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TASMANIA



REPORT

OF THE

SECRETARY FOR MINES

FOR

YEAR ENDING DECEMBER 31

1922

Including Reports of the Inspectors of Mines, Director  
Geological Survey, Government Geologists, Government  
Assayer, Mount Cameron Water-Race Board. &c.



Tasmania:

JOHN VAIL, GOVERNMENT PRINTER, HOBART

1s. 6d.]

1923

14184

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## Report of the Secretary for Mines.

Mines Department,  
Hobart, 25th May, 1923.

SIR,

I HAVE the honour to submit my report on the Mines Department and the Mining Industry for the year ending 31st December, 1922.

I was duly appointed to the position of Secretary for Mines on 1st May, having performed the duties pertaining to the office, in the capacity of Acting-Secretary, since November, 1920.

### GENERAL REMARKS.

The aggregate value of minerals raised during the year was £1,013,415, being an increase of £190,564 on the output for the previous year. The principal increases were in silver, £65,861; lead, £86,016; pyrites, £16,041; and those which show a decrease are:—Gold, £12,397; copper, £71,628; and tin, £17,850.

### APPENDICES.

Appended will be found:—

- Annual Report of Mt. Cameron Water-race Board.
- Report of the Director of the Geological Survey.
- Reports of the Government Geologists and Government Assayer.
- Report of the Chief Inspector of Mines.
- Report of the Chief Inspector of Explosives.
- Reports of the Inspectors of Mines.

## AID TO MINING.

During the period under review there has been a steady improvement in mining throughout Zeehan district. In the latter part of the year some very fine surface-shows of galena were uncovered 3 miles from central Zeehan, toward the northern extension of the Heemskirk Range. This has stimulated prospecting, which is now more active than it has been for 15 or 16 years. Another factor which has occasioned a movement has been the announcement of the Electrolytic Zinc Company of their intention to erect a flotation unit to treat the mixed galena-zinc ores. This has caused 20 tribute parties to apply for areas, mostly at the Comstock. Should the Electrolytic Zinc Company be able, as the result of experiments now progressing, to take the mixed ores at a satisfactory price, a good expansion in mining will eventuate. South of the Comstock are the extensive flats of the T.L.E. and Stonehenge, which extend through to the Swansea. There is a large amount of mixed high-grade galena and blende in the lodes which run through those flats, but capital is required by parties operating owing to the water difficulty.

For the year the assistance given to tributers totalled £631 for 1142 feet of driving. Some galena lodes were found, and a large deposit of iron pyrite was cut through on the Susanite. Negotiations for the sale of this ore are proceeding, and driving is being continued with the hope of meeting silver enrichments.

The No. 2 Argent Mine was unwatered early in May last, and 25 men have been constantly employed. Ore of the value of £10,278 has been won. This mine gives promise of proving valuable at a lower level, but the syndicate which is operating is not financially strong enough for the undertaking.

The No. 6 Argent Mine was unwatered in August to the 120 ft. level. Driving south was commenced, and new makes of ore on No. 3 and 4 lodes were found. These have proved very productive, and so far have yielded ore of the value of £4158. This must be classed as entirely new ore, as nothing has yet been won below the 120 feet level. The developmental method of this mine is unusual. The main shaft is distant 240 feet from the valuable lodes at the 120 feet level, the distance increasing with depth owing to the dip. Hence, to obviate the expense of driving long crosscuts, an adit was driven from the surface to 240

feet from the main shaft, and an auxiliary shaft sunk to the 120 feet level. This auxiliary shaft will be continued downward, and the lodes worked therefrom. Pumping is by means of 240 feet of flat rods from the main shaft bob to another bob at the auxiliary shaft. Provided that the heavy water is controlled this mine should yield large quantities of high-grade ore. Men constantly employed, 45, and this number shortly will be considerably increased.

The Swansea Mine, which was opened with State assistance, has had a successful year. The lode, in one place, was 12 feet wide of galena, assaying 19 oz. of silver and 66 per cent. lead. The lode has been traced on the surface for 1000 feet. Stacked in heaps are 900 tons of excellent zinc sulphide.

Several co-operative parties and tributers have obtained payable returns, the good metal prices being very encouraging.

The assaying of ores has been continued at a nominal charge of 1s. per prospect sample, and 5s. per sale sample. This work during the latter part of the year was heavy. Sale samples to the number of 275, and prospect samples numbering 631 were treated. These entailed 2588 separate metal determinations. Also, 72 mineral identifications were made. All necessary tribute surveys were again carried out free of charge.

The total quantity and value of ore sold during the year was as follows:—

	Quantity.	Value.	
	Tons.	£	s. d.
Silver-lead ore ... ..	833·8712	18,963	6 5
Pyritic ore ... ..	Nil.	Nil.	
	<hr/>	<hr/>	<hr/>
	833·8712	£18,963	6 5

The amount received from ore sales was £9223 15s. 9d., which was distributed as follows:—

	£	s.	d.
Paid to tributers ... ..	7,638	5	5
Royalty paid to lessees ... ..	351	11	2
Royalty paid to State ... ..	1,178	4	10
Miscellaneous payments to State ... ..	55	14	4
	<hr/>	<hr/>	<hr/>
	£9,223	15	9

EXPENDITURE.		£	s.	d.
Salaries		475	0	0
Wages		75	10	0
Office expenses		26	12	11
Assay material		116	18	1
Miscellaneous expenses		70	17	4
Advisory Board—Salary of secretary		6	5	0
Royalty paid Mt. Zeehan (Tas.) Silver-lead Mines, No Liability, in respect of ore from No. 6 Argent		14	10	2
Assistance to prospectors		623	10	6
Advance to No. 6 Argent Prospecting Syndicate, No Liability		1,247	10	4
Advance to No. 6 Argent Mining Company, No Liability		4,647	17	6
		<u>£7,304</u>	<u>11</u>	<u>10</u>

RECEIPTS.		£	s.	d.
Royalty paid by tributers	£1,133 5 2			
Less rebate, pumping account, No. 2 Argent P.S.	107 5 5			
		1,025	19	9
Assay fees		115	9	0
Loans repaid		389	9	6
Interest on loans		202	15	2
		<u>£1,733</u>	<u>13</u>	<u>5</u>

#### NO. 2 ARGENT PROSPECTING SYNDICATE, N.L.

During the year the sum of £575 8s. 7d. was advanced to the syndicate in connection with the purchase and installation of plant, &c.

The amount received from the syndicate in royalty was £731 15s. 2d., which was credited as follows:—

	£	s.	d.
Tribute royalty	224	4	10
Pumping account	252	16	6
Installation of plant (loan account)	254	13	10
	<u>£731</u>	<u>15</u>	<u>2</u>

The syndicate's loan account at the 31st December, 1922, stood as follows:—

	£	s.	d.
Total amount advanced	3,222	10	4
Repaid by royalty on ore sold	837	17	10
	<u>£2,384</u>	<u>12</u>	<u>6</u>

No. 6 ARGENT MINING COMPANY, NO LIABILITY.

During the year the sum of £4647 17s. 6d. was advanced to the company. The net proceeds from ore sold from the mine amounted to £1284 3s. 3d., from which the State received in tribute royalty, £13 4s. 3d.; in liquidation of loans, £153 3s. 5d.; and in interest on loans, £151 14s. 11d.

The company's loan account at 31st December, 1922, was as follows:—

	s.	d.
Total amount advanced ... ..	9,004	13 11
Repaid by royalty on ore sold ... ..	2,148	8 11
	<hr/>	
Balance owing ... ..	£6,856	5 0

GOLD.

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

	Fine Ozs.	
Beaconsfield ... ..	219 45	
Lefroy ... ..	7 926	
Lisle, Golconda ... ..	79 636	
Mt. Claude ... ..	125 375	
Mt. Cameron, Mt. Victoria, and Warren- tinna ... ..	75 712	
Mathinna ... ..	806 985	
North-West and West Coasts ... ..	2,116 402	
	<hr/>	
Total ... ..	3,431 486	

Value, £15,998.

*Beaconsfield.*—Outside prospecting, which is still being carried on by a few small prospecting parties, very little is being done in this district.

*Lefroy and Back Creek.*—A little prospecting has been carried on at Lefroy.

At Back Creek, Moore and Birkett have discovered a further patch of rich specimens.

*Lisle.*—At the New Bonanza and Lisle Sluicing Companies' Mines small recoveries of alluvial have been made, water, or the want of it, being the chief difficulty that both have to contend with. The former are bringing in a 12-mile race from the head waters of the Forester River, which when completed will overcome the trouble, and permit continuous operations on this property. Between 20 and 25 men have found employment.

*Golconda-Panama.*—On the Mt. Brown Company's and Jack's sections prospecting has continued. On the former new makes of stone were discovered which from dolly and assay tests should prove profitable with a battery. Off and on about 10 men have been employed.

*St. Patrick's River.*—The Messrs. Brock Bros. have put in a tunnel for a distance of 155 feet through very hard country, and have driven 35 feet on the reef without striking anything of value. Average number of men employed, 7.

*Forester Settlement.*—Linton Prospecting Association.—The following is a short report by the mine manager (Mr. J. T. Stubs), of work done by the above association for the year ending 31st December, 1922:—

No. 1 tunnel (50 feet), No. 1 reef, driven on for 180 feet. Winze sunk 21 feet, total depth from surface 84 feet, at which depth the reef is 2 feet wide, carrying payable prospects. The reef where driven on carries more or less gold for full distance, and about 60 feet in length carried payable prospects.

Crosscut north driven 185 feet, and intersected No. 2 reef, which was driven on for a total distance of about 100 feet, carrying payable prospects. Two shafts have been put down on this reef, 48 feet deep, and these carried some very good stone. A winze was sunk 32 feet from floor of drive, or 80 feet from surface, also proving some payable stone.

Surface-trenching has disclosed payable stone about 150 feet eastward on the line of No. 2 reef. No. 2 tunnel to intersect No. 2 reef at 120 feet, and No. 1 reef at 135 feet from surface has been driven 493 feet from entrance, passed through what is very probably the footwall of No. 2 reef at 303 feet, and which will be driven on later, and expect to drive another 95 feet before intersecting No. 1 reef.

No. 3 reef, located near boundary of section, was sunk on for a distance of 14 feet, showing some good quartz. A tunnel to prove this reef at a depth of 60 feet has been driven further east for a distance of 100 feet, but have not yet located the reef.

Work being confined to development and prospecting, no quartz other than that obtained from above work has been broken out, but if the No. 2 tunnel now being driven opens up a fair amount of payable quartz, steps will be at once taken to erect a suitable crushing-plant, and the dif-

ferent reefs will be practically ready for stoping operations. Number of men employed, 7.

Country, sandstone and slate, favourable for comparatively cheap mining.

*Mt. Victoria.*—Interest in this district has been revived, and there are several of the old mines being reopened. An Adelaide company (The Ringarooma United Gold Mining Company, N.L.) has taken over the sections which include the old Rinagrooma Gold Mine, and is making preparations to erect machinery to further exploit the property.

At the Mt. Victoria Struggle underground prospecting has been continued. A 20-foot overshot water-wheel and a 5-head battery have been erected. Prospecting is being carried out on the Golden Leader, Blair's, Holloway's, and Fowler's sections.

*Mathinna.*—New Golden Gate Mine.—Work on this mine was confined to stoping between the 316 feet and 500 feet levels, and 1416 tons of quartz were obtained and treated, and yielded 802·395 oz. of gold. Average number of men employed, 24.

At the Old Boys' Mine Messrs. H. C. and C. A. Brock sunk two shafts, one to a depth of 113 feet, and the other to a depth of 80 feet. Some fairly good stone was struck, but the prospects varied considerably. Average number of men employed 11.

*Mangana.*—Tower Hill Mine.—The mine manager (Mr. C. Chesshire), reports:—

Two shafts have been sunk, each to a depth of 53 feet, namely, No. 1 and No. 2. From No. 1 shaft a crosscut was put in 50 feet south; drive from shaft east on course of first make of stone, 46 feet; crosscut south from end of this drive, 12 feet; drive west on same make of stone, 35 feet; total driven from this shaft, 146 feet. No. 2 shaft: Driven south from this 6 feet between No. 1 and No. 2 shafts; opened upon two leads, one cut shot out in depth 7 feet, and the other 12 feet; have also done a fair amount of surface work on the various leases. Men employed from April to end of August, 10; from that date on five more have been employed. We have had no bulk crushings from this mine yet.

*Long Plains.*—Shore's Success Mine.—The No. 4 tunnel was picked up, cleaned out, and drained, and a truck line laid, but no ore was taken out. Number of men employed, two.

## SILVER-LEAD.

The quantity of silver produced was 794,585 oz., valued at £123,437.

The producers were:—

	Ounces.	Value. £
<i>Zeehan Mines—</i>		
Mt. Zeehan (Tas.) ... ..	9,912	1,554
Nike ... ..	22,249	3,490
Zeehan-Montana... ..	9,197	1,417
Oonah ... ..	8,900	1,376
Swansea (Dunn)... ..	10,696	1,640
Zeehan Queen ... ..	5,128	806
No. 6 Argent ... ..	14,961	2,255
No. 2 Argent ... ..	26,892	4,148
Colston... ..	3,464	537
Comet ... ..	5,905	917
Others ... ..	6,465	999
	<hr/>	<hr/>
North Mt. Farrell ... ..	123,769	19,139
Magnet Mines ... ..	201,059	31,056
Round Hill ... ..	335,818	52,545
Mt. Lyell ... ..	14,240	2,186
	<hr/>	<hr/>
Total ... ..	794,585	123,437

The quantity of lead produced was 4925·88 tons, valued at £118,257.

The producers were:—

	Tons.	Value. £
<i>Zeehan Mines—</i>		
Mt. Zeehan (Tas.) ... ..	118·40	2,760
Nike ... ..	240·90	5,745
Zeehan Montana ... ..	73·12	1,692
Oonah ... ..	67·81	1,625
Swansea ... ..	378·09	9,311
Zeehan Queen ... ..	62·27	1,486
No. 6 Argent ... ..	76·11	1,903
No. 2 Argent ... ..	250·75	6,130
Colston ... ..	31·63	735
Comet ... ..	5·14	116
Others ... ..	100·64	2,372
	<hr/>	<hr/>
North Mt. Farrell ... ..	1,404·86	33,875
Magnet Mines ... ..	2,022·14	47,910
Round Hill ... ..	1,318·68	32,019
	<hr/>	<hr/>
Total ... ..	4,925·88	118,257

*Northern Division.*—Mt. Claude—Round Hill Mine.—Work has been continued in the main adit and overhead stopes, which have produced appreciable quantities of “firsts” and concentrating ore, in addition to which an engine winze, mounted with poppet frames and winding gear, has been sunk 90 feet, and opened out at 80 feet on the lode’s strike and channel. Average number of men employed, 33

Section 8905-m, formerly known as the Round Hill Extended, and worked by (1) James, (2) Carlson, and (3) others, has recently come again into notice by workmen from the Round Hill Mine in their spare time unearthing slugs and veins of galena from the floor of the old workings that is likely to call for further notice.

*Moina.*—On the Wilmot River in a section taken up in the name of G. W. Kemp, samples of exceptionally clean galena were found, but no further progress has attended this discovery.

*Eastern Division.*—Scamander.—Lady Betty Mine.—The mine manager (Mr. Walter Windred) reports:—A shaft, 6 feet by 3 feet in the clear has been sunk, timbered, centred, and laddered to a depth of 66 feet, and drive was put in west from the bottom of the shaft 17 feet. In that drive a silver-bearing vein of ore was cut, and drive was put in north for 100 feet on this vein. Midway in that drive a winze was sunk on vein 37 feet. Several hundred feet (deep in places) of costeening have been done on the surface with a view of picking up a continuation of the vein going south from above workings.

*North-Western Division.*—Magnet Silver Mine.—The mine manager (Mr. R. G. Hales) reports:—Ore treated, 19,063 tons; metal obtained, 3073 tons; gross value, £61,617; nett value, £35,341; men employed, 132.

The principal mining operations have been confined to driving north and south on the footwall portion of the lode at No. 14 level for a distance of 149 feet. Payable ore has been mined for the whole distance, with ore still showing in the south drive, the north drive having reached the slide or dolomite which cuts the ore off. As the whole of the ore-bearing material cannot be taken out in the drive, wing stoping has to be brought into operation, the lode both north and south being stoped for a width of 15 feet on the ground floor in payable ore. Stoping over the back for a height of 15 feet and a width of 20 feet not

always on payable ore, but to ensure getting all the ore this width has to be taken out, the waste rock being put back in the stope for filling. I am pleased to say that the metal contents at this level have considerably improved on the contents at No. 13 level, the rich ore-vein on the footwall being wider, with a corresponding increase in values for a greater width to the hanging-wall.

No. 13 Level.—Stoping, with payable results both north and south, is the only work being done at this level.

Nos. 11 and 12 Levels.—Stoping has been carried out with fair results, and an improvement in metal contents is looked for in the near future.

No. 10 Level.—A little work has been done at this level with a view of picking up the main strike or track that will lead us south under the central shoot of ore worked south at No. 9 level. As there are quite a number of small veins it is difficult to pick up the right one, but from the work done I am very hopeful that we have picked up the right one, which will return profitable results.

Adit.—An adit level was started about 100 feet south, and 60 feet above No. 4 tunnel or approach to the main shaft. After driving 200 feet west a small vein of metal was passed through; the drive continued on for 40 feet through a gossan formation with veins of metal from 1 inch to 8 inches wide. Although not payable for any width, if three of four of the small veins can be carried in one drive they may be made to pay, as the ore is of high-grade, assaying up to 173 oz. of silver, 50 per cent. of lead, and 3 dwt. of gold. It is our intention to prospect south along the contact of the dyke rock and lode matter by driving a crosscut into the lode at intervals to see if the veins passed through in the adit improve in value going south.

I consider the prospects of the mine are very encouraging, especially at No. 14 level, which is 1000 feet below the outcrop where payable ore is being mined.

From a geological point of view I think the Magnet Mine should have more attention paid to it by advising mining men from other States when visiting Tasmania to include Magnet in the mines to be visited. Every facility will be given to anyone who would like to pay the mine a visit, if they or the Mines Department would advise me of their intended visit.

Victorian Magnet S. Mine.—Five men are still employed here driving and cross-cutting up in the oxidised zone of country.

Mt. Jasper Copper Mining Company are still working at what is known as the "Right Mine." Some five men are engaged on a very buncny make of galena.

*Western Division.*—The Mt. Zeehan (Tas.) S.L.M. Company continued work at their Britannia Mine, hand-picking out the first-class ore, sending the remainder to their concentrating mill for treatment. The company decided to go into liquidation, and stopped all active mining operation. Before doing so they put the mill in order, and crushed all the ore they had at grass, also treating all there was available from other sources. The Britannia Mine has been let on tribute to two men, who are making fair wages.

No. 2 Argent Prospecting Syndicate, No Liability.—The mine manager (Mr. W. J. Turner) reports as follows:—The new electric pump was put into commission on 16th January, 1922, and the mine was drained of accumulated water on the 25th February. The many difficulties encountered in draining and pumping out an old mine were successfully overcome, but unfortunately for the syndicate an accident occurred to the pump motor on February 28th, which necessitated sending the motor to Melbourne for repairs. On March 12th the pump was again put into commission, and on 12th April the mine was once more drained of accumulated water.

The syndicate struggled along until September under adverse circumstances. It was then decided to let the mine on tribute to the employees of the syndicate.

On September 11th the sub-tribute party commenced work, which has been confined chiefly to the stopes on No. 30 lode, between Nos. 1 and 2 levels, and the winze on "Hornsby's Lode," No. 1 level.

The winze on "Hornsby's Lode" is down 50 feet. Hauling material by means of a windlass and man-power from a greater depth than 50 feet is both slow and laborious, therefore this lode should be attacked from the No. 2 (bottom) level of the mine. There is a fairly large block of ground on No. 30 lode, both above and below the No. 1 level, which may provide profitable employment for some time to come. Active mining operations are going on in this portion of the mine.

There are several lodes between Nos. 1 and 2 levels that are worthy of attention if capital was available to develop them, e.g., "Watson's Lode," "No. 13 Lode," "Hornsby's Lode," and "No. 15 Lode."

No. 30 lode is well worth developing below the present bottom level of the mine. This is the main lode of the mine, and could be developed to a certain extent by means of a winze. Payable ore is showing along the bottom of the level. W. Smith, a sub-tributer, put a winze down 25 feet on No. 11 lode, No. 2 level. Very good values were obtained, and a very nice lode of galena is showing in the bottom. In driving north a burst of water was encountered, and the work was discontinued. Mr. Smith is now putting in a small electric pumping and winding plant to develop the lode at greater depth. This winze is the deepest working in the mine, and carries very high-grade galena.

Nike Mine.—A large amount of developmental work has been carried out with, at times, encouraging prospects.

J. Colston, tributer, is still working on his area.

Oonah Mine.—Bell Brothers have continued working their tribute, and for a time were doing very well.

Swansea Mine.—This mine has been in active operation, and a good bunch of ore has been won above No. 2 level. A new shoot of ore has been struck in the north end.

Clarke and Brown and party have done a good deal of prospecting on the old Barnett and Quigley tribute, and towards the end of the year made a promising discovery of galena, and the lode, where exposed, shows 4 feet of good ore.

*North-East Dundas.*—At the Hercules Mine at Williamsford a rise has been put up from No. 5 level to No. 4 level for a main ore-pass. A few small parcels of ore have also been broken and sent to Zeehan to the experimental flotation plant for treatment, where a considerable amount of research work has been carried out with a small flotation unit.

*Mt. Farrell District.*—North Mt. Farrell Mine.—The mine manager (Mr. Owen B. Williams) reports:—Underground.—The No. 3 level has been advanced 12 feet only during the term.

At No. 4 level the main north drive has been advanced a total distance of 134 feet north, making it 915 feet north of the shaft; a rise has been put up connecting it to No. 3 level. Stopping has been carried out above the No. 4 level during this period, and has produced average grade milling ore.

No. 5 Level.—Stopping has been carried on above this level throughout the year, and the ore of good grade, with a little prill ore obtained.

No. 6 Level.—This has been driven 347 feet for the year, and stoping also has been carried on, producing some high-grade ore, and a large tonnage of average grade seconds. The shaft has been sunk a further 109 feet below No. 6 level, and a plat cut for No. 7 level at a point 95½ feet below No. 6.

The total amount of development work done during the term is as follows:—

Driving levels ... ..	692 feet
Driving intermediates ... ..	100 feet
Rising ... ..	659 feet
Crosscutting ... ..	95 feet
Winzing ... ..	30 feet
Shaft-sinking ... ..	109 feet
Total ... ..	<u>1685 feet</u>

A statement of output of crude and marketable ore, with number of men employed, &c., is attached:—

Crude ore hauled ... ..	23,822 tons
Marketable ore produced ... ..	3,496 tons
Ounces silver produced ... ..	201,061 ozs.
Value ... ..	£30,080
Tons lead produced ... ..	2,022 tons
Value ... ..	£47,335
Number of men employed ... ..	130

### COPPER.

The quantity of copper produced was 5616 tons, valued at £391,535.

*The Mt. Lyell Mining and Railway Company Limited.*—Ore and metal-bearing flux smelted (as reported by the general manager), were as follows:—

Source of Material.	Tons (dry).*
Ore from the Company's Mt. Lyell Mine ...	21,088
Ditto from the Company's North Lyell Mine ... ..	11,373
Concentrates from the Company's North Lyell Mine ore ... ..	24,821
Total ... ..	<u>57,287</u>

Blister copper produced, 5661 tons, containing—Copper, 5616 tons; silver, 119,699 oz.; gold, 2067 oz.; approximate value, £416,017.

Average number of men employed :—

Mining Department—

At the Company's Mt. Lyell Mine...	170
At the Company's North Lyell Mine	272
At the Company's Lyell Comstock Mine ... ..	2
At the Company's Crotty leases... ..	17
	461

Reduction Works Department (including Lake Margaret) ... .. 373

Railway Department—

Mt. Lyell Railway ... ..	99
North Lyell Railway ... ..	9
	108

Total ... .. 942

Dividends paid during year, £64,459 15s. = 1s. per share.

Dividends paid from the inception of the Company to the 31st December, 1922, £3,894,469.

Copper produced from the inception of the Company to the 31st December, 1922, 180,160 tons fine.

Silver produced from the inception of the Company to the 31st December, 1922, 13,083,927 oz. fine.

Gold produced from the inception of the Company to the 31st December, 1922, 378,399 oz. fine.

The principal feature of the mining operations during the year was the further reduction in the consumption of pyrites for smelting purposes, this being due to the reorganisation of the ore-treatment plant.

Mount Lyell Mine.—A limited amount of development work was carried out during the period. Underground work was discontinued early in the year in consequence of the elimination of Mt. Lyell sulphide ore hitherto used in the smelting process, with the exception of a small tonnage required mainly for the purpose of controlling the grade of matte. The export of pyrites to the mainland for the production of sulphuric acid required for the manufacture of superphosphate was recommenced during the term. A small amount of copper precipitates was won from the overflow waters of the underground workings towards the end of the year.

North Lyell Mine.—The development work in this mine was again of limited extent. Ore extraction was actively maintained throughout, the principal source of production being the 850-1100 feet levels inclusive.

The precipitation plant produced the usual tonnage and grade of precipitate during the year.

Lyell Comstock Mine.—No mining was done in this mine, work being restricted to the maintenance of plant and buildings.

Reduction Works.—Early in the year the direct smelting of North Lyell ore, with the exception of a small tonnage of high-grade material, was discontinued, blast furnace operations being practically restricted to the treatment of concentrates produced by wet concentration from North Lyell ore. In consequence of the changes in the method of ore treatment, the tonnage of Mt. Lyell pyrites required for the blast furnace was reduced to a minimum, the figure being approximately 1000 tons per month for the last nine months of the year. The metal-bearing material furnaced during the year totalled 57,287 tons, including 21,088 tons of Mt. Lyell pyrites, 11,378 tons of North Lyell ore, and 24,821 tons of concentrates produced from North Lyell ore.

An 18-inch 9-compartment sub-aeration flotation unit was in course of construction during the year, which when completed will treat a considerably greater tonnage than was possible by the standard machine used hitherto.

The further additions to the Sinter handling plant in course of construction during the latter part of the year will, when completed and in operation, materially improve the metal output, as the greater capacity will permit of the maximum tonnage of concentrates produced from North Lyell ore being prepared for treatment in the blast furnace.

Hydro-Electric Plant.—The company's hydro-electric plant at the Lake Margaret supplied the whole of the power and lighting requirements for the period.

#### TIN.

The quantity of metallic tin won was 679·44 tons, valued at £112,407, an average value of £165 8s. 9·7d. per ton.

The statistics for the year are:—

	Value.		Miners Employed.
	Tons.	£	
Northern and Southern Division ... ..	1·11	174	27
North-Eastern Division ... ..	403·24	67,385	312
Eastern Division ... ..	119·44	19,385	156
North-Western Division ... ..	122·05	20,135	80
Western Division ... ..	33·60	5,328	45
Total ... ..	679·44	112,407	620

*Northern Division.*—The output was 1·11 tons, 31 of which came from the S. & M. Mine at Moina.

*North-Eastern Division.*—The output of tin was 403·24 tons, obtained as follows:—

*Pioneer and Gladstone Districts.*—

	Tons.	Tons.
Pioneer Tin Mine .....	154·77	
South Mt. Cameron .....	1·15	
Endurance .....	64·38	
Other claims .....	39·38	
	<hr/>	259·68

*Ringarooma, Derby, and Branchholm Districts.*—

Briseis Tin Mines .....	92·20	
Arba Tin Mine .....	27·65	
New Ruby Flat .....	4·30	
Other claims .....	18·91	
	<hr/>	143·06

*Moorina District.*—

Weld Tin Mine .....		50
Total .....		<hr/> 403·24

*Eastern Division.*—The output of tin was 119·44 tons, obtained as follows:—

*Weldborough, Lottah, and Blue Tier Mines.*—

	Tons.	Tons.
Total .....		41·35

*St. Helens Mines.*—

Argonaut .....	17·87	
Others .....	31·76	
	<hr/>	49·63

*Avoca Mines.*—

Story's Creek .....	21·43	
Others .....	7·03	
	<hr/>	28·46
Total .....		<hr/> 119·44

*North-Western Division.*—The output of tin was 122·05 tons, obtained as follows:—

	Tons.
Mt. Bischoff .....	115·62
Waratah Sluicing .....	3
Mt. Balfour .....	2·41
Others .....	1·02
	<hr/>
Total .....	<hr/> 122·05

*Western Division.*—The output of tin was 33·60 tons, obtained as follows:—

	Tons.
Dreadnought Boulder ... ..	83
Montana ... ..	2·54
Renison Bell ... ..	23·42
Others ... ..	6·81
Total ... ..	33·60

*Northern Division.*—The S. and M. Syndicate, Moina.—Owing to the value of products being less than cost of production, the work done on this mine consisted of completing erection of concentrating mill and prospecting only.

Cethana-Lorinna.—On Sections 8278-m, known as the "Tin Spur," and 8465-m, situated at Bull Creek, on the Ferth River, work has recently started, and found employment for six men.

*North-Eastern Division (Derby).*—The Briseis Tin and General Mining Company Ltd.—The output of black tin for the past 12 months was 126·5 tons, containing 92·20 tons of metallic tin, which realised £15,650. The average number of men employed was 80.

The following interesting particulars relating to the diversion of the Ringarooma River by the company have been kindly furnished by the manager (Mr. Lindesay C. Clarke):—

Diversion of Ringarooma River at Derby, Tasmania.—The Briseis Company, which was formed to work leases on the southern side of the Ringarooma River on what is known as the Cascade Lead, and carried out operations on a large scale since 1903, secured the Ringarooma Company's property on same lead on the north side of the river in 1906. The river divided the properties.

The lead at this point ran in a north-westerly direction under Krushka's Flat (called after the original discoverers of the lead), and then under the high basaltic hill opposite Derby; the river flowing south-easterly at the foot of the town on the western side of the lead and parallel to it for some distance, then it turned sharply to the north-east across the lead, and was joined by the Cascade River.

The problem was to work the old lead with its gutter 90 to 110 feet below the river, both confined within a narrow valley, with hard granite hills, and the town on the west, and a basaltic hill, 320 feet high, on the east. The main North-East Coast road crossing both river and lead was a further complication. The removal of overburden

200 feet thick was started in 1907, and continued until 1918, and 2,391,800 cubic yards of overburden were removed by hydraulicking and trucking. The main road was diverted round the south of the workings in 1912, involving 60 chains of road and a new bridge. The drift north of the river was attacked in 1911, and after that kept pace with removal of overburden.

Meanwhile on south side the Krushka's Flat workings (which had no overburden, but were below river-level), were started in 1909, and working continuously, approached so close to the river that in August, 1914, the river had to be turned into the first diversion, a channel out some distance to the north-east of old river, progress in stripping of the Ringarooma Mine making that possible.

Krushka's Flat working again proceeded until in December, 1919, the river had to be again shifted further north to the second diversion. After this there was little work done on the Ringarooma faces, but Krushka's Flat workings were carried forward, and the main scrub wall, the foundations of which were started in October, 1917, was built up gradually from the tailings of the ground treated for tin. The sand was lifted either by gravel pumps or jet elevators.

In October, 1921, the Krushka's Flat face had approached the second diversion within the limits of safety, and it was stopped, the wall then being well up to the river-level, but required topping-up to the finished level, and lining. When completed, this wall had a face 1800 feet long, and 120 feet vertical height in its highest places. The actual length of channel formed was about 50 chains.

When the Krushka's Flat face was stopped in October, 1921, all work was then directed to cutting the river channel, mostly out of virgin ground along the foot of the town, and using the spoil, which contained a fair quantity of sandy clay, for lining the inside of the wall to make it water-tight, and to form a water-tight bed under the river where it crossed the filled ground over the worked-out lead. This portion of the work was completed, and the river partly turned on July 18th, 1922, and completely turned on the 8th of the next month.

The shifting of the river necessitated a complete relaying of the water supply from the foot of Christopher-street, and the construction of a bridge to carry a 29½-inch Ringarooma column, and a 20-inch Cascade column across the new river.

All the plants in the various faces had to be rearranged, and everything was ready to fully resume sluicing on 29th August, with the river behind and the working faces ahead.

The channel along its western portion for a length of 1500 feet has a bottom width of 111 feet, mostly in solid ground, with sand tailings wall built up from the bottom of the workings to form the eastern bank. The top width is 165 feet, and the depth 17 feet. Width of wall on top 52 feet, with a slope of scrub wall  $1\frac{3}{4}$  to 1, or nearly 30 degrees. Vertical height of the wall 120 feet. The sand was all pumped up from the bottom and deposited by water, the face being held together by layers of scrub. The natural angle of rest of the sand is 34 degrees, so that the wall is on a slightly flatter slope.

To prevent leakage of water from the channel, a lining of silt or clay 24 feet wide at the bottom of channel, and taken about 8 feet below the bed into the solid, with a slope to the river of  $2\frac{1}{2}$  to 1, was deposited by water on the face of the sand, every effort being made to make this lining as impervious as possible; it is well faced with scrub, and still further protected by stones and heavy gravel.

The sand wall itself was purposely made porous so that any percolation from the channel would drop to the reef, and run out through the shingie and stone foundations at the toe. The toe was further strengthened by dumping all the available hopperings and stone on it.

Where the channel crosses the old lead on filled in tailings the wall has a much greater width at the top, viz., up to 110 feet, and the channel is up to 180 feet in the bottom. The outer side of the channel has a silt lining as in the ordinary channel, but the bed was cleaned up about 10 feet below grade, and about 8 feet of silt deposited, and a layer of 2 feet of sand allowed for to protect the silt from scouring.

Further precautions against scouring were taken by rippling up the outlet with a bar of large stones, and raising the water a few feet above grade to reduce the current across the filled ground. The channel was subjected to a test soon after it was opened, when a slight flood proved the soundness of the work.

**Branxholm.—New Ruby Flat Tin Mine.**—Owing to the adverse state of the metal during 1922, very little work of a productive character was done on the mine for

the greater part of that year, but considerable sums were spent on race and general repairs, &c., the total disbursements on wages alone being £726 3s. 6d., and the number of men employed being, on an average, six.

Arba T.M. Company.—This mine is now on tribute, and gives employment to 16 men.

Bradshaw's Creek.—Pioneer Tin Mine.—Owing to the uneven distribution of the rainfall, sluicing operations were only possible for the last six months of the term. During that period 284,400 cubic yards of drift were pumped and sluiced for a yield of 216 tons 2 cwt. of stream tin. The comparatively small yardage is due to the large proportion of bottom ground worked, which was very hard, and required explosives to break it. Tin values were, however, well maintained.

During the term one of the electric sluicing plants was floated ahead to a new site, and that portion of the transmission line serving it, and its tailings conveyor, erected in a more convenient position.

Garibaldi and Wyniford River.—Sheehan Bros., Clair and Simpson, have worked intermittently, also the Wyniford River Company with 10 or 12 men.

South Mt. Cameron.—Endurance T.M. Company.—This mine with a returned or repeated water supply has been a steady producer, and gives employment to 20 men.

Harman, Johnstone, Rasmussen, Coomber, and others, though small parties, some with steam plants, work ground up to 20 feet in depth with profitable results, and account for about 20 men's employment.

Gladstone.—With the increasing price of metal, and the completion of the Government deviation of the Mt. Cameron Water-race, an impetus must be given to the Gladstone and surrounding districts that are stated to contain profitable areas of ground which henceforth can be more profitably and expeditiously exploited. Messrs. Cross Bros. on the Shallamar Flats have worked some deep ground, to take over which a company, named the Monarch, has recently been floated.

Moorina.—Echo Weld.—A deep face on this mine was worked by gravitation, and four men were employed.

*Eastern Division.*—Weldborough T.P.C. and Ringarooma.—The Weld, Laffer, Bux, Star of Peace, Black Creek, Brice Bros., and several small parties, including Chinese, work about these centres, and employ about 80 men.

Lottah.—Blue Tier.—Small co-operative parties, including the Anchor, find employment for six to 10 men.

St. Helens.—George's Bay, Lanka, Derwent Creek, McAuliffe, Budgeon, and others, are producers, and provide work for about 40 men.

Argonaut Mine.—The completion of the additional water scheme from the Groom River enabled sluicing operations to be carried on continuously throughout the year, 89,100 cubic yards being sluiced for a yield of 25 tons 3 cwt. of stream tin.

Early in the year the low price of tin and increasing poverty of the ground made it necessary to cease operations with the steam-driven centrifugal sluicing plant, and sluicing has since been carried on with a hydraulic elevator in the remaining payable portions of the northern end of the mine that could be worked with a low lift. This is now practically worked out, and preparations are in hand for working the southern portion of the mine in which extensive prospecting has proved large areas of payable ground, most of which can be sluiced by gravitation.

Avoca.—The Story's Creek Tin Mining Syndicate.—During the first nine months of the year the mine continued to be worked by the party of tributers, while the syndicate, employing a few men, completed the erection of a compressor plant, and other surface equipment. At the beginning of September the syndicate resumed operations.

The following is the result of the year's operations:—

Tons mined and treated, 1902.

Yield—Wolfram, 20 tons, value £659; metallic tin, 22'11 tons, value £3124. Total, £3783.

Average number of employees, 43.

At Gipp's Creek, Rex Hill, South Esk, Foster's Freehold, and Brookstead, a little tin was produced. The average number of men employed was 12.

*North-Western Division.*—Mt. Bischoff Tin Mine.—The work performed during the year has consisted of a limited amount of development in the mine, and a small tonnage treatment in the milling and roasting departments. Average of only 43 men were employed on the above work.

A great improvement was made in the roasting department by the installation of a "water blast" for the killing and removal of the sulphur fumes from the township and machinery site areas. Another improvement

has been the utilisation of the sulphur content of the pyritic concentrates being treated in this department for the generation of the necessary heat to convert the sulphide gangue into an oxide.

The Government field geologists recently made a detailed examination of the ore-deposit, and their publication on same is eagerly looked for.

In general, the position during 1922 has been one of waiting for better operating conditions, and it is confidently expected that 1923 will bring such conditions along with a greatly increased activity in the mine workings.

The condensed statistics for 1922 are as under:—

Tons crushed ... ..	4,458
Tons roasted ... ..	1,984

Tonnage Recovered.	Tons. Oxide.	Assay Grade. Per Cent.
By Company ... ..	89·95	64·79
By tributers... ..	84·95	67·49
	<hr/>	<hr/>
	174·90	66·11

Development footage, 1179 feet.

Ore reserve—

Positive tons ... ..	257,000.	Av. grade, 0·35 per cent.
Probable tons ... ..	253,000	

Total tons ... .. 510,000

Since the system of treatment of the low-grade pyritic concentrates was put in hand, 4456 tons of these concentrates have passed through this department for a recovery of 129·9 tons of tin oxide, worth approximately £12,000. The average grade (recovery) has been 1·88 per cent. Sn, which makes it the lowest grade pyritic concentrate being profitably treated in the world to-day.

W aratah Tin-Sluicing Company.—The erection of a 9-head battery was completed early in September. Started crushing September 13th, and for approximately three months 4 tons 14 cwt. of tin ore was won, realising about £80 per ton. The number of men employed was five.

Western Division.—Heemskirk.—Federation Tin Mine.—From the 1st January to the 14th April, under the management of Mr. Keith Lewis, some 300 feet of driving and rising, together with thorough sampling, was carried out, eight men being employed.

Mr. W. Porte took charge on 15th April, and during the rest of the year supervised 40 feet of driving, 3000 feet of trenching and open-cut work, with further sampling and assaying. The average number of men employed for the 12 months was three.

At North Heemskirk District some 9 to 12 men have been at work ground-slucing, but results are not promising.

At South Heemskirk very little is being done. One man is working on Lyall and Greg's mining lease. A little work is being carried on around Mayne's old tin-mine.

North Dundas.—Renison Bell Mine.—The mine has been worked throughout the period on tribute on a restricted basis. The work carried out has to a great extent been of developmental character on oxidised ore, of which limited supplies have been made available for milling.

The tin dressing plant has worked intermittently owing to the fact that ore of sufficiently high grade to pay for working, while the market price for the metal tin remained so low, could not be continuously obtained.

During the term 1365.5 tons of crude ore were mined and treated, which yielded 34.77 tons of tin oxide, containing 21.47 tons of metallic tin, realising £2928.38. The average number of men employed was nine.

No work of any kind has been done on the large deposits of pyritic ore, the potential value of which warrant a comprehensive investigation with the object of determining the best means of commercially utilising the various constituents thereof.

At the X-Gorge and River a little tin has been won during the year, and a small amount of prospecting work carried out on Williams' mineral lease. Just recently these people have been sending trial parcels of ore for treatment to the Renison Bell Tin Mill, but the handling charges are too great for it to pay at present prices.

Montana Tin Mine.—For the best part of the year three men were engaged tributing on the alluvial ground.

Dreadnought Boulder Tin Mine.—Very little work has been carried out here during the year. At present, one man is tributing and obtaining a little tin.

Electric Tin Mine.—This mine continued active operations for a time, but results were disappointing, and the mill was closed.

Just lately further prospecting has been undertaken under new management.

On the northern slopes from Confidence Saddle, on G. Heywood's and D. Albury's Mine, some hydraulic sluicing has been carried out, but results are not very encouraging.

On A. Kemp's lease the owners are now engaged erecting a re-treatment tailing mill to treat an accumulation of Dreadnought-Boulder Tin Mine tailings.

At the Five-Mile, a little ground sluicing for tin, gold, and osmiridium, is being carried out by a few men. The Peace Tin Mine has started work again with two men.

At Stanley River district very little work is being carried out. Work at the Mt. Lindsay Mine has been suspended, and there is only a caretaker in charge. The Stanley River Mining Company surrendered their leases, and Mr. Arnott took portion of the ground up, two men having just started to do some work on it.

#### COAL.

The total quantity of coal raised amounted to 69,238 tons, valued at £61,016.

The raisings at the different collieries were:—

Colliery.	Tons Raised.
Mt. Nicholas ... ..	26,554
Cornwall ... ..	38,702
Cardiff-Jubilee ... ..	1,596
Spreyton ... ..	583
York Plains ... ..	729
Illamatha ... ..	305
Catamaran ... ..	714
Fingal ... ..	55
Total ... ..	<u>69,238</u>

The Mt. Nicholas Coal Company Proprietary Limited.—The manager reports:—"Mining operations have been carried on uninterruptedly during the whole of the year 1922 in the 6-foot seam in this company's leases.

"The main gateway in the longwall workings has been advanced a distance of 1.13 chains, making it a total distance of 63.85 chains in from the tunnel mouth.

"The seam in general is keeping at about its usual thickness, and the quality of the coal is being well maintained.

"The Sirocco ventilating fan, which I mentioned in my last report as being erected then, is now working and ventilating the mine. It is a decided improvement on the previous method.

“ The No. 3 tunnel has been worked during the year, but the main heading has not been advanced.

“ The same seam is being worked in this tunnel as what is being worked in the longwall workings mentioned above, and the coal is of good quality. The total output for the year was 26,554 tons, of a value of £23,635. There were 83 men and boys employed above and below ground.”

At Fingal and Mt. Christie, on the scarps or flanks of Ben Lomond, also the Silkstone, a little attention has been bestowed on each of those properties. With the accessory staffs fully 200 men find employment in connection with those mines.

Gregg's Colliery, York Plains.—A 3- to 4-foot smokeless seam is used chiefly for malting and hop-drying purposes. Five men are employed.

Latrobe.—Spreyton and Illamatha pits, both small, 15 to 24-inch seams are mined, and used chiefly for local domestic purposes, and employ from 6 to 10 men.

Preolenna Coal Mine.—The manager (Mr. Thos. Bottoms) reports:—The main tunnel (No. 2) was commenced, and after advancing 1 chain 16 links, the No. 2 seam (1 foot 3 inches) was struck; then a heading to left was set away (in coal), cutting across the strike of the dip; this heading has advanced 2 chains 80 links. At 50 links along this heading a crosscut, or slant, was set off, and has advanced 1 chain 50 links; and from this slant you will note (on plan), I am turning away two cross-gateways, one to left, and another to right, to set off my longwall workings. Going back to the No. 2 tunnel again, from the 7 chain 22 links mark, continuing in stone until we strike the No. 1 seam (of coal, 2 feet), 8 chains 65 links from tunnel mouth, where I have turned away a heading to right, and one to left (on coal) across the strike of the dip. The right side heading has advanced 42 feet, and the left 38 feet (on coal).

On plan you will note a drive from top tunnel to bottom tunnel, which was driven for ventilation, and about 1 chain 50 links was driven during the year 1922, getting a little coal from this drive, this being the whole of the development work done underground during the year 1922.

At present we have about 70 tons of coal on the surface, and to value it at 38s. per ton = £133.

I am grading and laying main haulage road from No. 2 tunnel mouth to engine site at top of hill, also grading (by filling up) main haulage to screens from top of hill (dipping

from top of hill to screens 1 in 12), thus the engine will pull full skips from No. 2 tunnel to the top of hill, and drop them down on to screens, then again take up the empty set, and drop them down to No. 2 tunnel mouth.

I may state the screens are (or will be) on the main railway extension line, near station.

I am also making a large dam to collect water for boiler purposes. Number of men employed underground, 9; surface, 15.

Catamaran Colliery Proprietary Limited.—The following is a resume of the work carried out at the Catamaran Colliery Proprietary Limited colliery, at Catamaran, for the year ending December 30, 1922:—

Tramway.—Early in March a start was made on the construction of a 2-foot gauge tramway, with steel rails, from wharf at Catamaran River to main shaft workings, a distance of 100 chains. A temporary wharf was constructed at Catamaran River to hold 200 tons of coal. The river has been dredged from the entrance to bin site, a distance of 20 chains, and 10 feet of water at low tide obtained. Plans are now in preparation for a coal bin to hold 500 tons of coal.

Mining.—Early in September last a start was made to unwater the main engine shaft, depth 130 feet. After same was unwatered, operations were started underground by driving out a main level heading, S. 40° W., and this road was driven 150 feet on good coal, height 4 feet to 4 feet 6 inches. Off this level heading three roads have been driven to full rise of the coal seam, No. 1 back heading, main incline, and No. 2 heading. Each road is now up about 100 feet, level roads are being driven off same at 50 feet centre, leaving pillars 40 feet × 40 feet. It is proposed to continue the main incline to surface outcrop for ventilation and haulage purposes, and also to serve as a second exit to main workings. The daily output of coal has now reached 23 tons gross.

Prospecting.—This has been carried out on the 100-acre lease, west of Lease 8242M, with the result that a seam of bright, hard, coal has been exposed, from a picked sample of which the following analysis was obtained:—

Moisture at 105°	4.54
Volatile combustible matter	8.22
Fixed carbon	82.46
Ash	4.78
Sulphur	0.38

We have traced the outcrop of this seam some 20 chains, and are now tracing same across Lease 8242M. Further work will be done on this seam when traced to the nearest point to our tramway. At several places when we have opened this seam on the outcrop it varies from 12 inches to 2 feet in thickness, and appears to increase in thickness as it dips north-west at the angle of  $10^{\circ}$ . Further prospecting has been carried out on the 540-acre section (License to Search), but with unsatisfactory results, small bands only of coal and shale being discovered.

#### SHALE.

Latrobe.—On the Southern Cross Motor Fuel Limited Company the work has been devoted to erecting another system or nest of retorts which it is believed will successfully cope with this important proposition, and satisfy the mine's requirements. Twenty men have been found employment.

The Victas-Mersey Valley and Adelaide Oil Exploration Companies have diamond-drilling plants in operation that have attained depths ranging up to 800 feet.

Mersey Valley Oil Company Limited.—The manager (Mr. J. Andrew Wauchope) reports that the work during the year consisted of putting down a series of holes in order to test the details of structure of the area lying between Sassafra and the Mersey River. Altogether 7 holes, ranging from 2 to 4 inches in diameter, have been drilled. These holes aggregate 4356 feet in depth; the deepest holes drilled are located at the old racecourse, Latrobe, or, as marked on plan, Devon 2, "Recreation Ground." One hole is drilled on the eastern, and one on the north-west margin to a depth of 1000 each. Both holes bottomed in mudstones, passing through a series of mudstones, sands, and other sedimentaries. At 700 feet veinlets of vegetable matter were intersected, through which a sapropelic action had occurred. The No. 1 system of test-holes was drilled at Sassafra on private property. The final hole was drilled near the junction of the Torquay Valley-Devonport and Wesleyvale roads, and bottomed at 300 feet, passing through mudstones in sandstones.

#### BISMUTH.

No bismuth was won during the year.

## WOLFRAM.

The output of wolfram was as follows:—

	Tons.	Value. £
Avoca Mines ... ..	19 13	1,016
S. and M. Mine, Middlesex ... ..	13	8
Total ... ..	19 26	1,024

## LIMESTONE.

The Broken Hill Proprietary Company employed an average of 5 men at its quarry at Melrose, quarrying limestone for shipment to its works at Newcastle; and the Hydro-Electric Power and Metallurgical Company employed an average of 148 men at its quarry near Ida Bay and at the works at Electrona in the manufacture of carbide of calcium.

## IRON ORE.

No iron ore has been produced during the year.

Blythe River.—Mr. Aubrey Sice, manager of the Blythe River Iron Mines, reports:—About 14 men were employed in January, 10 in June, and 14 in October on the unexplored portions of the company's sections in trenching, clearing, and driving tunnels, and in general prospecting, but no ore was broken.

Comstock District.—Hoskins' Iron and Steel Company.—Mr. W. Thomas, manager, reports:—The work during the year consisted of sinking some prospecting shafts, and tunnelling the hills to prove the extent and value of the iron lodes. The developments from these operations have in every way been satisfactory as regards value and extent, notably in the Tenth Legion Hill, where 100 feet of good iron was passed through at a depth of a little over 100 feet. There has been a good deal of trenching done, which has proved the deposits to be rich and extensive. The latest developments have proved the deposits to contain many millions of tons of the best quality magnetite. Number of men employed, two.

## IRON PYRITES.

The output was 8276 tons, valued at £18,620.

## OSMIRIDIUM.

The output for the year was 1173·924 oz., valued at £35,512, and the average number of men engaged was 271.

## BARYTES AND SCHEELITE.

No barytes nor scheelite was won during the year.

## PAINTS AND PIGMENTS.

The Serpentine Company, with works on the Old Wharf, Launceston, from earths obtained from Beaconsfield and Mowbray, produce various shades of oxides that find ready sale, both here and in the neighbouring States. Six men are employed.

## ZINC.

Electrolytic Zinc Company of Australasia Limited.—Operations at Risdon during the year 1922.—Production of zinc has proceeded steadily and with increasing efficiency throughout the year. During May the total power received from the Hydro-Electric Department was increased from 15,000 horsepower to 17,000 horsepower, this further 2000 horsepower being employed for construction and auxiliary purposes.

The remainder of the plant to take 30,000 horsepower (the first unit of which has been in operation throughout the year) was almost completed at the close of the year, construction having been somewhat delayed by the unsuccessful attempt of the company's engineering employees to establish a 44-hours week.

Sixty-four thousand four hundred and one tons of calcine were treated during the year, while 23,517 tons of slab zinc, valued at £705,390, and silver-lead product for realisation at Port Pirie, S.A., containing 2780 tons of lead and 535,701 oz. of silver, were produced.

The number of employees at Risdon has varied with the demand for constructional labour, the average throughout the year, including staff, being 894.

## OUTPUT.

*RETURN showing the Quantity and Value of Mineral Products for the State of Tasmania during the Year ending 31st December, 1922.*

Mineral.	Quantity.	Value.
		£
Gold ..... fine ozs.	3431·486	15,998
Silver..... "	794,585	123,437
Lead ..... tons	4925·88	118,257
Copper ..... "	5616	391,535
Tin ..... "	679·44	112,407
Coal ..... "	69,238	61,016
Wolfram ..... "	19·26	1024
Bismuth ..... "	...	...
Shale ..... "	40	100
Iron Pyrites..... "	8276	18,620
Scheelite ..... "	...	...
Osmiridium ..... ozs.	1173·924	*35,512
Asbestos ..... tons	...	...
Zinc ..... "	...	...
Barytes ..... "	...	...
Carbide..... "	4512	135,509
Total.....	...	£1,013,415

\* Value at market-price at time of export, subject to correction.

The Electrolytic Zinc Co. recovered 23.517 tons of Zinc, valued at £705,390 and employed 887 men.

## PLANS.

The total number of different plans now stocked by the Department is 102, and during the year 34 of these were revised for reproduction, and 1 new compilation was made.

The number of copies reproduced by the Government Printer was 1450.

Large Scale Plans.—The draughting-room staff has continued the work of the compilation of new plans on a scale of 10 chains to an inch—a necessity referred to in my report for the year 1920—and the second four are in course of preparation and nearing completion.

Underground Survey Plans.—During the year 25 plans of further workings, for addition to the principal plans required to be furnished under "The Mines and

Works Regulation Act, 1915," were received, checked, and filed.

### GEOLOGICAL SURVEY BRANCH.

The Reports of the Director of the Geological Survey, the Government Geologists, and the Government Assayer, are appended.

### INSPECTORS OF MINES.

The Reports of the Chief Inspector of Mines and the three inspectors are appended.

### REVENUE.

The revenue for the year amounted to £14,134 7s. 3d.

The sum of £1705 15s. 9d. deposited as survey fees with applications for leases is not included in the above.

### MINING MANAGER'S EXAMINATION.

As there was no candidate for examination no examination was held.

### DEPARTMENTAL STAFF.

The following changes in the Departmental staff were made during the year:—

- H. W. Park, Clerk, on 6 months' furlough, from 7th October, 1922.
- D. McKinnon, Registrar, Derby, resigned, 24th November, 1922.
- G. T. Gandy, Registrar, Derby, appointed from 1st December, 1922.
- H. G. W. Keid, Government Geologist—Office abolished from 30th June, 1922.
- Thos. Haley, Registrar, St. Helens, resigned 31st August, 1922.
- Urban A. Haley, Registrar, St. Helens, appointed from 1st September, 1922, *vice* Thos. Haley, resigned.
- T. C. Button, confirmed in appointment as Clerk, Launceston, from 1st January, 1922.
- Geo. James Edwards, confirmed in appointment as Draughtsman, Geological Survey, Launceston, from 16th July, 1922.

## CONCLUSION.

In conclusion, I have to again express my thanks to the officers of the Department for their loyal assistance at all times during the year, which, owing to the vacancies unfilled, and other causes, has been a very strenuous one for the limited staff.

I also desire to thank the officers of the Mining Branch of the Department of Lands and Surveys for their ready and willing assistance.

I have the honour to be,  
Sir.

Your obedient servant,

WM. A. PRETYMAN,

Secretary for Mines.

The Hon. the Minister for Mines, Hobart.

## No. 1.

*RETURN showing the Quantity and Value of Gold won from  
1880 to 1922 inclusive.*

Year.	Quantity.	Value.
	Ozs.	£
1880 to 1903 inclusive .....	1,265,836·95	4,905,706
1904 .....	65,921	280,015
1905 .....	73,540·5	312,380
1906 .....	60,023·4	254,963
1907 .....	65,354·25	277,607
1908 .....	57,085·1	242,482
1909 .....	44,777·366	190,201
1910 .....	37,048·053	157,370
1911 .....	31,100·873	132,108
1912 .....	37,973·252	161,300
1913 .....	33,400·457	141,876
1914 .....	26,248·453	111,475
1915 .....	18,547·338	78,784
1916 .....	15,790·096	67,072
1917 .....	14,496·464	61,577
1918 .....	10,528·930	44,724
1919 .....	7,686·470	32,650
1920 .....	6,246·192	29,796
1921 .....	5,340·094	28,395
1922 .....	3,431·486	15,998
	1,880,371·724	7,526,479

## No. 2.

*RETURN showing the Quantity and Value of Silver-Lead Ore produced from 1888 to 1922 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1888 to 1903 inclusive .....	300,977·5	2,571,771
1904 .....	51,138	203,702
1905 .....	75,270·5	246,888
1906 .....	87,117·75	462,443
1907 .....	89,762·5	572,560
1908 .....	63,116·9	322,007
1909 .....	80,378·35	298,880
1910 .....	51,226·91	247,576
1911 .....	61,501·195	253,361
1912 .....	90,123·868	309,098
1913 .....	83,289·268	319,997
1914 .....	11,565·54	96,225
1915 .....	10,382·95	91,689
1916 .....	11,229·410	153,796
1917 .....	9575·780	152,122
1918 .....	7241·400	127,176
1919 .....	* —	136,234
1920 .....	—	261,166
1921 .....	—	59,422
1922 .....	—	223,183
	—	7,109,296

\* "Quantity" discontinued, as it has been found previous figures are misleading, concentrates, hand-picked ore, and crude ore having all been added and included under the one head.

## No. 3.

*RETURN showing the Quantity and Value of Blister Copper produced from 1896 to 1922 inclusive.*

Year.	Quantity.		Value.
	Tons.	£	
1896 to 1903 inclusive .....	52,154	4,186,805	
1904 .....	8371	*582,540	
1905 .....	8610	*704,287	
1906 .....	8708	*862,444	
1907 .....	8247	*832,691	
1908 .....	8833	*603,063	
1909 .....	8638	*586,419	
1910 .....	8193	*553,822	
1911 .....	6022	*385,797	
1912 .....	5136	*430,965	
1913 .....	4569	*364,732	
1914 .....	7509	*477,361	
1915 .....	7901	*709,167	
1916 .....	6305	*884,689	
1917 .....	5845	*841,583	
1918 .....	5559	*772,162	
1919 .....	5071	*557,710	
1920 .....	4837	*576,046	
1921 .....	6221	*493,271	
1922 .....	—	*410,046	
			15,815,600

\* Value of Gold contents deducted.

## No. 4.

*RETURN showing the Quantity and Value of Silver contained in Silver-Lead and Blister Copper during the Years 1919, 1920, 1921, and 1922.*

Year.	In Silver Lead.		In Blister Copper.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Ozs.	£	Ozs.	£	Ozs.	£
1919 ...	296,719.27	71,831	223,624	53,733	525,343.27	125,564
1920 ...	453,411	118,898	169,948	47,869	623,359	166,767
1921 ...	165,637	27,181	183,021	30,395	348,658	57,576
1922 ...	674,886	104,926	119,699	18,511	794,585	123,437

## No. 5.

*RETURN showing the Quantity and Value of Lead included in Silver Lead during the Years 1919, 1920, 1921, and 1922.*

Year.	Quantity.	Value.
	Tons.	£
1919 .....	2357·142	64,403
1920 .....	3855·639	142,268
1921 .....	1434·794	32,241
1922 .....	4925·880	118,257

## No. 6.

*RETURN showing the Quantity and Value of Copper in Blister Copper and Copper Ore during the Years 1919, 1920, 1921, and 1922.*

Year.	In Blister Copper.		In Copper Ore.		Total.	
	Q'ty.	Value.	Q'ty.	Value.	Q'ty.	Value.
	Tons.	£	Tons.	£	Tons.	£
1919 .....	5014	503,977	13	984	5027	504,961
1920 .....	4791	528,177	·75	60	4791·75	528,237
1921 .....	6171	462,876	9·843	287	6180·843	463,163
1922 .....	5616	391,535	—	—	5616	391,535

## No. 7.

*RETURN showing Quantity and Value of Copper Matte exported during the Years 1902, 1903, and 1904 to 1922 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1902 .....	2500	50,112
1903 .....	3727	83,624
1904-1922 .....	—	—
	6227	133,736

No. 8.

**RETURN showing the Quantity and Value of Copper Ore produced from 1896 to 1922 inclusive.**

Year.	Quantity.		Value.
	Tons.	£	
1896 to 1903 inclusive .....	23,736·5	298,292	
1904 .....	104	1640	
1905 .....	1150·75	52,939	
1906 .....	2234·5	72,480	
1907 .....	788·25	36,975	
1908 .....	1185	6588	
1909 .....	1587·8	21,619	
1910 .....	671·27	13,150	
1911 .....	2286	22,852	
1912 .....	1391·6	9479	
1913 .....	1966·8	10,932	
1914 .....	3287·75	18,680	
1915 .....	66	1367	
1916 .....	96·84	3765	
1917 .....	771·40	6171	
1918 .....	444·170	3944	
1919 .....	123	984	
1920 .....	1·50	60	
1921 .....	—	287	
1922 .....	—	—	
	41,893·18	579,204	

RETURN showing the Quantity and Value of Lead Ore produced from 1897 to 1922 inclusive.

Year.	Quantity.	Value.
Tons.	£	
1897 to 1903 inclusive .....	30,443	157,281
1904 .....	9840	3378
1905 .....	8000	2400
1906 .....	2600	1100
1907 .....	3000	1180
1908 .....	3600	1600
1909 .....	—	—
1910 .....	—	—
1911 .....	—	—
1912 .....	—	—
1913 .....	—	—
1914 .....	—	—
1915 .....	—	—
1916 .....	—	—
1917 .....	—	—
1918 .....	—	—
1919 .....	—	—
1920 .....	—	—
1921 .....	—	—
1922 .....	—	—
	45,763	167,701

## No. 9.

RETURN showing the Quantity and Value of Tin exported from Tasmania from 1880 to 1904 (compiled from Customs Returns only), Tin Ore produced during the Years 1905 to 1918 inclusive, and Metallic Tin produced during the Years 1919 to 1922 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1880 to 1904 inclusive .....	76,708·4	7,167,564
1905 .....	3891·5	362,670
1906 .....	4472·75	557,266
1907 .....	4342·75	501,681
1908 .....	4520·8	421,580
1909 .....	4511·2	418,165
1910 .....	3701·01	399,393
1911 .....	3953·05	513,500
1912 .....	3713·825	543,103
1913 .....	4010·41	531,983
1914 .....	2572·713	259,300
1915 .....	2599·234	292,306
1916 .....	2854·636	350,852
1917 .....	2637·337	427,917
1918 .....	2256·203	488,798
1919 .....	1580·22*	395,794
1920 .....	1310·411*	369,362
1921 .....	790·395*	130,257
1922 .....	679·440*	112,407
	131,206·284	14,243,898

\* Metallic Tin.

## No. 10.

RETURN showing the Quantity and Value of Iron Ore produced from 1897 to 1922 inclusive.

Year.	Quantity.	Value.
	Tons.	£
1897 to 1903 inclusive .....	20,442	16,276
1904 .....	6840	2975
1905 .....	6300	2600
1906 .....	2600	1100
1907 .....	3000	1150
1908 .....	3600	1600
1909-1922 .....	—	—
	42,762	25,701

## No. 11.

*RETURN showing the Quantity and Value of Wolfram produced from 1899 to 1922 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1899 to 1903 inclusive .....	57·25	2157
1904 .....	15·5	1147
1905 .....	32·25	2371
1906 .....	19·75	1465
1907 .....	40·75	4411
1908 .....	4·5	338
1909 .....	28·35	2494
1910 .....	67·35	7280
1911 .....	69·96	7769
1912 .....	66·49	6601
1913 .....	68·07	7040
1914 .....	46·873	4327
1915 .....	94·685	11,115
1916 .....	106·265	16,910
1917 .....	172·190	28,714
1918 .....	155·362	27,239
1919 .....	120·907	26,613
1920 .....	70·89	13,626
1921 .....	10·34	676
1922 .....	19·26	1024
	1266·992	173,317

## No. 12.

*RETURN showing the Quantity and Value of Coal raised from  
1880 to 1922 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1880 to 1903 inclusive .....	767,261	659,010
1904 .....	61,109	51,942
1905 .....	51,993	44,194
1906 .....	52,895·75	44,962
1907 .....	58,891	50,057
1908 .....	61,067·75	51,907
1909 .....	66,161·75	56,237
1910 .....	82,445	48,609*
1911 .....	57,067	26,214*
1912 .....	53,560	24,568*
1913 .....	55,043	25,367*
1914 .....	60,794	27,853*
1915 .....	64,536·25	30,418*
1916 .....	55,575	27,736*
1917 .....	63,412	38,673*
1918 .....	60,163	37,676*
1919 .....	66,253	47,004*
1920 .....	75,429	64,005*
1921 .....	66,476	63,446*
1922 .....	69,238	61,016
	1,949,379	1,480,894

\* Value at pit's mouth.

## No. 13.

*RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 to 1922 inclusive.*

Year.	Quantity.	Value.
	Ozs.	£
1910 .....	120	530
1911 .....	271·88	1888
1912 .....	778·77	5742
1913 .....	1261·65	12,016
1914 .....	1018·83	10,076
1915 .....	247·048	1581
1916 .....	222·150	1899
1917 .....	332·079	4898
1918 .....	1606·743	44,833
1919 .....	1669·715	39,614
1920 .....	2009·196	77,114
1921 .....	1750·655	42,935
1922 .....	1173·924	35,512
	12,462·640	278,638

## No. 14.

*RETURN showing the Quantity and Value of Barytes produced during the Years 1916 to 1922 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1916 .....	83	359
1917 .....	52	234
1918 .....	217	977
1919 .....	399	1160
1920 .....	1048	4163
1921 .....	—	—
1922 .....	—	—
	1799	6893

## No. 15.

*RETURN showing the Quantity and Value of Bismuth produced from 1904 to 1922 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1904 .....	·3	15
1905 .....	3·5	800
1906 .....	·3	24
1907 .....	·175	27
1908 .....	3·75	462
1909 .....	2·9	980
1910 .....	10·70	4249
1911 .....	14·395	5758
1912 .....	7·59	2646
1913 .....	5·08	1627
1914 .....	5·619	1666
1915 .....	5·5	1203
1916 .....	3·51	1059
1917 .....	4·212	895
1918 .....	4·608	1038
1919 .....	1·77	573
1920 .....	·10	9
1921 .....	·05	21
1922 .....	—	—
	74·059	23,052

## No. 16.

*RETURN showing the Quantity and Value of Asbestos produced from 1899 to 1920-22 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1899 .....	200	363
1900 .....	128	113
1901 .....	46·5	45
1902-1915.....	—	—
1916 .....	15	30
1917 .....	271	271
1918 .....	2854	5008
1919 .....	51	1275
1920-1922.....	—	—
	3565·5	7105

## No. 17.

*RETURN showing the Quantity and Value of Shale produced during the Years 1910 to 1922 inclusive.*

Year.	Quantity.		Value.
	Tons.	£	
1910 .....	364	214	
1911 .....	500	250	
1912 .....	—	—	
1913 .....	130	130	
1914 .....	75	75	
1915 .....	—	—	
1916 .....	1286	1286	
1917 .....	—	—	
1918 .....	—	—	
1919 .....	600	900	
1920 .....	140	172	
1921 .....	868	1506	
1922 .....	40	100	
	4003	4633	

## No. 18.

*RETURN showing the Quantity and Value of Iron Pyrites produced during the Years 1915 to 1922 inclusive.*

Year.	Quantity.		Value.
	Tons.	£	
1915 .....	12,835·59	8945	
1916 .....	14,005·084	13,597	
1917 .....	7,685·549	7137	
1918 .....	5,105·600	4667	
1919 .....	3,456·95	4288	
1920 .....	4,440	7346	
1921 .....	606·5	2579	
1922 .....	8,276	18,620	
	56,411·273	67,179	

## No. 19.

*RETURN showing the Quantity and Value of Zinc produced during the Years 1917 to 1922 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1917 .....	48	1968
1918 .....	3822	152,880
1919 .....	285	13,110
1920 .....	9·3	334
1921 .....	—	—
1922 .....	—	—
	4164·3	168,292

## No. 20.

*RETURN showing the Quantity and Value of Scheelite produced during the Years 1917 to 1922 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1917 .....	69	12,130
1918 .....	216	39,252
1919 .....	198·98	43,181
1920 .....	105·09	17,905
1921 .....	—	—
1922 .....	—	—
	589·07	112,468

## No. 21.

*RETURN showing the Quantity and Value of Carbide produced during the Year 1922.*

Year.	Quantity.	Value.
	Tons.	£
1922 .....	4512	135,509
	4512	135,509

## No. 22.

*RETURN showing the Quantity and Value of Ochre produced during the Years 1918 to 1922 inclusive.*

Year.	Quantity.	Value.
	Tons. 100	£ 200
1918 .....	—	—
1919 .....	—	—
1920 .....	—	—
1921 .....	14	56
1922 .....	—	—
	114	256

## No. 23.

*RETURN showing Value of Minerals and Metal raised in Tasmania from 1880 to 1922 inclusive.*

Mineral or Metal.	Value.
	£
Gold .....	7,526,479
*Silver-lead Ore .....	7,109,296
*Blister Copper .....	15,815,600
Copper Matte .....	133,736
Copper Ore .....	579,204
Tin .....	14,243,898
Iron Ore .....	25,701
Wolfram .....	173,317
Coal .....	1,480,894
Osmiridium .....	278,638
Barytes .....	6893
Bismuth .....	23,052
Asbestos .....	7105
Shale .....	4633
Iron Pyrites .....	67,179
Zinc .....	168,292
Scheelite .....	112,468
Carbide .....	135,509
Ochre .....	256
Unenumerated prior to 1894 .....	31,988
<b>Total .....</b>	<b>£47,924,138</b>

\* Metallic contents and values are shown in Tables Nos. 4, 5, and 6.

## No. 24.

*RETURN showing the Amounts paid in Dividends by Mining Companies during the Year ending 31st December, 1922.*

Mines.	Dividends.		
	£	s.	d.
Copper .....	4031	2	0
Gold .....	...	...	...
Tin .....	8062	4	0
Silver .....	2397	3	0
Coal .....	6067	12	6
Scheelite .....	...	...	...
<b>Total .....</b>	<b>£20,558</b>	<b>1</b>	<b>6</b>

## No. 25.

*RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 to 1922 inclusive.*

Year.	Number.	Year.	Number.
1880.....	1653	1902.....	5934
1881.....	3156	1903.....	6017
1882.....	4098	1904.....	6194
1883.....	3818	1905.....	6581
1884.....	2972	1906.....	7005
1885.....	2783	1907.....	7516
1886.....	2681	1908.....	6466
1887.....	3361	1909.....	6054
1888.....	2989	1910.....	5770
1889.....	3141	1911.....	5247
1890.....	2868	1912.....	5566
1891.....	3219	1913.....	6107
1892.....	3295	1914.....	4741
1893.....	3403	1915.....	3908
1894.....	3433	1916.....	3864
1895.....	4062	1917.....	4050
1896.....	4350	1918.....	4278
1897.....	4510	1919.....	4413
1898.....	6052	1920.....	5364
1899.....	6622	1921.....	4011
1900.....	7023	1922.....	3835
1901.....	6923		

## No. 26.

*RETURN showing the Mining Companies registered during the Year ending 31st December, 1922.*

Number of Companies.	Capital.
9	£55,900

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

## No. 27.

*RETURN showing the Average Number of Miners employed during the Year ending 31st December, 1922.*

Division.	Number.
Northern and Southern .....	1282
North-Eastern .....	340
Eastern .....	399
North-Western.....	488
Western.....	1326
	3835

## No. 28.

*RETURN showing the Total Amount of Rents, Fees, &c., received by the Mines Department during the Year ending 31st December, 1922.*

Head of Revenue.	Amount.
	£    s.    d.
Rent of Auriferous and Mineral Land.....	12,964 12 6
Fees, ditto ditto .....	776 10 9
Survey Fees .....	1705 15 9
Fees under "Explosives and Inflammable Liquid Act" .....	443 4 0
Total .....	£15,890 3 0

## No. 29.

RETURN showing the Total Area of Land and Number of Sluice-heads of Water applied for during the Year ending 31st December, 1922.

Mineral.	Number.	Sluiceheads.	Area.
			Acres.
Arsenic .....	...	...	...
Asbestos .....	1	...	1
Barytes .....	...	...	...
Bismuth .....	...	...	...
Chrysotile .....	...	...	...
Clay .....	...	...	...
Coal .....	11	...	2570
Copper .....	1	...	40
Gold .....	63	...	1030
Gypsum .....	1	...	100
Iron .....	2	...	80
Kaolin .....	1	...	5
Limestone .....	3	...	280
Minerals .....	18	...	752
Oil .....	...	...	...
Oxide .....	...	...	...
Porphyry Granite .....	...	...	...
Phosphate Rock .....	1	...	30
Pyrites .....	4	...	200
Silver-lead Ore .....	5	...	275
Shale .....	1	...	101
Scheelite .....	...	...	...
Tin .....	74	...	1375
Wolfram .....	1	...	41
Timber Reserves .....	...	...	...
Machinery Sites .....	2	...	6
Mining Easements .....	17	...	95
Dredging Claims .....	6	...	87
Water Rights and Dam Sites .....	51	111	153
Licences to search for Coal or Oil .....	21	...	9561
	284	111	16,782

## No. 30.

*RETURN showing the Total Number and Area of Leases and Licences issued during the Year ending 31st December, 1922.*

Mineral.	No. of Leases.	No. of Sluiceways.	Area.
			Acres.
Asbestos .....	1	...	80
Barytes .....	...	...	...
Bismuth .....	...	...	...
Coal.....	8	...	1359
Copper .....	4	...	280
Clay .....	2	...	8
Gold .....	52	...	794
Guano.....	...	...	...
Iron .....	...	...	...
Limestone .....	1	...	320
Machinery Sites .....	3	...	7
Minerals .....	11	...	365
Molybdenite .....	...	...	...
Nickel.....	1	...	80
Osmiridium .....	...	...	...
Oxide .....	...	...	...
Plumbago .....	...	...	...
Scheelite .....	1	...	20
Shale .....	1	...	101
Silver-lead .....	9	...	242
Tin .....	59	...	1326
Wolfram .....	3	...	40
Zinc Lead .....	...	...	...
Dredging Claims .....	13	...	88
Water-rights .....	35	90	151
Mining Easements .....	8	...	28
Licences to search for Coal or Oil.....	27	...	25,481
	239	90	30,770

## No. 31.

*RETURN showing the Total Number of Leases and Licences  
in force on 31st December, 1922.*

Mineral.	No. of Leases.	No. of Sluiceways.	Area. Acres.
Asbestos.....	1	...	80
Bismuth .....	...	...	...
Barytes .....	2	...	160
Coal .....	63	...	13,835
Copper .....	24	...	1025
Clay .....	6	...	37
Chrysotile .....	...	...	...
Dredging Claims.....	36	...	399
Gold .....	127	...	2424
Iron .....	4	...	218
Limestone .....	8	...	1385
Mining Easements .....	87	..	607
Machinery Sites .....	31	...	123
Minerals.....	114	...	9455
Manganese.....	...	...	...
Nickel.....	1	...	80
Osmiridium .....	4	...	83
Ochre .....	1	...	20
Plumbago .....	1	...	8
Pyrites .....	...	...	...
Silica.....	1	...	20
Slate .....	...	...	...
Scheelite.....	5	...	352
Shale .....	2	...	1589
Silver-lead .....	31	...	2568
Tin.....	510	...	12,030
Water-rights and Dam Sites .....	493	1814	3002
Wolfraam.....	10	...	286
Zinc.....	1	...	37
Licences to search for Coal or Oil.....	73	...	137,692
	1636	1814	187,515

No. 32.

*RETURN showing the Annual Value of Mineral Products for the State of Tasmania from 1880 to 1922 inclusive.*

Year	Value.	Year.	Value.
	£		£
1880.....	554,031	1903.....	1,354,044
1881.....	602,723	1904.....	1,379,204
1882.....	556,306	1905.....	1,729,129
1883.....	560,873	1906.....	2,257,147
1884.....	468,302	1907.....	2,277,159
1885.....	518,885	1908.....	1,650,027
1886.....	489,966	1909.....	1,574,995
1887.....	593,256	1910.....	1,432,193
1888.....	616,733	1911.....	1,349,497
1889.....	504,718	1912.....	1,493,502
1890.....	444,210	1913.....	1,415,700
1891.....	528,388	1914.....	1,007,038
1892.....	526,909	1915.....	1,225,575
1893.....	627,909	1916.....	1,521,050
1894.....	732,764	1917.....	1,584,290
1895.....	575,692	1918.....	1,750,574
1896.....	662,058	1919.....	1,301,090
1897.....	1,006,140	1920.....	1,421,104
1898.....	1,071,084	1921.....	822,851
1899.....	1,660,622	1922.....	1,013,415
1900.....	1,888,695	Unenumerated prior to 1894	31,988
1901.....	1,763,896		
1902.....	1,378,406		
			£47,924,138

No. 33.

RETURN showing the Number and Area of Leases held under "The Mining Act," in force on 31st December, 1914 to 1922 inclusive.

Nature of Lease.	In force on 31st December, 1914.		In force on 31st Dec. 1915.		In force on 31st Dec., 1916.		In force on 31st Dec., 1917.		In force on 31st Dec., 1918.		In force on 31st Dec., 1919.		In force on 31st Dec., 1920.		In force on 31st Dec., 1921.		In force on 31st December, 1922.	
	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
For Minerals, Silver, Tin, &c.	1129	Acres. 37,785	907	Acres. 36,437	872	Acres. 34,458	876	Acres. 36,203	796	Acres. 32,011	823	Acres. 31,006	795	Acres. 30,043	901	Acres. 31,719	716	Acres. 26,459
For Coal, Slate, Shale, &c.	26	6405	45	11,522	52	13,742	50	13,138	44	10,729	45	11,562	50	11,667	66	15,430	73	16,809
For Gold	95	2130	94	2026	85	1692	91	1761	43	657	32	537	65	1403	92	1894	127	2424
Dredging Claims	36	403	29	351	30	437	30	401	23	323	31	482	30	410	29	413	36	399
Mining Easements	110	611	102	553	106	641	105	628	111	594	113	608	104	616	97	621	87	607
Machinery Sites	43	180	40	183	37	190	38	175	37	165	38	180	33	147	34	152	31	123
Licences to search for Coal or Oil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	51	117,031	73	137,692
Water-rights and Gold	605	2449 & 2160 sluice-heads	568	1988 & 2135 sluice-heads	572	2302 & 2061 sluice-heads	557	2085 & 2035 sluice-heads	494	2121 & 1865 sluice-heads	551	2116 & 1975 sluice-heads	559	2094 & 1982 sluice-heads	543	2247 & 2060 sluice-heads	493	30,028 & 1814 sluice-heads

No. 34.

*COMPARATIVE Statement of Revenue from Mines, being Rents, Fees, Storage of Explosives, &c. (exclusive of Survey Fees), paid to the Treasury for the Years ending 30th June, from 1882 to 1903, and for Six months ending 31st December, 1903, and for the Years ending 31st December, 1904 to 1922, inclusive.*

Year.	Amount.			Year.	Amount.		
	£	s.	d.		£	s.	d.
1882.....	23,077	1	9	1903.....	17,776	14	3
1883.....	15,439	14	5	1903, 1 July to 31 Dec. ....	14,758	17	1
1884.....	6981	11	10	1904, Jan. to Dec. ....	16,631	8	2
1885.....	11,070	5	7	1905.....	20,203	17	0
1886.....	12,523	10	4	1906.....	24,136	12	5
1887.....	14,611	11	5	1907.....	24,794	7	7
1888.....	23,502	8	4	1908.....	20,311	3	0
1889.....	17,254	9	0	1909.....	22,804	1	5
1890.....	26,955	4	9	1910.....	22,221	18	0
1891.....	37,829	16	5	1911.....	20,556	15	10
1892.....	17,568	18	4	1912.....	17,639	19	11
1893.....	16,971	9	2	1913.....	19,410	17	8
1894.....	16,732	7	7	1914.....	14,087	0	6
1895.....	15,323	1	9	1915.....	17,679	3	6
1896.....	20,901	13	2	1916.....	14,678	19	10
1897.....	25,631	0	3	1917.....	14,669	7	2
1898.....	33,661	13	9	1918.....	17,833	14	9
1899.....	24,696	10	5	1919.....	15,388	7	7
1900.....	28,380	11	10	1920.....	16,767	11	6
1901.....	21,569	5	2	1921.....	11,248	14	11
1902.....	19,471	0	1	1922.....	14,184	7	3

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.

1900	10 11 0 1	10 11 0 1
1901	11 0 0 0	11 0 0 0
1902	11 10 11 10	11 10 11 10
1903	11 10 10 2	11 10 10 2
1904	11 10 10 2	11 10 10 2
1905	11 10 10 2	11 10 10 2
1906	11 10 10 2	11 10 10 2
1907	11 10 10 2	11 10 10 2
1908	11 10 10 2	11 10 10 2
1909	11 10 10 2	11 10 10 2
1910	11 10 10 2	11 10 10 2
1911	11 10 10 2	11 10 10 2
1912	11 10 10 2	11 10 10 2
1913	11 10 10 2	11 10 10 2

No. 35.

RETURN Showing the Average Annual Prices for Minerals during recent years.

	Ten-Year Average ended 1913.	Average for 1914.	Average for 1915.	Average for 1916.	Average for 1917.	Average for 1918.	Average for 1919.	Average for 1920.	Average for 1921.	Average for 1922.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Copper—Standard, Spot : per ton...	67 13 3	59 11 3	72 12 9	116 1 3	125 2 5	115 11 6	90 19 4	97 12 5	69 8 8	62 3 6
Lead—Soft Foreign : per ton .....	15 3 6	18 13 9	22 17 8	30 19 6	30 0 0	30 2 8	28 3 11	38 4 7	22 14 6	23 14 10
Spelter : per ton.....	23 16 6	23 6 8	66 13 8	68 8 11	52 3 6	52 3 11	42 5 3	45 4 6	26 4 1	29 14 2
Tin—Standard, Spot : per ton .....	164 19 7	151 2 9	164 4 0	182 3 5	237 13 1	329 11 2	257 9 8	296 1 7	165 8 2	159 10 9
Silver—Standard, Spot : per oz ...	s. d. 2 2·81	s. d. 2 1·32	s. d. 1 11·69	s. d. 2 7·32	s. d. 3 4·88	s. d. 3 11·57	s. d. 4 9·06	s. d. 5 1·56	s. d. 3 0·875	s. d. 2 10·41

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THE STATISTICAL DEPARTMENT OF THE GOVERNMENT OF GREAT BRITAIN AND IRELAND  
 LONDON: H.M.S.O. 1922.

REPORT OF THE MOUNT CAMERON WATER-  
RACE BOARD FOR THE YEAR ENDED 31st  
DECEMBER, 1922.

Gladstone, 7th February, 1923.

SIR,

We have the honour to submit the report of the Board for the year ended 31st December, 1922.

*Race.*—From the intake on Mussel Roe River to No. 4 syphon the old race and syphons are all in good condition. The top end of the race has been cleaned out during the year, in order to ensure a free flow of water. This work has been done by Channel-keeper Keegan without assistance.

*Fluming and Syphons.*—The fluming at Old Chum Creek and syphons Nos. 1, 2, and 3 are also in a satisfactory state.

*Deviation.*—This work was started in March, and Nos. 4, 5, and 6 were dismantled. The two firstmentioned (iron) were cleaned and dipped and reassembled, No. 4 being extended 9 chains to obtain greater head. No. 6 (wood) was put in as the first portion of the long syphon crossing the Ringarooma, portion of No. 5 being used for that part immediately over the river on the trestle-bridge, which is 20 feet above summer level. During a flood in the river in June the water rose 8 feet up the trestle-legs, and caused some trouble and delay, but no serious damage was done.

The work was pushed on with the utmost despatch, but in October it was found that there was a credit balance of £1447 17s. 7d. only remaining. As the work was far from complete, an estimate of probable further expenditure was obtained, and a sum of £1000 was voted by Parliament; but it is with regret that the Board has to report this amount has proved inadequate, and in order to finally complete the work a further sum of £500 will be required.

The following may be mentioned as some of the causes of the original estimate being exceeded:—

Increase of race-section to provide for a larger volume of water and greater stability.

Repairs to steel syphon-pipes being more extensive than anticipated, and to it being found necessary to remove the whole of the original coating and redip them.

Five hundred pounds worth of additional steel bands being necessary to strengthen the wooden pipes in syphon.

Increased cost of the deep cutting due to intrusion of rock between the bores put down to ascertain character of country.

More rock being found in the general race-construction than was disclosed by the trial holes sunk along its course when the work was commenced.

Alteration of the original proposal for carrying the big syphon across the river by substituting a bridge 19½ chains long by 20 feet above the summer-level in place of 9 chains of piling, practically at water-level, which, in the opinion of the Board, meant too great a risk of the syphon being carried away by the first flood.

After a thorough inspection of the whole of the work the Board is quite satisfied that the race, as constructed, is more economical and satisfactory than that provided for in the original estimate, and that the work represents good value for the money expended.

While the work in connection with the deviation has been in progress no water has been brought beyond the intake of No. 4 syphon, consequently no water has been sold during that period, and the expenditure has exceeded the receipts to the extent of £197 10s. 9d., and the only money paid to the Public Debts Sinking Fund for the year ended 30th June, 1922, was the amount of rents of mineral land served by the race—12s. 6d.

The Board having received the resignation of Mr. Harvey, manager of the race, desire to express its appreciation of the valuable services rendered by him as channel-keeper for 11 years and manager for 17 years; also to thank him for his services while in charge of the construction of the deviation work during the past year, which were carried out to the Board's entire satisfaction, and deeply regret that ill-health has caused him to sever his connection with the Board.

*Rainfall.*—The registered rainfall for the year was as follows:—Main intake, 36 inches 6½ points; Little Mussel Roe intake, 34 inches 26 points.

*Revenue.*—The revenue for the year amounted to £139 3s., being a decrease of £420 6s. 1d. on the previous year.

*Expenditure.*—The expenditure amounted to £366 13s. 9d., being a decrease of £447 6s. 10d. on the previous year.

The statistics for the year are as follow:—

- Average number of claims supplied per week, 3.
- Greatest number supplied in any one week, 14.
- Total number of heads supplied—Under fixed or cash scale, 38½; under royalty or credit scale, 429.
- Total, 467½.
- Tin ore raised for the year:—Under fixed scale, 16 cwt.; under royalty scale, 5 tons 8 cwt. 0 qr. 5 lb.
- Average number of men employed per week, 3.

<i>Receipts.</i> —Total receipts for the year—	£	s.	d.
Water sold under fixed scale ... ..	18	14	6
Water sold under royalty scale ... ..	119	11	6
Rent of cottage ... ..	0	10	0
Refund of portion of insurance premium ... ..	0	7	0
	£139	3	0

<i>Expenditure—</i>	£	s.	d.
Salaries and wages .....	335	0	0
Travelling expenses .....	23	19	5
Insurance .....	7	4	4
Race-repairs .....	0	10	0
	£366	13	9

Paid to the Public Debts Sinking Fund for the year ended 30th June, 1922 (including moiety of rents of mineral land served by the race .....

	£0	12	6
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We have the honour to be,

Sir,

Your obedient Servants,

WM. A. PRETYMAN, Chairman.

<p>CECIL G. RYAN, JOHN SIMPSON, J. O. HUDSON, CHAS. BARNES, EDWARD L. HALL,</p>	}	Members.
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The Honourable the Minister for Mines.

## GEOLOGICAL SURVEY OF TASMANIA.

### REPORT OF THE DIRECTOR FOR THE YEAR 1922.

Launceston, 8th May, 1923.

#### A.—CORRESPONDENCE.

The correspondence is continually on the increase, and during the year 1393 letters inwards and 1600 letters outwards were dealt with.

#### B.—STAFF.

During the year it became necessary to abolish the office of third Government Geologist. In accordance with this necessity, Mr. H. G. W. Keid, M.Sc., severed his connection with the Department on 30th June.

#### C.—INVESTIGATIONS CARRIED OUT DURING THE YEAR.

##### (1) *Geological.*

The details of the field-work carried out by the geologists will be found in their own annual reports appearing herewith.

During the year the work carried out on the underground water resources of the midlands was advanced to the stage of actually producing the water. The boring-plant purchased by the Government to carry out this work was started at Nala, where water was located at 90 feet, and is available to the extent of 600 gallons per hour. Similarly, at Glenmorey and Richmond, water was obtained at the rate of 6000 and 20,000 gallons daily respectively.

The following field journeys were made by me during the year:—

- (1) Geological examinations at Zeehan and Mt. Lyell, in company with Professor Sir T. W. Edgeworth David, K.B.E.
- (2) Complete investigation of the Chudleigh Lakes in regard to dam-sites and storage-basins.
- (3) The asbestos deposits of Beaconsfield, to determine the desirability of erection of a State mill.
- (4) Investigation of underground water-supply at Glenorchy.
- (5) Examination of the stability of dam-site at Glenorchy reservoir.
- (6) The investigation of the possibilities of obtaining an underground water-supply at Kingston.
- (7) Geological survey of Beaconsfield goldfield.
- (8) Numerous journeys and examinations in connection with the initiation and supervision of boring for water at Nala, Glenmorey, and Richmond.

(2) *Chemical and Metallurgical.*

The routine work of the laboratory for the year is dealt with in the report of the Government Assayer.

I regret to have to report, however, that although the research laboratory was completed during the year, no definite start has yet been made on the metallurgical research designed by me, and which has been the objective in expending money on the development of the laboratory.

Suggestions which I made during the year with the object of enabling the Government Assayer, as the senior chemist of the staff, to be free from the greater number of interruptions due to the receipt and registration of samples, were not approved. As a result the initiation of research work, for which a maximum of quiet and seclusion is necessary, has not eventuated, and until some such scheme as I proposed is carried out, or an additional chemist is appointed, no appreciable progress can be made.

## D.—REPORTS PREPARED DURING THE YEAR.

The reports prepared by the staff are indicated in their respective reports.

The following reports were prepared by myself:—

- (1) "Report No. 2 on the Geological Conditions Affecting Dam-construction at the Upper Reservoir Site—Glenorchy Water-supply."
- (2) "Report on Underground Water at Glenorchy."
- (3) "Report on Underground Water at Kingston."
- (4) "Geological Conditions as Affecting Water-conservation in the Chudleigh Lakes District."
- (5) "Lake Fenton Water Scheme."
- (6) Sixteen Chapters of the "Coal Resources Publication."

## E.—PUBLICATIONS.

The compilation of the Coal Resources publication was completed during the year. This represents about two years' work of the geologists, and is being issued in one volume instead of in disconnected issues. The compilation of this work has been a great task, but it will be of distinct value in the development of Tasmania.

The following publication was issued during the year:—

Underground Water-supply Paper No. 2.—"The Underground Water Resources of the Jericho-Richmond-Bridgewater Area," by P. B. Nye, B.M.E., Government Geologist.

## F.—PROGRAMME OF WORK.

The following systematic work already arranged for in the past remains to be done, and I would urge that this be proceeded with, as being of importance to mining development in Tasmania:—

- (1) Completion of the investigation of the gold belt extending from Beaconsfield to Mathinna on the North-East Coast.
- (2) Investigation of the oil-shale resources of Tasmania.

- (3) Systematic investigation and testing of our clay deposits.
- (4) Research work on the factors controlling the distillation of our oil-shales.
- (5) Metallurgical and geological research on the North-East Dundas (Renison Bell, &c.) stanniferous pyrrhotites.

LOFTUS HILLS, M.B.E., M.Sc.,

Director Geological Survey of Tasmania.

The Secretary for Mines, Hobart.

... reports were prepared by myself...  
 ... Report No. 2 on the Geological Conditions Affecting  
 ... Water Supply  
 ... Report on Underground Water at...  
 ... Geological Conditions of the...  
 ... Lake Ranton Water Scheme  
 ... Sixteen Chapters of the "Coal Resources of Tasmania"

E. TOMBARTON

... publication of the Coal Resources publication was completed during the year. This report is about two years old, and is being issued in one volume in three issues. The completion of this report is a great task, but it will be of distinct value in the development of Tasmania.  
 ... publication was issued during the year...  
 ... Water Resources of the...  
 ... "The Great", by P. B. Nye, B.Sc., M.Sc., F.R.S.

F. PROGRESS OF WORK

... investigation of the oil-shale resources of Tasmania...  
 ... investigation of the oil-shale resources of Tasmania...  
 ... investigation of the oil-shale resources of Tasmania...

## REPORTS OF THE GOVERNMENT GEOLOGISTS FOR THE YEAR 1922.

Launceston, 14th March, 1923.

SIR,

I HAVE the honour to submit my report for the year ending 31st December, 1922.

The field-work carried out during the year consisted of—

- (1) An investigation of the Mt. Bischoff Tin Mine and the Waratah-Cleveland District;
- (2) The examination of the Swansea silver-lead area;
- (3) The geological survey of the copper-nickel field of North Dundas;
- (4) The examination of the Renison Bell and Central Renison Bell tin mines;
- (5) An investigation of the deposits of cement materials in the vicinity of Berriedale;
- (6) An inspection of the proposed lines of transport between the Fingal Coal Mine and the Fingal Railway;
- (7) A geological examination of the cement materials at Railton;
- (8) An investigation of a reported tin-ore discovery near Margate.

During the same period the following reports have been prepared:—

- (1) Completion of my contribution to the "Coal Resources of Tasmania."
- (2) Bulletin on Waratah Tin District.
- (3) Preliminary Report on the Waratah Tin District.
- (4) The Swansea Silver-lead Area.
- (5) Copper-Nickel Deposits of North Dundas.
- (6) Renison Bell and Central Renison Bell Tin Mines.
- (7) Geological Features of the Berriedale Cement Deposits.
- (8) Proposed Branch Railway to the Fingal Coal Mine.
- (9) Geological Features of the Railton Cement Deposits.
- (10) Conspectus Report on the Mineral Production of Tasmania.
- (11) Special Report on Zircon, Talc, Sapphire, and other Minerals occurring in Tasmania.

In addition to the preparation of the reports, a large number of letters have been written in answer to inquiries relating to subjects concerning the development and exploitation of mineral deposits and the establishment of industries in the State.

The following notes, of a general nature only, relate to the investigations conducted at the several localities mentioned:—

### *Waratah Tin District.*

At present only one of the mines in the district is in active operation. A little development work is being performed in

the underground department of the Mt. Bischoff Mine, and one unit of the milling-plant is employed in the treatment of the ore obtained. In the bulletin recently prepared advice has been tendered on the best means of attacking the known deposits, and recommendations have been made concerning their future development. It is not considered that ore-bodies approaching the size and richness of those worked during the past 40 years will be discovered, but it is anticipated they will prove of sufficient extent to keep the mine in active operation for many years. Before concluding these remarks, it may be mentioned that there is in addition a large reserve of low-grade material on this property.

#### *Swansea Silver-Lead Area.*

An examination was made of this area, and of the Swansea Mine in particular, in order to advise the operators as to the best method of continuing exploration and development. The results obtained in following the advice given fully justified the necessity for the visit. Other silver-lead ore-bodies of commercial importance have been discovered, and a nickel-bearing lode was found in the vicinity.

#### *Copper-Nickel Deposits of North Dundas.*

Mining operations on these deposits ceased in 1914. The ore-bodies consist of copper-nickel sulphides, and occur in association with dykes of norite and gabbro. The ore contains 10 per cent. nickel and 5 per cent. copper, these proportions varying in the slightest degree only from point to point.

A company has been formed in London to take over the property worked by the Dundas-Cuni Company, and now that a market has been found for this ore it is likely that those interested in other deposits will resume operations.

#### *Renison Bell and Central Renison Bell Tin Mines.*

At the present time very little productive work is being performed in this district. Hitherto operations have been confined almost exclusively to the excavating and mining of the richer ore contained within the zone of oxidation. At the Renison Bell Mine a small calcining plant was erected for the purpose of converting the concentrated sulphide ore into the oxide condition, thereby liberating the contained tin oxide and enabling a complete separation to be made by means of mechanical appliances, but only the richest of such material could be treated at a profit. Unfortunately the depletion of the rich oxidised ore synchronised with the collapse of the tin market, and the company was compelled to close this section of the treatment plant.

Successful operation depends on the solution of the sulphide-ore problem, and attention is now being directed to that end.

#### *Berriedale Cement Deposits.*

These deposits belong to the limestone member of the Permo-Carboniferous formation. The limestone occurs in beds of varying quality, some of which are suitable for the manufacture of Portland cement. The deposit as a whole, however, was found to be unsuitable for this purpose, owing to deficiency

in lime. It was suggested that high-grade material from the Ida Bay deposits should be added in order to obtain the desired proportion of lime.

*Railton Cement Deposits.*

In this district all the raw materials required in the manufacture of Portland cement are found. Limestone (Ordovician), shale, clay, and coal occur here in abundance, and of such quality as to leave no doubt of their suitability for cement-making. In addition to these advantages an ample supply of water, free from deleterious impurities, is available from nearby sources. Situated within easy reach of a populous district, and connected by rail and road with an important shipping centre, the conditions for economical operation and the facilities for the transportation of the product to overseas markets are very favourable.

Preparatory work in connection with the erection of a large cement-making plant is now in hand.

I have, &c.,

A. McINTOSH REID,  
Government Geologist.

W. A. PRETYMAN, Esq., Secretary for Mines, Hobart.

Launceston, 16th February, 1923.

SIR,

I HAVE the honour to submit my report for the year ending 31st December, 1922.

During the first week of the year I was engaged in general office work in the office, workroom, and library, and in preparing for the field trip to the Waratah District.

On 9th January I proceeded to Nala, and supervised the putting down of a trial-bore in connection with a supply of underground water for the Railway Department. The Acme hand-boring plant was used, a flow of water being obtained at 14 feet, and boring continued to 30 feet. On 14th January I returned to Launceston with samples of water for analysis.

Office work in connection with the manuscript of the Coal Resources publication occupied my time during the following week.

On the 23rd January I proceeded to the Waratah District, to investigate the silver-lead and copper deposits of that district. The investigation included the examination of the silver-lead and copper mines of the district, and a detailed geological examination of the surrounding country. The mines examined included the following:—Magnet, Persic, Silver Cliff, Gregory's, Godkin, Godkin Extended, Discoverer, Bell's Reward, Mt. Jasper Mines (Old Jasper, New Jasper, Heazlewood, Mt. Wright, and Mt. Stewart). The investigation was completed on 27th June, and I returned to Launceston on 29th June to prepare the report on the Waratah District.

During the greater part of July and August I was engaged in reading and checking the first and final proofs of "The Coal Resources of Tasmania." The remainder of this period and the following months of September, October, and November were spent in general office work and the preparation of the bulletin on "The Silver-Lead Deposits of the Waratah District," which was completed at the end of November.

During December I was engaged in general office work and in attending to the mineral and rock collections of the Geological Survey in the Victoria Museum.

On 21st December I proceeded to Exeter, and put down a bore-hole to a depth of 24 feet on the property of S. Traill, returning to Launceston on the 22nd.

As librarian of the Geological Survey Library during the year, I had to place several hundred volumes of exchange publications on the shelves, and otherwise attend to the library as required.

The following brief notes indicate the position of silver-lead mining in the Waratah District:—

Lead ores were found in the Waratah District before the actual discovery of the rich tin deposits of Mt. Bischoff, which have made the district famous throughout the world. These lead deposits were, however, small, and the discoveries of the more important deposits did not take place until much later. The Heazlewood lode was found in 1885, and others quickly followed, all the important discoveries being made between that year and 1891. These discoveries followed the silver boom caused by the rich discoveries at Broken Hill (N.S.W.) and at Zeehan, and great expectations were held regarding the future prospects of the field. As development work proceeded the majority of the silver-lead deposits were proved to be of little commercial value, and the expectations were not realised. The majority of the mines were abandoned, and although some were reopened at a later date, they met with no success. The only companies operating at the present time are the Magnet Silver-Lead Mining Company, (Victorian) Magnet Silver-Lead Mining Company, and the Mt. Jasper Copper Mines, No Liability.

The Magnet Mine has been the largest producer within the district, and the only one in the operation of which dividends have been paid. The deepest workings are 1000 feet below the surface, and the lode is still going underfoot. The present output is 75 tons of crudes and 25 tons of concentrates. With the ruling prices of lead and silver, the immediate future should be a successful one.

The Mt. Jasper Copper Mines, No Liability, is at present working the Mt. Wright Silver-Lead Mine. The lode contains a vein or veins of argentiferous galena with a total width up to 6 inches, but which average about 3 inches. Only portions have been stoped, and several small parcels produced. Prospecting and development work is at present being carried out to the south along this lode. The Old and New Jasper Mines have been worked for copper ore and produced small parcels, but are at present idle. The Heazlewood Mine was tested at greater depth, but is not now being worked. The Mt. Stewart Mine has been the second largest producer of silver-lead ore in the district, but is now idle. It was tested at the 200-foot level, but proved unpayable.

The (Victorian) Magnet Silver-Lead Mining Company is working the old Godkin Extended Mine. Operations have been carried on almost continuously by the company, and the original Godkin Silver-Lead Mining Company, on the Godkin and Godkin Extended leases since the original discovery. The workings have not been successful, however, no ore-bodies of any size being developed, and only several small shipments of ore have been sent away.

I have, &c.,

P. B. NYE, Government Geologist.

W. A. PRETYMAN, Esq., Secretary for Mines, Hobart.

## REPORT OF THE GOVERNMENT ASSAYER AND DRAUGHTSMAN FOR THE YEAR 1922.

Geological Survey Laboratory,  
Launceston, 28th March, 1923.

SIR,

I BEG to submit my annual report for the year ending 31st December, 1922.

The number of samples received for determination and analysis constitutes a record, the total number of assays and tests made for the Department and the public amounting to 5353.

The chemical work consisted largely of making analyses and tests of ores, rocks, clays, kaolin, cement, coal, coal-ash, water, &c.

The completion of the laboratory work in connection with the Coal Resources investigation has involved a large amount of work in the determination of calorific values, ignition point of coals, fusibility of coal-ash, specific gravity of coal, analyses of coal-ash.

Considerable technical information has been given to individuals and firms in regard to the testing of various materials for industrial processes.

The facilities for obtaining the information desired has been fully appreciated by the public and those who are directly interested in the development of the State's resources.

In addition to reports on various subjects, the following have been prepared:—

- (1) Sampled Berriedale cement deposits and prepared report.
- (2) Sampled Railton cement deposits and prepared report.
- (3) Designed a modern asbestos mill for treating asbestos-bearing rock.

In connection with "The Coal Resources of Tasmania" publication, the following chapters have been prepared:—

- (1) The Ignition Point of Coals.
- (2) The Method of Sampling the Coal Seams used in the Investigation.
- (3) The Scope of the Laboratory and Analytical Investigation.
- (4) The Ash-content: Its Amount, Character, Fusing Point, and the Extent to which it can be Eliminated.
- (5) The Heating value of Tasmanian Coals as Compared with Standard Coals.
- (6) Applicability to Gas-making and Coke-manufacture.
- (7) The Calorific Value and Evaporative Power of Coal.
- (8) Utilisation in the Powdered Form.

The application of pulverised coal to railway locomotives has passed the experimental stage, and serious consideration should be given to the firing of locomotives in Tasmania with this fuel.

Many locomotives used on the Swedish State railways are operating on powdered peat, with which is added a small proportion of powdered coal.

The Brazilian Government has solved one of its economic problems in equipping 250 of its locomotives with the pulverised coal-burning apparatus, so as to enable the domestic coal to be used.

The general average of the East Coast coal is of better quality than the Brazilian, as may be seen from the following analysis:—

*East Coast Coal, Tasmania.*

	Per Cent.
Moisture ... ..	4.09
Volatile combustible matter ... ..	22.36
Fixed carbon ... ..	53.20
Ash ... ..	21.90
Sulphur ... ..	0.42

*Brazilian Coal.*

	Per Cent.
Moisture ... .. from	2.8
Volatile combustible matter ... from	14.28
Fixed carbon ... .. from	34.58
Ash ... .. from	26.30
Sulphur ... .. from	3.9

Pulverised coal has been used in America for several years for stationary boilers, cement and copper smelting industries, &c.

The advantages to be gained by using fuel in this form more than offset the cost of pulverising.

If Tasmanian coal proved satisfactory, it would obviate the necessity of importing coal from New South Wales.

During the year a portion of the research laboratory has been fitted up, and a crusher and grinder have been ordered from America.

Considerably over 1000 personal interviews have been attended to during the year, in addition to a large number of inquiries by post.

In the majority of cases requests have been made for technical information on various subjects.

Owing to the large increase of work a large number of analyses, tests, &c., have been carried out after office hours.

I desire to place on record my appreciation of the work carried out by Messrs. L. H. Bath and W. St. C. Manson during the period under review.

I have, &c.,

W. D. REID,

Government Assayer and Draftsman.

W. A. PRETYMAN, Esq., Secretary for Mines, Hobart.

## REPORT OF THE CHIEF INSPECTOR OF MINES.

Chief Inspector of Mines Office,  
Hobart, Tasmania, 7th April, 1923.

SIR,

I HAVE the honour to forward my annual report for the year 1922 in connection with the inspection of mines.

The information in connection with mining accidents is tabulated in the attached tables and graph, which show that during the year 31 accidents occurred, causing the death of four persons and injury to 27 persons. The total is the lowest number of accidents since the year 1903. Two of the fatalities occurred underground and two at surface works. One of the accidents underground occurred while preparing to place in position a square set on the ground-floor of a pillar of pyritic ore which was being removed. In removing the ore a cave was formed, and the ore in the back was not supported by the back laths. A fall of heavy pyritic ore occurred, which crushed the back laths and fell on the miner, causing death. The second fatality was due to the collapse of a ladder-staging in a main shaft. Two tributors removed the staging over the ladderway at a plat. In doing so they dropped the old planking on to the first stage under the plat, and then removed the debris to the next level. When returning to the plat where the repairs had been made, the deceased reached the staging immediately under the plat, when it collapsed, allowing him to fall down the shaft. A fatality which occurred at treatment works was due to an employee falling from a stage while unloading material from a ship. Two men were employed on a stage about 12 feet above the wharf, landing buckets of calcines and tipping them on to a conveyor-belt. As a bucket was being landed it struck the deceased, knocking him off the stage on to the wharf, and he received injuries to the head which caused death. The other fatality occurred in the same vicinity. A labourer was employed greasing the rollers of a conveyor-belt. While screwing down a grease-cut he sustained an electric shock, which caused death. The occurrence was not witnessed, and it was assumed that the deceased obtained a shock from a lighting circuit which was attached to the conveyor.

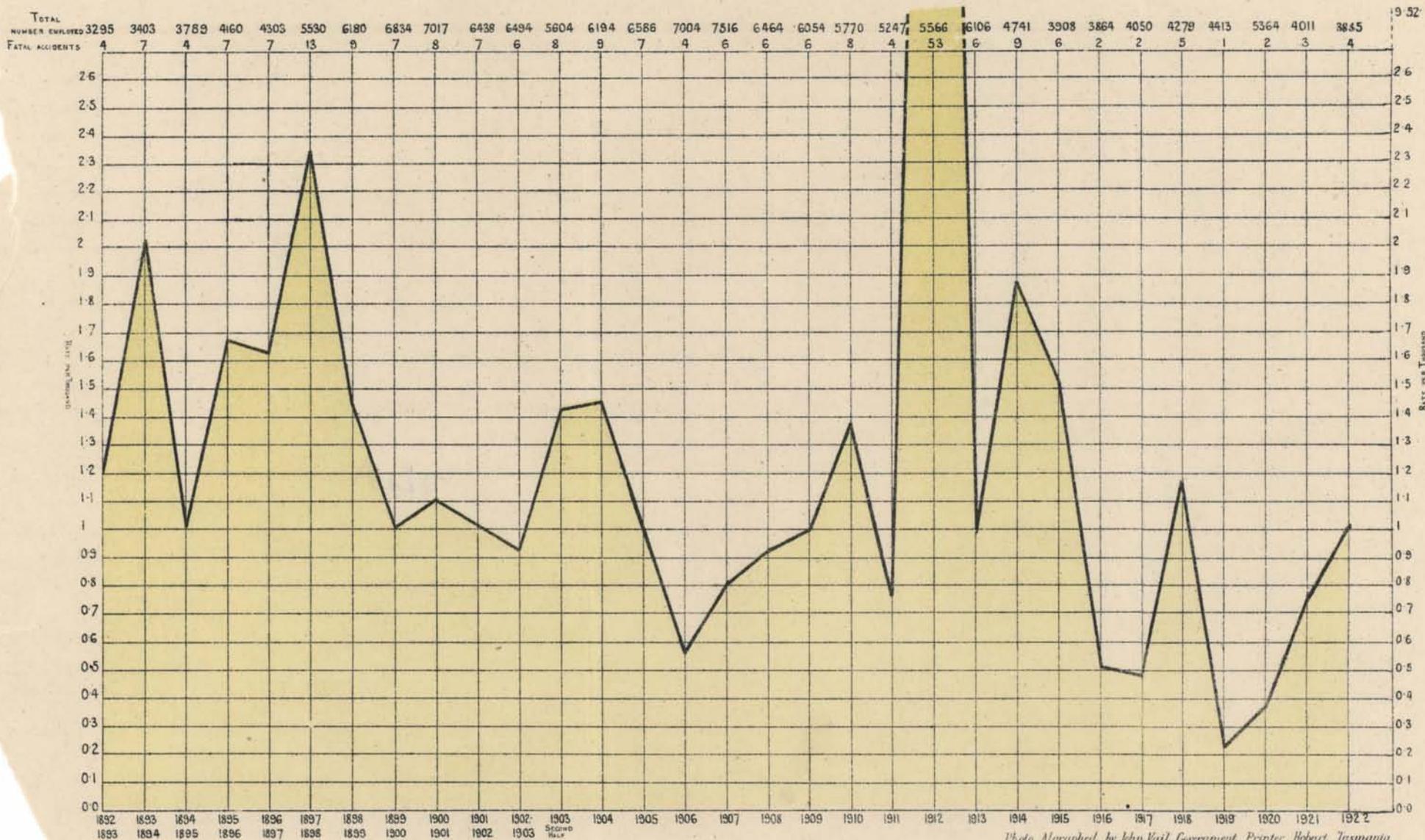
The death-rate per 1000 persons employed was 1.043. Twenty-seven persons received injury which caused them to be absent from work for more than 14 days. The average injured per 1000 persons employed was 7.040. Eleven of these accidents caused fracture of limbs, loss of sight, or injury likely to have a lasting effect. Five accidents were due to "falls of ground"—three occurred underground and two at surface. Four accidents were due to trucking. One accident due to a "fall of ground" caused fracture of the spine, which caused permanent disablement. One accident was due to a gas-explosion. The injured man opened a tin of carbide at night with an acetylene lamp in close proximity. Evidently gas



COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892, to 31st December, 1922.

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	1£	7	16	23	3·365	1·024	2·341
" 1900 " 1901	7017	29	8	23	31	4·417	1·140	3·278
" 1901 " 1902	6438	38	7	35	42	6·524	1·088	5·437
" 1902 " 1903	6484	44	6	43	49	7·557	0·925	6·632
" 1903, to 31 Dec., 1903	5604	27	8	20	28	4·977	1·428	3·569
1 Jan. 1904 " 1904	6192	73	9	65	74	11·951	1·454	10·497
" 1905 " 1905	6586	34	7	30	37	5·618	1·063	4·555
" 1906 " 1906	7004	65	4	61	65	9·280	0·571	8·709
" 1907 " 1907	7516	68	6	64	70	9·314	0·798	8·515
" 1908 " 1908	6464	60	6	58	64	9·900	0·928	8·972
" 1909 " 1909	6054	54	6	49	55	9·085	0·991	8·093
" 1910 " 1910	5770	63	8	57	65	11·265	1·386	9·878
" 1911 " 1911	5247	80	4	77	81	15·437	0·762	14·675
" 1912 " 1912	5566	60	53	53	106	19·044	9·522	9·522
" 1913 " 1913	6106	64	6	60	66	10·809	0·982	9·826
" 1914 " 1914	4741	69	9	62	71	14·977	1·896	13·081
" 1915 " 1915	3908	71	6	67	73	18·679	1·535	17·144
" 1916 " 1916	3864	53	2	51	53	13·716	0·517	13·198
" 1917 " 1917	4050	50	2	48	50	12·345	0·493	11·852
" 1918 " 1918	4279	50	5	45	50	11·684	1·168	10·516
" 1919 " 1919	4413	58	1	57	58	13·143	0·226	12·917
" 1920 " 1920	5364	52	2	50	52	9·694	0·372	9·322
" 1921 " 1921	4011	40	3	37	40	9·972	0·748	9·224
" 1922 " 1922	3835	31	4	27	31	8·083	1·043	7·040

# DIAGRAM SHOWING THE RATIO OF FATAL ACCIDENTS IN MINES IN TASMANIA RATE PER 1000 MEN EMPLOYED



*Photo Algraphed by John Veil Government Printer Hobart Tasmania.*

5 cm

*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.
Mt. Lyell .....	950	12	1	11	12	12·631	1·052	11·579
Zeehan, &c. ....	376	7	...	7	7	18·617	...	18·617

TABLE showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Year 1922.

PLACE OR CAUSE OF ACCIDENT.	INSPECTION DISTRICTS.												TOTAL.	
	Northern and Southern Division.		North-Eastern Division.		Eastern Division.		North-Western Division.		Western Division.					
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Zeehan and other Districts.		Lyell District.		Killed.	Injured.
UNDERGROUND—														
Falls of ground .....	...	...	...	...	...	...	2	...	1	1	...	1	3	
Shaft Accidents—														
Falling down passes and shafts .....	...	...	...	...	1	...	...	...	...	...	...	1	...	
Total .....	...	...	...	...	1	...	2	...	1	1	...	2	3	
Miscellaneous (underground).														
Haulage .....	...	...	...	...	...	...	...	...	...	...	...	...	...	
Trams, &c. ....	...	...	...	...	...	...	...	...	1	...	...	1	1	
Sundry accidents .....	...	...	...	...	...	...	1	...	...	...	1	...	2	
Explosives .....	...	...	...	...	...	...	...	...	2	...	3	...	5	
Total .....	...	...	...	...	...	...	1	...	3	...	4	...	8	
Total Underground ....	...	...	...	...	1	...	3	...	4	1	4	2	11	

ON SURFACE—														
Smelting works.....	...	...	...	...	...	...	...	...	...	...	2	...	2	
Machinery .....	1	...	...	...	...	...	...	...	...	...	3	1	3	
Sluicing .....	...	...	...	2	...	...	...	1	...	...	...	...	3	
Tramways .....	...	1	...	...	...	...	...	...	...	...	2	...	3	
Falls of persons .....	1	...	...	...	...	...	...	...	1	...	...	1	1	
Explosives .....	...	...	...	...	...	...	...	...	...	...	...	...	...	
Miscellaneous .....	...	...	...	2	...	...	...	...	...	2	...	...	4	
<i>Total Surface.....</i>	<i>2</i>	<i>1</i>	<i>...</i>	<i>4</i>	<i>...</i>	<i>...</i>	<i>...</i>	<i>1</i>	<i>...</i>	<i>3</i>	<i>...</i>	<i>7</i>	<i>2</i>	<i>16</i>
Gross Total, 1922 .....	2	1	...	4	1	...	...	4	...	7	1	11	4	27

*TABLE showing Rate per Thousand Killed and Injured in different Divisions for the Year ending December, 1922.*

Division.	Average Number of Men Employed.	Number of Accidents.	Number of Persons		Total Number Killed & Injured.	Average per 1000 Killed and Injured.	Average per 1000	
			Killed.	Injured.			Killed.	Injured.
Northern and Southern .....	1282	3	2	1	3	2.340	1.560	0.780
North-Eastern .....	340	4	...	4	4	11.764	...	11.764
Eastern .....	399	1	1	...	1	2.506	2.506	...
North-Western .....	488	4	...	4	4	8.196	...	8.196
Western .....	1326	19	1	18	19	14.328	0.754	13.574

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## REPORTS OF INSPECTORS OF MINES.

Mr. INSPECTOR CURTAIN (Launceston) reports:—

The accompanying list contains a number of casualties that have been deemed necessary for registration in this extensive district. Unfortunately the list contains three fatal accidents and six minor accidents. A man employed unloading material from a vessel fell from the platform to the wharf of the mine, a distance of 12 feet. His skull was fractured, and he died from the effects five days later. The second occurrence was due to electrocution. A miner was employed greasing conveyor belts on wharf, and during the morning he was found lying dead. The verdict returned was "death due to electrocution." The third fatal accident occurred at a mine at Mathinna. The miner was deputed to make repairs to a defective staging, which collapsed, from a long-disused level of the mine. Having fulfilled this duty, the man descended to ascertain the extent of the injury and the consequent condition of the staging immediately below, which proved to be satisfactory, but on again ascending to the upper level the whole staging collapsed, and carried the miner with it, a distance of 70 feet. When the body was recovered some time later life was pronounced to be extinct.

A serious accident occurred to a miner working alone on a private holding—which is only another instance of the danger that attends the single-handed method. In the case mentioned the ground was being worked by nozzle-pressure and gravitation, and more than once the holder was warned against venturing too near the "toe," which caution was evidently disregarded.

The balance of the list needs no further explanation, as the sufferers have resumed their various occupations.

*Health of Miners.*—As far as I can ascertain, this is satisfactory, and compares satisfactorily with other classes of industries in the State.

*Ventilation.*—Throughout the State this is good. A "Sirocco" fan capable of displacing 54,000 cubic feet of air per minute has been installed at the Mt. Nicholas Colliery. In addition to installing a similar type of fan at the Cornwall Mine pit, the management is completing a large 9-foot diameter circularly-bricked shaft, situated well abreast of their main workings. When these arrangements are completed general ventilation and cleanliness will compare favourably with any similar concern in the Commonwealth.

*Dust and Fumes.*—These pernicious nuisances are satisfactorily grappled with, the more recently installed rock-drilling appliances being at the Storey's Creek Mine, Ben Lomond.

*Equipment.*—Changing-houses were attached to all the metal mines, but during the year a fire caused that of the Round Hill Mine to be destroyed, which still awaits re-erection.

*Plants, Ropes, and Cages.*—Where in use, these have received their usual periodical overhauling and testing, all of which have been found reasonably satisfactory.

*Explosive Magazines and Oil Depots.*—Periodical inspections in this very extensive district have been carried out through the year, and the conditions in these matters have been found satisfactory.

*LIST of Accidents in Inspector Curtain's District for the Year ending December, 1922.*

Fatal 3; Non-fatal 6.

Date.	Name of Mine or Works.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1922. April 4	Section 3382/M	St. Helens	Fall of earth	William Girdlestone	Single, 61 years	Leg broken	—	1	Was working on his own property when fall took place. His left leg below knee was broken
May 25	Electrolytic Zinc Co.	Risdon	Fall from stage	Wilfred Reardon	Married, 48 years	Fractured skull	1	—	While unloading calcines from the s.s. "Barwon" fell from platform to wharf (12 feet) and fractured his skull, and died from injuries on 30/5/22
June 8	Endurance in Mining Co.	South Mt. Cameron	Fall from a scaffold	Carl Medwin Higgs	Married, 40 years	Broken elbow	—	1	While dismantling overhead fluming stage he lapsed, causing dislocation of left elbow and slight fracture of the skull
June 27	Argonaut Tin Mining Co.	St. Helens	Explosion of acetylene gas	George Salter	Married, 33 years	Burnt face	—	1	Hurricane lamp would not burn and was replaced by acetylene bicycle lamp, and the gaseous contact caused by carbide of calcium accounted for explosion and burnt face
July 7	Electrolytic Zinc Co.	Risdon	Electrocution	Samuel Cuthbert Fearuley	Single, 23 years	Electrocuted	1	—	Employed as greaser on conveyor belts on Risdon wharf. At about 10:40 a.m. he was found dead. Inquiry returned verdict of "Death due to electrocution"

July 24	New Golden Gate	Mathinna	Staging collapsed	Edward Tasman Nash	Married, 27 years	Broken neck	1	—	Failing to redeck staging with sound timbers; deceased was about to ascend the last ladder when the whole collapsed and carried Nash with it
Sept. 19	Preolenna Coal Mining Co.	Preolenna	Fall of earth	Rewan Bassell	Single, 28 years	Bruised shoulders and instep	—	1	While stooping to fill a truck a thick slab of stone fell on shoulders and instep, slightly bruising them
Oct. 1	ditto	ditto	Jammed toe between skip and trumper	Mervyn Raymond Alford	Single, 26 years	Bruised toe	—	1	While tipping a skip of stone, toe became caught between side of skip and trumper, causing severe bruises to toe
Nov. 11	Round Hill S. and L. Mining Co.	Cethana	lipped under truck	John Strong	Single, 47 years	Broken leg	—	1	Was taking trucks of mullock from mine to tip when he tripped under truck wheels, which passed over his leg

Mr. INSPECTOR VAUDEAU (Upper Burnie) reports:—

I HAVE the honour to submit my report as Inspector under "The Mines and Works Regulation Act, 1915," "Explosives Act, 1916," and "The Inflammable Liquid Act, 1920," for the year ending 31st December, 1922.

*Accidents.*—The tabulated list attached contains an account of the various accidents which occurred during the year. Taken on the whole, regarding safety, the working conditions during the year have been the best I have seen since I have been an Inspector of Mines for the Tasmanian Government, and yet the list is much larger than it was during 1921.

It is always easy to criticise after accidents have occurred, and one always needs to keep this in mind, but in the case of the accident which happened on 19th January it would appear that it would have been better mining practice to have, at least, caught up the centre of the caved ground, which had consolidated, still both the men and the mine superintendent considered the ground quite safe.

The accident that occurred on 14th September was rather a curious one. Two men on the underground brace had loaded into the cage two struts and a cap. When lifting the cap into cage it had slipped forward and a pinch-bar was used to pinch it back, and stuck in it in such a manner as to keep the cap in position. The struts were then jammed in on each side of the cap and fastened in, but the cage was knocked away without removing the pinch-bar. As far as can be ascertained, when the cage got to the No. 5 level this bar evidently got a bump and caught the cap in such a manner as to let the strut pass it and slip into the cage; the other end of strut caught on the frame-set, and then rolled out of cage, and in some way hung upon the timbers, the bar falling to the pent-house at or just before No. 6 level. When the boss had unloaded the strut and cap he got into cage, knocking so as to be pulled up slowly, placing a man at knocker in case he found anything wrong as he ascended. When he got near to No. 5 level his light went out, and the next he knew was that he got a knock on the foot. The enginedriver felt a jar, and fortunately pulled up. As already stated, it is easy to criticise after an accident, but being a boss, one would have expected him to either go up the ladder-way or use the other cage, so as to see what had happened, as he had ordered two struts and one cap to be sent down, and there was plenty of room for them in the cage. Still it was a remarkable thing how the strut hung up as it did. One would be quite safe in saying it would not do so once in a thousand times.

There is no need to further enumerate the accidents, as the tabulated list gives the necessary information.

At the end of the list an occurrence is recorded of a sad nature. It was well that the man was not in the act of being lowered into the mine at the time.

*Ventilation.*—As two of the mines are now getting down, and I have been supplied with an up-to-date anemometer, it was decided to go thoroughly into this question. On measuring up the air current it was found there was a lot of short-circuiting occurring, and requests were made that this be overcome, so as to make the conditions as good as possible, and as near to the requirements of the Act.

In one instance I was met (after letting the management know it must make good) with every assistance, and a decided improvement was effected. At the other mine I was met in a half-hearted manner, rather with a desire to evade me than to make good, but the management has been given to understand it must make good. It is far better for the companies to face the question now than to wait until they get deeper and deeper, for it then becomes a more expensive matter, and if provision is made as the work proceeds it is felt to a much less degree.

The desire of the Department here is at all times to assist mining and not to hinder it in any unreasonable manner, and if its desires were carried out at all times, not only would more healthy and safer conditions prevail, but a better efficiency would be obtained from the workers all round.

A little gas was noticed at another mine, but a system of ventilation was suggested and put in, until a connection was made which improved things considerably.

*Change-houses.*—A considerable improvement has been made at one mine, and at another, where the requirements of the Act are not being complied with, I have been promised the necessary alterations. These are now being proceeded with. Other than this, the conditions are reasonably satisfactory.

*Latrine Accommodation.*—This on the whole is reasonably satisfactory, very few complaints having to be made during the year.

*Health.*—As far as I can ascertain, this is reasonably satisfactory. Where rock-drills are in use water is supplied. One occasionally hears of cases where men are not using it for the allaying of dust, but care is taken that I do not see them.

During the term under review one of the managers came across two men in a stope not using water when boring, and reported the matter to this office. Legal action was taken against the men and both were fined and ordered to pay the court costs.

If the staffs on the mines were to assist in this manner for a few months, dry-boring and not using water would soon be a thing of the past, and mining would become a much healthier occupation.

*Explosives and Magazines.*—Considerable attention has been given to the handling and storing of explosives, and on the whole is much better than it was, though one occasionally comes across carelessness both in handling and storage.

Small quantities of nitro compounds were condemned and destroyed, mainly through saturation through absorption of moisture.

On one occasion, while I was nearby, a man lit a piece of fuse 3 feet 6 inches long, and dropped it with detonator and plug of gelignite attached into a hole about 9 feet deep, to clear a pass which had hung up. He had hardly got up the ladder 9 feet when it exploded. Luckily no damage was done. I tested 3 feet from each end of the remainder of coil, and found the burning rate to be quite satisfactory. The gelignite was in splendid condition, and some sparks from the fuse may have fallen on it and set it on fire, causing the premature explosion, or the piece of fuse may have been faulty; but apart from finding one lot on one mine on the quick-burning

side down to 23 seconds per yard, the fuse in this district has been quite satisfactory.

Five magazine licences were cancelled during the term and one new one taken out.

*Ropes and Cages.*—During the year under review three ropes had to be condemned and some alterations were requested on two cages. Other than this and the need to see that cages were tested and ropes cut as required by the Act, the general conditions were reasonably safe.

I have continued the practice of taking a piece of the rope cut off hoisting-ropes at the six monthly periods, and found the data useful, obtained by the bending-test. On one occasion the manager queried the test, and he was requested to send a piece of the rope to a testing-station, but preferred to send for another rope and not take the risk.

*Machinery.*—It was necessary on two occasions to call the attention of the Machinery Inspector to the unsatisfactory condition of same on two mines. He took this matter up with the management in connection with myself, and the necessary alterations were promised.

*Quarterly Returns* for statistical purposes, as required by Section 65 of "The Mines and Works Regulation Act, 1915."—There is still some difficulty in getting the necessary information, and it has been suggested that the present form be altered to make it clearer and simpler, so that the owners and managers may know what is required.

*Inflammable Liquid Depot.*—Those licensed in my district have been kept clean, and on the whole are reasonably satisfactory. Two registrations were cancelled and four new ones taken out.

*General.*—More active operations were commenced during the year at several mines. These and other mines and works have been regularly inspected as the importance of the operations called for. Several recommendations have been made in connection with the various operations, so as to assist in getting a reasonable degree of safety as well as better efficiency. In most instances I was thanked for my trouble; in a few cases the usual slipshod methods were persisted in. However, it is pleasing to say that, apart from a few instances, a general reciprocation towards ensuring a reasonable degree of safety invariably met my efforts, both from mine officials and the men. With the better prices for metals prevailing, I am hoping to see much greater activity in the industry.

*LIST of Accidents in Inspector Vaudeau's District for the Year 1922.*

Fatal 0 ; Non-fatal 10.

Date of Accident.	Name of Mine or Works.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1922. Jan. 19	Mt. Bischoff Tin Mine	Waratah	Fall of ground	Mark Hope	Widow- er, 51 yrs.	Internal injuries, broken right leg and back	—	1	Hope, with his mate, was rising to connect with a drive driven some time previously, and on striking the rails, which had been left in found the ground had caved and filled it, packing itself in such a manner that it looked solid. They were squaring out ground for rise timbers and considered the ground reasonably safe to do so, when without any warning the ground came away and partially buried both of them. The mate did not receive any injuries and was able to uncover Hope and get assistance. It was considered at the time that Hope had no chance of recovery, but he is still alive and reports are that he may still eventually recover
Feb. 15	Federation Tin Mine	South Heems- kirk	Lowering steel down a rise	John Bourke	Married, 55 yrs.	Internal pains and bleed- ing	—	1	Was lowering steel down a rise, on a rope, when they caught, he gave them a jerk when he felt something go inwardly. He had hurt himself some years previously in a similar manner, and the doctor considered it had reopened the old weakness

LIST of Accidents in Inspector Vaudeau's District for the Year 1922—continued.

Date of Accident.	Name of Mine or Works.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1922. Feb. 27	Miner's Right Claim, No. 2415	Savage River	Fall of embankment	Albert Moore	Married, 32 yrs.	Broken leg	—	1	Moore, with a mate, was working some "terrace" ground for osmiridium, was dry stripping about 13 to 15 feet deep. They had just rolled back a log and began to pick in face when suddenly the face came away without any warning. He stepped back against the log and the ground caught him on the leg, breaking the small bone of right leg. If they had rolled the log a bit further away he would not have been caught.
June 3	North Mt. Farrell Mine	Tullah	Stone rolled over on to ankle	John Fulford	Married, 58 yrs.	Fracture of right leg just above the ankle	—	1	While preparing "solar floor" under a set of broken ore, a piece rolled out and hit him on the ankle
Sept. 14	ditto	ditto	Piece of timber (a strut) fell on his foot	Gilbert Muir	Married, 36 yrs.	Bruised right foot	—	1	A "strut" had hung up in the shaft (how it did so, is hard to imagine), and Muir went up in cage not knowing it was there. The cage on striking it caused it to fall on to his foot. For fuller details see body of report

Sept. 27	ditto	ditto	Fall of ground	John Beckett	Married, 52 yrs.	Broken left forearm, head injuries, and abrasions	1	Beckett stated he took charges up to his mate in stope to load up holes they had bored, and was going down the ladder again when some ground fell down on top of him causing the injuries. He and his mate had been instructed by the manager that morning to put up a protection over the man-way, but had not done so, considering everything was quite allright. During the previous week they had just started rising for another floor right over the man-way. I spoke and recorded against the practice, as there was no protection made against fall of ground or loose material in any way, and requested that the practice be discontinued in the mine. However, at the time of the accident, they were stoping some feet away from the man-way and the ground which came away, was from the hanging-wall, which up to that time had always appeared to be good standing ground
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LIST of Accidents in Inspector Vaudeau's District for the Year 1922—continued.

Date.	Name of Mine or Works.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1922. Sept. 27	No. 6 Argent Mine	Zeehan	Fell on to piece of timber	Walter O'Donnell	Single, 30 yrs.	Broken titia and fibula of left leg	—	1	The man was barring down, after firing, in rise. A piece of rock, about 1 cwt., fell on to the staging (this piece of timber was dirty, and looked like a split lath, but was a piece of sawn myrtle which was very short in the grain) and broke it, letting him fall on to a cross-piece of timber which had been used for previous staging and had not been pulled off. This was only 3 feet lower than where he was standing and about 4½ feet from the bottom
Oct. 25	Magnet Silver Mine	Magnet	Hit by piece of ore	Henry Ralph	Single, 22 yrs.	Crushed big toe of left foot	—	1	Was filling truck from shoot when a piece of ore rolled off and hit him on the foot
Oct. 30	No. 6 Argent Mine	Zeehan	Fell into pump bob-pit	Albert Joseph Turley	Married, 37 yrs.	Strained the ligaments of his back	—	1	Was carrying in a rope to lower timbers into pump bob-pit being constructed underground. He in some way mistook the distance, and although the place was well lit up, he walked right into the bob-pit

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Nov. 20	North Mt. Farrell Mine	Tullah	Piece of timber fell on his thumb	Thomas Parker	Widow-er, 55 yrs.	Broken left thumb	—	1 The man was engaged laying a piece of plain galvanised iron on top of a bench in the mill assay office, when a piece of 3" x 2" hardwood fell off a cross-beam in the roof on to his thumb. Why the piece had been left there no one seemed to know
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Mr. INSPECTOR WILLIAMS (Queenstown) reports:—

I HAVE the honour to submit the following report upon the work of inspection and administration of the provisions of "The Mines and Works Regulation Act, 1915," "The Explosives Act, 1916," and "The Inflammable Liquid Act, 1920," within the Lyell inspection division for the year ended on the 31st December, 1922.

The year was characterised by reduced mining activity, largely as a result of restricted operations by the Mount Lyell Mining and Railway Company Limited. Modifications of metallurgical practices by this company lessened the demand for pyrites for blast-furnace requirements, and this was attended with a total cessation of operations below No. 5 level at the Mount Lyell Mine, the ore reserves on and above that level being sufficient to meet the demands of the smelters and of chemical works on the mainland. Pending a completion of additional treatment facilities, ore-production was curtailed at the North Mt. Lyell Mine. These and other factors reflected adversely upon the number of men employed, which was 30·2 per cent. less than the average number employed in connection with mining during the previous year. However, with a sustained demand for pyritic ore an early resumption of operations below No. 5 level at the Mount Lyell Mine is anticipated, and other things being equal, greater mining activity will ensue during the coming year, and incidentally result in an increase in the number of men employed in the inspection division.

Customary attention was directed to securing a reasonable compliance with the provisions of the "Mines and Works Regulation Act." Generally the machinery of the Act was not ignored, but records are not immune from instances of failure by employer and employee to make a reasonable observance of its provisions, and the desiderata of this office for the production and maintenance of improved conditions have not been regularly responded to.

*Settlements of Ground.*—There were no extensive settlements of ground, but several lesser occurrences of the kind were recorded, and these continued to emphasise the care that is necessary in respect to structural weaknesses of the ore-bodies. In one case a "picking-up" stope was collapsed by the weight of the depleted and filled stopes above, largely owing to the absence of progressive back-filling, necessity for which had been counselled by this office with all "picking up" work.

Effort was continued to secure the regular adoption of precautionary measures in the presence of lines or zones of weakness before danger became imminent, but an application of this principle was not constantly preferred to one positive or negative issue of uncertain conditions.

*Accidents.*—Twelve accidents, entailing injuries to a like number of persons, were recorded under the provisions of Section 26 of the "Mines and Works Regulation Act." There were one fatality and 11 casualties attended with non-fatal injuries, as against three of the former and 19 of the latter numbers recorded during the previous year, which is a reduction of 45·46 per cent. of the total casualties. Allowing for the reduction of 30·2 per cent. of the average number of men

employed, the accident ratio compares more than favourably with that of 1921 or preceding years.

In addition, two accidents, involving serious non-fatal injuries to two persons, occurred in connection with surface machinery, but were not recorded at this office, as such were accepted and dealt with by the Machinery Department.

The fatal accident occurred underground, and was caused by a fall of ground. A miner was preparing for the erection of a square set when a quantity of ore fell from overhead, cut off the laths which had been tailed out as overhead covering, struck and killed him instantly. The covering comprised several 6-inch by 2½-inch laths 7 feet long, tailed out about 5 feet and supported only by the bridging over the strut member of the leading set. The frailty of the structure pointed to an error of judgment in respect to the conditions obtaining, and this and other factors did not harmonise with the opinion of this office, previously recorded in writing, in respect to the conditions obtaining and the measures necessary for safe working. However, at the ensuing inquest the jury found that death was due to accidental causes.

The most serious of the non-fatal injuries was of simple origin. A chip from a casting, which a fitter was trimming, rebounded from the bench-wall, struck him in the left eye, and inflicted injuries which necessitated a removal of the eye.

In one case a miner was preparing for the erection of a set of timber in broken ground, when a quantity of ore slipped, from the side of the working-place and a portion struck him, inflicting injuries of a non-serious nature, but sufficient to incapacitate him for more than 14 days.

One person sustained a fractured thumb through carelessly allowing it to rest on a gad-head which his mate was striking with a hammer. Septicemia supervened in a case where leg-bruises had been sustained and caused the sufferer to be idled for more than 14 days. In one case a person sustained non-serious burns when escaping from a burning building at a reduction works.

The remainder of the accidents were not of serious moment, and these, together with other particulars, are epitomised in the tabulated list appended.

*Health and Sanitation.*—Production and maintenance of improved conditions governing health and sanitation were given due attention, but the securing of desired results was often accompanied with unpleasantness, and the year closed with much to be accomplished in respect to the repression and control of nuisances, particularly those due to dust and fumes, in and about the mines and works.

In one case a sintering plant was added to, and operated without provision for effectually dealing with the fumes and dust dispersed therefrom, and the resulting condition for employees was deplorable. The management was amenable to reason, and agreed to a removal of all objectionable fumes and dust, with a subsequent remodelling of the plant. Alterations to the plant were commenced upon, but progress was limited, and the conditions had not been alleviated at the close of the year. Efforts to obtain an extended suppression of dust at a sampling plant were not responded to, as was the case also in respect to coal-dust and fumes at a nodulising plant. Subsequently an outbreak of fire occurred, and dam-

aged the latter plant to an extent that reconstruction was not undertaken. Although the cause of the fire was not definitely revealed, the permitted accumulations of coal-dust were an important factor in propagating the fire from the point of origin.

One person was prosecuted for failing to use an appliance for the prevention of dust during rock-drilling operations underground, and several instances of insufficient precautions to allay dust were countered with cautionary measures. One instance was encountered where a miner had bored several holes in a place where the circulation of air was limited without means to prevent dust. The means provided by the management had become defective, and although this was known, reasonable effort was not made by officials to prevent drilling operations until the means had been restored to the place. Two other instances of rock-drilling operations being proceeded with without the provision of efficient means for allaying the dust were encountered. Instances of this nature were suggestive of lack of care on the part of officials for the repression of dust, and of an absence of a desire to co-operate in a campaign against that nuisance. Latterly, however, a kindly attitude was displayed towards the matter, and it is hoped that future results will justify all concerned being commended for efforts made to prevent dust in the mines.

Several instances were recorded of persons having to inspire underground atmospheres laden with fumes from blasting operations, for periods varying up to one and a half hour duration, owing to ineffective circulation of air and to a main travelling shaft being the only upcast airway at a mine. The periods of longer duration were largely averted by a regulation of blasting operations, and of lesser duration by an alteration of the winding arrangements. Latterly one complaint was received in respect to discomfort from fumes, but the matter was not finalised at the close of the year.

Ventilating systems were not different from those obtaining during the previous year. In three instances the thermometrical requirements of the Act were exceeded, and each was due to oxidation and leaching of pyrites in the absence of a compensating air-circulation. These cases were dealt with as conditions demanded, and close surveillance was maintained to ensure that the temperatures of underground working places were not allowed to remain in excess of the maxima prescribed by the Act.

Exclusive of occasional irregularities, which were promulgated for correction, existing crib-places and underground latrine accommodation were reasonably well cared for. Overcrowding of the former places gave rise to some differences, but the management was not amenable to the construction of additional places, of equal standard to existing ones, to meet the full demand, and with the existing machinery of the Act further action was not possible. In consequence several persons reverted to the practice of having crib elsewhere than at the allotted places, thereby mitigating the objective of the campaign entered upon in 1919. However, the disposal of food-scraps and other waste was reasonably well cared for, and it is hoped that circumstances will ensure of the accommodation being adequate during the coming year.

Maintenance of underground roadways to allow of congenial trucking and travelling conditions flagged to some extent, but latterly the work was commendably resumed, and conditions at the close of the year were not worse than hitherto.

Bathing and changing accommodation and facilities for rendering first-aid were equal to former standards, and there were no innovations in connection therewith.

An underground employee was reported to be suffering from pulmonary tuberculosis, and measures were taken to ensure against his employment underground whilst so affected.

The requirements of the Act and the desiderata of this office in respect to matters governing health and sanitation must now be apparent at the mines and works, and it should be recognised that wherever defective conditions are allowed to obtain, or conditions allowed to retrogress, effort will be made by this office to have those conditions corrected; consequently it would be of mutual benefit to all if those concerned would consistently produce and maintain equitable conditions before complaint by this office becomes necessary. This state of working is reasonably practicable, and its acquisition is worthy of a maximum effort by any management. A prevalent but necessary inflation of records by adverse comments would be largely replaced by commendation, and inspection and management would be rendered more congenial.

*Prosecutions.*—Legal proceedings were instituted against two persons for breaches of the "Mines and Works Regulation Act." One case concerned the allaying of dust from rock-drilling operations, and in the second case a person was prosecuted for riding in a cage with material. The contravention and result of the proceedings instituted in each case are shown in the following tabulation:—

Contravention.	Result.
General Rule 13 of the Schedule.—Failure to use, when necessary, an appliance for the prevention of dust during rock-drilling operations.	Miner: Convicted, fined £1, and ordered to pay costs amounting to 8s.
General Rule 37 of the Schedule.—Riding in a cage with material.	Machine-fitter: Convicted and ordered to pay costs amounting to 9s.

*Machinery.*—Due regard was given to the efficient maintenance of ropes, brakes, cages, and other appliances upon which safety depends. Where doubt existed in respect to the efficiency of appliances special examinations and tests were made, and any defects encountered were promulgated for correction. In three instances winding-engine brakes failed to respond to the applied tests, and were required to be made adequate. One rope, not in use at a shaft, was condemned and ordered to be replaced with a new one, while several new ropes were installed to replace those in use before condemnation of the latter by this office became necessary.

Three over-winding mishaps at one shaft were reported, and investigated. Two were due to a like error by the one engine-driver, who, on the first occasion, was cautioned, and on the second occasion was suspended from operating winding-engines for a period of three months. In the third case the engine-driver overlooked the travel of the indicators, and overwound the cage to the poppet-head. In each case the cage was suspended at the point of detachment; no person was injured, and no material damage was done. Although the engine-drivers were faulted, the management had passively resisted the efforts of this office to have certain innovations effected which would give the engine-drivers greater factors of safety in winding operations, and incidentally retard the likelihood of over-winds. After the third occurrence, and consequent upon the matter being dealt with by the Machinery Department, the management agreed to have the innovations effected.

*Explosives.*—Administration of the provisions of the "Explosives Act" and that part of the "Mines and Works Regulation Act" relating to explosives received due attention.

One new magazine was erected and licensed, and the use of two magazines was discontinued. Generally the conditions of storage were satisfactory.

Several instances of carelessness and improper handling of explosives were encountered, and those concerned were admonished for the misdemeanours.

Nitro-compounds of the same manufacture as hitherto were used, and no complaint was made to this office in respect to the quality thereof. Exclusive of small quantities which had deteriorated through local irregularities in storage and which were ordered to be destroyed, the condition of the compounds was satisfactory.

Frequent tests were made of the safety-fuse used, and at one period defective characteristics were encountered which discredited the quality of the fuse and called for the matter being brought under the notice of the manufacturer. Subsequently an improved-quality fuse was supplied and placed in use.

One premature explosion occurred during blasting operations in a mine, but no person was injured. The evidence obtained suggested faulty fuse, and such fuse was found to be of the same manufacture as that which had displayed defective characteristics when being tested.

Nothing untoward was brought under the notice of this office regarding the detonators used.

Landing of imported explosives at the port of Strahan was supervised as occasion demanded.

*Inflammable Liquids.*—A reasonable compliance was made of the provisions of the "Inflammable Act," and there is nothing of moment to be recorded in connection therewith.

*PARTICULARS of Accidents which occurred in the Lyell Inspection Division during the Year 1922.*

Fatal 1; Non-fatal 11.

Date.	Name of Mine or Works.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1922. Feb. 1	Mt. Lyell Co.'s Works	Queens-town	Jammed between truck and locomotive buffers	E. Williams	Single, 23 yrs.	Crushed foot	—	1	Whilst shunting ore trucks his foot was jammed between the truck and locomotive buffers
Feb. 2	Mt. Lyell Mine	Gormans-ton	Ground slipped from side of working place	J. Priestly	Married, 59 yrs.	Bruised shoulder and back	—	1	Whilst clearing for a leading set of timber, a quantity of ground slipped from the side, displaced the timber under cover of which he was working, and a portion of it struck him
Feb. 23	Mt. Lyell Co.'s Flux Quarries	Queens-town	Tripped on haulage rope	B. Allen	Single, 46 yrs.	Injured arm	—	1	When crossing an inclined haulage plane he tripped on the rope and fell to the ground
Mar. 16	North Lyell Mine	North Lyell	Ore rolled on him	J. Burns	Married, 35 yrs.	Injured foot	—	1	Whilst working at a heap of broken ore, a piece of the ore rolled on to his foot
Mar. 29	ditto	ditto	Obstruction caused truck to jump the roadway	L. Triffitt	Single, 20 yrs.	Lost tip of left small finger	—	1	When trucking ore under ground, the truck struck an obstruction, jumped the roadway, and jammed his finger against a chute lip

*PARTICULARS of Accidents which occurred in the Lyell Inspection Division during the Year 1922—continued.*

Date.	Name of Mine or Works.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1922. April 22	Mt. Lyell Co.'s Works	Queens-town	Chip of casting rebounded from bench wall	H. N. Paige	Married, 54 yrs.	Injury to left eye, which necessitated removal of latter	—	1	When chipping a casting, a chip of iron rebounded from the wall and struck his eye
April 24	Opencut Workings, Nth Lyell Mine	North Leel	Pick handle jarred his hand	A. Priestley	Single, 20 yrs.	Jarred left hand	—	1	Jarred his hand while using a pick
June 2	Mt. Lyell Co.'s Flo-tation Plant	Queens-town	Slipped off belt table	T. West	Married, 64 yrs.	Dislocated shoulder	—	1	He was standing on a conveyor belt table, and was reaching out for a "cut off" board, when he slipped backwards and downwards about three feet
June 3	Mt. Lyell Co.'s Nodulizing Plant	ditto	Building demolished by fire	H. Jones	Single, 55 yrs.	Burns on right arm	—	1	While escaping from a burning building he was scorched by the flames

June 28	Mt. Lyell Co.'s Works	ditto	Tripped	R. W. Gregory	Married, 53 yrs.	Bruised shin and ankle, with super- vening septic- emia	—	1	When moving machinery shafting he tripped and fell, and the shaft- ing struck him on the leg
Aug. 13	Mt. Lyell Co.'s Re- duction Works	ditto	Struck with a hammer	H. Jackson	Married, 48 yrs.	Frac- tured thumb	—	1	When cutting out a furnace fore- hearth he allowed his thumb to rest on the gad head, and his mate struck it with a hammer
Nov. 15	Mt. Lyell Mine	Gormans- ton	Fall of ground	W. Alderson	Married, 33 yrs.	Fatal	1	—	While preparing for a set of timber a quantity of ore fell from over- head, cut off the tailed-out laths, and struck him

## REPORT OF THE CHIEF INSPECTOR OF MAGAZINES AND EXPLOSIVES.

SIR,

I HAVE the honour to submit my annual report in connection with the Explosives and Inflammable Oils Acts for the year 1922.

The imports for the year were—

	lb.
Monobel ... ..	47,875
Gelignite ... ..	215,400
Blasting gelatine ... ..	9,250
Gelatine dynamite ... ..	3,000
Ligdyn ... ..	10,000
Powder ... ..	29,700
Detonators ... ..	205,000

The quantity of explosives was in excess of that imported for the previous year. The quality was satisfactory, except that some fuse had a very irregular burning rate. This defect was remedied by the manufacturer, and is now very satisfactory.

There were no accidents on mines or works which could be attributed to explosion. The storage and handling of explosives generally was satisfactory, and to this may be largely attributed the absence of accidents.

In rare cases it has been found necessary to destroy small quantities of explosives owing to absorption of moisture due to its remaining exposed to the atmosphere.

The provisions of the "Inflammable Liquids Act" have been complied with in a reasonable manner, but the practice of allowing the public access to the wharf where ships are unloading is one which must be viewed with apprehension. Those employed are restricted from carrying matches and from smoking, but there is little or no restriction on the general public visiting the wharf without precaution. The "Inflammable Liquids Act" applies only to those directly employed, but the by-laws of the Marine Board apply to all persons, and it is to be regretted that they are not more rigidly enforced. I feel sure that if the present system is not altered a very disastrous fire will result.

<i>Revenue.</i> —	£	s.	d.
Magazine licences, 63 ... ..	63	0	0
Licences to store, 46 ... ..	53	0	0
Permits to sell, 199 ... ..	49	15	0
Permits to import, 11 ... ..	22	0	0
Permits to convey, 32 ... ..	8	0	0
Registered premises, 134 ... ..	33	10	0
	<hr/>		
	£229	5	0
Magazine rents ... ..	213	0	9
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Total revenue ... ..	£442	5	9

I have, &c.,

J. O. HUDSON,

Chief Inspector of Magazines and Explosives.

W. A. PRETYMAN, Esq., Secretary for Mines, Hobart.