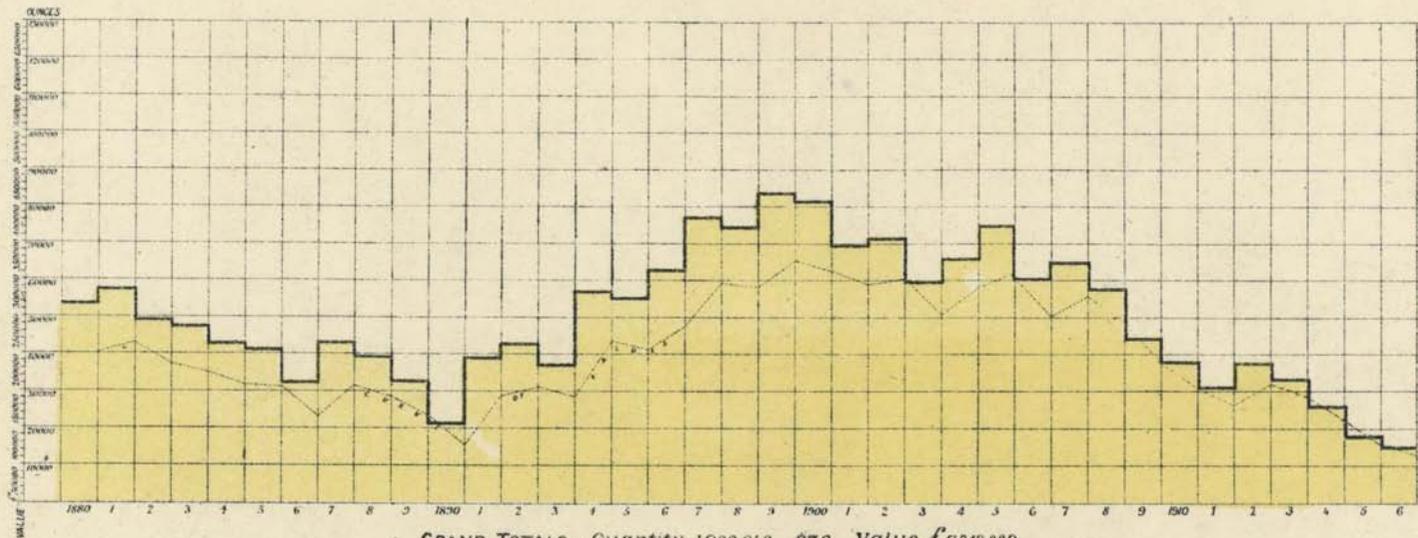
No. 1.

*RETURN showing the Quantity and Value of Gold won during
the Years 1880 to 1916 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.....	62,391	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
1916.....	15,790·096	67,072
	1,832,642·088	7,313,339

* Fine Gold.

Diagram showing Total Quantity & Value of Gold won in Tasmania during the years 1880-1916



GRAND TOTALS—Quantity 1,832,642 OZS: Value £731,339
 Photo Algraphed 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 1916 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
1916	11,229·410	153,796
	1,067,080·641	6,149,993

No. 3.

RETURN showing the Quantity and Value of Blister Copper produced during the Years 1896 to 1916 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1896	41·5	1245
1897	4700	322,500
1898	4955·5	400,668
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
1916	6305	*884,689
	149,196	12,164,782

* Value of Gold contents deducted.

No. 4.

RETURN showing Quantity and Value of Copper Matte exported during the Years 1902, 1903, and 1904 to 1916 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1902	2500	50,112
1903	3727	83,624
1904-1916	—	—
	6227	133,736

No. 5.

RETURN showing the Quantity and Value of Copper Ore produced during the Years 1896 to 1916 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1896	34	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
1916	96·84	1765
	40,558·06	567,758

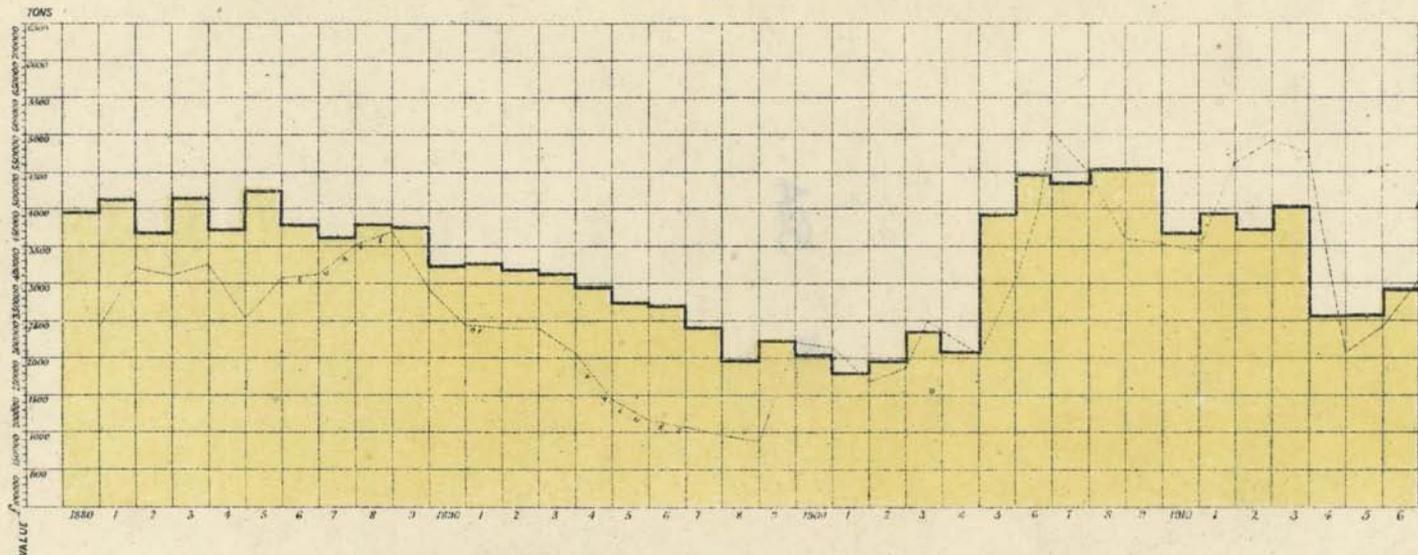
No. 6.

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 1916 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*	3711·01	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
1916*	2854·636	350,852
	121,952·278	12,319,363

* 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 ore produced during the years 1905-1916



GRAND TOTALS—Quantity 121,952 TONS Value £12,319,363
 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 1916 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	338
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
1916	106·265	16,910
	718·043	75,425

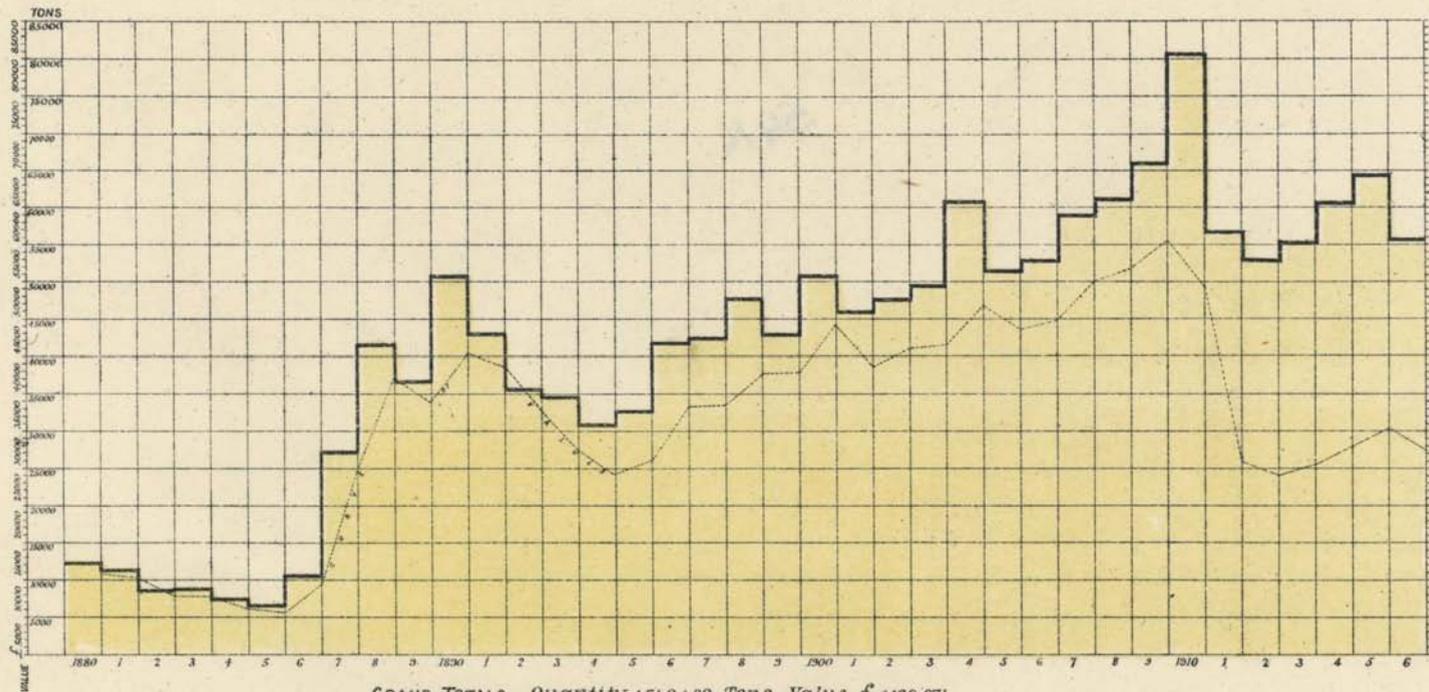
No. 8.

RETURN showing the Quantity and Value of Coal raised during the Years 1880 to 1916 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	38,008	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*
1914	60,794	27,853*
1915	64,536·25	30,418*
1916	55,575	27,736*
	1,548,408	1,169,074

* Value at pit's mouth.

Diagram showing Total Quantity & Value of Coal used in Tasmania during the years 1880-1916



GRAND TOTALS—Quantity 1,548,408 Tons Value £ 1,169,074

Photo Algraphed by John Veil Government Printer Hobart Tasmania.

5 cm

No. 9.

RETURN showing the Quantity and Value of Iron Ore produced during the Years 1897 to 1916 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
1909-1916	—	—
	42,762	25,701

No. 10.

RETURN showing the Quantity and Value of Asbestos produced during the Years 1899 to 1916 inclusive.

Year	Quantity.	Value.
	Tons.	£
1899	200	363
1900	128	113
1901	46·5	45
1902-1915	—	—
1916	15	30
	389·5	551

No. 11.

RETURN showing the Quantity and Value of Bismuth produced during the Years 1904 to 1916 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
1916	3·51	1059
	68·319	20,516

No. 12.

RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 to 1916 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
1916	222·150	1899
	3920·328	33,732

No 13.

RETURN showing the Quantity and Value of Barytes produced during the Year 1916.

Year.	Quantity.	Value.
	Tons.	£
1916	83	359

No. 14.

RETURN showing the Quantity and Value of Iron Pyrites produced during the Years 1915 and 1916 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1915	12,835·59	8945
1916	14,005·084	13,597
	26,840·674	22,542

No. 15.

RETURN showing the Quantity and Value of Shale produced during the Years 1910 to 1916 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1910	364	214
1911	500	250
1912	—	—
1913	130	130
1914	75	75
1915	—	—
1916	1286	1286
	2355	1953

No. 16.

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, 1915.

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 $\frac{1}{2}$ $\frac{3}{4}$	—	—	2417 $\frac{9}{10}$	1235 $\frac{1}{10}$	75,951	4707	—
1897	90,773 $\frac{1}{2}$	—	3476 $\frac{1}{2}$ $\frac{2}{10}$	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	—	9341	1,215,036	26,255	—
1901	355,528	1839	9982	50	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	—
1915	340,855	—	7901	—	7814	452,645	9870	—
1916	299,414	—	6305	—	6237	328,699	8803	—

No. 17.

RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 to 1916 inclusive.

Year.	Number.	Year.	Number.
1880.....	1653	1899.....	6622
1881.....	3156	1900.....	7023
1882.....	4098	1901.....	6923
1883.....	3818	1902.....	5934
1884.....	2972	1903.....	6017
1885.....	2783	1904.....	6194
1886.....	2681	1905.....	6581
1887.....	3361	1906.....	7005
1888.....	2989	1907.....	7516
1889.....	3141	1908.....	6466
1890.....	2868	1909.....	6054
1891.....	3219	1910.....	5770
1892.....	3295	1911.....	5247
1893.....	3403	1912.....	5566
1894.....	3433	1913.....	6107
1895.....	4062	1914.....	4741
1896.....	4350	1915.....	3908
1897.....	4510	1916.....	3864
1898.....	6052		

No. 18.

RETURN showing the total Number and Area of Leases issued during the Year ending 31st December, 1916.

Mineral.	No. of Applications.	No. of Sluiceways.	Area.
			Acres.
Asbestos	1	...	80
Baryta.....	1	...	80
Bismuth .....	...	...	...
Coal.....	12	...	2699
Copper	3	...	164
Chrysotile .....	...	...	...
Gold	42	...	684
Guano .....	...	...	...
Iron .....	...	...	...
Limestone .....	...	...	...
Machinery Sites	6	...	40
Minerals	41	...	1562
Molybdenite	1	...	37
Osmiridium .....	...	...	...
Shale .....	...	...	...
Silver	12	...	605
Tin	117	...	2415
Wolfram	9	...	356
Dredging Claims	9	...	205
Water-rights	72	279	293
Mining Easements	10	...	86
	336	279	9306

No. 19.

RETURN showing the total Area of Land and Number of Sluiceways of Water applied for during the Year ending 31st December, 1916.

Mineral.	Number.	Sluiceways.	Area.
			Acres.
Asbestos	3	...	178
Baryta	10	...	510
Bismuth .....	...	...	...
Chrysotile .....	...	...	...
Clay .....	...	...	...
Coal	6	...	957
Copper	20	...	988
Gold	89	...	1798
Guano .....	...	...	...
Iron .....	...	...	...
Limestone	1	...	80
Minerals	73	...	3896
Molybdenite	1	...	40
Nickel	1	...	80
Osmiridium .....	...	...	...
Phosphate of Lime	1	...	4
Silver-lead Ore	11	...	558
Silica	1	...	20
Shale .....	...	...	...
Tin	120	...	2469
Wolfram	6	...	180
Machinery Sites	5	...	31
Mining Easements	15	...	40
Dredging Claims	13	...	192
Water Rights and Dam Sites	66	256	159
	442	256	12,180

No. 20.

RETURN showing the Number and Area of Leases held under "The Mining Act," in force on 31st December, 1909 to 1916 inclusive.

Nature of Lease.	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.		In force on 31st Dec., 1916.	
	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
For Minerals, Silver, Tin, &c.	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	872	Acres. 34,458
For Coal, Slate, Shale, &c.	51	10,590	50	10,608	58	13,049	37	8854	23	5660	26	6405	45	11,522	52	13,742
For Gold Dredging Claims	87	1265	76	1159	73	1220	73	1344	54	988	95	2130	94	2026	85	1692
Mining Easements	47	712	35	441	42	647	42	489	30	329	36	403	29	351	30	437
Machinery Sites	92	464	84	484	99	606	133	606	105	603	110	611	102	553	106	641
Water-rights Mineral and Gold	32	129	33	121	37	145	39	149	36	153	43	180	40	183	37	190
	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	572	2302 & 2061 sluice-heads

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No. 21.

*RETURN showing the Total Number of Leases in force on
31st December, 1916.*

Mineral.	No. of Applications.	No. of Sluicheads.	Area.
			Acres.
Asbestos.....	3	...	160
Bismuth.....	2	...	150
Baryta.....	2	...	160
Coal.....	47	...	11,652
Copper.....	31	...	1325
Clay.....	1	...	10
Chrysotile.....	3	...	160
Dredging Claims.....	30	..	437
Gold.....	85	..	1692
Iron.....	4	..	148
Limestone.....	4	...	602
Mining Easements.....	106	...	641
Machinery Sites.....	37	...	190
Minerals.....	181	...	13,861
Molybdenite.....	1	...	37
Nickel.....	1	...	41
Osmiridium.....	1	...	40
Shale.....	1	...	1488
Silver-Lead.....	36	...	2803
Serpentine.....	...	...	...
Tin.....	591	...	15,185
Water-rights.....	572	2061	2302
Wolfram.....	15	...	378
Zinc Sulphide.....	...	...	...
	1754	2061	53,462

No. 22.

RETURN showing the Average Number of Miners employed during the Year ending 31st December, 1916.

	Europeans.	Chinese.
Northern and Southern Division	232	...
North-Eastern Division	28	45
Eastern Division	429	11
North-Western Division	553	...
Western Division	2166	...
	3308	56

No. 23.

RETURN showing the Amounts paid in Dividends by Mining Companies during the Year ending 31st December, 1916.

Mines.	Dividends.		
	£	s.	d.
Copper	214,731	0	0
Gold .....	...	
Tin	75,305	0	0
Silver	33,814	0	0
Coal	3919	0	0
TOTAL	£327,769	0	0

No. 24.

RETURN showing the total Amount of Rents, Fees &c., received by the Mines Department during the Year ending 31st December, 1916.

Head of Revenue.	Amount.		
	£	s.	d.
Rent of Auriferous and Mineral Land	14,045	7	4
Fees, ditto ditto	633	12	6
Survey Fees	1790	19	1
TOTAL	£16,469	18	11

No. 25.

RETURN showing Quantity and Value of Minerals and Metal raised in Tasmania from 1880 to 1916 inclusive.

Mineral or Metal.	Quantity.	Value.
Gold	ozs. 1,832,642·088	£ 7,313,339
Silver-lead ore	tons 1,067,080·641	6,149,993
Blister Copper	" 149,196	12,164,782
Copper Matte	" 6,227	133,736
Copper and Copper Ore...	" 40,553·060	567,758
Tin Ore	" 121,952·278	12,319,363
Iron Ore	" 42,762	25,701
Coal	" 1,548,408	1,169,074
Wolfram	" 718·043	75,425
Bismuth	" 63·319	20,516
Asbestos	" 389·500	551
Shale	" 2,355	1,955
Iron Pyrites	" 26,840·674	22,542
Osmiridium	ozs. 3,020·328	33,732
Barytes	tons 83	359
Unenumerated prior to 1894...	...	31,988
Total .....	...	£40,030,814

No. 26.

RETURN showing the Mining Companies registered during the Year ending 31st December, 1916.

Number of Companies.	Capital.
4	£32,200

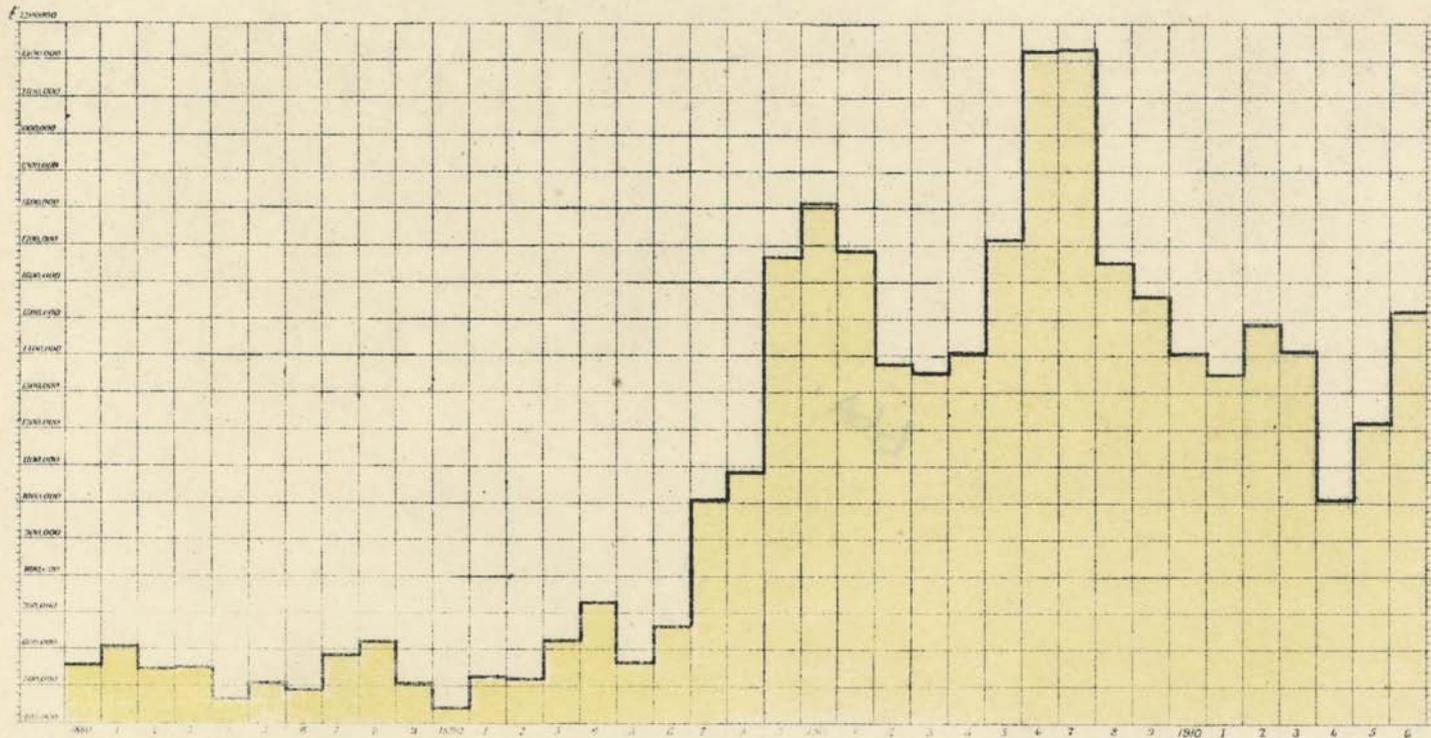
In addition to the above, 3 Agents for Foreign Companies, and 1 Syndicate, under Part Va of the Act, were registered.

No. 27.

RETURN showing the Annual Value of Mineral Products for the State of Tasmania from 1880 to 1916 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	1916.....	1,521,050
1897.....	1,006,140	Unenumerated	
1898.....	1,071,084	prior to 1894	31,988
1899.....	1,660,622		
			£40,030,814

Diagram showing the Annual Value of Minerals & Metals raised in Tasmania from 1880-1916



GRAND TOTAL - Value £ 6,403,834

Photo Algraphed by John Vail Government Printer Hobart Tasmania

5 cm

No. 28.

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 1882 to 1903, and for Six months ending 31st December, 1903, and for the Years ending 31st December, 1904, to 1916 inclusive.

Year.	Amount.			Year.	Amount.		
	£	s.	d.		£	s.	d.
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.....	20,203	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.....	33,061	13	9	1915.....	17,679	3	6
1899.....	24,696	10	5	1916.....	14,678	19	10

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, 1916.

METALLIFEROUS.

SUBJECT—MINING.

1. Describe some methods applied to open-cut mining, clearly stating the advantages and disadvantages pertaining to each.
2. Show by means of sketches an arrangement of a bucket and traveller for raising broken rock from a shaft in the course of sinking.
3. A drive in moderately hard rock. Show position of holes in the face, with order of firing. Briefly give reasons for the arrangement of holes.
4. Why are chairs attached to cages? Describe any type known to you.
5. Explain how you would proceed to timber a wide stope with square sets. What particular care should be exercised in this work?
6. Describe a method of working a wide lode where the ore-bodies and the walls are treacherous.
7. In what manner would you timber a shaft, size 12' x 3' in clear, through fractured or heady, but fairly hard, rock?
Supply dimension sketches of the timber members you would use for the shaft and for the construction of a working-plat.
8. Describe the important parts of an up-to-date gold dredge. Under what conditions of an auriferous deposit would you look for successful dredging operations?
9. Give particulars of several methods of supporting underground excavations made during ore-winning operations.
10. What vigilance should be exercised by a mine manager in order to prevent the occurrence of chronic and temporary diseases amongst his employees?
11. Describe in detail the construction and mode of operation of a modern type of small or "one-man" drill for use in mines.
12. Explain the process of boring and firing out a round of holes in a rise (size 8 feet by 4 feet) which is being put up through schistose ground. Give plan of position of holes bored. What precautions must be taken to ensure a safe return to the working face in the rise after the shots have been fired?

SUBJECT—ORE-DRESSING AND SAMPLING.

1. Give description of machine for reducing—
 - (a) Crude ore to $\frac{1}{4}$ -inch size.
 - (b) Ore to a fineness of 80-mesh.
2. Explain in detail the sampling which is usually required for—
 - (a) Lead-zinc mill; or
 - (b) Smelting works (copper).
 (Answer (a) or (b), but not both.)

3. Describe a good type of jig, and explain what adjustments and regulation are necessary to ensure its successful operation on some particular class of ore.
4. Write out a short description of rolls for crushing. Show their general construction by means of sketches.
5. Define what is meant by classifiers. Briefly detail their principles of action.
6. Given an ore with a gold content ranging from 5 to 7 dwts. per ton, simple in composition, containing 65 per cent. of its gold in amalgamable form and a small portion in pyrite which is quite amenable to cyanide treatment. Draw, with the necessary explanatory notes, the flow-plan of a mill you would propose for treating the above.

SUBJECT—SURFACE WORK.

1. A stamp-battery of 40 heads makes 80 drops per minute. The weight of each stamp with shank, &c., is 10 cwt., and the lift is 8 inches. If you allow 20 per cent. for friction, what horse-power would you require to drive this battery?
2. You propose to install a pair of high-pressure steam-engines to drive the abovementioned battery. Assuming the mean pressure in the cylinders to be 50 lbs. per square inch, and the revolutions to be 80 per minute, what size should they be?
3. Say what size Cornish boiler, or boilers, you would recommend to supply steam to the abovementioned engine.
4. If the steam-pipe for the abovementioned engine were 20 feet long, what size should it be?
5. Make a sketch of a suitable feed-water heater to handle the exhaust steam from the abovementioned engine, and mark in the dimensions of same.
6. In constructing a concrete retaining wall, what material would you use for the concrete and in what proportions? What principle governs these proportions? What is meant by "plums," and what is their effect? What is ferro-concrete, and what special advantages does it give?
7. The rainfall over a certain area of 2 square miles amounts to 100 inches per annum, and can all be conserved, less 10 per cent. evaporation. The rainfall is distributed evenly over 10 months of the year, but two months of complete drought must be provided for. What minimum storage in cubic feet will be required to ensure a steady maximum flow all the year round? What will this flow amount to, and how would you gauge it?
8. It is necessary to move a piece of machinery of 5 tons weight with a derrick 25 feet high. The machinery has an area of 5 feet square, and is to be first raised 2 feet vertically and then moved 5 feet in towards the foot of the derrick into its position by straightening the derrick by its back-guy rope. Sketch the arrangement and sizes of ropes you would advocate, and state the strain on the back-guy rope due to the machinery in each position of the derrick. Requisite pulleys and winch are available.
9. How would you proceed to set out a countershaft, distant 20 feet from axis of driving-wheel of horizontal engine?

10. Give a sketch of the trestling you would construct to carry mine trucks, gross weight loaded 15 cwt. each, over a gully 30 feet wide, with maximum depth 20 feet. Show dimensions and details of joints, &c.

SUBJECT—MINING ARITHMETIC, MENSURATION, AND MINE ACCOUNTS.

1. Divide .00785 by 8.754, and express the following in vulgar fractions:—72, .00892, 10.956.
2. How many superficial feet of timber are there in 8 pieces 7 in. by 1½ in. by 14 ft.; 15 pieces 8 in. by 2 in. by 16 ft.; 17 pieces 9 in. by 1½ in. by 9 ft.?
3. Find the quantity of water in a shaft 10 ft. by 4 ft. and 135 ft. in depth.
4. Show how contractors' accounts are kept, 10 per cent. being retained and stores sold to the contractor by the mine.
5. How should costs be segregated in a drive which costs £2 per foot, there being 12 inches of ore assaying 8 dwts. fine gold per short ton?
6. Show method of keeping a time-book, with dissection of costs.
7. Show the segregation of costs on a large low-grade mine, so that the costs of every department are readily available.

SUBJECT—MINE SURVEYING.

1. Work out the co-ordinates of the following traverse in proper office book-form. Plot the co-ordinates to a scale of 1 inch = 50 feet, station A being datum. Calculate the length and bearing of the closing line J to A:—

A—B	N. 60° E.	67 ft.
B—C	S. 45° E.	70 ft.
C—D	E.	140 ft.
D—E	S. 60° W.	200 ft.
E—F	N. 45° E.	150 ft.
F—G	N. 3° E.	200 ft.
G—H	N. 77° E.	220 ft.
H—J	S. 87° E.	300 ft.

2. Describe step by step how you would connect the surface survey with the underground survey at the 200-ft. level, only a single vertical shaft 6 ft. by 4 ft. being available. What special precautions would be necessary if the level were at 1500 ft. in place of 200 ft.?
3. Describe, with sketches, either—(1) the Abney level, or (2) the Brunton transit, showing in either case the course of the rays of light from object to eye.
4. The ground beneath an ore-dump slopes at an angle of 20°. The dump starts from ground-level and runs out horizontally with a flat portion 6 feet wide and 30 feet long. From this flat portion the slope of the broken ore is 25° to the ground. Draw the outline of the dump, and give three cross-sections at 10, 20, and 30 feet out.
5. What is meant by tachometer surveying? Describe it, and mention what precautions are necessary to ensure accuracy.
6. What method would you recommend to ascertain the true meridian at any place? Describe the process in detail.

7. What means would you adopt to test rapidly in the field the accuracy of a level? Give your booking for three set-ups and three intermediates at each station. Name four or more means by which the staff-holder can cause errors in the results.
8. Show by sketches what plans you would recommend to represent clearly the weekly progress in a slope 20 feet wide and 60 feet long, starting from the level upwards.

SUBJECT—MINING GEOLOGY.

1. What is an "inlier"? Sketch and describe anticlinal and synclinal folding of interstratified conglomerate and limestone, and show how inliers may result from this.
2. What are dykes, sills, contorted strata, and faults? How is the extent of a fault usually measured? Illustrate by sketches a reversed fault in alternating beds of sandstone and limestone dipping at an angle of 20° .
3. Describe, with sketches, three different ways in which ore may occur, illustrating by examples from Tasmania if possible.
4. Coal is said to occur frequently in "basins." What does this term mean, and how has the "basin" theory been practically applied in Australia? Do regular basins occur in Tasmania? If not, for what reason?
5. Explain the principles of "secondary enrichment." What would be the effect of this action on a silver-bearing galena lode in a hilly country with heavy rainfall?
6. What are the appearance, general characteristics, and composition of the following minerals?—How would you identify them in the field?—Scheelite, molybdenite, graphite, garnet, marcasite, chalcedony, cassiterite, fluor spar, tasmanite, kaolin.
7. In blowpipe analysis, how would you identify the following minerals:—Galena, calcite, chromite, blende, stibnite, cobalt glance, pyrrhotite, argentite, mispickel, hematite? What elements do they each contain?

SUBJECT—MINING LAW.

1. Who is required to have the control of explosives?
2. What is required to be done when a charge of nitro-glycerine compound misses fire?
3. What age must a person be before he is allowed to use explosives under the "Mining Act"?
4. What safety precautions are necessary when ascending or descending a shaft by the aid of machinery in which a cage is not in use or available?
5. How often are safety-cages to be tested?
6. How often is a mine manager required to examine the state of—
 - (a) All ropes, cages, and gear connected with the shafts of a mine?
 - (b) Buildings, machinery, shafts, levels, planes, and all other places connected with a mine?
7. How would you mark off for—
 - (a) A prospecting claim?
 - (b) A water-right?
 - (c) A mining lease?
8. What annual expenditure is necessary to comply with the covenants of gold and mineral leases?

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
44. 1916	Barr, Hugh	31 Aug. 1916

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

CERTIFICATES of Competency—continued.

No of Certificate.	Name.	Date of Certificate.	Class of Certificate.
40. 1903	Weston, Eustace Moriarty	12 Aug. 1903	First class
41. 1903	Clark, Lindesay 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	McIntyre, William Keve- rall	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	Vaudeau, Henry Alex- ander	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
92. 1916	Waterhouse, Lionel Lawry	3 May, 1916	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	—
8. 1916	Gray, James	18 Apr. 1916	—

REPORT OF THE MOUNT CAMERON WATER-
RACE BOARD FOR THE YEAR ENDING
31st DECEMBER, 1916.

Gladstone, 13th February, 1917.

SIR,

WE have the honour to submit the report of the Board for the year ending the 31st December, 1916.

Race.—The race throughout is in good order, and no breaks nor earth-slips of any consequence have occurred, the cost of repairs amounting to £15 12s. 6d. only.

Syphons.—The two iron pipes have been cleaned and painted, and are in good condition. The wooden pipes, which are underground, also appear to be in good condition, and give no cause for anxiety. The pipe across the river, which is covered with hessian and erected on trestles, is standing well, and is not much affected by weather conditions.

General.—A sum of £20 was paid to Mrs. Canham, the widow of one of the channel-keepers, who had been employed by the Board for many years, for improvements made and outbuildings erected by him prior to his death.

The channel-keepers' cottages, which were erected at the time the race was constructed, are in a very bad state of repair, and are now being renovated.

The Board undertook, at the request of the Government, to test certain parts of the Gladstone tinfield for new deposits, and this work is being carried out at present under the supervision of its manager. One hundred and sixty-seven bore-holes have been put down, but the results, so far, have not been very encouraging.

Revenue.—The revenue for the year amounted to £1365 7s. 5d., being an increase of £258 13s. 8d. on the previous year.

Expenditure.—The expenditure amounted to £764 13s. 7d., being an increase of £74 3s. 7d. as compared with the previous year.

The statistics for the year are as follow :—

Average per week of claims supplied, 9.

Greatest number supplied in any one week, 12.

Total number of heads supplied—Under fixed or cash scale, 772½; under royalty or credit scale, 2480.
Total, 3202½.

Tin ore raised for the year :—Fixed scale, 35 tons 3 cwt. 1 qr.; royalty scale, 34 tons 12 cwt. 3 qr. 24 lb.
Total, 69 tons 16 cwt. 0 qr. 24 lb.

Average number of men employed per week, 21.

Total receipts for the year :—Water sold, fixed scale, £369 7s. 3d.; water sold, royalty scale, £991 2s. 8d.; rent of cottage, £4 17s. 6d. Total, £1365 7s. 5d.

Expenditure.—Cost of maintenance and management:—

	£	s.	d.
Salaries and wages	618	10	10
Insurance and purchase of improvements at Canham's Camp... ..	26	3	0
Travelling expenses	36	13	2
Stationery and printing	4	9	3
Stores and tools	14	5	2
Race-repairs	15	12	6
Syphon-pipes, repairs	42	19	0
Telephones	6	0	8
Total	£764	13	7

Paid to Public Debts Sinking Fund
for the year ending 30th June, 1916
(including moiety of rents of mineral
land served by the race, £10 7s. 3d.) £513 15 5

Rainfall.—The registered rainfall for the year was as follows:—Main intake, 47 inches 70½ points; Little Mussel Roe intake, 43 inches 61 points.

We have the honour to be,

Sir,

Your obedient Servants,

W. H. WALLACE, Chairman.

EDWARD L. HALL, }
CECIL G. RYAN, }
JOHN SIMPSON, }
CHAS. BARNES, }
J. O. HUDSON, }

Members.

The Hon. the Minister for Mines.

REPORT OF THE STATE MINING ENGINEER.

State Mining Engineer's Office,
Hobart, Tasmania, 26th May, 1917.

SIR,

I HAVE the honour to submit my report for the year 1916 in regard to the working of "The Aid to Mining Act."

The system of assisting prospectors in isolated places has been continued, six parties having received assistance to prospect at Arthur River, Frenchman's Cap, Craycroft Ranges, Mt. Donaldson, Long Back Range, Meredith Range, North Heemskirk, and Pieman River. The prospectors report having found gold, silver, lead, tin, copper, wolfram, and osmiridium, but not in payable quantities. The discoveries in the Pieman district give promise of importance, one party having brought in samples of very rich lode-tin. These prospectors were assisted to the extent of £5 per man per month, and the total expenditure was £201 16s.

At the Preolenna coal reserve two prospectors were employed on wages. Five seams of coal were located, the seams being small, and varying from 15 inches to 28 inches in thickness. The coal was of good quality, and further work on them is warranted. In carrying out this work £102 17s. 6d. was expended.

The store at Corinna was continued, but owing to the small number making use of it and the large expense in carrying it on, it has been decided to close the store.

Assistance to tributers at Zeehan has been continued. Twenty-one parties received assistance during the year, and eight of these paid royalty to the amount of £232 19s. There are fifteen tribute parties operating who did not receive monetary assistance during the year, and who paid royalty of £560 15s. 1d., making the total royalty received £843 14s. 1d. The expenditure for the year was £810 13s., in advance to tributers.

The amount received from ore-sales on behalf of the tributers was £10,667 4s. 1d., and was distributed as follows:—Paid to tributers, £9075 16s. 7d.; royalty to owners of sections, £747 13s. 5d.; royalty paid to State, £843 14s. 1d.

The large amount of prospecting which has been carried out above water-level gives little promise of further discoveries.

During the year a petrol-pumping plant was purchased, and placed on the No. 2 Argent Section, which was the means of proving that rich ore existed under water-level.

It would appear that in future the question of unwatering some of the old mines will have to be considered. To carry this out successfully it is essential that cheap power should be available.

Cheap assaying was continued, 628 assays being treated. Total expenditure, £2205 15s. 2d.; total received, £1097 14s. 10d.

I have, &c.,

J. O. HUDSON, State Mining Engineer.

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

GEOLOGICAL SURVEY OF TASMANIA.

REPORT OF THE GOVERNMENT GEOLOGIST.

Geological Survey Office,
Launceston, 3rd April, 1917.

SIR,

I BEG to submit my report for the year ending 31st December, 1916.

I append annual report of Mr. W. D. Reid, Government Assayer. Mr. Waterhouse's report will be added if it arrives in time for publication.

During the year the following publications have been prepared:—

- (1) Mineral Resources, No. 1, Tungsten and Molybdenum, Part III., King Island, by L. Lawry Waterhouse, B.E. 31st May, 1916.

This was a record of the examination of the scheelite deposit, with some notes on the geology of the island, preliminary to a bulletin on which Mr. Waterhouse is now engaged.

- (2) Bulletin No. 25.—The Gladstone Mineral District, by W. H. Twelvetrees. 28th August, 1916.

During the year Mr. Waterhouse visited Flinders and Cape Barren Islands, paying special attention to the occurrences of the munitions minerals, wolframite and molybdenite. He is at present preparing his bulletin on this visit. This will be Part IV. of the Mineral Resources, No. 1, publication, bringing that series up to date so far as concerns these deposits in Tasmania. There is a deposit of wolframite at the Interview River, north of the Pieman Heads, which was last visited by Mr. L. K. Ward in 1911, but which has been unworked ever since 1901. The main workings there consist of a shaft and some trenches, but when Mr. Ward was on the field the 1901 works had already fallen into disrepair. A wolfram lode has been worked recently at Gladstone by Messrs. Fleming and O'Halloran, and is described in my bulletin on the Gladstone district. Consequently, all the known occurrences of the ores of tungsten and molybdenum in Tasmania have now been fully described, and the information is accessible to anyone desirous of undertaking work on these minerals. The fact that the world's wolfram output was virtually controlled by Germany prior to the war, and that the production of tungsten was practically a German monopoly, has made it important for every British community to fully realise its resources in this particular. The United States, Portugal, Burmah, and Australia are the principal world-producers of tungsten ores. Out of the world's annual output, 9000 or 10,000 tons, Australia's production counts for upwards of 1000 tons, falling off, however, by a few hundred tons in recent years.

Portland Cement Materials.

Pursuant to instructions, I visited Beaconsfield in October and examined such deposits of limestone in the vicinity as could be used in the manufacture of Portland cement. The most suitable occurrence was that on Adams' Hill, at Flowery Gully. The Winkleigh caves are situated in this belt. The rock is a high-calcium one, and otherwise of a composition suited for the purpose. The quantities available are adequate for supplying large works for a lengthy period, and the works site on the spot would be within 8 miles from a shipping port at Beauty Point on the River Tamar. Clays and shales of varying composition exist in the immediate neighbourhood, but the beds of these would have to be prospected to gain satisfactory information as to quantity and quality. A serious drawback is that coal would have to be brought from a distance at a cost which may preclude competition with works on the mainland, but when the Hydro-Electric Department can supply current, the power-fuel costs could be considerably reduced. A bulletin is being prepared in which the proposition will be dealt with in detail.

The Gladstone District.

This mineral area was visited by me in the beginning of the year, more especially for the purpose of gaining information as to the local needs of the industry. The position was found to be somewhat complex, as, in addition to the old-established alluvial mining which has been so long the main support of the district, some lode and stone mining (gold, tin, and wolfram) has been started.

The tin output has for years remained pretty constant, nevertheless, it steadily declines with the depletion of many of the alluvial deposits, and this process is accelerated by the departure of miners for the war. To conserve the future of the mining population and the usefulness of the Government race, I recommended a scheme for subsidising boring parties, to be carried out under the control of the Mt. Cameron Water-Race Board. These boring operations are now in progress. The Board has also devised a method of assisting the local people engaged in gold quartz mining. The wolfram lode on the township is a patchy one, and is poor where struck in the deep crosscut; if driven on, irregular values must be expected. A stockwork of tin-veins is being worked at the Fly-by-Night, and a small output is in progress. There is every sign here of a persistent deposit. Despite some adverse tests, it may be anticipated that the ore will recur in floors at successive horizons as it is followed down, and especially near the junction of the granite with the adjoining slate.

The arsenical gold-quartz reefs at the Portland and in the Mussel Roe district deserve testing in depth, though it is uncertain whether further work on them will show much improvement. On the other hand, the Royal Tasman group of gold-quartz reefs call loudly for deeper exploration.

The country between the Great Mussel Roe and the sea has been very imperfectly prospected, but it has possibilities as regards both tin and gold.

Asbestos.

In September I visited the Anderson's Creek asbestos field, where deposits are being operated on by investors from Melbourne and Sydney. Prospecting has been carried on here at intervals for many years, but though the asbestos-bearing rock has been cut into at various points, industrial results have not been achieved. Lately the rising prices of asbestos fibre and the increasing use to which it is being put in modern life have led to a renewal of interest in the field, and small parcels are being shipped to the mainland for trial.

Buxton's leases are being prospected under option by the Durabestos Company, of Sydney, under the supervision of Mr. Hartwell Conder, and some good chrysotile fibre has been obtained. M. Paul Charriol is working a lease further north, on which there is an occurrence of long fibre amphibole asbestos. It is stated that a market for this has been secured in Melbourne. The prospects of the field are encouraging, and it is hoped that the industry may advance to a profitable stage. A great deal depends on the result of the present prospecting and on the capacity of the Australian market to absorb the various classes of fibre.

Information from the Commonwealth offices in London is to the effect that every particle of asbestos is now worth £20 a ton. This being the case, the market prices in Australia should exceed that figure, and should enable the Anderson's Creek deposits to be worked at a profit. The chrysotile fibre as a rule is between $\frac{1}{2}$ -inch and $\frac{3}{4}$ -inch in length, and in some veins $1\frac{1}{2}$ -inch and upwards; and the amphibole fibre varies from 6 inches to 1 foot. Some of the chrysotile fibre and the serpentine in which it occurs are indistinguishable from similar material from Coleraine, in the great asbestos range in Canada, samples of which the Geological Survey of Canada has been good enough to supply. Mr. J. D. Sharpe, manager of the Asbestos Corporation of Canada, has very kindly made up and sent us a series of prepared fibre, to illustrate the various grades of product put on the market by the Canadian mines. The samples will be placed on exhibition in the Victoria Museum.

The only other asbestos properties on which work is being done in Tasmania are those situate on the shore of Macquarie Harbour. These were examined by Mr. Loftus Hills in 1913. He reported the occurrence of good chrysotile fibre in veins 1 inch wide and upwards. The Macquarie Asbestos Proprietary Limited of Melbourne holds the leases, and some of the rock has been shipped both to Melbourne and England for trial treatment. Reports based on various small samplings are stated to be satisfactory.

Ida Bay.

The lessees of the coal and limestone property here have been cutting a track through the timbered portion of their sections to the limestone which it is intended to utilise for the manufacture of Portland cement. They have carried out some boring for the double purpose of proving the coal-seam ahead of the present workings, and of obtaining data for establishing the quantities of clay available for the cement works. During this work a new seam of coal has been found, making altogether three seams on these leases. A sample of the coal has been

assayed in the Geological Survey laboratory, with the following results:—

Fixed carbon	50.13
Volatile matter	26.01
Ash	17.86
Moisture at 100° C.	6.00
	<hr/>
	100.00

The ash is a little high and the moisture is considerable, but the proportions of fixed carbon and volatile matter are satisfactory, pointing to probable improvement under further cover.

Samples of the clay and shale were also received, and assayed as under:—

	Clay, 10 feet thick 12 feet down.	Clay, 14 feet thick 26 feet down.	Clay, 35 feet thick 75 feet down.
Loss on ignition	8.96	7.42	9.01
Silica	60.82	65.24	57.32
Iron and alumina... ..	29.44	26.52	32.60
Lime	0.71	0.42	0.51
Magnesia	0.20	0.36	0.47
	<hr/>	<hr/>	<hr/>
	100.13	99.96	99.91

The clays near the surface (down to 26 feet) are very suitable for Portland cement making. The blue shale has a rather high proportion of iron and alumina, but not really higher than the proportions stated as being used in some of the American cements. It is not the theoretical ratio, which is one part of alumina and iron to 2.5 or 3 parts of silica, but the allowable limits appear to be somewhat wider in practice. However, unless the configuration of the ground is favourable, the depth of this shale is too great for cheap extraction. The satisfactory circumstance is, that according to the depths given, the suitable clays can be worked at surface.

Sand for Concrete.

During the year I examined an extensive deposit of sand and grit very suitable for cement concrete work on the hill range south-west of Beauty Point on the Tamar. There exists there a superficial bed of clean white quartz sand shown by open-cuts to have a thickness of 6 or 7 feet, spreading all over the flat surface of the top of the hill. Its adaptability for concrete work has been amply shown by its use at the Tasmania Mine for buildings and machinery foundations. It can be easily worked and delivered cheaply to the deep-water port at Beauty Point. Good sand will bear transport cost from a considerable distance, as exemplified by the transport of similar sand from the Blythe, on the North-West Coast, to Hobart, where it has been used in the Domain concrete work, as well as in the cement pipe works recently started by Messrs. Hume Brothers Limited.

Laboratory.

The Government Assayer's report, appended hereto, shows that 1694 analyses and determinations were made during the year. Besides the actual assaying and determination of samples

and specimens, a good deal of technical advice solicited by enquirers has been given by the Assayer. It is clear that much of the usefulness of the laboratory consists in such work. The library attached to the laboratory places the institution in a position to supply recent metallurgical information to persons seeking it. Many who are interested in the development of their ore deposits resort to the laboratory as a place where they can obtain reliable advice and particulars respecting modern metallurgical and treatment methods.

The scale of charges to the public is an extremely liberal one; most single metal assays being only 1s. each, and simple tests carried out free.

In connection with any examination of mineral deposits to be carried out under the recommendation of the Advisory Council of Science and Industry, this laboratory may be advantageously used for making the necessary analyses, a work which will be conducted by the Government Assayer.

Microscopical work and photo-micrography will be carried out by the Geological staff.

With a little more expenditure on apparatus work of a new nature could be undertaken. For instance, the distillation of oils and the determination of the calorific value of our coals—the latter is indispensable in coal assays. The necessary additional appliances are as follow—

- (1) Calorimeter for standard determination of heat values. The Assayer reports that its cost will be about £90.
- (2) Apparatus for the distillation of oils. This will cost about £30.

Industrial Science.

During the year the Geological Survey was invited by the Advisory Council of Science and Industry to supply information for a register of experimental research, giving particulars of work now in progress, its object, names of the staff, and details of any impediments to work arising from want of funds, equipment, or any other cause. This request was complied with.

Later I was requested by the Hon. the Premier to join (in the capacity of associate member) the State Committee which has been appointed under the Commonwealth Advisory Council to act as an agency for collecting research data and focussing the activities of science on industrial problems. In accepting this duty, I indicated how the Geological Survey could assist by directing public attention to the mineral resources of the State and expounding their adaptability to public use and benefit. The lines along which I conceived progress could be made were:—

- (1) To continue the examination and description of occurrences of minerals likely to be of increasing use, such as the munitions minerals, wolfram, scheelite, and molybdenite (reports on which are in course of completion), nickel, asbestos, cement materials, iron ore, coal, barytes, pottery clay, paint, ochres, building-stone, &c.
- (2) Provision of additional laboratory apparatus, more particularly for determining the calorific values of coal and for distillation tests.
- (3) The preparation of maps showing the distribution of minerals in Tasmania.

- (4) Provision for the more extensive museum exhibition of industrial minerals by the Geological Survey.
- (5) To encourage university students to work up material for these in the summer months, the Government paying their travelling expenses and the Mines Department publishing the results of the field or laboratory investigations in the form of geological survey bulletins. If the university makes an application on behalf of any student, I should suggest that the State Committee recommend a grant from the Advisory Council.

These are a few of the ways in which we can be of use in contributing to the diffusion of the kind of knowledge which it is desired to promote.

I am getting together collections of paint materials, barytes, asbestos, and building-stones for exhibition among our collections, and the work of the Survey this year has, generally speaking, been on practical lines designed to foster and encourage development of our useful mineral deposits. Among other subjects which have had attention is that of the utilisation of materials for the manufacture of paint. A very considerable deposit of ochres has been prospected in the neighbourhood of Launceston, and has been examined with a view of assisting in the establishment of the industry here. The preliminary products have been tried by various firms and corporations in the city, and have met with unqualified approval.

Mineral Collections.

Additions have been made to the collections in the museum during the year, but the available case accommodation is now exhausted, and acquisitions have to be stored for the present until more cases are provided. There is immediate need of a few cases for technical and industrial exhibits. These are urgently required in connection with the new movement for promoting our primary industries, and representations have been made to the Honourable the Minister with a view of meeting requirements in some slight measure.

A larger question is that of the structural addition to the museum building referred to in my last annual report. This, however, has perforce to remain in abeyance for the moment, but when the financial outlook improves it will have to be seriously considered if the permanent character and repute of the institution as a mining and industrial museum is to be maintained. With a generous outlay on building and equipment, and with the use of the ample material which the Geological Survey has at its disposal, the institution can be easily raised to the status of a State mining museum of the first rank.

With the additions which have been made to the collections, a rearrangement of them has become necessary, and as soon as this is effected it is intended to prepare a handbook or guide for the convenience of visitors, need for which is already being felt.

A representative collection of Tasmanian ores and minerals was assembled and sent to the Tasmanian Government Tourist Bureau for display at the Brisbane Exhibition, and for permanent exhibition subsequently, in the tourist offices there.

A collection of Tasmanian minerals for demonstration purposes was prepared for the Gladstone State school.

On the visit to Gladstone I placed on view during my stay in the township a small collection of Tasmanian economic minerals for the purpose of familiarising prospectors with the aspect of minerals which they are likely to meet with in their explorations, and this was much appreciated.

The Geological Survey of Canada has sent us a small collection of Canadian minerals, among which is a series of samples of asbestos rock and asbestos fibre illustrating the various classes of product turned out by the asbestos mills of that country. The asbestos specimens were put together for us by Mr. J. D. Sharpe, general manager of the Asbestos Corporation of Canada, Thetford Mines, Quebec. They are being placed in the museum for inspection by the public.

Geological Map of Tasmania.

The 15 miles to the inch map has been published. Its foundation is a geological map which was prepared in 1888 by Mr. R. M. Johnston, Government Statistician, in connection with his well-known work on the geology of Tasmania. It has been brought up to date by incorporating such additions and modifications as have resulted from the new material collected from time to time by the officers of the Geological Survey. In any work of this nature new material is bound to be gathered continuously, and already much could be added to the map just issued. The classification of the information for a large scale map will be taken in hand when circumstances permit, but until we have once more a settled full staff not much work of this kind is possible.

Staff.

Mr. Loftus Hills is still absent with the Mining Corps at the theatre of war, and is, I hear, rendering efficient service in the branch of work for which he volunteered.

I regret to say that at the close of the year Mr. Waterhouse found it necessary to resign his position on the Survey on account of ill-health, brought on by exposure in the field and climatic conditions generally. I cannot omit bearing testimony to the value and thoroughness of his work during the period that he has been with us, and I must express my deep regret at losing the services of an officer whose command of his work and devotion to duty, together with many other wholly admirable traits, gained for him the respect and appreciation of all who knew him.

Since Mr. Waterhouse left, Miss D. Middleton has, in addition to her office duties, been acting as librarian.

Library.

The library, supported by the annual vote devoted to its upkeep and by the donations of publications from scientific institutions all over the world (with whom we exchange literature) has acquired a firm status, and is the only one of its kind in Tasmania. It enables us to supply to the public highly useful technical and industrial information, in connection with which it is continually and largely used.

An indispensable feature of such a library is that it be kept without intermission up to date, in order that the information supplied may be of real use. If intervals are allowed during which no fresh literature accrues, the whole library has only a scrap value; while if its shelves are kept filled each year its value is incalculable. Successive Governments have recognised this, and no doubt it will be admitted that the present is a time when the State can least afford to lose sight of the necessity of taking all possible measures for organising and developing industrial research. The Commonwealth Advisory Council of Science and Industry is already instituting enquiries as to the literature possessed by the technical libraries of Tasmania and available for assisting the new movement. Our Government has therefore an opportunity of aiding in a modest way the scheme which it has been asked to further and encourage, and this by no new or special effort, but by simply continuing the policy which has been in force for many years.

Office.

During the year 1916 the correspondence and mail matter received and despatched comprised 2546 items (1411 outwards and 1135 inwards).

Five hundred and seventy-one publications have been received, comprising 103 interstate and New Zealand and 468 British and foreign, in addition to papers and various mining magazines. I have to acknowledge, with thanks, receipt from the proprietors of copies of the following papers:—Launceston "Examiner" and "Daily Telegraph," Australasian "Mining and Engineering Review," "Queensland Government Mining Journal," and others.

The Council of the Institution of Mining and Metallurgy, London, has been good enough to send us a complete set of its transactions, which form a valuable addition to our library.

University Students.

I would here renew a previous suggestion of mine, that the Geological Survey work might be advantageously extended by encouraging students at the University to work up material for a research thesis in the vacation months, the Government paying the travelling expenses and publishing the results as a Geological Survey bulletin. For large problems affecting the Commonwealth as a whole, adequate facilities for research are wanting in Tasmania, but there are domains of enquiry in which problems immediately affecting the State call for investigation, and which could be handled by University students with the necessary qualifications, and who were prepared to give the necessary time to them.

Programme of Work for the Current Year.

With the staff losses detailed above, the work this year will inevitably be greatly restricted. As far as can be seen it will embrace the following:—

- (1) Preparation of a report on cement material at Flowery Gully.
- (2) Preparation of a report on asbestos deposits in Tasmania.

- (3) Examination of limestone beds at Gunn's Plains.
- (4) Examination of occurrences of barytes at Alma, Port Sorell, and Minnow.
- (5) Current work in the laboratory by the Government Assayer.

The above, with the ordinary departmental work, and apart from any unforeseen demands, will fully absorb all possible attention for the year. Notwithstanding that under the present unprecedented circumstances, our expenditure must be curtailed by necessary economies, and the scale of work correspondingly reduced, no effort will be spared, as far as possible, to maintain normal efficiency and usefulness.

I have, &c.,

W. H. TWELVETREES, Government Geologist.

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

REPORT OF ASSISTANT GOVERNMENT GEOLOGIST.

Sydney, New South Wales,
28th April, 1917.

SIR,

I HAVE the honour to submit my report for the year ending 31st December, 1916.

In the early portion of the year my time was partly taken up in preparing a report on the occurrence of scheelite on King Island, and this report was completed on 31st May, and afterwards published as Mineral Resources No. 1, Tungsten and Molybdenum, Part III., King Island. This report included the assay results of 42 samples taken by me and assayed by Mr. W. D. Reid, Government Assayer. After publication very appreciative letters were received, indicating that the publication of assay results in this way proved of practical value to those interested in the development of the property.

During the year a considerable amount of time was devoted to office routine work, such as correspondence, library work, and the interviewing of numerous enquirers. Museum work also claimed a share of attention. During Mr. Twelvetrees' absence in the field, I carried out the office duties pertaining to the position of Government Geologist.

On 23rd June, acting on instructions received, I left Launceston for Flinders Island, essentially to investigate the reported occurrences of molybdenite in the group, but also to make a geological reconnaissance of the principal islands of the group. In the short time allowed it was found impossible to do more than gain a general idea of the geology of the more accessible portions of Flinders and Cape Barren Islands. Clarke Island was not examined. It must be borne in mind that Flinders Island has an area of about 800 square miles, and Cape Barren Island about 150 square miles.

On both Flinders and Cape Barren Islands old slates and quartzites (probably of Pre-Silurian age) are intruded by large masses of granite, both classes of rock being overlain by comparatively recent deposits of beach sand, usually consolidated, and carrying marine shells.

One occurrence of molybdenite has been located in the south of Flinders Island (on the northern slopes of Mt. Strzelecki), and one on Cape Barren Island (on the northern slopes of Mt. Munro). In each case the mineral occurs in granite, with which it is genetically connected. A very small amount of prospecting work had been done in each case, but in neither case had this work proved that the mineral occurred in payable quantity. On Cape Barren Island the molybdenite is associated with irregularly distributed coarse crystals and crystal aggregates of cassiterite.

The granite is stanniferous at other localities also, for deposits of alluvial tin ore have been located and worked in the north of Flinders, near Tanner's Bay (where there is difficulty in getting water on to the ground), on the western side of the island, near Pat's River (where the deposits have proved payable for small parties), and on the northern coast of Cape Bar-

ren Island, at Rook's River (where the deposit has proved highly payable). In no case had any defined lode-formation been located in connection with these alluvial tin deposits.

A variety of peat occurring in the south-east of Flinders Island has attracted some attention. It appears to have been formed by the decomposition of reed-like plants which flourish on the winter lagoons, and are deposited as the water disappears in the summer season. It is very doubtful if this peat really has an economic value, although it carries about 50 per cent. volatile matter.

The islands are worthy of a closer examination than I was able to give in the time available.

Leaving Cape Barren Island on 26th August, I reached Launceston on the following day.

Office duties claimed a large share of attention during the succeeding few weeks.

My health had been bad during the year, as acute rheumatism had been contracted during field work in the cold wet weather, and I was steadily growing worse, in spite of carrying on the treatment recommended by my medical adviser. At length, on 17th October, I was compelled to ask for the accumulated leave of absence which was due to me, and left for a warmer climate. Further medical advice confirmed the opinion previously expressed by my doctor, viz., that the case was a bad one, and that in spite of treatment recovery was impossible if I remained in Tasmania. After very careful consideration I decided to take my medical adviser's advice, and resign my position as Assistant Government Geologist and Inspector of Mines for Tasmania. My resignation dated from 5th December. It was with great regret that I took this drastic step and severed my connection with the Mines Department after four and a half years' service, but doctor's assurance that I would probably be permanently crippled if I remained much longer left no alternative.

In conclusion, I beg to tender my sincere thanks to all officers of the Department for help received during the past four and a half years, and to wish them all success and prosperity in the future. From mine managers, prospectors, and others I have always received a warm welcome and great kindness, and to them also I would tender thanks.

I have, &c.,

L. LAWRY WATERHOUSE.

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

REPORT OF THE GOVERNMENT ASSAYER AND
DRAFTSMAN.

Geological Survey Laboratory,
Launceston, 24th March, 1917.

SIR,

I HAVE the honour to submit my report on the work done in the Geological Survey Laboratory for the year ending 31st December, 1916.

The number of samples received was 502, involving 1202 separate determinations. Qualitative tests of 492 minerals were made for the public free of charge. The number of tests and determinations for the year totalled 1694.

Samples have been received from every mining district in the State. They included coal, shale, limestone, clay, and peat 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.

Judging by the increased number of samples received and the heavy demands made on my time by the mining public, the laboratory is proving of great value to the industry.

So much of my time has been devoted to supplying general information to the numerous callers that it has been impossible to carry out the ordinary assay work during office hours.

Information relative to modern methods of concentration of ores, fine grinding, and treatment plants has been supplied. All those to whom particulars have been furnished have appreciated very much the assistance rendered.

The work in the laboratory has now assumed such proportions as to warrant the appointment of an assistant.

Maps, plans, and sections have been prepared for the printer, and a considerable amount of time has been devoted to the checking of plans and sections of underground workings.

The correspondence during the year consisted of 604 letters, reports, &c., in and out.

I have, &c.,

W. D. REID,

Government Assayer and Draftsman.

The Secretary for Mines, Hobart, Tasmania.

REPORT OF THE CHIEF INSPECTOR
OF MINES.

Chief Inspector of Mines Office,
Hobart, Tasmania, 22nd May, 1917.

SIR,

I HAVE the honour to submit an annual report on the inspection of mines for the year 1916.

The work of inspection has been carried out by the same staff as in the preceding year. The principal mines have been visited frequently, and the provisions of the Act appear to have been complied with in a very reasonable manner. In some cases, as in isolated places where the mining operations are on a small scale or in the initial stages, it has not been possible to make frequent inspections. The value of inspections in such places is shown by the occurrence of the fatal accidents of the year having occurred on mines of this description only. In each case the accident was due to work being carried out in a manner which is not approved of by inspectors.

Accidents.—Appended is the usual diagram and statistical tables in connection with accidents. It is pleasing to find that only two accidents have occurred during the year with fatal results. In each case the accident occurred in small tin-slucing mines, and were due to men working alone when piping down the face and carrying out other work in front of the nozzle, a fall from the face covering the men before they could escape. No doubt the noise of the water from the nozzle prevented them from hearing the fall. There were fifty-three accidents for the year, being a reduction of thirty-eight compared with the preceding year. Twenty-five occurred underground and twenty-eight on the surface. Four of the accidents occurred in coal mines, and fourteen men were injured underground by falls of ground.

The number of persons employed on mines was 3864, being 34 less than the preceding year. The average per 1000 employed was 13.198; for the preceding year it was 17.144. Fourteen of the accidents were fractures or permanent injuries, the remaining seven were not injuries of a serious nature, but were such as to cause the injured man to be absent from his ordinary work for more than 14 days.

Prevention of Dust.

A system of jets or sprays is installed in all mines using rock-drills, and during the year have been maintained in a very satisfactory manner. When a large system of water-pipes is in use there will always be breakages which affect the water-supply. It is pleasing to note that these have not been of frequent occurrence. Inspectors have been instructed that when water is not available to allay the dust, that rock-drilling must be discontinued till water is again available. It is to be regretted that some of the men employed underground do not

realise that the allaying of dust is of the utmost importance in regard to health. It has been found necessary to take action in five cases during the year, and in no case was there reasonable excuse for not complying with the Act. It is to be regretted, too, that these five are not the only cases, but only those which have come under the observation of the inspectors. It is not uncommon to find men working rock-drills with dust around their mouth and nostrils, clearly showing that they have been drilling without using water to allay the dust. It is to be hoped that during the present year these men will realise that they are not only impairing their own health, but also that of others throughout the mine, who are forced to breathe the air laden with dust. This matter is of such importance that instructions have been issued that in all future prosecutions severe penalties will be asked for.

Inspectors' Reports.

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

I desire to tender my thanks to these officers for the able manner in which they have carried out their various duties.

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, 1916.

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	7·390	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	19·044	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
" 1916 " 1916	3864	53	2	51	53	13·716	0·517	13·198

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

Rate per 1000 men employed.

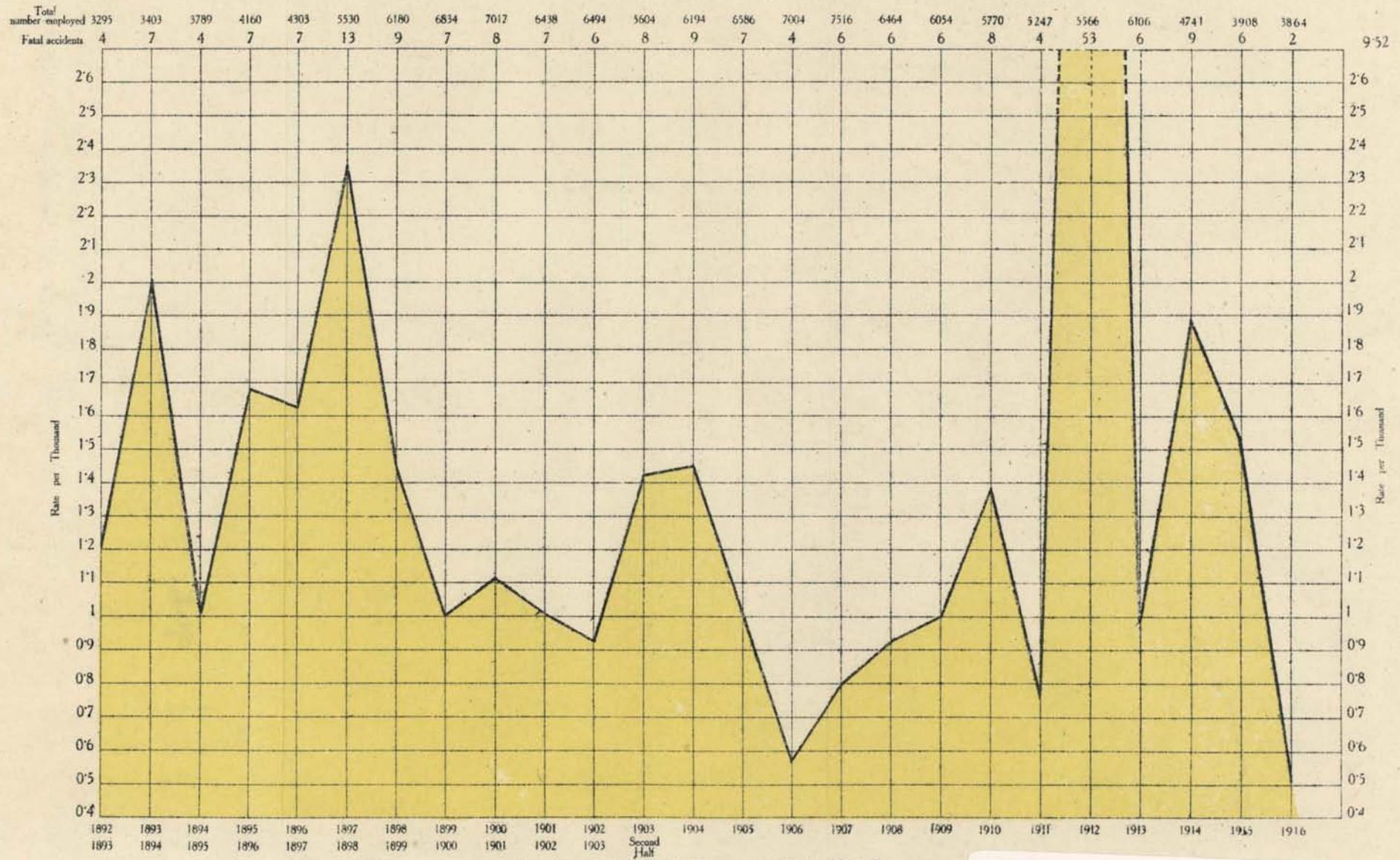


Photo Algraphed by John Veil Government Printer Hobart Tasmania.

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	1698	33	—	33	33	19·434	—	19·434
Zeehan, &c.	468	3	—	3	3	6·410	—	6·410

TABLE showing Rate per Thousand Killed and Injured in the different Divisions for the Year 1916.

Division.	Average Number of Persons 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	292	1	Nil	1	1	4·310	Nil	4·310
North-Eastern	473	4	2	2	4	8·456	4·228	4·228
Eastern	440	9	Nil	9	9	20·454	Nil	20·454
North-Western	553	3	Nil	3	3	5·425	Nil	5·425
Western	2166	36	Nil	36	36	16·620	Nil	16·620
Total	3864	53	2	51	53	13·716	0·517	13·198

TABLE showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Year 1916.

PLACE OR CAUSE OF ACCIDENT.	INSPECTION DISTRICTS.													
	Northern and Southern Division.		North-Eastern Division.		Eastern Division.		North-Western Division.		Western Division.				TOTAL.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Zeehan and other Districts.		Lyell District.			
Killed.									Injured.	Killed.	Injured.	Killed.	Injured.	
UNDERGROUND—														
Falls of ground	2	...	1	...	1	...	8	...	12
<i>Shaft Accidents—</i>														
Falling down passes and shafts	1	...	1	...	2
Total	2	...	1	...	2	...	9	...	14

<i>Miscellaneous (underground).</i>														
Haulage—														
Trams, &c. ....	...	...	...	...	...	2	...	...	...	...	...	4	...	6
Sundry accidents .....	...	...	...	...	...	1	...	...	...	1	...	6	...	8
Explosives .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total .....	...	...	...	...	...	3	...	1	...	1	...	10	...	14
<i>Total Underground</i> ....	...	...	...	...	...	5	...	1	...	3	...	19	...	28
ON SURFACE—														
Smelting-works .....	...	...	...	...	...	...	...	...	...	...	...	3	...	3
Machinery .....	...	...	...	...	...	...	...	...	...	...	...	4	...	4
Tramways .....	...	...	...	...	...	2	...	1	...	...	...	1	...	4
Falls of persons .....	...	1	...	...	...	1	...	...	...	...	...	...	...	2
Explosives .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Miscellaneous .....	...	...	2	2	...	1	...	1	...	...	...	6	2	10
<i>Total Surface</i> .....	...	1	2	2	...	4	...	2	...	...	...	14	2	23
GROSS TOTAL, 1916.....	...	1	2	2	...	9	...	3	...	...	...	33	2	51
Gross Total, 1915 .....	...	3	...	6	...	2	...	10	1	...	5	46	6	67

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, 1916.

Accidents.—Fatal, 2; non-fatal, 12. Total, 14.

Of the fatal accidents, the occurrence of which were of a very similar nature, it cannot be said that anyone was directly to blame in either case, although if strict observance of rule was maintained, as the inspector always tries to enforce, with regard to the working of deep open-cut sluicing faces, that is, that no man be allowed to work by himself, either during the day time or at night, in such places, in all probability neither of these accidents would have occurred.

There are but few rules necessary, or, indeed, that are required, in connection with the reasonably safe working of these sluicing faces: (1) A good supply of water with a sufficient head-pressure to admit of the nozzle being placed at a distance from the face being operated on; (2) plenty of room-space at the working-level and a good get-away (at all times free from obstructions) for the men employed; (3) safe sloping or batter of permanent banks of sluice-race and approach to face, good lighting at night time, &c.; (4) that no man be allowed to work by himself in any place where the face is deep and dangerous. Observance of this rule is most essential, as if there is only one man, and he leaves the nozzle to go nearer to the face to break lumps or for any other purpose, the noise of the water playing on the face will prevent him from hearing approaching danger from the face. As a matter of fact, the nozzle man should not leave his post whilst the water is on; he is the look-out man, and always in a position to give timely warning of immediate danger.

In the fatal accident at Lottah, when the body of the unfortunate man, Johnson, was recovered, he had still clutched in his right hand a hammer and a couple of nails, indicating that he was engaged laying iron tram-rails close into the face when he was caught. There was no one at the nozzle to give him warning, and so he lost his life.

The Cape Barren Island accident happened under similar circumstances to the Lottah one, but in this case the owner of the mine, John Fisher, prior to going away for a few days, gave instructions to the two men, Booker and his mate, Burgess, to work together in a certain portion of the face, and not to run any risks or to go into danger. His instructions were not obeyed. Burgess went away in the morning, and Booker, left to work alone, went too close to the face to break up lumps, and was caught by a fall. Luckily a man named Lowrey and his wife were at work in a claim not far away, and, hearing his cries, went to Booker's assistance, otherwise the unfortunate man might have been left to die a lingering death.

The occurrence of these accidents was not reported to the inspector. No mine manager had been appointed, as required by the Act.

In the Cape Barren Island case Fisher had some excuse, living in such a remote locality; but in the Lottah accident there was no excuse, and the owner, Charles Maddox, was proceeded against for a breach of the regulations. He pleaded guilty, and was let off with a nominal fine and costs.

Of the 12 non-fatal accidents, with the exception of the first and the last on the list, the remainder may be classed as unavoidable, or occurrences for which no person was to blame. In the case of the Gipps Creek accident, Sullivan was doing a bit of burrowing in his wolfram tribute claim, and narrowly escaped a very serious accident through his carelessness in not timbering the ground properly. At the Royal George Mine, Dabner, an experienced miner, attempted to descend to a lower ledge for refuge whilst his son fired a couple of holes they had drilled in a rock-pillar in the open-cut. He missed his footing, probably trusting to a slack rope, and fell on to loose stones, sustaining rather severe injuries. He could have ascended the rock slope in safety to the surface, 15 feet, using the rope provided for the purpose. He has only himself to blame for the accident.

Ventilation.—The ventilation of both coal and metal mines is adequate in most instances; so far as the metal mines are concerned, it is very good. A proper means of destroying dust arising from the use of rock-drills underground or from machinery in use at other places is provided.

Health of the Miners.—This, so far as can be judged in the absence of medical testimony, is fairly good. The conditions that men work under in these mines at the present time with regard to ventilation, &c., should go far to prevent the contraction of pulmonary diseases. Proper latrine accommodation is now being provided in coal as well as in metal mines. Hitherto the pan system was not in use in coal mines. The world-wide spread of hookworm disease (*Ankylostomiasis*) amongst coalminers (some cases already known in Queensland) has, however, induced the Chief Health Officer, Dr. Robertson, to strongly recommend that proper sanitary conveniences be provided and used in every mine in the State. It has cost, the doctor says, the American Government £2,000,000 to combat the ravages of this dreadful disease. The most important part of prevention rests in perfect sanitation, which, short of proper sanitary conveniences, cannot be attained. Change-houses for collieries is also recommended, although the use of such is not insisted on in any of the other States, Western Australia excepted. Coalminers everywhere are accustomed to go to their homes, after coming off work, before changing their sweat-laden clothes, and it will be difficult to make them alter this practice. Tasmania is no exception to the general rule, and so far as I have been able to ascertain, the majority of the coalminers here are opposed to the use of the "change-house." The matter is at present in abeyance, as it is not desired to compel owners of collieries to incur the cost of constructing proper change-houses until there is a certainty that such places will be used by the miners.

Equipment.—The mines as a whole are well equipped, and proper attention is given to machinery in use, cages, ropes, and safety appliances are maintained in good working order.

Magazines and Explosives.—The magazines are properly placed and constructed, and well kept as a rule; careless or ill-

kept places are not tolerated. The explosives in use are of good quality.

Quarries' Inspection.—No accidents have been reported from quarries in my districts during the year.

Under "The Mines and Works Regulation Act, 1915," power is given for extending and applying the provisions of this Act, or any of them, with such modifications and alterations as the Chief Inspector may recommend and the Governor approve, to quarries, tunnels, reservoirs, or any other works or undertakings of a similar nature, other than mining. Already a number of the principal quarries in connection with harbour works, reservoir-construction, brickmaking, building, road-making, &c., in the North and South have been gazetted as coming under the provisions of a number of sections and general rules of the Act, that will enable an inspector to deal with them as if they were mines. Inspections have been made as frequently as practicable. The handling and use of explosives, as well as dust arising from the use of crushing and screening machinery, were the principal things requiring to be remedied.

Magazines.—Licences have been issued for nine new magazines in the North, including one at King Island. The total number now licensed is 49. Permits to sell explosives (the fee for which is 5s. per annum each) were issued to 44 applicants, and permits to convey explosives to 11.

Inflammable Oils.—Inspections have been made from time to time of registered premises for the keeping of petrol, kerosene, and carbide of calcium. Certificates of registration have been issued to 36 applicants for this purpose; also five licences for stores stocking up to 200,000 gallons each. The respective stores and premises are kept in a satisfactory condition with regard to safety and cleanliness.

Appended is a tabulated list of accidents mentioned in this report.

LIST of Accidents in Inspector Griffin's District for Year 1916.

Fatal, 2 ; non-fatal, 12 ; total, 14.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Age.	Killed.	Injured.	Particulars.
1916. 14 Jan.	Mace's Wolfram Section	Gipp's Creek, Avoca	Fall of ground	Sullivan, Joseph	Single	40	—	1	Sullivan and party worked Mace's section (wolfram) on tribute. He was caught by a fall of ground while stoping, and had two ribs broken ; was 37 days off work, as result of accident.
29 Jan.	Mt. Nicholas Coal Co.	Mt. Nicholas	Fall of coal	Croft, Keith	Single	18	—	1	Croft, employed as wheeler, was assisting others to draw chocks in No. 7 right hand road. A piece of coal fell out of the side and crushed his hand against a chock. He was off work 43 whole days as result of the injuries received.
3 Feb.	Arba Tin Mining Co.	Branxholm	Struck by wood flying from schute	Davis, Harry	Married	44	—	1	Davis was employed stacking firewood at schute, and attempted to move a piece that stuck without first signaling to the man at top ; was struck by a flying piece of wood and sustained fracture of leg above the ankle. Was off 94 working days as result of the accident.

LIST of Accidents in Inspector Griffin's District for Year 1916—continued.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Age.	Killed.	Injured.	Particulars.
1916. 17 Feb.	Tasmania Gold Mine	Beaconsfield	Fall from building	Dummett, Geo. Thos.	Married	34	—	1	Dummett was assisting to dismantle an old boiler house, when he fell from a height of 10 feet and fractured a wrist bone, also sustained slight cuts on head; was off 50 working days as result of injuries received.
18 Feb.	Ben Lomond Republic Tin Mine	Avoca	Stone rolling on trolley	Keefe, John J.	Single	40	—	1	Keefe was trucking out stone from an open-cut excavation; when tipping trolley a stone rolled against his leg, inflicting a severe wound. Was for a time in the Launceston General Hospital. Not reported as having returned to work at the mine.
13 Mar.	Chas. Maddox Tin Section 6818-M	Lottah	Fall of earth	Johnson, James	Married	60	1	—	Deceased was employed by his son-in-law, Chas. Maddox, and worked in a deep face open-cut tin-slucing mine at old "Cambria." He and Maddox each worked alone, 12-hour shifts; Maddox went on at noon on the day of accident to find that Johnson was buried beneath a very large slip of earth, from the 60-ft. face. From appearances, when the body was recovered, it would seem that he was laying tram rails between the nozzle and the foot of face, when the fall overwhelmed him. He should not have worked alone; there was no one to warn him of danger.

19 Apr.	Mt. Nicholas Coal Co.	Mt. Nicholas	Uncoupling moving skips	Nolan, Terence	Single	17	—	1	Nolan was employed shunting and coupling coal skips at bank top; was uncoupling skips on inclined haulage line, got the fingers of his right hand jammed between links and hook, causing severe laceration. Was off work 18 days.
4 May	Royal George T.M. Co.	Avoca	Hand caught by stamp	Furley, Edward	Ditto	25	—	1	Furley, employed as mill-foreman while adjusting one of the stamps, had the first joint of thumb on his left hand jammed off: was off work 27 whole days as result of injuries he received.
25 May	Briseis Tin and General Mining Co.	Derby	Finger jammed when filling truck	Quinn, Walter E.	Married	40	—	1	Was filling dirt into a truck in Ringarooma O.B. face, and jammed the second finger of his right hand. He continued to work for two days, when septic poisoning supervened. Was off work 76 days.
17 July	Mt. Nicholas Coal Co.	Mt. Nicholas	Caught between coal skips	Meehan, Clement	Single	17	—	1	Meehan, engaged as pony driver, was running skips down to end of flat; other skips followed; his arm got caught between buffers of two, break-small bone. He is not reported as having returned to work.
17 Aug.	Ditto	Ditto	Skips leaving rails	Aulich, Chas.	Married	56	—	1	Aulich was emptying dirt skips at bank top, rode on back of empty skip, which tilted and left the rails; he fell on his side, on edge of board, and sustained bruises. Was off work 28 days.
11 Sept.	Royal George Tin Mine	Avoca	Piece of stone falling	Hill, William	Ditto	23	—	1	Was working in open-cut over stopes; a small piece of stone fell on his hand, crushing a finger badly. Was off work 30 whole days as result of injuries received.

LIST of Accidents in Inspector Griffin's District for Year 1916—continued.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Age.	Killed.	Injured.	Remark.
1916. 7 Oct.	Fisher's Tin Mine	Rooke's River, Cape Barren Is.	Fall of earth in open-cut face	Booker, William	Not known	49	1	—	Booker was employed by John Fisher, and worked alone in open-cut sluicing face, his mate, Percy Burgess, having left him in the morning. About 3 o'clock in the afternoon he was found partly buried from a fall of earth from the 15-ft. face, his right leg broken in four places, also fracture of left thigh, and some internal injuries. Was attended by Dr. McSweeney, of White Mark, Flinders Island. He died on the fourth day after the accident.
15 Nov.	Royal George Tin Mine	Avoca	Fall down open-cut face	Dabner, William	Married	56	—	1	Dabner and his son, James, were working a machine drill on one of the tin rock pillars, spanning the open-cut, about 15 feet below the surface. He attempted to descend to a lower ledge, but lost his footing and fell about 25 feet on to broken stone, overlying stope rill. Sustained severe scalp wounds, and shock. Was discharged from hospital five weeks after accident.

MR. INSPECTOR HARRISON (Zeehan) reports:—

In submitting my report for the year I am pleased to state that we have been free from any very serious accidents. A miner lost an eye through a small particle of stone striking it while pitching off a hole. This, I consider, the most serious accident reported.

Safety Appliances.—Safety appliances have received strict attention. Old ropes have been replaced by new ones where necessary.

Magazines.—I have had no complaints respecting magazines. Inspection has shown them to be well looked after.

Inflammable Oil Stores.—Stores for inflammable oils are kept clean, and in fairly good order.

Ventilation.—I have only one mine in my district where complaints are being made respecting faulty ventilation; and in this instance the manager is doing all he possibly can to rectify the evil.

Zeehan.—The State Mine, I regret to state, has, so far, proved a disappointment. Nothing of a satisfactory character has been found in the bottom level; but the No. 1 level has shown a decided improvement during the last six weeks. The unwatering of the flat keeps a large number of small parties of tributers employed.

Nike Mine.—This mine (late Queen Extended) keeps up a fair output of high-grade ore. Power for pumping and winding is obtained from the municipality power-station, distant about $1\frac{1}{2}$ miles. Sufficient power for winding is only obtainable about six hours per day. This is a serious hindrance to the more rapid development of the mine. The output for the quarter ending December 31 was 68 tons of marketable ore, value £1260.

Tributes.—All the other mines on the Zeehan field are in the hands of small parties of tributers, most of whom are making over wages.

North-East Dundas.—The Dreadnought-Boulder Mine has kept up a steady output for the year, although there were several serious delays through shortage of water during dry weather. The mine is opening up well, and the manager has no difficulty in keeping the battery supplied with ore. On this property there are very extensive deposits of sulphide ore which could be exported to advantage if better means of transit to the railway trucks were obtainable. Crushing material treated for the year, 10,622 tons, which gave a return of 96 tons 19 cwt. 1 qr. 22 lb.; net weight, 83 tons 12 cwt. 3 qr. 4 lb.; value £7834 3s. 8d.

Renison Bell Mine.—This mine still remains idle. On the property there are large deposits of sulphide ore available.

Montana Tin Syndicate.—The tributers are obtaining satisfactory results. Their small reduction plant is constantly employed.

The Central Tin Mine.—This mine is worked by tributers, with fair results.

Stanley River.—The work is mostly of a progressive character—sinking main shaft, &c.

Mt. Lindsay.—This property has been taken over by the company from the tribute party that held it, and they are opening up a good face of ore.

X River.—This somewhat neglected district is looking up again. A small parcel of ore sent to the Renison Bell Mine for treatment gave very satisfactory results.

Rosebery.—The mines in this district have been taken over by the Mt. Lyell Company, and the work going on there, and also at Mt. Read, is only of a developmental nature, by the aid of the diamond-drill, &c.

Tullah.—The North Farrell is keeping up its usual output of galena, and proving to be a splendid property.

Waratah.—At the Mt. Bischoff Mine work is going on as usual. A large area of wash is being opened up in the North Valley district. The Mt. Bischoff Extended Mine is keeping up the usual returns. The company is opening up the deeper levels.

South Bischoff.—This is a new district, from which good tin results are anticipated. The mine is about 10 miles from Waratah by road and track. The turn-off is about 6 miles distance on the Corinna-road. The prospectors have erected a small battery, and have obtained a satisfactory result from a trial crushing.

Whyte River.—The Cleveland Tin Mine is working away, but should be in a much better position than it is. Want of capital to equip it with a suitable crushing-plant is the trouble.

Hazlewood.—The Victorian Magnet Mine is still prospecting. The Jasper Company has been constructing a large dam to supply water for crushing purposes.

Magnet.—The Magnet Silver Mine is opening up splendidly. The deeper levels are giving good results. I regret to state that the ventilation of this mine is far from perfect. The principal cause for this is the introduction of steam underground for power purposes. The manager is now doing his best to improve the conditions by a rise to the surface from No. 4; the driving of another adit; the connecting of the various levels by extra rises; and by the introduction of a powerful exhaust fan.

Savage River (Osmiridium).—A few men are returning to the river, as there is now a good market for the metal, which realises £12 per oz.

In conclusion, I may state that there is a much better feeling existing amongst the business people of Zeehan as to the future of the district. The taking over of the big mines of Rosebery and Mt. Read by the Lyell Company, the erection of reduction works in the near future, and the knowledge that there is an abundance of minerals to supply the same should certainly give considerable impetus to the field.

LIST of Accidents in Inspector Harrison's District for the Year 1916.

Fatal, 0; non-fatal, 8; total, 8.

Date.	Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1916.									
Mar. 18	Bischoff Extended	Waratah	Jammed by truck door	Albert Evans	Single 18 years	Right hand lacerated	—	1	Injury not serious; absent from work for over 14 days
Mar. 18	ditto	ditto	Carelessness in using adze	Charles Ellis	Single 24 years	Cut leg	—	1	Manager reported accident due to carelessness.
Mar. 22	ditto	ditto	Cut	R. W. Ellwood	Married 27 years	Poisoned hand	—	1	Hand was cut while shovelling; dirt got into the wound, which showed signs of poison
May 6	North Mt. Farrell	Tullah	Hit by crusher-jaw	Jas. Longheran	Married 32 years	Wrist and left hand cut	—	1	Slipped while assisting to carry a crusher-jaw to the mill
May 20	State Mine	Zeehan	Fall of rock	Arthur Morris	Married 52 years	Two ribs broken	—	1	Struck by piece of rock when working out results of round of shots fired by previous shift
June 6	Bischoff Extended	Waratah	Fall of rock	Rd. Shuttleworth	Married 35 years	Cut forearm	—	1	While engaged clearing a pass, a piece of ore fell from overhead, striking arm
June 16	North Mt. Farrell	Tullah	Struck by bucket	George F. Garrett	Married 45 years	Two ribs broken and bruised side	—	1	While sinking a shaft, the strap round a bucket broke, causing the latter to fall, inflicting injuries mentioned
July 11	Nike Mine	Zeehan	Struck by stone	Walter Matheson	Married 37 years	Loss of eye	—	1	While pitching a hole, preparatory to hand-drilling, a small fragment of stone flew up, striking and destroying the eye; the eye was removed at Launceston

MR. INSPECTOR CURTAIN (Queenstown) reports:—

Following the tabulated list of accidents already supplied, I further beg to state that, apart from Meaney's, the balance of all local casualties has been of a minor character, and the injured men in each instance returned to work.

Health of the Miners.—“Miners' Complaint,” and the ills usually allied with the calling, remain normal. The medical testimony—especially that supplied by Dr. Love, who, residing in Gormanston, is in closer touch with the majority of those working underground—states, “that while additional cases of pneumokoniosis continue to crop up, those for 1916 were all in elderly men who had been mining for a long time, and having worked in other fields it was not possible to say where they contracted the disease. During the year no fresh case of men below 40 years of age had come under notice, so that the precautions taken, coupled with the fact that the men themselves are understanding more about its gravity and insidiousness, tends to lessen the incidence of the complaint; the deaths in all cases being confined to those affected for many years. Pneumonia and other chest complaints were less frequent than for some preceding years. Troubles due to alcoholism were much less amongst the general community, but a number of undesirable “birds of passage” have lately been brought into the district, and amongst them disease of all kinds is common, including a number of “mentally defectives,” whose presence constitute a source of very real danger in a mine. Many men have also arrived who were quite unfitted for mining work, and of whom a considerable number had to be sent straight to the hospital; while others were returned from whence they came without doing any work.

Casualty Wards.—At both of the Mt. Lyell Company's principal mines suitable buildings, equipped with first aid requisites, have been erected. A similar building is included in the alterations and renovations that are now taking place at the reduction works, where temporary relief is afforded pending the ultimate disposal of the case.

Sanitation.—Latrines and receptacles for all waste or refuse, in accordance with the general requirements of the Mining Regulations, are provided, but in many instances fail to receive the attention and appreciation they deserve.

Dust.—Provision for combating this evil prevails in all the underground workings, while the application of water-jets to all elevated holes is rigidly enforced; in connection with which there have been no less than five prosecutions, and in each case a penalty was imposed on the defendants.

Ventilation.—This in the principal mines is good, and as work progresses in the deeper levels of the Mt. Lyell Blocks Mine, it may become necessary to recommend another connection for this purpose with the adjoining North Lyell property.

Changing Houses.—These in the principal mines are well up to date, and in addition to the wash-hand basins, possess tub and hot and cold shower-baths, that are well availed of by the men. A similar structure is being also completed at the reduction works.

Fuse Detonators, Explosives, and Candles.—These commodities are still consumed in large quantities, and generally

give satisfaction, although two separate cases of fumes or "gassing" have been investigated. The statements in both instances were somewhat contradictory, and the cause in each case may in a measure be attributed to the men returning too soon.

Ropes and Cages.—Periodical tests have been carried out, in compliance with the requirements of the Mining Regulations, and apart from the ropes in use at the Lyell Blocks Mines, those factors are satisfactory. Ropes to replace the exception mentioned have arrived on the mine, and are now being shod and made ready to put into immediate use.

Inspections.—Without entering into detail, these have been weekly spread over the mines and works in operation, including visits to Zeehan, Tullah, and Waratah; and it is pleasing to add that a general reciprocation towards ensuring a reasonable degree of safety invariably met my efforts, both from the mine officers, and men who were associated with them.

No.	Name	Rank	Age	Height	Weight	Complexion	Build	Education	Religion	Marital Status	Family	Remarks
1
2
3
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10

List of Men employed at the Lyell Blocks Mines, 1911.

LIST of Accidents in Inspector Curtain's District for the Year 1916.

Fatal, 0 ; non-fatal, 33 ; total, 33.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1916. Jan. 13	Mt. Lyell M. & R. Co. Ltd., (North Lyell)	N. Lyell	Lifting a truck	Robert Hayes	Single 17 years	Sprained foot	—	1	In an endeavour to place a truck on line, ankle was twisted and strained
Jan. 15	Do., do.	Ditto	Tipping-up of truck	Robert Hook	Single 27 years	Jammed finger	—	1	Owing to a broken rail, the truck that was being pushed tipped up under a chute, causing finger to be jammed
Jan. 25	Do. (Mt. Lyell)	Gorman- ston	Lifting tim- ber	Henry Geard	Married 51 years	Strained back	—	1	Over-exertion, while loading pass-logs in timber-yard, caused back to be strained
Mar. 13	Do. (N. Lyell)	N. Lyell	J a m m e d between two trucks	John Hales	Married 54 years	Bruised back & side	—	1	Caught between two trucks while endeavouring to couple them
Mar. 27	Do., do.	Ditto	Struck by a plank	Geo. McAuley	Widower 51 years	A b r a - sions face & arms	—	1	During the operation of "popping," the boulder being operated on rolled on to a plank, causing the latter to fly up
Mar. 29	Do., do.	Ditto	Fall of rock	Frederick Lut- terall	Widower 38 years	Calf of leg crushed	—	1	By accidentally slipping was unable to avoid a fall of rock, which occurred during "bar-ring-down" operations subsequent to sand blasting

Mar. 29	Mt. Lyell Blocks Copper Mine	Ditto	Struck by rivet-head	James H. Jones	Single 20 years	Eye perma- nently injured	—	1	When assisting blacksmith to cut off rivet-heads one flew up, striking the eye
Apr. 4	Mt. Lyell M. & R. Co. Ltd. (Mt. Lyell)	Gorman- ston	Fall of schist filling	Ernest Hock- ing	Single 39 years	Sprained ankle	—	1	Due to a fall of "side-filling" or mullock, while assisting to effect repairs
Apr. 7	Do., do.	Ditto	Struck by particle of steel	Andrew Geo. Perry	Married 35 years	Loss of an eye	—	1	Due to the detachment of a piece of steel from workmate's ham- mer flying upwards
Apr. 8	Do. (Re- duction Works)	Queens- town	Cross-bearer giving way	Maurice Ahearne	Married 28 years	Concus- sion of brain	—	1	Through the giving way of a cross-bearer, while assisting to dis-mantle a coal-bin, a fall of 29ft. resulted
May 5	Do. (Mt. Lyell)	Gorman- ston	Struck by boulder	William Cosker	Married 47 years	Knee cap bruised and sprained	—	1	While working in one of the open-cut benches, a boulder, rolled by the ganger from the bench above, swerved from the course it was expected to take
May 9	Do. (Re- duction Works)	Queens- town	Jammed	Frederick Allomes	Married 37 years	Hand jammed	—	1	Hand became jammed between a hauling crook and a centre stud of the building when assisting to drag a load of moulded bars to trimming floor
May 10	Do., do.	Ditto	Slip into slag drain	Percival Rush	Single 17 years	Burnt leg	—	1	In attempting to control a loaded slag-pot, was overborne, and backed into slag drain
May 24	Do. (N. Lyell)	N. Lyell	Fall of rock	Louis Genick	Single 24 years	Crushed thumb	—	1	While machine-boring an ele- vated hole, a wedge-shaped lump of ore fell out of the "back," with the result stated

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

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1916. May 30	Mt. Lyell M. & R. Co. Ltd. (N. Lyell)	N. Lyell	Fall of timber	Henry Brough	Married 61 years	Broken thumb and bruised leg	—	1	Due to the falling of a "leg" that was temporarily placed on one side when building a pass
June 5	Do. (Mt. Lyell)	Gormanston	Adze slipping	Chas. Stanton	Married 27 years	Cut knee	—	1	Due to the slipping of an adze used while at work in timber-shed
June 8	Do., do.	Ditto	Fall of ore	Andrea Fatiga	Married 29 years	Broken toe	—	1	When barring-down, a piece of ore fell, and broke the big toe
July 15	Do. (N. Lyell)	N. Lyell	Timber slipped	James Cahill	Single 61 years	Crushed fingers	—	1	While getting pass-timbers down a mullock-chute, a piece slipped, hit the left hand, and crushed three fingers
July 18	Do., do.	Ditto	Fall of rock	Robert John Meaney	Married 62 years	Compound fracture of leg, &c.	—	1	While engaged in filling a truck, a side piece of rock came away, striking and fracturing the leg, and bruising head and shoulders
July 21	Do., do.	Ditto	Truck tipped back	Frank Best	Single 45 years	Bruised chest, side, and ankle	—	1	Injuries caused through being pinned to the ground by a truck, which tipped back when ejecting its contents into a mullock-chute

July 27	Do. (Mt. Lyell)	Gormanston	Fall of stone from chute	Harry Matthews	Married 32 years	Broken finger	--	1	Struck on hand by about 1½ cwt. of stone while "poking" main mullock-chute in open-cut
Aug. 4	Do. (N. Lyell)	N. Lyell	Fall of ore on foot	Cecil Pullen	Single 20 years	Crushed big toe	--	1	While "poking" ore-chute, a piece of ore rolled out and fell on big toe
Aug. 7	Do. (Mt. Lyell)	Gormanston	Fall down pass	Thomas Wilcox	Widower 50 years	Broken rib and bruises	--	1	Fall was due to slipping when engaged in shovelling ore into the pass
Aug. 10	Do. (Reduction Works)	Queens-town	Splashed by matte	William Edw. Burns	Single 20 years	Burnt foot	--	1	While tapping No. 3 fore-hearth, a splash of matte lodged in boot
Aug. 14	Do. (N. Lyell)	N. Lyell	Struck by, or a fall against, timber	Martin Laurence McConochie	Married 53 years	Broken rib and bruises	--	1	A heavy pass-log, on being thrown to the ground, rebounded; or accident may have been caused by a fall against the timbers of an adjoining ore-chute
Aug. 14	Do. (N. Lyell)	Ditto	Caught between two tracks	Clive Coventry	Married 23 years	Crushed finger	--	1	Finger became jammed when letting a rake of full trucks on to the plat
Aug. 22	Do., do.	Ditto	Fall of ore	Richard E. Hocking	Married 30 years	Bruised head	--	1	Struck on head by a small piece of ore when returning by the man-way
Sept. 6	Do., do.	Ditto	Fall of rock	John Monsell	Married 44 years	Crushed finger	--	1	While timbering, a small piece of schist fell from the "back," striking and breaking fore-finger
Sept. 27	Do. (Mt. Lyell)	Gormanston	Struck by spaul	William Rowe	Married 37 years	Contused eyeball	--	1	While spauling ore, a small piece flew up, hitting the eye, and causing sight to be temporarily impaired

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

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Remarks.
1916. Nov. 16	Mt. Lyell M. & R. Co. Ltd. (Mt. Lyll)	Gorman- ston	Slip	Reidar Parsons	Single 21 years	Sprained knee	—	1	Injury caused by slipping heavily on knee when loading timber on No. 7 plat
Nov. 18	Do. (Lyll Comstock)	N. Lyell	Lifting heavy weight	Robt. McKenzie	Single 36 years	Partial rupture	—	1	Over-exertion at open-cut workings while lifting a boulder into truck
Dec. 9	Do., do.	Ditto	Fall of rock from chute	William Pell	Married 45 years	Broken shoulder blade	—	1	While engaged clearing a drain from open-cut near main chute, a piece of rock bounded out, striking and breaking right shoulder-blade
Dec. 13	Do. (Mt. Lyll)	Gorman- ston	Truck tipped backwards	Anovata Xic- lema	Single 20 years	Right leg broken	—	1	When assisting to tip a truck in the open-cut workings, it overbalanced backwards, striking and breaking the right leg

REPORT OF THE CHIEF INSPECTOR OF EXPLOSIVES.

Chief Inspector of Magazines and Explosives,
Hobart, Tasmania, 26th May, 1917.

SIR,

I HAVE the honour to submit my annual report in connection with "The Explosives Act, 1915," and "The Inflammable Oils Act, 1910," for the year 1916.

The usual custom of furnishing a table of the explosives imported into the State will not be resumed till the termination of the war. It is also deemed advisable that any discussion in regard to explosives should be withheld from publication during the period of war. The quality of explosives imported was good, with the exception of one shipment, which did not prove satisfactory, but provision was made before it was used to restrict its use to places where it could be handled without danger.

Magazine Licences were issued to 84 persons, being an increase of eight, compared with the preceding year; Twenty-one permits to convey explosives were issued, being an increase of one compared with 1915. Ninety-seven permits to sell were issued, exceeding 1915 issues by 27. Ten permits were issued to import, being 13 less than 1915.

Inflammable Oils.

Eighty-six premises were registered for the storage of inflammable oils, being 12 less than the preceding year.

Thirteen licences to store inflammable oils were issued, being two more than the preceding year. A large number of persons still continue to store inflammable oils without a licence. These are principally in country centres, and are difficult to locate, but every endeavour is being made to bring such storage under the provisions of the Act.

Prosecutions.

There were four prosecutions during the year; two being for storing inflammable oils on unregistered premises; one for landing explosives on a wharf without permission; and one for storing explosives without a licence. In each case a fine was imposed.

<i>Revenue.</i>	£	s.	d.
Magazine rents	222	0	7½
Licences to store inflammable oils	16	0	0
Private magazines	84	0	0
Permits to import	20	0	0
Permits to sell	24	5	0
Permits to convey	5	5	0
Registered premises	21	10	0
Total	£393	0	7½

Magazine licences	84
Registered premises	86
Permits to sell	97
Permits to convey	21
Permits to import	10
Licences to store (10 at £1, and 3 at £2—£16)...	13

I have, &c.,

J. O. HUDSON,
Chief Inspector of Explosives.

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

Accidents.

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

Date.	Locality.	Explosive.	Name of Person.	Injured.	Cause.
1916. Sept.	Devonport	Detonator	Lamprey	1	A boy given a detonator by his father, while playing with it in school, caused it to explode, injuring his finger seriously
April 30, 1916	Tyenna	Powder	Walter Cole	1	After charging, Cole neglected to remove the powder, and, when firing the charge, a spark ignited the powder in the cask, causing serious injury to his eyes