

AR 1917

TASMANIA



REPORT

OF THE

SECRETARY FOR MINES

FOR

YEAR ENDING DECEMBER 31

1917

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



Tasmania:

JOHN VAIL, GOVERNMENT PRINTER, HOBART

1s. 6d.]

1918

B82094

TABLE OF CONTENTS.

	PAGE
Annual Report of the Secretary for Mines	1
Gold won	44
Silver-lead Ore : Quantity and Value	44
Copper, Blister :	45
Copper Matte :	45
Copper Ore :	46
Tin : Statement of Export and Production	46
Wolfram : Quantity raised, Value	47
Coal :	48
Iron Ore :	47
Asbestos :	50
Bismuth :	49
Osmiridium :	48
Barytes :	49
Iron Pyrites :	51
Shale :	50
Scheelite :	51
Zinc :	51
Miners Employed : Average Number of	53
Leases issued	56
Land applied for : Total Area	55
Leases in Force	57
Leases in Force : No. of, for various Minerals	59
Miners employed	54
Dividends paid	52
Total Revenue	54
Mining Companies Registered	53
Quantity and Value of Minerals raised since 1880	52
Annual Value of Mineral Products for each year from 1880	58
Net Revenue : Comparative Statement	60
Report of the Mt. Cameron Water-race Board	61
Annual Report of the Government Geologist	63
Annual Report of the Acting Assistant Government Geologist	77
Report of the Government Assayer and Draftsman	80
Report of the Chief Inspector of Mines	81
Reports of Inspectors of Mines	87
Report of the Chief Inspector of Explosives	102
Notes on the Discovery of a New Fossil Fruit	104



Report of the Secretary for Mines.

Mines Department,
Hobart, 18th April, 1918.

SIR,

I HAVE the honour to submit my report on the Mines Department and the Mining Industry for the year ending 31st December, 1917.

GENERAL REMARKS.

The aggregate value of minerals raised during the year was £1,584,290, being an increase of £63,240 on the value of the output for the previous year.

With the exception of copper pyrites, wolfram, bismuth, and asbestos, there has been a decrease in the output of all minerals, but with the increased price of metals and the production of scheelite and zinc for the first time in the State, the value of the output has been maintained. This may be regarded as very creditable considering that, owing to the war, it is very difficult to obtain men and mining machinery, while the strikes on the mainland and the increase of wages owing to the increased cost of living have considerably handicapped the progress of the industry. On the other hand, the increased price of metals and the demand for war-time necessaries has been an incentive for increased production.

The Mt. Lyell Mining and Railway Company Ltd. has been the chief producer of gold, and the Tasmania Gold Mine still continues to extract a considerable quantity of gold from the battery tailings sand. No new gold discoveries of importance have been made during the year. Several of the mines working last year with assistance from the Government have been forced to close down, and the mining plants have been sold and removed.

The New Golden Mara Mine at Branhholm has again been taken up and a new company formed. This is the third attempt, and the last three crushings, although small, have proved sufficiently encouraging to induce the company to continue further developmental work.

AID TO MINING.

The following is an account of the work carried out under the provisions of "The Aid to Mining Act, 1912":—

Assistance to tributers at Zeehan was continued, and 1176 feet of driving was carried out for an expenditure of £530 2s. 6d. The amount of royalty received was £471 16s. 6d. No royalty was received for the last three months of the year, owing to the ore sales having stopped on account of the industrial strikes on the mainland.

At No. 2 Argent Mine an electric pumping plant was installed towards the end of the year, at a cost of £672 5s. 10d. for purchasing, erecting, running, and maintaining the plant. The tributers repaid £58 5s. 8d. towards the cost of running and maintaining the plant. In addition to the usual royalty, the tributers have agreed to pay an additional royalty of $2\frac{1}{2}$ per cent. to repay the cost of the plant.

The amount received from ore sales on behalf of the tributers was £6346 12s. 3d., which was distributed as follows:—

	£	s.	d.
Royalty paid to lessees	327	16	7
Royalty paid to State	530	2	2
Amount returned to tributers	5488	13	6

The total expenditure for the year (not including the advances on ores) was £2379 14s. 11d., and the amount received was £737 10s. 5d.

Prospecting.—Prospectors were assisted in the vicinity of Preolenna, Arthur River, Heemskirk, Corinna, Port Davey, and Cox's Bight, the expenditure being £283 5s. 9d. At Preolenna the coal seams located the previous year were further developed. In the other districts a considerable number of minerals were found, but there was no discovery which could be considered payable.

Assaying and Surveying.—The system of making assays at the nominal charge of 1s. was continued, and 529 assays were made. In addition, 102 mineral determinations were made free. This has proved a boon to prospectors who are in quest of minerals which have become valuable through

enhanced metal prices. Tributers have been assisted by having surveys of their workings made free of charge.

Boring Operations.—Mr. Harry T. Roach, with his assistants, has continued boring operations in the Gladstone District for the purpose of locating further deposits of alluvial tin. The work was undertaken by the Mt. Cameron Water Race Board, at the request of the Government, a sum of £600 having been provided for the purpose under “The Aid to Mining Act, 1912.”

During the year 339 bores were put down, and approximately 7312 feet bored. The results have not been very encouraging, as no new deposits of rich ground have been proved. The work was still proceeding at the end of the year, but operations ceased at the end of February.

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

For whom.	Description of Holding.	No. of Bores.
G. S. and A. H. Mullinson	Prospecting Area, Great Northern Plain	33
Higgs and Kerrison	Prospecting Area, Esk	16
Higgs and Kerrison	Ditto, Vulcan	16
Higgs and Kerrison	Ditto, Scotia Flat	27
Higgs and Kerrison	Ditto, Jewel's Flat	13
H. G. Beltz	Leases, Nos. 7092-m, 7037-m, 7038-m, and Prospecting Area, Great Northern Plain	39
Chas. Barnes	Leases, Nos. 6987-m, 6231-m, and Prospecting Area, Edina Flat	32
Chas. Barnes	Prospecting Area, Lark Creek	14
Chas. King	Ditto, South Cybele	10
Chas. Barnes	Ditto, ditto	11
Chas. Barnes	Ditto, Cybele	32
Jas. Fleming	Ditto, ditto	10
C. Barnes and R. Harvey	Ditto, Tamar	11
D. Shields	Ditto, Bridge Sections	13
Bailey & McDonald	Lease No. 7620-m, Scotia	24
Jas. Galloway	Lease No. 4121-m, and Prospecting Area, Scotia	13
Higgs and Kerrison	Prospecting Area, Black Duck	10
Higgs and Kerrison	Ditto, McGregor Flat	10
Higgs and Kerrison	Ditto, Big Bend	5
		339

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

Expenditure during the year ended 31st December, 1917 :—

Purpose.	Amount provided.	Expenditure previous to 1917	Expenditure during 1917.	Total Expenditure to 31st December, 1917.
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	6900 16 0	2106 1 9	9006 17 9
	<i>Cr.</i> 2019 19 3			
2. For carrying out all or any of the purposes of "The Mining Development Act, 1912"	6000 0 0	5788 15 9	189 5 11	5978 1 8
	<i>Cr.</i> 73 8 1			
3. Assisting prospectors to further develop their discoveries, &c.	1000 0 0	265 17 6	508 5 0	774 2 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	54,888 6 11	2803 12 8	57,691 19 7
	<i>Cr.</i> 31,233 16 5			

"THE PUBLIC WORKS APPROPRIATION ACT, 1913."

Expenditure during the year ended 31st December, 1917:—

Purpose.	Amount provided.	Expenditure previous to 1917.	Expenditure during 1917.	Total Expenditure to 31st December, 1917.
Item -	£ s. d.	£ s. d.	£ s. d.	£ s. d.
11. For carrying out all or any of the purposes of "The Mining Development Act, 1912"	6000 0 0	5705 0 10	230 15 0	5935 15 10
12. Assisting prospectors to further develop their discoveries, &c.	2000 0 0	1573 8 2	...	1573 8 2
	£8000 0 0	7278 9 0	230 15 0	7509 4 0

"THE MINING APPROPRIATION ACT, 1915."

Purpose.	Amount provided.	Expenditure previous to 1917.	Expenditure during 1917.	Total Expenditure to 31st December, 1917.
	£ 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	15,586 5 9	1668 1 10	17,254 7 7
	<i>Cr.</i> 9254 7 7			

"THE AID TO MINING ACT, 1912."

Expenditure to 31st December, 1917:—

Purpose.	Amount provided.	Expenditure previous to 1917.	Expenditure during 1917.	Total Expendi- ture to 31st December, 1917.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
(A)— <i>Mining, Prospecting, and Development Work, &c., undertaken by or under the direction of the Department of Mines.</i>				
1. To provide for salaries of supervising engineers, and office charges, travelling expenses, printing and advertising, and any miscellaneous charges con- nected 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	1338 14 10	309 4 4	1647 19 2

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
(B)— <i>Advances in Aid of Mining and Prospecting.</i>				
10. Advances to miners for prospecting, pursuant to "The Mining Development Act, 1912"	750 0 0	539 10 2	...	539 10 2
11. Assistance towards boring not exceeding one-half the total cost, pursuant to Part V. of "The Mining Development Act, 1912"	500 0 0	191 19 8	271 8 7	463 8 3
	£20,000 0 0	18,899 2 10	580 12 11	19,479 15 9
	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.

From 1st January, 1917, to 12th May, 1917, the date of ceasing active operations at the State Argent Mine, the following work was carried out:—

Surface.—Outside the ordinary routine work an air-shaft was sunk 58 feet to connect and ventilate the stopes on the north block of the No. 3 lode. Sufficient ore was obtained from this shaft to cover the cost of sinking.

300-Foot Level.—The west crosscut was extended 75 feet, total 565 feet. At this point Fulton's lode was penetrated; a drive was then extended 83 feet on the lode, and a rise sent up to the 150-foot level. The work done on both drive and rise failed to reveal any payable ore. The drive on Flaherty's lode was advanced 299 feet, making a total driven north of 447 feet 6 inches. A rise was sent up 35 feet, total 91 feet. The lode in both places varied from 2 feet to 4 feet in width, and in a few places showed silver-lead ore, but not in sufficient quantities to pay.

The eastern crosscut was extended 199 feet, total from shaft 747 feet. At a point 740 feet in, the No. 4 lode was intersected, and proved to be 4 feet wide, showing some nice nodules of clean galena. Drives were sent out along the lode 23 feet north and 72 feet south. In the latter end some nice milling ore was showing; a large body of water was tapped in this end, which drained the lode in the upper level and also drained Kestle's working, 200 feet south. A rise was sent up 53 feet. The lode in the rise showed small seams of galena.

150-Foot Level.—During the last week, prior to closing, the manager was able to sink on the No. 4 level, and a winze was sent down 7 feet. The lode in the winze was from 20 to 24 inches wide, of very good milling ore.

A crosscut in a north-easterly direction was extended 88 feet from the north drive to tap the No. 4 lode near the No. 1 Argent Mine. This crosscut was not advanced far enough to meet its objective.

Stoping was confined to the north block of the No. 3 lode, which proved highly remunerative, as far as this part of the mine was concerned.

Tributers.—Several parties of tributers were engaged working blocks with profitable results on the leases, chiefly in the No. 1 Argent Mine and the flat between the main shaft and the No. 6 Argent Shaft.

The following is a summary of the work carried out during the 4½ months of active work:—

	Feet.
Crosscuts were extended	362
Drives were extended	419
Stopes were extended.....	968
Rises were extended	235
Shaft was extended	58
Winze was extended	7
	£ s. d.
Expenditure previous to 1917	35,091 14 10
Expenditure during 1917	8309 15 10
Total expenditure to 31st December, 1917	£43,401 10 8
Value of ore sold by the State previous to 1917	7421 14 8
Ditto during 1917 (280·3453 tons)	4794 4 1
Total value of ore sold by the State to 31st December, 1917	£12,215 18 4
Royalty paid by tributers previous to 1917	1177 13 6
Ditto during 1917.....	980 0 2
Total royalty paid by tributers to 31st December, 1917	£2157 13 8

The value of ore sold (550·1565 tons) by the tributors during the year was £6750 14s. 5d., of which sum £3629 6s. 6d. was paid to the tributers, £1 5s. 1d. to the Mt. Zeehan (Tas.) Silver-lead Mines Limited, and £1131 18s. 1d. retained by the State for royalty and stores supplied. The cash payments for stores supplied to the tributors during the year amounted to £93 5s. 5d.

ADVANCES ON ORES.

Owing to a general strike on the mainland the Sulphide Corporation notified that the purchase of ore raised by the Zeehan tributers would cease for a time, and application was made to the Government for financial assistance to keep the mines working and purchase the ore until the Sulphide Corporation was ready to resume operations and purchase the accumulated stocks. A sum of £10,000 was provided by the Governor for the purpose on the 31st August, and advances at the rate of 50 per cent. on silver at 3s. per ounce, and lead at £25 per ton, were made on all the ore raised by the tributers. The advances were limited to £2000

per month up to the 1st March, 1918, but not to exceed in the aggregate the amount provided; interest to be charged at the rate of 6 per cent.

The first advance was made on the 26th September, and at the end of the year a sum of £4291 13s. 11d. had been advanced to 40 tribute parties and one company, operating within a radius of two miles of the Zeehan Post-office.

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 Acting Assistant Government Geologist.

Report of the Government Assayer.

Report of the Chief Inspector of Mines.

Report of the Chief Inspector of Explosives.

Reports of the Inspectors of Mines.

Notes on the Discovery of a New Fossil Fruit from the Deep Lead Tin Drifts at Derby, Tasmania. By R. M. Johnston, I.S.O., F.S.S.

GOLD MINING.

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

	Ounces.
Beaconsfield	5976
Mathinna	807·4
Mt. Victoria	} 199·76
Warrentinna	
Mt. Cameron	} 30·655
Lefroy	
Lisle	} 310·360
Golconda	
Lilydale... ..	} 7413·530
North-West and West Coasts... ..	
Total	14,737·705

Value, £61,577, equal to 14,496·464 oz. fine gold.

Beaconsfield.—The Tasmania Gold Mine Limited.—Since the closing down of this mine no mining operations of any consequence have been carried on in this district. The company has been treating its accumulated tailings, slimes, and concentrates, from which 5476 oz. of fine gold were obtained.

Lefroy.—The Back Creek Deep Leads Gold Mining Company, in prospecting with Government assistance for the deep alluvial lead, extended the drive at the top of Allen's rise a distance of 57 feet, in a full face of angular wash, which returned about a grain of gold to the truck load. This work proved unprofitable, and it was decided to extend the main or deep drive towards the No. 4 bore-hole. This was accomplished in a distance of 850 feet. At 750 feet a test bore was put up through the back of the drive, and at a height of 4 feet entered and bored into 2 feet 6 inches of hard wash, carrying traces of gold. The work was continued through to the face, but the results obtained were not encouraging, and the bore was discontinued. It was then decided to drive north to locate the "White Lead." After driving about 39 feet work ceased for want of capital.

Golconda.—Pearson's Gold Mine.—A shaft has been sunk on Section 1228-g, known as the "Enterprise" Mine, and the reef opened up and driven upon for a distance of 110 feet, and connected with the old workings overhead. The results obtained after crushing were disappointing, and operations ceased towards the end of the year.

The Golden Crest Gold Mine.—This company has continued prospecting operations. The chief work was from the end of the lowest adit. Here the reef was intersected and driven upon, and finally connected with the old workings 60 feet overhead. The stone is mineralised and assays 3 oz. of gold, 6 per cent. of copper, and a quantity of arsenic per ton.

The Eureka and Golden Pyramid Mines have continued prospecting, but no new developments have been made.

Lisle.—The Lisle Hydraulic Gold Mine treated 16,258 tons of quartz and obtained 294 oz. of gold, valued at £756 18s. Since the 1st October last the mine has only been running one shift with eight men. The lead is a little over 4 feet in width and an average depth of 22 feet, and runs up the flat for over a mile. In the bottom and up through a sandy sediment there is a quantity of sticks, rubbish, and timber up to 18 inches in diameter, which prove that the company is working the bed of an ancient river. On the eastern side of Thomas' Creek another run of gold has been discovered, and it is intended to test its extent at a later date.

Lisle Gold Mine.—Towards the close of the year sluicing operations were resumed, but owing to an intrusion of clay the clean-up from about 4200 cubic yards and an unknown quantity of drift only gave a return of 5 oz. 14 dwt. of

gold. It is the intention of the company to open up one of its other leases when the wet season sets in.

The Somallee Gold Mining Company.—Work has been confined principally to prospecting by means of trenches from 1 to 10 feet in depth and in driving a tunnel a distance of 124 feet into the foot of the hill on Section 1333-g. Some very encouraging prospects have been obtained.

Warrentinna.—The Mara Gold Mining Company, under the management of Mr. J. T. Stubs, has started operations and has obtained 80½ oz. of gold from 53 tons of quartz. This is the third time the lease has been forfeited and taken up by some of the old shareholders in the original company, known as the Golden Mara Gold Mining Company. After the original company failed the ground was taken up by the New Golden Mara Gold Mining Company, and although assisted by the Government to the extent of £1000 on the pound for pound principle, failed to make a success of the mine, and it was again taken up by the present company. Since the end of the year two crushings have been put through the battery, and better results have been obtained. The company deserves every success, as it is said to be owing to the confidence of a few of the shareholders in the former companies that the mine is now being given a fair chance.

Gladstone.—The Gladstone Gold, Tin, and Wolfram Developing Company advanced the north-west drive on the reef for a distance of 95 feet, the face terminating in 2 feet of well-defined stone. Assays taken along the face and other parts of the workings are said to have averaged 14 dwt. of gold to the ton.

Moore's Mine.—Drives put in at the bottom of the shaft are said to have given dish prospects of free gold.

Mathinna.—The New Golden Gate Syndicate.—Work has been chiefly confined to opening up and retimbering at the 500-foot level. A little stoping was done at the back of No. 4 level, and 323 oz. of gold were obtained from 542 tons of quartz; 1000 tons of tailings were treated by cyanide, and 118 oz. of bullion obtained. The total quantity of gold won was 660 oz., valued at £1582.

The New Jubilee Gold Mining Company.—Work was continued on "Lyons'" and the Derby reefs, but the mine finally had to close down for want of capital.

Fingal.—The Daylight Gold Mining Company.—A shaft was sunk to a depth of 60 feet and driven some distance on a small but promising reef, which, however, became broken, and the mine was abandoned.

Alluvial Mining.—One man prospecting near the head of the Forth River obtained about 14 oz. of coarse water-worn gold.

The Briseis Tin and General Mining Company at Derby obtained 26·86 oz. when streaming the tin drifts. The South Mt. Cameron Company obtained 3·55 oz. from the tin drifts in their mine near Gladstone.

West Coast.—The McDowell Prospecting Association, No Liability.—The manager, Mr. Kaye, with another man, completed the erection of 5-head battery and waterwheel. They then cleaned out the lower and upper adits and opened out in the rise connecting the adits at a point about 20 feet below the top one. After breaking and crushing a small quantity, which work was done by the same men, the mine was closed down, the stone evidently being unpayable.

The registered gold buyer for the district states he bought a small quantity of gold from two prospectors in the year, and from one prospector during the latter part.

SILVER-LEAD MINING.

The quantity of silver-lead ore produced was 9575·780 tons, valued at £152,122, being a decrease in quantity of 1653·630 tons, and a decrease in value of £1674.

The principal producers were:—

<i>Zeehan Mines.</i>	Tons.	Value.
Zeehan-Montana... ..	224·35	6321
Zeehan-Western	38·80	829
Zeehan-Queen	318·46	4971
Mt. Zeehan (Tas.)... ..	437·30	7521
Oonah... ..	36·019	636
Nike	211·06	5565
State Mine	618·64	9568
<i>Mt. Farrell Mines.</i>		
North Mt. Farrell... ..	1994·34	23,275
<i>Magnet Mines.</i>		
Magnet... ..	3813	75,883
<i>Mt. Claude Mines.</i>		
Round Hill	763·50	10,408

Zeehan District.—Since operations at the State Argent Flat Mine were suspended the ore raised has been principally won by small parties of tributers working under agreements with some of the companies and the Government, most of whom have been making good wages.

The Mt. Zeehan (Tasmania) Mines Limited has been concentrating ore for tributers and the public. A considerable portion of the company's lease has been resumed under the provisions of "The Aid to Mining Act, 1912," and with the financial assistance granted by the Government under the Act several parties of tributers are working with very encouraging results. Part of the lease has been worked under a tribute by the State Argent Flat Mine, but unfortunately the undertaking proved unremunerative, and operations had to be suspended. A local syndicate has been formed at Zeehan, and application has been made to the Government for a sub-tribute of 10 acres for the purpose of unwatering the company's No. 6 shaft, where it is stated some good ore was left in the stopes on the No. 3 lode when the company ceased work some years ago owing to a breakdown of machinery. It is the intention of the company to conduct experiments with a view of treating, on a comprehensive scale, the accumulated dump of mill tailings, from which it is anticipated a fair profit will be made for the purpose of further developing any promising discoveries that may be made on such parts of the lease as are not held by the State under "The Aid to Mining Act, 1912," or under tribute by the State Mine. The number of men employed by the company and engaged in tributing on its lease is 45.

The Zeehan Queen Limited.—The average number of men employed in tributing was 17. W. Hill's tribute on Taylor's lode was the most remunerative, but indications of the continuance of the ore chute in depth are not very promising. No new discoveries have been made.

The Dundas Cuni Mining Company Limited.—Work on this property is still suspended owing to there being no market available for the copper nickel ore produced. About 800 tons, of an estimated pre-war value of £4800, have been stacked ready for shipment since the mine closed down.

Mt. Read District.—The Mt. Read and Rosebery Mines Limited.—During the year no ore has been exported or sold, but some 2000 tons have been broken from various parts of the mine to provide down loading for the inclined haulage tramway. This had been added to the storage dump at Williamsford, and it is apparently of the approximate average value of the usual product of the mine.

The average number of men employed for the 12 months, including contractors and the diamond-drill staff, was 40.

Underground Works.—The usual maintenance and other works required for the upkeep of the mine have been carried on, and practically all the main galleries and crosscuts have

been retimbered; also a very considerable amount of mullocking work has been completed, and there is now only a comparatively small area of open ground in the mine. The general condition of the various stopes and workings can be considered to be quite satisfactory and apparently quite safe.

Development Work.—Exploratory work has been continued with the diamond-drill, and some 1616 feet of drilling completed; in addition, a very comprehensive scheme for the proper opening up of the mine below the present working level has been commenced; also the putting through of several mullock passes to the surface. About 100 feet of crosscutting, 78 feet of driving, and 203 feet of rising can be added to the total of the mine workings.

In February, 1917, a disastrous bush fire consumed 19 of the mine buildings and did a considerable amount of other damage. Some of the buildings, including a new blacksmith's shop and a change-house, have since been re-erected. The compressor plant and the haulage tramway have been operated as required, and both are in good working order. Various other surface works have received attention, including the bush fuel and timber tramways.

The various works have been carried out without any serious, or indeed, minor, accident to any of the employees. The workings of the mine are now in better order than they have been for some time past.

Lyell District.—The Tasman and Crown Lyell Extended Mine.—During the early part of the year experimental work was carried out in connection with the treatment of the ore by various methods in conjunction with the "Nicholson's Air Blast Flotation Machine." This was eventually discarded, and the ore-dumps lying at the mouth of the lowest adit were treated by wet concentration over Wilfley tables. When this material was finished operations underground were resumed, breaking ore from No. 2 level. The manager, Mr. J. Kirby, who was in full control during the latter part of the term under review, considered the extraction of values as satisfactory. During the recent strike in New South Wales the company could not get a market for its concentrates, so decided to close up this portion of its works.

Mt. Farrell District.—The North Mt. Farrell Mining Company.—During the year 13,081 tons of crude ore have been mined and dressed, resulting in the production of 1998.24 tons of marketable ore, containing 95,326 oz. of silver and 1021.3 tons of lead, of a net cash value at the mine of £23,980.

The total production to date amounts to 38,777·5 tons of ore, containing 2,223,585 oz. of silver and 22,421 tons of lead, of a net value of £397,870.

For the first six months productive operations continued on normal lines. From July onwards, however, ore production had to be considerably curtailed owing to the inability of the ore buyers to purchase the full output of the mine. A few weeks later the effect of the industrial troubles then current in maritime circles in Australia began to be felt, and in September the position became acute. Owing to the suspension of the Burnie-Newcastle shipping service, since the beginning of August a large quantity of ore had accumulated at Burnie and at the mine. There was at that time no prospect of an early resumption of the shipping service, and the outlook regarding the ultimate disposal of the ore which was accumulating was very uncertain. Under the circumstances then prevailing there was no alternative but to suspend ore extraction until such times as normal conditions were restored and a market again available for the mine's product. So from then on until the close of the year underground operations were confined to shaft-sinking and developmental work.

The bulk of the output has been drawn from the stopes at the No. 3 shaft level. This has been supplemented by ore won in the course of developmental work at the No. 4 level, 270 feet below the adit level. The main lode here has been opened up for a length of 250 feet, and developments have been satisfactory. The shaft has been sunk a further distance of 82 feet, attaining a total depth of 348 feet. It is proposed later on to open out for No. 5 level at 340 feet. With a large tonnage of ore yet to be extracted at No. 3 level, and the No. 4 level only just starting to produce, the position regarding supplies of ore is assured for a considerable time to come.

The demand for power for hoisting and pumping requirements having grown beyond the economical capacity of the steam-power plant, it was decided to instal a new power plant. This comprises a National twin-cylinder gas engine, developing 370 b.h.p., using gas generated from firewood in a "Commonwealth" down-draught suction gas generator; and a rope-driven cross-compound two-stage air-compressor. The concentrating milling machinery and the air-compressor are driven from a countershaft which is driven from the main engine-shaft, friction clutches being provided to enable any portion of the driven machinery to be started and worked independently of the rest. The erection of the

plant was commenced in May, but considerable delay in the delivery of the machinery and material was occasioned through the shipping strike, and it was not until February, 1918, that the plant was in commission.

During the year the Mt. Farrell Mining Company has been engaged in crosscutting from their low-level drive at the No. 4 adit level, North Farrell Mine. Their eastern crosscut has penetrated into the quartz lode, but so far the continuation of the ore-body worked in their upper level has not been located.

Under normal conditions employment is afforded to about 150 men, but in the latter part of the year a number of men had to be discharged on account of the dislocation of operations due to the shipping and other strikes on the mainland. With the exception of a little occasional prospecting, mining elsewhere on the field still remains dormant.

North-Western Mining District.—The Magnet Silver Mining Company, No Liability, obtained 3813 tons of ore of a net value of £52,363, employing 178 men. Operations were confined principally to driving the south hanging-wall drive, the south hanging-wall "A" drive, the north foot-wall drive, and the drive at the No. 12 level.

The south hanging-wall drive has opened up some nice veins of ore during the last 80 feet of driving, with ore now showing in the face of the drive.

The lode is patchy in the "A" drive, and has been displaced by local slides, which are characteristic of this part of the mine. Although the drive is poor, good stoping ground is opened up.

The north footwall drive is in slide country, but it is intended to penetrate through this slide to see what is beyond.

The stopes over No. 12 level have produced payable ore.

Nos. 10 and 11 Levels.—Stoping has been carried out at these levels with fair results.

South Adit.—This adit has reached a point 952 feet from the approach, and although nothing of value has been met with yet, the company has 250 feet further to drive before reaching the lode, so there is still a reasonable chance of meeting with payable ore.

No. 2 Dam.—It was intended to construct a dam capable of holding 50,000,000 gallons of water, but it has now been decided to enlarge same so that its capacity will be

125,000,000 gallons. This, it is anticipated, will give a sufficient storage to enable the winding engine and pumps to be operated with electric power through the summer months.

Hydro-Electric Plant.—The work of installing this plant is well under way, and unless any interruption takes place in the delivery of machinery now ordered it should be in operation about July.

General.—Owing to the limited space of overseas shipping, the heavy rain during the winter months, and industrial troubles on the mainland, the output was seriously interfered with.

Northern and Southern Division.—The Round Hill Silver and Lead Mining Company, No Liability.—During the year 6909 tons of ore have been mined and treated at the concentrating mill, which produced 763.5 tons of concentrates, containing 112 oz. of gold, 34,431 oz. silver, and 410 tons lead, valued at £10,408.

The average number of men employed was 32.

The usual exploratory and developmental work was carried out in the mine. The No. 1, or bottom tunnel, was driven a further distance of 200 feet, making the total length 632 feet. The greater portion of this driving was along what appears to be a branch of the main fissure; the ground was very hard quartzite, and produced a fair quantity of milling ore.

Two rises were put up from No. 1 tunnel, connecting with the No. 2 tunnel. These rises gave excellent ventilation to both levels, and are now being used for mullocking the stopes.

No. 2 Tunnel.—This tunnel was driven a distance of 20 feet. Two short crosscuts are now in course of being driven to explore the ground on each side of the centre country.

Two rises were put up from the No. 2 tunnel to the surface for the purpose of ventilation. Quarries were started on the surface where the rises have broken through. These are being worked to provide mullock for filling the stopes both at No. 1 and No. 2 tunnels.

Stopes.—Stopeing operations are being carried on both at No. 1 and No. 2 tunnels, there being two stopes at each level. All mining operations are being carried on by rock-drills. It is practically impossible to do any drilling by hand labour.

The bridge carried away by the floods last year has been rebuilt across the junction of the two creeks, giving ample surface for storage of mine material.

A new 90-h.p. National suction gas engine, with a 100-h.p. down-draught wood producer, has been erected at the concentrating mill. The plant is intended as an auxiliary power plant to work the concentrating plant during the dry season. The gas engine plant is in commission and is working smoothly and giving every satisfaction.

Concentrating Plant.—During the early part of the year, and especially during the dry months, this plant only worked part time owing to scarcity of water.

The Round Hill Extended Silver and Lead Mine.—Towards the end of the year work was suspended. The lowest adit has been extended a total distance of 160 feet. Some distance has yet to be driven before the trend of the ore cut on the surface workings can be reached.

COPPER MINING.

The quantity of blister copper and copper ore produced was 6305 tons, valued at £884,689.

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

Ore—	Tons (dry).
From the Company's Mt. Lyell Mine ...	154,100
Ditto, North Lyell Mine	81,947
Concentrates from the Company's Lyell Comstock and North Lyell ores	4337
Purchased ore (from other mines)	510
Total	<u>240,894</u>

Blister copper produced, 5845 tons, containing:—Copper, 5779 tons; silver, 305,506 oz.; gold, 7339 oz. Approximate value, £872,406.

Average number of men employed:—

Mining Department—	
At the company's Mt. Lyell Mine	354
At the company's North Lyell Mine	339
At the company's Lyell Comstock Mine	32
At the company's Crotty Leases	26
At the company's King River Power Scheme	4
	<u>755</u>
Reduction Works Department (including Lake Margaret)	
	701
Railway Department—	
Mt. Lyell Railway	125
North Lyell Railway	31
	<u>156</u>
	<u>1612</u>

Dividends paid during year, £209,494 3s. 9d. = 3s. 3d. per share.

Dividends paid from the inception of the company to the 31st December, 1917, £3,475,480.

Copper produced from the inception of the company to the 31st December, 1917, 153,079 tons, fine.

Silver produced from the inception of the company to the 31st December, 1917, 12,068,550 oz., fine.

Gold produced from the inception of the company to the 31st December, 1917, 354,796 oz., fine.

The mines were worked continuously during the year, with the exception of a period of three weeks in May, when the miners were out on strike.

The strike followed a demand by the Miners' Association for an all-round bonus of 2s. per shift over and above the rates awarded by the Arbitration Court a few months earlier. As a result of the miners' strike smelting operations were entirely suspended for a period of 19 days, while for 16 days only one furnace could be worked. The men having failed to obtain their demands returned to work on pre-strike conditions.

The aggregate output of ore from the mines was materially diminished by reason of the general shortage of labourers and the introduction of the 44-hour week, in pursuance of Mr. Justice Powers' award on the 5th March, 1917. The half-shifts worked on Saturdays are having a most serious effect on the company's operations, and have resulted in a decreased production and increased working costs.

At the Mt. Lyell Mine, the open-cut was worked for pyrites and filling material for depleted stopes, while the usual ore-winning operations were carried out underground. A small amount of development work was undertaken at the No. 9 level on the South Lyell ore-body.

The South Lyell section of the mine is now supplying a large tonnage for smelting, and the testing of the ore-body at a lower level by means of the diamond-drill is under consideration.

The upward extension of No. 6 level workings has reached the floor of the open-cut, and stopes Nos. 2 and 5 are being worked from the surface.

The third unit of the new electrically-operated compressor plant was added, and the whole outfit is in regular and satisfactory operation.

A pump-house and sump at No. 9 level at the main shaft was completed and equipped with two electrically-driven pumps.

At No. 6 level the largest producing stopes were Nos. 1, 2, 4, and 5. The main stope on the South Lyell body has been timbered to allow overhead stoping to proceed. The pillars separating stopes Nos. 1 and 3, 2 and 5, are now being extracted.

A large tonnage was broken at No. 8 level, and the area of the South Lyell main stope at No. 9 level was proved to be greater than previous examination had indicated.

At the North Lyell Mine the assay values were well maintained, and all levels from the 700-feet to the 1100-feet were in active operation.

A further portion of the Crown shaft was completed, and the diamond-drill utilised for exploratory work, with useful results.

The usual copper precipitation from mine waters was continued.

During the miners' strike in May the 1200-foot level was allowed to fill up with water, and, owing to the shortage of labour for operating the other levels, it remained under water up to the close of the year.

The extension of the north drive at the 850-foot level resulted in opening up good grade ore, and this occurrence promises to be important.

The 925-foot level continues to develop in a very satisfactory manner, and is already a very productive zone. Bores Nos. 307 and 311, at this level, proved good ore for 38 and 23 feet respectively.

The Crown shaft was risen 63 feet and plats cut at the 1000 and 925 feet levels. The shaft was carried up for its full size and timbered from the opening sets.

The 1100-foot level was extended northward and various drill-holes were bored with fair success.

The routine stoping operations were continued without incident, and the chief producing places were No. 50 stope at the 850-foot level, Nos. 43, 44, 45, at the 925-foot level. At the 1000-foot level stopes 34, 40, 48, and at the 1100-foot level stopes 36, 37, 41, were all worked energetically.

At the Lyell Comstock Mine the operations were confined to open-cut ore winning for the flotation plant. The grade of the ore is improving, and as soon as extra labour can be obtained a much larger output will be established.

At the reduction works the usual smelting operations were followed, but owing to the diminished output of ore

it was only possible to keep an average of two furnaces in blast. The new converter plant is ready to be put into use as soon as the necessary magnesite brick linings are delivered. A mechanically-operated copper casting machine has been constructed for use with this plant.

Trial parcels of Comstock ore and concentrates were subjected to leaching tests, and useful data obtained. Further investigation is in hand.

The flotation plant has been operated day shift only, owing to short deliveries of ore. The recoveries for the year were 88.52 per cent. of the copper, 75.12 per cent. of the silver, and 71.88 per cent. of the gold.

The Lake Margaret hydro-electric power installation has continued to meet all demands, and the machinery is in first-class order. The work of the extension of the plant to its full capacity is well in hand. Two additional units will be added and the retaining-wall at the lake raised to impound a larger supply. The preparatory work in connection with the extension of the buildings, foundations for new steel pipe-line, and for the concreted wall, has made good progress.

The King River scheme was more closely investigated, and data shows that an excellent power source is available. A 45,000 h.p. outfit is under consideration by the Government Hydro-Electric Department, for which the Public Works Committee has already voted £10,000 to cover initial investigation.

In the railway department all lines were maintained in good running order, and the service was well carried out.

The earth embankment to replace the high timber bridge at the 10-mile point on the North Mt. Lyell Railway is completed. It required 78,082 cubic yards of filling material.

The Mt. Lyell Blocks Copper Mines, No Liability.—At the 1000-foot level, where the mine is connected to the North Lyell Mine, excavation was made for an ore-bin, so that the ore could be taken *via* the north shaft to the Mt. Lyell Company's reduction works, thus saving a lot of handling and expense. At the 1200-foot level the north drive was extended to 427 feet, ore being cut at 423 feet and continued to 451 feet, where it gave place to schist, heavy spar, and jasper, carrying splashes of bornite and chalcopyrites. A crosscut was put out from this drive, and a connection made with No. 1 rise, which was put up from the 1300-foot level. A rise was put up from this 1200-foot level to the 1100-foot

level of the North Lyell Mine, at which level it was connected by a crosscut from No. 49 stope.

Some underhand stoping was carried out, and a ground-floor stope taken out on the ore body mentioned above, various parcels being sent to the Mt. Lyell Company's reduction works for treatment.

At the 1300-foot level some driving and crosscutting was done, opening up some ore of various quality.

A considerable amount of repair work was put in hand, the old head-gear being removed and replaced, and the engine-chamber attended to; also, the hoisting-engine was given a thorough overhaul and renovation.

Unfortunately, up to the present this company has not met with the success it merits, still it is hard to say what the future holds, and one can only hope it may bring success to them, for they richly deserve it.

Mts. Jukes and Darwin.—On the Mt. Jukes Proprietary Mine cross-cutting the lode-formation and driving along on the contact of it and the country-rock has been in progress during the year, and the manager reports that the values have continued fairly satisfactory.

Tasman and Crown Lyell Extended.—Owing to the closing of the market for the sale of their silver-lead ore, attention was given to a copper formation, some 128 tons being broken and despatched to the Mt. Lyell Company's reduction works, but was not payable.

Dundas District.—The Colebrook Prospecting Association extended the south drive in No. 3 adit 100 feet in a lode formation of an average width of 2 feet of fair-grade zinc-lead sulphide ore. A crosscut was also put in for a distance of 56 feet, which proved the lode-channel to be 40 feet wide, showing a little sulphide ore for the full width. A fair amount of prospecting work was also done, but nothing payable was discovered.

Jupiter Mine, No Liability.—Work was started on the property in May, and suspended on the 5th October, 1917. During this period an average of four men was employed on developmental work and winning a little copper ore, the development footage being 99 feet. A complete resampling and assaying of the mine was undertaken for the determination of the ore in sight and its value.

The year's output was as under:—

Copper ore shipped, 11·15 tons.
Average grade, 8·05 per cent. copper.
Value of output, £36 8s. 1d.

Rosebery District.—The North Tasmania Copper Mine started operations in the beginning of March, and ceased work on the 1st August. The company drove along the course of the lode at No. 2 adit a distance of 80 feet north, and at this point put in a crosscut, which proved the lode to be 16 feet wide, of good zinc-lead sulphide ore.

Balfour District.—The Copper Reward Mine.—The output from this mine was $93\frac{3}{4}$ tons of copper ore, valued at £979 13s., and 1 ton 1 cwt. 1 qr. 24 lb. of tin ore, valued at £167 19s. 7d., 11 men being employed. The tin-bearing ground was further tested, and a start made to treat the button-grass land in a large way. About 3 tons of tin ore was taken up from the races ready for streaming. No. 1 dam was completed in January, and No. 2 dam was built as far as wet weather would allow, and proved very useful during the spring and summer. This dam will be enlarged to hold 50 million gallons as opportunity offers. About 1 mile of races has been cut. Ten horses are employed on the mine and tramways.

TIN MINING.

The quantity of tin ore raised was 2637·337 tons, valued at £427,917; an average value of £162 5s. 0·82d. per ton.

The statistics for the year are:—

	Ore won, tons.	Value. £	Miners Employed
Northern and Southern Division	72·43	6766	38
North-Eastern Division.....	1250·43	211,995	435
Eastern Division.....	372·855	59,684	237
North-Western Division	691·282	111,998	400
Western Division.....	250·340	37,474	127
Total.....	2637·337	427,917	1237

North-Eastern Division.—The output of tin ore was 1250·43 tons, obtained as follows:—

	Tons.	Tons.
<i>Pioneer and Gladstone Districts.</i>		
Pioneer Tin Mine	441	
South Mt. Cameron	24·30	
Clifton Creek	28·30	
Other claims.....	137·62	
		631·22

Ringarooma, Derby, and Branxholm Districts—

Briseis Tin Mines	293 67	
Ditto Mutual	20 30	
Arba Tin Mine.....	165 89	
New Ruby Flat	27 50	
Other claims.....	63 25	
		<hr/> 570 61

Moorina District.

Weld Tin Mine.....	36 90	
Other claims.....	5 50	
		<hr/> 42 40

<i>Straits Islands</i>	6 20
------------------------------	-----	------

Total	<hr/> 1250 43
--------------------	-----	---------------

Eastern Division.—The output of tin ore was 372 855 tons, obtained as follows:—

	Tons.	Tons.
<i>Weldborough, Lottah, and Blue Tier Mines.</i>		
Anchor Mine	8 775	
Other claims.....	72 200	
<i>St. Helens Mines</i> .....	...	80 975
		<hr/> 90 330

Avoca Mines.

Royal George	102	
Story's Creek	42 30	
Foster	7 40	
South Esk	8 55	
Republic	28 85	
Others	12 45	
		<hr/> 201 55
Total .....	...	<hr/>372 855

North-Western Division.—The output of tin ore was 691 282 tons, obtained as follows:—

	Tons.
Mt. Bischoff.....	438
Mt. Bischoff Extended	194 96
Weir's Bischoff Surprise	12 050
Mt. Cleveland	16
Ringtail	0 150
Waratah Alluvial	11 242
Mt. Balfour	6 980
South Bischoff	11 900
Total	<hr/> 691 282

Western Division.—The output of tin ore was 250·34 tons, obtained as follows:—

	Tons
Dreadnought-Boulder Mine	66·46
Renison Bell Mine	8·89
Central	38·67
Heemskirk	33·23
Stanley River	24·30
Mt. Lindsay	24·83
Others	53·96
Total	250·34

Northern and Southern Divisions.—The Shepherd and Murphy Syndicate.—Progressive work on the strike of the No. 6 lode has continued, the supplies for the mill, including bismuth and wolfram, being obtained from this source. The main crosscut has been put out from the No. 3 level, and cut the parallel lode, upon which work is proceeding.

North-Eastern Mining Division.—The Arba Tin Mine.—Sluicing was carried on continuously at both the Mainland easement workings with a full supply of water.

The total yardage treated during the period was as follows:—

	Cubic yds.	Working cost.	Tin won. Tons.	Contents per c. yd
Main workings	190,886	9·88d.	45·14	0·536
Easement... ..	144,373	8·80d.	97·8	1·62

The average number of men employed was as follows:—Sluicing, 58; firewood, 15. Total, 73. Approximate value of the output was £28,600.

Briseis Tin and General Mining Company Limited.—

	Briseis Mine	Mutual Hill Mine.
Average number of men employed	86	10
Black tin won	316 tons	22·20 tons
Equivalent metallic tin	224·34 tons	15·74 tons
Value	£53,220	—
Gold	26·86 oz.	—

There has been practically no change in the nature of the work during the past year. The deep ground in the so-called Krushka's Flat face has produced good yields, but the work is now rather confined between the present river diversion and the western reef (or rim-rock of the lead).

Overburden and drift have been removed on the north-eastern side of the inlet to the river cut, with the immediate object of further turning the inlet to the present diversion, so as to give more room in Krushka's Flat.

The Pioneer Tin Mining Company Limited.—An abnormal and well-distributed rainfall enabled both electric plants to be kept continuously at work, and to sluice 922,400 cubic yards of drift, for a yield of $417\frac{1}{4}$ tons of stream-tin, worth £75,000, with metal at £250. The average number of men employed was 68.

A considerable amount of dead work has been carried out during the above term, including the construction of a new flood-race from Bradshaw's Creek dam, as well as other work in connection with the floating of No. 1 electric plant to its next site, which will be done early in the season.

Argonaut Mine (St. Helens).—On this mine 141,200 cubic yards have been sluiced for a yield of 49 tons 7 cwt. 2 qr. of stream-tin, worth £9000, with metal at £250. The average number of men employed was 17. The plant has now worked across the first strip of terrace ground, and is about to turn and work the second strip. The ground has varied from 2 to 10 feet in depth, and nearly everything has been taken on a face as it came.

North Mt. Cameron.—Messrs. Whitaker and Daw's section on Fly-by-Night Creek has been working successfully. The alluvial mines in this district, which are commanded by the Government water-race, have been working with very profitable results, owing to the very high price of tin.

A little work of a prospecting nature has been done on the Gladstone Gold, Tin, and Wolfram Development Company's property. There is a great demand for wolfram for munition purposes, and it is a great pity that, owing to insufficient capital, the export of mineral from this mine is retarded.

South Mt. Cameron.—The Clifton Creek Tin Mine has been sold to a Sydney syndicate. No work has been done at the mine for some months.

The Endurance Tin Mining Proprietary commenced erecting machinery for the centrifugal gravel pump in October.

Moovina.—The Weld River and Echo Mines.—Both mines are being worked conjointly by water-pressure, and are making profitable returns.

Eastern Mining Division.—Small co-operative parties, including Chinese, are working and obtaining ore. The old Star Mine has been recently acquired by Mr. J. C. Cleveland, and is being opened up in a systematic manner, with very encouraging prospects.

Lottah.—The Anchor Tin Mine, towards the end of the year, was sold by the Government to Messrs. Kennedy Brothers, of Hobart, who have started operations, and also let parts of the mine on tribute.

The Allies Syndicate continued their operations on the "Don Face" on a portion of the Australian Mine, and have been obtaining some fair milling ore for their 5-head battery.

The Kirwan Brothers, with the aid of a couple of portable boilers, are working some shallow alluvial ground near Goshen, with good results.

Avoca District.—The Royal George Tin Mine, employing an average of 51 men, crushed 19,823 tons of lode-stone, and obtained 112 tons 7 cwt. of tin ore, valued at £14,481.

The ore-channel, 12 feet wide, has been driven on for a distance of 124 feet, over which stoping is in progress on fair values of tin stone.

South Esk Tin Mine.—Sluicing is being carried on, with very satisfactory results.

Desire Tin Mine.—The proprietor, Mr. A. T. Anderson, has completed the erection of a small mill, and commenced crushing.

Rex Hill Tin Mine.—Capital is being obtained for the purpose of providing a plant for working the mine by water.

Ben Lomond.—The Great Republic Tin Mine.—Work underground has been retarded owing to the winding-plant having been destroyed by fire, consequently attention has been directed to surface-prospecting near the main workings, where tin-stone, giving 1 per cent. of metal, is being obtained.

The Story's Creek Tin Mining Syndicate has driven 165½ feet on the lodes, and 110½ feet in the adit. The quantity of ore won and treated was 8596 tons. The concentrates yielded 38 tons 14 cwt. of tin ore, valued at £5205, and 113 tons 7 cwt. of wolfram, valued at £21,307. The separation plant started in August, and treated 55 tons 4 cwt. of concentrates of wolfram and tin. Average number of men employed, 70—51 underground and 19 on the

surface. Owing to the scarcity of practical miners, work was impeded, and the treatment plants were restricted to one shift per day.

Gipp's Creek Mine.—Messrs. Eberhardt, Cook, and Mace now occupy and work this mine.

Western Mining Division.—The Renison Bell Prospecting and Mining Company.—Owing to the peremptory demand for an increase in the rate of wages by the employees in July, 1916, and their refusal to continue at the then existing rate, the company, through being unable to meet the employees' demand, was forced to close the mine down. No further work was done until September, when the mine was let on tribute.

Prospecting work carried out by the tribute party was successful in locating a large gossan formation carrying payable tin. The formation is located in the south-eastern portion of the lease, close to the boundary of the Central and Montana tin mines. To connect this development with the company's milling-plant involved the construction of 20 chains of 2-foot gauge tramway, 8 chains of which is a self-acting incline. Some six weeks was occupied in connecting the faces with the battery. Crushing from the new find was commenced at the end of October, and proceeded in a limited manner up to the end of the year. A shortage of water for power purposes, owing to the dry season, prevented more active work being undertaken.

The prospects of a considerable quantity of payable oxidised stone in the vicinity of the present workings are most hopeful, and should be sufficient to keep the plant in profitable work for some time to come.

For the year ending the 31st December last, 1115 tons of crude ore were mined and sent to the battery (the mine workings are entirely on the open-cut system), the net amount of tin oxide recovered being 8.87 tons, containing 5.98 tons of metallic tin, the net value of which was £1566. The ore was smelted at the Mt. Bischoff smelting works, Launceston. The average number of men employed was 13.

The Heemskirk Tin Syndicate, North Heemskirk.—The syndicate obtained 32 tons of tin ore, valued at £5000, an average of 14 men per week being employed.

North-Western Mining Division.—The Mt. Bischoff Tin Mining Company, Registered.—Mine Work.—The output of ore from the mine totalled 106,509 tons, of which

103,925 tons were delivered at the mills for crushing and concentration, and 2584 tons, being very low-grade, were rejected.

Four hundred and thirty-eight tons of concentrates were obtained, of an approximate value of £78,840. The average number of men employed was 263.

Surface Workings.—Operations were carried on under steadily growing difficulties, arising out of a decreased value per ton in the material treated and the greater distance the principal workings are situated from the milling and concentrating plant. To these must be added the uncertainty of obtaining supplies, the cost of which has shown an enormous increase. In view of these conditions the results for the year have been satisfactory.

Southern Slopes.—In the White Face operations were restricted to the quartz-porphry dyke and to the detrital material close to the main line. The gossan benches and Happy Valley workings have yielded a large quantity of stanniferous ores, but little work has been done at the Brown Face, Stanhope, and Don sections.

Northern Slopes.—The extraction of ore from the various benches and flats has been regular and systematic. The benches on the terrace at the lower end of the North Valley Flats are being thoroughly opened up, and it is intended to install electric traction for the more economical handling of the large ore reserve.

Underground Workings.—Operations in this department were carried on for a portion of the year on a small scale, but owing to the difficulty of obtaining skilled labour, it was decided to employ all the men available on the surface workings.

Milling and Concentrating Plant.—The erection of the new unit of the 20-head stamps was completed during the latter half of the year, and the many innovations made in the design have proved entirely satisfactory. A considerable saving in labour and maintenance will be effected by the new installation.

Aerial Ropeways.—These systems have worked in a satisfactory manner. During the period under review one of the carrying-ropes had to be renewed after a life of only six months. The previous rope had been in constant use for more than six years.

Mt. Bischoff Extended Tin Mining Company, No Liability.—The mine worked continuously during the year, an average of 96 men being employed. The developmental

work consisted of 3496 feet, mostly along the lode, revealing ore of the size and grade that is profitable on this property. During the year the No. 9 crosscut cut the main or Giblin lode at 1536 feet in. The lode, where cut, is well defined, but not payable. This is at a vertical depth below Hammond shaft of 1002 feet. A rise is now being run to connect this level to the winze from the No. 6 level.

The year's output is as under:—

Quantity of ore crushed, 15,101 tons.
 Tin oxide recovered (dry), 195·2 tons.
 Value of output, £29,943 13s. 11d.
 Average grade of output, 70·92 per cent. tin

COAL-MINING.

The total quantity of coal raised amounted to 63,412 tons, valued at £38,673; being an increase of 7837 tons on the previous year.

The raisings at the different collieries were:—

Colliery.	Tons Raised.
Cornwall	27,681
Mt. Nicholas	32,113
Spreyton	350
York Plains	219
Ilamatha	463
Sandfly	553
Cardiff	123
Mt. Cygnet	200
Dalmayne	1530
Pateena	180
Total	63,412

The Mt. Nicholas Coal Company Limited.—Operations have been carried on in the 6-foot seam without interruption. The working-face has been advanced approximately 3 chains, making the face a total distance of 52 chains in from the tunnel mouth. The seam still keeps at its usual thickness, and the quality of the coal has been well maintained. The tunnel into the 4-foot seam has been driven a further distance of 152 feet, making a total distance of 571 feet from its mouth. This seam is also keeping its usual thickness, and the quality of the coal is good. Eighty-eight men and boys were employed above and below ground.

The Cornwall and Cardiff Collieries, in the St. Marys district, have maintained their output, and have found a ready market for their product.

York Plains Coal Mine.—This mine has a fairly consistent seam, averaging about 3 feet in thickness, and is noted for its calorific qualities. It is free from smoke, and for that reason is used by brewers and hop-kiln dryers for special purposes connected with their callings.

Spreyton Coal Mine.—This is a small seam of 12 inches in thickness, and is being worked to supply local needs.

Illamatha Coal Mine.—The seam in this mine is about 20 inches thick, and is also being worked to supply local needs.

Catamaran Coal Mine.—This mine has again passed into the hands of Mr. E. C. James, who intends starting operations at once for supplying coal to the city.

Mt. Cygnet Coal Mine.—This mine is situated on private property near Gardiner's Bay. This mine has been worked on a small scale for the purpose of supplying local requirements.

Sandfly Coal Mine.—This mine has been taken up by a small syndicate, and is being given another trial.

The Dalmayne Collieries Limited.—This is a new enterprise. The mine is situated on the East Coast, about 3 miles from Picanini Point, and was officially opened on the 24th August last by Sir Elliott Lewis, Minister for Mines. The mine drains itself, and discharges the coal from the face of the screens practically automatically. The coal affords easy facility for cheap operations. The tunnel is about 1000 feet above sea-level. From the top hopper and loading station to the shipping-bin the trees and scrub have been cleared for a width of 2 chains for the self-acting ropeway. The capacity of the rope is 50 tons per hour.

Unfortunately the company has experienced great difficulty in getting boats to convey the coal to the mainland, owing to the war, but it is hoped that this difficulty will soon be overcome, and that the mine will be producing to its full capacity during the current year.

Railton-Latrobe Shale Oil Company.—No work has been done at this mine since the last report.

Preolenna Coal Mine.—There has been no output from this mine up to the present, owing to the lack of transport facilities to the railway. The No. 1 tunnel has been widened from 6 to 10 feet, to allow for a double track. Driving a dip heading down on the coal-seam for a distance of 100 feet, constructing a loading-station, and laying down about 9 chains of track to same was the only work done during the year.

State Coal Reserve.—The Preolenna State Coal Reserve was gazetted on the 11th April, 1916. From September to December, 1916, two men were employed prospecting for coal on the reserve. Unfortunately, most of their work was conducted at the north-eastern corner of the reserve, on the boundary of the Preolenna Company's sections. Four outcrops were located dipping into the company's sections. At the end of the term of their engagement they prospected west of Section 7035, and located coal outcrops—Nos. 5 and 6. In July, 1917, it was decided to carry out further prospecting, and two men were employed for two months. The first work was carried out at No. 6 outcrop, which was stripped, and the coal broken to obtain a clean sample. The seam is 2 feet thick, of clean coal, dipping about 30 degrees to the north-west. A sample submitted to the Government Assayer gave the following results:—

Moisture at 100° C.	1·00
Volatile combustible matter ...	22·00
Fixed carbon ...	56·80
Ash ...	19·80
Sulphur ...	0·40

Further prospecting in this vicinity having failed to locate outcrops, operations were moved to a creek running south from No. 5 outcrop. In this creek No. 7 outcrop was located. Mr. H. E. Evenden, who was in charge of the operations, reported the seam to be 2 feet thick, consisting of seams of torbanite and coal. A sample submitted to the Government Assayer gave the following results:—

Moisture at 100° C.	1·15
Volatile combustible matter ...	30·67
Fixed carbon ...	59·04
Ash ...	5·30
Sulphur ...	3·84

A few chains further up the creek No. 8 outcrop was located. This consisted of 1 foot of torbanite on the top of the seam, and 1 foot of shale. The torbanite sample, after analysis, gave:—

Moisture at 100° C.	0·50
Volatile combustible matter ...	26·00
Fixed carbon ...	54·17
Ash ...	15·50
Sulphur ...	3·83

And also a return of crude oil of 31.6 gallons per ton. The shale was tested for crude oil, and gave a return of 8.8 gallons per ton.

West of No. 8 outcrop No. 9 outcrop was located. A sample taken from this outcrop, which is 22 inches thick, gave the following results:—

Moisture at 100° C.	0.90
Volatile combustible matter	32.60
Fixed carbon	60.33
Ash	4.00
Sulphur	2.17

The country is very difficult to prospect, being covered by an impenetrable forest, which requires track-cutting for every foot prospected. The prospecting has demonstrated the existence of coal south-west of the known area, and opens up the possibility of a considerable extension of the coal-bearing area.

OSMIRIDIUM.

The quantity of osmiridium obtained from the Wilson and Savage Rivers was 322.079 ounces, valued at £4898, being an increase of 112.029 ounces on the previous year, and an increase in value of £3000, the prices offered by the buyers having steadily increased from £11 to £18 10s. during the year. At the present time buyers are offering £22 10s. per ounce for selected parcels. A number of new names have been added to the list of buyers, and competition is very keen. Some buyers have visited the places of operations personally for the purpose of securing the best parcels and paying for them on the spot.

It has been reported that a new and valuable discovery has been made in a creek between the Mt. Stewart Silver Mine and the Meredith Range. The discoverer reported that he obtained £104 worth of the metal in three weeks. The metal is coarse, and is found in the creek and flats. At the time of writing there are between 30 and 40 miners at work, many of them working on payable ground, and the number is steadily increasing. The source of the metal will probably be found in the Meredith Range, as it is known to exist in the serpentine belt between the new field and the Wilson River deposits, and when tracks are cut to enable prospectors to get into the intervening country, which is very rough, the scrub being almost impenetrable, it is highly probable that a very extensive

field will be opened up and give employment to a large number of men.

BISMUTH.

The Shepherd and Murphy Mine at Middlesex obtained from its tin ore 4.15 tons of bismuth, valued at £875.

The Iris Mine obtained 0.012 tons, valued at £4; and the All Nations 0.05 tons, valued at £16.

WOLFRAM AND SCHEELITE.

The output of wolfram ore was as follows:—

	Tons.	Value.
Avoca Mines	121.96	£21,812
St. Helens	3.55	548
Anchor ... ..	.05	7
Shepherd and Murphy Mine at Middlesex	36.50	4680
Iris Mine ... ..	.83	150
Squib	5.20	803
All Nations	3.45	622
Others ... ..	.65	92
Total	172.19	£28,714

The production of scheelite appears in the mining statistics for the first time in the history of this State. The King Island Scheelite Company, No Liability, was incorporated in Melbourne on the 13th February, 1917, and immediately thereafter operations were commenced, a plant purchased, erected, and installed before the 26th July. During the first nine weeks the plant treated 2108 tons of crude ore, producing 29 tons 14 cwt. of concentrates, assaying 70.66 per cent. of tungstic acid, and valued at £5225 19s. 2d. At the half-yearly meeting held in Melbourne on the 26th November a dividend of 1s. per share was declared. Up to the 31st December 4937 tons of ore were treated, and yielded 69 tons of concentrates, of an approximate value of £12,130. Two adits, named north and south, were started from a point corresponding to the elevation of the ore-bins, and were driven 265 feet and 392 feet respectively. In both cases ore has been encountered. Two open-cuts, on the glory hole system, were also started, and the ore treated during the period was taken from these open-cuts. The ore is passed through a chute to the adit level, and is then trucked to the bins. The average number of men employed was 60 weekly.

The following is a copy of a letter received by me from the Government Geologist in reply to a communication received from the Agent-General regarding ores of tungsten for munition purposes:—

“ I have to acknowledge receipt of, and to return herewith, circular despatch of the 26th February from Downing-street, with reference to the urgent need of an increased supply of munition mineral (in our case, ores of tungsten).

“ I have interviewed the local agents of our wolfram mines with a view of impressing them with the necessity for taking all possible measures for maintaining and increasing output, and also of learning the actual position of their respective enterprises.

“ We have two centres of wolfram mining and one of scheelite. The ores and concentrates from the tin-wolfram-bismuth mine of the S. and M. Company at Moina are treated with the company's magnetic separation plant in Launceston, and a clean wolfram product obtained averaging 69 or 70 per cent. tungstic acid. The same plant also treats the output of three or four small mines in the Moina district; and the whole produce is shipped to Dalgety and Company, the agents for the Commonwealth in Sydney. Operations at the company's mine mill have been inactive for the last couple of months, as, owing to the dry weather, there has been insufficient water for milling purposes. The weather now shows signs of breaking. There is nothing that the company desires more than to resume milling, and overtake the loss of output, and it will be done at the very earliest opportunity.

“ Perhaps the most important active wolfram mine in the island at present is that at Story's Creek, Ben Lomond. It has a magnetic separation plant on the spot which treats the tin-wolfram ore of this mine. The fortnightly output is about 5 tons of wolfram, averaging 73 per cent., and 1½ ton of tin ore. This wolfram is also shipped to Dalgety. The dry season has also affected the output here, but the most constant drawback is the difficulty of obtaining labour. When men can obtain £12 per bag for tin ore, there is a great inducement for them to put in their time fossicking for that mineral; under such circumstances workmen frequently give up their employment at the mine and go off to look over previously worked or imperfectly worked ground. In addition to this, many miners have left to take part in the war, and a serious

shortage of labour has resulted. But for these conditions the output of wolfram would have been greater. The management is exerting itself continuously in the direction of securing more men, but with no marked success.

"A scheelite mine has recently been started on King Island, and is in full work. Its produce also goes to the Commonwealth agents for shipment to England.

"A new wolfram deposit has lately been taken up near Mt. Pelion, in a rather inaccessible part of the island. The lode is being prospected, and it is hoped that it may prove payable.

"The above represents the present position of wolfram and scheelite mining here. The interests of patriotism and those of self-interest combine in stimulating mine-owners to use their best endeavours to increase the output of these ores. The agents have promised me to write to their managers with instructions to do all that is possible to comply with the request contained in the memorandum."

ASBESTOS.

Asbestos has been known to exist in the vicinity of Anderson's Creek, near Beaconsfield, for many years, and several unsuccessful attempts have been made to work the deposit in the past.

A few months ago the Durabestos Company of Sydney obtained a lease and erected a mill—the first plant established in Australia—to concentrate asbestos fibre from the ore for the purpose of making panelling slabs for roofing and lining buildings. The crude mineral is known as crysotile, and it occurs in veins in the serpentine rock ranging from one-eighth of an inch to 1 inch in length.

Mr. Hartwell Conder, M.A., Consulting Engineer, in a report published in "The Australian and Industrial Journal" of the 6th December last, says:—

"The mill is built largely of the panelling slabs made by the Durabestos Company of Sydney, the owners of the property. These are 8 feet by 4 feet, and give a handsome finish to the building. The system of crushing is simple. The ore is passed through rock-breakers and rolls till about the size of kidney beans. It is then fed to a disintegrator, with revolving dish and beaters. This

machine breaks up the brittle portion of the rock to fine sand, but fluffs up the asbestos till it has the appearance of crude cotton. The product is delivered to a shaking screen, through which the sands pass while the fluff passes down to the lower end. A narrow spout connected to a suction fan here extends right across the screen, with mouth close down to it. The fluff is at once caught up by the suction, and is delivered to a settling chamber. There are two chambers, and as one is filling the ore is being bagged up for shipment in the other.

"The most troublesome feature is the dust, but fortunately it is not of a cutting nature, so that neither to the men nor the machinery does it carry the danger that quartz or other gritty dust is bound to. In any case, however, this problem is being dealt with, and by the use of fans and enclosing the machinery, it will shortly be overcome.

"At present very satisfactory results are being obtained, and if the grade of ore can be maintained, the success of the enterprise is undoubted. With regard to this important point, there is the assurance that the whole bulk so far removed from the quarries is of payable value, and there is no reason to anticipate either laterally or vertically any lessening of grade within limits that will yield a very large tonnage. In fact, even better-grade ore and larger tonnage may be revealed as the ground is opened up and the habits of the minerals become more familiar. In any case, the undertaking serves a useful purpose in relieving the tonnage that must be shipped into Australia in these present days, and in showing once again that Australia is well supplied with the raw materials needed for manufacture, and can make good use of them when proper scope obtains.

"Mr. H. Masters is in charge of the mine, and Mr. G. Gurman, who has had experience in Canadian mills, is in control of the mill."

About 70 tons of fibre were obtained from 600 tons of ore crushed.

BARYTES.

The Colonial Barium Company Proprietary Limited.—Further samples were broken and sent away, and during the last quarter of the year 10 tons were sent to Risdon and 42 tons to Melbourne.

From work done to date there appears to be an appreciable quantity of this material available.

ZINC.

The production of zinc appears in the mining statistics for the first time. This was produced at the Electrolytic Zinc Company's works at Risdon, from concentrates obtained from Broken Hill, and amounted to 48 tons, of the value of £1968.

POTTERY CLAYS.

Samples of pottery clay were submitted by me to the manager of the Broken Hill Associated Smelters Proprietary Limited in Melbourne, who reported as follows:—

“Gatenby's Clays.—We have completed our tests on the samples you were so kind as to furnish, and have obtained results which are of some interest.

“The following data covers the results of the tests:—

Behaviour at 1600° C.:

- No. 1.—Erect; edges fair; slight puffiness.
- 2.—Erect; edges good; condition good.
- 4A.—Erect; edges good; condition fair.
- 5.—Fused; slightly bent; edges gone.

“These results indicate that Nos. 1, 2, and 4A showed a quite satisfactory resistance; No. 5 is in the doubtful class. The others failed.

“The samples were then mixed with water and allowed to temper until they came to maximum strength. The tensile strength was then taken, both green and after burning at 900° C. for 16 hours. The following results were obtained:—

	Tensile Strength (lbs. per sq. inch).	
	Green.	Burned.
No. 1	67	279
No. 2	32	170
No. 4A... ..	59	111

“The best result is obviously No. 1, which appears to be a pretty strong clay.

“As I think I have already explained, the way in which spelter retorts are supported and the heavy strains to which they are subjected make it essential to have a clay which combines a high tensile strength with a high refractory co-efficient. The only drawback to this clay is its rather low alumina, 26 per cent.; but this fact would not be sufficient to necessarily make it unsuitable. No. 2 shows a very low strength in the green, but it is possible that by mixing 1 and 2 together a more satisfactory blend could be obtained. No. 4A shows a better tensile in the green than No. 2, which is rather low on burning. Its alumina showed 36.7 per cent, which would probably account for the latter figure. Clays with a higher alumina content are generally weaker after burning, owing to their strong tendency to shrink; this action could probably be overcome by suitable blending.

“These three clays show possibilities of being useful, and we understand from you they are available in considerable quantity. The next step would consist in making up retorts from these clays, for which purpose we should need about 20 tons of each. We should also like to know at what figure they could be placed at some shipping point on the coast.

“I might reiterate in explanation of the apparent delay in getting these results that it is necessary to give the clays time to attain their maximum strength, which is frequently a matter of several months. This has been the case in connection with the samples in question.

“Royce's Clay.—In regard to clay sample from Mr. Victor Royce, submitted by you last July, we have now completed our tests, with the following result:—

“This clay withstands a temperature of from 1500° C. to 1600° C. quite satisfactorily. It shows a tensile strength of 170 lb. per square inch dried, and 450 lb. per square inch burnt at from 900° C. to 1000° C. These figures are very good. The shrinkage on burning is 18 per cent., which is high, but this can be taken care of, I believe, by suitable mixing with a clay of lower shrinkage.

“I should be interested in a larger sample, say about 20 tons, of this clay, and shall be glad to take up the matter with Mr. Royce further. It seems to me that this clay has distinct possibilities.”

OUTPUT.

Return showing the Quantity and Value of Mineral Products for the State of Tasmania during the Year ending 31st December, 1917.

Mineral.	Quantity.	Value.
		£
Gold*	ozs. 14,496·464	61,577
Silver-lead Ore	tons 9575·780	152,122
Blister Copper †	5845	841,583
Copper and Copper Ore	771·400	6171
Tin Ore	2637·337	427,917
Coal	63,412	38,673
Wolfram	172·190	28,714
Bismuth	4·212	895
Osmiridium	ozs. 332·079	4898
Scheelite	tons 69	12,130
Barytes	52	234
Iron Pyrites	7685·549	7137
Asbestos	271	271
Zinc	48	1968
Total		£1,584,290

* 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.

The Assistant Government Geologist (Mr. Loftus Hills, M.Sc.) is still absent at the front, and has done good work in connection with the Mining Corps.

The pressing work of this office necessitated the engagement of Mr. Hartwell Conder, M.A., to report upon the tin mines in the Renison Bell district. His report has been furnished, and is now in the hands of the printer.

INSPECTORS OF MINES.

The report of the Chief Inspector of Mines, together with the reports of the three inspectors of mines, is appended.

Mr. M. J. Griffin, who was Inspector for the Northern, Eastern, North-Eastern, and Southern Districts for many

years, having reached the retiring age in October, retired from the Public Service.

I desire to place upon record my very high appreciation of the work performed by Mr. Griffin during the 29 years he was connected with the Department as Manager of the Mt. Cameron Water-race and as an inspector. He was conscientious and thorough, and performed his duties without fear or favour, and gained the respect and esteem not only of his brother officers, but of all with whom he came into contact. His retirement is a severe loss to the Department, and his services cannot easily be replaced.

REVENUE.

The revenue for the year amounted to £14,669 7s. 2d., being a decrease of £9 12s. 8d. on the previous year.

The sum of £1340 16s. 5d. 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. M. J. Griffin, Inspector of Mines, Launceston, retired from the service on the 31st September, 1917.
- Mr. C. H. Curtain, Inspector of Mines, Queenstown, was transferred to Launceston, *vice* Griffin, retired, 1.10.17.
- Mr. H. A. Vaudeau was appointed Inspector of Mines, Queenstown, *vice* Curtain, transferred, from 1.10.17.
- Miss L. R. Edmunds, Clerk and Typiste, resigned, 10.10.17.
- Mr. E. A. Fisher was confirmed in his appointment as Clerk at the Launceston Branch Office, from 15.5.17.
- Mr. E. W. Turner, Warden of Mines, Zeehan, retired from the position of Warden of Mines on the 3rd September, having been appointed Police Magistrate at Hobart.

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.

In conclusion, I desire once more to express my sincere thanks to the officers of the Department for the loyal and ready support during the year, which, owing to the war and strikes on the mainland, and labour disputes in this State, has been a very strenuous one; also to the officers of the Mining Branch of the Department of Lands and Surveys for the manner in which they have performed the work entrusted to them.

I have the honour to be,

Sir,

Your 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 from 1880 to 1917 inclusive.

Year.	Quantity.	Value.
	ozs.	£
1880 to 1903 inclusive	1,265,836·95	4,905,706
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
1917	14,496·464	61,577
	1,847,138·552	7,374,916

No. 2.

RETURN showing the Quantity and Value of Silver-Lead Ore produced from 1888 to 1917 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1888 to 1903 inclusive	300,977·5	2,571,771
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	153,786
1917	9,575·780	152,122
	1,076,656·421	6,302,115

No. 3.

RETURN showing the Quantity and Value of Blister Copper produced from 1896 to 1917 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1896 to 1903 inclusive	52,154	4,186,805
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	*490,965
1913	4569	*364,732
1914	7509	*477,361
1915	7901	*709,167
1916	6305	*884,689
1917	5845	*841,583
	155,041	13,006,365

* Value of Gold contents deducted.

No. 4.

RETURN showing Quantity and Value of Copper Matte exported during the Years 1902, 1903, and 1904 to 1917 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1902	2500	50,112
1903	3727	83,624
1904-1917	—	—
	6227	133,736

No. 5.

RETURN showing the Quantity and Value of Copper Ore produced from 1896 to 1917 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1896 to 1903 inclusive	23,736·5	298,292
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
1917	771·40	6171
	41,324·46	573,929

No. 6.

RETURN showing the Quantity and Value of Tin exported from Tasmania from 1880 to 1904 (compiled from Customs Returns only), and Tin Ore produced during the Years 1905 to 1917 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1880 to 1904 inclusive	76,708·4	7,167,564
1905	3891·5	362,670
1906	4472·75	557,266
1907	4342·75	501,681
1908	4520·8	421,580
1909	4511·2	418,165
1910	3701·01	399,393
1911	3953·05	513,500
1912	3713·825	543,103
1913	4010·41	531,983
1914	2572·713	259,300
1915	2599·234	292,306
1916	2854·636	350,852
1917	2637·337	427,917
	124,589·615	12,747,280

No. 7.

RETURN showing the Quantity and Value of Iron Ore produced from 1897 to 1917 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1897 to 1903 inclusive	20,442	16,276
1904	6840	2975
1905	6300	2600
1906	2600	1100
1907	3000	1150
1908	3600	1600
1909-1917.....	—	—
	42,762	25,701

No. 8.

RETURN showing the Quantity and Value of Wolfram produced from 1899 to 1917 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1899 to 1903 inclusive	57·25	2157
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	7762
1912	66·49	6601
1913	68·07	7040
1914	46·873	4327
1915	94·685	11,115
1916	106 265	16,910
1917	172·190	28,714
	890·233	104,139

No. 9.

RETURN showing the Quantity and Value of Coal raised from 1880 to 1917 inclusive.

Year.	Quantity.	Value.*
	Tons.	£
1880 to 1903 inclusive	767,261	659,010
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*
1917	63,412	38,673*
	1,611,820	1,207,747

* Value at pit's mouth.

No. 10.

RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 to 1917 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
1917	332·079	4898
	4252·407	38,630

No. 11.

RETURN showing the Quantity and Value of Barytes produced during the Years 1916 and 1917.

Year.	Quantity.	Value.
	Tons.	£
1916	83	359
1917	52	234
	135	593

No. 12.

RETURN showing the Quantity and Value of Bismuth produced from 1904 to 1917 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
1917	4·212	895
	67·531	21,411

No. 13.

RETURN showing the Quantity and Value of Asbestos produced from 1899 to 1917 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1899	200	363
1900	128	113
1901	46·5	45
1902-1915.....	—	—
1916	15	30
1917	271	271
	660·5	822

No. 14.

RETURN showing the Quantity and Value of Shale produced during the Years 1910 to 1917 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1910	364	214
1911	500	250
1912	—	—
1913	130	130
1914	75	75
1915	—	—
1916	1286	1286
1917	—	—
	2355	1955

No. 15.

RETURN showing the Quantity and Value of Iron Pyrites produced during the Years 1915 to 1917 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1915	12,835·59	8945
1916	14,005·084	13,597
1917	7,685·549	7137
	34,526·223	29,679

No. 16.

RETURN showing the Quantity and Value of Zinc produced during the Year 1917.

Year.	Quantity.	Value.
	Tons.	£
1917	48	1968

No. 17.

RETURN showing the Quantity and Value of Scheelite produced during the Year 1917.

Year.	Quantity.	Value.
	Tons.	£
1917	69	12,130

No. 18.

RETURN showing Quantity and Value of Minerals and Metal raised in Tasmania from 1880 to 1917 inclusive.

Mineral or Metal.	Quantity.	Value.
		£
Gold	1,847,138·552 ozs.	7,374,916
Silver-lead Ore	1,076,656·421 tons	6,302,115
Blister Copper.....	155,024 "	13,006,365
Copper Matte	6227 "	133,736
Copper and Copper Ore...	41,324·460 "	573,929
Tin Ore.....	124,589·615 "	12,747,280
Iron Ore	42,762 "	25,701
Coal	1,611,820 "	1,207,747
Wolfram	890·233 "	104,139
Bismuth	67·531 "	21,411
Asbestos	660·500 "	822
Shale	2355 "	1955
Iron Pyrites.....	34,526·223 "	29,679
Osmiridium	4252·407 ozs.	38,630
Barytes.....	135 tons	593
Scheelite	69 "	12,130
Zinc	48 "	1968
Unenumerated prior to 1894...	...	31,988
Total .....	...	£41,615,104

No. 19.

RETURN showing the Amounts paid in Dividends by Mining Companies during the Year ending 31st December, 1917.

Mines.	Dividends.
	£
Copper	80,575
Gold .....	...
Tin	100,537
Silver	11,191
Coal.....	5278
Scheelite	5000
TOTAL	£202,581

No. 20.

RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 to 1917 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	1917.....	4050

No. 21.

RETURN showing the Mining Companies registered during the Year ending 31st December, 1917.

Number of Companies.	Capital.
5	£10,450

In addition to the above, two Agents for Foreign Companies and one Syndicate, under Part V.a of the Mining Companies Act, were registered.

No. 22.

RETURN showing the Average Number of Miners employed during the Year ending 31st December, 1917.

Division.	Number.
Northern and Southern	254
North-Eastern	470
Eastern	488
North-Western.....	649
Western.....	2189
◆	4050

No. 23.

RETURN showing the Total Amount of Rents, Fees, &c., received by the Mines Department during the Year ending 31st December, 1917.

Head of Revenue.	Amount.
	£ s. d.
Rent of Auriferous and Mineral Land.....	13,872 16 6
Fees, ditto ditto	796 10 8
Survey Fees	1340 16 5
TOTAL.....	£16,010 3 7

No. 24.

RETURN showing the Total Area of Land and Number of Sluice-heads of Water applied for during the Year ending 31st December, 1917.

Mineral.	Number.	Sluiceheads.	Area.
			Acres.
Asbestos .....	...	...	...
Barytes ... ..	...	...	...
Bismuth .....	...	...	...
Chrysotile .....	...	...	...
Clay	1	...	10
Coal	10	...	1194
Copper	2	...	80
Gold	41	...	818
Guano .....	...	...	...
Iron	1	...	20
Limestone .....	...	...	...
Minerals	62	...	2566
Molybdenite .....	...	...	...
Nickel .....	...	...	...
Osmiridium	1	...	20
Phosphate of Lime .....	...	...	...
Silver-lead Ore	4	...	202
Slate	4	...	717
Scheelite	1	...	10
Tin	188	...	3501
Wolfram .....	...	...	...
Machinery Sites	3	...	21
Mining Easements	15	...	54
Dredging Claims	15	...	180
Water Rights and Dam Sites	95	298	301
	443	298	9694

No. 25.

RETURN showing the Total Number and Area of Leases issued during the Year ending 31st December, 1917.

Mineral.	No. of Leases.	No. of Sluiceways.	Area.
			Acres.
Asbestos	2	...	100
Barytes	4	...	110
Bismuth .....	...	...	...
Coal	4	...	554
Copper	10	...	526
Chrysotile .....	...	...	...
Gold	48	...	784
Guano .....	...	...	...
Iron .....	...	...	...
Limestone .....	...	...	...
Machinery Sites	1	...	2
Minerals	48	...	2284
Manganese	1	...	63
Nickel	1	...	80
Phosphate Rock	1	...	4
Scheelite	1	...	75
Silver-lead	7	...	437
Tin	96	...	1960
Wolfram	7	...	336
Dredging Claims	9	...	101
Water-rights	49	189	85
Mining Easements	9	...	14
	298	189	7515

No. 26.

*RETURN showing the Total Number of Leases in force on
31st December, 1917.*

Mineral.	No. of Leases.	No. of Sluicheads.	Area. Acres.
Asbestos.....	5	...	260
Bismuth.....	2	...	150
Barytes.....	6	...	270
Coal.....	44	...	11,043
Copper.....	37	...	1495
Clay.....	1	...	10
Chrysotile.....	3	...	160
Dredging Claims.....	30	...	401
Gold.....	91	...	1761
Iron.....	3	..	138
Limestone.....	5	...	607
Mining Easements.....	105	..	628
Machinery Sites.....	38	...	175
Minerals.....	198	...	15,163
Molybdenite.....	1	...	37
Manganese.....	1	...	63
Nickel.....	2	...	121
Osmiridium.....	2	...	42
Phosphate Rock.....	1	...	4
Shale.....	1	...	1488
Silver-lead.....	34	...	2882
Scheelite.....	1	...	75
Tin.....	559	...	14,690
Water-rights.....	557	2035	2085
Wolfram.....	20	...	643
Zinc Sulphide.....	...	...	...
	1747	2035	54,391

No. 27.

RETURN showing the Annual Value of Mineral Products for the State of Tasmania from 1880 to 1917 inclusive.

Year.	Value.	Year.	Value.
	£		£
1880.....	554,031	1901.....	1,763,896
1881.....	602,723	1902... ..	1,378,406
1882.....	556,306	1903.....	1,354,044
1883.....	560,873	1904.....	1,379,204
1884.....	468,302	1905.....	1,729,129
1885.....	518,885	1906.....	2,257,147
1886.....	489,966	1907.....	2,277,159
1887.....	593,256	1908.....	1,650,027
1888.....	616,733	1909.....	1,574,995
1889.....	504,718	1910.....	1,432,193
1890.....	444,210	1911.....	1,349,497
1891.....	528,388	1912.....	1,493,502
1892.....	526,909	1913.....	1,415,700
1893.....	627,909	1914.....	1,007,038
1894.....	732,764	1915.....	1,225,575
1895.....	575,692	1916.....	1,521,050
1896.....	662,058	1917.....	1,584,290
1897.....	1,006,140	Unenumerated	
1898.....	1,071,084	prior to 1894	31,988
1899.....	1,660,622		
1900.....	1,888,695		£41,615,104

No. 28.

RETURN showing the Number and Area of Leases held under "The Mining Act," in force on 31st December, 1910 to 1917 inclusive.

Nature of Lease.	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.		In force on 31st Dec., 1917.	
	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
For Minerals, Silver, Tin, &c.	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	876	Acres. 36,203
For Coal, Slate, Shale, &c.	50	10,608	58	13,049	37	8854	23	5660	26	6405	45	11,522	52	13,742	50	13,138
For Gold Dredging Claims	76	1159	73	1220	73	1344	54	988	95	2130	94	2026	85	1692	91	1761
Mining Easements	35	441	42	647	42	489	30	329	36	403	29	351	30	437	30	401
Machinery Sites	84	484	99	606	133	606	105	603	110	611	102	553	106	641	105	628
Water-rights Mineral and Gold	33	121	37	145	39	149	36	153	43	180	40	183	37	190	38	175
	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	557	2085 & 2035 sluice-heads

No. 29.

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 1917 inclusive.

Year.	Amount.			Year.	Amount.		
	£	s.	d.		£	s.	d.
1882.....	23,077	1	9	1901.....	21,569	5	2
1883.....	15,439	14	5	1902.....	19,471	0	1
1884.....	6981	11	10	1903.....	17,776	14	3
1885.....	11,070	5	7	1903, 1 July to 31 Dec.	14,758	17	1
1886.....	12,523	10	4	1904, Jan. to Dec.	16,631	8	2
1887.....	14,611	11	5	1905.....	20,203	17	0
1888.....	23,502	8	4	1906.....	24,136	12	5
1889.....	17,254	9	0	1907.....	24,794	7	7
1890.....	26,955	4	9	1908.....	20,311	3	0
1891.....	37,829	16	5	1909.....	22,804	1	5
1892.....	17,568	18	4	1910.....	22,221	18	0
1893.....	16,971	9	2	1911.....	20,556	15	10
1894.....	16,732	7	7	1912.....	17,639	19	11
1895.....	15,323	1	9	1913.....	19,410	17	8
1896.....	20,901	13	2	1914.....	14,087	0	6
1897.....	25,631	0	3	1915.....	17,679	3	6
1898.....	33,661	13	9	1916.....	14,678	19	10
1899.....	24,696	10	5	1917.....	14,669	7	2
1900.....	28,380	11	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.

REPORT OF THE MOUNT CAMERON WATER-
RACE BOARD FOR THE YEAR ENDING 31st
DECEMBER, 1917.

Gladstone, 7th February, 1918.

SIR,

WE have the honour to submit the report of the Board for the year ending 31st December, 1917.

Race.—The race throughout is in good order. One or two slight breaks occurred during the wet season, but these were repaired at a cost of £8 4s. 6d. Advantage was taken of the dry season in the early part of the year to have the race cleaned out and the scrub on the banks cut and cleared. The handrail along the bridge at the iron fluming requires to be renewed, and some repairs are necessary to the cross-ties over the flume. These will receive immediate attention.

Syphons.—These are all in excellent condition, and give no cause for anxiety. At the last meeting of the Board the manager was authorised to turn the sections of the pipe columns Nos. 4 and 5 for the purpose of thoroughly cleaning and painting them. Owing, however, to the shortage of labour in the district at a convenient time, the manager has been unable to carry out the work up to the present time.

General.—The channel-keepers' cottages have been renovated at a cost of £89 3s. 8d. The cost has not been charged against the revenue received from the race, but has been paid out of the balance provided by the Public Works Department some years ago for the Mount Cameron Water-race. After paying the cost of construction of the rock cuttings, earth embankments, syphons, &c., a balance remained, and this has now been expended in general repairs to the race, manager's residence, and channel-keepers' cottages.

The work of boring certain parts of the Gladstone tinfield for new deposits, which was undertaken by the Board at your request, has proceeded, but the results obtained have not proved the existence of any rich deposits of alluvial tin. Nineteen applications were received, and 339 bore holes, aggregating 7315 feet, were put down during the year, making a total of 506 bores and 9625 feet.

During the last quarter the drill was hired by the Arba Tin Mining Company for the purpose of testing the tin drifts on the company's leased land.

Revenue.—The revenue for the year amounted to £1532 5s., being an increase of £166 17s. 7d. on the previous year.

Expenditure.—The expenditure amounted to £775 9s. 4d., being an increase of £10 15s. 9d. as compared with the previous year.

The statistics for the year are as follow:—

Average per week of claims supplied, 8.

Greatest number supplied in any one week, 12.

Total number of heads supplied—Under fixed or cash scale, 245½; under royalty or credit scale, 2535.

Total, 2780½.

Tin ore raised for the year:—Fixed scale, 11 tons 18 cwt. 1 qr.; royalty scale, 34 tons 14 cwt. 0 qr. 26 lb.

Total, 46 tons 12 cwt. 1 qr. 26 lb., being a decrease of 23 tons 3 cwt. 2 qr. 26 lb. on the previous year.

Average number of men employed per week, 8.

Total receipts for the year:—Water sold, fixed scale, £184 13s. 11d.; water sold, royalty scale, £1341 1s. 1d.; rent of cottage, £6 10s.

Expenditure.—Cost of maintenance and management:—

	£	s.	d.
Salaries and wages	609	13	0
Insurance	6	3	0
Travelling expenses	43	12	10
Stationery and printing	2	5	10
Stores and tools	20	5	6
Race repairs	8	4	6
Cleaning race	85	4	8
Total	£775	9	4

Paid to Public Debts Sinking Fund
for the year ending 30th June, 1917
(including moiety of rents of mineral
land served by the race, £7 1s. 8d.) £386 2 4

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.
E. L. HALL,	} Members.
JOHN SIMPSON,	
J. O. HUDSON,	
CECIL G. RYAN,	
CHARLES BARNES,	

GEOLOGICAL SURVEY OF TASMANIA.

REPORT OF THE GOVERNMENT GEOLOGIST.

Geological Survey Office,
Launceston, 22nd April, 1918.

SIR,

I BEG to present my report for the year ending 31st December, 1917. Herewith also are the annual reports of Mr. W. D. Reid, Government Assayer, and Mr. A. McIntosh Reid, Acting Assistant Government Geologist.

The following publications have been issued in the course of the year:—

- (1) Mineral Resources, No. 2: Cement Materials at Flowery Gully, by W. H. Twelvetrees. 5th April, 1917.
- (2) Mineral Resources, No. 3: Phosphate Deposits in Tasmania, by W. H. Twelvetrees. 9th May, 1917.
- (3) Mineral Resources, No. 4: Asbestos at Anderson's Creek, by W. H. Twelvetrees. 18th May, 1917.
- (4) Mineral Resources, No. 5: A Deposit of Ochre near Mowbray, by W. H. Twelvetrees. 10th July, 1917.

Phosphate Deposits in Tasmania.

At the instance of the Commonwealth Advisory Council of Science and Industry, I prepared a report recording briefly what is known relating to our phosphate deposits. Mineral phosphates occur only in microscopic quantities in some of our igneous rocks, but organic phosphates are found to some extent in the various limestones and in the guano deposits on the islands round our coasts. Among the latter may be mentioned Sea Elephant Rocks, on the east coast of King Island; White Rock Island, between Freycinet Peninsula and Maria Island; Slopens Island, in Frederick Henry Bay; and some islands in the Furneaux Group. Samples of material have been received containing from 25 per cent. to 30 per cent. phosphate of lime, which, however, is insufficient for competition with supplies used by manufacturers from other sources. The guano deposits, moreover, seem to be of limited extent, and hardly warrant much expenditure in examination of the islands on which they occur, but it is desirable to continue to collect information when and wherever possible.

Ochre.

An examination was made during the year of the old Paint Mine Hill, on Russell's Plains, north of Mowbray, where some preliminary operations have been recently carried on with a view to the extraction of ochres and the manufacture of paint therefrom. It was found that a few hundred feet of trenches, &c., had been cut near the summit of the hill, and a considerable body of red and yellow ochres of workable quality exposed. About 20 years ago this proposition was taken in hand, and some shipments made to Melbourne, but for some reason or

other continuous work was not initiated, and the deposit has lain dormant ever since. Interest in it was lately revived, and some working tests made of paint manufactured from the raw material. The product was tried by the Launceston Corporation and by building firms in the city and neighbourhood, giving entire satisfaction. It was also reported on favourably by Mr. Flounders, of Adelaide, a technological expert of repute.

All the evidence points to the possession in an unusual degree by these ochres of the necessary properties which are required for the manufacture of paints of the highest quality. Attention, however, has for a time been diverted to deposits of chrome and iron oxides at Anderson's Creek, near Beaconsfield, where preparations are being made for work on an extensive scale. I visited the latter deposit, and found a long cut up the west side of Scott's Hill exposing a body of chromiferous clay of great purity and well situated for economic working. The syndicate which has the enterprise in hand intends concentrating the raw materials on the spot and manufacturing the paints by means of a plant which has been installed on the old Loongana Wharf in Launceston. The erection of the necessary machinery is just approaching completion.

Slate.

An attempt has been made recently to revive work at the old Bangor slate quarries, 4 miles north of Karoola-station. The old enterprise came to an end 30 years ago, when the galvanised iron era began and slate became too dear for roofing. The present high price of iron roofing has led to search for substitutes, and it is thought that now is a favourable time for resuscitating the slate industry.

I made an examination of the old quarries in December, with a view of seeing what prospects investors can look forward to. Two 40-acres sections have been taken up; one section by W. J. Southerwood, at the southern end of the field, and the other at the northern end, by W. J. Hammersley, including T. C. Just's old quarry worked over 40 years ago.

The Bangor property was last worked from a deep shaft and underground workings, which are now filled with water, so that at present it cannot be seen what the faces were looking like when operations were discontinued. As far as can be learned now, approximately 9000 or 10,000 tons of slate were produced altogether during the last three years of work. A good many split slates of not altogether the best quality are still at grass near the shaft and quarry, but it is said that the best grade of the output was disposed of in Victoria, leaving second and third qualities for sale locally. The method of working was expensive, and in the new enterprise some effort should be made to work the deposit, if possible, by open cut, or, at the most, by shallow underground quarries. A good deal of the slate cleaves well; it is free from veins of quartz and troublesome joints, magnetite is absent—which will permit slabs to be used for electric switchboards—and the slate stands weathering quite well. It has to be admitted that much of it is on the soft side, but as cover is gained, it will no doubt improve in this respect. There is apparently a sufficiently large body of it to carry on a substantial enterprise for a lengthy period.

The promoters must—(1) Unwater the deep workings to discover the actual quality of the slate in the old faces; (2) ascertain what working faces could be started; (3) endeavour to keep their new work from getting too deep and costly; and (4) give great attention to the grading of their product. The transport route would be by road or tram to Karoola-station, thence by rail to Launceston. This ought to cost within 10s. per ton. It is probable that motor transport would be adopted for the first section of the route, and subsequently tramway easements could be obtained over lands between Bangor and Karoola. Altogether the time seems to have arrived for a serious investigation of the proposition, with a view of re-establishing the industry. As regards markets, prices are somewhat uncertain, and under present war conditions cannot be considered as stable: before the war imported slates of standard size were bought at £14 or £15 per thousand, but double that rate is now quoted. Besides roofing slates, slabs enter largely into the product of modern slate enterprises. Massive blocks not adapted to splitting are used for this purpose. They make good mantelpieces, door steps, cisterns, &c., and are, on account of their cleanliness, particularly well adapted for feeding-troughs on farms. It ought not to be difficult to establish a demand for Bangor slabs.

W. J. Hammersley's section, North Bangor, includes the old quarry of T. C. Just. The slate here is harder than at South Bangor, some of it perhaps a trifle too hard. A good deal of it, however, is of excellent quality. Two enterprises in this district would not be politic, but possibly the Bangor Company might make use of these northern occurrences for some special demands of the market.

Gold at Bangor.

Some gold quartz veins at North Bangor were also examined on this occasion. Formations were inspected on R. McKenna's and G. W. Freeman's lots. Although gold is present (up to 2 dwt. 3 gr. per ton), appearances did not justify the hope of any payable mine being opened up where trial work had been started. This, of course, does not preclude the possibility of new and more promising discoveries.

Oil Shale at Bangor.

Half-way between Bangor and Karoola, on the summit of a hill east of the main-road, on T. Windsor's 68½ acres, is an occurrence of carbonaceous shale, from samples of which crude oil has been extracted by distillation in the laboratory, at the rate of 15 to 19 gallons per ton. The seam is imperfectly exposed in the little excavation that has been made, but some slabs of shale from it are lying at grass near the outcrop. The oil has been determined by Mr. D. Griffin, manager of the Railton-Latrobe Shale Oil Works, as being of a paraffin base. Considered as an oil shale it is poor in quality; the quantity available has also not been established. Some work is necessary to ascertain whether there is any extent of seam which could be worked. At present it seems possible that it may cut out on the other side of the hill, unless some fault has occurred, throwing it down into the lower country beyond.

North Pieman and Sterling Valley Districts.

These mineral areas have been examined by Mr. A. M. Reid, Assistant Government Geologist, during the year, and are referred to in his annual report herewith.

Mines Department Circulars.

The Mines Department, with a view of affording information to prospectors with reference to minerals concerning which inquiries are constantly being made, has initiated the publication of a series of circulars for free distribution embodying useful knowledge and suggestions. During the year I have prepared for the Department three of these circulars, namely:—

- (1) Bauxite: A Source of Aluminium. August, 1917.
- (2) The Search for Petroleum in Tasmania. October, 1917.
- (3) Prospecting for Mercury in Tasmania. December, 1917.

From the demand experienced for copies of these, they appear to have met a genuine want. It is intended to continue the series, and during the current year there will be fresh issues.

Bauxite.

A great deal of interest has been evinced in the search for bauxite ores which might serve as the foundation of an aluminium-producing industry, utilising current from the State hydro-electric plant.

Bauxite is first concentrated by one of several processes and pure alumina obtained, which in its turn serves for the production of aluminium. The processes of extraction of the metal are thermo-electric. Cheap electric current, such as will be available from the State hydro-electric installation, is an essential for success, and opens up attractive possibilities for this industry in Tasmania, if only deposits of raw material can be discovered. Numerous samples of supposed bauxite have been brought to the Geological Survey laboratory for assay, but so far no useful deposit has been disclosed.

Petroleum.

The inconclusive operations on Bruny Island have not quenched the enthusiasm of many who are still sanguine about the existence of a rock oil field in Tasmania. It was thought desirable to supply some information about petroleum deposits in general, together with suggestions referring particularly to Tasmania. The conclusions put forward in the circular published are that the two most likely areas in the island for the existence of an oil reservoir are the Tertiary beds, of which the Launceston and Longford basin is an example; and the saliferous beds of the Midlands; and that if seepages and gas emanations can be found in these fields, trial bores at structurally suitable spots would be warranted. But it cannot be too clearly emphasised that surface indications are a *sine quâ non* in any drilling scheme. There is nothing exceptional in the condition of sedimentation in Tasmania which would forbid the possibility of a discovery, and the Survey recommends continued search.

Mercury.

Prospectors for cinnabar, the principal ore of mercury, in Tasmania have not always had a definite and correct idea of the appearance of the mineral, nor of its usual mode of occurrence, and the information now issued on these points is calculated to be of use. Several samples have been brought in from time to time, but in no instance have they proved to be what they were supposed. The characters of the ore and hints as to the kind of country to prospect are given in this publication.

North Dundas and X River Tinfields.

Sundry developments having occurred on these fields since Mr. L. K. Ward's visits in 1909 and 1911, the need of a fresh examination of the district was urged upon the Hon. the Minister by some of those interested in the progress of mining there. To meet these requests, Mr. Hartwell Conder, M.A., A.R.S.M., was appointed to report on the present state and prospects of the fields. His report is in the hands of the printer, and will be published as a Geological Survey bulletin. With regard to the future of the tin mining, Mr. Conder lays stress on by-products being obtainable from the pyritic constituent of the ores. The extraction of tin ore from the oxidised lode material, as at present, he regards as a temporary phase; the future life of the field being dependent on the use made of the pyritic ore.

Mineral Maps.

During the year twelve mineral maps were prepared by the Assistant Geologist, showing the localities of economic minerals in the State, and copies of same were forwarded to you. These will be useful for purposes of reference. They comprise localities for asbestos, osmiridium, nickel, copper ore, tungsten, bismuth and antimony ores, monazite, tin ore, silver-lead and zinc ores, zircon, sapphire, diamond, topaz and chrysoberyl, iron ore, molybdenite, rutile, coal, shale and bitumen, and meteoric iron and glass.

Freshwater Point.

In conformity with a request by the Agricultural Department, I visited, in December, with Mr. Ward, the Government Fruit Expert, some orchard land at Freshwater Point, on the Tamar, where some mysterious subsidences had taken place, in order to ascertain the geological reasons for the subsidence and whether any practical remedy was possible. The visit resulted in the conclusion that the phenomenon was due to soakages, which had their source in underground water brought from a distance in an unusually wet season. While a radical remedy is difficult to devise, a partial cure will be found in exhausting the soakages by trenching and otherwise draining. The disturbance is not strictly confined to one orchard, but extends to others further north on the same peninsula.

British Science Guild.

This important institution exists for the purpose of securing the recognition by the Imperial Government of the aid which can be rendered to the national life by the application of science and scientific methods to the problems of industry, and, in fact, to the whole range of human activity. The Guild has approached the Geological Survey as a channel of authoritative information relating to what is being done in this direction in Tasmania, and the Government Geologist will act as its corresponding secretary here. Communications which I have furnished set forth some of the natural resources of Tasmania and give some account of the efforts which are being made by the State Industrial Science Committees, the Hydro-Electric Department, and the Mines Department in the investigation of research problems and industrial science generally. The presentment of the development of the resources of the State from time to time in this manner will, it is hoped, prove a useful means of attracting attention to Tasmania's natural wealth and possibilities.

Museum and Mineral Collections.

Additions continue to be made to our collections of rocks and minerals by private donors and from the Survey work in the field, but with the rigid economy which has become necessary, expenditure on cases has ceased, and extreme difficulty is being experienced with regard to the disposal of specimens. Further case space is essential for accommodation of exhibits in connection with new industries. Mr. A. M. Reid, since his appointment, has done useful work in rearranging exhibits and numbering the specimens throughout the collections. The display of our collections is a part of our function as a Geological Survey, and their arrangement in a manner which proves advantageous and instructive alike to the prospector and the student is, there is reason to believe, greatly appreciated by the public.

Owing to demands on my time elsewhere, I have not been able to make much progress with the preparation of the museum handbook referred to in my report last year.

An application was received from the Royal College of Science, South Kensington, for a collection of specimens of tin ore and the country-rock illustrative of our deposits in Tasmania, but the Federal authorities intimated that under present shipping conditions permission could not be granted for its despatch.

At the request of the Tasmanian Tourist Department, a collection of ores was made up for the Tasmanian offices in Sydney, where, I understand, they attracted much attention.

Some samples of slate from the Arthur River, 13 miles north of Waratah, were brought in by Mr. Kirkup, who is interested in the deposits in that locality, and as some fossil impressions were noticed in them, a specimen was sent to Mr. F. Chapman, palaeontologist to the National Museum, Melbourne, for determination. He kindly replied as follows:—

“There is very little doubt that the impressions are made by an organism allied to some lately described by C. W. Walcott from the middle and upper Cambrian, and referred to chatopods (fossil annelids). I would like to further examine it and am looking into the literature. I would not hazard the suggestion that the Tasmanian specimens are as old as the American.”

Mr. Chapman also determined some crinoid fossils (stone lilies) from apparently Silurian beds in the neighbourhood of the Princess Mine, near Lynchford, as follows:—

“Your specimen of grey sandstone shows impressions of rather deep columnars of a crinoid in which the sutural faces of the joints are excavated. Some crinoid ossicles are also present; also traces of monticuliporoids (polyzoa).”

Determinations of some fossils found by Mr. T. H. Lawson in Tertiary limestone at Marrawah were also carried out by Mr. Chapman, to whom thanks are due for the trouble he has taken in connection with our collections. He writes as follows:—

“I have examined the small collection of fossils from limestone at Marrawah, and append my note on them. They present several points of interest, and I am glad to have seen them.

“*Pleurotomaria* sp. (cast).—This specimen is remarkable as it shows some annectant characters between the Moorabool Valley species, *P. tertiaria*, McCoy, and the Table Cape species, *P. bassiana*, Pritchard. It agrees with the firstnamed species in its more obtuse spire, and with the latter in its slightly concave whorls.

“*Cypraea* sp. (cast).—This form most resembles *C. subidua*, Tate, with the exception that it is shorter and the dorsal surface is not so depressed as in that species. It may be a small specimen of *C. leptorhyncha*, although hardly globose enough for that species.

“*Conus* cf. *complicatus*, Tate (cast).—In the general shape and depressed spire this specimen appears to approach the above species, but as the external ornament is not preserved, the identification must remain doubtful.

“The relationships of this small collection point unmistakably to the Janjukian (Table Cape) series. The condition of the fossil cases resembles that of the Moorabool Valley, near Maude, Victoria.”

Tasmanite Shale.

Quite a new locality for Tasmanite oil shale has been reported during the year from the Cam River. Mr. W. Cross, of Lower Mt. Hicks, south of Henrietta Plains, discovered an outcrop on his 79-acres block on the east bank of the river. It is reported as extending across the southern boundary of that block for 5 chains into the 102 acres south and adjoining. It is a good distance east of the Preolenna field, but the two are probably connected by intervening beds of the same age. A particular interest attaches to this discovery, as the shale is the first that has been discovered in the State outside the Mersey area. The quality of the sample received is rather poor, somewhat similar to the poor hand in the Mersey seam; but it is possible that by search a better quality may be picked up. Little, however, is known of the occurrence, and without examination the value cannot be well gauged.

Geothermic Degree.

At the instance of the International Congress of Mining, Metallurgy, and Applied Geology, the International Geological Congress, at its 1906 session in Mexico, decided to form a Commission for the study of the variation of this degree in different parts of the world. The Geological Survey of Tasmania has undertaken the necessary work for Tasmania. The New Golden Gate Mine at Mathinna having closed down, the only deep mines available for observations of underground rock temperatures have been the Tasmania Gold Mine at Beaconsfield and the North Lyell Mine on the West Coast. Both these companies entered readily on the task, and the manager carried out the tests in their entirety with a care and thoroughness which have been greatly appreciated.

It is undoubted that with increasing depth below the seasonal surface zone of the earth's crust the rock temperature invariably rises. The phenomena which surround this fact are of the highest interest to the scientific investigator, who has founded on them conclusions with reference to the interior of the earth and the age of certain rock masses. The mining engineer also studies them closely on account of the bearing which the downward increment of heat has on the economic possibility of mining operations at the extreme depths which will confront mine-owners in the future.

The determination of the rate of increase is affected by various conditions which make a difference in the results obtained. The trials in different countries, in different mines, and even in different parts of the same mine, show divergences which can only be accounted for by varying rock conductivities, want of uniformity of conditions in the sites chosen for the tests, and possibly by instrumental defects. The lack of standardisation of methods adopted by different observers must also count for a good deal.

The geothermic degree may be here defined as the depth to which it is necessary to sink in order to raise the rock temperature by one degree. British temperatures have been usually given in degrees Fahrenheit, but in international literature and scientific work in general the Centigrade scale is followed.

Conditions of Tests.

The conditions laid down by the Survey for taking the temperatures were practically those of the Austrian Government regulations. They were as follow:—

1. New ground to be selected for bore holes, quite away from other workings; to be as dry as possible, and to be free from pyrites.
2. The holes to be horizontal and of the standard depth of 6 feet.
3. The thermometer to have its index lowered by immersing the bulb in cold water before it is inserted in the bore hole, and directly after it has been removed and during the reading. The instrument to be carefully pushed in until the bulb reaches the end of the bore hole, and the latter is to be closed with an efficient plug.
4. The thermometer to be inserted 24 hours after the hole has been bored, and to remain in the hole for two

days, when the first reading may be made; the reading to be repeated daily until the temperature remains constant.

Tasmania Gold Mine.

The trials at this mine were under the control of Mr. C. F. Heathcote, A.M.I.C.E., the company's superintendent, who has furnished the following report:—

“The country-rock in the neighbourhood of the mine from east to west consists of:—

Sandstone and limestone	
Shale	
Sandstone and limestone	
Limestone	About 400 feet thick
Sandstone	About 600 feet thick
Grits with a few conglomerate beds	} About 600 feet thick
Grits and conglomerate	
Conglomerate	
Limestone	About 30 feet thick
Conglomerate and grit	
Shale	
Sandstone and conglomerate	

The age of these strata is considered to be Silurian; the strike is north-west, and the dip about 45 degree to the north-east.

The Tasmania reef is the filling of a fissure crossing the strata at about right angles and dipping south-east at an angle of 72 degrees. It exists only between the two beds of limestone, and the downthrow of the hanging-wall is from 30 to 33 feet.

Pumping operations have drained the area between the two beds of shale, the sandstones to a depth of 1500 feet below collar of shaft (125 feet above sea-level), and the conglomerate to a depth of 1370 feet. The outcrop of the conglomerate forms a long hill, the crest of which rises from 325 to 425 feet above the sea-level. The seepage of surface water is not great, but for every foot of vertical depth from 18 to 22 million gallons of water have to be raised from the bottom level.

Pyrites.—The conglomerates and grits contain a large quantity of pyrites and also contain carbon; they are very siliceous, and the lower beds showing in the mine are very much fractured, with open channels between the beds. In the 30-feet of limestone caves have been found at 700 and 800 feet below surface, filled or partly filled with fine carbon deposit leached from the conglomerates. The decomposition of the pyrites renders the old workings in the conglomerates very hot, and gives rise to considerable efflorescence of sulphate of iron. One level in a period of three years was filled to a depth of from 2 to 3 feet, and another in two years showed a depth of from 18 inches to 2 feet. The efflorescence appears as light-brown cauliflower-like growths, which change to white curled celery growths, and later to massive green sulphate. In one place the conglomerates adjoining the limestone were caved for stope filling, and after 12 months' work the stone, then coming from about 150 feet higher up, was too hot to hold in the hand for any length of time.

Mine Water.—This is slightly alkaline, and contains a large quantity of iron in solution. The hardness by standard solutions as issuing from faces is about 28 parts per 100,000, reduced after two days' exposure in dams to about 23.8. Chlorine, by standard silver nitrate, is 3.5 to 4 parts; while local streams vary from 2.5 to 5.5 parts per 100,000.

Carbon Dioxide.—Large quantities are given off by the country whenever the barometer falls—warm from the upper levels, cold from the lower.

Experiments on underground temperatures were confined to the sandstone beds. The thermometer used was a self-registering standard one made for bore-hole investigations by Casella & Co., London, and supplied by the Geological Survey of Tasmania, whose instructions were strictly followed.

The first trial was made in a footwall crosscut, 690 feet north-east of the lode, but owing to trouble with the gas and want of practice on the part of the observer, the results were of no value.

Table I. gives readings from a borehole in footwall country, near the north-east end of the 1500-foot level, in beds about 100 feet distant from the limestone. Final temperature, 71 degrees Fahr.

Table II. gives results from a borehole in a drive in footwall country about 150 feet from the highest of the conglomerate beds and 100 feet from the reef or lode. Final temperature, 71 degrees Fahr.

Table III. gives results from a borehole in recent prospecting drive, 100 feet from surface and about 1300 feet south-east of Table II. Final temperature, 60 degrees Fahr.

Table I.

1914.	Temperature when placed in Bore-hole.	Temperature when taken out of Bore-hole.	
	Degrees Fahrenheit.	Degrees Fahrenheit.	
Feb. 11	68	—	} 1500 feet
16	68	76	
23	64	74	
25	64	71	
Mar. 2	68	71	
4	—	71	

Final temperature, 71 degrees F. = 21.7 degrees C.

Table II.

1914.	Temperature when placed in Bore-hole.	Temperature when taken out of Bore-hole.	
	Degrees Fahrenheit.	Degrees Fahrenheit.	
Mar. 4	69	—	} 1500 feet
6	68	75	
8	69 withdrawn with difficulty	71	
14	67	73	
17	67	73	
20	65	71	
23	68	71	
28	—	71	

Final temperature, 71 degrees F. = 21.7 C.

Table III.

Apr. 6	60	—	} 100 feet
8	59	61	
14	54	63	
16	57	60	
20	59	60	
22	—	60	

Final temperature, 60 degrees F. = 15.6 degrees C.

Average result shows an increase in rock temperature of 11 degrees Fahr. in 1400 feet, or 1 degree per 127 feet vertical depth.

(Sd.) C. F. HEATHCOTE,

A.K.C., Assoc.M.Inst.C.E., M.Inst.M.M., &c."

North Lyell Mine.

A series of readings has been carried out to a depth of 1200 feet in the North Lyell Mine, under similar technical conditions to those observed in the Tasmania Mine trials. The bores put in and the readings obtained were under the supervision of Mr. R. M. Murray, the engineer in charge of the mine. The depositions of ore in this mine consist, as is well known, of bornite lenses in feldspathic schist and quartzite, and the bores which were put in for these trials were in schist. On the 19th February, 1917, Mr. Robert Sticht, the General Manager of the Mt. Lyell Mining and Railway Company Limited, forwarded to me the following report by Mr. Murray on the temperature determinations:—

"This work was undertaken at the request of Mr. W. H. Twelvetrees in his letters to Mr. Sawyer on May 30 and July 23, 1914, and was commenced upon receipt of the thermometer supplied by Mr. Twelvetrees; and has been in intermittent progress since then, having been delayed from time to time on account of changes in our technical staff and consequent pressure of work.

Determinations were made as closely in accordance with the instructions supplied by Mr. Twelvetrees as possible; that is to say, the workings which had been most recently opened up were selected, and holes 6 feet deep were specially bored for the purpose, in ground free from fissures and water, and also free from pyrites or other oxidisable minerals.

The highest altitude at which any determination was made was at the 200-foot level, which is 1574 feet above sea-level, and 200 feet below the actual surface. A reliable record was obtained here, all the conditions being favourable, and the rock temperature was found to be 47.8 degrees Fahr.

At the 300-foot, 400-foot, and 600-foot levels, although great trouble was taken, no satisfactory results could be obtained, due to the fact that these levels being practically abandoned, most of the accessible workings are old and unsuitable for the purpose, whilst the newer ones are generally air-ways, and the adjacent rock is heated by the warm upcasts travelling through them. In each case all the readings obtained were unduly high, and I am compelled to reject them all from the investigation as being valueless for the purpose required.

At the 700-feet, 850-feet, 1000-feet, 1100-feet, and 1200-feet levels satisfactory determinations were made under favourable conditions, and these can be taken as being reliable and valuable, although the one at the 1100-feet level is slightly erratic.

The net result shows the increase in temperature between the 200-foot and 1200-foot levels to be 6.1 degrees Fahr., the vertical height between these horizons being 1008 feet, which gives an increase of 1 degree Fahr. for each 165 feet of vertical depth.

The following table gives details of the final observations at each level:—

Level.	Altitude above Sea-level.	Rock Temperature.
Feet.	Feet.	Degrees Fahr.
200	1574	47.8
700	1065	50.2
850	912	51.9
1000	765	52.9
1100	666	52.8
1200	566	53.9 "

General Results.

According to the above trials, the increase was:—

Tasmania Mine: 1 degree Fahr. for each 127 feet of vertical depth.

North Lyell: 1 degree Fahr. for each 165 feet of vertical depth.

Reduced to Centigrade, these depths are as follow:—

Tasmania Mine: 1 degree C. for each 228.6 feet of vertical depth.

North Lyell Mine: 1 degree C. for each 297 feet of vertical depth.

The differences in the temperatures of the two mines may be ascribed partly to the looser nature of the country-rock in the neighbourhood of the Tasmania reef, which might favour the passage of heat from the decomposition of pyrites in the lode; that is to say, to a difference of rock conductivity.

The increment of heat shown by these observations gives a low gradient compared with readings in Australia and other countries. Thus H. C. Jenkins, in his paper on "Rock Temperature and Rate of Increase with Increased Depths in Victoria," presented to the Australasian Association for the Advancement of Science, Hobart, 1902 (pp. 316-317), states increments at Bendigo of 1 degree Fahr. in 77 feet, or 1 degree C. in 138 feet at the depth of 3000 feet; at 3645 feet, 1 degree Fahr. in 77.5, or 1 degree C. in 139 feet; at 3000 feet and 3645 feet, of 1 degree Fahr. for each 80 feet, or 1 degree C. for each 144 feet, calculated from a determined mean surface temperature of 61.4 degrees. These are higher than European rates, which indicate generally a gradient of 1 degree Fahr. for from 50 to 60 feet. L. de Launay, in his "Science Geologique," states that in European latitudes under normal conditions the geothermic degree is usually between 30 and 45 metres.

From the above it will be seen that the progressive increase of temperature in both the Tasmanian mines under consideration is very much less rapid than is the case elsewhere, but there is no reason to doubt the accuracy of the observations.

The instrument used was the same in both cases; it was a standard self-registering thermometer made especially for boreholes by Casella & Co., London, and Kew-verified. The trials, too, were under the personal supervision of civil engineers of high standing in their profession. The explanation of the apparent anomaly must probably be sought in the high heat-resisting properties, or in other words, the low conductivity of the rocks traversed by the bores. The sandstone rock of the Tasmania Mine bores is certainly a rock with high heat resistance. The bores in the North Lyell Mine were in schist, but transverse to the planes of foliation, which would diminish the conductivity. Making all these allowances, however, the bores must be regarded as giving unexpected results. The low rates of increase are not absolutely unique, for A. Geikie, in his "Text Book of Geology" (vol. I., page 62), quotes Prof. A. Agassiz as reporting the lowest rate yet recorded, from Calumet, Michigan, where it was found to be on an average 1 degree Fahr. for every 223·7 feet.

Library and Office.

The library is in good condition. Unfortunately war conditions interpose difficulties in obtaining regular consignments, and this disadvantage is strongly felt at the present time, when frequent reference to the latest sources of information is more necessary than usual. I have transferred 250 books on geological subjects (145 bound and 105 unbound) from my private library to the shelves of the Survey, in the hope that they may prove of permanent use to the Department. A list of periodicals in the library has been prepared and forwarded to Dr. Glasston, who is compiling for the State Committee of Science and Industry a catalogue of technical periodical literature in the libraries of the State.

Laboratory.

Your special attention is drawn to the Government Assayer's report herewith, from which the services that the laboratory is rendering to the mining community may be fully gauged.

During the year the correspondence and mail matter amounted to 2267 items (1296 outwards and 971 inwards). Four hundred and sixty publications have been received, comprising 134 interstate and New Zealand; and 326 British and foreign.

Thanks are due to the proprietors of the following papers, kindly supplied for our files:—Launceston "Examiner" and "Daily Telegraph," "Daily Post," "Chemical, Engineering, and Mining Review," "Queensland Government Mining Journal," and others. The Council of the Australasian Institute of Mining Engineers has kindly sent us a set of their Transactions, bringing our volumes up to date.

Mr. Hartwell Conder, M.A., A.R.S.M., was appointed Acting Assistant Government Geologist for special temporary duties, and his engagement terminated at the end of the year. Mr. A. McIntosh Reid was provisionally appointed Acting Assistant Government Geologist from the 17th September, and is still performing the duties of the appointment. No other changes of staff have occurred. Mr. Loftus Hills, M.Sc., Assistant Government Geologist, is still at the war front in France.

I have to express my indebtedness to the officers of the Survey, professional and clerical, for the efficiency and zeal with which they have carried out their duties.

Programme of Work for the Current Year.

Some of the work laid out for the past year has had to be carried forward; on the other hand, additional work not foreseen has been accomplished. The commitments for this year are at present as follow:—

- (1) Examination of limestone beds and cement materials at Gunn's Plains.
- (2) Examinations of deposits of barytes at Alma, Port Sorell, and Beulah.
- (3) West Coast field examinations by Assistant Government Geologist.
- (4) Current work in the laboratory by the Government Assayer.
- (5) Departmental and other reports by the Government Geologist (in hand).

It will be understood that the sequence of the scheduled items is always subject to interruption, and the programme itself to postponement, by reason of unforeseen demands. Apart from this, so much time is now being devoted almost from day to day to satisfying inquiries bearing on economic subjects, that a rigid time-table cannot be observed.

I have, &c.,

W. H. TWELVETREES, Government Geologist.

The Secretary for Mines, Hobart, Tasmania.

REPORT OF THE ACTING ASSISTANT GOVERN
MENT GEOLOGIST.

Geological Survey Office,
Launceston, 22nd April, 1918.

SIR,

I HAVE the honour to present the following report on the work upon which I have been engaged during the period extending from the 17th September to the 30th December, 1917.

The first work entered upon since my appointment to this office was that of numbering the mineralogical and geological exhibits contained in the Victoria Museum, Launceston. This is a preliminary undertaking to the production of a complete catalogue of the collection.

Twelve locality maps, covering the most important occurrences in Tasmania of minerals of scientific and economic interest, have been prepared in duplicate. These maps have an additional interest in illustrating the distribution of the various ore-deposits and mineral occurrences along certain definite lines of major folding or crustal weakness.

Covering such a short period, the amount of field work completed is necessarily small, and has been confined to:—

- (1) An examination of the ore of the Golden Crest Mine, and a report upon the metallurgical processes involved in the separation and concentration of the metallic contents of economic value; and
- (2) The geological examination of the North Pieman and Huskisson district.

Acting on instructions received, I left Launceston on November 6 for Golconda, and after completing the investigation, returned on the 9th.

A report on the treatment of the ore of the Golden Crest Mine, with some remarks upon the methods adopted for mining and transportation, was completed on the 12th November, and was published in the press on the 19th of that month. In compliance with the request of the company, supplementary notes on the amalgamation and chlorination processes as applied to this ore were appended. The lode, which is contained in hornblende granite near the contact with sandstone, consists of gold-bearing quartz with the accessory sulphides arsenopyrite, chalcopyrite, pyrite, and a little bismuthinite. The greater portion of the gold is contained in the metallic sulphides, and of these arsenopyrite seems to be the most favoured. The oxidised portion of the lode produced quartz containing 7 to 10 dwt. of free gold per ton. To recover this, the ore, after having been crushed in the stamp battery, is passed over amalgamating plates prior to concentration on Wilfley tables. In treating the more sulphidic ore only the lip-plate of the battery will be employed in this connection. The process recommended is, in effect, the concentration of the metallic sulphides on Wilfley tables. The product is a mixed concentrate containing upwards of 5 oz. of gold and 8 oz. silver per ton, 2 to 5 per cent. copper,

and from 15 to 24 per cent. arsenic. A concentrate of this kind finds a ready market, and payment is made in respect of each constituent.

On the 17th November, I left Launceston on my journey to the western division for the purpose of making a geological examination of the North Pieman and Huskisson and Sterling Valley areas. At the end of the year the investigation of the former district had been advanced to such a stage that a brief *resumé* of the work may be given.

Geologically, the North Pieman and Huskisson area is the northward continuation of the Read-Rosebery area. The dominant feature of this and the areas southward, both structurally and petrographically, is the porphyroid group of igneous rocks extending from Mt. Darwin in the south to the northernmost limits of this area, a distance of over 33 miles. Representatives of all the different formations of sedimentary rocks, which have been described as occurring in the neighbouring district of Rosebery, are to be found in the North Pieman and Huskisson area. Furthermore, the ore-deposits of greatest extent and economic value occur here on the same geological horizon and under exactly similar conditions as there. The ore-bodies are contained in calcitic, dolomitic, and argillaceous schists near the junction with members of the porphyroid group, and occur as hydrothermal metasomatic replacement deposits, the mineralisation of which originated from the sub-jacent granitic consolidations of Devonian age. The best illustration of these deposits is to be found in the great pyritic lenticular masses composing the Chester ore-body. The Chester Mine, owned by the Mt. Lyell Mining and Railway Company, and operated by Messrs. Cuming Smith & Co., is the only one in operation in the district at the present time. The production of ore from this mine by the Mt. Lyell Company during the period 1909-1913 amounted to 36,223 tons of first-grade pyrites and 60,545 tons of second grade. Working costs had increased so much, owing to the necessity for removing large quantities of second-grade material to get at the first grade, that active operations were discontinued. The company operating there at present is engaged upon the erection of a concentrating plant designed to treat the ore in mass.

The Pinnacles Mine, situated 2 miles northward of Chester, has lain dormant for several years. Lessees, from time to time carried out much developmental work in the endeavour to discover richer lodes or richer shoots in the known ore-bodies. Some very high-grade zinc-lead sulphide ore was recovered from the north open-cut workings, but the south open-cut ore-body presents the most promising appearance. In general the ore-bodies are massive and continuous, but the rich shoots of ore contained in them are short and erratic. It is to be regretted that these lodes have not received more attention.

Two miles still further northward, the very large low-grade Silver Falls ore-body is situated. This is a massive serpentinitised dolomite, containing blebs of galena sporadically distributed throughout the rock.

Westward, towards the Huskisson River, a large siliceous gossan outcrop containing much barytes and a little galena was discovered on this expedition.

Lapham's zinc-lead sulphide lode at the south end of Bobadil Plain, is one of considerable promise. The zinc-blende is of a very fine quality.

Numerous minor developments have been made in all parts of the field, some of which may reach the productive stage.

The greater part of the North Pieman and Huskisson area has been only superficially prospected. Thorough detailed work on the known mineral-bearing formations will certainly extend the discoveries of deposits of economic value. In view of the natural advantages of location and transportation, it is safe to conclude that many of the deposits already known will shortly be further exploited, and that new discoveries will be made from time to time. Furthermore, should the utilisation of low-grade ores become feasible, very large quantities of zinc-lead and copper ores can be put in the market from this field.

I have, &c.,

A. McINTOSH REID,
Acting Assistant Government Geologist.

The Secretary for Mines, Hobart.

REPORT OF THE GOVERNMENT ASSAYER AND
DRAFTSMAN.

Geological Survey Laboratory,
Launceston, 20th April, 1918.

SIR,

I HAVE the honour to submit my report on the work done in the Geological Survey Laboratory for the year ending 31st December, 1917.

The number of assays and tests made in accordance with the regulations totalled 2254, being an increase of 560 over the previous year.

Samples have been received for the determination of gold, silver, tin, lead, zinc, copper, bismuth, wolfram, molybdenum, barium, iron, manganese, sulphur, nickel, osmiridium, chromium, antimony, arsenic, titanium, phosphorus, &c. Analyses have been made of coals, slates, clays, &c.

The facilities for having assays made at a nominal fee have been the means of keeping a large number of prospectors in the field and have materially assisted mining syndicates and others to carry on developmental work.

Several applications have been made for the determination of the calorific value of coals: the need of a bomb calorimeter for carrying out such work is increasingly felt.

Following upon the publication of the Mines Department Circular No. 1, "Bauxite: A Source of Aluminium," a large number of samples has been received from all parts of the State to be tested for alumina. The majority of the samples submitted for examination were ordinary clays and kaolins.

A considerable amount of time has been spent in assisting syndicates and prospectors in the design of ore-dressing plants, &c. Particulars of plants have been supplied with such modifications and changes as experience has shown desirable.

Recent metallurgical and industrial information has been sought by many inquirers. To meet this growing demand, it will be necessary to obtain a considerable amount of technical literature each year.

In addition to the preparation of geological maps for the printer, the plans and sections of the underground workings of the mines in the State have been checked.

During the year the correspondence consisted of 950 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, 13th May, 1918.

SIR,

I HAVE the honour to submit the annual report on the inspection of mines for the year 1917.

The work of inspection has been carried out with the same number of inspectors as the previous year. Inspector Griffin, who was on leave, has now retired, having reached the age limit. Inspector Vaudeau, who was acting in Inspector Curtain's district temporarily, has now been appointed permanently. With the exception of a very few cases the provisions of the Act have been complied with in a very reasonable manner.

Accidents.—Appended is the usual diagram and statistical tables in connection with accidents. It is again pleasing to find that there is a further reduction in the fatal injuries per thousand men employed, and that the return is the lowest on record. The average number of men employed was 4050, out of which two were fatally injured and 48 seriously injured. The two fatal accidents occurred underground in metal mines. One was due to a fall of ground in a stope. The men were preparing for timber, when a piece of rock fell down the foot-wall, causing injuries which resulted in death. In the other case a man was employed shovelling in a flat stope which was connected with the level above. A rearing had been placed in position to prevent stones falling to the stope in which the men were working. There was no evidence as to where the stone was dislodged, but it would appear that it came from above the rearing. Of the 48 serious accidents, 6 were such as caused fractures; the remainder were not of a very serious character, but necessitated the injured persons being absent from their employment for more than fourteen working days. One accident was caused by igniting fuse with a piece of gelignite, which is contrary to the provisions of the Act. The injured man placed the piece of gelignite on his spider and was igniting a number of charges; the gelignite exploded, causing injury. The man left the State before action could be taken against him. It was found that the practice was usual in the mine, and steps were taken to have it discontinued.

Prosecutions.—Action was taken against nine persons for breaches of the Act. In eight of the nine cases convictions were obtained, while the other case was dismissed. The majority of the cases were for failing to use water to allay dust while rock-drilling. It is to be regretted that men will persist in rock-drilling without using the sprays which are provided for their benefit. It is well known that the practice of boring dry is very prevalent, and such being the case, it does not appear that the officials in charge of the men are actively co-operating to prevent the evil. Every endeavour has been

made to obtain this co-operation, and the men also have been personally appealed to, apparently without obtaining the desired result. If the practice continues it will be necessary to seriously consider the advisability of increasing the fine.

Inspectors' Reports.—Attached are reports from Mr. C. H. Curtain, Inspector for the Northern and Southern Divisions; Mr. J. Harrison, for the Western and North-Western Divisions; and Mr. H. A. Vaudeau, Inspector for the Lyell District.

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

I have, &c.,

J. O. HUDSON,

Chief Inspector of Mines.

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

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

Rate per 1000 men employed.

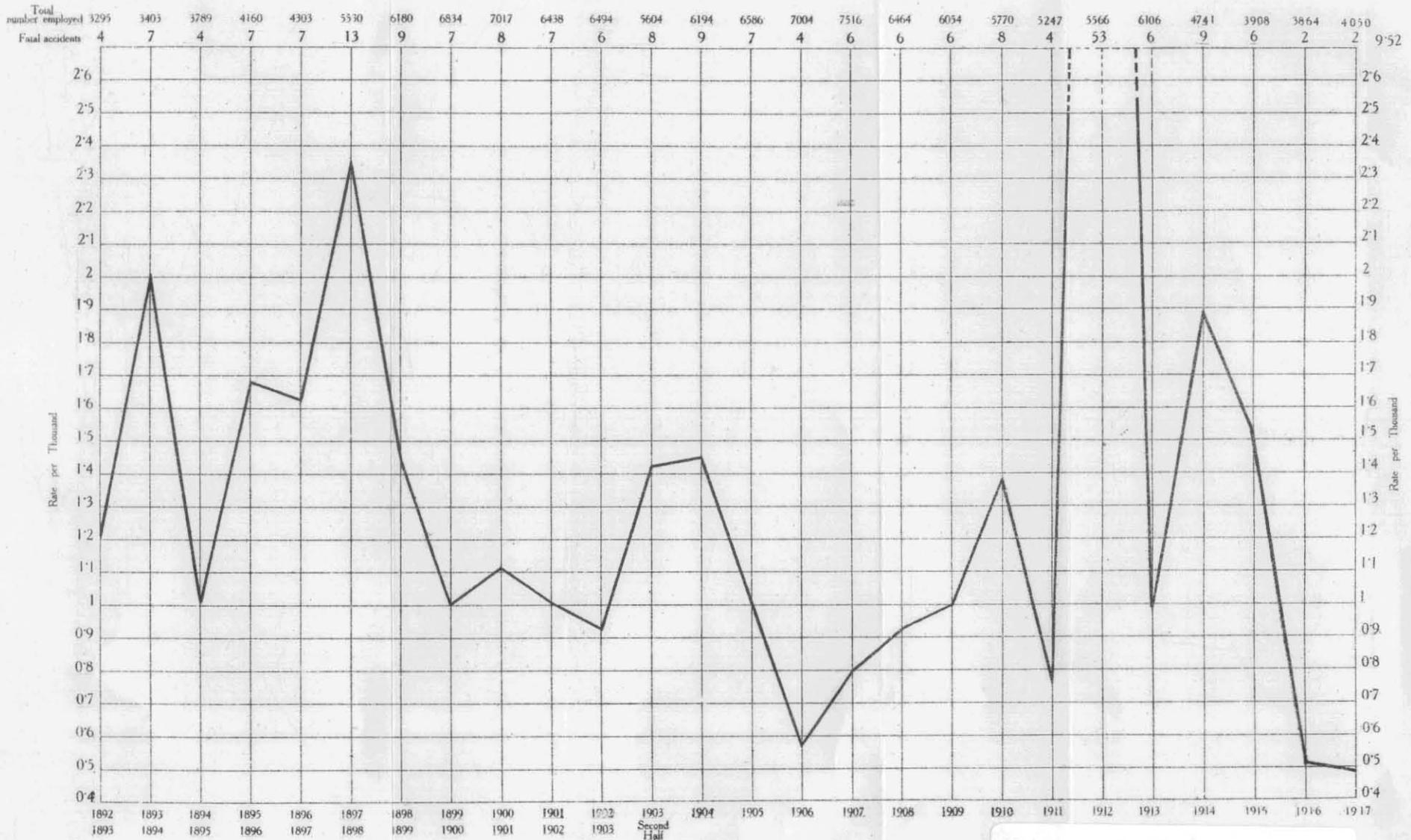


Photo Aligned by John Vail Government Printer Hobart Tasmania.

5 cm

COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892, to 31st December, 1917.

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	80	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	82	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
" 1917 " 1917	4050	50	2	48	50	12·345	0·493	11·852

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	1779	27	1	26	27	15·177	0·562	14·615
Zeehan, &c.	410	—	—	—	—	—	—	—

TABLE showing Rate per Thousand Killed and Injured in the different Divisions for the Year 1917.

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	254	7	—	7	7	27·559	—	27·559
North-Eastern	470	2	—	2	2	4·255	—	4·255
Eastern	488	6	—	6	6	12·295	—	12·295
North-Western	649	8	1	7	8	12·326	1·540	10·786
Western	2189	27	1	26	27	12·334	0·457	11·877
Total	4050	50	2	48	50	12·345	0·493	11·852

TABLE showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Year 1917.

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.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	
UNDERGROUND—														
Falls of ground	1	...	...	...	1	1	...	...	...	1	...	2	2
<i>Shaft Accidents—</i>														
Falling down passes and shafts	2	...	...	...	...	...	2
Total	1	...	...	...	1	1	2	...	...	1	...	2	4
<i>Miscellaneous (underground).</i>														
Haulage.....	1	...	1
Trams, &c.	1	...	...	...	...	...	7	...	8
Sundry accidents	1	...	...	...	2	...	1	...	...	...	3	...	7
Explosives	1	...	...	...	1	...	2
Total	1	...	...	...	3	...	2	...	...	...	12	...	18
<i>Total Underground</i>	2	...	...	...	4	1	4	...	...	1	12	2	22

Table showing Number of Persons Killed and Injured, &c.—continued.

PLACE OR CAUSE OF ACCIDENT.	INSPECTION DISTRICTS.													
	Northern and Southern Division.		North-Eastern Division.		Eastern Division.		North-Western Division.		Western Division.				TOTAL.	
									Zechar and other Districts.		Lyll District.			
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
ON SURFACE—														
Smelting-works	5	...	...	...	...	...	...	...	...	3	...	...	8
Machinery	1	...	...	...	...	...	...	1
Tramways	1	...	2	...	...	...	...	...	7	...	...	10
Falls of persons	1	...	...	...	...	...	...	1
Explosives
Miscellaneous.....	1	...	...	...	1	...	...	...	4	...	...	6
<i>Total Surface</i>	5	...	2	...	2	...	3	...	...	1	14	...	26
GROSS TOTAL, 1917.....	...	7	...	2	...	6	1	7	...	...	1	26	2	48
Gross Total, 1916	1	2	2	...	9	...	3	...	3	...	33	2	51

REPORTS OF INSPECTORS OF MINES.

MR. INSPECTOR CURTAIN (Launceston) reports:—

I have the honour to submit my report for the year ending 31st December, 1917.

Accidents.—The marginal references in the tabulated list accompanying this report sufficiently detail each occurrence and its consequences, and there is no necessity to further dwell on any particular case. Suffice it to state that, taking into consideration the varied operations which prevail over the extensive portion of the State under my charge, the casualties have been appreciably low and must compare favourably with any similarly compiled statistics throughout the Commonwealth. This must necessarily reflect credit on both supervision and workmen.

Health of Miners.—Without medical testimony it is somewhat difficult to make a pronouncement. Judging, however, by those cases which have come under my personal observation, their physical appearance would compare favourably with any corresponding number of men engaged in other industrial occupations. Instances of pulmonary trouble are unfortunately in evidence, but it is questionable if the victims would have averted other forms of this insidious malady had they adopted another calling. This is a matter which, sooner or later, must receive attention by a medical examination, before a person (of any age) is permitted to take up mining for a livelihood in consequence of underground conditions being rarely, if ever, congenial for anyone predisposed to consumption. Hence it would be more merciful to stop their entering a mine than to subsequently witness the pitiable wrecks who—rightly or wrongly—attribute their condition to the result of work they were probably unfitted for.

Ventilation.—In the metalliferous mines the ventilation is satisfactory, but at times not so in the larger collieries, principally during hot, calm weather. The managers of the mines involved have had their attention drawn to the fact, and promise the speedy completion of extra connections which, it is believed, will improve the situation. In dealing with this matter it is essential that suitable approved or recognised apparatus should be provided for taking the quality of air in all mines.

Equipment.—Changing-houses are provided on the principal metal mines, but their absence is noticeable in collieries. The representatives of the latter state that men working therein prefer to change at their homes, which, of course, opens opportunity for evading the mining regulations in other directions, which should not be encouraged. Latrines are provided, and are kept clean and disinfected. Reticulated water jets for allaying the dust where rock-drills are in use are provided. Strange to state, however, there are men who at times, particularly in rises, fail to use them, which is most regrettable, and the only hope of successfully combatting this evil is to restrict the work in such places to the use of drills which can be serviceably worked only by the constant use of water.

Ropes and Cages.—These have been periodically inspected and tested by their owners, whose mine records are satisfactory. The replacement of the former is a matter of some moment, as the supply is stated to be much below the demand, and inquiries have already been made as to whether the Department has any stock on hand or the knowledge where the approved wire hoisting ropes are procurable.

Explosive Magazine and Inflammable Oils.—With little exception these continue on lines which were approved of in the past. Contention at times is advanced as to whether two or more quantities of petrol and kerosene may be kept without a licence, provided each is parcelled out or separately stored in quantities that do not exceed 50 gallons of the former and 200 gallons of the latter. As this practice has been resorted to, it is mentioned so that, if necessary, the Act or the regulations may be amended to prevent it.

Inspections.—These have spread over the greater part of the district, and include visits to Hobart, York Plains, Avoca, Ben Lomond, Fingal, Mathinna, Mt. Nicholas, St. Marys, Dalmayne, St. Helens, Lottah, Weldborough, Gladstone, South Mt. Cameron, Pioneer, Moorina, Derby, Branxholm, Warrentinna, Ringarooma, Scottsdale, Lisle, Golconda, Bangor, Beaconsfield, Longford, Sheffield, Round Hill, Lebrina, Upper Forth, Moina, Wilmot, Latrobe, Melrose, Devonport, Ulverstone, Penguin, and Burnie; also private and municipal quarries.

General.—The prospects throughout are encouraging, and the principal tin mines keep up their regular output, while the high price of metal has permitted several small or co-operative companies to come into existence and materially swell the output.

Wolfram.—This is well in evidence, chiefly in the Moina and Ben Lomond mines; the lode at Storey's Creek being probably one of the best in the Commonwealth.

Gold-mining.—This has unfortunately languished, but the prospects and returns from the mines at Mathinna, Warrentinna, and Golconda, and last, but not least, the Hydraulic proposition at Lisle, are most satisfactory.

Silver-lead.—Mining is chiefly confined to operations in and around the Round Hill Mine near Sheffield, where steady and progressive work has continued. Recently attention has been drawn to the old Scamander show, which, with the ruling price of metals, is believed to be payable. At the Copper King Mine, on the Blythe River, small but favourable indications are being prospected by deeper adits, causing a revival of the interest in this locality.

Prospecting continues in the vicinity of the Dial Range and Barn Bluff, but, so far, no discovery of importance has been reported.

LIST of Accidents in Inspector Curtain's District for the Year 1917.

Fatal, 0 ; non-fatal, 14 ; total, 14.

Date.	Name of Mine	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1917.									
Jan. 16	Electrolytic Zinc Co. of Australasia Pty. Ltd.	Risdon	Stood on nail	Algernon W. Brain	Married, 29 years	Left foot punctured	—	1	Whilst carrying a large piece of timber, to build a platform inside the 250 lb. plant, the man stepped on a nail
Feb. 3	Ditto	Ditto	Ingot of lead slipped	Thomas Brown	Married, 31 years	Jarred wrist	—	1	Whilst working on the 250 lb. plant, removing lead from inside the building, and passing an ingot through a window, it slipped back and jarred the man's hand
Mar. 26	New Ruby Flat	Branxholm	Log slipped on bar	John Purcell	Married, 58 years	Lacerated and jarred finger	—	1	Whilst carrying a log of timber, it slipped on the bar, and jammed the man's finger against a sharp piece of rock
Apr. 20	Ditto	Ditto	Slipped on building steps	Harry Rough	Single, 14 years	Cut wrist	—	1	Whilst carrying tea to the workmen the lad slipped
May 7	Ditto	Ditto	Over-balanced and fell	John Rusden	Married, 29 years	Broke left leg	—	1	Whilst assisting to carry a stump-extractor, came in contact with the nozzle-jet, and losing his balance fell with load on top of him

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.
1917. May 21	Electrolytic Zinc Co. of Australasia Pty. Ltd.	Risdon	Horse moved	George Hill	Married, 25 years	Broken finger	—	1	Whilst unloading a case of machinery from a dray, the horse moved, and the skid in use, slipping, jammed the man's finger between the dray and the store's platform
June 1	Mt. Nicholas Coal Co.	Mt. Nicholas	Fall of coal	Arthur Baker	Married, 33 years	Slight concussion & bruised shoulder	—	1	Whilst making preparations for a prop, a small quantity of coal came away from the back and caused the man's injuries
June 6	Briseis T.M. Co.	Derby	Slipped	Stephen Daley Whiting	Married, 42 years	Contused muscle of spinal column	—	1	Whilst assisting to carry a water-pipe, fell and injured himself
July 3	Royal George T.M. Co.	Avoca	Truck and ore chute collided	John Fisher	Married, 44 years	Bruised fingers	—	1	Whilst trucking past a chute a stone in the truck came in contact with the chute, and turning over caused the man's injuries
July 5	S. & M. Syndicate	Moina	Struck by timber	Thomas Lyons	Single, 50 years	Cut and strained thumb-joint	—	1	Injured by a piece of timber thrown down by a workmate

Aug. 24	Mt. Nicholas Coal Co.	Mt. Nicholas	Moving truck	Roy Gatty	Single	Palm of right hand severely torn	—	1	Whilst in the performance of his duty was tripped, and falling on the running-road of the incline-haulage, a full truck of coal passed over his hand, without breaking any bones
Sept. 28	Round Hill S. & L. Mine	Sheffield	Fall of rock	James Richard Jubb	Married, 51 years	Bruised leg	—	1	Following a general firing, a piece of rock that had been tried came away, and slightly injured Jubb
Oct. 5	Mt. Nicholas Coal Co.	Mt. Nicholas	Working pick	Adrian Kearran	Married	Jarred hand	—	1	Whilst hewing coal, jarred his hand
Dec. 12	Ditto	Ditto	Caught between moving truck and prop	John Reginald Ford	Married, 33 years	Fractured forearm	—	1	Whilst pulling a truck towards him got his elbow caught between it and a side prop

P.S.—All the sufferers mentioned in the foregoing list have returned, or been able to resume their usual occupations.

MR. INSPECTOR HARRISON (Zeehan) reports:—

Accidents.—I beg to state that the accidents were nine in number, one proving fatal. None of the others were of a very serious character.

Safety Appliances.—These are attended to and kept in good working order and condition.

Magazines.—Magazines are 22 in number. They are kept clean and in efficient condition.

Output of Ore.—The limiting of the quantity of ore the purchasers will accept has had a very disastrous effect on the silver-lead returns. It has been especially severe on the mines in the Farrell and Magnet districts.

Tin-mining.—The continued dry weather has caused the closing down of several mines through scarcity of water for dressing purposes.

Osmiridium.—On the Wilson field, north of the Pieman, there has only been an average of 12 men employed during the year, but this number will be increased when the bridge over the Wilson River is re-erected, so that pack-horses can go right out.

Savage River and 19-Mile.—This district is going ahead, and there are now over 100 miners employed, and the reports coming in are of a most encouraging character. The new track now under construction will open up a considerable amount of new country.

Zeehan.—The numerous tribute parties that are scattered over the field are keeping up a decent output, and in most instances doing well.

Heemskirk.—The Heemskirk Tin Syndicate, which was having a good run and doing well, had to close down early in December through want of water, and have done nothing since.

Comstock.—Three parties are sending out regular parcels of iron ore.

Renison Bell.—We have three companies on this field equipped with batteries, namely, the Dreadnought, Central, and Renison Bell; but the continued dry weather has interfered with their output to a considerable extent.

Stanley River and Mt. Ramsay.—The Stanley River and Mt. Ramsay districts have kept up a good steady output of tin oxide during the year. With better facilities for getting ore away and machinery on the ground, this field would go ahead.

Rosebery and Williamsford.—The development work going on by the Mt. Lyell Company on the Tasmanian Copper and Mt. Reid mines is opening up large quantities of highly payable ore. This is especially noticeable in the work done by the diamond-drills in both cases.

Prospecting by other companies is also going on in the district.

Chester.—Mr. A. E. Bruce has reopened this mine and has a number of men employed in erecting machinery, &c.

Tullah.—North Farrell Mine is looking well, but the output has been restricted to 80 tons per fortnight, indeed for a good while there was no sale for the ore. The new power plant, consisting of a 330-h.p. producer gas engine, is nearing completion in erection, and will be put into commission at an early date.

Mt. Bischoff and Whyte River.—The Mt. Bischoff Mine keeps up a good output, the high price of tin allowing the manager to deal with ore that otherwise could not be treated to advantage. A large area of new ground is being opened up down the North Valley-road. The prospects of the mine are better than they have been for some time.

Bischoff Extended.—The mine still opens up well; manager busy duplicating his crushing power and erecting powerful compressing plant for driving rock-drills; a considerable increase in the returns may be expected.

Cleveland Tin Mine had to close down through financial difficulties. Their battery plant was most unsuitable.

Magnet.—Magnet Mine is practically closed down since early in Decemebr for want of water for dressing purposes. The new dam, capacity 125 million gallons, is to be completed by the end of March. Manager is also busy erecting a hydro-electric plant, which will generate 530 h.p. when running 500 revolutions per minute. Everything is ready to resume active operations directly water is available either from rain or conservation.

Victorian Magnet.—Mine was shut down for nearly two months, but has resumed driving again.

Heazlewood.—Jasper Copper Mine: Year's results have been somewhat disappointing. The battery system for this class of ore proved most unsuitable, the losses being very heavy.

LIST of Accidents in Inspector Harrison's District for the Year 1917.

Fatal, 1; non-fatal, 8; total, 9.

Date.	Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Killed.	Injured.	Particulars.
1917.								
Jan 13	Bischoff Ex- tended	Waratah	Not stated	R. A. Thomas	Single	—	1	Third finger of right hand crushed by piece of wall
Feb. 5	ditto	ditto	Caught by truck and ore-shoot	H. Frazer	Married	—	1	Lacerated finger while trucking
Mar. 6	ditto	ditto	Slipping off strong-arm	V. Butler	Married	—	1	While trucking, strong-arm slipped and injured elbow
Apr. 16	Mt. Bischoff	ditto	Putting on belt while in motion	Walter Lucas	Married	—	1	Broke his arm while attempting to put on belt in dressing-mill while in motion
Sept. 28	Bischoff Ex- tended	ditto	Fell from leading stope	T. Butler	Married 45 years	—	1	While tipping truck, foot slipped, and became jammed under truck wheel, which injured toes
Oct. 13	ditto	ditto	Fell off a wall	Wm. Morgan	Single	—	1	Collar-bone fractured through falling off wall on surface
Nov. 21	Magnet	Magnet	Fell down a pass	John Denison	Married	—	1	Lost his light after firing, and fell down a pass while in the dark, and broke his left leg while getting out of a shoot
Nov. 23	Bischoff Ex- tended	Waratah	Caught by crab-winch	Les. Smith	Married	—	1	Was attending to a crab-winch, and neglected to use a pawl, his hand slipped off the handle, and while endeavouring to get pawl in position, arm got caught in the cogs, which pulled him forward, bringing face into contact with brake and causing injury to mouth.
Nov. 23	ditto	ditto	Struck on head by a stone	Albert Ivory	Single	1	—	While shovelling ore in a flat open pass, a stone rolled from above, going over or rearing, striking him on the head, and fractured skull

MR. INSPECTOR VAUDEAU (Queenstown) reports:—

I have the honour to submit my report as Inspector for the Lyell Division for the year ending December 31, 1917.

Considering the magnitude of the operations of the principal mines here belonging to the Mt. Lyell M. and R. Co. Ltd., on which all the serious accidents have occurred, they have been light compared with other works of a similar magnitude.

At the North Lyell Mine an Italian lost his life as the result of an accident which occurred in No. 36 stope on the 1100-foot level, owing to a piece of footwall falling out on to his legs. In evidence his mate stated that the deceased and himself had both tried this particular piece of ground which was affected, and that they could not bar it down. Shortly after it came away and pinned him to the floor of stope. The remainder of the accidents (see attached list) necessitated the absence of the men from work for fourteen days or longer. It is pleasing to note that, apart from the fatal accident, there was not another man hurt by any ground falling from the "sides" or backs of any of the workings. On November 26, at the North Lyell Mine, there occurred what might very easily have been a very serious accident. Two men who had lighted two holes left by the same way, and did not protect the entrance from the main shaft to their workings, and two miners walked into them, getting within four or five steps of the face when the first hole went off. They were both thrown down by the concussion, one being peppered about the head and body. Luckily, however, none of his hurts were serious, and he only lost a few days from work. His mate lost no time from duty. Action is being taken against the two men under "The Mines and Works Regulation Act, 1915," for breach of General Rule 20, Clause 13, Sub-clause 3, and Rule 21A. Another accident which, I think, should be a warning to others, happened to a miner on October 31. He had a piece of gelignite on his spider (candlestick) lighting several holes, using it as a torch, which practice is against General Rule 20, Clause 22. This is a very bad practice, and more will be said about it later on. He had lighted all but one hole, when it fell off his spider. In picking it up and dabbing the spider into it again, he burnt his fingers, and he stated it exploded in his hand. He left the district, otherwise action would have been taken against him.

Health of Miners.—The medical testimonies obtained from the three doctors stationed here are as follow:—

Dr. H. G. Hamilton: "I have only treated two cases of miners' phthisis during the past year, both of which originated before coming here, as one of them works in the converters and never was in Mt. Lyell mines, but had worked for years underground at Ararat; the other works in the mine, but has not been here long enough for the disease to have originated here. So far as I have observed, there has been no increase of cases of miners' complaint or disease due to the calling of miner or smelter."

Dr. G. J. Walker: "Among the cases I have seen there is certainly no increase in number of occupational diseases among the workmen of the Lyell district. The number of cases seem

to be about stationary. I have seen one case of pulmonary tuberculosis in a miner during 1917. There have been several cases of respiratory disease (asthma, bronchitis, &c.) among the men working at the Reduction Works, but no more than usual."

Dr. J. Love: "In reply to your inquiry as to sickness amongst miners or other workmen on this field during 1917. I have seen the following cases that may be considered of interest from an industrial point of view:—

"1. All pulmonary diseases occurring in miners or other workmen except bronchitis and colds, 20, subdivided as follows:— Previously reported, 7; not previously reported, 6. Total, 13.

"Of the new cases two had been less than six months in the district, and certainly brought the disease with them. The other four had been here 4, 7, 11, and 20 years respectively.

"Asthma, 2; pneumonia, 2; congestion of lungs, 1; pleurisy, 1; pneumothorax of undermentioned origin, 1. Total pulmonary diseases, 20.

"No case of tuberculosis occurring in a miner or workman was observed unless the case of pneumothorax mentioned above was tubercular. I came to the conclusion, however, that it was due to pneumokoniosis, though no other evidence of that disease was demonstrated.

"2. Hernia in workmen, 4.

"3. Disease of eyes not common; injury to the eyes from flying particles of stone or metal was common, but only in two cases resulted in serious impairment to vision.

"4. Anæmia was not observed. Ankylostomiasis was not observed. This is as one would expect, because the mine water is impregnated with sulphate of copper and iron, in which ankylostomia or its eggs are unable to survive.

"5. Accidents of sufficient severity to cause a man to lose work for one or more days, 96. These were varied in character, the most common being crushed hands and fingers."

For the prevention of dust a system of jets is installed in all mines, but owing to the acidity of the water in the mines, &c., the wear and tear is considerable and necessitates a lot of renewals and repair work, but apart from a few occasions, as far as my knowledge goes, the service has been kept fairly good. Owing to the few occurrences the Chief Inspector of Mines wrote to the Mt. Lyell Company stating that action would be taken in all future cases where any negligence on the part of the company was shown. This led up to the following notice being posted on their Mt. and North Lyell mines:—"Notice to Machine-drillmen.—The attention of the machine-drillmen is directed to the fact that the failure of the water-supply for dust-laying purposes at any machine, due to any cause whatsoever, is no excuse for working the machine dry. Should there be no water available at a machine for any reason whatsoever, the machine must not be worked, but the machineman must immediately notify the shift boss that no water is available, and obtain employment at work other than machine work until water has been made available. Any employee neglecting these instructions is liable to dismissal, and in the case of contractors, a contract party of whom the

offender is a member is liable to have their contract cancelled.—(Sgd.) R. M. MURRAY, Engineer-in-Charge, Mine Office, Gormanston, 8th October, 1917.

I also wrote a letter addressed to the men asking for their co-operation in using the water, not only during rock-drilling, but after firing and when shovelling dry material. We are hoping that these will tend to better results. During the year action has been taken against six men, and another case is to be heard on January 24, making a total of seven cases for the year for failing to use water to allay dust while rock-drilling, fines being imposed in each instance, not having any reasonable excuse for not using the water. It is to be regretted that some of the men do not yet take the trouble to use the water, and thus not only injure their own health, but also that of others. At different times I have come across men working drills, with dust round their mouth and nostrils, the circumstances pointing to the fact that they had been boring dry. On all occasions these men are spoken to, and at all times I am endeavouring to get the men to use every care against this evil which is a very serious one in our mines here.

Owing to the accident to a miner through using gelignite as a torch to light his holes, it came out on inquiry that many men in the mines still continue this practice. I had often wondered why there had been so much miners' complaint in this district, and feel sure now that this practice is accountable for a lot of it. The fumes given off (nitrous fumes) from burning nitro-compounds explosives are very injurious and attack the bronchial tubes, &c., and thus caused them to be not only seriously affected but render them much more susceptible to the very fine dust particles in suspension in the air. I believe that with the co-operation and assistance of the shift and level bosses at the various mines a lot of this evil could be put down, also the boring of holes dry. The trouble is that the easiest way is that which a lot of men will use in spite of the fact that it is dangerous and injurious to health, and if caught are liable to fines up to £10 and costs.

Equipment and Safety Appliances.—Taken on the whole, these are in a reasonably satisfactory condition. The examination of the ropes and safety appliances by those responsible on the main shaft and plain haulage of the Mt. Lyell Company's mines being particularly good.

Magazine and Inflammable Oils.—It was found necessary to refuse registration of three inflammable oil premises owing to their position being dangerous in case of fire. The remainder in use are in a satisfactory condition.

Explosives.—During the early part of the year an explosive was introduced at the Mt. Lyell Mine. Permit was given for it to be used in well-ventilated places, but the agents wanted to demonstrate it could be used anywhere, and two men were affected by fumes as the result of it. The matter was very carefully gone into, and a promise given that it would be used only in very well-ventilated places. Since then I have not heard of any complaint in regard to fumes. The usual complaints regarding the weakness of the nitro-compounds (50 per cent.) still continue, but otherwise all satisfactory, as was fuse and detonators.

Ventilation.—The Lyell Blocks Copper Mine and the North Lyell Mine have been again connected at the 1100-foot level, thus improving conditions in the Blocks and at No. 49 stope, North Lyell Mine. Taken on the whole, the ventilation is good; occasionally, when a mullock pass leading into a stope is blocked up, the atmosphere becomes hot and humid, but not above that allowed by the Act.

Change-houses.—Apart from the one at North Lyell Mine, about which a complaint was received and inquired into, and attention to the matter promised, these have been kept in first-class condition. At the Reduction Works, Queenstown (Mt. Lyell M. and R. Co. Ltd.), a commodious one has been built and put in use. It is one of the best—in fact, the best—I have ever seen, and is being well patronised.

Casualty Wards.—These at the main works are kept in good order and everything kept ready for emergencies. During the latter part of the year the officials at and about the Reduction Works have been attending a series of lectures on first aid, given by the local doctors at Queenstown. It would be a good thing if the companies here would join in giving encouragement in the way of prizes, &c., to get the men of the various branches of the works and mines to compete for them at different times. It would probably keep the interest keen and would keep the men in practice, which I find is much needed.

General.—The various mines and works in the district have been thoroughly inspected and kept in close touch with during the year, and I am pleased to say that during the latter part of the term there has been a decided improvement on the part of the officials to meet meet me in the interests of safety and well-being of the workers.

Appended is a tabulated list of accidents.

LIST of Accidents in Inspector Vaudeau's District for Year 1917.

Fatal, 1 ; non-fatal, 26 ; total, 27.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1917.									
Jan 19	North Lyell Mine	N. Lyell	Slipped off platform	A. Spiteri	Single, 40 years	Sprained ankle	—	1	Slipped off the platform whilst applying brakes on side-tip truck
Feb. 5	ditto	ditto	Finger caught under shoot	J. Cray	Single, 16 years	Torn finger	—	1	Got finger caught under shoot whilst trucking
Feb. 23	ditto	ditto	Fall of rock	G. Guech	Married, 41 years	Thigh & right leg broken	1	—	While preparing a place for the erection of timber, a piece of ore fell from a height of 8 ft. out of footwall on to his legs, and he died from injury
Mar. 15	Mt. Lyell Mine	Gormans-ton	Truck came back	W. Caldan	Single, 38 years	Crushed finger	—	1	Jammed fingers between a side-tip truck and a plat sheet
Mar. 28	ditto	ditto	Struck by piece of ore from shoot	F. Cravino	Married, 30 years	Scalp wound & concussion of the brain	—	1	Put his head into lip of shoot to see if any ore was hung up, when piece of ore struck him on neck
Apr. 2	Converters	Queens-town	Jammed finger between truck and bar	F. Nightingale	Single, 21 years	Jammed finger	—	1	Got finger caught between truck and bar
Apr. 25	Reduction works	ditto	Jammed finger between rock and truck	A. N. Shaw	Married	Split finger	—	1	Jammed finger between rock and truck
Apr. 28	Mt. Lyell Mine	Gormans-ton	Elbow jammed between truck and shoot door	M. Harrison	Married, 51 years	Bone broken in wrist	—	1	While pushing a truck of ore, it came back on him, and jammed his elbow against the side of the drive

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

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1917.									
June 1	Reduction Works	Queens-town	Bank came away on to man's legs	H. Hanigan	Married, 38 years	Bruised legs	—	1	While cleaning out by-wash, bank came away, and fell on his legs
July 11	North Lyell Mine	N. Lyell	Lagging slipped on thumb	B. Ewans	Married, 26 years	Fractured thumb	—	1	While loading lagging in a cage, a piece slipped and cut his thumb
July 17	Reduction Works	Queens-town	Rail breaking earlier than expected	S. Biddulph	Single, 35 years	Bruised finger	—	1	Was breaking a steel rail with a "crow." The rail broke quicker than expected and caused bruised finger
July 19	North Lyell Mine	N. Lyell	Truck came back on toes	W. Willaton	Married, 48 years	Crushed toe	—	1	While tipping a truck, it came back on him, and crushed his toe
Aug. 2	Mt. Lyell Mine	Gormans-ton	Timber striking head	M. McLeod	Single, 20 years	Fractured skull	—	1	Boards were being thrown down pass into stope. McLeod was sheltering behind a pass, his head was jolted by a board striking the other end of log, against which his forehead was leaning
Aug. 2	North Lyell Mine	N. Lyell	Truck ran off line	W. Ford	Single, 50 years	Bruised leg	—	1	Tram ran off end of line on to man's legs
Aug 10	Saw-mill	Mt. Lyell	Jumping off platform	G. Jenner	Married, 38 years	Sprained ankle	—	1	Jumped off platform, stepped on rail, and twisted ankle
Aug. 17	Foundry	Queens-town	Metal splashed on finger	P. Green	Single, 30 years	Burnt finger	—	1	Metal splashed on to man's finger and burnt it
Aug. 18	North Lyell Mine	N. Lyell	Finger caught in bridle of cage	E. Callow	Single, 14 years	Crushed finger	—	1	Got finger caught in bridle of cage
Sept. 4	Mt. Lyell Mine	Gormans-ton	Piece of ore hit finger	L. Gatt	Married, 47 years	Cut finger	—	1	Struck a piece of ore with hand while spauling another lump

Sept. 19	ditto	ditto	Ore slipped against truck	T. Kalin	Single, 47 years	Crushed thumb	—	1	While putting piece ore in truck, ore slipped and jammed thumb between ore and truck
Sept. 25	ditto	ditto	Stone falling down ladderway	B. Tunney	Married, 35 years	Concussion of brain	—	1	Struck on head by piece of ore, which came down manway as he was starting to go up ladders
Sept. 29	Flotation plant	Queens-town	Foot slipped under truck	A. G. Jones	Married, 24 years	Crushed toes	—	1	Slipped on plank, and his foot was caught under the wheels of ore truck
Oct. 18	Mt. Lyell Mine	Gormans-ton	Piece of ore rolled down rill on to man's leg	E. Mapley	Single, 22 years	Crushed leg	—	1	Ore was interfered with, and rolled down rill and caught Mapley's leg
Oct. 31	North Lyell Mine	N. Lyell	Gelignite exploding before time	J. Donaghy	Married, 48 years	Burnt fingers	—	1	Was lighting holes with gelignite ; first hole burnt off before the last was spit, and burnt fingers
Nov. 1	ditto	ditto	Earth hit fingers	G. Whitmee	Single, 29 years	Crushed finger	—	1	While filling truck from under ground bin, piece of earth rolled and jammed his fingers badly
Nov. 9	Converters	Queens-town	Hot metal got into man's boot	H. Manion	Single, 25 years	Burnt foot	—	1	Piece of hot metal splashed out of converter into man's boot
Nov. 16	North Mount Lyell	N. Lyell	Slipped and timber jammed finger	L. Eddy	Single, 26 years	Crushed finger	—	1	Whilst handling a log, jammed finger against it
Nov. 26	Flotation Plant	Queens-town	...	R. Escourt	Married, 46 years	Crushed left thumb	—	1	While driving nail, hammer struck pipe overhead, causing hammer to glide
Nov. 30	Converters	ditto	Slipped, and caught under truck	T. O. Ghana-bury	...	Jammed & cut leg	—	1	While assisting to pull truck on to rails, he slipped, and got caught under truck, and jammed leg

REPORT OF THE CHIEF INSPECTOR OF EXPLOSIVES.

Chief Inspector of Magazines and Explosives,
Hobart, Tasmania, 13th May, 1918.

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 ending December 31, 1917.

The usual table of explosives imported into the State is again omitted, and will not be furnished until the termination of the war. The quality of the explosives imported was very satisfactory, and it is pleasing to record that the year has been free from any accidents which could be attributed to the quality of the explosives. The provisions of the Act are now being complied with in a very reasonable manner. The difficulty experienced at ports where no departmental officer is stationed has been overcome by the assistance and courtesy of the harbour authorities.

Magazine licences were issued to 75 persons, being a decrease of 9 compared with the previous year; 22 permits to convey were issued, being an increase of 1; 102 permits to sell were issued, showing an increase of 5; 11 permits to import were issued, being an increase of 1 compared with the year 1916.

Inflammable Oils.

Eighty-five licences were issued for registered premises, being a decrease of 1; 20 licences to store were issued, being an increase of 8 in comparison with the year 1916. It has been found necessary to refuse licences owing to the storage being in congested centres, where the buildings were of a very inflammable nature and the storage of oils would be a menace to other buildings in the vicinity. In several cases it was found necessary to insist on a better system of ventilation, and also to make provision to prevent outflow.

Prosecutions.

There were two prosecutions—one for the storage of inflammable oils in unregistered premises and one for failing to comply with the regulations dealing with the landing of explosives. In the first case a conviction was recorded and in the latter a fine of £5 was imposed.

	<i>Revenue.</i>	£	s.	d.
Magazine rents		156	10	7
Licences to store		25	0	0
Magazine licences		75	0	0
Permits to import		22	0	0
Permits to sell		25	10	0
Permits to convey		5	10	0
Registered premises		21	5	0
Total		£330	15	7

Accidents.

The following accidents have been reported and inquired into:—

Date.	Locality.	Explosive.	Name of Person.	Injured.	Cause.
1917. Ap. 4	Hobart	Detonator	McDonald	1	A boy found a detonator, struck it with a tomahawk; received cuts on face and hands
Oct. 15	Hobart	Gunpowder	H. Low	1	A boy extracted powder from a cartridge, placed it in a bottle, and applied match; had face severely burnt
Oct. 30	Queens- town	Gelignite	J. Donaghy	1	While lighting fuses with a piece of gelignite, it exploded, causing injury to hand

I have, &c.,

J. O. HUDSON,

Chief Inspector of Mines and Explosives.

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

NOTES ON THE DISCOVERY OF A NEW
FOSSIL FRUIT FROM THE DEEP-LEAD TIN
DRIFTS AT DERBY, TASMANIA.

By R. M. JOHNSTON, I.S.O., F.S.S.

On my last visit to the Briseis Mine workings at Derby, the mining manager, Mr. Lindesay Clark, kindly guided me over the various alluvial tin-bearing sections now being sluiced by powerful hydraulic force.

The formation in which the fine alluvial occurs at successive levels consists of white clayey sediments of an ancient lake-like river course, generally overlaid by a thick layer of olivine-basalt.

Among the successive alluvial tin-bearing layers of the 60 to 70 feet of clays, underlying the basalt, lenticular patches of lignite frequently occur, where, as in the ligneous clays of the auriferous deep-leads of Beaconsfield, they are associated with fossil leaves, twigs, and fruits, now regarded by me as of Eocene age and contemporaneous with the fossil vegetable remains found abundantly intermixed with the marine fossils of the Eocene age at Table Cape.

On the basis of the percentage proportion of extinct to living forms the marine beds at Table Cape are now generally assigned to the earliest Eocene period.

I have always been confident that if the lignites of the Briseis deep-leads were carefully examined after sluicing operations, that fossil fruits would be found. The discovery of such fruits would then enable us to determine with confidence the true relation of these older alluvial tin-drift deposits to similar lignitic clays of the same character underlying the older olivine basalts in areas occupied by the sediments of the numerous old Tertiary lake basins, as at Macquarie Harbour, Mt. Bischoff, "old lake of the Derwent," Launceston Tertiary lake basin, and elsewhere.

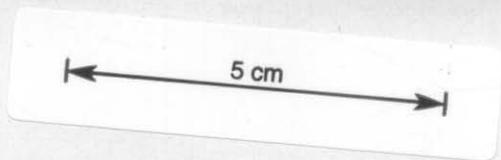
The recent discovery by Mr. Lindesay Clark of a large lignified fossil fruit (closely resembling and possibly allied to *Plesiocapparis prisca*, F. von Mueller) occurring in probably the lowest layers of the oldest auriferous deep-leads at Haddon, Victoria; is most important, as it affords satisfactory evidence in determining the relationship and geological horizon of the deep layer of the stanniferous drift where the fruit was embedded.

The following description of the new species of fossil fruit, together with photographic views of various sections of the same, will be of much interest to palæontologists:—

Carpolithes (Plesiocapparis) Clarkii—nov. sp.

Fruit, lignified, roundly ovate, indehiscent, about 2½ inches long, and 2 inches broad, when freshly removed from the moist lignitic clay.

The lignified pericarp is soft and plastic, and may be cleanly sliced with a sharp razor, when freshly removed from the moist lignitic clay in which it had been embedded; but after removal



dries quickly, contracts, and becomes hard, distorted, and brittle, exhibiting deep cracks or fractures. The pericarp is, relatively, very thick, measuring five-eighths of an inch or nearly one-third of the total diameter of the fruit. The cavity is depressedly globular, measuring about 1 inch in its vertical diameter and three-quarters of an inch transversely. When the pericarp was opened in the line of one of its principal fractures, the whole cavity appeared to be filled with a series of closely compressed, concavely laminated, wing-like seeds. These wing-like seeds filling the whole cavity are minutely striated longitudinally, and closely enfolded in curved shell-like layers. There were no distinct protuberant portions discernible on the winged seeds such as shown in Figs. 11, Pl. Vi. (F. von Mueller's Observations on New Vegetable Fossils of the Auriferous Drifts, Vol. I., Geol. Survey of Victoria)) under the specific name of *Plesiocapparis prisca*, F. von. M.

The external surface of the pericarp is microscopically verrucose, and much less pronouncedly rugose as compared with the pericarp surface of *P. prisca*.

The specific name of the new species of fruit from the Briseis Mine is given in honour of its discoverer, Mr. Lindesay Clark, the mining manager.