

AR 1914

TASMANIA



REPORT

OF THE

SECRETARY FOR MINES

FOR

YEAR ENDING DECEMBER 31

1914

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



Tasmania:

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REPORT OF THE SECRETARY FOR MINES.

Mines Department,
Hobart, 20th May, 1915.

SIR,

I HAVE the honour to submit my report upon the Mines Department and the Mining Industry for the year ending 31st December, 1914.

GENERAL REMARKS.

The aggregate value of the minerals raised during the year was £1,007,038, being a decrease of £408,662 on the value of the output of the preceding year.

The value of the mineral output is less than that of any preceding year since 1897. This has been caused, in the first place, by the exceedingly dry summer and the closing down of many of the tin mines for want of water for sluicing and dressing purposes; the closing down of the Tasmania Gold Mine, at Beaconsfield, in the early part of the year (a full account of which will be found under the heading of "Gold Mining," in another part of this report), and to the closing down of the silver-lead mines on the West Coast; and in the second place, to the outbreak of the war in the latter half of the year, followed by the closing of the London metal market and the stock exchanges throughout the Commonwealth.

It was impossible to forecast the effect the war would have upon the mining industry of the State, and it was not until after the closing of the London metal market that its paralysing effect began to be felt. There being no market for the metals, many of the mines had to close down altogether, while others continued work upon a smaller scale, or were either let on tribute to the employees, or worked on half wages for the time being. Many appeals were made to the Department for financial assistance, and Parliament came to the rescue and provided an amount of £40,000 for the purpose of making advances upon the ores raised, at the rate of 50 per cent. on the London quoted market price of metals on the 23rd July to enable the mines to be kept going until the market reopened. This necessarily increased the work of the Department's small staff very considerably, as arrangements had to be made for receiving, weighing, and sampling, paying advances, and stacking the ore until a market was available. All this extra work was, however, cheerfully undertaken, and the Department was thus able to assist the mine-owners through a very trying and anxious time.

“ THE MINING AND PUBLIC WORKS APPROPRIATION ACT,
1913.”

Expenditure during the year ended the 31st December,
1914:—

Item—	Purpose.	Amount	Expenditure		
		Provided.	during 1914.		
		£	£	s.	d.
1.	For carrying out all or any of the purposes of “The Aid to Mining Act, 1912”	7000	...	—	—
2.	For carrying out all or any of the purposes of “The Mining Development Act, 1912”	6000	...	194	13 0

"THE MINING AND PUBLIC WORKS APPROPRIATION ACT,
1913."—*continued.*

Item—	Purpose.	Amount Provided. £	Expenditure during 1914. £ s. d.
3.	Assisting prospectors to further develop their discoveries, &c.	1000	... 100 0 0
4.	For defraying the expenses incurred or to be incurred in connection with the State Argent Flat Mine, Zeehan	10,000	... 3891 16 8
5.	For defraying the expenses incurred or to be incurred in carrying on the operations of the Tasmania Gold Mine at Beaconsfield	2000	... 9314 19 2
		Cr. £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	... 13,558 5 10
		£66,000	
		Cr. £7450/15/8	... £27,059 14 8

"THE PUBLIC WORKS APPROPRIATION ACT, 1913."

Expenditure during the year ended 31st December, 1914:—

Item—	Purpose.	Amount Provided. £	Expenditure during 1914. £ s. d.
11.	For carrying out all or any of the purposes of "The Mining Development Act, 1912"	6000	... 4372 3 2
12.	Assisting Prospectors to further develop their discoveries, &c.	2000	... 1073 3 0
		£8000	... £5446 6 2

"THE AID TO MINING ACT, 1912."

Expenditure to the 31st December, 1914:—

(A)—Mining, Prospecting, and Development Work, &c., undertaken by or under the Direction of the Department of Mines.	Amount Provided.		Expenditure previous to 1914.		Expenditure during 1914.		Total Expenditure to Dec. 31, 1914.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.
Purpose.								
1. To provide for salaries of supervising engineers, and office charges, travelling expenses, printing and advertising, and any miscellaneous charges connected with the purposes of this Act	2000	0 0	1381	11 3	619	4 0	2000	15 3
	Cr.	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	2893	8 8	1108	15 5	4002	4 1
	Cr.	16 7 0						
3. In the equipment, salaries, wages, &c., of four Government prospecting parties	1500	0 0	902	19 7	622	9 11	1525	9 6
	Cr.	43 7 5						
4. In prospecting for gold by means of diamond-drill or otherwise, at Beaconsfield	1000	0 0	214	18 5	785	1 7	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	697	4 3	434	0 9	1131	5 0

9

6. In the purchase and erection or hiring of a State battery or other plant for the examination or treatment of ores in a locality on the West Coast deemed suitable by the Minister, and the cutting, construction, and formation of races, dams, and other works deemed necessary by the Minister in connection with the same, pursuant to Part IV. of "The Mining Development Act, 1912"	6000 0 0	47 10 0	...	47 10 0
* (1) .....	...	...	701 10 8	701 10 8
* (2) .....	...	...	2299 4 4	2299 4 4
* (3) .....	...	...	821 8 6	821 8 6
* (4) .....	...	...	83 12 5	83 12 5
* (7) .....	...	...	35 9 3	35 9
* (9) .....	...	601 10 5	696 19 7	1298 16 0
7. In opening up old tracks	500 0 0	309 1 3	190 18 9	500 0 0
8. In cutting and constructing tracks in the Heemskirk District, and from Macquarie Harbour to Port Davey	1400 0 0	1388 19 7	10 1 6	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	423 7 5	116 2 9	539 10 2
11. Assistance towards boring not exceeding one-half the total cost, pursuant to Part V. of "The Mining Development Act, 1912"	500 0 0	136 13 8	...	136 13 8
	£20,000 0 0	9,347 4 6	8,524 19 5	17,872 3 11
Cr.	£60 9 8			

* 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.

AID TO MINING.

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

In the office the usual routine work was carried on and several special reports compiled. The more important of these include a "Report on the Lake Rolleston Hydro-electric Scheme," and a monograph, entitled a "Review of Tasmanian Mining." The latter gives a concise presentation of the Mineral Industry of the State, by Mr. Hartwell Conder, State Mining Engineer.

In the assay department, 524 samples were treated, and 18 mineral determinations made.

To relieve the mine operator from the paralysis of the ore market occasioned by the war, during the last quarter of the year a scheme for State advances on ore was inaugurated. Advances totalling £6600 4s. 8d. have been made on 1510 tons of companies' ore, and of £4925 7s. 4d. on 468 tons of tributers' ore.

FIELD WORK.

Zeehan.—The testing of the Zeehan district has been on an extensive scale, comprising 5214 feet of tunnelling and 347 feet of sinking and rising, at a cost of £3122 17s. 7d. This economical result was only made possible by the greater portion of the work being performed under the assisted tribute system.

Although no large productive lodes have been found, several payable ones have been cut, and are now being exploited. Other discoveries have good prospects. Taken altogether, the year's operations have been decidedly encouraging.

PROSPECTING.

Prospecting has been carried out on a wide area. Two stores depots were established—one at Corinna, and the other at Point Hibbs.

Old tracks have been cut out and new tracks made for an aggregate length of 57 miles.

Several discoveries were reported, but none of these on opening up proved payable.

It must now be accepted that, with the exception of the Port Davey district, all the creeks of any size in the State have been tested for minerals practically over their whole course. Deposits that could be located by tracing the alluvial from the creeks have, in the main, been found. Prospectors will, in future, have to confine their attention more to the densely-timbered ground, where deposits whose wastage has not reached the main streams most certainly exist. Under such circumstances success can only be assured by patient and laborious toil.

At Heemskirk a departure from the usual State method of reporting on the mineral fields has been adopted. Here the endeavour is being made to present the lodes to the miner and investor in the terms of business propositions. In a condensed form the results are made available in the monthly official report.

Water-power.—An investigation has been undertaken of the high-level waters of Lakes Rolleston, Selena, Westwood, and Julia, with the object of their utilisation as a source of cheap power and electrical distribution to the mining centres.

It was quickly realised that 2000 horsepower could be secured at a comparatively low cost; but the contour of the country suggested greater possibilities. Eventually, after surveys had been made by a limited staff in that difficult and exposed region, it was found that the waters

of the Lake Rolleston catchment can be brought over the divide and used in conjunction with the streams of the Henty watershed. This raises the horsepower obtainable from 2000 to 12,000.

As this power is situated only a few miles from the mining fields, it must be regarded as a great asset. For the remunerative treatment of the ores of the big mixed sulphide mines, the large tonnages of low-grade material at Renison Bell, and the revivification of Zeehan, the most necessary adjunct is cheap power.

STATE ARGENT FLAT MINE.

After this mine was taken over by the Government, Mr. Gerald Ahern was appointed manager, and the shaft at No. 5 Argent was chosen for the base of operations, the reason for choosing this shaft being its proximity to a very strong lode known as Flaherty's lode, which could be traced for a very long distance on the surface; also the shaft being in good order, well timbered, capable of holding large pumps, had been sunk to a depth of 150 feet, and a chamber cut and a crosscut driven 425 feet to the west. It was expected that by extending this crosscut, and also crosscutting to the east in maiden ground, lodes which are known to exist on the surface would be intersected, which might give a considerable amount of work whilst shaft-sinking was in progress.

The fact that a set of steel poppet-heads was over the shaft and the excavations taken out for the proposed machinery and buildings was also taken into consideration. This shaft was the most central, it being equidistant from Nos. 1 and 6, and close to No. 3 shaft. Crosscuts driven from here will unwater both these mines, and by extending the western crosscut No. 2 Argent may be unwatered. Since operations commenced in June, 1914, a powerful pumping-engine has been erected at the mine, which should be capable of sinking to 1000 feet, and a

15-inch Cornish lift has been placed in the shaft. A winding engine, capstan engine, and engine for driving dynamo for lighting purposes, and a well-equipped engineering shop, have also been erected.

A large dam has been built for conserving water for steam purposes. Operations commenced underground on November 10, and since then a fair amount of ground has been drained, which has enabled tributaries to sink on lodes west of the shaft which previously were full of water. At the end of the year the east crosscut had been driven 57 feet in fair ground. This crosscut will have to be extended 200 feet further to cut the first lode showing on the surface. The lode worked at No. 3 Argent should be cut in 400 feet of crosscutting. The west crosscut has been extended 51 feet. This crosscut now totals 476 feet, and will have to be extended 250 feet further to intersect the lode now being worked by Ruggeri, at 20 feet from the surface. The north drive on Flaherty's lode has been extended 57 feet, making a total of 123 feet from the west crosscut. A little ore has been found in this lode, but it is not payable. This drive, on being extended north, should reach the workings at No. 1 Argent. When this mine is drained it will open up a lot of ground which may prove profitable to tribute parties.

STATE MINING ENGINEER.

Mr. Hartwell Conder held the position of State Mining Engineer in charge of the works provided for under "The Aid to Mining Act, 1912," from the 14th November, 1912, to the 11th November last, when his engagement terminated, and Mr. J. O. Hudson, Chief Inspector of Mines, was appointed in his stead. Most of the important works provided for had been either completed or were well in hand. The change was made in order to economise expenditure, Mr. Hudson having to take over the work in connection with his other duties, without extra salary.

During the period of Mr. Conder's engagement he proved to be a most capable and reliable officer, and I regret that, owing to financial circumstances, the Department could not renew the engagement for a further term.

CHIEF INSPECTOR OF MINES.

Ever since the inception of the Mines Department the office of the Chief Inspector of Mines has been associated with that of Government Geologist, but the growth of the Geological Survey Branch and the many demands made upon the time of the Government Geologist, have for some considerable time past clearly indicated that the time had arrived when the Geologist should be relieved of the duties pertaining to mine inspection and the control and supervision of the inspectors. The Public Service Board was asked to create a new office and call for applications. Out of 57 applicants from the Commonwealth States and New Zealand, Mr. James Owen Hudson was finally selected and appointed, and took up his duties on the 16th June last.

Mr. Hudson received his early training in the School of Mines, New Zealand, in which country he afterwards gained many years' experience in his profession, and then went to Coolgardie, where he managed mines for Messrs. Bewick, Moreing, & Co. He has held the position of Senior Inspector of Mines at Kalgoorlie for the past seven years, and has had 17 years' experience as an inspector in West Australia.

MAGAZINES AND EXPLOSIVES.

The control and administration of this branch was transferred from the Inspection of Machinery Department to this Department in June last, and Mr. J. O. Hudson, Chief Inspector of Mines, was appointed Chief Inspector of Magazines and Explosives.

APPENDICES.

Appended will be found the following reports:—

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

Report of the Government Geologist.

Reports of the Assistant Government Geologists.

Report of the Government Assayer.

Report of the Chief Inspector of Mines.

Reports of the Inspectors of Mines.

Report of the Chief Inspector of Explosives.

GOLD MINING.

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

	Quartz.	Alluvial.	Cyanide.	Blister Copper	Silver- lead Bullion	Totals.
	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Beaconsfield ..	9260·35	20·35	6124	...	...	15,404·70
Mathinna ...	1005·85	...	...	...	...	1005·85
Mt. Victoria. }	71·50	133·81	...	...	...	205·31
Mt. Cameron. }	36·75	...	...	...	...	36·75
Lefroy .....	...	...	...	...	...	...
Lisle.....	...	125·77	...	...	...	125·77
Golconda. ... }	...	...	...	...	...	...
Lilydale	2·50	27·04	...	9898	...	9927·54
West Coast...	...	...	...	...	...	...
Totals ...	10,376·95	306·97	6124	9898	...	26,705·92

Value, £111,475, equal to 26,243·453 oz. fine gold.

Beaconsfield.—The Tasmania Gold Mine Limited, for the five months ending May, 1914, obtained 11,247 oz. of fine gold, valued at £48,397, from 15,280 tons of quartz and concentrates. The above figures include the gold obtained from concentrates purchased from the Government. The average number of men employed was 205.

The total quantity of gold obtained from the mine by the company is 832,478 oz., from 1,051,000 tons of quartz. The total amount paid in dividends up to 1905 was £772,671, since which date no dividends have been paid.

At the close of 1913, Mr. Arthur Llewellyn, mining engineer and expert, arrived from England, having been sent out by the board of management to report on the mine. As a result of the investigation he made, which fully coincided with the report and recommendation of the mine superintendent (Mr. C. F. Heathcote), it was decided to close down the mine, which was being worked at a considerable loss.

In April, mining operations, so far as the company was concerned, ceased; but not before an opportunity was afforded the Government of having an examination made by two experts (Messrs. Cundy and Fawcett), who, after going thoroughly into the matter, reported adversely on the possibility of deepening the mine to 1600 or 1700 feet, with any chance of future profitable working. The great cost of sinking, owing to the heavy influx of water and the additional cost of ventilating to be faced, was, in the opinion of these gentlemen, not warranted by the prospects and gold values at the bottom levels. This decision was not acceptable to the mining community of Beaconsfield, who contended that the mine would still pay, if only given a chance, under economical management. It was urged that the ore left in the bottom (1370 and 1500 feet) levels, could be won at a good profit; that sinking to deeper levels was not at all such a formidable undertaking as the experts made it to appear. Arguments were brought to bear in support of this contention. It was said that ore was left in some of the blocks which would pay; that sampling was defective; working costs extravagantly high; in short, that the failure or closing down was entirely due to mismanagement.

The Government was asked to purchase the mine and run it as a State mine, or failing that, arrangements

should be made to lease the mine and plant from the company, in order that it might be worked by the late employees on a system of tributing. It was urged that no time should be lost, as, the pumps having stopped, the water was accumulating fast. On the 27th May, the Minister entered into an agreement with the company and took control. The draft agreement between the company and the Government being completed, Mr. Hartwell Condon, State Mining Engineer, was then instructed to proceed to Beaconsfield and interview the committee in connection with the tribute party of employees. As a result of this, a large meeting of miners and employees of the company (Mr. W. H. Allison, chairman of the committee, presiding) met on Monday, 25th May, and discussed the agreements between the Minister and the company, and between the Minister and the tributers. About 60 miners and 30 drivers and stokers signed on at once; others soon followed, and eventually the party numbered about 150 men. It took about 10 days to unwater the mine. Mr. Joseph Allan was appointed mine manager by the Minister, and had full control of the mining operations.

The arrangement for the working of the mine by a co-operative party of men was based on two agreements between the Minister for Mines and the Tasmania Gold Mines Limited.

Under the first of these agreements the mine, together with all requisite machinery and plant for working it, was leased to the Minister at a rental of £50 per week for three years; the machinery and plant to be returned in the same condition as received, fair wear and tear excepted. The agreement to be terminated at any time on one month's notice from the Minister.

Under the second agreement the Tasmania Company agreed to crush any ore and purchase any concentrates under a certain tariff, which, for crushing alone, would normally amount to 5s. 6d. per ton. The price for the concentrates was fixed at 90 per cent. of the gold con-

tents by assay, less a returning charge of 30s. per ton. Briefly, these terms amounted to a charge of about 10s. per ton for treatment, with a loss of about $1\frac{1}{2}$ dwt. on the contents of the ore.

The special character of the ore accounts mainly for the high rates of these charges.

All the rights and responsibilities under these two agreements were transferred by the Minister to the committee of the co-operative party under a third agreement, with certain provisions. These were as follows:—

(1) The Minister to pay all charges for rent to the company, and also purchase for the co-operative party such stores as were essential to them, and to guarantee and pay the salaries of the mine manager, the engineer, and a clerk.

(2) Of the above amounts, part of the salary of the mine manager, to the extent of £200 out of £500 per annum, and the salary of the clerk at £4 per week, to be paid by the Minister outright. All other charges were only of the nature of advances, and were a first charge on any gold won, the custody of which remained with the Minister, the men to receive no payment from the gold until these charges had been defrayed.

(3) The Minister to assume the responsibility for any claim for accidents or death that might be made against the co-operative party; the Tasmania Company in Agreement "A" having been relieved in this respect. This was not chargeable against the gold.

(4) A proviso was made that if the men secured full wages from the undertaking they should become liable for all salaries and any legal claims, and free the Minister from financial or other liability.

Prices were fixed for the machinery, buildings, &c., and the Minister had the right to purchase at any time on these terms.

The first clean-up was not satisfactory, and after the second clean-up it soon became apparent that the tribute project was not likely to be successful, and on the 21st November it was decided to close down.

The quantity of fine gold won by the co-operative party from 16,556 tons of quartz was 4078½ oz. The total quantity of gold obtained from the mine from its inception to the final closing down in November is, therefore, 836,556½ oz., and the quantity of quartz crushed is 1,067,556 tons.

Taking into consideration, therefore, the fact that the Government was able to keep about 150 men employed for six months at a cost of £1005 6s. 8d., it may fairly lay claim to having accomplished an end of which it may be proud; for at the time the company ceased operations over 320 men were thrown out of employment at a time when there were no works on the Public Works Schedule upon which they could have been engaged, and the Government would have had to provide some means of employing such a large body of men at great expense to the country.

Another factor which has to be borne in mind is that had the mine filled with water and the pumping-plant been removed, each successive Ministry for years would have been petitioned to undertake the work of unwatering and restarting the mine, at a cost of £50,000 or £60,000, to prove what has now been proved for an expenditure of £1005 6s. 8d.

North Tasmania Gold Mine.—This mine has been worked by Messrs. Alfred Dally and party. A good deal of work was done on the surface also to test a lode half-way down the old underlay shaft. This was eventually abandoned in favour of a scheme to get good ventilation to work a very rich 6-inch vein discovered by the Tasmania Company when prospecting south-east from the bottom level at the main shaft. To do this it is necessary to deepen the Beacon Shaft (situate further to the south-east) to 400 feet, and make a connection with the main level. Government aid was obtained for this work. The sinking process, is, however, very slow, owing to bad air, and now that the Tasmania Mine has ceased working the drainage of this and other small mines in the locality will be no longer assured for any length of time.

Coronation Gold Mine.—Some further prospecting has been done in the south end, but nothing of a payable nature has been discovered.

John Hampton received Government aid to prospect for alluvial gold at West Beaconsfield. An adit was driven to tap a terrace run of wash, which did not prove to be payable.

At Salisbury, Messrs. Burt and party received Government assistance to test a big lode-formation.

Lefroy.—Golden Crest Gold Mining Company, No Liability completed a rise through to the bottom of the winze on the Gift lode, but nothing payable was discovered, and work ceased altogether in the beginning of March.

New Pinafore Gold Mine (Deep Alluvial).—The company completed sinking the main shaft to a depth of 260 feet. The main reef drive was driven 230 feet west, at the end of which a 28-foot rise tapped the gutter in very heavy boulder wash, large blocks of sandstone, and smaller stuff of a shingly nature. The prospects of gold are fairly good, but patchy. The gutter drive was extended about 280 feet south, and a connection made with a blind shaft

from the Clarence lode. Prospects at this place are improving, but the area of payable wash is limited. Beautiful samples of coarse gold, up to $2\frac{1}{2}$ dwts., are being obtained.

Lefroy Deep Leads Mining Company.—This company made a good commencement; substantial poppet-heads were erected, and a steam-winch winding plant and Cameron sinking pump installed. The shaft was sunk to a depth of 287 feet. Operations ceased when the European war broke out, and the mine is still idle.

Back Creek Deep Lead Gold Mining Company (6 miles north-east of Lefroy).—This company commenced operations about the middle of the year. The main shaft was sunk 55 feet by windlass; poppet-heads were then erected, a steam winding plant installed, and sinking resumed; but it was found that the water was too heavy for the small sinking pump in use. A larger pump, 10-inch lift, is being installed, and shaft-sinking will be resumed, it is anticipated, early in the new year. The shaft will be sunk to a total depth of 230 feet, and the reef drive extended to the top of what are called the red and white leads—tributaries of the Back Creek main lead. A good deal of shallow prospecting has been done in the past at the intersection of these tributary leads, and payable results obtained, until they dipped beneath the basaltic covering. Quite recently a 2-oz. nugget and coarse gold were obtained by a prospector.

It is anticipated that good results will be obtained when the deeper channels are exploited.

Lisle.—The Lisle Hydraulic Gold Mine started sluicing operations on the 31st July, and treated 8250 cubic yards of gravel for a return of about 45 oz. of gold.

Golconda.—The Lebrina Gold Mining Company.—Progress has been very slow. The battery was completed, and some stone crushed; the result was not very good. Work in adit prospecting has been going on for some time. Deepening of the shaft is intended when sufficient funds are available.

Mathinna.—New Golden Gate Syndicate.—The owners of this mine are doing well. Work on "Loan's Reef" is being pushed forward into the old Consols section with most encouraging results; a strong lode, 5 to 7 feet in width, highly payable, from wall to wall, is being worked; 1540 tons of stone were crushed, yielding 1031 oz. of gold, valued at £4013 12s. 8d.; 21 men being employed.

New Jubilee Gold Mine.—The underlay winze was sunk to a depth of 40 feet below No. 1 level, and connected by a rise from the bottom level. A good deal of prospecting was done in and about this winze. The lode split at the bottom of the winze (the eastern branch) was followed some distance, the size varying from 12 inches to 3 feet of payable stone on a flat lode curving round to almost a right-angled course in the direction of the main winze. A vertical cross-course cut shows 2 ft. 6 in. to 3 ft. of payable stone, the full width of which is not yet ascertained. It would seem that the whole thing is a big flat reef formation, dipping at an angle of about 32 degrees; deep corrugations in such, may be easily mistaken, when struck in the rough, for a strong vertical lode. These flat corrugated lodes are more difficult to work than vertical formations, but they are generally of a good payable nature. The company is now erecting a 10-head battery close to the main shaft, and it is anticipated that crushing will be commenced at an early date.

Upper Scamander.—New Trafalgar Gold Mining Company.—The main shaft has been sunk to a depth of 200 feet. In sinking the shaft a lode 2 ft. 6 in. in width was cut in the granite, which is rich in gold and silver. Assays made at the Government Assay Laboratory, Launceston, gave the following results:—

		oz. dwt.
No. 1. Quartz and Pyrites—bulk sample ...	Gold	2 16
	Silver	2 13
No. 2. " taken " heap " ...	Gold	4 5
	Silver	4 5
No. 3. Sample of fine " stuff at slide dis- placement of lode in shaft ...	Gold	3 9
	Silver	2 9

The lode, which has very little underlay, was cut at 50 feet down from the surface, and passed out from the shaft at 90 feet. This is "contact" country, but the sandstone is generally found overlying the granite. The company has several lodes on its property. The 10-head battery of the old Constant Mine (2 miles west of the Trafalgar) has been purchased by the Company, and is being erected on the Mine.

Warrentinna.—New Golden Mara Gold Mining Company.—Crosscuts have been extended west, and the Coronella lode cut and driven on at both No. 2 and the bottom levels. A crosscut going east has cut the Branhholm lode. A rise has been put up to connect with a winze coming down from Bayly's old shaft level. Some stoping and rising has also been done above the latter level.

A 10-head battery has been purchased from the New River Company, and is being re-erected at the mine. The prospects of this company are very good.

Golden Mara North Mine, No Liability.—This company commenced operations during the year; poppet-heads have been erected, a winding plant installed, and the main shaft sunk to a depth of 200 feet.

There are three well-defined lodes on the property. The shallow workings of the past prove these to be rich in gold, but successful results could not be expected when so much money was wasted in driving long tunnels, one of these 1700 feet to cut a lode, at only 75 feet from the surface. The gold won was from amalgamation; no attempt was made at close concentration. It would be quite safe to assume that the recovery was not more than 50 per cent. of the values.

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

South Mt. Cameron Tin Mining Company	...	21·25
Briseis Tin and General Mining Company	...	21·21
Total	...	43·36

West Coast.—In October last it was reported that Messrs. Horsburg and Stubbings had discovered alluvial gold about 2 miles south of the Urquhart River, about $1\frac{1}{2}$ mile inland from the sea, on the track from Double Cove to Port Davey. Mr. C. H. Curtain, Inspector of Mines, who was instructed to visit the discovery, reported that he did not consider it of any importance.

Several parties of prospectors are working in the Whyte and Savage River districts, and are obtaining alluvial gold. Gold propositions have received attention both at Harvey's Creek and at Linda, assisted by the Government, but their prospects have not come up to expectations. Operations have recently been resumed at the McDowell Prospecting Association's Mine for the purpose of rising 100 feet between two adit levels, which are said to carry gold.

On Howard's Plains, Prospector Davie is working a show known as "Hunn's," from which appreciable prospects of specimen and free gold have been obtained.

At Nuggety Creek, Lynchford, Donohue and mate, in the old workings, have discovered specimens of exceptionally rich stone.

SILVER-LEAD MINING.

The quantity of silver-lead ore produced was 11,565.54 tons, valued at £96,225, being a decrease in quantity of 72,723.728 tons, and a decrease in value of £223,772.

The principal producers were:—

<i>Zeehan Mines.</i>	Tons.	Value. £
Zeehan-Montana	530.77	11,355
Zeehan-Western	27.52	485
Zeehan-Queen	281	2386
Mt. Zeehan (Tas.)	458	10,441
Oonah... ..	3265.05	2219
Broken Hill Propy. Block 10 ...	396	240
Silver Queen Extended	200.35	3314
Queensberry	57.65	352

<i>Dundas Mines.</i>	Tons.	Value.
Hercules	326'25	£ 2217
Zeehan-Dundas	13'50	439
Penzance... ..	19'80	533
<i>Mt. Farrell Mines.</i>		
North Mt. Farrell... ..	2459'75	23,722

Zeehan District.—Zeehan-Montana Mine, Limited.—During the early part of the year the principal mining operations were confined to the workings in the vicinity of No. 1 shaft, and particularly at Nos. 2, 3, 4, 5, and 6 levels.

Mining operations at Nos. 7 and 8 levels were discontinued some four years ago, owing to the fact that for several years the exploratory work proved unproductive. There were, however, some fair prospects along the bottom of No. 8 level, but to prove their value entails deeper sinking. This the company were unable to finance, consequently the two lower levels were allowed to fill with water.

During the past five years the exploratory work has been confined on lodes at Nos. 3, 4, 5, and 6 levels; whilst stoping has been conducted on lodes at Nos. 1, 2, 3, 4, 5, and 6 levels.

Unfortunately, the exploratory work, as carried out during the past few years, has proved, with very few exceptions, unproductive; consequently, no new ore-bodies have been discovered to take the place of the ore reserves which have been supplying the monthly output, and finally the reserves became depleted, and for some months the mine was run at a considerable loss, and it was finally decided to close No. 1 shaft and conduct exploratory work on the surface and at shallow levels above water-level.

The pumps were stopped on the 16th May, 1914, and the water was allowed to rise in the mine. Operations since then have been carried on above water-level, and in surface prospecting.

Mill Lode.—A prospecting shaft was sunk on this lode to a depth of 50 feet, and a drive driven north along the

lode for a distance of 130 feet. The lode so far has proved bunchy, but with fair prices for metals and smelting tariff, this lode may prove payable.

Tributers.—Ten parties of tributers, averaging about 40 men, have been employed on the mine since the closing of No. 1 shaft. These tributers for the most part are operating the old stopes above water-level, and are making fair wages. The company supplies tools and timber free, and stores at cost price, deducting the cost of the latter from the proceeds of sale of the tributers' ore.

During the year the following work has been carried out on the mine, including that of tributers:—

Prospect shaft and winzes ...	279 feet	
Rises	108 ,,	
Crosscuts	468 ,,	
Main drive	962 ,,	
Stopes... ..		69,260 cub. ft.
	<hr/>	
	1817 feet	69,260 cub. ft.

Concentration.—The company's concentrating plant, prior to the closing down of the No. 1 shaft, was kept fully employed, the ore treated being principally from the No. 1 shaft. The company also undertook the treatment of customers' ore, consequently the ore raised by tributers both in Zeehan and Dundas has been treated at this company's mill. Since the closing of the No. 1 shaft there has been a scarcity of ore for concentrating purposes. Although the company has treated the whole of the ore which has been raised by tributers, the total tonnage from the 1st June to 31st December, 1914, amounted to only 1232 tons.

Second-class Ore.—During the year the company has treated the following second-class ore:—

	Tons.
Company's ore	1806
Company's tributers' ore	1183
Sundry tributers	1161
	<hr/>
	4150
	<hr/>

Output of Ore.—During the year the following ore has been raised from the mine:—

	Tons.		Tons.
Company's first-class ore	179·17	Concentrates	159·25
Company's tributers ...	144·00	Concentrates	171·26
	<u>323·17</u>		<u>330·51</u>
	330·51		

Total of 653·68 tons marketable ore.

A total value of £8625 14s. 7d.

Expenditure.—The total expenditure for the year, including stores, was £11,184 2s. 1d.

Average Number of Men Employed.—Succeeding the closing of the mine in May last, the number of men employed at the mine has been variable, the probable daily average of men employed for the year would be 50.

The Mt. Zeehan (Tasmania) Silver-lead Mines.—Operations have been chiefly carried on by tributers. North of No. 2 shaft, a tunnel was driven by the company, which intersected No. 10 lode. This work was continued by the company, and a fair quantity of ore was raised, but on the whole the work was not profitable. In these circumstances, and as the Government-assisted tributers were driving the tunnel further, it was decided to let the whole of these workings on tribute. Nos. 10, 15, and 16 lodes are being operated on by three parties of tributers in this tunnel, and a fair measure of success gained. South of this tunnel three other parties are working lodes discovered in the course of the company's operations, and on the whole they have made fair wages.

At the company's Spray Mine three parties were working old ground, and made good wages. Another party, with State aid, are driving "G" tunnel west, but so far have not discovered anything of value.

At the Britannia Section, a lode has been successfully operated on by a party of tributers, whose average output has been 20 tons of high-grade ore a month.

The Zeehan-Western Limited.—The work carried out on the mine has consisted of prospecting the surface, whilst during the early part of the year a few tributers were employed stoping-out the remaining small vein of ore left in the top of the old stopes.

A total of 24.77 tons of marketable galena ore has been raised and sold during the year by tributers, valued at £463 0s. 9d., which enabled them to make very good wages.

Expenditure.—The total expenditure for the year in wages and stores was £634 19s. 1d.

Exploratory Work.—Unfortunately the exploratory work carried out during the year has not disclosed anything payable. There are still four men employed on the mine prospecting on the surface.

Zeehan-Queen Limited.—Operations have been restricted to tributers, who have been operating chiefly on Clark's and Taylor's lodes, in the adit levels.

On the whole, the results have been moderately successful, practically all the tributers making fair wages.

A considerable amount of prospecting has been done with State aid, but no new discoveries of importance have been made.

State Argent Flat Mine.—Since starting operations on the 8th June, 1914, the whole of the plant purchased by the Government from the Western Silver Mining Company has been removed, and erected at the mine. The plant comprises a tandem compound pumping engine, winding engine, capstan engine, and an engine for driving dynamo: these are all set on concrete foundations. Two Babcock and Wilcox boilers were also placed in position and bricked in; an engine-house, engineering shop, with carpenter's shop and changing-house, have been built. A dam for conserving water for the boilers and condenser was built, and a race 20 chains long was cut to connect the dam with the tanks at the mine.

Underground.—The surface adit connecting with the main shaft was cleaned out and repaired for a distance of 800 feet. At No. 1 level the west crosscut has been extended 51 feet, making a total of 476 feet. The east crosscut has been extended 57 feet, total 57 feet. The north drive on Flaherty's lode has been extended 57 feet, total 123 feet from the west crosscut. Skids were placed in the shaft from top to bottom.

Zeehan-Dundas Mines Limited.—As the development of this mine resulted in the loss of £13,000 of the company's capital, and no other part of the lease offered any reasonable prospect, it was decided to withdraw the pumps and close down the mine. This has been done, and the two northern sections of the company's holding have been surrendered. The south section, on which the company's workings are, is still held a party of tributers making a living by working little veins above water-level that were left by the company, being unpayable at the then price of metals.

A considerable quantity of machinery is stored on the ground, but will ultimately be removed for use elsewhere on Mt. Zeehan Company's ground, from whom it was borrowed by the Zeehan-Dundas Mines Limited.

Mt. Read District.—The Hercules Gold and Silver Mining Company.—During the year no ore has been sold, but the following quantities have been broken and stacked:—

Fifty-four tons of gossan ore, of an estimated gross value of 90s. per ton, which, after deducting a supposititious returning charge of 65s., leaves a net value per ton of 25s., and a total net value of £68 10s.

Fifty-nine tons zinc-lead ore, of an estimated gross value of 63s. per ton, which, after deducting a supposititious returning charge of 47s. 6d., leaves a net value per ton of 15s. 6d., and a total net value of £45 4s. 6d.

SUMMARY OF ORE MINED.

	Gross value.			Net value.		
	£	s.	d.	£	s.	d.
Gossan Ore, 54 tons	243	0	0	68	10	0
Sulphide Ore, 59 tons	185	17	0	45	14	6
Total 113 tons	428	17	0	114	4	6

Average Number of Men Employed.—Six to seven monthly.

Underground Works.—Practically no works have been carried out during the year, except the necessary constant maintenance and supervision; the only developmental work was a small crosscut driven across the "C" ore-body for a distance of 44 feet; a thorough overhaul of the drainage system throughout the mine, and the diamond drilling work in the "E" ore-body at No. 4 level, where some 442 feet were bored with generally satisfactory results.

Surface Work.—No work of any kind has been attempted, but all the various mine buildings have been repaired and maintained in good order. The haulage tramway worked intermittently in the early part of the year, and since then has been carefully looked after.

Mt. Read Mining Company Limited.—The work done on the mine consisted of driving the north drive on Williams' lode in the west crosscut, a distance of 52 feet, through mineralised schist; nothing payable was disclosed.

Two men were employed.

Work was discontinued at the mine on the 18th June, 1914.

Lyell District.—Tasman and Crown Lyell Extended Mine.—Work of a prospecting character has been continued on the "sulphide lode," the primary object being to establish its presence in the No. 3, or deepest adit, when fresh capital will be invited to deal with its development and treatment.

An average of six men have been employed.

Mt. Farrell District.—North Mt. Farrell Mining Company.—16,118 tons of crude ore has been mined and dressed, resulting in the production of 2459 tons 14 cwt. 1 qr. 18 lb. of marketable ore, containing 128,969 oz. of silver and 1321 tons of lead, of an estimated value of £23,378. As 806 tons of marketable ore produced since July has not yet been realised upon, the estimate of the cash value given above is necessarily only approximate. The total output to date now amounts to 31,068 tons, of a cash value of £298,428.

For the first seven months of the year operations followed the usual routine, and a steady output of about 240 tons of marketable ore per month was maintained. Although the decline in the proportion of "first-class" or hand-picked ore won still persisted, yet the grade of the milling ore was good, and the resulting increased production of concentrates compensated for the falling-off in the output of "firsts." Being favoured with a continuance of good market prices for silver and lead, results generally were very satisfactory.

On the closing of the market for lead ores, consequent upon the outbreak of war, in August, productive operations had to be suspended for a time; but they were resumed again in September, arrangements having been made to obtain cash advances from the State Government upon the ore raised, in order to provide employment for the miners resident on the field. Since then ore-production has proceeded without interruption, but on a restricted scale; and the ore raised has been stacked at the mine pending the reopening of the metal market.

The bulk of the output has been drawn from the bottom shaft level (No. 6), where stoping is in progress on the two main lodes, viz., No. 2 and No. 3. A third lode formation, situated midway between the other two, is being exploited, and so far is opening up very well. This lode stands nearly vertically, and will probably junction with

the No. 2 lode in going upwards and with the No. 3 in its downward extension, within a vertical distance of 50 or 60 feet in each instance. Fair reserves of milling ore are available for extraction at this level, and the appearance of the ore-bodies going underfoot indicates favourable prospects for the next deeper level.

With the object of exploiting at a depth the lode formations on their northern lease, the Mt. Farrell Mining Company entered into an arrangement with the North Mt. Farrell Company to drive south from the latter company's workings at the No. 4 or bottom adit level. This work was commenced in April last, and so far 330 feet of driving has been accomplished, which leaves about 350 feet yet to be driven to reach the Mt. Farrell Company's lease. Although at times a little low-grade milling ore has been passed through, nothing of any commercial value has yet been met with. The drive is in virgin country, and as it commands somewhere about 300 feet of "backs" any favourable development here would be of great importance.

During the latter portion of the year shaft-sinking was resumed, and at the close of the year the shaft had attained a depth of 214 feet below the No. 4 adit level. At 200 feet an opening out for the third shaft level has been made, and as soon as the installation of a more powerful hoisting engine is completed the development of this No. 7 level will be proceeded with.

Until the commencement of the war the mine provided employment for about 120 men; but since then the number employed has fallen to 85, a number of employees having volunteered and been accepted for active service with the Commonwealth Military Expeditionary Forces, and others having left the district.

At the end of the year negotiations were in progress for the purchase of the mine's output.

North-Western Mining Division.—The Magnet Silver-Mining Company.—During the early part of the year the No. 4 winding chamber, main shaft, from No. 4 to No. 5 level, was retimbered. The principal mining operations were confined to driving south at the No. 10 level, and stoping Nos. 9, 10, and 11 levels, with good results, the ore being found in bunches, most of which is in paying quantities. Owing to war complications, mining operations were suspended early in August. The main shaft was sunk 100 feet and the main plat partly cut. Active mining operations were resumed on a limited scale on the 8th December at a reduced price for metals, the employees agreeing to accept reduced wages for the time being. During the period under review 14,179 tons was treated for 3183 tons metal obtained, carrying 182,735 oz. silver, and 791 tons of lead. The gross value of the ore was £34,970, and the net value £26,292, the average number of men employed being 120. The latter part of the year was the driest ever known.

Northern and Southern Division.—The Round Hill Mine produced 346·9 tons of ore, valued at £3576. The mine has been worked for the greater part of the year with good results. The old tribute party's term expired in October. New arrangements were made, and the mine is now being worked by Mr. George Gabbidy (mine manager and a member of the old tribute party), who has taken it on tribute.

The great ore-body is improving as the hill is being worked into at the upper adit level. Silver values have improved, and the mine is looking well.

COPPER MINING.

The quantity of blister copper and copper ore produced was 10,796·75 tons, valued at £496,041, being an increase of 4260·95 tons on the previous year.

THE MT. LYELL MINING AND RAILWAY COMPANY LIMITED.

The ores and metal-bearing fluxes treated by the company were as follow:—

	Dry weight. Tons.
Mt. Lyell Mine ore	209,459
North Lyell Mine ore	129,180
Purchased ore	33
Lyell Comstock ore	285
Total	<u>338,957</u>

Quantity and value of metal produced:—

Blister copper, 7509 tons, containing—	£
Copper, 7420 tons, valued at	427,704
Silver, fine, 471,930 oz., valued at... ..	49,657
Gold, fine, 9898 oz., valued at	41,574
	<u>518,935</u>

Since the inception of the company 133,250 tons of fine copper, 10,981,699 oz. of fine silver, and 328,784 oz. fine gold have been won, and £2,886,443 has been distributed in dividends.

Average Number of Men Employed:—

Mining Department—

At the Company's Mt. Lyell Mine ...	404
At the North Lyell Mine	500
At the Lyell Comstock Mine	16
At the Crotty Leases	20
	<u>940</u>

Reduction Works Department 886

Railway Department—

Mt. Lyell Railway	130
North Lyell Railway... ..	19
	<u>149</u>
	<u>1975</u>

The dividends paid during the year amounted to £64,459 15s., equal to 1s. per share.

Mt. Lyell Mine.—The usual extraction of pyrites was made from the underground workings and the open cut. The stopes have yielded ample supplies for the smelters, and all workings are in a satisfactory condition.

The deepening of the main shaft below No. 8 level has been in hand, with the object of attacking the ore known to exist below that level.

The country passed through was hard conglomerate, which has made the work expensive. The depth reached at the close of the year was 77 feet. The plat-chamber and crosscut to the lode will follow, and the old South Lyell shaft has been equipped at the No. 8 level with a head-frame, and everything is in readiness for exploration at a lower level. Stopping on the ore-body at the plat level has been commenced, and will materially aid the output of the parent mine for smelting and acid-making purposes.

North Mt. Lyell Mine.—Normal working conditions have prevailed during the year, and the stopes at the 350-foot, 1000-foot, and 1100-foot levels were the most productive.

The grade of the output from the mine has been very satisfactory, and the exploration of the good stopes at the 1100-foot has been continued with success. The deepening and conversion of the Crown Lyell shaft into a large working shaft is still in hand, and connection has already been made from the 700-foot level to the surface, and the section from the 850-foot to the 700-foot will be completed at an early date. The usual open-cut operations for filling material have been maintained.

Lyell Comstock Mine.—Exploratory work only was continued during the year, but work was suspended at the outbreak of the European War. It has been decided to erect a flotation plant to deal with ore from the Comstock Mine, at the rate of 600 tons per week.

Reduction Works.—Smelting operations have continued without interruption throughout the year, with three fur

naces in blast, the tonnage treated amounting to 33,957 tons. The converters were worked as usual, and the blister copper output amounted to 7510 tons, with an approximate value of £518,935.

Lake Margaret Hydro-Electric Scheme.—Construction work on this scheme was completed in November, and the generation of power was at once successfully inaugurated, displacing the whole of the steam plant at the reduction works and the mines, with the exception of the Mt. Lyell Mine air-compressors. The generation plant consists of three turbine generators, with a fourth unit in reserve. The three generators are rated to yield 36,000 k.w., with a flow of water of 45 cubic feet per second. The current at 6600 volts is carried a distance of $5\frac{1}{2}$ miles to the reduction works. The transformer and new blower stations are well-built iron and concrete structures. The whole plant is working very satisfactorily and is fulfilling expectations.

General.

The flux and limestone quarries were in operation as usual.

The railway department maintained its usual standard of efficiency.

The Mt. Lyell Blocks Copper Mining Company.—The main shaft has been sunk 127 feet for the year, making a total vertical depth of 1357 feet. Plats have been opened at each succeeding 100 feet from the "Consols" or adit level, the lowest being at 1335 feet, from which, and on the next level above, drives are being put out north and south to prospect for similar ore-bodies to those so successfully worked in the neighbouring mine. An average of 35 men has been employed.

Jukes and Darwin.—At the old Proprietary Mine, now leased to Mr. James Soutar, the new adit has been advanced to a total length of 236 feet, working with two men. During the progress of the latter part of this work, a promising make of copper ore was intercepted, which will

receive future attention after a connection for ventilating purposes, &c., is made with the top adit winze, where values were favourably reported by the old company.

On the old "Hal Jukes" a syndicate under the direction of Prospector Burke and two men, has deviated the face of the drive, and hope to cut the ore channel exposed on the surface within another 30 feet of driving.

Zeehan District.—Ring Valley Mine.—At the 130-foot level the north and south drives are continued for a distance of 44 feet and 68 feet respectively. Approximately 5000 cubic feet of stone were stoped, and 112 tons of ore obtained, valued at £2415, the average number of men employed being 17. The mine closed down on the 13th August, owing to the outbreak of war.

The Dundas Cuni Mining Company Limited.—Owing to the company's inability to dispose of its copper-nickel ore the mines closed down.

The lode has been driven on for 100 feet at the first level at 80 feet deep, and stoping has proceeded above this level.

From the main shaft 1100 tons of ore have been raised, which is estimated to be worth £5500, but with the exception of 300 tons which were shipped, the remainder of the ore is held in stock pending the reopening of the market.

Copper-Nickel Prospecting Syndicate.—During the past year the company sold to Messrs. Elders Metal Company 3089 tons 4 cwt. of copper-nickel ore, the price received for same in bags in railway trucks at the mine, being £15,815, metal values being approximately 10 per cent. nickel, and $4\frac{1}{2}$ per cent. copper per ton, some going as high as 14 per cent. copper and as low as 4.1 per cent.; nickel contents as high as 10.9 per cent. and as low as 8.7 per cent.

The shoot of ore at the 76-foot level was proved to be 78 feet long; this was beaten out to the surface. The main

shaft was sunk on to 122 feet, and the lode cut and driven on, the south drive being 41 feet from the crosscut. The formation was very much disturbed for some distance, but during the last 20 feet looked a great deal better, and some very nice metal is now showing in the face.

The water was very troublesome (30,000 gallons per hour), and a 20-inch diameter pump had just been installed when the war broke out, and the ore contract was suspended, and the mine practically shut down, only a little prospecting being carried on.

Mt. Balfour Field.—The quantity and value of copper ore produced from this field was:—Murray's Reward, 44 tons, valued at £178.

Heazlewood.—The Jasper Copper Mine.—An average of 17 men was employed at this mine, the output being 20·25 tons, valued at £436.

TIN MINING.

The quantity of tin ore raised was 2572·713 tons, valued at £259,300; an average value of £100 15s. 9·25d. per ton.

The statistics for the year are:—

	Ore won, tons.	Value. £	Miners Employed.	
			Euro.	Chi.
Northern and Southern Division	40·978	3998	45	...
North-Eastern Division	1066·960	111,894	490	31
Eastern Division	311·150	31,871	259	17
North-Western Division	889·050	84,852	492	...
Western Division	264·575	26,685	189	...
Total... ..	2572·713	259,300	1475	48

North-Eastern Division.—The output of tin ore was 1066·96 tons, obtained as follows:—

Pioneer and Gladstone Districts.

	Tons.	Tons.
Pioneer Tin Mine	282·50	
Aberroe	15·15	
South Mt. Cameron	40·32	
Garibaldi	·75	
Clifton Creek	146·11	
Yee Gee	25·75	
Other claims	117·60	
	<hr/>	628·18
<i>Ringarooma District</i> ... ..	...	15·20
<i>Derby District.</i>		
Briseis Tin Mines	197·45	
Other claims	45·65	
	<hr/>	243·10
<i>Branzholm District.</i>		
Arba Tin Mine	94·39	
New Ruby Flat	25·25	
Other claims	16·45	
	<hr/>	136·09
<i>Moorina District.</i>		
Weld Tin Mine	27·02	
New Banca	3·06	
Other claims	12·35	
	<hr/>	43·15
<i>Straits Islands</i> ... ..	...	1·24
	<hr/>	
Total ... ..	...	1066·96
	<hr/>	

Eastern Division.—The output of tin ore was 311·15 tons, obtained as follows:—

Weldborough, Lottah, and Blue Tier Mines.

	Tons.	Tons.
Anchor Mine	85·55	
Other claims	73·45	
	<hr/>	159·00
<i>St. Helens Mines</i> ... ..	...	42·65

<i>Avoca Mines.</i>		Tons.	Tons.
Gipp's Creek		1'90	
South Esk		2'55	
Royal George		81'50	
Storey's Creek		9'25	
Foster's		5'55	
Others		8'75	
		<hr/>	109'50
Total ... ..		...	<hr/>311'15 <hr/>

North-Western Division.—The output of tin ore was 889'050 tons, obtained as follows:—

	Tons.
Mt. Bischoff	697'75
Mt. Bischoff Extended... ..	110'50
Weir's Bischoff Surprise	10'90
Mt. Cleveland	16'40
Ringtail... ..	7'25
Waratah Alluvial	15'75
Mt. Balfour	30'50
	<hr/>
Total	889'05

Western Division.—The output of tin ore was 264'575 tons, obtained as follows:—

	Tons
Boulder Mine	30'00
Renison Bell Mine	80'50
Montana Tin Syndicate	13'80
Heemskirk	20'70
Penzance	6'20
Others... ..	113'375
	<hr/>
Total	264'575

Northern and Southern Division.—Total output was 40'978 tons, of which the Shepherd and Murphy Mine produced 37'275 tons, and the Iris Mine 3'703 tons.

This industry has suffered much in its operations during the year, owing first to the unprecedented drought, especially on the eastern and north-eastern mines, where the rainfall recorded was lower than for 15 years past;

no rain at all for the first three months of the year. April was showery, and some of the smaller mines commenced; the large ones, too (their already low supply being augmented), worked full-handed for a time. The climax was reached, however, when the war broke out in August, and the metal market was completely paralysed for the time being. No market, no quotation for tin!

The Government was approached with a view to arranging for 50 per cent. loans, on a basis of £132 values, it being assumed that this would be sufficient to enable the small tin mine owners to keep going, but there was no water to keep going with. A dry winter was followed by a dry spring, and the year closed as a record one of hardship to the tin-miner.

The S. and M. Syndicate Ltd.—The mill ran 35 weeks, treating 5710 tons, and producing 100·7 tons of concentrates. Seventeen weeks were lost owing to shortage of water, due to the abnormally dry seasons in the early and latter parts of the year.

In the mine, stoping and development works were carried on at Creek drive, and No. 3 adit on Nos. 2 and 4 lodes.

On No. 2 lode, driving was continued east at Creek drive, intermediate, and No. 3 adit levels, and the necessary connections made for ventilation between these levels. A large block of stoping ground is now opened up on this lode.

On No. 4 lode, driving was done east at intermediate and No. 3 adit, and west at No. 3 adit. The usual stoping has been carried on over these drives.

The main shaft has been sunk to 80 feet below No. 3 adit, using an air winch for hoisting, and will be continued to 170 feet, with a chamber at 150 feet for cross-cutting to the different lodes.

The shaft has also been continued upwards to the surface a height, at this point, of 100 feet, and preparations are being made to erect head-gear and steam hoisting plant.

An auxiliary steam plant has been installed, consisting of two loco. type fire tube boilers, each of 90 horsepower, and has been in use for driving the air compressor during periods of shortage of power water.

Operations during the year have been greatly hampered by the abnormally dry seasons, and production much lessened thereby.

Development work, however, has been kept going, and the mine is in good order for full production when power is again available.

The average number of hands employed at the mine during the year was 38.

The Briseis Tin and General Mining Company Ltd.—Until the outbreak of war the work of removal of basaltic overburden and sluicing of tin drifts was carried on as usual.

The Cascade lead runs northward under the Ringarooma River at a depth of 100 feet below flood-level in the river. A diversion of the river northward was completed in August.

The increasing depth of the ground to be worked has been met with the same appliances formerly in use, viz., generally, hydraulic reaction turbines and Pelton wheels driving gravel pumps, belt conveyors, &c. A screen and belt conveyor for dealing with shingle have been erected in the bottom of the main tin workings.

On the outbreak of the war, the moratorium and collapse of the tin market so affected financial arrangements that the company was only able to work half-time till November, after which date, time worked was again normal.

Apart from the war, the work has been seriously affected by the drought, 1914 being the driest year since rainfall records were started here in 1900.

The water-supply is also seriously affected by the forest destruction going on in the watersheds.

Statement of Quantities Removed, Output, Value, &c.

	Cubic yds.	Black Tin, tons. cwt.
Ringarooma Mine—Drift	117,000	24 9
Briseis Mine—Drift and over- burden	161,000	155 19
Mutual Hill	40,000	10 8
Ringarooma Mine—Overburden ...	74,600	
Value of output (estimated)		£22,989

Average number of men employed—

Quarter ended March 31...	133	
Quarter ended June 30 ...	150	
Quarter ended September 30	146	Half-time from Aug. 8 to Nov. 30
Quarter ended December 31	135	

The Arba Tin Mining Company.—During the months from January 1 to September 30, 1914, inclusive, sluicing was carried on at all faces at the main workings, with the exception of the overburden face, at which work was stopped on August 1 owing to shortage of water.

At the easement workings, sluicing was carried on till the 30th July, when this plant was closed down in consequence of the low price of tin, the Metal Exchange being closed.

Sluicing was continued at the main workings up till the 30th September, by employing the men half time, but as water was slack and there was no market for tin, the whole mine was closed down.

This decisive action would have taken place in about three weeks, even if the market for tin had been good, as there was not sufficient water to continue sluicing, and since then the water-supply has failed altogether. At present all head-races are practically dry.

The following work was done during the year 1914:—Sluicing main workings, 182,425 cubic yards; working cost, 6·72d. per cubic yard; tin contents, 1·05 lb. per cubic yard. Easement lease, 49,644 cubic yards; working cost, 7·96d. per cubic yard; tin contents were poor, owing to the plant having been placed at the poor end of the lead.

Value of the output was £10,724 11s. 3d.

The average number of men employed up to the 30th September was 54.

The mine will resume work immediately the present drought breaks and a continuous supply of water is assured.

The Pioneer Tin Mining Company Limited.—During the year 502,900 cubic yards of drift were pumped and sluiced for a yield of 318.5 tons of stream tin. The exceptionally dry season, which involved the total suspension of all sluicing for 14 weeks during the first half of the year, and intermittent work for only four months of the latter half, accounts for the comparatively small yardage sluiced.

The average number of men employed has been 60.

Argonaut Mine (St. Helens).—Sixty-nine thousand cubic yards were pumped and sluiced during the year, for a yield of 30.6 tons of stream tin. Owing to the drought and closing of the metal markets since the outbreak of the war, it was only possible to carry on sluicing for 18 weeks during the year, which seriously affected the output.

Average number of men employed, 17.

In spite of the drought and dislocation of the metal markets due to the war, the employees at the Pioneer Mine have been able to work nearly three-quarter time, and at the Argonaut Mine full time.

Guiding Star Tin Mining Company.—Very little has been done in the way of mining during the year. Some additions have been made at the battery in the way of dressing plant.

Mutual Hill Tin Mining Company.—The working of this mine is now being carried on by the Briseis Company. No work was done during the last half of the year.

North-Eastern Mining Division.—The South Mt. Cameron Tin Mining Company.—At the commencement of the year very hard and poor wash was met with, which barely paid for treatment, averaging only 815 lb. of tin oxide per cubic yard. The next lot taken out for about

a two-months' run showed a slight improvement, as 50,960 cubic yards were treated, yielding 1 lb. of oxide per cubic yard and 13 oz. 1 dwt. of alluvial gold.

At the beginning of August the last clean-up was effected, resulting in the low return of 956 lb. of oxide per cubic yard, from 33,960 cubic yards of wash of a hard nature. At the time these discouraging results were being obtained the price of the metal was very low, touching the unsatisfactory price of £130 per ton for metallic tin; and while looking forward to a rise in the price, the European war broke out, causing the complete collapse of the metal market, and the inevitable collapse of the mine till such time as our much disturbed country and the tin market recover sufficiently to warrant a resumption of operations, which it is earnestly hoped will not be very long. At the time mining was suspended through the above-mentioned causes the company's pumping-plant, tail-races, tramlines, &c., were in good working order, and they still have a considerable amount of ground to work of about the same average quality as that described above; *i.e.*, low-grade, but payable under economical working, and with tin at anything like a reasonable price.

The number of men employed was 24.

The Aberroe Tin Mining Company, No Liability.—During the year 55,000 cubic yards were treated, for a yield of 15.15 tons of tin ore.

The season was characterised by the dryness of the late winter and spring, only 1½ inch of rain being recorded from the middle of July to the middle of November. The water gave out by the end of October.

The number of men employed averaged nine, and the value of the ore was £1850.

Clifton Creek Tin Mine.—This mine, through a method by which the water is returned from settling dams and used over again for the gravel-pumps and sluices, has been enabled to work throughout the entire year. Number of men employed, 32. No tin has been sold since August.

The owners (McDonald Ltd., of Sydney) have now 85 tons of white tin stored at the smelters in Launceston.

Gladstone Mines.—Only a few of the numerous small mines were working at the close of the year; want of water had almost brought everything to a standstill. The slump in the metal market was, of course, a great check, but now that this difficulty is passed and the market is fairly good, there is no water to get the tin with. The owners of two mines (Kerrison and Higgs, and Bracey and Harris) installed centrifugal pumping plants, operated by portable steam-engines, to pump water from the Mt. Cameron Water-race on to their respective claims at Garfield Hill; they have found it necessary to remove to fresh places in the lower country. There is no ground at Garfield Hill good enough to bear the extra cost of pumping, as in this case.

Messrs. O'Halloran and Fleming discovered a small tin lode running east and west through the township and cutting right across the old Royal Tasman, North Tasman, and Royal Standard line of auriferous reefs. The vein is in the slates, forming portion of the stanniferous greisenised belt at the margin of the granite, the home of tin ore. The owners, who are receiving Government aid to prospect, have driven an adit eastward, on the course of the lode, from where it outcrops on the western slope of the hill. The vein is small (3 to 9 or 10 inches), but persistent, and gives fairly good prospects of tin oxide; in places some of the soft greisenised matter is very rich in tin. Prospecting is still going on, and it is possible that this show may develop into a payable tin lode.

Weld Tin Mine.—The ground north of the river (old Echo Mine) is being worked, and is improving in prospects as the lead trends to the north-west.

Eastern Mining Division.—Weldborough.—Very little doing; want of water and a falling tin market made matters bad about the middle of the year, and, since the war commenced, the place is practically at a standstill.

Cream Creek.—Some tributers working for the Pioneer Tin Mining Company are working a soft lode-formation, with good results.

Anchor Tin Mine Limited.—This company ceased operations, and finally shut down at the end of May. A large sum was due to men for wages. The Government loaned £5000 to the company a few years back, and were secured by a first mortgage on the mine and plant. Arrangements were at once made to allow the mine to be worked on tribute by the late employees. Water was scarce, but there was sufficient to run one battery (50 heads). A good number of men joined at the start; others followed, and the tribute party did fairly well until the water failed in November. The Government now has control of the whole mine and plant.

St. Helens.—The Pioneer Tin Mining Company's Argonaut Mine, on Golden Fleece Rivulet, has been doing fairly well. Not much doing amongst other small mines in the locality.

Troy Tin Mine.—The result of the prospecting done under control of Mr. C. F. Heathcote, for John Taylor & Son, London, was not good enough to induce further capital to be spent, and the mine is now idle.

Royal George Tin Mining Company.—This mine ceased operations about the middle of the year. Additional crushing power has been added to the mill, and operations are to be resumed as soon as there is sufficient water to work with.

Ben Lomond.—Little or nothing was done during the last half of the year owing to the want of water. A company has been formed to reopen and work the old Great Republic Mine, and some preliminary work was being done at the close of the year.

Western Mining Division.—Renison Bell.—The number of tons of ore mined and treated for the year totalled 10,325, which returned, on concentration, 80.5 tons of tin oxide, valued at £8367. In consequence of the outbreak

of war and failure of the tin market, the mine was closed down on August 4 last. At that time the duplication of the plant was nearing completion, and the treatment of the pyritic ore was in progress. Since the cessation of mining work the duplication of the plant has now been completed, and consists of one 16-inch by 9-inch jaw-crusher, 20 head of modern stamps (1000 lb.) batteries are provided with automatic feeders, 3 Forward and Down grinding pans, 19 concentrating machines of various kinds, including Card and Bannister concentrators, Luhrig and Buss slimers, with classifiers, &c.

The treatment of the pyritic ore involved the installation of a roasting plant and additional concentrating machinery.

The roasting plant is an Edwards duplex, 7-panel, 28-rabble calciner, capable of treating upwards of 20 tons of ore per day. The calciner is provided with automatic feed and discharge. Up to the time the calciner was put into commission—that is about six weeks prior to closing down—the oxidised portions of the ore-bodies were mined for treatment. When the calciner was ready for work the treatment of the large bodies of pyritic ore existing on the mine was undertaken with highly satisfactory results. Developmental work on the mine has resulted in disclosing large bodies of pyritic ore, which for the most part carry good payable tin values. Nearly the whole of the ore mined was obtained from the open-cut workings, from what is known as the "northern ore-body." The pyritic stone was taken from the southern workings.

The second large storage dam on the Argent River was nearing completion when the mine closed down; a few weeks' work is now only necessary to complete it.

The Boulder Tin Mine.—Milling operations occupied part only of the first half of the year. During the first quarter the battery worked less than half-time. This was due to the shortage of water resultant on the abnormally

light rainfall experienced. Up to the date of stopping the mill, only 65 per cent. of the possible stamp hours were worked.

Ore crushed, 5446 tons; oxide recovered, 30 tons, of an average value of £98 10s. per ton; average number of men employed, 34. During the year a rivetted steel pipeline, 30 chains in length, was constructed and connected to the high-level race, with a fall of 435 feet. The pipes are 15-inch diameter for about 22 chains, and are then reduced to 12½-inch diameter; the gauge of the pipes varies to suit the pressure. The water is directed on a 9-foot Pelton wheel, which was installed at the same time, the new power thus obtained being available in March.

In June last the company amalgamated with the Dreadnought-Morton Mines, the new title being the Dreadnought-Boulder Amalgamated. After the amalgamation steps were taken to connect the vase ore-deposits of the Dreadnought section with the Boulder mill; this entailed the construction of about 60 chains of steel tramway, which was finished at the end of the year. This steel tramway will be connected to the mill hopper at one end, and at the other with about 16 chains of self-acting gravity tram, the self-acting tram being connected to the working faces. On the completion of these necessary connections milling operations will be resumed.

The Montana Tin Prospecting Syndicate, No Liability.-- On the north side of Section 1342-m a dressing plant was erected, consisting of two Wilfrey tables, two trommels, one Luhrig vanner, two rotary tables, one set of Strake tables, and one 6 horsepower gasolene engine. An average of 13 men were employed, and 13.80 tons of tin ore were mined and dressed, value £1141. The year's work was disappointing, owing to the continued dry weather and the low price of tin.

North-Western Mining Division.—The Mount Bischoff Tin Mining Company, Registered.—The output of ore from the mine totalled 174,992 tons, of which 160,593

tons were delivered at the mills for crushing and concentration, and 14,399 tons, being very low grade, were rejected; 719 tons of concentrates were obtained.

The present crisis has had a disastrous effect on the market for the mine produce, and early in the second half of the year a co-operative system of working was introduced in an endeavour to keep the mine open and find employment for numbers of employees who have been connected with the company for several years. The venture has worked satisfactorily.

The number of men employed up to August averaged 431, and under the co-operative system 140.

Surface Working.—As the co-operative scheme was limited in its application, and only embraced one third of the number normally employed on the mine, a corresponding reduction is shown in the tonnage of crush-dirt produced from the various workings.

Prospecting.—Surface prospecting operations were carried on, with gratifying results. Further exploratory work in the Happy Valley revealed some fair quality detrital matter.

On the north-eastern portion of the Don Hill a considerable area of shallow alluvial material of good average grade was developed, and the connection of these deposits with the transport system for the conveyance of the material to the mills is now having attention.

During the latter half of the year the development of the alluvial deposits at the North Valley was undertaken. The formation of these deposits varies from fine pipe-clay, sands, and gravels, to rolled pebbles and small boulders, and is apparently due to a river system, whose waters—eroding the slates, which included stanniferous veins—concentrated the tin oxide in a deposit having a depth, as shown by the 16 shafts which have been sunk, varying from 3 feet to 47 feet, and an average of about 25 feet.

The minimum yield per cubic yard of material that can be mined profitably is now being considered in connection with the determination of the extent of the workable deposits.

Complete data are also being obtained as to the area of the ground, character, and depth of the alluvium, facilities for working, and the supply and cost of water necessary to work these deposits. When the prospecting and developmental operations on these sections have been systematically carried out they will undoubtedly show that large quantities of tin oxide can be profitably obtained. The prospecting operations up to the end of the year have disclosed a large area of detrital matter, which, wherever it was tried, proved to be of a payable nature.

Milling and Concentrating Plant.—The portion of this plant that has been in constant operation has maintained its high standard, both in regard to the extraction of the tin oxide and the grade of the concentrates produced.

Hydro-electric Power Plant.—The whole of the machinery in connection with this plant has run entirely satisfactorily.

Aerial Ropeways.—All these installations have proved to be most efficient.

The approximate value of the output was £79,090.

Mount Bischoff Extended Tin Mining Company, No Liability.—The mine worked full handed until the 8th August, when, owing to the war, the hands were reduced to a small body of men, kept on to effect necessary repairs to the milling plant.

Up to this time the mine employed on an average 119 men, and produced 9861 short tons of ore, and from this time until the end of the year only 15 men found employment.

In the underground department, up till the 8th August development and stoping were carried on as usual. The development footages are as under:—Driving, 998 feet; crosscutting, 50 feet; rising, 315 feet; sinking, 89 feet;

total, 1452 feet. The total reserves of ore are 37,412 tons, of an average grade of 1 per cent.

In the milling department, 9861 S tons of ore were treated, producing 829 tons of concentrates (pyritic), which was put through the calcine furnace and in addition, 124 tons from the heap of accumulated seconds, for a return of (net dry weight) 127 tons 18 cwt. 0 qr. 18 lb., of a gross value of £11,342 9s. 11d.

Since the 8th of August, 15 men have been employed on the following works:—

Rebuilding a new calcination furnace on the site of the old one (this furnace is a three-column double rabble type, and is 26 feet by 10 feet by 10 feet); repairing the foundations of the battery; retubing the steam boiler; and installing a new three-phase electrical plant, consisting of a 32 K.W. generator, one 10-horsepower, one 14-horsepower, and one 2-horsepower motor. This work was finished in the middle of January of this year, and the mine is now employing 80 men on a co-operative basis.

COAL MINING.

The total quantity of coal raised amounted to 60,794 tons, valued at £270,853; being an increase of 5751 tons on the previous year.

The raisings at the different collieries were:—

Colliery.	Tons raised.	Men employed.
Cornwall	24,466	66
Mt. Nicholas	34,177	73
Spreyton	1000	6
York Plains	847	3
Hlamatha	74	1
Mt. Cygnet	100	1
Cardiff	100	1
Sandfly	30	1
Total	60,794	152

The Principal Collieries.—Mount Nicholas and Cornwall maintain their usual outputs; the former is well opened up, and could easily double its output if there was trade for the coal. The latter company has encountered difficulties owing to the faulting of the seam in the old pit. Numerous minor faults were met with going west, and now a main down-throw fault has cut off the seam completely. The principal work will now be in the 6-foot seam in No. 3 pit.

Dalmayne.—A company has been floated to open up the seams about 8 miles to the south-east of St. Marys; a large expenditure will be required to construct a jetty at Seymour, where it is intended to ship the coal from. Railway construction will also be costly; about 7 or 8 miles of line will be required to reach the mine, which is 1100 feet above sea-level. Prospecting has been done to prove the seams, but they should be tested by either tunnelling or boring, and proved to have continuity into the hill without interruption by faulting.

Catamaran Colliery.—As a result of boring operations, it was decided to sink a shaft, the position of which is about 600 feet to the dip of the seam from the old workings. The depth of the new shaft is about 120 feet. A 10-foot seam of good coal was cut in the bottom, but here work ceased, pending reconstruction of the company.

Sandfly.—An attempt is being made to prove the extent and value of a certain seam supposed to be identical with a 6-foot seam cut in No. 1 bore many years ago, but which was never touched by the old company's workings. Aid has been obtained from the Government, and a dip-heading is being driven from the outcrop of the seam near the tramway-line.

TASMANITE SHALE.

The Railton-Latrobe Shale Oil Company, No Liability.—The area of shale-bearing land held by the company consists of a consolidated lease of 1482 acres, held under a 21-years' lease from the Government.

The area has been thoroughly prospected by diamond-drill and shaft-sinking, and thereby proved to contain 6½ million tons of retortable shale.

The average oil-contents recovered amount to 40 gallons per ton of shale, or a total quantity of 260 million gallons of crude oil. These figures are confirmed by the Government Geologist in his report on the Geological Survey of the field.

The average thickness of the seam is 5 feet, and the maximum depth from the surface only 200 feet. Fully 50 per cent. of total tonnage can be won by adit tunnels driven to the rise, thus dispensing with hauling and pumping.

An abundant supply of timber for mining and fuel purposes exists on the lease.

The present works are situated about the centre of the property, being 7 miles from the seaport of Devonport, and about three-quarters of a mile from the railway. These consist of a bench of four vertical and two horizontal retorts, with complete condensing and refining plant. Capacity, 250 to 300 gallons of crude oil per day.

The products include motor spirit, turpentine substitute, rubber solvent, and fuel oil.

The fuel oil constitutes 80 per cent. of the original crude oil. It conforms to the British Admiralty's specification for fuel oil. Its special features are high calorific value and total freedom from paraffin wax. It flows freely through small bone pipes at temperatures as low as 20° F.

The Admiralty made a test and pronounced it suitable. In Tasmania and Victoria it has given every satisfaction in Deisal engines.

As soon as finances permit it, it is the intention of the present company to enlarge the plant to a capacity of at least 10,000 gallons per day, and connect by pipe-line with storage-tanks at Devonport.

OSMIRIDIUM.

During the first half of the year an average of 65 men were employed in the Wilson and Savage Rivers and their tributaries, and obtained 1018·83 ounces, valued at £10,076, an average value of £9 17s. 9·54d. per ounce; an increase of 7s. 3·77d. per ounce on the previous year.

When the war broke out in August there was no market for the metal, and many of the miners abandoned the field. Some turned their attention to mining for gold in alluvial in the Whyte and Savage Rivers, and have been fairly successful. One prospector at the Whyte River has a very fine specimen of osmiridium weighing 2 oz. 8 dwt. 7 gr. Another large specimen was purchased by the Department, and has been placed in the Department's Geological Survey specimens in the Victoria Museum, Launceston.

When the metal market closed I communicated with the Agent-General, Sir John McCall, in London, also with a number of penmakers and other firms in America, with a view to opening up a market for this metal, and upon receiving a favourable reply from Messrs. Baker & Co., of Newark, New Jersey, I forwarded to them a parcel of 13 ounces, and received in return a cheque for £75 15s. 6d., equal to about £5 13s. 6d. per ounce. Other parcels have since been forwarded to the same firm.

In 1912 I sent a small parcel to the Agent-General for testing purposes by the Imperial Institute, and received the following results:—

Imperial Institute.

Results of the examination of osmiridium from Tasmania:—

Imperial Institute, No.—49939. Date, 3rd April, 1914.

Reference.—Letter No. 2149/1913, dated 30th July, 1913, from the Agent-General for Tasmania in London.

Number and Quantity.—Osmiridium; weight, $\frac{1}{2}$ -oz.

Results of Examination—

- (1) Mineralogical.—The sample consisted of loose metallic grains varying in colour from tin-white to yellowish-grey. Half of the grains averaged about 1 mm. in diameter, and the remainder about $\frac{1}{2}$ -mm.

(2) Chemical. - -

				Per cent.
Platinum	...	...	Pt	0·37
Ruthenium	...	...	Ru	8·19
Palladium	...	...	Pd	0·21
Gold	...	...	Au	0·04
Iron	...	...	Fe	0·30
Copper	...	...	Cu	trace
Iridium	...	...	Ir	} 33·80
and				
Rhodium	...	...	Rh	} 57·09
Osmium (by difference)	...	...	Os	
				<u>100·00</u>

Commercial Valuation and Remarks.—The above analysis indicates that the sample consists of iridosmium (siserskite), in which the amount of osmium present is considerably in excess of the iridium, the reverse being usually the case in the analyses of iridosmium from other sources already on record.

It does not appear likely that this Tasmanian iridosmium can be applied to any other than those for which iridosmium is already used.

BISMUTH.

The Shepherd and Murphy Mine at Middlesex obtained from its tin ore 5·265 tons of bismuth, valued at £1609.

The Squib Mine obtained 0·35 ton, valued at £56.

The Iris Mine obtained 0·004 ton, valued at £1.

WOLFRAM.

The output of Wolfram ore was as follows:—

	Tons.	Value. £
Avoca	14·05	1478
Shepherd and Murphy Mine at Middlesex	23·69	2012
Iris Mine	·433	32
Squib	8·700	805
	<u>46·873</u>	<u>4327</u>
Total		

KAOLIN.

A sample of kaolin forwarded to the Agent-General was examined at the Imperial Institute, with the following results:—

Imperial Institute No.—53,518. Dated 9th October, 1914.

Reference.—Letter No. 1299/1914, dated 22nd May, 1914, from the Agent-General in London.

Number and Quality.—Kaolin from Bridgenorth; weight, 20 lb.

Result of Examination.—

- (1) Mineralogical.—Crude white clay, showing small brown patches of ferruginous matter on the freshly-fractured surfaces.

Some gritty impurity was present.

In order to obtain a product suitable for technical trial, it was necessary to wash the crude material. By this means a yield of about 37 per cent. of fine clay was obtained. The clay thus obtained was analysed, with the following results:—

- (2) Chemical.—

	Per cent.
Silica	Si O ² 44·36
Ferric oxide	Fe 2 O ³ 1·68
Alumina	Al 2 O ³ 38·30
Titanium dioxide	Ti O ² 0·70
Lime	Ca O —
Magnesia	Mg O trace
Potash	K 2 O 0·05
Soda	Na 2 O 0·07
Loss on Ignition ... ..	... 15·28

Commercial Valuation and Remarks.—The crude material was very difficult to wash, owing to the coarse nature of the clay and the finely-divided state of the silica. The washed clay was very plastic, and worked well on the wheel. A vessel was made by this means and fired to a temperature of 1110° C.; gave a fairly strong white biscuit with an almost imperceptible pinkish tinge.

The washed product should be suitable for the manufacture of white pottery, and, possibly, porcelain. It could not be exported to Europe at a profit in competition with British clays, but it would be quite suitable for use locally in Tasmania, and for export to neighbouring countries.

MOLYBDENITE.

This mineral is known to exist in many parts of Tasmania, but, up to the present time, no mines have been worked, probably owing to the market price not being sufficiently high to attract attention. Since the outbreak of the war, however, there has been a strong demand for this mineral in Great Britain.

I recently received a letter from the Director of the Imperial Institute, enclosing a circular on the "Sources and Uses of Molybdenite Ores." The Director adds:—"The object of this circular is to call attention to the demand now existing in the United Kingdom for molybdenite. The Institute will be glad to have the names and addresses of any firms in Tasmania producing this mineral who wish to communicate with possible buyers. The institute will also be glad to receive samples of molybdenite from localities in which supplies are available. Such samples will be placed on exhibition in the public galleries, and the attention of enquirers will be directed to them."

The circular enclosed points out that at present there is an exceptional demand for "steel-hardeners," two of the chief of which are molybdenum and tungsten. Early in December, molybdenite ore, containing the equivalent of 90 per cent. of molybdic acid, was quoted at £6 10s. per unit, or £585 per ton of 2240 lb.

Attention was drawn to the circulars in the newspapers, and many enquiries have since been made at this office.

so that it is probable that in the near future this mineral may be added to the list of mineral exports.

RUTILE.

Mr. Thomas Sharp, of Ulverstone, has recently discovered an extensive deposit of rutile-bearing wash-dirt in the Forth district, and on the Westwood estate. The alluvial deposit in question is about 5 feet deep, half a mile long, and about 2 chains wide. Very fair prospects of this ore can be obtained from a depth of 2 feet from the surface down to bedrock, which is a soft micaceous schist. The wash consists of fragments of this rock and quartzite. The rutile is not waterworn, and certainly has not travelled any considerable distance. On the higher ground on either side of this deposit a good deal of rutile, and possibly brookite and anatase, is known to exist, but here the ore is more waterworn in some instances, and is associated with sapphires, topazes, and fragments of granite, porphyry, breccia, and other rocks which are not known to occur in the immediate vicinity of Westwood. On this property the ore has been noticed *in situ* in conglomerate outcrops, and it doubtless also exists in the mica and quartz schists, as it has been discovered with fragments of these rocks attached. It has also been seen on sea-beach at the mouth of Clayton's Rivulet in the form of needle-like crystals.

Analysis made by the Government Analyst gave 91 per cent. titanic acid.

A small parcel has been forwarded to the Agent-General to ascertain if there is any market for the mineral in England.

Return showing the Quantity and Value of Mineral Products for the State of Tasmania during the Year ending 31st December, 1914.

Mineral.	Quantity.	Value.
		£
Gold*..... ozs.	26,243·453	111,475
Silver-lead Ore tons	11,565·54	96,225
Blister Copper † „	7500	477,361
Copper and Copper Ore... „	3287·75	18,680
Tin Ore „	2572·713	259,300
Coal „	60,794	27,853
Wolfram „	46·873	4327
Bismuth „	5·619	1666
Osmiridium..... ozs.	1018·83	10,076
Shale.....tons	75	75
Total.....	...	£1,007,038

* Fine gold, including gold contained in blister copper and silver-lead bullion.

† Value of gold deducted.

GEOLOGICAL SURVEY.

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

INSPECTORS OF MINES.

The Government Geologist, who was also Chief Inspector of Mines, was relieved of the duties of mine-inspection early in June, and Mr. J. O. Hudson, who for many years

held the position of Inspector of Mines in Western Australia, was appointed in his stead, and took up his duties on the 16th June last.

The reports of the Chief Inspector and the three Inspectors of Mines are appended.

MINING MANAGERS' EXAMINATION.

One candidate only (Mr. Rupert M. Vaughan) presented himself for examination, and having gained the requisite number of marks, was awarded a metal mine manager's certificate by the Board of Examiners.

REVENUE.

The revenue for the year amounted to £15,761 14s. 7d., being a decrease of £3649 3s. 1d. on the previous year. This is accounted for by the fact that, owing to the outbreak of the war, many mines were idle for a time and were unable to dispose of the ore on hand, and the time for the payment of the annual rents was, by proclamation of the Governor, extended up to the 31st March, 1915.

The sum of £1674 14s. 1d. deposited as survey fees with applications for leases is not included in the revenue.

DEPARTMENTAL STAFF.

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

- J. Wardrop, Clerk, transferred to Lands Titles' Department, 1st February, 1914.
- J. E. Cronly, Clerk, transferred to Minister of Lands' Office, 1st March, 1914.
- W. D. Reid, Clerk and Draftsman, Launceston, appointed Government Assayer (new office created) from 1st March, 1914.

- E. V. Goldsmid, Registrar of Mines, Zeehan, deceased, 27th February, 1914.
- J. Gatty appointed Registrar of Mines, Zeehan, *vice* E. V. Goldsmid, from 30th April, 1914.
- H. M. Elliott, Registrar of Mines, Hobart, deceased, 28th June, 1914.
- W. A. Smith, Clerk, promoted to Registrar of Mines, *vice* H. M. Elliott.
- H. W. Park appointed Clerk from 1st October, 1914, *vice* W. A. Smith, promoted.
- E. W. Turner, Warden of Mines, Zeehan, transferred to Devonport, from 1st August, 1914.
- F. N. Stops appointed Warden of Mines, Zeehan, *vice* E. W. Turner, transferred.
- A. Parry, Clerk, Launceston Office, left with Expeditionary Force.

CONCLUSION.

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

I have, &c.

W. H. WALLACE, Secretary for Mines.

The Hon. the Minister for Mines.

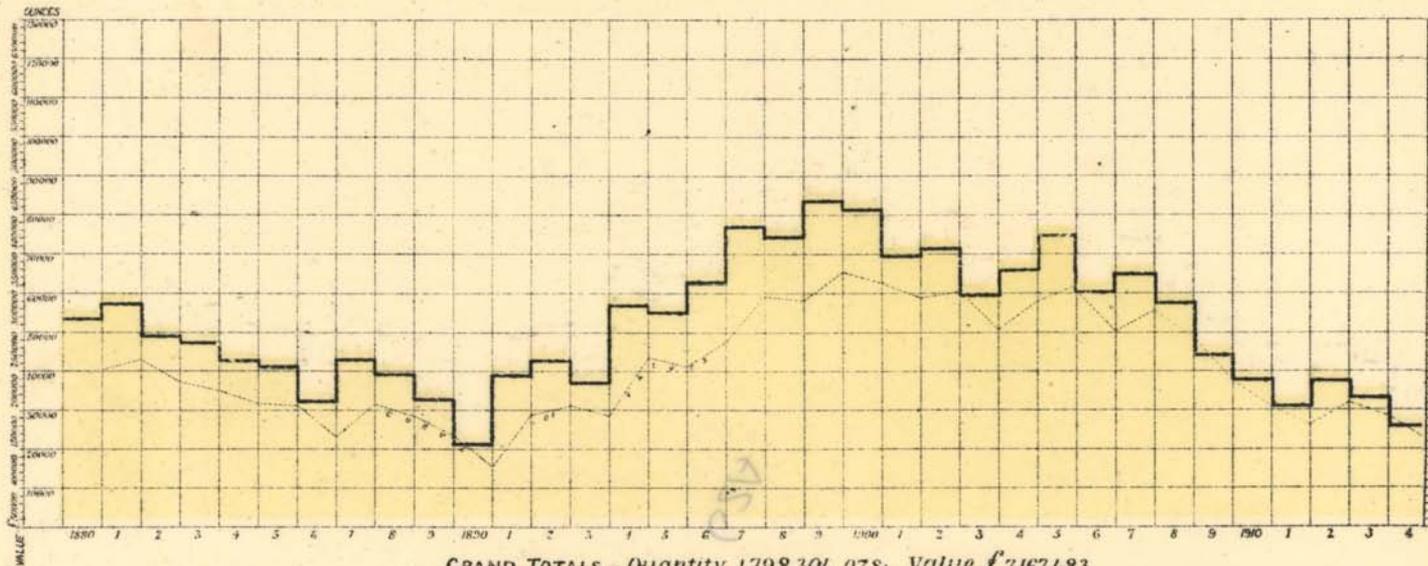
No. 1.

RETURN showing the Quantity and Value of Gold won during the Years 1880 to 1914 inclusive.

Year.	Quantity.	Value.
	ozs.	£
1880.....	52,595	201,297
1881.....	56,693	216,901
1882.....	49,122·3	187,337
1883.....	46,577·5	176,442
1884.....	42,339·95	160,404
1885.....	41,240·95	155,309
1886.....	31,014·5	117,250
1887.....	42,609·15	158,533
1888.....	39,610·95	147,154
1889.....	32,332·65	119,703
1890.....	20,510	75,888
1891.....	38,789	145,459
1892.....	42,378	158,917
1893.....	37,687	141,326
1894.....	57,873	217,024
1895.....	54,964	206,115
1896.....	62,591	237,574
1897.....	77,131	296,660
1898.....	74,233	291,496
1899.....	83,992	327,545
1900.....	81,175	316,220
1901.....	*69,491	295,176
1902.....	*70,996	301,573
1903.....	*59,891	254,403
1904.....	*65,921	280,015
1905.....	*73,540·5	312,380
1906.....	*60,023·4	254,963
1907.....	*65,354·25	277,607
1908.....	*57,085·1	242,482
1909.....	*44,777·366	190,201
1910.....	*37,048·053	157,370
1911.....	*31,100·873	132,108
1912.....	*37,973·252	161,300
1913.....	*33,400·457	141,876
1914.....	*26,243·453	111,475
	1,798,304·654	7,167,483

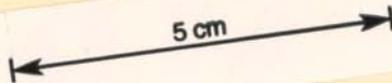
* Fine Gold.

Diagram showing Total Quantity & Value of Gold won in Tasmania during the years 1880-1914



GRAND TOTALS - Quantity 1,798,304 OZS: Value £2167,483

Photo Algraphed by John Vail Government Printer Hobart Tasmania.



No. 2.

RETURN showing the Quantity and Value of Silver-Lead Ore produced during the Years 1888 to 1914 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1888	417	5838
1889	415	7044
1890	2053	26,487
1891	4810	52,284
1892	9326	45,502
1893	14,302	198,610
1894	21,064	293,043
1895	17,980	175,957
1896	21,167	229,660
1897	18,364	200,167
1898	15,320	188,892
1899	31,519·5	250,331
1900	26,564	279,372
1901	28,774	207,228
1902	46,480	218,864
1903	42,422	192,492
1904	51,138	203,702
1905	75,270·5	246,888
1906	87,117·7	462,443
1907	89,762·5	572,560
1908	63,116·9	322,007
1909	80,378·35	298,880
1910	51,226·91	247,576
1911	61,501·195	253,361
1912	90,123·868	309,098
1913	183,289·268	319,997
1914	11,565·54	96,225
	<u>1,045,468·281</u>	<u>5,904,508</u>

No. 3.

RETURN showing the Quantity and Value of Blister Copper produced during the Years 1896 to 1914 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1896	41·5	1245
1897	4700	322,500
1898	4955·5	400,668
1899	8598	735,305
1900	9449	907,288
1901	9981	879,625
1902	7745	*462,151
1903	6684	*478,023
1904	8371	*582,540
1905	8610	*704,287
1906	8708	*862,444
1907	8247	*832,691
1908	8833	*603,063
1909	8638	*586,419
1910	8193	*553,822
1911	6022	*385,797
1912	5136	*430,965
1913	4569	*364,732
1914	7509	*477,361
	134,990	10,570,926

* Value of Gold contents deducted.

No. 4.

RETURN showing Quantity and Value of Copper Matte exported during the Years 1902, 1903, and 1904 to 1914 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1902	2500	50,112
1903	3727	83,624
1904-1914.....	—	—
	6227	133,736

No. 5.

RETURN showing the Quantity and Value of Copper Ore produced during the Years 1896 to 1914 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1896	34	1020
1897	75	2250
1898	394	8128
1899	1695	26,833
1900	4221·5	63,589
1901	11,221	130,412
1902	5994	65,270
1903	102	790
1904	104	1640
1905	1150·75	52,939
1906	2234·5	72,480
1907	788·25	36,975
1908	1185	6588
1909	1587·8	21,619
1910	671·27	13,150
1911	2286	22,852
1912	1391·6	9479
1913	1966·8	10,932
1914	3287·75	18,680
	40,390·22	565,626

No. 6.

RETURN showing the Quantity and Value of Tin exported from Tasmania during the Years 1880 to 1904 (compiled from Customs Returns only), and Tin Ore produced during the Years 1905 to 1914 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1880	3954	341,736
1881	4124	375,775
1882	3670	361,046
1883	4122	376,446
1884	3707	301,423
1885	4242	357,587
1886	3776	363,364
1887	3607·5	409,853
1888	3775·25	426,321
1889	3764	344,941
1890	3209·25	296,368
1891	3235	291,715
1892	3174	290,083
1893	3128·5	260,219
1894	2934	198,298
1895	2726·75	167,461
1896	2700	159,036
1897	2423·5	149,994
1898	1972	142,046
1899	2239·25	278,323
1900	2029	269,833
1901	1789·5	212,542
1902	1958·25	237,828
1903	2376·15	300,098
1904	2171·5	255,228
1905*	3891·5	362,670
1906*	4472·75	557,266
1907*	4342·75	501,681
1908*	4520·8	421,580
1909*	4511·2	418,165
1910*	3701·01	399,393
1911*	3953·05	513,500
1912*	3713·825	543,103
1913*	4010·41	531,983
1914*	2572·713	259,300
	116,498·408	11,676,205

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

Diagram showing Total Quantity & Value of Tin exported from Tasmania during the years 1880-1904 and Tin ore produced during the years 1905-1914



GRAND TOTALS—Quantity 116,498 Tons Value £11,676,205

Photo Algraphed by John Vail Government Printer Hobart Tasmania

5 cm

No. 7.

RETURN showing the Quantity and Value of Wolfram produced during the Years 1899 to 1914 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1899	3·5	99
1900	53·75	2058
1901	—	—
1902	—	—
1903	—	—
1904	15·5	1147
1905	32·25	2371
1906	19·75	1465
1907	40·75	4411
1908	4·5	338
1909	28·35	2494
1910	67·35	7280
1911	69·96	7769
1912	66·49	6601
1913	68·07	7040
1914	46·873	4327
	517·093	47,400

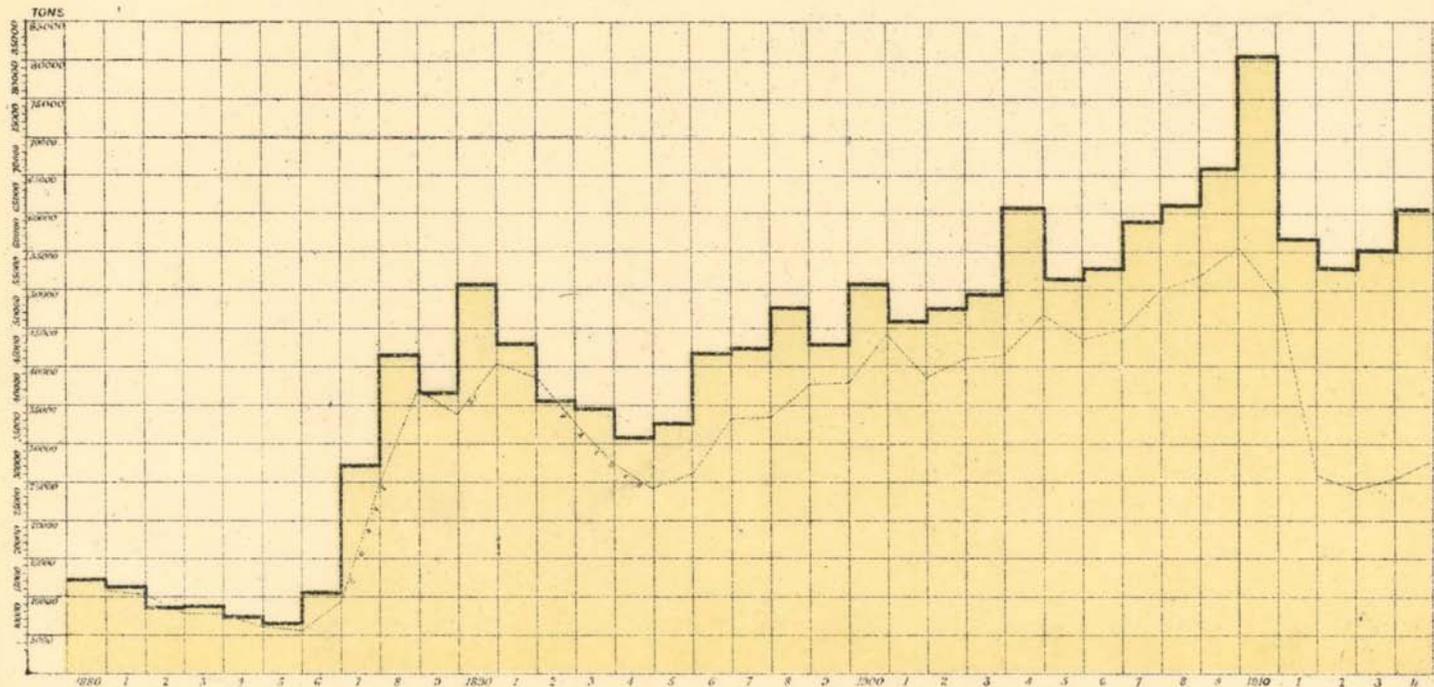
No. 8.

RETURN showing the Quantity and Value of Coal raised during the Years 1880 to 1914 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1880	12,219	10,998
1881	11,163	10,047
1882	8803	7923
1883	8872	7985
1884	7194	6475
1885	6654	5989
1886	10,391	9352
1887	27,633	24,870
1888	41,577	37,420
1889	36,700	33,030
1890	50,519	45,467
1891	43,256	38,930
1892	36,008	32,407
1893	34,693	27,754
1894	30,499	24,399
1895	32,698	26,159
1896	41,904	33,523
1897	42,196	33,757
1898	47,678	38,256
1899	42,609	38,349
1900	50,633	44,227
1901	45,438	38,451
1902	48,863·5	41,533
1903	49,069	41,709
1904	61,109	51,942
1905	51,993	44,194
1906	52,895·75	44,962
1907	58,891	50,057
1908	61,067·75	51,907
1909	66,161·75	56,237
1910	82,445	48,609*
1911	57,067	26,214*
1912	53,560	24,568*
1913	55,043	25,367
1914	60,794	27,853
	1,428,296·75	1,110,920

* Value at pit's mouth.

Diagram showing total Quantity & Value of Coal raised in Tasmania during the years 1880-1914.



GRAND TOTALS - Quantity 1,428,296 Tons Value £ 1,110,920

Photo Algraphed by John Veil Government Printer Hobart Tasmania.

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No. 9.

RETURN showing the Quantity and Value of Iron Ore produced during the Years 1897 to 1914 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1897	894	812
1898	1598	1598
1899	3577	3474
1900	5375	5995
1901	612	417
1902	2386	1075
1903	5980	2905
1904	6840	2975
1905	6300	2600
1906	2600	1100
1907	3000	1150
1908	3600	1600
1909-1914.....	—	—
	42,762	25,701

No. 10.

RETURN showing the Quantity and Value of Asbestos produced during the Years 1899 to 1914 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1899	200	363
1900	128	113
1901	46·5	45
1902-1914.....	—	—
	374·5	521

No. 11.

RETURN showing the Quantity and Value of Bismuth produced during the Years 1904 to 1914 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
	54·309	18,254

No. 12.

RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 to 1914 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
	3451·13	30,252

No. 13.

RETURN showing the Quantity and Value of Shale produced during the Years 1910 to 1914 inclusive.

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

No. 14.

RETURN showing the Quantity of Silver-Lead and Copper Ore smelted for period 25th June to 31st December, 1896, and 1st January, 1897, to 31st December, 1913.

Year.	Ore Smelted.	Products.			Yield.			
		Silver-Lead Bull'n.	Blister Copper.	Matte.	Copper.	Silver.	Gold.	Lead.
		Tons.	Tons.	Tons.	Tons.	Ozs.	Ozs.	Tons.
1896	26,028 $\frac{13}{20}$	—	—	2417 $\frac{6}{20}$	1235 $\frac{1}{20}$	75,951	4707	—
1897	90,773 $\frac{1}{2}$	—	3476 $\frac{13}{20}$	257 $\frac{13}{20}$	3583 $\frac{1}{20}$	334,349	16,485	—
1898	170,933	—	4992	—	4783	606,123	24,418	—
1899	275,239	2295	8463	89 $\frac{8}{20}$	8362	1,089,657	27,617	—
1900	363,113	4817	9440	—	9341	1,215,036	26,255	—
1901	355,528	1839	9982	50	9880	800,317	21,717	—
1902	411,736	6825	7727	2882	8841	1,674,816	24,719	6654
1903	399,032	7560	6683	3413	8094	1,855,158	25,238	7529
1904	433,366	—	8371	—	8265	1,896,134	26,809	7754
1905	466,578	9422	8611	—	8596	2,075,431	26,469	9086
1906	479,775	9380	8768	—	8613	2,150,405	24,986	9300
1907	472,658	10,590	8248	—	8145	2,147,120	24,531	10,060
1908	440,145	7181	8834	—	8723	1,654,350	22,008	6850
1909	429,549	6960	8640	—	8534	1,534,780	18,812	6696
1910	386,679	—	8192	—	8093	656,793	11,861	—
1911	284,038	3328	6022	—	5951	747,748	10,565	3204
1912	331,182	5293	5136	—	5073	958,541	12,809	5123
1913	319,833	3812	4568	—	4511	765,137	11,983	3691

No. 15.

RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 to 1914 inclusive.

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

No. 16.

RETURN showing the total Number and Area of Leases issued during the Year ending 31st December, 1914.

Mineral.	No. of Applications.	No. of Sluiceways.	Area.
			Acres.
Asbestos	6	...	342
Clay.....	...	...	...
Coal.....	12	...	3728
Copper	11	...	465
Chrysotile	3	...	160
Gold	56	...	1354
Guano.....	...	...	...
Iron .....	...	...	...
Limestone	2	...	242
Machinery Sites	6	...	26
Minerals	67	...	4130
Nickel	2	...	138
Osmiridium	38	..	616
Shale .....	...	...	...
Silver	4	...	124
Tin	201	...	3546
Wolfram .....	...	...	...
Dredging Claims	8	...	97
Water-rights	61	119	141
Mining Easements	10	...	14
	487	119	15,123

No. 17.

RETURN showing the total Area of Land and Number of Sluiceways of Water applied for during the Year ending 31st December, 1914.

Mineral.	No. of Applications.	No. of Sluiceways.	Area.
			Acres.
Asbestos.....	1	...	40
Bismuth	2	...	150
Coal	17	...	6599
Copper	5	...	277
Chrysotile .....	...	...	...
Dredging Claims.....	9	...	152
Gold	40	...	783
Gypsum	1	..	80
Limestone	5	...	525
Mining Easements	6	..	27
Machinery Sites	2	...	8
Minerals.....	87	...	5127
Molybdenite	4	...	240
Osmiridium	2	...	25
Shale	2	...	520
Silver-Lead.....	6	...	241
Serpentine	1	...	50
Tin.....	115	...	2205
Water-rights	70	137	47
Wolfram.....	1	...	5
	376	137	17,101

No. 18.

RETURN showing the Number and Area of Leases held under "The Mining Act," in force on 31st December, 1907 to 1914 inclusive.

Nature of Lease.	In force on 31st Dec., 1907.		In force on 31st Dec., 1908.		In force on 31st Dec., 1909.		In force on 31st Dec., 1910.		In force on 31st Dec., 1911.		In force on 31st Dec., 1912.		In force on 31st Dec., 1913.		In force on 31st Dec., 1914.	
	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
For Minerals, Silver, Tin, &c.	1844	Acres. 65,047	1269	Acres. 44,099	1143	Acres. 41,637	1141	Acres. 44,001	1025	Acres. 41,311	960	Acres. 36,157	926	Acres. 36,271	1129	Acres. 37,785
For Coal, Slate, Shale, &c.	45	7962	45	8745	51	10,590	50	10,608	58	13,049	37	8854	23	5660	26	6405
For Gold Dredging Claims	222	2671	111	1344	87	1265	76	1159	73	1220	73	1344	54	988	95	2130
Mining Easements	79	1494	64	916	47	712	35	441	42	647	42	489	30	329	36	403
Machinery Sites	75	436	88	453	92	464	84	484	99	606	133	606	105	603	110	611
Water-rights Mineral and Gold	—	—	33	133	32	129	33	121	37	145	39	149	36	153	43	180
	490	1978 sluice-heads	511	1003 & 2000 sluice-heads	550	1022 & 2210 sluice-heads	511	1094 & 1751 sluice-heads	502	1060 & 1845 sluice-heads	550	1640 & 2043 sluice-heads	546	1909 & 2034 sluice-heads	605	2449 & 2160 sluice-heads

No. 19.

*RETURN showing the Total Number of Leases in force on
31st December, 1914.*

Mineral.	Number.	Sluiceways.	Area. Acres.
Asbestos	6	...	342
Chrysotile	3	...	160
Clay	1	...	10
Coal	26	...	6405
Copper	60	...	2910
Gold	95	...	2130
Guano	1	...	2
Iron	5	...	222
Limestone	5	...	612
Minerals	109	...	10,019
Manganese .....	...	...	...
Nickel	4	...	199
Osmiridium	38	...	616
Phosphate of Lime	4	...	15
Silver	57	...	3469
Slate .....	...	...	...
Shale	2	...	1801
Tin	832	...	19,732
Wolfram	9	...	89
Machinery Sites	43	...	180
Mining Easements	110	...	611
Dredging Claims	36	...	403
Water Rights and Dam sites	605	2160	2449
	2051	2160	52,376

No. 20.

RETURN showing the Average Number of Miners employed during the Year ending 31st December, 1914.

	Europeans.	Chinese.
Northern and Southern Division	429	...
North-Eastern Division.....	504	31
Eastern Division.....	433	17
North-Western Division	731	...
Western Division	2596	...
	4693	48

No. 21.

RETURN showing the Amounts paid in Dividends by Mining Companies during the Year ending 31st December, 1914.

Mines.	Dividends.		
	£	s.	d.
Copper	39,445	0	0
Gold .....	...	
Tin	37,087	13	0
Silver	1203	0	0
Coal.....	906	6	6
TOTAL	£78,641	19	6

No. 22.

RETURN showing the total Amount of Rents, Fees &c., received by the Mines Department during the Year ending 31st December, 1914.

Head of Revenue.	Amount.		
	£	s.	d.
Rent of Auriferous and Mineral Land.....	13,176	5	10
Fees, ditto ditto	910	14	8
Survey Fees	1674	14	1
TOTAL	£15,761	14	7

Postponement of payment of Rent to 31 Mar., 1915, is responsible for marked decrease.

No. 23.

RETURN showing Quantity and Value of Minerals and Metal raised in Tasmania from 1880 to 1914 inclusive.

Mineral or Metal.	Quantity.	Value.
		£
Gold ozs.	1,798,304·654	7,167,483
Silver-lead ore tons	1,045,468·281	5,904,508
Blister Copper..... "	134,990	10,570,926
Copper Matte..... "	6227	133,736
Copper and Copper Ore... "	40,390·220	565,626
Tin "	116,498·408	11,676,205
Iron Ore "	42,762	25,701
Coal "	1,428,296·750	1,110,920
Wolfram "	517·093	47,400
Bismuth "	54·309	18,254
Asbestos "	374·500	521
Shale "	1069	669
Osmiridium ozs.	3451·130	30,252
Unenumerated prior to 1894...	...	31,988
Total.....	...	£37,284,189

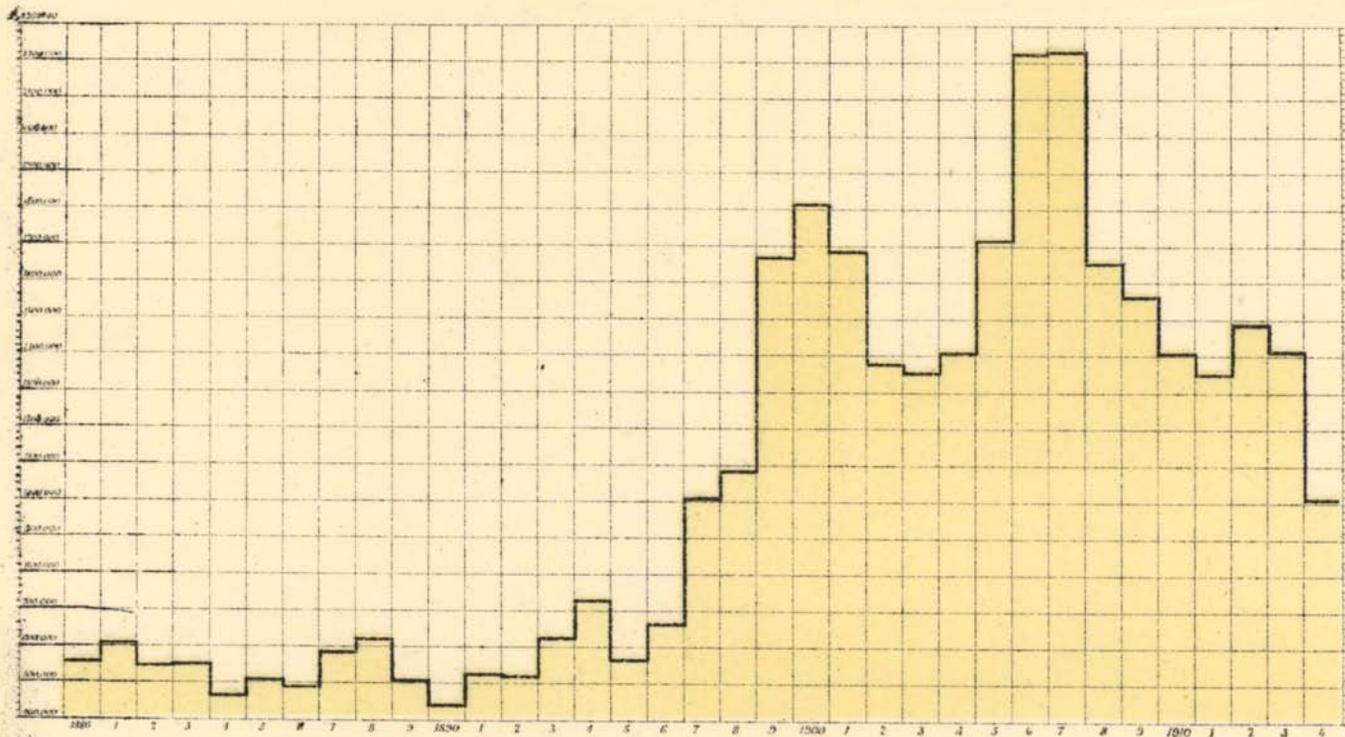
No. 24.

RETURN showing the Mining Companies registered during the Year ending 31st December, 1914.

Number of Companies.	Capital.
8	£42,950

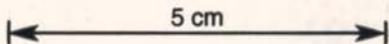
In addition to the above, 4 Agents for Foreign Companies, and 2 Syndicates, under Part Va of the Act, were registered.

Diagram showing the Annual Value of Minerals & Metals raised in Tasmania from 1880 to 1914



GRAND TOTAL - Value £37,284,189

Photo Aligned by John Veil Government Printer Hobart Tasmania



RETURN showing the Annual Value of Mineral Products for the State of Tasmania from 1880 to 1914 inclusive.

Year.	Value.	Year.	Value.
	£		£
1880.....	554,031	1899.....	1,660,622
1881.....	602,723	1900.....	1,888,695
1882.....	556,306	1901.....	1,763,896
1883.....	560,873	1902... ..	1,378,406
1884.....	468,302	1903.....	1,354,044
1885.....	518,885	1904.....	1,379,204
1886.....	489,966	1905.....	1,729,129
1887.....	593,256	1906... ..	2,257,147
1888.....	616,733	1907.....	2,277,159
1889.....	504,718	1908.....	1,650,027
1890.....	444,210	1909.....	1,574,995
1891.....	528,388	1910.....	1,432,193
1892.....	526,909	1911.....	1,349,497
1893.....	627,909	1912.....	1,493,502
1894.....	732,764	1913.....	1,415,700
1895.....	575,692	1914.....	1,007,038
1896.....	662,058	Unenumerated	
1897.....	1,006,140	prior to 1894	31,988
1898.....	1,071,084		
			£37,284,189

No. 26.

COMPARATIVE Statement of Revenue from Mines, being Rents, Fees, &c. (exclusive of Survey Fees) paid to the Treasury for the Years ending 30th June, from 1881 to 1903, and for Six months ending 31st December, 1903, and for the Years ending 31st December, 1904, to 1914 inclusive.

Year.	Amount.			Year.	Amount.		
	£	s.	d.		£	s.	d.
1881.....	20,936	5	5	1899.....	24,696	10	5
1882.....	23,077	1	9	1900.....	28,380	11	10
1883.....	15,439	14	5	1901.....	21,569	5	2
1884.....	6981	11	10	1902.....	19,471	0	1
1885.....	11,070	5	7	1903.....	17,776	14	3
1886.....	12,523	10	4	1903, 1 July to 31 Dec.	14,758	17	1
1887.....	14,611	11	5	1904, Jan. to Dec.	16,631	8	2
1888.....	23,502	8	4	1905.....	20,203	17	0
1889.....	17,254	9	0	1906.....	24,136	12	5
1890.....	26,955	4	9	1907.....	24,794	7	7
1891.....	37,829	16	5	1908.....	20,311	3	0
1892.....	17,568	18	4	1909.....	22,804	1	5
1893.....	16,971	9	2	1910.....	22,221	18	0
1894.....	16,732	7	7	1911.....	20,556	15	10
1895.....	15,323	1	9	1912.....	17,639	19	11
1896.....	20,901	13	2	1913.....	19,410	17	8
1897.....	25,631	0	3	1914.....	14,087	0	6
1898.....	33,661	13	9				

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

MINE MANAGERS' EXAMINATION.

March, 1914.

METALLIFEROUS.

SUBJECT—MINING.

1. Under what conditions would you adopt square set timbering in a stope, and describe the method of installing same?
2. In a mine that has a main tunnel 880 yards long, and sufficiently wide for two parallel tracks, 20-inch gauge, what method of transport would you adopt so as to deliver 500 tons of ore per diem?
3. In making up a specification for sinking a shaft in apparently soft ground, on what points would you lay particular stress?
4. What, in your opinion, is the best method for lining an ore-pass designed to withstand severe wear and tear? Illustrate by means of sketches.
5. Describe, with sketches, the principles of the pulsometer pump. Under what conditions would you instal one?
6. Describe in detail any rock-drill with which you are acquainted. Enumerate those points which, in your opinion, must be embodied in the design of a machine so that it may have the maximum efficiency.
7. Describe ore-extraction methods known as—
 - (a) "Rill" stoping;
 - (b) "Flat-back" stoping;and give the advantages of each method under certain conditions.
8. Submit a report showing your examination of the winding-rope, and also of the main hauling shaft, of a large mine.
9. What are the requirements of a good machine-drill? Describe and give sketches of the valve operating a good type of machine.
10. Show by sketches and dimensions the construction of ladders and their arrangement in position in a 5-feet by 4-feet travelling-way connecting two levels.
11. Give full details showing how you would test the safety-appliances of a cage. How often would you test the cage? If the test failed, what would you do to remedy the cause of the failure?
12. What precautions would you take to ensure the good general health of your underground employees? What are the symptoms of carbon-monoxide poisoning?

SUBJECT—ORE DRESSING AND SAMPLING.

1. Describe a good method of transporting 700 tons of tailings daily to dump where there is no natural fall from the millsite. Give details of apparatus required.
2. How would you carry out the sampling of a bulk-parcel of 500 tons of crushed ore by—
 - (a) Quartering;
 - (b) Mechanical subdivision?

Under what conditions would you prefer the quartering method?

3. The output of a mine is 2500 tons per week, mined at a cost of 6s. per ton. It assays 4 per cent. copper, and the ore occurs as chalcopyrite, with some iron pyrites, in a quartzitic gangue. Could you successfully treat this ore with copper at £65 per ton market-price? If so, give scheme and details.
4. Describe in detail any of the various kinds of jigs with which you are acquainted.
5. Draw out a flow-sheet, and add any explanatory notes that may be necessary, for the milling and concentration of an ore containing—

Tin oxide, 1 per cent.;
 Arsenical pyrites, 0.5 per cent.;
 Copper pyrites, 1.5 per cent.

6. Describe, with sketches, a tube mill. In what circumstances would you recommend the installation of one of these machines?

SUBJECT—SURFACE WORK.

1. A continuous current-generator gives out 100 amperes at 220 volts. What horsepower would be required to drive it at full load?
2. Assuming that the above machine runs at a speed of 600 revolutions per minute, and is direct-driven by a single cylinder non-condensing steam-engine, what diameter of cylinder and what stroke would be necessary if the steam-pressure at the engine stop-valve is 100 lb. per square inch?
3. What size should the steam-pipe be for the abovementioned engine if it be 20 feet long?
4. If a loaded truck weighs 1000 lb., and it runs down a tram-line 150 feet long having a uniform grade with a difference of level of 6 feet between the two ends in 18 seconds, what is the, (1) resistance due to friction, and (2) the "co-efficient of friction"?
5. Describe the "pulsometer" pump. Give its advantages and disadvantages.
6. A steam-winch is of the following dimensions:—
 - Drums, 3' 9" diam.;
 - Gearing, 4 to 1;
 - Cylinders, 9½" diam., 15" stroke;
 - Average available steam-pressure, 44 lbs.

From what depth will it raise a weight of 15 cwt.? (Weight of rope = ½-lb. per foot.)

7. Describe fully the foundations you would put in for an $18' \times 30'$ duplex air-compressor where rock is found 8 feet below the surface.

What are the principal forces which foundations should be designed to resist?

8. Give a sketch showing the arrangement for automatic emptying of "skips" on the head-gear of an inclined shaft; also the position of a hopper capable of holding 150 tons of ore.
9. 1000 cubic feet of water per minute can be obtained having a fall of 30 feet. It is proposed to drive a stamper battery with this motive-power. What class of motor would you recommend, and what actual available energy do you guarantee it to give?

How many heads of stamps will it drive, assuming that 2 h.p. is required for each stamp?

10. State the information you would supply in the form of specifications for a 5-head 1050 lb. stamper battery with steel framing.

SUBJECT—MINING ARITHMETIC, MENSURATION, AND MINE ACCOUNTS.

- Reduce $1/305$ to a decimal fraction, and 16.875 to a vulgar fraction.
- Increase 56 in the ratio of 5 to 4.
- How many long tons are equivalent to 1645 metric tons?
- Find the square root of 71,289.
- If the specific gravity of a metallic nodule measuring 4 inches in diameter is 7.2, what is its weight?
- Find the sum of the areas of the four sides of an adit 8 feet wide, 6 feet high, and a quarter of a mile long.
- On starting work at a mine and concentrating works, what accounts would you open to keep yourself informed in respect of your operations? Explain the meaning of such accounts and how you would keep them. This question must be answered fully.

SUBJECT—MINING SURVEYING.

- Describe in detail the best method of connecting the surface with the underground survey in the case of an ordinary three-compartment main shaft 600 feet deep, having a chamber and levels extending therefrom.

State the methods and appliances used at surface, and at the bottom of shaft, the precautions against error, and illustrate by means of diagrams the various operations connected with the process.

2. Explain the method of reducing and plotting a survey by rectangular co-ordinates.

What are the advantages of this method as compared with the ordinary mode of plotting with the scale and protractor?

3. A direct line is surveyed in four lengths from the collar of a shaft sunk on the top of a hill to a peg at the mouth of a tunnel driven into the side of the hill to meet the shaft.

The field-notes are:—

Angle of Depression	Length Measured on Slope.
30° 15'	65' 6"
7° 20'	66' 0"
25° 35'	60' 6"
12° 14'	50' 0"

Find the horizontal distance from shaft to tunnel.
Find the height of the collar of shaft above the tunnel.

4. Describe the ordinary process of levelling, stating any precautions required to ensure accuracy.
5. Two shafts, *A* and *B*, are 36 chains 60 links apart, the collar of shaft *A* is 22.12 ft. above the collar of shaft *B*.

Construct an imaginary level-book, giving five settings up of the instrument, with back-sights, fore-sights, and two intermediate sights; the readings of the staff to give the above ultimate result, and the reduced levels to be shown, taking any datum above sea-level, the collar of shaft *B* being 51.60 feet above such datum.

Plot the section from notes.

6. What are the points which should be previously ascertained by a surveyor in regard to bringing in the water-supply to a proposed hydraulic sluicing-plant?
7. How would you sample an alluvial deposit consisting of river flats averaging 20 feet in depth?

SUBJECT—MINING GEOLOGY.

1. What tests would you apply to distinguish between, (1) molybdenite and osmiridium; (2) zinc-blende and pitchblende; (3) tourmaline and cassiterite; (4) iron pyrites and copper pyrites; (5) topaz and quartz?

2. In driving north-west on the course of a lode it is displaced by a fault which strikes east and west. The lode underlies south-west, and the fault underlies south. How would you proceed in searching for the faulted portion of the lode? Illustrate your explanation by diagram.
3. Describe the differences between, (a) slate and schist; (b) tuff, conglomerate, and breccia; (c) granite, gabbro, and serpentine; (d) basalt and diabase.
4. Describe the variations met with in the nature of the ores of copper and lead at different horizons in lodes.
5. Give an account of the features of any ore-deposit with which you may be acquainted.
6. Classify the different types of ore-deposits occurring in Tasmania, and indicate briefly the characters of each type.
7. Enumerate the systems of the geological record in their descending order.

SUBJECT—MINING LAW.

1. State how you would proceed to mark off—
 - (a) A prospecting claim;
 - (b) A mineral section;
 - (c) A water-right.
2. What is a mining manager required to do when about to resume operations after same have ceased for a period exceeding six months?
3. How would you test a rope or chain for use in a shaft before using same?
4. What kind of hook is prohibited by the rules under "The Mining Act, 1905," when hoisting with a bucket?
5. When a fence, gate, or cover has been temporarily removed from the entrance to a shaft, what is required to be done for the safety of the men employed?
6. Who is responsible for the safe keeping of explosives in a mine?
7. How would you thaw frozen or hard nitro-glycerine compounds?
8. What is the limit of period of employment of men in charge of machinery, and what interval must elapse between such period and the next period of employment?

MINE MANAGERS' CERTIFICATES.

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

SERVICE Certificates of Competency granted by the Board of Examiners.

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

CERTIFICATES of Competency granted by the Board of Examiners.

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

CERTIFICATES of Competency—continued.

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

CERTIFICATES of Competency—continued.

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

COLLIERY Certificates of Competency granted by Board of Examiners.

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

REPORT OF THE MOUNT CAMERON WATER-
RACE BOARD FOR THE YEAR ENDING
31st DECEMBER, 1914.

Gladstone, 11th February, 1915.

SIR,

WE have the honour to submit the report of the Board for the year ending the 31st December, 1914.

Repairs.—The race is in excellent condition throughout, and no repairs have been necessary. The whole of the woodwork in the race has been tarred, and the inlet and outlet ends of the wooden syphon over the Little Mussel Roe River have been covered with earth to protect them against bush fires.

Syphon Pipes.—These are working satisfactorily, and are being carefully painted wherever they show any signs of corrosion.

Revenue.—The revenue for the year amounted to £1021 4s. 1d., being a decrease of £673 7s. 10d. as compared with the previous year. The falling off was due to the shortage of water during the last quarter of the year, owing to the exceptionally dry winter; to the fall in the market-price of tin, and the closing of the London metal market after the declaration of war with Germany. Since the market reopened the price of tin has gradually increased, but, unfortunately, there is not sufficient water available to meet the full demands of the customers.

Expenditure.—The total expenditure was £732 9s. 6d., being an increase of £62 7s. 6d., owing principally to the necessity for procuring tools and a new buggy and harness.

The statistics for the year are as follows:—

Average per week of claims supplied, 13.

Greatest number supplied in any one week, 19.

Total number of heads supplied—Under fixed or cash scale, $2236\frac{5}{8}$; under royalty or credit scale, 679.
Total, $2915\frac{5}{8}$.

Tin ore raised for the year:—Fixed scale, 56 tons 9 cwt. 2 qr. 3 lb.; royalty scale, 7 tons 9 cwt. 1 qr. 8 lb. Total, 63 tons 19 cwt. 0 qr. 11 lb.

Average number of men employed per week, 28.

Total receipts for the year:—Water sold, fixed scale, £851 12s. 1d.; water sold, royalty scale, £169 12s.
Total, £1021 4s. 1d.

Expenditure.—Cost of maintenance and management:—

	£	s.	d.
Salaries and wages	612	8	0
Insurance	6	3	0
Travelling expenses... ..	17	17	3
Stationery and printing	2	19	7
Stores and tools	12	10	10
Syphon pipes (painting and repairs)	21	1	8
Race (repairs)	1	18	0
Buggy and harness	53	16	0
Telephone accessories	3	14	9
Total	£732	9	6

Paid to Public Debts Sinking Fund for the year ending 30th June, 1914 (including moiety of rents of mineral land served by the race, £13 2s. 11d.) £778 18 8

Rainfall.—At the last annual meeting of the Board it was decided to place rain-gauges at the main intake and at Little Mussel Roe intake. The following results were recorded:—

	ins.	pts.
Main intake—		
April to June, 1914	10	54
July to December, 1914	13	79
Total... ..	24	33
Little Mussel Roe intake—		
April to June, 1914	10	58
July to December, 1914	12	7
Total	22	65

We have the honour to be,

Sir,

Your obedient Servants,

W. H. WALLACE, Chairman
 EDWARD L. HALL,
 CECIL RYAN,
 J. O. HUDSON,
 CHAS. BARNES,
 JOHN SIMPSON, } Members.

The Hon. the Minister for Mines.

GEOLOGICAL SURVEY OF TASMANIA.

REPORT OF THE GOVERNMENT GEOLOGIST.

Geological Survey Office,
Launceston, 12th May, 1915.

SIR,

I BEG to submit my report for the year ending 31st December, 1914.

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

- Bulletin No. 15.—The Stanley River Tinfield, by L. L. Waterhouse, B.E. 20th November, 1913. Published in 1914.
- Bulletin No. 16.—The Jukes-Darwin Mining Field, by Loftus Hills, M.Sc. 24th October, 1913. Published in 1914.
- Bulletin No. 17.—The Bald Hill Osmiridium Field, by W. H. Twelvetrees. 24th November, 1913. Published in 1914.
- Bulletin No. 18.—Geological Reconnaissance of the Country between Cape Sorell and Point Hibbs, by Loftus Hills, M.Sc. 25th February, 1914.
- Bulletin No. 19.—The Zinc-lead Sulphide Deposits of the Read-Rosebery District, Part I. (Mt. Read Group), by Loftus Hills, M.Sc. 30th November, 1914.
- Report No. 3.—Preliminary Report on the Zinc-lead Sulphide Deposits of Mt. Read, by Loftus Hills, M.Sc. 1st August, 1914.
- Report No. 4.—On Cement Materials at West Arm, by W. H. Twelvetrees. 25th August, 1914.
- Report No. 5.—On Some Gold Mining Properties at Mathinna, by W. H. Twelvetrees. 30th September, 1914.
- Record No. 2.—Stichtite, a New Tasmanian Mineral: Notes by various authors collected and edited by W. H. Twelvetrees. 19th June, 1914.
- Record No. 3.—Darwin Glass, a New Variety of the Tektites, by Loftus Hills, M.Sc. 7th December, 1914.

The above were forwarded for publication. In addition to these, the following are approaching completion, and will be transmitted for the printer early in the year:—

- Bulletin No. 20.—The Catamaran and Strathblane Coalfields, and Coal and Limestone at Ida Bay, by W. H. Twelvetrees.
- Bulletin No. 21.—The South Heemskirk Tinfield, by L. L. Waterhouse, B.E.
- Report No. 6.—Reconnaissance of the North Heemskirk Tinfield, by L. L. Waterhouse, B.E.
- Record No. 4.—A Monograph of *Nototherium tasmanicum*, by H. H. Scott.

Appended hereto are reports by Mr. L. L. Waterhouse, B.E., Assistant Government Geologist, Mr. Loftus Hills, M.Sc., Assistant Government Geologist, and Mr. W. D. Reid, Government Assayer, covering their work during the past year.

From the publications enumerated above it will be seen that the field work has been varied and important. The results afford much useful information relating to our mining fields.

Cement Materials at West Arm.

Some beds of limestone on the west arm of the River Tamar were examined this year in connection with the needs of the Launceston Marine Board for its projected works on the river. Some calcareous beds were being prospected by the Board with the idea of turning them to account in the manufacture of Portland cement. Some ground was tested near Soldier's Point, and a hill at Yorktown was extensively explored by trenching. The beds on the beach proved to be mostly calcareous mudstone, with bands of impure limestone, possessing too low a lime content for even Roman or natural cement. In any case the quantity of limestone rock available and suitable for making Portland cement near Soldier's Point seems to be very limited, and the deposit is, besides, unfavourably situated for economic and profitable work.

The prospecting operations on the hill at Yorktown carried out by the Marine Board have also not been successful. The trenches disclose calcareous mudstones with insufficient lime content for making Portland cement.

A better-quality limestone was visited on Anderson's Creek, at about a mile from its mouth, containing 66 per cent. carbonate of lime, and suitable for the production of natural cement. To bring its lime percentage to a proper grade for Portland cement, the rock would have to receive an addition of higher-grade limestone. The nearest spot whence such limestone could be brought is Winkleigh.

There are numerous places in Tasmania where the raw materials for the manufacture of Portland cement exist in sufficient quantity and purity, but from the inquiries which are addressed to the Geological Survey it does not appear to be sufficiently realised that the conditions of fuel-supply, of power, and of distribution of the manufactured article must be favourable.

Gold Mines at Mathinna.

The Mathinna field was visited during the year and the active mines examined. After the large companies abandoned their mines, the district fell into a moribund condition, but, thanks to the present New Golden Gate Mining Syndicate, the New Jubilee Gold Mining Syndicate, and some others, the outlook has begun to wear a brighter appearance. It is clear that a field which has yielded over 300,000 ozs. gold merits some serious endeavour to show that it is not exhausted. Primary gold has been proved to occur here at a depth of 1900 feet, the greatest depth at which it has been seen in this State. The upper parts of reefs are, as is well known, usually richer than in depth, in consequence of enrichment by decomposition of the gold-bearing sulphides and reprecipitation of the descending gold; naturally, when the downward limit of this gold is passed, the shoot of auriferous stone may be expected to resume

its original grade. The primary ore will then continue downward with more or less regularity for an indeterminate distance until the end of that particular shoot is reached. At 1900 feet in the New Golden Gate Mine the bottom of the winze showed a 3-foot reef, with fair prospects of gold in small bands of quartz. The present syndicate is working in the upper levels of the mine, developing a payable branch of Loane's reef running off in a northerly direction.

The New Jubilee Gold Mining Syndicate is working the old Jubilee Mine, $1\frac{1}{4}$ mile south-east of Mathinna. The property was first exploited by the Derby Company, which raised payable stone, reported as worth fully 1 oz. per ton, but the syndicate had to relinquish operations in 1881. The Jubilee Company began work on a portion of the ground in 1887, and in 1896 the Tasmanian Exploration Company entered into possession and carried out some work, with unsatisfactory results. The present syndicate has discovered new stone underground, averaging about 1 oz. in value, and is now engaged in developing same. The success of the mine depends largely on intelligent management, for the occurrence of slides and flat reefs complicates operations, and makes the laying out of work somewhat difficult.

The adjoining Mountaineer Mine, south-east of the New Jubilee, was visited. It is inactive, and until the existing shaft is deepened and the reef in the vicinity of the slide explored nothing can be said of its prospects. The slide features resemble those of the New Jubilee, but owing to the slope of the hill the length of the shoot cannot be great until greater depth is attained.

The old Caledonian Mine, now being worked by Messrs. Reece and Lawson, is on the east side of Long Gully. The reefs on this ground were formerly worked by the Caledonian Company, and later by the Gate Extended and Golden Ladder Companies. The Gate Extended shaft is on the property, 410 feet deep, and offers remarkable facilities for following the quartz-channel into the Caledonian reefing ground. The east reef of the New Golden Gate Mine was intersected at 250 feet in the east crosscut from the 1400-foot level in the Tasmanian Consols Mine, and at that depth it must lie in the Caledonian property. From its bearing at the point of intersection its course would take it below the Gate Extended shaft. By extending the Caledonian tunnel some distance the reef, which has been tested by the present owners with favourable results, will probably be cut at nearly 150 feet from the surface. A wide reef formation consisting of slate veined with quartz is exposed about 2 chains west of the mouth of the Caledonian tunnel, and is well worth a trial. An adit can be driven about 25 feet below the outcrop, and the reef followed into the hill.

The small venture called the Dawn of Hope Mine, worked by Messrs. Kitto and Thurley, was also inspected. This is on land which was formerly held by the Old Boys Gold Mining Company, and before then by the Black Boy Company. A shaft has been sunk 20 feet on the eastern branch of the Black Boy reef, and gold-bearing stone worth 10 or 11 ozs. per ton taken out. The future work at this mine will mainly consist in sinking a fresh shaft further north where a junction of reefs takes place; and opening out to prove these reefs and others in the immediate vicinity.

The ground on which the Golden Stairs Mine, now idle, is situate was visited on this occasion. The Golden Stairs Company sank a 230-foot shaft 23 years ago, and drove two crosscuts at 150 feet and 230 feet, but the reef in the bottom level was irregular and the stone poor. The shaft is in slate rock and seems to be just near the western edge of the slate reefing belt of the Gate line, while the two crosscuts have been in sandstone. The favourable slate country has in fact not been tested at all, and when work is resumed here the first thing to do will be to drive a crosscut east. A good deal of gold has been obtained from the surface rubble and from over the cappings of the various veins on the property. It is a debatable question whether the main shaft is deep enough to have entered properly settled country.

The alluvial flats at Mathinna were also inspected. These have been unworked for some time. At one time the flat ground west of the township was turned over repeatedly. The drift has an average depth of 6 to 7 feet, and where trial bores have gone down the ground was considered to be worth $\frac{1}{2}$ -dwt. of gold per cubic yard. There appear to be two classes of wash on this flat, namely, a narrow belt of wash from the gully and a broader belt of finer wash, which is probably the older sediment deposited by the ancient Esk River. The best ground is that belonging to the gully sediments, and is perhaps a couple of chains wide, though the whole zone is fully 400 feet in width.

The gullies are narrow, with steep sides, and are plainly young. Their age is insufficient for the accumulation of much auriferous deposit. The South Esk alluvial, on the other hand, is an older drift, much of it brought from a distance and reassorted. While no doubt it holds a fair quantity of gold in the aggregate, the metal is sparsely scattered through it, and concentrations will be difficult to locate over such a wide area.

Catamaran Coal Mine.

In September I examined this property, which is now owned by a Broken Hill syndicate. Mr. R. C. Young is the resident engineer in charge of the works.

The Catamaran seams, where operated upon, are on the north side of the Catamaran River, which empties into Recherche Bay, and are reported as discovered by Mr. Wm. Anderson in 1899. Mr. Major Lloyd Hood took up the lease in 1900, and got a few test parcels from time to time. These gave gratifying results. Mr. E. C. James afterwards came into possession of the mine, and intermittent work was carried on until 1912, about 5000 tons of coal being raised to that date. At the end of the latter year the present owners took it over, and have prospected the working seam along the outcrop by means of shafts and bores for a length of over 4000 feet. They have also sunk a main shaft for working the coal to the dip. This shaft is 138 feet deep, and has cut a 19-foot seam of coal, of which 6 or 7 feet are the best quality, and will probably form the part of the seam which will be worked. In this portion of the seam the coal is solid and workable. The coal of this mine is excellent for steaming purposes, having between 61 per cent. and 69 per cent. fixed carbon, about 25 per cent.

volatile matter, and 4 to 10 per cent. ash. The only drawback is that it is rather soft at present, and may require specially careful handling to prevent breaking down into slack. The owners have in view the special cultivation of a bunker trade, in which hauling will be reduced to a minimum. There are indications, however, that this physical property will be found restricted to the upper part of the seam, which in the recent geological past has been under water, for the bottom part of the seam in the main shaft is firm, and remains so when exposed to the atmosphere for a considerable time.

The coal is of the same geological age as the East Coast coals, but its fixed carbon content is higher, and it emits very little smoke. Mr. Young states that he has used it regularly on the steam yacht "Preana" between Catamaran and Hobart, and finds that it is excellent for steam boilers, burning clean and not clinkering. Its calorific power is 12,430 British thermal units.

Hardly any work has been done in the direction of the dip of the seam, so any calculations of quantity must necessarily be based upon somewhat uncertain and partial data. However, within the leases there are probably 1500 acres of seam, or, deducting 20 per cent. for breaks, &c., say 1200 acres. Allowing 5 feet workable thickness and one-third deficiency for loss in working, this acreage should yield 7,000,000 tons coal, or, if 6 feet thick, upwards of 8,000,000 tons.

The coal basin is no doubt limited by igneous rock (diabase) at its sides, and the same rock unquestionably exists as a floor at some undefined depth below the surface. If there is any considerable upward undulation in the surface of this floor, it will affect the continuity of the seam. Whether this really happens or not, and whether any prejudicial faults occur, can only be determined by actual work or by boring in advance of the work. As far as can be seen from the surface indications, the coal-seam where opened upon is in a deep part of the basin.

A small 2-foot tramway-line constructed by the late owner connects the mine with the Catamaran River near its mouth in a distance of $1\frac{1}{2}$ mile. The river can be entered at high tide by small craft with a draught of 8 or 9 feet, and the present shipping facilities would perhaps suffice for a small trade, but the present owners aim at capturing wider markets, and have in view the provision of other harbour arrangements. A long jetty in Recherche Bay could be constructed into deep water, and adequate shelter secured. The colliery is well situated in this respect. It is within a very short distance from the coast, and is not much more than 50 miles from Hobart through quiet, protected waters. These advantages are possessed by few other Tasmanian collieries.

Coal and Limestone at Ida Bay.

These deposits were also examined during the year. They are situate immediately south-west of Ida Bay, which is part of the sheet of water which connects through the Narrows with the bay of Southport on the shore of D'Entrecasteaux Channel opposite South Bruny.

The proprietors intend initiating a Portland cement enterprise on the leases, utilising the coal on the property in the manufacture of cement.

The bulk of the Sugar-loaf Hill on the property consists of Silurian limestone, which is exposed on the flanks in precipitous cliff faces. The stone is high-grade, free from any objectionable constituents, and quite suitable for cement purposes. The carbonate of lime content ranges between 91 per cent. and 97 per cent. Clay with 50 per cent. to 60 per cent. silica exists also on the property in adequate quantities. The limestone area probably covers a square mile, from which it may be calculated that a foot thickness would suffice for 17 years for a cement plant producing 500 barrels per day.

A singular advantage possessed by this property is the occurrence of coal on the leases. Two seams are known. Work has been mainly done on the lower one, near the main-road to Ramsgate, where the seam has been opened up and found to be of a workable thickness of 5 feet. It is a dull, somewhat soft coal, a little clayey near the outcrop, but improving as it continues under cover. Its fixed carbon content is 56 per cent. to 67 per cent., and volatile matter 15 to 16 per cent., with between 12 and 17 per cent. of ash, and nearly half per cent. of sulphur. The outstanding features are a rather high carbon value for our Trias-Jura coal and a low gas content. The sulphur content is low and the ash about normal for the general run of seams of this age. I anticipate an increase in the gas content as the workings get away from the neighbouring diabase. Its heating power will be found to be within the limits of sufficiency for cement kilns if the coal is finely pulverised for the purpose. About 18,000 tons of coal will be required for the proposed output of 30,000 tons per annum.

A tramway will have to be constructed from the works to the shipping port at Deep Hole, which is about 3 miles from the coalmine. A fairly level route is available, and the country is, for the most part, quite open.

The advantageous conditions here for starting a cement enterprise are undoubted. The increasing consumption of cement throughout the Commonwealth and the facilities for initiating its manufacture in Tasmania at Ida Bay would appear to open the door to the establishment of a profitable industry.

Strathblane Coal Mine.

A visit was paid to these leases, situate south-west from Port Esperance. Coal was found six or seven years ago by Mr. William Anderson, since when some 400 feet of driving and sinking have been done, and small parcels of coal sent away and tested on river steamers and small locomotives. The short tunnels which have been driven have shown a 3-foot seam of hard, good East Coast coal, with 55 per cent. fixed carbon and 28 to 30 per cent. volatile matter, and 8 to 13 per cent. ash. The coal withstands weathering well, burns well, and with no tendency to spit.

Too little work has been done to admit of any calculation of the acreage of the seam. There are more seams than one. The main seam no doubt extends to the hill west of the narrow valley in which the main workings are situate, and some

attempt might very well be made to pick it up in that direction. Such work and the development of the seam from the present working faces would form an adequate working programme for the moment, and as the coal is followed into the hill the capital could be enlarged and the scale of work expanded.

Gigantic Fossil Marsupials in Tasmania.

A monograph of *Nototherium tasmanicum* (Scott), a skeleton of which was unearthed in 1910 in the Mowbray Swamp by Mr. E. C. Lovell, has been prepared by Mr. H. H. Scott, Curator of the Victoria Museum, Launceston, and entrusted to the Geological Survey for issue as one of its publications. The great interest attached to these extinct Pleistocene animals was strongly brought before the Government by Dr. Stirling, the late Director of the Adelaide Museum.

A femoral bone of another animal belonging to the same genus has been obtained by Mr. Harrison from another part of the Smithton Swamp, and the remains of still another individual (*Nototherium victoria*) have been found in swamp land on King Island by Mr. F. H. Stephenson.

The above are the only indications yet known of the existence of this genus outside the Australian Continent.

The skeleton of *Nototherium tasmanicum* is of special value, as all its bones belong to one animal. Its osteological characters are fully described and discussed by Mr. Scott in the Monograph. Its nearest living congener is considered by him to be the native bear, and the author has attempted a conjectural restoration of the animal as it appeared during life. It was about 9 feet long by 5 feet in height, and nearly 3 feet across the hips. It is suggested that it had a mobile prolonged snout, and was essentially a tapir-like creature with heavy elephantine movements.

The age of the peaty beds of the swamp in which the Smithton remains were found appears to be Quaternary, probably late Pleistocene. Recent land and freshwater shells characterise the deposit. The animals must have entered Tasmania when the island was connected with Australia by the King Island bridge.

British Association for the Advancement of Science.

This Association visited Australia in August. Its official programme did not include Tasmania, but a small party of members came over in September. They made a close examination of the collections of the Geological Survey in the Museum at Launceston, and were taken on excursions arranged for them in the south and east of the island. A chapter on the "Mining Industry" was contributed by Mr. Hartwell Conder, M.A., State Mining Engineer, to the handbook which was prepared for the Association, and one was written by myself on the Geology of Tasmania.

Mineral Collections.

Collections of Tasmanian ores, minerals, and rocks have been put together during the year and supplied to the undermentioned:—Queensland Museum, West Zeehan State School, Major Morrisby (for despatch abroad), and Mr. W. T. Watkin Brown (against exchange).

The work of arranging and extending the permanent Survey collections has been continued; the exhibits have received public attention, and have been much consulted by individuals. With the other demands on our time, it is hardly possible to devote to this work as much time as it deserves, but it has been pursued as far as practicable. The Survey is greatly indebted to the Launceston Municipal Council for its co-operation in the provision of museum cases.

Mr. W. S. Dun, Palaeontologist to the Geological Survey of New South Wales, has kindly determined some of our Paleozoic fossils for us.

Samples of granite and sandstone suitable for building purposes have been sent by request to Mr. R. T. Baker, Curator of the Technological Museum, Sydney, together with photographs of buildings in Tasmania which have been built with stone from Tasmanian quarries.

A collection of Tasmanian minerals was received during the year from Mr. W. Prior Hales, Resident Engineer of Railways, Launceston.

Maps and Handbook.

During the year the materials for a geological map of Tasmania were assembled and revised, and a small scale map (15 miles to the inch) prepared for publication. Two colours have been laid on, and the whole will be completed in the coming year. To meet frequent enquiries, a small handbook of the geology of the State will be prepared at the same time. On the completion of this work a large scale geological map of Tasmania will be taken in hand.

Three maps were prepared for the Federal Atlas, viz. :—

1. Map showing positions of mining fields in Tasmania.
2. Geological sketch-map.
3. Map showing positions of coalfields.

The geological map was based on Mr. R. M. Johnston's map, with such additions to our knowledge as have been made since the latter was first published. The small scale prescribed by the Federal authorities necessitated the exclusion of minor areas, and it was only possible to give broad outlines.

The Work of the Survey for the Coming Year.

The full programme has not been finally settled, but it will include the following:—

- (1) Mr. Waterhouse will complete his bulletin on the South Heens Kirk tinfield, and when it is finished it is intended that he should examine the North Dundas district to bring our knowledge of the mining work there up to date. Mr. Ward's bulletin of 1909 on this field was quickly out of print, and a good deal of work has been done since. Mr. Waterhouse's examination will extend over the country from Renison Bell on the west to the Colebrook hill on the east, and will include the X River country. A completely new bulletin covering the whole tinfield will be issued.

- (2) Mr. Loftus Hills will continue the important investigation of the deposits on the West Coast Range, on which he has been engaged since his appointment. The Rosebery group of mines will be examined during the coming year, and the results published in the bulletin forming Part 2 of the Read-Rosebery series, to be followed by Part 3 dealing with the ore-treatment processes.
- (3) The work which is immediately before myself comprises:—
- (a) A visit to Rocky Boat Harbour and the New River on the south coast, to inspect some alleged indications of petroleum on extended prospecting areas held for boring purposes. The indications consist of the occurrence on different beaches of pieces of asphaltum, and smooth oily patches are said to have been noticed on the surface of the sea. Certain hills in the vicinity are referred to as resembling the gas mounds found on many petroleum fields. The question of the existence of oilfields in Tasmania is one which the Geological Survey has been directed to investigate, and especially the indicative value of the discoveries of asphaltum on the sea beaches at different places. The cutting of a track to the New River and Cox Bight is contemplated, and while this is being done I shall avail myself of the opportunity of examining and reporting on this unexplored country generally, and particularly as to whether the indications warrant boring operations in search of oil.
 - (b) A visit will be paid to Gladstone, with the view of reporting on and mapping that mining field. Inquiry will be made into the needs of the district for a public battery for lode or stone mines, which has been asked for by the residents. The Government has also been approached for aid in diamond-drill boring, to test certain gold-bearing reefs in the neighbourhood of Gladstone, and this matter will also be looked into.
 - (c) A visit to the Back Creek field has been promised. Work is proceeding there with the object of exploiting the deep auriferous alluvial ground. The present workers have expressed themselves as being greatly in need of geological information as to the structure of the field and the nature of the ground which they anticipate exploring.
- (4) A visit to King Island has been promised for a long time, and it is now definitely settled that one of the staff shall undertake the examination during the coming season. Information from the island is to the effect that it is best to select the summer months for the journey.

Severance of Mines Inspection from the Geological Survey.

This greatly-needed reform has been carried out this year. The inspection of mines branch has been separated from the Geological Survey, Mr. J. O. Hudson, the new Chief Inspector, arriving on 16th June last to take over the duties. The whole time of the officers is now devoted to the Geological service, with the exception of work connected with mine plans, which is still carried out by Mr. W. D. Reid (Government Assayer).

Laboratory.

The new laboratory in connection with the Survey was completed by the 1st June, when work for the public was commenced. Regulations were drawn up and printed for the guidance of persons forwarding samples for assay. The facilities placed within public reach have been largely used. The Assayer reports that to the end of the year 688 mineral determinations were made. The general rate for metallic assays is one shilling, and five shillings for coal. Mining companies pay full schedule rates. Simple tests are made free of charge, and in special cases free assays are allowed.

Office and Library.

During the year the correspondence and mail matter received and despatched totalled 3803.

The library and exchange lists are in a satisfactory condition. Acknowledgments are tendered to the proprietors of the Launceston "Examiner," "Daily Telegraph," "Daily Post," "Zeehan Herald," "Australian Mining Standard," "Australian Mining and Engineering Review," "Queensland Government Mining Gazette," and others for copies of these papers supplied to this office. Miss Doris Middleton entered upon her duties as shorthand-writer and typiste on the 1st May. She has discharged them to my entire satisfaction.

W. H. TWELVETREES, Government Geologist.

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

REPORTS OF ASSISTANT GOVERNMENT
GEOLOGISTS.

Geological Survey Office,
Launceston, Tasmania, 11th February, 1915.

SIR,

I HAVE the honour to submit my report for the year ending 31st December, 1914.

At the beginning of the year I was engaged in continuing the examination of the South Heemskirk tinfield, which had been commenced just before the close of the previous year. The field examination was concluded on the 28th February, when I proceeded to North Heemskirk. My examination of the northern area was somewhat hurried, and was really a reconnaissance, extending over a little more than a fortnight. In accordance with instructions received, I returned to headquarters again on 20th March. In the time spent on the North Heemskirk field several miles of the northern boundary of the Heemskirk granite massif were traversed and plotted, while various other formations were inspected, and some important deductions drawn from the observed structural features. Time did not permit of the accurate mapping of the boundaries of other formations, or even determining their extent. The importance of this work and the fact that the country to the north, included between the final big bend of the Pieman River and the coast, has never been geologically examined, makes it appear advisable that a geological examination of this area should be undertaken at no distant date. The state of the prospecting operations being carried out on the alluvial tin deposits of the old river system indicates that an important industry is being established here, and suggests that other deposits of stanniferous gravels may be located, if further information can be obtained as to the old river systems, and the factors which governed the drainage areas. This again points to the advisability of a further examination of this northern area. In my report on the North Heemskirk district the economic significance of the various rock types has been discussed, and the importance of differentiating between them emphasised, owing to their relations to the tin deposits.

The mining properties of the district were visited, and descriptions have been included in my report. With regard to the district as a whole, the opinion expressed is that it is one which after a long period of comparative inactivity, owing mainly to lack of sufficient capital, is likely at last to come into some prominence and importance as a tin-producer. The operations of one company in particular have shown conclusively that deposits of secondary tin ores of considerable extent do exist, and that the contained values are sufficient to pay for extraction with tin at a fair price. It is anticipated that the company referred to, the Heemskirk Tin Syndicate, will shortly erect a more powerful plant than has hitherto been employed, to enable the deeper ground to be

successfully treated. It is believed that the success of this company will lead to the introduction of fresh capital to other genuine properties, and to a general restoration of confidence in the Heemskirk tinfield. The field as a whole has long been under a cloud, due to the failure of most of the earliest-formed companies, this failure being caused by inefficient management in the early history of the field and the reckless expenditure on surface works of capital which should have been available for mining operations.

The Zeehan-Granville tram under construction will certainly benefit the district if it be completed, and will be of assistance in stimulating prospecting, in addition to encouraging work on known ore-bodies. My report also touches on the resources of the district other than mining, which are important.

Shortly after returning from the field advance reports were furnished on the Cliff Mine, South Heemskirk, and on the Federation Tin Mine, South Heemskirk, the former comprising the Heemskirk field as a whole, with notes on the general 9, and the latter 150 pages of foolscap. A summary report on the Heemskirk field as a whole, with notes on the general geology and the condition of the various mines, was also prepared shortly after my return from the field, and was appended to my last annual report.

Early in the year my complete report on the Stanley River district, prepared during the previous year, was received from the printer, and published as Geological Survey Bulletin 15, "The Stanley River Tinfield." The bulletin comprised 207 pages, and was accompanied by 6 plates and 7 photographs.

During the year a good deal of time was taken up in carrying out various duties incidental to office routine work. During the absence of the Government Geologist on field journeys all correspondence was attended to, enquirers interviewed, and general control assumed of office affairs. This work has necessarily interfered considerably with the preparation of reports. Assistance was also rendered the draftsman of the Geological Survey in the preparation of the new geological map of Tasmania.

Acting on instructions received, I prepared a complete list of all the periodical literature in the Geological Survey library. This work had not been previously undertaken, and the listing of the periodicals, which had accumulated for years, was necessarily not a light undertaking. Exclusive of various mining journals and newspapers, the periodicals (which are in paper covers only) number about 3000, and have been received from about 130 different institutions in various parts of the world. Rather more than one-third of the above books are Australasian.

In addition to the regular publications several hundred miscellaneous reports from various sources have been received.

During last year 47 bound books were purchased by the Department, and form a very valuable addition to our library. The latter now includes many of the latest scientific works dealing with subjects connected with the mining industry, and enables the officers to supply the many enquirers during the course of the year, with the latest information available on the particular subject of interest. As librarian, a certain amount of my time has necessarily been taken up in that connection.

The Victoria Museum, in which the Geological Survey collection of rocks, ores, and minerals is exhibited, has also claimed a share of my time. Not only are there specimens collected by the geologists on various field journeys, to be exhibited, but miscellaneous donations are shown as far as space will allow. During the year ten new cases were added by the Mines Department, several of them replacing old ones which were very unsatisfactory, the remainder being utilised for the exhibition of fresh specimens. On the occasion of the visit of members of the British Association for the Advancement of Science I spent several weeks arranging new specimens, rearranging several old cases, preparing fresh labels descriptive of the exhibits, &c., and this work was greatly appreciated by the scientists who visited Tasmania in September. While there is still room for improvement in this branch of our work, we feel that definite progress has been made, and that useful work is being done, by exhibiting systematic collections of Tasmanian ores and minerals, and so calling attention to the mineral resources of the State in an attractive manner. The Geological Survey thanks mining companies and others who have donated exhibits during the past year.

I have, &c.,

L. LAWRY WATERHOUSE, B.E.,
Assistant Government Geologist.

The Secretary for Mines, Hobart.

Geological Survey Office,
Launceston, Tasmania, 30th January, 1915.

SIR,

I HAVE the honour to submit my annual report as Assistant Government Geologist for the year ending 31st December, 1914.

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

- (1) Complete investigation of the zinc-lead sulphide deposits of Mt. Read, including a geological survey of the district. 4th March to 31st July.
- (2) A visit to Melbourne and Broken Hill to ascertain what progress had been made in the application of the flotation process in the treatment of zinc-lead sulphide ores. 8th December to 14th January, 1915.
- (3) A visit to Queenstown in connection with this latter investigation. 30th November to 4th December.

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

- (1) Geological Survey Bulletin No. 18: "Geological Reconnaissance of the Country between Cape Sorell and Point Hibbs," accompanied by two plates. 25th February.

- (2) Geological Survey Report No. 3: "Preliminary Report on the Zinc-lead Sulphide Deposits of Mt. Read." 1st August.
- (3) Geological Survey Bulletin No. 19: "The Zinc-lead Sulphide Deposits of the Read-Rosebery District, Part I. (Mt. Read Group)," accompanied by 20 plates and one photo. 30th November.
- (4) Geological Survey Record No. 3: "The Darwin Glass: A new Variety of the Tektites," accompanied by one plate and three photos. 7th December.

Since the close of the year I have submitted a brief summary of my conclusions as to the success of differential flotation on the treatment of the zinc-lead sulphides of the Read-Rosebery district.

During this period also there have been issued from the Government Printing Office the following publications prepared by me:—

- (1) Geological Survey Bulletin No. 16: "The Jukes-Darwin Mining Field," accompanied by six maps and plans and three photos.
- (2) Geological Survey Report No. 3: "Preliminary Report on the Zinc-lead Sulphide Deposits of Mt. Read."
- (3) Geological Survey Bulletin No. 18: "Geological Reconnaissance of the Country between Cape Sorell and Point Hibbs," accompanied by two maps.

In addition to the above work, representing the more immediate purpose of the Geological Survey, I have from time to time been called to assist in the general work of the Department, such as assisting in the preparation of the Geological Map of Tasmania, assisting the Chief Inspector of Mines in connection with advances on ore, &c.

I now beg to give a brief statement of the results of the several investigations made, as well as an epitome of the contents of the publications mentioned above.

Point Hibbs District.

In Bulletin No. 18 the physiography, general geology, and economic geology are dealt with, and the possibilities of the area as a source of minerals discussed. The conclusion is arrived at that the district is one deserving of careful prospecting on certain lines specifically indicated, but it is pointed out that the location of any ore-deposit will be difficult, owing to the nature of the surface militating against the possibility of any prominent outcrop. It pointed out also that the area is one well adapted to agricultural and pastoral pursuits.

The Zinc-lead Sulphide Deposits of the Read-Rosebery District.

The complete investigation of the complex zinc-lead sulphide deposits known to extend over a belt of country 7 miles in length, from Mt. Read on the south to Rosebery on the north, was undertaken by me during this year. It was decided to divide this belt into two portions for the purposes of the investigation—a northern and southern half. To properly present the resources of this important mineral belt to the

mining and investing public it is proposed to publish a series of three bulletins dealing therewith. The title of all three of these will be, "The Zinc-lead Sulphide Deposits of the Read-Rosebery District."

The first of the series is designated by the qualification Part I. (Mt. Read Group), and deals with the southern half of the belt. The second will be referred to as Part II. (Rosebery Group), and similarly will deal with the northern half; while Part III. (Metallurgy and General Review) will contain a discussion of the important question of the treatment of the ores, together with a concise representation of the resources and possibilities of the whole belt and definite indication of the procedure essential to the successful development of the field.

The investigation of the southern half was commenced early in March, and I soon found that the problem in connection with these deposits was a difficult one indeed. The investigation was not completed until the end of July, but the success attained during that period was far greater than was anticipated at the outset, resulting, in fact, in the elucidation of the factors governing distribution and extent of the zinc-lead sulphide deposits. The importance of these discoveries is undoubtedly great, as the whole system of exploration is thereby altered, and ore will be found, probably, where it was not previously expected.

In view of the attention being paid to these deposits, I deemed it desirable to present to the public the results of my investigations at the earliest opportunity, and accordingly prepared a preliminary statement of my deductions before leaving the field. This report was issued as Geological Survey Report No. 3 before the end of August.

The preparation of the complete bulletin was proceeded with immediately on my return to headquarters, and was completed on the 30th November, together with twenty-one maps, plans, and sections.

This bulletin is written on the same general lines as others of the same class of publications, but the chapters on Physiography and General Geology have been curtailed somewhat, the object being to present the details concerning the structure and trend of the ore-bodies as clearly as possible, giving only that amount of detail under the general geology which was essential to a clear understanding of the economic aspects of the geology of the belt. It is hoped that after a study of this bulletin, together with the accompanying maps, plans, and sections, the average reader will have grasped the structural features of the ore-bodies and appreciate the reasoning on which the calculation of the reserves and the deductions as to the potentialities of the field have been based. Having done so, he cannot fail to be convinced of the great possibilities lying before this important mineral belt.

Concisely, the conclusion arrived at is that the ore-bodies are replacements of folded calcareous beds. These beds have been subjected to folding in two directions, thus making the structural features exceptionally complicated. These folds have been located and their axes determined, and are fully described in the bulletin. Based on the structure thus disclosed, a complete scheme of diamond-drilling is indicated,

which has for its object the exploration of the unexplored country between the known occurrences of the zinc-lead sulphide deposits. In addition, the amount of ore available is carefully calculated, and the result shows that in this southern half of the belt there are:--

Blocked ore	273,000 tons.
Probable ore	537,000 tons.
Total	810,000 tons.

The opinion is further expressed that exploratory work on the lines clearly indicated in the bulletin will prove ore to exist compared with which the above estimate will be quite insignificant.

In the preliminary report on this field I pointed out the causes of the present deadlock and inactivity of the field, and indicated the procedure essential to the successful development of the field. These matters will be more fully dealt with in Part III. of this series of bulletins.

I am now proceeding to Rosebery to complete the investigation of this mineral belt, and the description of this northern half will be included in Part II. of the series.

Investigation Concerning the Treatment by Flotation of the Zinc-lead Sulphides.

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

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

I have, &c.,

LOFTUS HILLS, M.Sc.,

Assistant Government Geologist.

The Secretary for Mines, Hobart.

REPORT OF THE GOVERNMENT ASSAYER AND
DRAFTSMAN.

Geological Survey Office,
Launceston, Tasmania, 21st April, 1915.

SIR,

I HAVE the honour to submit my report on the work done in the Geological Survey Laboratory for the year ending 31st December, 1914.

Although my appointment as Government Assayer and Draftsman dated from the 1st March, I was not relieved of the clerical work in the Geological Survey Office until the appointment of a clerk on 1st May.

Early in March I received instructions to proceed to Melbourne with the Department's diamond-drill diamonds. Before my return to Launceston the diamonds were disposed of to the Goldfields Diamond-drilling Company at a satisfactory figure.

The Laboratory was opened for public work on the 1st June. From this date to the end of the year 276 samples were received, involving 560 separate determinations. The samples included ores for the determination of gold, silver, lead, copper, osmiridium, bismuth, molybdenum, tungsten, thorium, arsenic, sulphur, tin, titanium, cobalt, nickel, zinc, iron, phosphoric acid, chromium, and manganese.

Qualitative tests of 128 minerals were made for the public free of charge.

During the period the Tasmania Mine was on tribute the whole of the assaying, including the mine and sale samples, was carried out by the writer.

The assaying facilities afforded to prospectors and others have been highly appreciated.

In addition to carrying out the whole of the assaying work, a great deal of my time has been taken up in preparing geological maps and plans for the printer and checking the mine plans, field notes, and calculations which are filed in the archives of the Department.

The correspondence during the year consisted of 274 letters, reports, &c., in and out.

I have, &c.,

W. D. REID,
Government Assayer and Draftsman.

The Secretary for Mines, Hobart.

REPORT OF THE CHIEF INSPECTOR OF MINES.

Chief Inspector of Mines Office,
Hobart, Tasmania, 16th March, 1915.

DEAR SIR,

I HAVE the honour to submit for your information my report for the year ending 31st December, 1914.

I received the appointment of Chief Inspector of Mines in May, and assumed office on the 16th of June, 1914.

On my arrival it was decided to alter the duties by including those of Chief Inspector of Magazines and Explosives, and later the duties of State Mining Engineer were also added to the position.

A considerable amount of time has been spent in obtaining a knowledge of local conditions and the routine of the work attached to the positions.

A month after assuming office the war broke out, causing the closing of the metal markets, necessitating the stoppage of the majority of the mines. Fortunately the Mt. Lyell M. and R. Company was not affected, and was in a position to absorb a large amount of the labour. The Government, by making advances on ore, relieved the difficulty to a very large extent. The Mt. Bischoff Tin Mine closed down for a few weeks, when it restarted on a co-operation system. While not employing the full number of men previously engaged, employment was found for over one hundred men, most of whom were married and had their homes in the district.

Towards the end of the year a market opened for tin, but owing to the shortage of water due to the extremely dry season very few mines were in a position to take advantage of it. The Sulphide Corporation became buyers of lead and silver ores, allowing the Magnet and other mines to resume operations. The Tasmania Gold Mining Company having decided to discontinue, the mine has been closed down. The Mines Department assisted the employees to unwater the mine and work blocks of ore which were considered payable. Unfortunately, owing to the high cost of pumping, the venture did not prove profitable, and the party discontinued work in November.

Districts Visited.

Waratah (2), Magnet, Queenstown (3), Zeehan (2), St. Marys, Mathinna, Beaconsfield (4), and Lefroy.

Rescue Appliances and First-aid.

Several mines are provided with suitable appliances, but it is very doubtful if the appliances are a source of safety unless used by men conversant with their manipulation and trained in their use. Rescue appliances are very liable to be found defective unless they receive constant attention and are regulated by persons thoroughly acquainted with the mechanism.

It is now customary, and in several countries compulsory, for mines to maintain a number of men trained in "first-aid" and "rescue work," the corps being formed from the mine employees, and the service is honorary. It is recognised in many cases that the injury received in the accident is simple compared with that due to inexperienced attention after the accident.

In addition to rescue appliances, it is very essential that casualty rooms should be maintained on all mines as near to the main exit as possible. These rooms should be equipped with all requisites necessary for the comfort of the injured person before removal to his home or the hospital. The training of men in this necessary work is undertaken by "St. John Ambulance Association," and it is hoped that in the near future the Tasmanian centre of "St. John Ambulance Association" will inaugurate this very necessary work.

Signalling.

The present system of each district, and in many cases mines in the same district, having a different code of signals is a matter which is likely to lead to serious accidents, and which does not have any advantage in regard to economy over a uniform system.

It is to be hoped that at an early date a conference of those interested will be convened, and a uniform code of signals will be agreed to for the State.

Prevention of Dust.

Inspectors have paid special attention to installation of water jets to be used in conjunction with rock-drills. Difficulties have occurred, such as shortage of water due to the extremely dry season, employees neglecting to use the appliances, temporary breakage in the reticulating pipes, and similar mishaps, which are unavoidable. It being recognised that "miners' complaint" is largely due to dust, it is necessary that every effort should be made to reduce the evil to a minimum.

The Mt. Lyell Company has been experimenting during the year with "water-drills," and has installed a water system throughout the mine at considerable cost.

"Mining Act, 1905."

A new Act has been drafted dealing with the working, regulation, and inspection of mines and works. It was proposed to deal with it at the last session of Parliament, but, unfortunately, owing to other business, this was not found practicable. The measure is urgently required so that the provisions may be brought up to date with modern practice.

Accidents.

Appended is a diagram and statistical tables with reference to accidents which occurred during the year. The number of men employed during 1913 was 6106, and during 1914 was 4741, a decrease of 1365.

There were 71 accidents, causing the deaths of 9 persons and injuring 62 persons. Of the fatal accidents, 8 occurred underground and 1 on the surface; 4 were due to falls of ground, 4 to explosions, and 1 to machinery. The death rate per thousand from accidents on mines was 1.896, against .982 for the year 1913. Four fatal accidents were due to explosions, against 1 during 1913. The accidents were in no way due to the quality of the explosives. Of the 62 serious accidents, 29 consisted of fractures to limbs and injuries likely to have a disabling effect. The remaining 33 were of a minor character, necessitating absence from work for more than 14 days.

Accidents at Quarries and Other Works.

Three accidents were reported, causing injury to 4 persons; no fatalities. One was caused by falling from a barrow-gangway, 2 by explosions, and 1 by being struck by a stone from a shot.

Prosecutions.

During the year there were four prosecutions for breaches of the Act. In three cases convictions were obtained, and the other case was dismissed. The latter case was taken for not complying with General Rule 13, the Court ruling "that it was the duty of the Department to prove that the manager had not done all that was reasonably practicable to comply with the general rule." This renders it very difficult, if not impossible, to obtain a conviction against managers for not complying with the general rules.

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

I beg to acknowledge, with thanks, the valuable assistance rendered me by officers of the Service.

I have, &c.,

J. O. HUDSON,

Chief Inspector of Mines.

The Secretary for Mines.

COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892, to 31st December, 1914.

Period.	Number of Miners employed.	Number of Accidents.	Number of Persons.		Total Killed and Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
			Killed.	Injured.			Killed.	Injured.
1 July, 1892, to 30 June 1893	3295	28	4	25	29	8·8001	1·214	7·586
" 1893 " 1894	3403	25	7	20	27	7·934	2·057	5·877
" 1894 " 1895	3789	26	4	24	28	7·390	1·058	6·332
" 1895 " 1896	4160	22	7	16	23	5·529	1·682	3·847
" 1896 " 1897	4303	36	7	31	38	8·831	1·627	7·204
" 1897 " 1898	5530	36	13	33	46	8·318	2·351	5·967
" 1898 " 1899	6180	35	9	34	43	6·957	1·456	5·501
" 1899 " 1900	6834	19	7	16	23	3·365	1·024	2·341
" 1900 " 1901	7017	29	8	23	31	4·417	1·140	3·278
" 1901 " 1902	6438	38	7	35	42	6·524	1·088	5·437
" 1902 " 1903	6484	44	6	43	49	7·557	0·925	6·632
" 1903, to 31 Dec., 1903	5604	27	8	20	28	4·977	1·428	3·569
1 Jan., 1904 " 1904	6192	73	9	65	74	11·951	1·454	10·497
" 1905 " 1905	6586	34	7	30	37	5·618	1·063	4·555
" 1906 " 1906	7004	65	4	61	65	9·280	0·571	8·709
" 1907 " 1907	7516	68	6	64	70	9·314	0·798	8·515
" 1908 " 1908	6464	60	6	58	64	9·900	0·928	8·972
" 1909 " 1909	6054	54	6	49	55	9·085	0·991	8·093
" 1910 " 1910	5770	63	8	57	65	11·265	1·386	9·878
" 1911 " 1911	5247	80	4	77	81	15·437	0·762	14·675
" 1912 " 1912	5566	60	53	53	106	13·044	9·522	9·522
" 1913 " 1913	6106	64	6	60	66	10·809	0·982	9·826
" 1914 " 1914	4741	69	9	62	71	14·977	1·896	13·081

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

Rate per 1000 men employed.



Photo Aligned by John Veal Government Printer Hobart Tasmania.

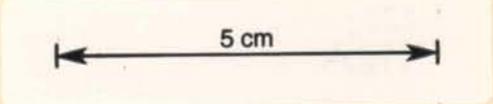


TABLE showing Rate per Thousand Killed and Injured in the different Divisions for the Year 1914.

Division.	Average Number of Men Employed.	Number of Persons.		Number of Accidents.	Total Number Killed & Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
		Killed.	Injured.				Killed.	Injured.
Northern and Southern	429	2	6	7	8	18·634	4·648	13·986
North-Eastern	535	Nil	4	4	4	7·476	Nil	7·476
Eastern	459	1	3	3	3	6·666	Nil	6·666
North-Western	731	1	5	5	6	8·267	1·367	6·839
Western	2596	6	44	50	50	19·260	2·311	16·949
	4741	9	62	69	71	14·977	1·896	13·081

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	2013	39	3	36	39	19·373	1·490	17·883
Zeehan, &c.	583	11	3	8	11	18·867	5·145	13·722
	2596	50	6	44	50	19·260	2·311	13·081

J. O. HUDSON, Chief Inspector of Mines.

TABLE showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Year 1914.

PLACE OR CAUSE OF ACCIDENT.	INSPECTION DISTRICTS.													
	Northern and Southern Division.		North-Eastern Division.		Eastern Division.		North-Western Division.		Western Division.				TOTAL.	
									Zeehan and other Districts.		Lyell District.			
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
UNDERGROUND— Falls of ground	2	...	...	...	...	...	1	1	...	3	1	5	4	9
<i>Shaft Accidents—</i> Haulage .....	...	...	...	...	...	...	...	...	...	2	...	...	...	2
Falling down passes and shafts.....	...	...	...	...	...	...	...	...	...	1	...	...	...	1
Total .....	...	...	...	...	...	...	...	...	...	3	...	...	...	3

<i>Miscellaneous (underground).</i>														
Haulage—														
Trams, &c.
Sundry accidents.....	...	4	...	...	...	...	3	...	...	...	21	...	28
Explosives .....	...	...	...	...	...	...	...	2	1	2	2	4	13
Total .....	...	4	...	...	...	...	3	2	1	2	23	4	31
<i>Total Underground</i>	2	4	1	4	2	7	3	28	8	47
ON SURFACE—														
Smelting-works .....	...	...	...	...	...	...	...	...	1	...	...	...	1
Machinery .....	...	...	...	...	...	...	...	1	...	...	2	1	2
Falls of stone.....	...	1	...	1	...	...	...	...	...	...	1	...	3
Tramways .....	...	...	...	...	...	...	...	...	...	...	3	...	3
Falls of persons .....	...	...	...	1	...	...	...	...	...	...	1	...	2
Explosives .....	...	...	...	...	...	...	1	...	...	...	...	...	1
Miscellaneous.....	...	1	...	2	...	3	...	...	...	...	1	...	7
<i>Total Surface</i>	2	...	4	...	3	...	1	1	1	...	8	1	19
GROSS TOTAL, 1914.....	2	6	...	4	...	3	1	5	3	8	3	36	9	62
Total during 1913.....	1	9	1	4	1	8	...	3	2	15	1	21	6	60

REPORTS OF INSPECTORS OF MINES.

MR. INSPECTOR GRIFFIN (Newstead) reports:—

I have the honour to submit my report as Inspector for the Northern and Southern, North-Eastern and Eastern Divisions of the State for the year ending 31st December, 1914.

Number of accidents, 14; casualties—2 fatal, 13 non-fatal. Total, 15.

Of the fatal accidents, John Kirby and Thomas Joseph Reid, working at the Tasmania Gold Mine, were engaged stoping in Block 557, above the 1500-foot level. Opening from a rise going up on the hanging-wall, the lode at this place is nearly 20 feet in width. The country is hard blasting ground, and when the rise was put up it was only necessary to use stulls for staging purposes. There is, however, a very hard, dark-coloured mineralised rock from 12 inches to 3 feet in thickness, attaching to the true hanging-wall. Portion of this had been worked off at lower stopes as lode-matter.

The accident occurred on Friday, 2nd January. A set of eight holes had been drilled on New Year's Eve, two days before the accident. Reid and Kirby went to work at 8 o'clock in the morning, and proceeded to charge and fire these. Three holes, from 4 to 5 feet in depth, were first fired out on the hanging-wall side. Shift Captain Kelly went to the place at 10.40 and got the men to work down the stone broken by the shots. He returned half an hour later and took some measurements. The place seemed safe enough then; no danger was anticipated from the hanging-wall.

An hour later the mine superintendent, Mr. C. F. Heathcote, Mr. Llewellyn, mining expert, and the under-manager, R. S. Spowart, went up into the stope. They were shocked to find that a large fall of rock from the hanging-wall had taken place, and that both men, Reid and Kirby, were crushed to death beneath its weight.

It would appear that these unfortunate men, after the shift captain left them, proceeded to charge the remaining five holes, and whilst doing so were caught and killed by the falling mass of rock. The slab of rock that fell was about 6 feet broad at the base, narrowing upwards to its full height of 14 feet in the rise; the upper portion may have been winded previous to the shooting, but could not be noticed to be dangerous at that height. The firing of the three shots liberated the base. The half-set timber used in the stope could not be put in until the full width of the lode was broken. Toms could easily have been used as a temporary support for the hanging-wall if danger was anticipated from that direction, but such a thing was evidently not thought of. No blame is attachable to anyone for this deplorable accident.

Of the non-fatal accidents, Wm. Lewis was stoping in Tasmania Mine. A defective hitch gave way, letting down the half-set timber on some stone. He was jammed and severely bruised. This was defective workmanship and worse supervision.

John Cashman had his right thigh fractured by a branch from a falling tree when clearing timber off face at Iris Tin Mine.

Wm. Brown went too near the face of open-cut when working on his mine at Gladstone, was caught by a fall of earth, and had his thigh broken.

John Hurst, engaged cutting a very deep drainage-race at Price's Copper Mine, Natone, was jammed by a slip of earth from the side, and badly bruised about the hips and legs. He was unable to resume work for five weeks.

Archibald Cowie was cutting away a rearing to let mullock run in a stope of the Tasmania Mine. A tom gave way, he received nasty cuts and bruises about the head and face, and was in the hospital for a considerable time.

A very painful accident happened to Albert Ford at the Mt. Nicholas Colliery. He was shunting and tipping skips at the screens, and got the great toe of his right foot smashed by the tippler flying back on to it.

The remaining seven casualties mainly resulted from cuts and bruises to hands or feet of workers in open-cut faces; injuries painful enough to keep men from their usual employment for over 14 days.

The total number of casualties for the year is 40 per cent. less than for 1913; this, in a measure, due to more time being taken before finally recording, so as to make sure that the sufferer was off over 14 days as a result of the injuries he received, and was not malingering. This latter kind of thing too frequently happens among a certain class, who prefer to have a holiday when they know their place at the mine will be safe for their return.

Ventilation.—Taken on the whole, the ventilation of both metal and coal mines leaves nothing to complain of; in most cases it is very good. At Beaconsfield the presence of carbonic acid gas in the country-rock has always to be counted with.

The Tasmania Mine (now closed down) had this to contend with in ever increasing quantities as greater depths were attained, and work in the bottom levels had sometimes to cease on account of sudden inrushes of gas. Ventilation by natural means could no longer be relied on, and the installing of powerful machinery to overcome the difficulty would have had to be considered had sinking to a greater depth been decided upon. This question of future cost of ventilating was no doubt seriously considered when the final estimate of working costs was under review.

At the North Tasmania and Coronation Mines (small parties working at each place) work has been frequently interrupted through gas, often for days at a time, when unfavourable weather prevails. Men are generally careful at these places, yet there is always the risk of someone being overcome unless extreme precautions are taken.

In the remainder of the metal mines outside Beaconsfield ventilation is very good.

Coal Mines.—The ventilation of the smaller mines is easily effected, and is generally very good. At the larger collieries, Nicholas and Cornwall, there is but very seldom anything to complain of. Faulting of the seam and a break in the continuity of the air-course has sometimes affected the ventilation, but not for long. Both these collieries are ventilated by means of good return air-ways connected with furnace upcast shafts. The longwall system of working lends itself to this

method of ventilating, which is simple and effective. Fortunately we have no "fiery mines" in this State; carburetted hydrogen or inflammable gas has not so far been discovered in our coal mines. This is, in a measure, due to the nature of the coal and its comparatively shallow depths below the surface so far as the works have yet penetrated.

The return airways are used as a second means of escape in the collieries.

A means of destroying dust is provided in connection with the use of rock-drills; also wherever found necessary in other places.

Sanitation.—Proper appliances are generally provided, but it is by no means easy to get some miners to observe even simple precautions for health's sake.

Health.—The health of the miners appears on the whole to be very good. Cases of phthisis are very seldom heard of so far as the miners at present at work are concerned. Now and again one hears of an old miner succumbing to lung disease, probably contracted many years ago when less stringent regulations were in force with regard to ventilation, the destroying of dust, and stowing of stopes with deleterious material, such as cyanide, sand, &c.

Magazines and Explosives.—The mine magazines are, as a rule, well constructed with regard to safety and the proper storage of explosives. Carelessness on the part of some miners has at times to be reprovod, but it has not been necessary to prosecute, although some offenders come very close to this.

The explosives in use are of good brand. No accidents from the use of explosives have occurred during the year, although two have occurred at quarry workings.

The equipment of the mines is, as a rule, good, and reasonable precautions are taken by those in charge who are responsible for safe working. Ropes are cleaned and oiled, cut, and reshod, chains and shackles annealed, and safety-cages tested at regular intervals.

Prosecutions.—A mine manager was proceeded against for neglecting to keep certain machinery, to wit, a steel winding-rope, in repair, thereby causing the said rope to break. The offender pleaded guilty, and was let off with a light fine.

Peter Price, the owner of a mine at Natone, 9 miles from Burnie, was prosecuted on two counts. In the first information he was charged with having failed to register a mine manager for his mine, as required by Section 168 of the "Mining Act."

The second information charged him with failing to report (he being the person in charge) the occurrence of an accident at his mine, by which one, John Hurst, was seriously injured.

He pleaded guilty to both charges, and was fined—for the first, 10s.; and for the second, which was the more serious of the two, a fine of £3 was imposed.

Quarry Accidents.—Three accidents have been reported during the year.

At Mr. R. Kennedy's New Wharf quarry, Hobart, Thomas Lonergan fell from an elevated gangway, or barrow-run, owing to the barrow he was wheeling coming in contact with a stone. He sustained a broken ankle.

Walter Cousins, employed as powder-monkey at Hobart Brick Company's works, New Town, proceeded to bull a hole with four plugs of gelignite. A previous charge had been fired, and it was said the hole was allowed to cool for a half-hour. After spitting a short piece of fuse with a primer attached, he dropped it into the hole, and was pouring in a handful of sand when the charge exploded. Cousins had his right hand severely lacerated, and top of the middle finger cut off. His mate, Smith, who was standing by, received a cut on his right eyebrow.

The explosives in use at the quarry were in good order. Possibly the piece of fuse used was too short, or that it coiled down under the tamping-stick, bringing the end just lighted in contact with the gelignite.

At the Mersey Marine Board's quarry, Devonport, John Saunders, who was assisting the powder-monkey to fire a round of holes, stood in the open instead of taking refuge in a place provided, and was struck on the head by a small fragment of rock flying from the blasting. He was insensible for a time, and had to be conveyed to the Devon Hospital for treatment.

Explosives and Inflammable Oils.

There are in all 37 private magazines registered for the storage of explosives in my district in Northern Tasmania. Of these, 16 are on mines; the remaining 21 are owned by storekeepers who supply a number of small mines as well as road contractors and others. They range in size and capacity from the smallest, of from 200 to 250 lb. (which are generally situate in the towns), to the largest, containing up to 10,000 lb. The buildings are, as a rule, well constructed of brick, stone, or concrete. Where galvanised-iron is used the building is lined with soft wood, the space between the iron wall and lining being filled with sawdust. The explosives are of the best brand, and are well stored with regard to dryness, temperature, and ventilation.

Inflammable Oils and Carbide of Calcium.—There are in all 21 places holding certificates for registered premises to store petrol, kerosene, and carbide of calcium. There are also two large stores licensed for the storage of petrol and kerosene; one of these owned by the Vacuum Oil Company is licensed for 62,500 gallons of petrol and 140,000 gallons of kerosene.

Much difficulty has been experienced in getting storekeepers, garage-owners, and others who exceed the limit of quantities allowed to take out a licence. It is not so much that they object to the 5s. annual fee, as they do to the initial cost (where petrol is stored) of building a proper depot, which generally runs into £10 or £12. There are some who try to evade the law, and succeed fairly well, as the inspector cannot be everywhere. A prosecution at Burnie recently, where the owner of a garage was ordered to pay a penalty of £2, with 8s. costs, has had a salutary effect. This man had been cautioned more than once, but persisted in importing more petrol than is allowed to be kept without a certificate.

LIST of Accidents in Inspector Griffin's District for Year 1914.

Fatal, 2; non-fatal, 13; total, 15.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
3 Jan.	Tasmania Gold Mine Ltd.	Beaconsfield	Fall of rock	Kirby, John	Married	Fatal. Chest crushed in, ribs broken	Was stopping with Thomas Jos. Reid in Block 557, opening from a rise; fired round on hanging-wall side, from which a large slab of rock was loosened, but not noticed by either man, nor by the shift boss. This rock subsequently fell away without warning, and both men were crushed to death beneath it
2 Jan.	Ditto	Ditto	Ditto	Reid, Thos. Joseph	Ditto	Fatal. Head badly smashed	
2 Feb.	Briesis Tin and General Mining Co.	Derby	Fall off a barrow plank	Cooper, George	Ditto	Bruised on hip bone, and on ribs of left side	Was wheeling a barrow of stones on a raised plank in open-cut workings; barrow left the plank causing Cooper to fall on to the rocks. He was off work 41 days as result of accident
25 Feb.	Tasmania Gold Mine Ltd.	Beaconsfield	Stope timber hitch giving way	Lewis, William	Single	Severe bruise on side, and supposed fracture of a rib	Opening from a rise, Block 305, a half-set cap, badly hitched, gave way, letting down set timber and stone. Lewis was struck by a piece of timber

25 Feb.	Iris Tin Mine	Miona, Middlesex	Caught by branch of a falling tree	Cashman, John	Ditto	Fracture of bone of right leg	Cashman was cleaning off timber at top of open-cut working face; a smouldering tree fell; he was struck by a branch and had his leg broken
16 Mar.	Mt. Nicholas Colliery Co.	Mt. Nicholas	Getting his foot into loop of rope	Cocker, Frank	Ditto	Foot squeezed, and badly bruised	Cocker was engaged as wheeler underground; inadvertently got his foot in loop of tail rope at shunting flat, and had it badly squeezed
9 May	Anchor Tin Mine Ltd.	Lottah	Stone rolling	Singline, L.	Ditto	Great toe crushed and nail torn off	Was handling stone in open-cut face, a boulder rolled on his foot, crushing it and tearing nail from great toe
10 July	Briseis Tin and General Mining Co., Ltd.	Derby	Jarred hand when using a shovel	Spillance Daniel	Ditto	Jarred hand	Was engaged shovelling at River works, got his hand jarred, and was off work for over 14 days
21 July	Garfield Propy. Tin Mine	Gladstone	Fall of earth in open-cut face	Bracey, Will.	Married	Fracture of thigh bone	Was working in open-cut face with his mine partner, Harris; went too close to face to break lumps; a slip occurred, and Bracey was struck on leg by pick handle
7 Aug.	Briseis Tin and General Mining Co. Ltd.	Derby	Boulder rolling	Egan, Morgan	Single	Left foot badly crushed	Was barring down stone in open-cut face; a boulder rolled on to his foot, bruising it badly. Egan was off work nine weeks as a result of accident
14 Sept.	Tasmania Gold Mine Ltd.	Beaconsfield	Rock-drill slipping	Moore, David	Married	Severe cut on foot	Moore was setting up a rock-drill in stope; the pedestal of the drill slipped off a piece of wood on to his foot inflicting a deep wound

LIST of Accidents in Inspector Griffin's District for Year 1914—continued.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
14 Oct.	Tasmania Gold Mine Ltd.	Beaconsfield	Drill-hammer slipping	Brown, George	Married	Bruised hand	Was turning a drill, the striker (Dally) made a false blow, the hammer catching Crown on the hand. Underground workings
31 Oct.	Ditto	Ditto	Run of mullock in stope	Cowie, Archibald	Ditto	Severe cuts about the head	Cowie was cutting away a rearing to let mullock run in stope; a tom gave way, and he was struck on the head by timber and dirt
21 Nov	Price's Copper Mine	Natone, via Burnie	Fall of earth	Hurst, John	Ditto	Severe bruising of hips and legs	Hurst was working with owner of the mine (Price) in a deep, open drainage cut; a slip from the side pinned him against the opposite bank
18 Nov.	Mt. Nicholas Colliery Co.	Mt. Nicholas	Rebound of skip tippler	Ford, Albert	Single	Great toe of right foot badly smashed	Ford was tipping a coal skip at the screens, thrust his foot too far forward, but the tippie on the rebound caught it

LIST of Quarry Accidents in Inspector Griffin's District for the Year 1914.

Accidents, 3; Casualties, 4; all non-fatal.

Date of Accident	No.	Name of Quarry and Locality.	Owner of Quarry.	Cause of Accident.	Killed.	Injured.	Particulars of Accident.
1914. 1 May	1	New Wharf, Quarry, Hobart	R. Kennely & Sons	Falling from a barrow gangway	—	1	A man named Thos. Lonergan was wheeling a barrow of stone over an elevated gangway; a jolt caused the barrow to collide with a stanchion, throwing Lonergan to the ground about 9 feet. He fell on some loose stones and broke his ankle. The gangway, or barrow-run, was sufficiently broad, but had no railing on sides, which, if provided, would probably have prevented the man from falling

Last of Quarry Accidents in Inspector Griffin's District for the Year 1914—continued.

Date of Accident.	No.	Name of Quarry and Locality.	Owner of Quarry.	Cause of Accident.	Killed.	Injured.	Particulars of Accident.
1914. 10 Sept.	2	Hobart Brick Co. Works, New Town	Hobart Brick Co. (2) casualties	Explosion of gelignite	—	1	Walter Cousins, employed as powder monkey, proceeded to bull a hole with 4 plugs of gelignite; an explosion occurred immediately on his dropping a short fuse and primer into the hole. Cousins had his right hand severely lacerated, and top of middle finger cut off; his mate, Smith, who was standing by, received a cut on right eyebrow. The fuse used was probably too short, and did not allow sufficient time for tamping.
16 Oct.	3	Marine Board of Mersey, Spreyton Road, Devonport	Marine Board of Mersey	Fragment of stone flying from blast	—	1	The sufferer, John Saunders, was assisting powder monkey in a round of shots. He stood in open instead of taking shelter, and was struck on the head by a small fragment of rock, flying from a blast. He has only himself to blame, as shelter places were provided.

MR. INSPECTOR HARRISON (Zeehan) reports:—

Accidents.—I regret to have to state, although mining in this district has been very much restricted through the war and other circumstances, the accident list has been heavy, namely, 4 fatal and 9 injured. Of the former, 2 were caused through explosions, 1 through being caught in mill machinery, and the other through fall of rock in a stope.

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

Magazines and Oil Stores.—There are 27 magazines and 8 stores for inflammable oils. They are all kept in a satisfactory condition. There have not been any complaints respecting the class of explosives used during the year.

Zeehan District.—Mining on Zeehan is now entirely confined to the action of tributers, of which there are numerous parties.

Five-mile.—Both the Cuni and the Copper Nickel Mines, in which large bodies of ore were opened up, found it necessary to close down when war was declared, as there was no further sale for the ore.

Renison Bell and Rosebery.—All the large mines are closed down for the time being through the same cause.

The Tasmania Copper Company sends ore to the Metal Extraction Company's works as required. Other mines in the district are at a standstill.

Mt. Read.—The Hercules and other mines have been idle since the closing down of the Zeehan Smelters.

Waratah.—The Mt. Bischoff Tin Mine, which was closed down for some time, restarted on a co-operative system, which seems to work fairly satisfactorily.

The Bischoff Extended Tin Mine.—A few men are employed opening up new ground and effecting repairs to the mill plant.

Whyte River and Heazlewood.—The Cleveland Tin Mine has been worked by tribute, with moderate results. This mine has large bodies of payable tin stone opened up, but the dressing appliances are quite inadequate to deal with it.

The Victorian Magnet.—Considerable difficulty has been experienced in keeping the drainage adit open, through the swelling nature of the ground, and there has been a lot of lost time in consequence.

The Jasper Copper Mine.—This mine was kept constantly at work until the beginning of December, when all hands, except the manager, were discharged. I understand active work is to be resumed early in the year.

Heemskirk and Comstock.—Small parties of tinminers are employed on various parts of the mount. On the Comstock pyrites carrying a little galena is worked to advantage by tributers.

Henty.—The Queensberry Mine.—Tributers have sunk the shaft another 35 feet, but the continual dry weather compelled them to confine their work to the No. 1 level. When rain sets in the opening up of No. 2 level will be resumed.

Savage and Wilson River Districts.—Osmiridium miners on both these fields received a set-back when the price of the metal fell below £4 per ounce, and afterwards became unsalable; but there are still a few men employed.

Prospecting.—Prospecting parties are employed all over the district, most of them under the direct supervision of the mining engineer.

LIST of Accidents in Inspector Harrison's District for the Year 1914.

Fatal, 4; non-fatal, 13; total, 17.

Date.	Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Killed.	Injured.	Particulars.
1914. Feb. 11	Penzance	N.E.Dundas	Fall of rock	Cornelius Donaghy	Married	One rib broken	—	1	While employed timbering, a rock struck him on the side and broke one of his ribs
"	"	"	Fall down a pass	James Goldstraw	Single	Bruised, not serious	—	1	While stepping over a pass foot slipped and he fell in
" 12	Montana	Zeehan	Explosion	Thomas Piper	Married	Killed instantly	1	—	Aged 49, native of Cumberland, England. Piper struck a miss-fire with his pick; the miss-fire was reported by the previous shift
	"	"	"	Alfred C. Courts	"	Not serious; a few surface marks	—	1	Courts was working with Piper, and was standing immediately behind him when the explosion took place
Feb. 28	Mt. Bischoff	Waratah	Stone from a shot	William J. Thomas	Single	Leg badly broken	—	1	While having crib on surface, a stone from a shot in open cut travelled a distance of 477 feet, and struck Thomas

March 5	Mt. Bischoff	"	"	John Duncanson	Married	Right arm broken	1	Duncanson was picking down the effects of a shot after firing, when a piece of rock fell down and broke his arm
" 7	Magnet	Magnet	Fall of rock	Andrew Kelly	Single	Head badly crushed	1	Age about 40, place of birth unknown. Kelly and his mate were working in leading stope, No. 11 level, when a large quantity of rock came away from a greasy head. It crushed the timber under which Kelly was working and drove him into the ore pass, killing him instantly
April 8	Magnet	"	Run into by a truck	Hebert Summers	Single	Bruised foot	1	Doctor stated he would only be off for a few days
June 12	Oonah	Zeehan	Caught in machinery	James Smith	Married	No injuries	1	Age 50, native of Aberdeen, Scotland. While clearing elevator of dressing mill was caught by the machinery and died from shock; no injuries either internal or external. Verdict of jury, died through shock and not otherwise
July 18	Magnet	Magnet	Neglecting to secure timbers	Gerald Holloyay	"	Bruises to head and back	1	While timbering stope neglected to tom off timber against the wall of lode, and it slipped; injuries not serious

LIST of Accidents in Inspector Harrison's District for the Year 1914—continued.

Date.	Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Killed.	Injured.	Particulars.
1914. July 23	Bischoff Extended	Waratah	Timber slipped while being put in position	Michael Leary	Single	Finger jammed, nail torn off	—	1	Doctor states probably three weeks idle
Aug. 20	Metals Extraction	Rosebery	Foot slipped	M. Greagon	Married	Foot bruised	—	1	While carrying piece of lead on hand-barrow foot slipped and the lead fell on his foot
Sept 15	South Comstock	Comstock	Fall of debris in a rise	Henry Judd	"	Sprained ankle	—	1	While Judd and his mate, Kerr, were putting up a rise, a fall of debris took place. Judd hurt his ankle in pulling his foot clear of the fallen debris and going for assistance to release his mate
"	"	"	"	James Kerr	"	Bruises on left side from hip down	—	1	When the fall took place Kerr was caught on the stage by the debris, and was held there until Judd brought assistance

Nov. 10	Mt. Zeehan (Tas.)	Zeehan	Explosion	James Keogh	"	Disembowelled, and left hand blown off	1	Age 44, native of Tasmania. About 12.20 p.m. on the day of accident men working near heard a peculiar sound of an explosion in the vicinity of the adit where Keogh was working, and on examination found the adit full of smoke. On entering found the body of deceased about 70 feet from the entrance. Keogh was evidently carrying explosives out of the mine when the accident happened, but the police and myself failed to find out for what purpose. Keogh did not enjoy good health. It is thought he fainted and that his candle set fire to the explosives
Dec. 5	State Mine, Argent Flat		Caught by cage	Henry Cranwell	"	Wrench to right knee cap	1	Cranwell was slow in getting into cage after signal was given to lower; his foot was caught
"	"	"	truck against frame-set	Roderick Dhu	"	Back hurt and one rib broken	1	Dhu pulled Cranwell into the cage, and in doing so was caught by the frame-set
							4	13

MR. INSPECTOR CURTAIN (Queenstown) reports:—

Accidents.—The tabulated list accompanying this report gives such detailed statements of each case that there is no need to recapitulate. The four fatalities enumerated happened under such attendant circumstances that, apart from the victims themselves, little, if any, provision could be made for their prevention. Owing to a somewhat diversity of testimony adduced at the coronial inquest on Dwyer, the Department deemed it expedient to take action against the Mt. Lyell Mining and Railway Company, presumptively for the purpose of establishing a precedent that any similar case occurring, the fact of death ensuing would be *prima facie* evidence of negligence on the part of the employer, but this contention was not entertained by the Warden of Mines, who dismissed the case.

For the past 14 years, Dwyer's was the ninth death that had taken place at the *working face underground*, which, while regrettable, compares *per 1000 men employed*, favourably with any other mining field in the Commonwealth for such an era.

Health of the Miners.—From medical testimony it is regrettable to learn that what is termed "miner's complaint" and allied disorders are on the increase. This, in part at least, can be accounted for by the fact that owing to depression in other mining fields, men have come here and brought the disease with them, while the period is also arriving when some of the *pioneer workers* of this field are reaching that stage when their vitality must slacken, and amongst the ill nature is heir to, pulmonary troubles are not the least. Dr. Love, who is practically the mines' doctor, states: "It is not thought the actual number of new cases contracted on this field is on the increase, if at all. The number of deaths from *pneumo-koniosis* have been more than usual, but this need not convey the impression that the victims contracted the disease here. It is insidious, and once started in a lung becomes progressive, and continues to increase in severity even though no more dust be inhaled; consequently, the proportion of affected men is now at a higher ratio than formerly, while cases of *pneumonia* have decreased and are really below or less than at any time during the past five years, no miner having died from this cause during the period under review, although other members of the community have done so, chest troubles on the whole being rare."

Ventilation.—Apart from rising and advancing ends—where mechanical appliances have to be adopted—natural ventilation by connections and "winzing" pervades the whole workings, and the temperature and quality of the air leaves little to be desired. The former ranges from 54 degrees to 70 degrees Fahrenheit; while the latter rarely exceeds 0.20 C.O.², the more pernicious carbon monoxide (C.O.) being, under ordinary circumstances, unknown.

Dust.—The rock in most instances of our mines "sweats" sufficiently to absorb much of the suspended particles that attend each firing, which, locally, is usually heavy, while each stop is provided with a reticulated surface-water service, which, under normal weather conditions, and excluding time lost in adjustments and repairs, should meet all reasonable requirements.

Fuse Detonators, Explosives, and Candles.—There has been no complaint respecting the quality of these necessaries during the past year, and as their consumption exceeds all other parts of the State combined, this must be a most satisfactory recommendation for their class and composition.

Ropes and Cages.—The former, in the principal mines, are new, and with the cages have been tested in sympathy with the requirements of the mining regulations, and found satisfactory.

Inspections, &c.—During the year the following visits and examinations have been made, viz.:—North Lyell Mine—surface 40, underground 50; Mount Lyell Mine—surface 48, underground 42, main haulage ropes 50; Mt. Lyell Blocks—underground 25; Tasman and Crown Lyell Extended and Lyell-Comstock, 7; Jukes-Crotty-Darwin, 3; limestone quarry, 25; silica quarry, 21; reduction works, 26; Lake Margaret, 12; McDowell Prospecting Association, 10; Harvey's Creek, 6; Hunn's Show, Diamond Creek, 3; explosive magazines, 41; inflammable oils depots, 18; interviews and enquiries, 41; mining conferences (Launceston), 2; reports of mining fields, Port Davey-track, in addition to the clerical duties pertaining to the work of this office.

LIST of Accidents in Inspector Curtain's Lyell District for 12 months, from the 31st of December, 1913, to the 31st December, 1914.

Fatal, 3 ; non-fatal, 33 ; total, 36.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single	Age.	Killed.	Injured.	Remarks.
1914.									
Jan. 7	Mt. Lyell M. & R. Co.	Lake Margaret	Fall of earth	Emmanuel Pace	Single	35	—	1	While washing cemented sand, some fell on his leg, with the result that his left leg was broken
Jan. 9	Ditto	Gormanston	Explosion	Reginald Matthews	Ditto	23	—	1	Explosion in stope where Matthews was working, causing his arm to be broken and his eyes to be injured
Jan. 13	Ditto	Ditto	Fall of rock	James Brock	Ditto	29	—	1	While shovelling ore piece fell down rill on to his back
Jan. 21	Ditto	Ditto	Fumes, and fall off ladder	Paolo Vella	Married	35	1	—	Overcome by fumes of explosion, he fell from ladder-way and succumbed owing to fumes
Jan. 29	Ditto	Ditto	Fell from ladder-way	E. G. Moseley	Ditto	28	—	1	While on ladder, piece of rock from overflow fell on his hand causing him to loose his grip ; left leg fractured
Feb. 2	Ditto	Ditto	Jammed by piece of timber	James H. Freeman	Widower	49	—	1	While unloading "logging," piece fell on foot, breaking three toes

Feb. 20	Ditto	Ditto	Fall of rock	R. J. Weston	Married	23	—	1	While working in No. 2 stope, at No. 7 level, a piece of mullock fell on his finger and crushed it
Mar. 4	Ditto	Ditto	Truck overturned	Monte Denholm	Single	21	—	1	A loaded truck overturned, catching him on the left leg and breaking it
Mar. 17	Ditto	Ditto	Covering of ore-pass broke	Hugh O'Neill	Ditto	24	—	1	While clearing away effects of a blast, timber gave way and he fell through to lower stope, bruising his body, and breaking his thumb
Mar. 18	Ditto	Ditto	Fall of mullock	Peter Knowles	Married	35	—	1	While climbing out of No. 1 stope, No. 7 level, piece of mullock fell through logging and caught him on the hand, breaking a bone
Mar. 19	Ditto	Ditto	Struck in eye by fragment of rock	Joseph Cantia	Ditto	30	—	1	While working in open cut, a spall from a hammer struck him in the eye
Mar. 24	Ditto	Ditto	Fell from staging	Robert Harper	Ditto	35	—	1	While rigging a machine over the 700-foot level, he overbalanced from timber he was standing on, and sprained his right ankle
Apr. 15	Ditto	Ditto	Caught between machine	John Moodie	Ditto	28	—	1	While working a rock-drill he got his finger caught between jack-bar and drill, with the result that it was crushed off

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

Date	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Age.	Killed.	Injured.	Remarks.
1914. May 6	Mt. Lyell M. & R. Co.	Gormanston	Slipped off flat-sheet	Edward Murray	Single	20	—	1	While slewing a truck at the 85-foot level he slipped and fell across rails, breaking a rib
May 6	Ditto	Ditto	Caught and dragged into tumbler	Albert Smith	Ditto	18	—	1	While tipping truck in a tumbler he got his finger caught between truck and tumbler, and was dragged into the bin and received a severe shaking
May 7	Ditto	Ditto	Jammed between truck buffers	Rowland Rollings	Ditto	26	—	1	While coupling a rake of trucks his fingers got caught in truck buffers, one finger being jammed off
May 9	Ditto	Ditto	Slipped, and was run over	Max William Dobbie	Ditto	16	—	1	While passing in front of rake of empty trucks in front of main haulage, he fell, and was run over, fracturing his right leg
May 15	Ditto	Ditto	Fall off small piece of "back"	Arthur Albert Mears	Ditto	26	—	1	While in No. 3 stope at No. 6 level, piece of the "back" came away and struck him, cutting his left arm severely near the elbow

May 22	Ditto	Ditto	Hand caught in truck tumbler	Adam Osborne	Ditto	49	—	1	While assisting to "tip" he got his finger caught in trucker tumblers and was pulled into the bin, crushing off the third finger of the left hand
June 5	Ditto	Ditto	Rock came through empty ore-chute	William Clark	Ditto	19	—	1	While trucking out of section 4 of 19 stope, a piece came through empty chute and struck him, bruising the back and palm of his hand
June 12	Ditto	Ditto	Fall of rock	Norman Scott	Ditto	21	—	1	While working in No. 3 section of No. 20 stope he was struck by a large boulder, which bruised his body and cut his right eye
June 12	Ditto	Ditto	Jammed between truck and ore-chute	Michael Herick	Ditto	41	—	1	While working from No. 4 stope, No. 6 level, he got his right hand jammed between truck and ore-chute
June 20	Ditto	Ditto	Fell down rill of stope	Frank Regan	Married	46	—	1	The spanner used for tightening rock-drill became loose; Regan overbalanced and fell down rill of stope, fracturing a rib
June 20	Ditto	Ditto	Piece of timber fell off truck	George Gorrige	Single	60	—	1	While assisting to unload a "bolster," a piece of timber fell from truck and caught his foot
July 4	Ditto	Ditto	Spalling a rock	Andrew Hibberas	Ditto	20	—	1	While spalling in the open cut, spall from hammer struck him and injured his left eye

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

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer	Married or Single.	Age.	Killed.	Injured.	Remarks.
1914. July 10	Mt. Lyell M. & R. Co.	Gormanston	Hydraulic lift	Robert R. Livingstone	Single	14	--	1	While returning a barrow-load of sweeping to feed-floor he got his right foot jammed between moving platform and shaft column
July 17	Ditto	Ditto	Machinery	A. Gudmunson	Ditto	20	--	1	While oiling the guides of the electric pump he got his finger crushed in the cross-head
July 17	Ditto	Ditto	Truck overturned	Victor Chetcuti	Ditto	18	--	1	While filling truck in stope, the truck, not being securely "spragged," came back, and struck him on his right leg and fractured it
July 23	Ditto	Ditto	Fall of rock	William Dwyer	Married	42	1	--	Dwyer fired a "sandblast," and while sounding the ground later, a quantity of rock came away, struck him, and caused instant death
July 29	Ditto	Ditto	Ditto	Richard McArthy	Ditto	30	--	1	Having fired some heavy ground, a "blocky piece" struck him on the left leg and broke it
Aug. 8	Ditto	Ditto	Fell against truck	Martin Healy	Ditto	66	--	1	While walking on the incline road of No. 4 stope, he slipped against truck, and fractured one of his ribs

Aug. 28	Ditto	Ditto	Struck by piece wood	Michael Loner-gan	Ditto	29	1	1	When standing in shelter tunne was struck by a stone from a shot fired in open cut, severely rupturing his intestines
Sep. 23	Ditto	Ditto	Stage colliap-sing	Bert Iles	Ditto	36	1	1	While placing a "cap" in position, temporary staging collapsed; he fell and broke his left arm
Oct. 10	Ditto	Ditto	Fall of rock-drill	Michael Kearns	Married	49	—	1	While lifting a machine-drill on the "bar," it fell and crushed his finger
Oct. 27	Ditto	Ditto	Explosion	Thomas Ma-guire	Ditto	47	—	1	While endeavouring to spring a "hung up" mullock-pass, an unexpected explosion took place, fracturing his skull
Nov. 22	Ditto	Ditto	Fall of sur-face rock	John Withers	Ditto	40	—	1	While "barring down" in the open cut, a piece of rock sprang back and struck him, fracturing his ribs
Nov. 30	Ditto	Ditto	Jammed be-tween truck and timber	Charles Horace Ion	Single	19	—	1	While trucking mullock he got his left arm caught between "truck and timber" and severely fractured it
Dec. 23	Ditto	Ditto	Aerial buc-ket left running-rail	Alfred Simons	Ditto	18	—	1	An aerial bucket left the run-ning rails, and Simons, trying to recover it, got his finger crushed between the catch-clip and the hanger
Dec. 30	Ditto	Ditto	Fell over embank-ment	Henry Hayes	Married	44	—	1	While gathering firewood at the flux quarry, he fell over embankment and bruised his shoulder, together with re-ceiving scalp wounds

REPORT OF THE CHIEF INSPECTOR OF EXPLOSIVES.

Chief Inspector of Mines Office,
Hobart, Tasmania, 3rd May, 1915.

SIR,

I HAVE the honour to submit herewith my annual report in connection with the working of "The Explosives Act, 1900," and "The Inflammable Oils Act, 1910," for the year ending 31st December, 1914.

The administration of this Department was transferred from the Inspection of Machinery Branch to the Inspection of Mines Branch at the end of June, 1914.

It has been customary for the annual report to be compiled to the end of June each year, but as other annual reports of the Mines Department are made to the end of December, it has been considered advisable to issue the report in connection with explosives and inflammable oils for the same period; it is therefore impracticable to compare the tables with the previous year.

The following tables show the explosives imported into Tasmania during the year 1914 and their approximate value:—

Name.	Quantity.	Total Value.
	Lbs.	£
Gelignite	266,750	} 23,009
Blasting powder	113,500	
Ammon ligdyn	5050	
Monobel powder	35,600	
Excellite	12,500	
Blasting gelatine	157,500	
Sporting powder	9650	
	500,450	
Detonators	539,500	

The quality of the explosives imported was very satisfactory; no complaints were received, and there were no accidents which could be attributed to the quality of the explosives.

Licences were issued for eighty-two private magazines, which have been inspected. In several cases it has been found that more care could be exercised, and in such cases the owners have been notified that, unless the regulations are

strictly enforced in future, action will be taken. The construction and position of some of the magazines are not all that can be desired; in such cases steps have been taken to overcome this difficulty.

Ten permits were issued to convey explosives, and the holders of the permits have carried out the provisions of the regulations in a satisfactory manner. Explosives have been carried without permission, and with little regard to safety. The investigation of an explosion showed that the explosives were carried as ordinary merchandise on a passenger steamer without authority, and that it was a practice; action was taken and a fine imposed. This and other steamers have applied for permits, and the steamers have been provided with suitable magazines.

Forty-eight permits were issued to sell explosives. The holders of magazine licences have complied with the regulations in a fairly satisfactory manner; but in the case of persons storing less quantities than is necessary for a licence, the method of storage has been far from satisfactory, and in many cases in a very dangerous manner. It is the intention to have more frequent inspections made of these premises, and to insist on the provisions of the Act being strictly complied with.

Eight permits have been issued to import explosives. It has been found that firms have been importing without permits; attention has been drawn to the matter.

There are Government public magazines at Hobart, Launceston, and Strahan. These are maintained in good order, are kept clean, and the provisions of the Act are rigidly enforced.

Inflammable Oils.

Eighty-four premises were registered for the storage of inflammable oils, and the provisions of the Act complied with in a satisfactory manner.

A considerable amount of trouble has been experienced by persons storing without registering. Action was taken in one case, and a fine imposed. A warning had previously been given, which did not have any effect.

Three stores have been licensed to store more than 5000 gallons, and five others to store quantities not exceeding 5000 gallons.

The total revenue obtained was £387 11s. 2½d. Details of revenue are as follow:—

Revenue—	£	s.	d.
Magazine rents	273	11	2½
Licence to store inflammable oils	11	0	0
Fees for private magazines	82	0	0
Fees under the "Inflammable Oils Act" ...	21	0	0

Total £387 11 2½

Accidents.

The following accidents have been reported and inquired into by the Inspectors of Mines:—

Date.	Locality.	Explosive.	Name of Person.	No. of Persons		Cause of Accident.
				Killed.	Injured	
1914. 9 Jan.	Gormanston	Nitro-com- pound	Reginald Matthews	—	1	Returning to stope before all holes had exploded
12 Feb.	Zeehan	Nitro-com- pound	T. Piper	1	—	Struck a charge, which had miss- fired, with a pick
	Waratah	Nitro-com- pound	A. Courts	—	1	Struck by a stone from shot on sur- face of mine
10 Sept.	Hobart Brick Works	Nitro-com- pound	William J. Thomas	—	1	While bulling a deep hole he dropped the detonator and fuse into the hole, which exploded before he could get away
28 August	Lyell	Nitro-com- pound	Walter Cousins	1	—	While standing in shelter tunnel was struck by a stone from explosion in open-cut
13 Oct.	Devonport	Nitro-com- pound	Michael Lonergan	—	1	Struck on the head by a small stone flying from blast in quarry
27 Oct.	Lyell	Nitro-com- pound	John Saun- ders	—	1	Clearing an ore-pass while it was hung up, dropped a charge down a pipe, which exploded before he could escape
10 Nov.	Zeehan	Nitro-com- pound	Thomas McGuire.	1	—	Was apparently carrying explosives in his shirt which exploded

Prosecutions.

There were two prosecutions for breaches of the "Explosives Act." One for conveying explosives by steamer without a permit; a fine of £1 and costs was imposed. One for storing explosives without a licence; a fine of £5 was imposed. In this case the explosives were stored in a barn, which caught fire; an explosion followed, causing considerable damage.

One prosecution was taken for not complying with the provisions of the "Inflammable Oils Act"; a fine was imposed of £2, together with costs. In this case previous warning had been given.

I beg to tend my appreciation to the officers who have been responsible for the carrying out of the Acts.

I have, &c.,

J. O. HUDSON,
Chief Inspector of Explosives

The Secretary for Mines.