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TASMANIA



REPORT

OF THE

SECRETARY FOR MINES

FOR

YEAR ENDING DECEMBER 31

1919

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



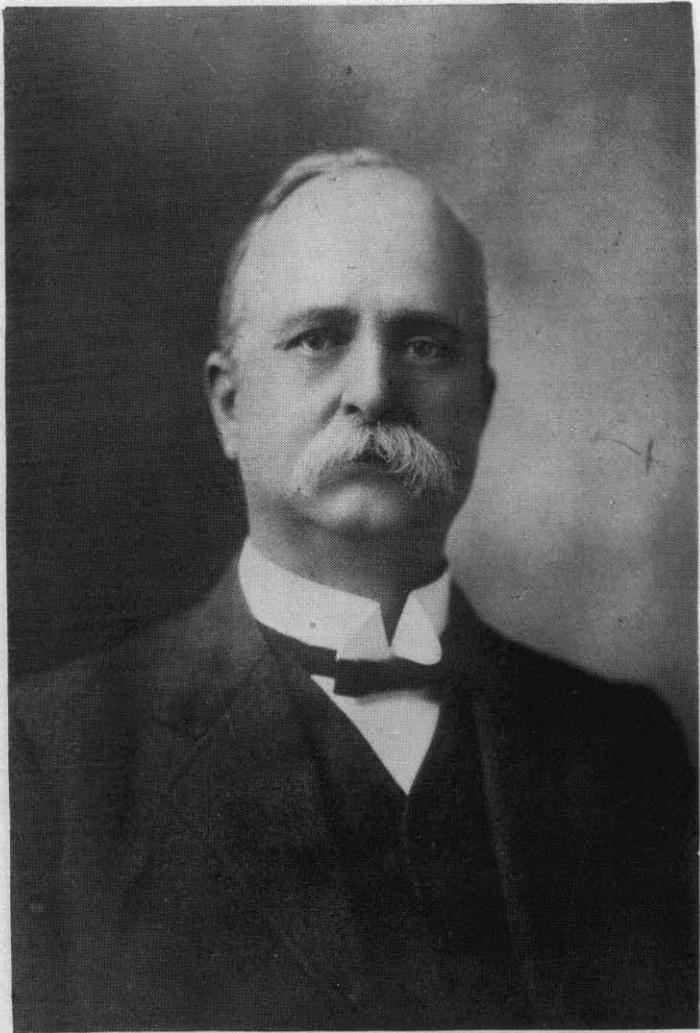
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THE LATE W. H. TWELVETREES, GOVERNMENT GEOLOGIST.

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## Report of the Secretary for Mines.

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Mines Department,  
Hobart, 17th May, 1920.

SIR,

I HAVE the honour to submit my report on the Mines Department and the Mining Industry for the year ending 31st December, 1919.

### GENERAL REMARKS.

The aggregate value of minerals raised during the year was £1,301,090, being a decrease of £449,484 on the value of the output for the previous year.

It will be noticed that a new departure has been made in regard to the statistical returns, which hitherto have shown the quantity of ores produced. In order to bring the information into line with the returns published in the other States, and in compliance with the wishes of the Commonwealth Statistician, it was decided to publish in future returns showing the actual metal contents of all ores won.

The mining industry has been hampered very much owing to the shipping strikes on the mainland, the influenza epidemic in this and other States, and the closing of the Sulphide Corporation's works at Cockle Creek (which was the only market for the silver-lead ores of the western and north-western districts). Another outlet has, however, since been obtained, and the ore is being purchased by a Melbourne firm for direct export to England now that the embargo on the export of such ore has been removed by the Commonwealth Government.

The Mount Read and Rosebery Mines Limited have entered into agreement with the Government for the purchase of the site upon which the Tasmanian Smelting Company's works at Zeehan were erected, and a provisional agreement has been made with the State Government for the necessary supply of hydro-electric power from Lake Rolleston; and it is proposed to erect a transmission-line from Lake Margaret to Zeehan for working an experimental electrolytic zinc plant capable of producing from 1 to 2 tons of zinc per day.

A New South Wales firm has secured a large area of land near Mt. Agnew for the purpose of working the extensive iron deposits in the vicinity. It is proposed at present to export the ore for smelting, but when there is sufficient electric power available on the West Coast it may be an inducement for the firm to erect smelting furnaces for the production of pig-iron in this State.

#### STATE ARGENT FLAT MINE.

The mine was unwatered, and the plant and rails recovered. Tenders were called for the whole of the mine plant, but none of those received were considered satisfactory. Some portions have been sold at the scheduled price, and one boiler has been hired (with the option of purchase) to the No. 6 Argent Prospecting Syndicate, No Liability.

The receipts during the year amounted to £226 3s. 3d., and the expenditure to £927 10s. 6d.

The following is a statement of the total expenditure and receipts to the 31st December, 1919:—

	£	s.	d.
Expenditure previous to 1919 ... ..	43,589	18	6
Expenditure during 1919 ... ..	927	10	6
Total ... ..	£44,517	9	0
Total value of ore sold by State ... ..	£12,226	8	3
Royalty paid by tributers previous to	£	s.	d.
1919 ... ..	2,228	12	10
Royalty paid by tributers during			
1919 ... ..	23	9	4
	£2,252	2	2
Total value of plant and stores sold ... ..	£858	14	7

The value of ore sold by tributers (Walshe & Inglis) during the year was £156 8s. 11d., from which sum the

royalty, at 15 per cent., due to the State (£23 9s. 4d.) was retained, and the balance (£132 19s. 7d.) paid to tributers.

#### AID TO MINING.

The period under review has been the most unsettled in the history of silver-lead mining on the West Coast. Early in the year the collapse of the lead market caused the cessation of production for a time. After the recovery a series of strikes made the transit of the ores most erratic. Despite these disabilities the Zeehan field has had a fairly good year, and a continuance of the present high metal prices will mean increased future activity and expansion.

In April the No. 2 Argent Tribute Syndicate, which has been employing 40 men, decided to instal one of the latest types of electrical pumping-plants, and the order was given to a well-known European firm which specialises in that class of machinery. The plant has not yet arrived, but when in place its working will be of great interest, as indicating what may be accomplished by electrical pumping when cheap power is available.

The No. 6 Argent Tribute Syndicate has replaced its steam pumping-plant by a much more powerful unit. The water is now under control, and some 50 men are employed on the mine. The stopes and ends are showing payable ore, and a good output is being maintained.

The various other tributes are doing fairly well. At the Comstock a crosscut is being driven from the long tunnel to intersect Tengdahl's and Davenport's lodes. On the Oonah a drainage tunnel has been driven 630 feet to lower the mine water 60 feet below the present level. Another 80 feet will complete the work, and it is anticipated that considerable ore will be made available for extraction.

#### PROSPECTING.

Altogether, tributers have been assisted in 541 feet of driving, at an average cost of 7s. 9d. per foot, and some payable lodes have been found, from which moderate returns are being obtained.

#### ASSAYING AND SURVEYING.

The assay and survey office has been maintained at Zeehan, and all tributer's surveys have been made free of charge. Samples to the number of 589 were assayed, which necessitated 1274 metal determinations; also, 216 mineral identifications were made gratuitously.

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

	Quantity. Tons.	Value. £ s. d.
Silver-lead ore ... ..	518·2952	13,958 7 3
Pyritic ore ... ..	523·4090	534 11 0
Total... ..	1041·7042	£14,492 18 3

The amount received from ore sales was £10,271 7s. 2d., which was distributed as follows:—

	£ s. d.
Paid to tributers ... ..	8,261 13 7
Royalty paid to lessees ... ..	517 19 11
Royalty paid to State ... ..	1,486 11 6
Miscellaneous payments to State ... ..	5 2 2
	<u>£10,271 7 2</u>

EXPENDITURE.	£ s. d.
Salaries ... ..	412 10 0
Wages ... ..	21 0 0
Office expenses ... ..	19 10 0
Assay material ... ..	49 19 8
Assistance to prospectors (541 feet driven) ... ..	210 0 0
Pumping charges (No. 2 Argent) ... ..	242 11 5
Advances to No. 6 Argent Prospecting Syndicate ... ..	1,099 7 10
Miscellaneous ... ..	10 11 10
	<u>£2,065 10 9</u>

RECEIPTS.	£ s. d.
Royalty paid by tributers ... ..	1,190 19 11
Assay fees ... ..	32 8 0
Stores sold ex Corinna depot ... ..	1 0 0
	<u>£1,224 7 11</u>

#### NO. 2 ARGENT PROSPECTING SYNDICATE, NO LIABILITY

	£ s. d.
Purchase and erection of plant ... ..	456 7 3
Repaid by royalty ... ..	376 2 0
Cost of running and maintaining pumping plant—	
Expenditure during the year—	
Power (four months) ... ..	232 17 3
Credit by rebate royalty repayments ... ..	361 12 8
Credit balance ... ..	<u>£128 15 5</u>
Royalty paid in addition to above ... ..	<u>£367 5 3</u>

## No. 6 ARGENT PROSPECTING SYNDICATE, NO LIABILITY.

Amounts authorised:—	£	s.	d.
Sundry Public Works Suspense Account ...	600	0	0
Aids to Mining Trust Fund ... .. .	1,100	0	0
Loan to No. 6 Argent Prospecting Syndi- cate, N.L., Ins. Account, G.C.A., 23.6.19	1,360	0	0
Ditto, ditto, G.C.A., 11.9.19... .. .	600	0	0
<b>Total ... .. .</b>	<b>£3,660</b>	<b>0</b>	<b>0</b>
<b>Total amount advanced to 31st December, 1919</b>	<b>£3,236</b>	<b>11</b>	<b>9</b>
<b>Total royalty paid to 31st December, 1919 ... ..</b>	<b>£333</b>	<b>3</b>	<b>2</b>

## APPENDICES.

Appended will be found—

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

Report of the Government Geologist.

Report of the Assistant Government Geologist.

Report of the Government Assayer.

Report of the Chief Inspector of Mines.

Report of the Chief Inspector of Explosives.

Reports of the Inspectors of Mines.

## GOLD.

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

	Ozs.
Beaconsfield ... .. .	572,473
Lefroy ... .. .	2,900
Lisle, Golconda ... .. .	109,841
Mt. Claude ... .. .	100,600
Mt. Cameron, Mt. Victoria, and Warren- tinna ... .. .	375,770
Mathinna ... .. .	1,529,450
North-West and West Coasts ... .. .	5,466
<b>Total ... .. .</b>	<b>8,157,034</b>

Value, £32,650, equal to 7686·47 oz. fine gold.

*Beaconsfield.*—The Tasmania Gold Mine Limited.—This famous gold mine, which was discovered by Dally in 1877, has, after winning 849,913 oz. of gold, valued at £3,610,180, and distributing a sum of £772,671 by way of dividends amongst its shareholders, been forced to close down. For some years the company has been extracting the gold from its vast heap of tailings, and a plant was

erected for the purpose of treating the raw slimes from the dams, but proved to be unsuccessful, and the plant was closed down in April. During the year 6388 tons of slimes were treated, and from this and other cleaning-up sources 559 oz. of gold, of the value of £2373, were obtained. The company has since endeavoured to obtain tenders for the purchase of the slimes, but so far without avail, and the men at the reduction works and at the mine have been employed in dismantling and breaking-up any machinery for which sales cannot be found. The number of men employed was 23.

*Lefroy, Golconda, Panama, Mangana, and Mt. Victoria.*—These goldfields, from which large returns were being obtained a few years ago, are now idle.

*Lisle.*—The Lisle Gold Mine, with two men sluicing for a period of five months, obtained 37 oz. of gold.

*Warrentinna.*—Operations at the Mara Gold Mine continue. Sufficient gold is obtained from the small reefs to keep a few men employed. The mine needs capital to thoroughly and systematically develop it.

The Dawn of Peace Gold Prospecting Syndicate is prospecting on a reef about 2 miles from Branzholm, which was discovered by W. Holloway, and from which some good prospects are said to have been obtained close to the surface. The approach to and the tunnel has been driven westerly a distance of 150 feet, at which point the reef was cut at a vertical depth of 50 feet from the surface. This was driven on 102 feet north and south of the tunnel, varying in width from 6 inches to 15 inches. A little gold was obtained for the full distance, but the reef channel was filled chiefly with lode slate, and on the whole was very disappointing. The tunnel was connected with the surface workings. Six tons of quartz were crushed, and  $5\frac{3}{4}$  oz. of gold obtained, valued at £15. Operations have now ceased.

*Mathinna.*—The New Golden Gate Gold Mining Syndicate.—Work at this mine has been confined to stoping small blocks of stone at the back of the 500-foot level, from which 1383 tons were raised, returning 1442 oz. of gold. Seven tons of pyrites were sent away for treatment, and returned 81 oz. of gold. Total value, £5750. The average number of men employed was 20.

*Derby and Gladstone.*—About 19·30 oz. of gold were obtained by the Briseis Tin and General Mining Company from the tin drifts at Derby, and a little was also obtained from the tin sluice-boxes in the Gladstone district.

*Port Cygnet.*—Considerable local interest has been revived in the township at Port Cygnet owing to the discovery of a gold reef in the locality, and a small syndicate, called the Mt. Mary Gold Mining Syndicate, has been formed for the purpose of developing the reef. Gold was reported to have been discovered in this locality about 20 years ago, and a shallow shaft was put down, but the prospects did not at that time warrant further expenditure. The property has been recently reported upon privately, and it is understood that further prospecting has been recommended.

A number of permits to search for gold on private property have been granted during the year, and it is hoped that those who are devoting their time and money in trying to trace the source from which the alluvial gold in the vicinity was obtained some years ago will be rewarded for their industry.

*West Coast.*—The McDowell Prospecting Association.—After suffering a period of idleness, operations were resumed at this mine, with two men, during the early part of the year, and attention was directed to exploration in the lower tunnel, and to stoping a block of ground in the upper tunnel. Sixty tons of ore were raised and crushed at the syndicate's battery, for a yield of 2.25 oz. of gold, valued at £9. Results offered no encouragement for further work, and the mine has been closed down.

### SILVER-LEAD.

The quantity of silver produced was 525,343.270 oz., valued at £125,564.

The principal producers were:—

	Ozs.	Value. £
<i>Zeehan Mines.</i>		
Mt. Zeehan (Tasmania)...	28,650	6,830
Nike ... ..	27,648	6,783
Zeehan-Montana ... ..	6,986.56	1,675
Oonah ... ..	4,276.21	1,155
Dunn ... ..	3,797.5	760
Zeehan-Queen... ..	2,561	613
<i>Mt. Farrell Mines.</i>		
North Mt. Farrell ... ..	42,960	9,581
<i>Magnet Mines.</i>		
Magnet ... ..	98,625	24,539
<i>Mt. Claude Mines.</i>		
Round Hill... ..	51,994	12,554

The quantity of lead produced was 2357·142 tons, valued at £64,403.

The principal producers were:—

	Tons.	Value. £
<i>Zeehan Mines.</i>		
Mt. Zeehan (Tasmania) ... ..	286·25	8,199
Nike ... ..	258·4	6,928
Dunn ... ..	144·42	3,024
Zeehan-Montana ... ..	52·13	1,364
Zeehan-Queen ... ..	36·4	1,177
Oonah ... ..	31	874
<i>Mt. Farrell Mines.</i>		
North Mt. Farrell ... ..	447	12,215
<i>Magnet Mines.</i>		
Magnet ... ..	528·6	14,550
<i>Mt. Claude Mines.</i>		
Round Hill ... ..	365·1	9,750

*Zeehan District.*—Electric power was supplied for a time by the Zeehan Municipality to some of the mines during the early part of the year, but, owing to various causes, the power could afterwards only be supplied between 3.30 p.m. and 12.30 a.m. This seriously affected developmental work in some of the larger mines. New plant is now being erected at the power-house, and as soon as the necessary power is available a more vigorous policy will eventuate.

The Mt. Zeehan (Tasmania) Mines Ltd.—Work is proceeding on the No. 2 Argent Mine by various tributaries from adit levels, with fair results. A new electrical pump has been ordered, and as soon as it arrives it will be put into commission, as it is expected that power will be available by that time, and active operations will then be resumed in the lower levels.

On the No. 1 Argent Mine the concentrating mill is being overhauled, and additional plant erected for treating the old tailings dumps as well as the milling ore from various mines in the district.

No. 6 Argent Prospecting Syndicate.—Towards the end of the year pumping operations were started, and the mine was unwatered. It is expected that this mine, which has received Government assistance, will very shortly produce sufficient ore to repay the Government loans.

At the Oonah, Zeehan-Queen, and Montana Mines various tribute parties are engaged in developmental work and in extracting silver-lead ores, with varying results.

The Nike Mining Company, No Liability.—A fair amount of developmental work has been done in the upper levels, and some good ore exposed. As soon as power is available, the sinking of the main shaft will be resumed,

in order to get under the very good ore worked by this company in the past, as well as to drive out and cut the ore recently developed.

The Swansea Mining Company.—This company has been putting in a water-power scheme, and expects to be sending out regular parcels of ore in the near future. The values in lead are high, but the silver contents are low for Zeehan ore. This ore should be very suitable for the manufacture of whitelead. The mine also contains some very high-grade zinc ore.

Various old mines, which have been reserved under "The Aid to Mining Act, 1912," and portions of other leases, are being worked by various tributers under the Act, some of which are giving very satisfactory results.

McDermott's, Thomas', and Davern's Mines.—Some developmental work has been carried out on these mines, but nothing of much value has been exposed.

*North-East Dundas.*—Kapi Mines.—Small parcels of high-grade ore continue to be sent away by the men working the property on tribute.

*Lyell District.*—The Tasman and Crown Lyell Extended Mine.—Production from the silver-lead ore-body on and above the 120-foot level was continued, with an average number of 18 men, until April, when the number was reduced to 2. Production was then discontinued, and attention was directed to exploring the extremities of the ore-body above the 120-foot level. The consequent period of dormancy was not due to a depletion of the ore-body or to impoverished values, but solely to an alteration in the company's policy. Prior to the reduced activity, the primary object was the production of a high-grade concentrate for shipment to Cockle Creek, but the losses incurred in stamper crushing and Wilfley table concentration indicated unsuitability of the company's local concentration plant for the silver-lead-zinc-iron sulphide ore.

Latterly expert opinion was obtained in respect to the possibilities of the mine, and the most suitable form of mechanical concentration. A finalised project was to explore the possibilities of a persistence of ore below the 120-foot level, and if such responds to development with consistent values, the installation of mechanical concentration will be considered.

It is estimated the exploration and development on and above the 120-foot level have proved 20,000 tons of ore of satisfactory values, and if the developments anticipated are realised the mine will present interesting, though possibly limited, future possibilities.

*Mt. Read District.*—The Mount Read and Rosebery Mines Limited.—During the early part of the year developmental work was continued at the mines at Rosebery and Williamsford, and the filling of old stopes at the latter place was completed. Work was then discontinued, pending the erection of treatment plant.

Tasmanian Metals Extraction Company.—Some new machinery has arrived on the works, and it is expected that work will be resumed in the near future. This company has recently acquired the old Mount Read Mine near Williamsford.

*Mt. Farrell District.*—North Mt. Farrell Mining Company, No Liability.—A total of 5462 tons have been mined and milled, for a return of 929 tons of marketable product, containing 49,572 oz. of silver, and 510·5 tons of lead, of an estimated net cash value of £12,453.

The total production of the mine to date amounts to 46,383·5 tons of crude ore, containing 2,375,884 oz. of silver and 24,020·5 tons of lead of a net value of £436,843.

Immediately after the new year mining and milling operations were resumed, with a view to continuous production, but unfortunately three months later the prevailing epidemic on the mainland, coupled with industrial troubles, rendered the regular shipments of ore to the smelters an impossibility. In addition, the contract price for the sale of lead having expired, the £15 per ton was not considered sufficient. The company therefore decided to close down the productive side of its mine and carry on an active policy of development until normal conditions were once again restored. Consequently, the year's production shows a considerable falling-off.

The general development work carried out was as follows:—

No. 5 Level.—The shaft was squared up, and a chamber was cut out at 72 feet below No. 4 level. A crosscut, 8 feet by 8 feet, was driven, cutting No. 3 lode at 79 feet from the chamber; and a main level continued on a further distance of 93 feet on the lode. Values throughout the distance were poor, but it is expected that the rich lode met on the level above will be found another 150 feet further north. A cistern for pumping purposes has been excavated at this level.

No. 4 Level.—The north end of this level was extended a further distance of 230 feet on No. 3 lode, making a total from the main shaft of 580 feet. Throughout the distance the lode preserved an average width of 11 feet,

and carried good values. Four rises connecting the stopes above this level with No. 3 level were completed. They will be invaluable for filling stopes and lowering timber when ore-breaking is again resumed. The bulk of the crude ore milled was won from this level.

No. 3 Level.—No work, except usual mine repairs, has been carried out at this level. A rise connecting the adit-level with the surface has been completed, and will be used for filling in the stopes.

Surface.—The old ore-bin has been replaced by a new one, and the rock-breaker section of the treatment plant has been improved. A second rock-breaker was installed, and both machines placed on new foundations.

Mt. Farrell Mining Company, No Liability.—No work has been carried on during the year.

A small party of men have been breaking some high-grade ore parallel with some of the Murchison Company's old workings.

*North-Western Mining Division.*—The Magnet Silver Mining Company, No Liability.—Mining operations have been carried on at No. 12 and No. 13 levels, most of the ore coming from No. 12 level.

The main shaft was sunk to a depth of 220 feet below No. 12 level, when the No. 13 platt was cut 100 feet from this level, and the crosscut sent in to intercept the lode, which was done 330 feet from the main shaft. Good ore was met with, and the crosscut continued across the lode to the hanging-wall in good seconds. The north and south footwall drives were driven for a distance of 40 and 50 feet respectively, opening up good ore. Shortage of labour (especially good miners) has retarded developmental work. At no period of the year was the mine fully staffed. Shipping troubles, coupled with the influenza epidemic, made it very difficult to ship ore, which also restricted production; and the very dry weather during the last quarter caused considerable inconvenience.

The following are the particulars regarding the ore produced:—

Ore treated	11,615 tons
Metal produced	1,371 „
Contents:	
Lead	528 „
Silver	98,625 ozs.
Gross value	£32,777
Men employed	138

The Persic Silver Mine.—One of the old mining sections (past the old Silver Cliff Mine, worked some time ago) was taken up again by a returned soldier, and a lower adit driven to cut the shoot of ore driven on at the level above.

The formation was cut and then turned on, and, just before the close of the year, ore of a similar nature to that exposed in the level above was cut and driven into for a few feet.

The Victoria Magnet Mine is still prospecting; and the Mt. Jasper Company has been doing some prospecting work on the "Right Mine" on a silver-lead formation, which appears to be the same as that worked by the old Heazlewood Silver Lead Mining Company.

*Northern and Southern Mining Division.*—The Round Hill Silver and Lead Mining Company, No Liability:—

Mine Development.—During the year the main No. 1 tunnel has been driven along the main lode 21 feet north-westerly and 286 feet south-easterly (or a total of 307 feet). The average width of the lode for this distance is 16 feet. The lode has varied in values from time to time. A total distance of 415 feet along the main lode has now been driven, and the lode has proved payable for the full distance.

No. 2 Tunnel.—This tunnel is 70 feet above the main or No. 1 tunnel, and during the year the Company has been engaged exploring and driving south-easterly along the anticline formation to reach the upward trend of the main lode. During the year this tunnel has been extended a total distance of 218 feet. One rise has been put through from No. 1 tunnel connecting with the bottom of this tunnel, and calculations made from this show that a further 100 feet of driving will reach the lode. In the meanwhile several small shoots of galena ore in the anticline formation have been passed through, which will pay for stoping later on.

Stopes.—Operations have been started on five stopes above No. 1 tunnel with two rock-drills. The lode in each of these stopes is equal in value to that found and passed through in No. 1 tunnel.

Rises.—During the year, as above stated, a rise was put up from No. 1 to No. 2 tunnel, which provided good ventilation at both levels.

The following work was accomplished:—

Driving main tunnels.....	525 feet
Rises .....	50 "
Crosscuts.....	20 "

Output.—The total output from the mine during the period under review was as follows. The values stated are approximate, and are based on the prices paid from time to time by the Cockle Creek Smelting Works. These prices have varied from 3s. 10d. per oz. of silver during the first half of the year, to 4s. 5d. per oz. during the

latter half; and prices paid for lead have varied from £15 and £18 for the first half of the year to £23 per ton for the latter half of the year:—

Ore milled .....	6,904 tons
Concentrates .....	740 „
Contents:	
Gold .....	99 ozs.
Silver .....	51,304 „
Lead .....	365 tons
Value .....	£19,345
Average number of men employed .....	32

### COPPER.

The quantity of copper produced was 5027 tons, valued at £504,961.

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

Ore—	Tons (dry).
From the Company's Mt. Lyell Mine .....	113,644
Ditto, North Mt. Lyell Mine .....	56,972
Concentrates from the Company's Lyell Comstock and North Mt. Lyell ores .....	7,883
Purchased ore (from other mines) .....	473
<b>Total .....</b>	<b>178,972</b>

Blister copper produced, 5071 tons, containing:—Copper, 5014 tons; silver, 228,652 ozs.; gold, 5251 ozs.; approximate value, £579,768.

Average number of men employed:—

Mining Department—	
At the Company's Mt. Lyell Mine .....	385
At the Company's North Mt. Lyell Mine .....	295
At the Company's Lyell Comstock Mine .....	44
At the Company's Crotty leases .....	28
Reduction Works Department (including Lake Margaret) .....	752
Railway Department—	
Mt. Lyell Railway .....	135
North Lyell Railway .....	14
<b>Total .....</b>	<b>1,545</b>

Dividends paid during the year, £128,919 10s., equal to 2s. per share.

Dividends paid from the inception of the Company to the 31st December, 1919, £3,765,549.

Copper produced from the inception of the Company to the 31st December, 1919, 163,583 tons fine.

Silver produced from the inception of the Company to the 31st December, 1919, 12,611,260 ozs. fine.

Gold produced from the inception of the Company to the 31st December, 1919, 366,414 ozs. fine.

Mining operations were in continuous progress at the Mt. Lyell Mine, but the output of pyrites was considerably hampered by shortage of miners, brought about chiefly by quarantine restrictions preventing arrivals from the mainland during the first half of the year, and by a serious outbreak of influenza during the latter part of the year.

The principal development work in hand was the opening up of a new level on the South Lyell ore-body, by means of an engine winze from the No. 9 level, to exploit the continuation of the ore-body, as proved by diamond-drilling. The South Lyell workings contributed largely to the total output of pyrites. The open-cut yielded some ore, but towards the close of the period a large slip of country-rock came from the hanging-wall, filling up the floor of cut, and causing temporary inconvenience, until a drive to the main travelling shaft had been completed.

All machinery at the Lyell Mine, including the aerial, new compressors, and haulage, operated satisfactorily, and without accidents. A commodious machine-shop, with modern equipment, is nearing completion.

A change-house, built of concrete and asbestolite, is in course of construction.

North Mt. Lyell Mine.—Ore-production was in progress on a restricted scale throughout the whole of this mine, in conformity with the low output of pyrites from the parent mine.

The ore-bodies have continued to develop favourably, and diamond-drilling ahead of present faces indicates considerable accessions to the ore reserves.

The most important development work was an extension of the 925-foot level in a northerly direction. Stopping operations at the northern end of 850-foot level and 1000-foot level proved continuity of ore-bodies at each of these levels.

As usual, filling material for depleted stopes was broken in the open-cut, and the usual recovery of copper precipitates from the mine waters took place.

The electric winding-plant and air-compressor machinery continued to give no trouble.

Lyell Comstock Mine.—The extraction of low-grade copper ore by open-cutting proceeded throughout the period, but no underground work was attempted. The output from this mine was passed to the flotation plant.

Lyell Blocks Mine.—This property was purchased outright, but no work was done on it during the year.

Smelting.—The usual smelting operations were in progress at the reduction works. Owing to the low output at the mines, due to scarcity of labour, it was not possible to operate continuously more than one blast furnace. Occasionally a second furnace was operated for short periods. The new converter plant was in operation all the year, and proved very economical and satisfactory. The blister copper output was despatched, as usual, to the Electrolytic Refinery Company at Port Kembla, New South Wales.

The flotation plant treated ore from the Comstock Mine, and low-grade ore from the North Lyell Mine, and gave a good recovery.

The Dwight-Lloyd sintering plant handled the flotation concentrates and fluedust, prior to blast-furnace treatment.

A nodulizing plant, to treat all fine material, is in course of construction at the site of the original converter plant.

Hydro-Electric Power.—The Lake Margaret power plant supplied all the requirements of the works. The dam has been raised, and two additional generators were placed at the power-station. The third high-pressure steel pipe is in position, and additional bands have been put on the wood-stave pipe. The increase of power, due to the above additions, brings the total of the plant to 9000 horsepower.

Welfare Work.—This has been continued on a liberal scale. Additional homes have been built at Gormanston, and at Queenstown houses have been purchased and employees have been financed towards purchase of houses of their own. The large brick building known as "The Imperial Hotel" was purchased and thoroughly renovated to serve as a boarding-house for 70 men. The Federal Hotel, a large wooden building, was also purchased, and its renovation is in view. The Y.M.C.A. institution was supported, and various other social interests were brought into use by the company.

The electric lighting of Gormanston was completed, and is a great boon to the townspeople.

Mt. Lyell Blocks Copper Mining Company, No Liability.—Operations were continuous until May, when, owing to a depletion of payable ore at the 1200-foot level, the mine was closed for a short period until sufficient capital was raised to permit the exploration of a probable continuation of the cupriferous clays below the old workings on that deposit.

This was subsequently undertaken, and at the 630-foot level a convergence of the deposit was intersected, driven, and risen on, but values were impoverished. Results offered no encouragement for further work, and the mine was closed down.

The property was ultimately absorbed by the Mt. Lyell Mining and Railway Company Limited at a purchase-price of £5000, and this company is at present using the main shaft for baling purposes in connection with the North Mt. Lyell Mine.

Official returns show that 291 tons of ore were mined at the 1200-foot level, which was sold to the Mt. Lyell Mining and Railway Company Limited, and realised 39·3 tons of copper and 2619 oz. of silver, valued at £3667.

*Mts. Jukes and Darwin.*—Mt. Jukes Proprietary Mine.—A small amount of exploration was undertaken in a cupriferos lode-formation, but results did not merge into importance, and the section was under exemption for the greater part of the year.

Adamthwaite's section.—Limited prospecting was pursued at the close of the year on a deposit of cupriferos clays, but there is nothing of consequence to be recorded in connection therewith.

*Balfour District.*—The Copper Reward Mine.—No copper was shipped. The average number of men employed was 14. Most of the year was spent in renovating the 13-mile Government tram connecting Balfour with the seaport, Temma. This work is being done preliminary to the erection of plant for concentrating the copper ore. Machinery for this has been purchased, and is now at Temma. Bush fires during the summer destroyed  $\frac{3}{4}$ -mile of tramway, including 500 feet of bridges, and about 8000 superficial feet of sawn and squared timber.

## TIN.

The quantity of metallic tin won was 1580·22 tons, valued at £395,794; an average value of £250 9s. 4.237d. per ton.

The statistics for the year are:—

	Tons.	Value £	Miners Employed
Northern and Southern Division ... ..	38·84	9,871	38
North-Eastern Division	679	174,319	462
Eastern Division ... ..	223,159	56,726	283
North-Western Division	516,494	122,486	391
Western Division ... ..	122,722	32,392	129
Total ... ..	1,580,215	395,794	1,303

*North-Eastern Division.*—The output of tin was 679 tons, obtained as follows:—

	Tons.	Tons.
<i>Pioneer and Gladstone Districts.</i>		
Pioneer Tin Mine .....	190.33	
South Mt. Cameron .....	17.59	
Endurance .....	36.68	
Other claims.....	79.22	
		323.82
<i>Ringarooma, Derby, and Branzholm Districts—</i>		
Briseis Tin Mines .....	127.98	
Clyde Mine .....	3.59	
Arba Tin Mine .....	71.03	
New Ruby Flat .....	10.60	
Other claims.....	59.10	
		272.30
<i>Moorina District.</i>		
Weld Tin Mine .....	...	14
<i>Straits Islands</i> .....	...	7.88
Others .....	...	61
Total .....	...	679

*Eastern Division.*—The output of tin was 223.159 tons, obtained as follows:—

	Tons.	Tons.
<i>Weldborough, Lottah, and Blue Tier Mines.</i>		
Anchor Mine .....	4.55	
Allied Mine .....	1.15	
Star Mine .....	5.80	
Full Moon Mine .....	6.60	
Other claims .....	34.62	
		52.72
<i>St. Helens Mines</i> .....	...	55.075
<i>Avoca Mines.</i>		
Royal George .....	17.71	
Story's Creek .....	34.245	
South Esk .....	3.651	
Ben Lomond Republic .....	10.325	
Dalrymple .....	3.518	
Others .....	5.915	
		75.364
Others .....	...	40.000
Total .....	...	223.159

*North-Western Division.*—The output of tin was 516.494 tons, obtained as follows:—

	Tons.
Mt. Bischoff .....	351.21
Mt. Bischoff Extended .....	146.175
Weir's Bischoff Surprise.....	2.33
Waratah Alluvial .....	10.529
Mt. Balfour .....	6.25
Total .....	516.494

*Western Division.*—The output of tin was 122·722 tons, obtained as follows:—

	Tons.
Renison Bell Mine ... ..	16·67
Central ... ..	1·73
Heemskirk ... ..	38·97
Stanley River ... ..	7·955
Iris Tin recovery ... ..	3·335
Montana ... ..	5·615
Federal ... ..	30·790
Others ... ..	17·657
Total... ..	122·722

*Northern and Southern Division.*—The S. and M. Syndicate.—About 4906 tons of stone were milled, which produced 88·35 tons of concentrates. Operations were retarded by the general shortage of labour and water. Owing to the latter, milling was only possible during 35 weeks of the year. Ore-breaking was done on lodes 2, 4, and 6. Development work was mainly done to No. 3 level on No. 4 lode. This lode was driven on for a length of 338 feet. The ore was of good average grade.

*North-Eastern Mining Division.*—The Arba Tin Mining Company, No Liability.—The following is a statement of the work done and cost of treatment for the past 12 months, with a summary of sluicing results to date:—

	Cubic yds.	Working cost.	Tin won. Tons. Cwts.	Tin con- tents per c. yd. lbs.
<b>Main Workings—</b>				
From 1.1.19 to 31.12.19...	154,159	14·01d.	53 0	0·77
From 30.6.03 to 31.12.19...	3,169,661	6·58d.	1306 19	0·92
<b>Easement Lease—</b>				
From 1.1.19 to 31.12.19...	101,452	11·88d.	31 6	0·68
From 30.6.13 to 31.12.19...	562,859	9·68d.	274 6	1·08

The total quantity of black tin recovered was 84 tons 6 cwt.; approximate value, £16,000. The average number of men employed was 56.

Stripping overburden was carried on at the main workings during the latter half of the above period; tin contents, nil

The Briseis Tin and General Mining Company Limited.—The work during the year has varied little from that carried out previously.

Extraction of tin drifts from the Cascade lead has gone on regularly.

The lowest workings are 100 feet below river-level. The Ringarooma River, which runs across the ancient Cascade River bed or lead, and through the middle of the workings, has been again diverted to the north to allow for the advance of the main deep workings northward. The completing of this work during the second half of the year has seriously affected the output of tin ore. At the end of the year the water was turned through the new diversion, which is quite satisfactory, the drainage in the main workings showing very little, if any, increase over the usual heavy soakage from the main lead ahead.

The main tailings bank upon which the rediverted river is to be finally carried is making fair progress.

All power used, so far, is derived from various types of water turbines. Beyond a few pumps and the redesign of a Francis turbine, nothing of any consequence has been added to the plant.

Average number of men ... ..	90
Black tin won ... ..	180 tons
Equivalent metallic tin ... ..	128 „
Value ... ..	£30,954
Gold won ... ..	19.30 ozs.
Value ... ..	£75

The Pioneer Tin Mining Company Limited.—During the year 571,200 cubic yards of drift were pumped and sluiced, for a yield of 271 tons of stream tin.

The dry season seriously affected the output and involved the suspension of sluicing with No. 1 electric plant for 27 weeks, and No. 2 electric plant for 12 weeks of the term.

The high price of tin has enabled the working faces to be extended into ground formerly unpayable, and thus helped to conserve the company's reserves of payable drift.

The approximate value of the output of tin was £50,000 and the average number of men employed 70.

Since the inception of sluicing in 1900, 10,282,300 cubic yards of drift have been pumped and sluiced, for a yield of 7184 tons of stream tin.

On this company's Argonaut Mine, at St. Helens, 112,000 cubic yards of drift were pumped and sluiced, for a yield of 40 tons of stream tin.

Although a dry season was also experienced here, it did not seriously affect sluicing.

To work this mine to better advantage a water-race has been constructed from the Groom River to deliver into the present head-race, which will double the present water-

supply, and enable two faces to be worked in the winter, as well as ensure continuous sluicing for one plant throughout the summer in all but the driest seasons. To bring this extra volume of water on to the mine, a new wood pipe-line, 28 inches in diameter, and 2750 feet long, is to replace the existing pipe-line across the George River valley, and will be laid shortly. The approximate value of the output from this mine was £7400, and the number of men employed 17.

**Branxholm.**—The New Ruby Flat Tin Mining Company, No Liability.—Owing to the very dry weather the mine was only able to work for about six months, during which period 31,546 cubic yards of ground were treated, for 16½ tons of tin, valued at £3200 10s. The ground treated was partly solid and partly ground which had been previously worked; an average of 10 men being employed.

**The New Hope Tin Mining Company, No Liability.**—This company, employing three men, obtained nearly 4 tons of tin oxide, for a net return of £573 12s. 6d. The amount expended in wages was £506, and in development work £102.

**South Mt. Cameron.**—The Endurance Tin Mining Proprietary, No Liability.—This is an alluvial mine, and was started in May, 1918, since which date 54 tons of tin oxide have been won, valued at £10,800, an average of 24 men being employed. The mine is worked by a centrifugal pump erected on a barge, and operations were started in some old Chinese workings, and are now in solid ground, and future prospects are very promising. The last clean-up gave 20 tons of oxide.

**The Briseis Central Tin Mining Company, No Liability.**—At the main dam-site, Morning Star Flat, near Weldborough, surveys were made, and the ground cleared for the site of the proposed embankment 40 feet high. A tunnel was driven under the site of the embankment for the purpose of drawing off the water from the dam-site while the embankment is being built, and for supplying water to the company's race and ruine when the dam is completed. At the 31st December the tunnel had been driven 78 feet through solid granite. An outlet from the tunnel into the Cascade River was blasted out for a length of 120 feet. Two small dams about 350 feet above the level of the main dam were completed, and will hold about two million gallons of water, to be used for hydraulic sluicing of material to the main dam

embankment. A small tin face was opened out and worked with water from the small dams. About 33 cwt. of tin ore was sent away.

The main dam-site being about 1300 feet above the level of the company's mine, on the Ringarooma River, near Derby, and distant about 6 miles in a straight line, the water will be sent down the natural channel from the dam for about 3 miles along the Cascade River.

Main Race from Cascade River to Mine.—This was commenced during the year, but with only a few men. At the end of the year the race works were extended over a length of  $1\frac{1}{4}$  miles from the intake in difficult and stony ground.

The total length of the race will be about 5 miles, with a pipe-line giving 600 feet pressure for lifting purposes on the river flats of the company's ground.

No work was done on the company's ground in the Ringarooma River flats pending the completion of the race and pipe-line. About 14 men were employed during the year on main dam-site and race works.

Gladstone.—Rankin and Ogilvie, working with four men, and water from the Mt. Cameron race, are operating on Section 6987-m, on the Edina Flats, with satisfactory results. Close by the Groves Bros., on their consolidated lease, 7612-m, have gone to considerable expense in erecting tresselled fluming for half a mile, and cutting races, in order to bring water on to Amber Hill.

Messrs. Higgs and Kerrison, on Section 7599-m, immediately below the township, have built a barge to carry portable steam power. In addition, they are erecting flumings and cleaning out the old faces, from which good results are expected.

A party of Chinese, on Sections 227-m and 984-m, are doing satisfactory work with a couple of nozzles on a 20-foot face of decomposed granite.

*Eastern Mining Division.*—The Anchor Tin Mine has ceased to exist. The mining plant has been removed, and only two small tribute parties are working on the property.

The Allied Tin Syndicate, working on Section 3954-m, with a five-head battery, is obtaining a little tin ore.

The old Crystal Hill Mine is now known as the Duco Mine. The semi-decomposed granite was being sluiced but was found to be too hard, and the erection of crushing machinery is considered necessary.

The Full Moon Syndicate is working an old mine by open cutting, and some rich patches of tin ore are occasionally disclosed, and are treated in a five-head battery.

*Avoca District.*—The Royal George Tin Mining Company, No Liability.—Full mining operations ceased on the 29th March, when the erection of a 220-horsepower suction gas-engine was proceeded with. This was practically completed by the end of the year. During this latter period an average of 23 men were employed in the erection of the engine, and doing a little mining work, also a few men were on tribute.

The output up to the end of March was as follows:—

Stone crushed ... ..	3,223 tons
Tin oxide produced... ..	34½ ..
Value ... ..	£4,726
Average number of men (to 29th March) ... ..	75

Some tributers have been working on the Brookstead and Foster's freehold properties, but have been greatly hampered for want of water during the dry season.

South Esk Tin Mining Company.—Sluicing operations have been continued on the flats of the river banks with fairly good results.

The Ben Lomond Tin Mining Company has resumed operations both on the surface and underground.

The Story's Creek Tin Mining Syndicate.—A mechanical roasting furnace has been erected. Development work consisted of adits driven 245 feet, drives on lode 479 feet, crosscutting 24 feet, and rises on country-rock 12 feet.

The mill treated 47 tons of tin oxide, valued at £5789.

*Western Mining Division.*—North Heemskirk.—The Heemskirk Tin Syndicate.—A water-supply sufficient to permit of a commencement of sluicing operations was not available until the 19th March. From that date to the end of the year 41,736 cubic yards, averaging 2·93 lb. per cubic yard, were sluiced, for 54 tons 13 cwt. 9 lb. of stream tin. The value at the mine was £10,676. The number of men employed averaged 18.

South Heemskirk.—The Federation Tin Mining Company, No Liability.—This mine, which has been lying idle for some years, has been successfully floated, and a company formed with a capital of £120,000 in 120,000 shares of £1 each. Work was started at the beginning of October—prospecting and opening-up formations, making surveys for permanent work, cutting tracks, repairing

roads, putting up buildings, and other preparatory work; an average of 17 men being employed. There was no output of ore.

The Renison Bell Prospecting and Mining Company, No Liability.—Productive operations on the mine were carried out by tributers. Mining work by open-cut methods was confined exclusively to the large gossanous formation situated on the south-eastern portion of the property adjoining the Central Mine lease, the average width of the formation being from 15 to 20 feet, depth of face about 15 feet. The ore treated was oxidised, or what is generally termed free-milling, ore. In the workings mentioned, the latter at a comparatively shallow depth is replaced by pyritic ore, of which very large bodies are exposed. The ore mined was treated at the Central Mine plant, the tribute party having a lease of the latter. The plant being of small capacity, work was of a limited character. For the period, 3415 tons were mined and treated, yielding 24·09 tons of tin oxide, containing 16·67 tons of metallic tin; gross value, £3608; men engaged, 14.

The Federal Mine.—The Renison Bell concentrating plant has been occupied in treating ore from the Federal Mine, with which it is connected by a 2-foot gauge steel tramway, the latter being constructed by the Government and completed early in the year.

Operations at the Federal Mine have been carried out on the large gossan formation exposed at the surface. Practically the whole of the ore treated has been mined by open-cut methods. The average width of the lode is 20 feet; depth of faces, 30 feet.

Crude ore mined ... ..	6,576 tons
Tin oxide produced ... ..	47·54 tons
Containing metallic tin ... ..	30·79 tons
Gross value ... ..	£7,261
Average number of men employed	30

The Dreadnought-Boulder Tin Mines Amalgamated, No Liability.—The mine and mill have been practically closed down since the 1st January. Two men were engaged to keep the plant in repair, remove overburden, and carry on mine development and prospecting. A promising discovery was made on an adjoining section, and this was applied for and secured. Rich tin was discovered on this section, and trenching operations have proved a lode to be tin-bearing for 18 chains in length. A shaft was sunk to a depth of 30 feet at one point on this ore-body. The ore taken in this shaft averaged 2 per cent. tin over a

width of 5 feet, and for the full depth. A bore-hole was put out towards the hanging-wall a further distance of 4 feet, and was all the way in payable ore. The manager considers this to be a most important development.

Another promising ore-body was discovered on the Boulder lease. This occurs below what is known as Luck's face. Over 100 tons of tin oxide were obtained from these workings. There is every indication that the recent discovery is connected with the ore-body known as Luck's. There is a good deal of payable detritus shed from this formation, and it is intended to put a tramway in to connect this face and the mill.

On what is known as the South face, on the Dreadnought section, a considerable quantity of overburden was removed, and a water-race was brought on to this overburden to facilitate the removal of material, and to enable the company to mine the ore which is lying underneath. The lode here is over 20 feet wide. A tunnel was extended under this face 56 feet; total length of tunnel, 115 feet. The ground here was extremely hard, and the company was unable, with its limited labour supply, to put the end in far enough to intercept this ore-body. The work was discontinued for the time, and attention was directed towards getting the mill ready to start crushing when the winter rains set in.

Work has been resumed at the North Reison Bell Tin Mine under new ownership and management.

Ground-sluicing has been re-started on Kemp's sections.

A concentrating mill is being erected on the Gallipoli Mine, and there is some nice ore showing in one of the faces recently opened up.

On the old Penzance Mine two men are engaged sluicing off the surface with only fair results. They are hoping they will expose the lode-formation, from which occasionally they obtain some nice specimen tin, this having been carried down with the detrital.

Dundas.—At the Peace Tin Mine a concentrating mill is being erected, and a regular output of tin oxide is expected to be made in the near future.

Some ground-sluicing and prospecting has been carried out by a few men.

Stanley River.—At the Stanley River Tin Mine work underground was continued during the early part of the year, and a regular output of ore sent to the smelters. The old hydraulic sump was then cleaned out and tenders called early in the new year for taking the mine on tribute.

Mt. Lindsay.—At the Mt. Lindsay Mine a main shaft has been sunk to a depth of 60 feet, and crosscutting to cut the rich ore-shoot worked above has been started. A water-power scheme is being put in for hoisting and pumping purposes.

Bluff River.—On the Bluff River Tin Mine, about 26 miles from Tullah, work was started, and an hydraulic sluicing plant is being erected.

*North-Western Mining Division.*—The Mt. Bischoff Tin Mining Company, Registered.—The mine worked continuously during the period under review, an average of 250 men being employed.

Crude ore output was slightly restricted, and held up by the shipping strike and the influenza epidemic.

A limited amount of prospecting and development work was done, that carried out by the drilling-machine being as yet inconclusive.

No high-grade ore was exposed by either developing or stoping, the tenor of the ore-grade remaining constant during the year.

The ore won for the period and the faces operated on are as under:—

Section.	Tons Ore.
Don Bench .....	968
Happy Valley Bench .....	6,318
Gossan Bench .....	46,644
White Face Benches .....	12,098
Northern Slopes Benches .....	11,328
North Valley Benches .....	24,204
North Valley Lode .....	506
South-west Lode .....	121
Total .....	102,187

The milling plant ran, approximately, full time, slight stoppage, however, being caused by the heavy snowfalls experienced.

The year's output is as under:—

Ore crushed .....	102,187 tons
Pyritic concentrates washed .....	190 „
Tin oxide recovered (dry tons) .....	415.3 „
Average grade of oxide produced .....	63.24% Sn.
Average recovery per ton of ore crushed .....	0.257% Sn.
Value of output .....	£74,692
Value of ore per ton crushed .....	14.618s.

The total output of the mine from inception to the end of 1919 is as under:—

Tons of oxide produced .....	75,968
Value .....	£5,224,608

The Mt. Bischoff Extended Tin Mining Company, No Liability.—Regular operations were carried out, with an average of 119 men.

Production during the year has been continuous, with the exception of short periods in the winter months, when there was a shortage of firewood caused by heavy snowfalls.

Development work underground consisted of 1195 feet of driving, rising, and winzes—all on ore, with the exception of about 300 feet. Nothing of any importance has been met with below No. 6 level.

The second opening to No. 9 level has been completed, thus providing two ore passes to No. 9 level.

The stopes throughout the mine are looking fairly well, but with the narrowing of the lode, and the increased hardness of the material, tonnages are somewhat restricted.

Ore won during the period has been spread from No. 6 level to the surface; average width of lode mined about 12 inches.

In the firewood department the consumption was as under:—

Boiler, 6415·75 tons. Roasting, 774 tons. Total, 7189·75 tons or 50 cubic feet.

The year's output is as under:—

Tons of ore crushed, 23,677.

Tons of pyritic concentrate roasted, 1060·5.

Tin oxide recovered (dry tons), 210·35.

Average grade of oxide produced, 70·63 per cent. tin.

Average recovery per ton of ore crushed, 0·834 per cent. tin.

Value of output, £33,553 12s. 6d.

Value per ton of ore crushed, £1 8s. 4½d.

Average number of men employed, 119.

*Balfour.*—The Copper Reward Mine.—Three tons of tin ore, valued at £473 5s., were obtained from the alluvial workings.

Other alluvial mines working in the vicinity obtained 72 bags of tin ore, valued at £792.

#### COAL.

The total quantity of coal raised amounted to 66,253 tons, valued at £47,004.

The raisings at the different collieries were:—

Colliery.	Tons Raised.
Mt. Nicholas ... ..	28,053
Cornwall ... ..	31,456
Spreyton ... ..	657
York Plains ... ..	384
Illamatha ... ..	2,139
Sandfly... ..	628
Mt. Cygnet ... ..	381
Tasma... ..	1,659
Preolenna... ..	40
Gatenby ... ..	586
Total... ..	66,253

The Mt. Nicholas Coal Company Limited.—Mining operations have been carried on uninterruptedly during the whole of the year on the 6-foot seam in this company's leases. The main gateway in these workings has been advanced an approximate distance of  $1\frac{1}{2}$  chain, making it a total distance of 57 chains from the tunnel mouth. The seam still keeps at its usual thickness, and the quality of the coal is well maintained. In the early part of the year the company stopped driving on the 4-foot seam, and put a cross-measure drift up from that seam to the 6 feet seam above, which it struck in some old workings. Main headings will be driven through these old workings to the solid coal.

The total output of coal from the mine was 28,053 tons, of a value of £19,367 6s. 6d. Eighty-seven men and boys were employed above and below ground.

The Cornwall Coal Company, No Liability.—The whole of the output was won from the lower seam. The total quantity of coal raised was 31,456 tons, valued at £21,267; 76 men being employed.

The Spreyton Coal Mine.—The quantity of coal raised from this mine was only 657 tons, and was used principally for local consumption; 4 men were employed.

York Plains Coal Mine.—This mine is situated on private property, and the coal is principally used in breweries and hop-kilns. Two men were employed.

Illamatha Coal Mine, Spreyton.—There was a great increase in the quantity of coal won during the year, which is used in ships' bunkers and for household purposes; 10 men were employed.

Sandfly Coal Mine.—About 400 tons of coal were won from the anthracite seam, which is 4 feet in thickness. The northern drive was extended about 90 feet. About

200 tons of steam coal were obtained from the old workings, and the drainage tunnel was extended about 45 feet, when the mine closed down.

Mt. Cygnet Coal Mine.—This mine has recently been acquired by the Electrolytic Zinc Company of Australasia, Risdon, and work was commenced on the 3rd September, and a boiler, winch, and pump were installed. The workings at Gordon's dip were put in order, and extended a further distance of 82 feet, making a total of 280 feet. In addition, considerable exploratory work was done in tracing the outcrop of seam, which is 2 feet 9 inches in thickness, and produces coal of a semi-anthracitic nature; 6 men were employed.

Tasma Coal Mine, Colebrook.—Work was confined to driving headings and opening up 100 yards of coal face on No. 2 seam. Very little work was done during the last three months of the year owing to the slackness of trade.

Jubilee Coal Mine, St. Marys.—This mine has been taken up again, and is to have another chance, sufficient capital having been raised to give it a fair trial. The coal is said to be of good quality, and should command a ready sale. Operations are to commence in what was once known as the Cardiff Mine.

The Preolenna Coal Mine, Wynyard.—The output was from the No. 1, or Upcast, tunnel, in which no further development work has been done. The intake tunnel was driven a further 126 feet, making the total distance 226 feet. The coal raised was used for household purposes.

Great Fitzroy Coal Mine.—From a report which appeared in the press recently, it is learned that a new seam of good coal has lately been discovered, about 2 miles from the Preolenna tramway terminus. It is stated that the seam varies from 2 feet to 4 feet in thickness. No official report has, however, been received.

Mr. L. Gatenby, of Hagley, has sunk a shaft on his private property to a depth of 107 feet, passing through a bed of kaolin for 35 feet, and at 41 feet a seam of brown shale was struck, and a second seam at a depth of 100 feet.

The shale, after being ground, is used as a manure for vegetable and field crops. From 700 tons of shale treated, by partly calcining and grinding, a marketable product of 400 tons of fertiliser was obtained. The practical results from tests made with this fertiliser are said to be very good, when 1 cwt. of the product to the acre is applied.

When used as a heavy dressing it is said to burn the crop, as it appears to have hot properties, due probably to the sodium salts, with which the whole of the material is charged.

The shale is used for household purposes, but the cost of transport to a market is too heavy to pay at present.

#### BISMUTH.

The S. and M. Mine, at Middlesex obtained from its tin ore 1.57 tons of bismuth, valued at £473; and the All Nations Company .2 tons, valued at £100.

#### WOLFRAM.

The output of wolfram was as follows:—

	Tons.	Value. £
Avoca Mines .....	85.637	19,375
S. & M. Mine, Middlesex .....	23.400	4,905
Squib Mine .....	7.300	1,306
Lawson & Riley .....	2.870	673
All Nations .....	1.450	302
Iris Mine .....	.250	52
	<hr/> 120.907	<hr/> £26,613

The S. and M. Syndicate.—Tin, wolfram, and bismuth ores are won from this mine, principally from the No. 6 and No. 2 lodes. The No. 2 lode is worked by a shallow adit-level; and the No. 6 by a shaft 150 feet below water-level. Prospecting work continues on the No. 5 and No. 4 lodes from the bottom level.

Squib Mine.—The work has been confined to stoping on the No. 7 lode. The main drive is being extended, and crosscutting is being done to connect with lodes 1 to 6.

Messrs. Lawson and Riley are working small veins of ore on Section 7207-m, which they crush and jig in a small plant erected at the mine.

All Nations Mine.—Operations are confined to adit work and ground-slucing.

Iris Mine.—This is a shallow alluvial deposit worked by a small party with satisfactory results.

#### IRON PYRITES.

At the old Susanite and Kynance Mines, Comstock District, various parcels of good-grade ore have been broken from underground workings and sent forward to the Mt.

Lyell Mining and Railway Company's superphosphate works on the mainland.

From the Chester Mine a considerable quantity of ore has been mined from the open-cut workings and treated at the concentrating mill. The capacity of the mill is to be enlarged, and rock-drills introduced at the open-cut. The product is being shipped to the mainland.

#### ARSENICAL COPPER PYRITES.

The Fraser Mine, on the North-East Dundas tramline, is still producing ore of average grade from adit workings, which is being sent to the Edwards' Pyrites and Ore-Reduction Company's works in Victoria.

#### COPPER NICKEL.

The two mines at the Five-mile are still closed down, there being no payable market available for the ore.

#### OSMIRIDIUM.

This metal is being won from the Savage River, Mt. Stewart, and Wilson River districts.

As many as 60 men have been at work at the latter, and 200 at the former, at one time, many of whom have been doing very well, owing to the high price obtained for the metal.

A few men are also obtaining a little metal in the Dundas district.

During the latter part of the year and the beginning of the new year, Mr. A. McIntosh Reid, Assistant Government Geologist, was engaged in making an exhaustive examination of the osmiridium fields, and his report will be of great interest and value to the State and to the mining industry.

#### BARYTES.

The period under review witnessed a slight revival in Barytes mining. Two syndicates operated at Howard's Plains towards the latter part of the year, but production and activity were mitigated by market limitations.

The Tasmanian Barium Company.—The lease of 80 acres previously held by the Colonial Barium Company was acquired by an original part owner under the above title, and operations were resumed with two men during October, and limited to open-cutting and shallow surfacing

along the line of lode previously operated on. A lode varying up to 5 feet and 6 feet in width was disclosed, and croppings are traceable across the entire holding. The greatest depth attained was about 12 feet, and here there was no direct evidence of shallow convergence in the channel, but the persistence of barytes at a depth is dependent upon the genesis of the deposit.

About 229 tons of barytes were sold to the Electrolytic Zinc Company at Risdon and to buyers in Australia, and realised £650, but the quality of the product was described as second-grade.

Queenstown Barium Company.—A small company was formed, and acquired a lease of 40 acres adjoining the Tasmanian Barium Company's lease, but embracing a different line of lode.

Two men were employed, and after limited surfacing had been done on the outcropping barytes, a small tunnel was driven, and intersected a lode varying up to 2 feet in width. This was driven on for some distance, but operations were of a prospecting nature, and the ore obtained was placed at grass. No ore was sold during the year.

The future prospects of these properties are entirely dependent upon an available market, which at present is limited, but given a reasonable market and an adequate value, there is ample scope for a large output from this locality.

One hundred and fifty-six tons of barytes were sent to the Electrolytic Zinc Works, Risdon, from a mine recently opened up near Beulah.

#### SCHEELITE.

The only mine operating in the State is that of the King Island Scheelite Company, No Liability. The mine is situated on King Island, and is worked on the "Glory-hole" open-cut system. Operations have been continuously carried on during the year, with the exception of one week in January for the annual overhaul of the machinery, and two weeks in September owing to the influenza epidemic.

During the year the company treated 27,832 tons of ore, and obtained 199 tons of scheelite, valued at £43,181.

Tasmania is now one of the largest producers of scheelite in Australia.

## PAINT.

The Serpentine Paint Company Limited, Launceston.—The manufacture of mixed paint and paste paint from Tasmanian pigments was curtailed for the year owing to the difficulty in obtaining full supplies of linseed oil, caused by the shipping restrictions, strikes, &c.

The value of mixed paint and paste paint manufactured and sold for the year was £4278.

The demand for Tasmanian paint is growing, as its high quality is becoming better known.

The Lead Sulphate Limited, Launceston.—Owing to the delay caused by shipping and other troubles, up to the 31st December only two short experimental runs had taken place for the purpose of adjusting the new plant.

The freight on lead ore from Western Australia to Launceston is stated to be only 39s. per ton, as against 55s. 9d. per ton railway freight from Zeehan.

There are lead mines at and near Zeehan which could not be very profitably worked because of the low silver contents. Now that there is a market for such ore there is little chance of these mines being developed while producers from a distant State can compete successfully against producers in this State.

## KINGSTON CLAY DEPOSIT.

At Kingston a very valuable clay and sand deposit is being worked by Mr. Scown. The deposit has been opened up by a very primitive plant, with a view of obtaining a good knowledge of its commercial possibilities. It is pleasing to note that even under these circumstances the proposition has proved payable. A splendid class of whiting, suitable for cleaning white footwear and other similar purposes—also a composition suitable for whitening and cleaning stonework—is being produced, for which there is a market for more than can be supplied. Experiments have been made in other directions with a view of ascertaining the possibilities of the deposit in connection with pottery works. These, I understand, have proved so satisfactory that it is intended to float the proposition into a company for the purpose of raising capital to work on a larger scale.

## ZINC.

The Electrolytic Zinc Company of Australasia Proprietary Limited, Risdon.—This company has continued the treatment of calcines from Broken Hill, and produced 3668 tons of slab zinc, of an approximate value of £154,660. The average number of men employed on the works was 322.

## OUTPUT.

*Return showing the Quantity and Value of Mineral Products for the State of Tasmania during the Year ending 31st December, 1919:—*

Mineral.	Quantity.	Value.
		£
Gold ..... ozs.	7,686·470	32,650
Silver..... "	525,343·270	125,564
Lead ..... tons	2,357·142	64,403
Copper ..... "	5027	504,961
Tin ..... "	1580·22	395,794
Coal ..... "	66,253	47,004
Wolfram ..... "	120·907	26,613
Bismuth ..... "	1·77	573
Shale ..... "	600	900
Iron Pyrites..... "	3456·95	4288
Scheelite ..... "	198·98	43,181
Osmiridium ..... ozs.	1669·715	39,614
Asbestos ..... tons	51	1275
Zinc ..... "	285	13,110
Barytes ..... "	399	1160
Total.....	...	£1,301,090

### GOVERNMENT GEOLOGIST.

Through the death of the late William Harper Twelvetrees, Government Geologist, which took place in Launceston on the 7th November last, the Mines Department, the mining community of the State, and the scientific world, has lost one whose services could ill be spared, and whose position will be very difficult to fill.

Mr. Twelvetrees was a native of Dunstan, in Bedfordshire, England, and had just attained his 71st birthday, when he died after a short but painful illness. He was a man of wide experience, possessed great scientific knowledge, and was an accomplished linguist. He was appointed Government Geologist in August, 1899, and during his 20 years of faithful service, he did most useful work for the Department and the State, and brought the Geological Survey library and Geological museum to such a state of efficiency and usefulness that they compare favourably with any similar institutions in the Commonwealth.

Mr. Twelvetrees has been succeeded by Mr. Loftus Hills, M.B.E., M.Sc., formerly Assistant Government Geologist, who returned from the war in May last, and his report, together with those of Mr. A. McIntosh Reid, Assistant Government Geologist, and Mr. W. D. Reid, Government Assayer, is appended.

### INSPECTORS OF MINES.

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

### REVENUE.

The revenue for the year amounted to £17,164 8s. 9d., being a decrease of £669 5s. 11d. on the previous year. The sum of £1776 1s. 2d., deposited as survey fees with applications for leases, is not included in the above.

### MINING MANAGER'S EXAMINATIONS.

No candidates presented themselves for examination during the year.

### DEPARTMENTAL STAFF.

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

Miss B. W. Simm, clerk, Hobart, resigned 14th February, 1919.

- Mr. Loftus Hills, M.B.E., M.Sc., Assistant Government Geologist, resumed duty 12th May, 1919.
- Mr. A. McIntosh Reid appointed Assistant Government Geologist from 19th July, 1919.
- Mr. H. R. Driscoll, clerk, Hobart, resumed duty 1st October, 1919.
- Miss A. J. Long appointed typiste, Hobart, *vice* Miss B. W. Simm, from the 27th October, 1919.
- Mr. J. Harrison, Inspector of Mines, Zeehan, retired 31st October, 1919.
- Mr. W. H. Williams appointed Inspector of Mines, Queenstown, from 1st November, 1919.
- Mr. W. H. Twelvetrees, Government Geologist, died 7th November, 1919.
- Mr. Loftus Hills appointed Government Geologist, *vice* W. H. Twelvetrees, deceased, from 1st December, 1919.
- Mr. D. J. McKinnon appointed Registrar of Mines, Derby, *vice* J. C. Farrell, deceased, from 1st December, 1919.

#### CONCLUSION.

In conclusion, I desire to express my sincere thanks to the officers of the Department for their loyalty and hearty support through a very strenuous year; also the officers of the Mining Branch of the Department of Lands and Surveys, who have loyally performed the arduous duties required of them. These officers have now been so long connected with the work of this Department, and are so familiar with its requirements, that the loss or removal of any one of them would be greatly felt, and his successor would have to serve a long period to obtain the knowledge and experience essential to the particular class of work each has to perform.

I have, &c.,

W. H. WALLACE,

Secretary for Mines

The Hon. the Minister for Mines.

## No. 1.

*RETURN showing the Quantity and Value of Gold won from  
1880 to 1919 inclusive.*

Year.	Quantity.	Value.
	ozs.	£
1880 to 1903 inclusive .....	1,265,836·95	4,905,706
1904 .....	65,921	280,015
1905 .....	73,540·5	312,380
1906 .....	60,023·4	254,963
1907 .....	65,354·25	277,607
1908 .....	57,085·1	242,482
1909 .....	44,777·366	190,201
1910 .....	37,048·053	157,370
1911 .....	31,100·873	132,108
1912 .....	37,973·252	161,300
1913 .....	33,400·457	141,876
1914 .....	26,243·453	111,475
1915 .....	18,547·338	78,784
1916 .....	15,790·096	67,072
1917 .....	14,496·464	61,577
1918 .....	10,528·930	44,724
1919 .....	7,686,470	32,650
	1,865,353·952	7,452,290

## No. 2.

*RETURN showing the Quantity and Value of Silver-Lead Ore  
produced from 1888 to 1918 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
	1,083,897·821	6,429,291

## No. 3.

*RETURN showing the Quantity and Value of Blister Copper produced from 1896 to 1918 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
	160,600	13,778,527

\* Value of Gold contents deducted.

## No. 4.

*RETURN showing the Quantity and Value of Silver produce during the Year 1919.*

Year.	Quantity.	Value.
	Ozs.	£
1919 .....	525,343·27	125,564

## No. 5.

*RETURN showing the Quantity and Value of Lead produced during the Year 1919.*

Year.	Quantity.	Value.
	Tons.	£
1919 .....	2357·142	64,403

## No. 6.

*RETURN showing the Quantity and Value of Copper produced during the Year, 1919.*

Year.	Quantity.	Value.
	Tons.	£
1919 .....	5027	504,961

## No. 7.

*RETURN showing Quantity and Value of Copper Matte exported during the Years 1902, 1903, and 1904 to 1918 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1902 .....	2500	50,112
1903 .....	3727	83,624
1904-1918 .....	—	—
	6227	133,736

## No. 8.

*RETURN showing the Quantity and Value of Copper Ore produced from 1896 to 1918 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
	41,768·63	577,873

## 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 Year 1919.*

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 (Metallic Tin) .....	1580·22	395,794
	128,426·038	13,631,872

## No. 10.

*RETURN showing the Quantity and Value of Iron Ore produced from 1897 to 1919 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
1909-1919.....	—	—
	42,762	25,701

## No. 11.

*RETURN showing the Quantity and Value of Wolfram produced from 1899 to 1919 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
	1166·502	157,991

## No. 12.

*RETURN showing the Quantity and Value of Coal raised from 1880 to 1919 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*
	1,738,236	1,292,427

\* Value at pit's mouth.

## No. 13.

*RETURN showing the Quantity and Value of Osmiridium produced during the Years 1910 to 1919 inclusive.*

Year.	Quantity.	Value.
	Ozs.	£
1910 .....	120	530
1911 .....	271·88	1188
1912 .....	778·77	5742
1913 .....	1261·65	12,016
1914 .....	1018·83	10,076
1915 .....	247·048	1581
1916 .....	222·150	1899
1917 .....	332·079	4898
1918 .....	1606·743	44,833
1919 .....	1669·715	39,614
	7528·865	123,077

## No. 14.

*RETURN showing the Quantity and Value of Barytes produced during the Years 1916 to 1919 inclusive.*

Year.	Quantity.	Value.
	Tons.	£
1916 .....	83	359
1917 .....	52	234
1918 .....	217	977
1919 .....	399	1160
	751	2730

## No. 15.

*RETURN showing the Quantity and Value of Bismuth produced from 1904 to 1919 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
	73.909	23,022

## No. 16.

*RETURN showing the Quantity and Value of Asbestos produced from 1899 to 1919 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
	3565·5	7105

## No. 17.

*RETURN showing the Quantity and Value of Shale produced during the Years 1910 to 1919 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
	2955	2855

## No. 18.

*RETURN showing the Quantity and Value of Iron Pyrites produced during the Years 1915 to 1919 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
	43,088·773	38,634

## No. 19.

*RETURN showing the Quantity and Value of Zinc produced during the Years 1917 and 1919.*

Year.	Quantity.	Value.
	Tons.	£
1917 .....	48	1968
1918 .....	3822	152,880
1919 .....	285	13,110
	4155	167,958

## No. 20.

*RETURN showing the Quantity and Value of Scheelite produced during the Years 1917 and 1919.*

Year.	Quantity.	Value.
	Tons.	£
1917 .....	69	12,130
1918 .....	216	39,252
1919 .....	198·98	43,181
	483·98	94,563

## No. 21.

*RETURN showing the Quantity and Value of Ochre produced during the Years 1918 and 1919.*

Year.	Quantity.	Value.
	Tons.	£
1918 .....	100	200
1919 .....	—	—

## No. 22.

*RETURN showing Quantity and Value of Minerals and Metal raised in Tasmania from 1880 to 1919 inclusive.*

Mineral or Metal.	Quantity.	Value.
		£
Gold .....	1,865,353·952 ozs.	7,452,290
Silver-lead Ore .....	1,083,897·821 tons	6,429,291
Blister Copper.....	160,600 "	13,778,527
Silver (from 1.1.19) .....	525,343·270 ozs.	125,564
Lead (ditto).....	2,357·142 tons	64,403
Copper .....	5027 "	504,961
Copper Matte .....	6227 "	133,736
Copper Ore .....	41,768·630 "	577,873
Tin.....	128,426·038 "	13,631,872
Iron Ore .....	42,762 "	25,701
Wolfram .....	1166·502 "	157,991
Coal .....	1,738,236 "	1,292,427
Osmiridium ... ..	7528·865 ozs.	123,077
Barytes.....	751 tons	2730
Bismuth .....	73·909 "	23,022
Asbestos .....	3565·5 "	7105
Shale .....	2955 "	2855
Iron Pyrites.....	43,088·773 "	38,634
Zinc .....	4155 "	167,958
Scheelite .....	483·980 "	94,563
Ochre .....	100 "	200
Unenumerated prior to 1894...	...	31,988
<b>Total .....</b>	...	<b>£44,666,768</b>

## No. 23.

*RETURN showing the Amounts paid in Dividends by Mining Companies during the Year ending 31st December, 1919.*

Mines.	Dividends.
	£
Copper .....	165,274
Gold .....	...
Tin .....	59,031
Silver .....	870
Coal.....	3092
Scheelite .....	5000
<b>Total .....</b>	<b>£233,267</b>

## No. 24.

*RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 to 1919 inclusive.*

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

## No. 25.

*RETURN showing the Mining Companies registered during the Year ending 31st December, 1919.*

Number of Companies.	Capital.
4	£25,500

In addition to the above, eight Agents for Foreign Companies were registered.

## No. 26.

*RETURN showing the Average Number of Miners employed during the Year ending 31st December, 1919.*

Division.	Number.
Northern and Southern .....	647
North-Eastern .....	475
Eastern .....	525
North-Western.....	720
Western.....	2046
	4413

## No. 27.

*RETURN showing the Total Amount of Rents, Fees, &c., received by the Mines Department during the Year ending 31st December, 1919.*

Head of Revenue.	Amount.
Rent of Auriferous and Mineral Land.....	£ s. d. 14,514 0 7
Fees, ditto ditto .....	874 7 0
Survey Fees .....	1776 1 2
Total .....	£17,164 8 9

## No. 28.

*RETURN showing the Total Area of Land and Number of Sluiceways of Water applied for during the Year ending 31st December, 1919.*

Mineral.	Number.	Sluiceways.	Area. Acres.
Arsenic .....	2	...	11
Asbestos .....	...	...	...
Barytes .....	2	...	60
Bismuth .....	...	...	...
Chrysotile .....	...	...	...
Clay .....	1	...	4
Coal .....	6	...	1371
Copper .....	8	...	520
Gold .....	70	...	1794
Guano .....	...	...	...
Iron .....	10	...	560
Limestone .....	1	...	15
Minerals .....	65	...	4403
Molybdenite .....	...	...	...
Ochre .....	2	...	11
Osmiridium .....	2	...	20
Phosphate of Lime .....	...	...	...
Pyrites .....	1	...	10
Silver-lead Ore .....	8	...	520
Slate .....	4	...	734
Scheelite .....	4	...	383
Tin .....	99	...	1445
Wolfram .....	6	...	198
Zinc .....	2	...	77
Machinery Sites .....	3	...	8
Mining Easements .....	8	...	135
Dredging Claims .....	5	...	28
Water Rights and Dam Sites .....	53	160	336
	362	160	12,643

## No. 29.

*RETURN showing the Total Number and Area of Leases issued during the Year ending 31st December, 1919.*

Mineral.	No. of Leases.	No. of Sluicheads.	Area. Acres.
Asbestos .....	...	...	...
Barytes .....	1	...	80
Bismuth .....	...	...	...
Coal.....	10	...	2048
Copper .....	4	...	200
Clay .....	1	...	5
Gold .....	15	...	205
Guano.....	...	...	...
Iron .....	4	...	211
Limestone .....	4	...	586
Machinery Sites .....	5	...	28
Minerals .....	33	...	1498
Manganese .....	...	...	...
Nickel.....	...	...	...
Osmiridium .....	2	...	50
Ochre .....	1	...	20
Pyrites .....	4	...	140
Scheelite .....	...	...	...
Silver-lead .....	3	...	120
Tin .....	150	...	2171
Wolfram .....	1	...	20
Dredging Claims .....	14	...	231
Water-rights .....	91	222	39
Mining Easements .....	9	...	33
	352	222	7685

## No. 30.

RETURN showing the Total Number of Leases in force on  
31st December, 1919.

Mineral.	No. of Leases.	No. of Sluicheads.	Area. Acres.
Asbestos.....	2	...	100
Bismuth.....	1	...	70
Barytes.....	6	...	270
Coal.....	39	...	9283
Copper.....	30	...	1320
Clay.....	4	...	26
Chrysotile.....	...	...	...
Dredging Claims.....	31	...	482
Gold.....	32	...	537
Iron.....	7	...	349
Limestone.....	5	...	791
Mining Easements.....	113	..	608
Machinery Sites.....	38	...	180
Minerals.....	163	...	12,354
Manganese.....	1	...	63
Nickel.....	2	...	121
Osmiridium.....	3	...	73
Ochre.....	1	...	20
Pyrites.....	1	...	40
Silica.....	1	...	20
Slate.....	...	...	...
Scheelite.....	2	...	85
Shale.....	1	...	1488
Silver-lead.....	24	...	2230
Tin.....	562	...	13,508
Water rights.....	551	1975	2116
Wolfram.....	13	...	357
	1633	1975	46,491

## No. 31.

*RETURN showing the Annual Value of Mineral Products for the State of Tasmania from 1880 to 1919 inclusive.*

Year	Value.	Year.	Value.
	£		£
1880.....	554,031	1902.....	1,378,406
1881.....	602,723	1903.....	1,354,044
1882.....	556,306	1904.....	1,379,204
1883.....	560,873	1905.....	1,729,129
1884.....	468,302	1906.....	2,257,147
1885.....	518,885	1907.....	2,277,159
1886.....	489,966	1908.....	1,650,027
1887.....	593,256	1909.....	1,574,995
1888.....	616,793	1910.....	1,432,193
1889.....	504,718	1911.....	1,349,497
1890.....	444,210	1912.....	1,493,502
1891.....	528,388	1913.....	1,415,700
1892.....	526,909	1914.....	1,007,038
1893.....	627,909	1915.....	1,225,575
1894.....	732,764	1916.....	1,521,050
1895.....	575,692	1917.....	1,584,290
1896.....	662,058	1918.....	1,750,574
1897.....	1,006,140	1919.....	1,301,090
1898.....	1,071,084	Unenumerated	
1899.....	1,660,622	prior to 1894	31,988
1900.....	1,888,695		
1901.....	1,763,896		£44,666,768

No. 32.

RETURN showing the Number and Area of Leases held under "The Mining Act," in force on 31st December, 1912 to 1919 inclusive.

Nature of Lease.	In force on 31st Dec., 1912.		In force on 31st December, 1913.		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.	
	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
For Minerals, Silver, Tin, &c.	960	Acres. 36,157	926	Acres. 36,271	1129	Acres. 37,785	907	Acres. 36,437	872	Acres. 34,458	876	Acres. 36,203	796	Acres. 32,011	823	Acres. 31,006
For Coal, Slate, Shale, &c.	37	8854	23	5660	26	6405	45	11,522	52	13,742	50	13,138	44	10,729	45	11,562
For Gold	73	1344	54	988	95	2130	94	2026	85	1692	91	1761	43	657	32	537
Dredging Claims	42	489	30	329	36	403	29	351	30	437	30	401	23	323	31	482
Mining Easements	133	606	105	603	110	611	102	553	106	641	105	628	111	594	113	608
Machinery Sites	39	149	36	153	43	180	40	183	37	190	38	175	37	165	38	180
Water-rights Mineral and Gold	550	1640 & 2043 sluice-heads	546	1909 & 2034 sluice-heads	605	2449 & 2160 sluice-heads	568	1988 & 2135 sluice-heads	572	2302 & 2061 sluice-heads	557	2085 & 2035 sluice-heads	494	2121 & 1865 sluice-heads	551	2116 & 1975 sluice-heads

No. 33.

*COMPARATIVE Statement of Revenue from Mines, being Rents, Fees, &c. (exclusive of Survey Fees) paid to the Treasury for the Years ending 30th June, from 1882 to 1903, and for Six months ending 31st December, 1903, and for the Years ending 31st December, 1904, to 1919 inclusive.*

Year.	Amount.			Year.	Amount.		
	£	s.	d.		£	s.	d.
1882.....	23,077	1	9	1902.....	19,471	0	1
1883.....	15,439	14	5	1903.....	17,776	14	3
1884.....	6981	11	10	1903, 1 July to 31 Dec. ....	14,758	17	1
1885.....	11,070	5	7	1904, Jan. to Dec. ....	16,631	8	2
1886.....	12,523	10	4	1905.....	20,208	17	0
1887.....	14,611	11	5	1906.....	24,136	12	5
1888.....	23,502	8	4	1907.....	24,794	7	7
1889.....	17,254	9	0	1908.....	20,311	3	0
1890.....	26,955	4	9	1909.....	22,804	1	5
1891.....	37,829	16	5	1910.....	22,221	18	0
1892.....	17,568	18	4	1911.....	20,556	15	10
1893.....	16,971	9	2	1912.....	17,639	19	11
1894.....	16,732	7	7	1913.....	19,410	17	8
1895.....	15,323	1	9	1914.....	14,087	0	6
1896.....	20,901	13	2	1915.....	17,679	3	6
1897.....	25,631	0	3	1916.....	14,678	19	10
1898.....	33,661	13	9	1917.....	14,669	7	2
1899.....	24,696	10	5	1918.....	17,833	14	9
1900.....	28,380	11	10	1919.....	15,388	7	7
1901.....	21,569	5	2				

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 sum are derived.

REPORT OF THE MOUNT CAMERON WATER-  
RACE BOARD FOR THE YEAR ENDING  
31st DECEMBER, 1919.

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Gladstone, 6th February, 1920.

SIR,

WE have the honour to submit the report of the Board for the year ending 31st December, 1919.

It will be observed that there has been a falling-off in the quantity of water sold to the customers, and consequently a decrease in the revenue received, owing to the abnormally dry winter and spring weather. With better weather conditions there would, in all probability, have been a good increase in the revenue and the output of tin ore.

A new mine has been opened up by Messrs. Higgs and Kerrison, with very fair prospects of success. Preliminary operations were only completed shortly before the close of the year, and their first clean-up in the new year gave a return of about 5 tons of tin ore.

*Race.*—The race throughout is in excellent condition, and, with the exception of one or two small breaks after heavy rain, no damage of any consequence has occurred. The Scotia branch race was thoroughly cleaned out; and the main race will require to be thoroughly cleaned out and the scrub along the banks cut, as soon as opportunity permits.

*Syphons.*—These are standing well, and great care is being bestowed upon them by the Manager and Channel-keepers to prevent the outside coating of asphaltum from blistering and peeling off. Directly the coating shows signs of weathering it is chipped off and a new coating of Plymel paint is applied.

*Rainfall.*—The registered rainfall for the year was as follows:—Main intake, 26 inches 68 points; Little Mussel Roe intake, 26 inches 30 points.

*Revenue.*—The revenue for the year amounted to £1157 2s. 2d., being a decrease of £544 ls. 4d. on the previous year.

*Expenditure.*—The expenditure amounted to £773 8s. 7d., being a decrease of £17 11s. 11d. on the previous year.

The statistics for the year are as follow:—

Average No. of claims supplied per week, 9.

Greatest number supplied in any one week, 12.

Total number of heads supplied—Under fixed or cash scale, 290 $\frac{7}{8}$ ; under royalty or credit scale, 2159.

Total, 2449 $\frac{7}{8}$ .

Tin ore raised for the year:—Under fixed scale, 6 tons 16 cwt.; under royalty scale, 21 tons 1 cwt.

1 qr. 14 lb. Total, 27 tons 17 cwt. 1 qr. 14 lb.

Average number of men employed per week, 10.

<i>Receipts.</i> —Total receipts for the year:—		£	s.	d.
Water sold under fixed scale ... ..	250	16	7	
Water sold under royalty scale ... ..	883	3	7	
Miscellaneous ... ..	23	2	0	
	<u>£1,157</u>	<u>2</u>	<u>2</u>	

<i>Expenditure.</i> —		£	s.	d.
Salary and wages ... ..	695	2	4	
Travelling expenses ... ..	19	8	6	
Race-repairs ... ..	29	11	6	
Insurance ... ..	7	15	10	
Stores and tools ... ..	3	12	3	
Printing and stationery ... ..	1	15	8	
Repairs to buggy ... ..	16	2	6	
	<u>£773</u>	<u>8</u>	<u>7</u>	

Paid to the Public Debts Sinking Fund  
for the year ended 30th June, 1919  
(including moiety of rents of mineral  
land served by the race, £3 5s.) ... .. £485 11 4

We have the honour to be,

Sir,

Your obedient Servants,

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

The Hon. the Minister for Mines.

## GEOLOGICAL SURVEY OF TASMANIA.

## REPORT OF THE GOVERNMENT GEOLOGIST.

Geological Survey Office,  
Launceston, 13th April, 1920.

SIR,

I BEG to submit my report for the year ending 31st December, 1919, and append annual reports by Mr. A. McIntosh Reid, Assistant Government Geologist, and Mr. W. D. Reid, Government Assayer.

*Publications Issued.*

The following publications have been issued during the year:—

- (1) Bulletin No. 28: "The North Pieman and Huskisson and Sterling Valley Mining Fields," by A. McIntosh Reid, 12th June, 1918.
- (2) Bulletin No. 29: "The Mining Fields of Moina, Mt. Claude, and Lorinna," by A. McIntosh Reid, 22nd Jan., 1919.
- (3) Bulletin No. 30: "The Mount Pelion Mineral District," by A. McIntosh Reid, 20th June, 1919.
- (4) Bulletin No. 31: "The Zinc-Lead Sulphide Deposits of the Read-Rosebery District," Part III. (Metallurgy and General Review), by Loftus Hills, M.B.E., M.Sc., 24th July, 1919.
- (5) Record No. 5: "The Occurrence of Tetradium in the Gordon River Limestone, Tasmania," by Frederick Chapman, A.L.S., F.R.M.S., 13th August, 1919.

*Staff.*

On 25th April I returned from active service. I resumed my duties as Assistant Government Geologist on 12th May.

Mr. A. McIntosh Reid, who had been Acting-Assistant Government Geologist, was made Assistant Government Geologist on 1st July.

Mr. W. H. Twelvetrees, Government Geologist, died on 7th November.

My appointment as Government Geologist, in succession to the late W. H. Twelvetrees, dates from 1st December.

Mr. Walter Manson was appointed Laboratory Assistant from 1st December, to enable the increase in the work of the laboratory to be dealt with.

*The Constructive Work of the Late W. H. Twelvetrees.*

In the death of the late Government Geologist the Geological Survey and the State have lost a very valuable and able geologist. His death took place while he was still in harness, and he was only away from the office a fortnight before he died.

The work he accomplished during his 20 years' tenure of office is perhaps not as fully realised by the general public as it should be. The officials of the Mines Department are fully aware of it, and particularly the officers of the Geological Survey, who realise the difficulties he had to contend with and the progress he made in spite of them.

At the time of his appointment 20 years ago the work of the Government Geologist consisted of the visiting of mines and prospects and reporting on what had been disclosed therein. Gradually Mr. Twelvetrees increased the scope and utility of such examinations by including the investigation of the geology of the immediate surroundings of the mine workings, until in 1907, or seven years after his appointment, the systematic geological survey of prescribed areas was initiated. When one realises the antagonism and distrust with which a certain section of the mining community regarded what they were pleased to term "theoretical geology," and their reiterated demand for definite statements on mining properties, with a total elimination of description of the geological data on which such conclusions can alone be based, the achievement by Mr. Twelvetrees in instituting the investigation and publication of such scientific questions shows the exercise of considerable tact and diplomacy, and his subsequent control of such investigations has demonstrated a very happy and effective balancing of the demands of the practical miner, who knows what he wants but has no conception of the proper manner of arriving at the correct information, and the demands of the pure scientist, who may desire investigations made which would have no immediate practical value. He demonstrated to a considerable extent to the miner and the investing public that the type of investigations to which they had objected were really of benefit to them.

We have all admired the way in which he adjusted the divergent demands and views of these sections of the community. His same tactfulness and genial and kindly disposition endeared him to his staff, and their loss of such a considerate chief, who was at the same time a sincere friend, is a real one.

His heart was in his work, in which he lived very largely. The development of the Geological Survey was his dearest wish, and his life-work. He died while still working towards that end. If he had been less keen on his work and less anxious to continue his efforts to the utmost possible limit, he would probably have been alive to-day.

Knowing how his whole desires were directed towards the development of the work of his Department, and having witnessed his struggles to continue at work when really too ill to attempt it, and in admiration of his personal qualities, as well as in appreciation of many kindnesses and unlimited help, his staff feel that a memorial should exist to fittingly perpetuate his memory and his life's work. No more fitting memorial could, in our opinion, be designed than a development of the functions and scope of the Geological Survey to the stage in which its utility to the State will be as great and as diversified as the

most efficient geological survey of the world. He initiated the Geological Survey of Tasmania, and his heart was in the development of it. He brought it to such a state that the time was ripe for an enlargement of its scope and an increase in its personnel and its activities. This will be my endeavour as his successor, and I feel that the more I accomplish in this direction the more fitting I shall be making the memorial to his life's work.

#### *Iron Resources of Tasmania.*

The last work on which the late Mr. W. H. Twelvetrees was engaged consisted of the investigation of the iron-ore deposits of the State, and the preparation of a publication dealing therewith. In this he was assisted by Mr. A. McIntosh Reid, Assistant Government Geologist, who examined certain of the deposits and prepared those portions of the publication dealing with them. Mr. Twelvetrees completed the preparation of the publication just three weeks before he died. It has been submitted for publication as Mineral Resources No. 6. The iron-ore reserves of Tasmania are shown therein to be as follow:—

	Potential Tons.
Blythe River lode ... ..	17,000,000
Dial Range and Penguin ... ..	700,000
Beaconsfield and Anderson's Creek ...	1,300,000
Long Plain ... ..	20,000,000
Zeehan District ... ..	2,900,000
Nelson River ... ..	Unknown
<b>Total ... ..</b>	<b>41,900,000</b>

The treatment by electric smelting of our iron ores is dealt with in a comprehensive manner, and the work is destined to be the reference-book on Tasmanian iron for years to come.

#### *Read-Rosebery Zinc-Lead Deposits.*

On resuming duty after my return from active service, I visited the Read-Rosebery field, to bring the information in regard thereto up-to-date preparatory to preparing Part III. of the bulletins describing the deposits. Parts I. and II. had been completed before my enlistment.

Part III. of the Read-Rosebery Bulletins describes in detail the metallurgical treatment of the ores, and shows how the problem has at last been solved. It further shows that, as the result of the development work carried out since my initial investigation and report, my conclusions as to the structural features, origin, and extent of the ore-bodies were correct, and the ore reserves now consist of 1,680,000 tons of "proved ore," which, together with 915,000 tons of "probable ore," give a total of 2,595,000 tons of "proved and probable" ore, made up in the various mines as follow:—

Mine.	Amount.	Proved Ore.			
		Gold.	Assay Silver.	Lead.	Zinc.
	Tons.	Ozs. per Ton.	Ozs. per Ton.	%	%
Tasmanian Copper } Rosebery Mine .....	1,050,000	0·118	10·5	7·5	25·6
Primrose .....	530,000	0·143	8·2	7·3	30·3
Hercules .....	100,000	0·110	9·0	7·0	22·0
Mount Read .....					
Total.....	1,680,000	0·127	9·6	7·4	27·3

Mine.	Probable Ore (Amount in Tons).
Tasmanian Copper } Rosebery Mine.....	720,000
Primrose.....	
Hercules .....	156,000
Mount Read.....	24,000
North Tasmanian Copper .....	10,000
South Hercules .....	5,000
TOTAL .....	915,000

The publication also describes the leading features and size of the more important zinc-lead deposits of the world, and by comparisons and contrasts shows that the Read-Rosebery zinc-lead sulphide deposits are among the most important and richest in the world, and as such constitute a valuable asset to the State and to Australia as a nation, making it possible for the latter to shortly supply over 30 per cent. of the world's output of zinc.

#### *Investigations in Progress.*

The geological survey of the Mt. Lyell field has been started by myself, and will be continued as early as possible next year. This is an important and arduous undertaking.

Mr. A. McIntosh Reid is engaged on a complete investigation of the osmiridium fields of the State.

The number of geologists being at present limited to two, no field investigations other than these are possible at present.

#### *Programme of Work for 1920.*

The following is an indication of the general intention as to the work to be undertaken during the coming year:—

- (1) The completion of the geological survey of the Mt. Lyell district.
- (2) The completion of the investigation of the osmiridium fields.
- (3) The geological survey of the midlands, to ascertain the possibility of artesian or sub-artesian water.
- (4) The investigation of the coal deposits of Tasmania as regards extent, composition, and calorific value.
- (5) The geological survey of the Mt. Bischoff field.

#### *Conclusion.*

In conclusion, I beg to express my realisation of the fact that I have been appointed to an important position, in the occupancy of which I shall be responsible for the initiation and carrying out of investigations intimately associated with the development of our great natural resources. Being cognisant of this, it will be my earnest endeavour to prove a worthy successor to our departed chief, and I shall spare no effort to attain that end. I cannot do this successfully, however, without the cordial co-operation of an efficient and contented staff, and I trust that the incoming staff will show the same keenness and cordial co-operation as have characterised the work of the officials of the Geological Survey in the past.—I have, &c.,

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

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

## REPORT OF ASSISTANT GOVERNMENT GEOLOGIST.

Geological Survey Office,  
Launceston, 13th April, 1920.

SIR,

I HAVE the honour to submit my report for the year ending 31st December, 1919.

The field work carried out during the year under review consisted of—

- (1) The geological examination of the Mt. Pelion mineral district.
- (2) The geological examination of the iron-ore deposits in Long Plain and Zeehan districts.
- (3) An investigation of the asbestos formations in the vicinity of Beaconsfield.

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

- (1) The Mining Fields of Moina, Mt. Claude, and Lorinna.
- (2) The Mt. Pelion Mineral District.
- (3) Iron Ore in Long Plain and Zeehan Districts.
- (4) Asbestos in the Beaconsfield District.

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. Attention has been paid also to the mineral section of the Victoria Museum.

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

*The Mt. Pelion Mineral District.*

In this mineral district occur wolfram and tinstone-bearing lodes, chalcopyrite and galena veins and seams of coal and shale. Wolfram-bearing lodes, which are the most important commercially, were discovered in the upper part of Forth Valley in 1916. The mining of these lodes is not yet an established industry; but developmental work shows most encouraging results, and preparations are now being made for their active exploitation.

Copper deposits were discovered many years ago near Mt. Pelion (West) and in the vicinity of Lake McRae. Several attempts, in one case on a considerable scale, have been made from time to time to develop these ore-bodies, but the operations have lead to no important results. The most promising of the several deposits is that known as the Barn Bluff Mine. Here an enormous body of low-grade copper ore has been opened up by means of trenches and tunnels. The copper content of the ore, however, is too sparsely distributed through the lode matrix to be profitably exploited under prevailing economic conditions.

In this locality two workable seams of coal occur. The coal is of the cannel and semi-cannel types. These measures are parts of a very extensive formation occupying a considerable portion of the great central tableland. In the future development of the district this coal-field has a high potential value.

Apart altogether from its undoubted mineral wealth this region possesses scenery of surpassing beauty, and the plateau grass lands are of great value, for they provide rich pastures in the dry season when the lowlands are almost devoid of vegetation.

*Iron Ore Deposits in Long Plain and Zeehan Districts.*

In the Long Plain district the iron ore occurs in disconnected masses contained in a belt of metamorphosed gabbro-amphibolite,  $\frac{1}{2}$ -mile wide by 25 miles long. They lie for the most part on the eastern side of Savage River, but cross the valley at the Rio Tinto Mine and extend northward to Specimen Reef Goldfield. Southward they continue on the western confines of Long Plain, cross the Whyte and Rocky Rivers near their confluence, and extend beyond Paradise River. The Rio Tinto group is now held under lease by a Waratah syndicate, who contemplate entering upon extensive exploratory works with a view to the early exploitation of the deposits. This magnetite ore-field is the largest in Tasmania. The ore consists chiefly of magnetite and subordinately of hematite, and is almost free of deleterious impurities. Occurring in basic rocks it naturally follows that the ore contains very little free silica. The only impurities likely to cause anxiety are sulphidic minerals, but these appear in large quantities only near the walls of the magnetite bodies, and have not been observed within 200 feet of the outcrops. It is estimated that over 20 million tons of high-grade ore are available from this source.

Similar ore-bodies occur in Zeehan district under similar conditions. All of the deposits examined are contained in a small area at the foot of Mt. Agnew. The ores occur in discontinuous, lenticular masses along the peripheries of gabbro-amphibolite dykes. Magnetite deposits occur likewise at comparatively short intervals all round the associated granite, either at the contact with slates or else in the vicinity. These deposits are conveniently situated to supply the immediate demand for high-grade ore, and they are of sufficient magnitude to meet all the requirements of the markets for many years. The ore can be produced at a minimum cost, without the necessity for heavy initial outlay in the preparation of the deposits for exploitation. Thus all the essentials are here for the economical production of high-grade ore on a large scale.

*Asbestos in the Beaconsfield District.*

The closing of the asbestos milling works and the cessation of quarrying operations at the Durabestos Mine will be keenly felt in the Beaconsfield district. It was hoped that the establishment of these works would resuscitate mining in the district, and bring back the condition of industrial prosperity enjoyed for so many years; but, notwithstanding all the natural advantages under which the industry was launched, the business connected with the exploitation of the deposits has not been prosperous. It is unfortunate at this stage that low-grade ore is showing in all the quarries, and no discoveries of value have been made for some time. The grade of the material is very much lower than the average produced in Canada. Nearly 100 tons of stone are removed in order to obtain 1 ton of marketable chrysolite fibre, whereas in Canada the proportion is not more than 40 to 1. The facilities for economical exploitation are so many here that only a trifling increase in asbestos content is necessary to place the enterprise on a profitable basis.

I have, &c.,

A. McINTOSH REID,

Assistant Government Geologist.

LOFTUS HILLS, Esq., Government Geologist, Launceston.

REPORT OF THE GOVERNMENT ASSAYER AND  
DRAFTSMAN.

Geological Survey Laboratory,  
Launceston, 31st March, 1920.

SIR,

I BEG to submit this my annual report for the year ending 31st December, 1919.

During the year the work consisted largely of making metallurgical tests and analyses of minerals, rocks, and ores. The total number of assays and qualitative tests made for the public and the Department was 2787, as compared with 2750 for the previous year.

Assays have been made for gold, silver, lead, tin, zinc, copper, bismuth, tungstic acid, molybdenum, barium, sulphate iron, manganese, sulphur, nickel, cobalt, osmiridium, platinum, radium, chromium, antimony, arsenic, titanium, calcium, mercury, and aluminium.

Complete analyses have been made of rocks, ores, clays, coals, and alloys. Distillation tests of shale, &c., have been carried out.

Provision has been made for the purchase of a bomb-calorimeter. Such an instrument has been urgently required, and will prove of great value to the Department and a benefit to those requiring calorific tests made.

Approximately one thousand personal interviews have been attended to during the year, in addition to a large number of inquiries by post.

A considerable amount of time has been spent in checking the plans and sections of the underground workings of mines furnished by mine-owners, in compliance with "The Mines and Works Regulation Act."

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

A suggestion made in my last annual report that a laboratory assistant be appointed has been acceded to by the appointment of Mr. W. Manson, who commenced work on the 1st December.

I have, &c.,

W. D. REID,  
Government Assayer and Draftsman.

LOFTUS HILLS, Esq., Government Geologist, Launceston.

REPORT OF THE CHIEF INSPECTOR OF  
MINES.

Chief Inspector of Mines' Office,  
Hobart, Tasmania, 23rd April, 1920.

SIR,

I HAVE the honour to submit my annual report on the inspection of mines for the year 1919.

Mr. J. Harrison retired from the position of Inspector of Mines at Zeehan, having reached the retiring age, after 37 years' service. I desire to express my appreciation of the valuable services performed by this officer. Mr. Vaudeau was transferred from Queenstown to Zeehan, and Mr. W. H. Williams, who was an officer in the Queensland Department, was appointed to Queenstown.

*Accidents.*—Attached is diagram and statistical tables in connection with accidents. The return for the year may be considered with satisfaction. The total number of accidents was 58, causing injury to 58 persons, one of which proved fatal. The death-rate per thousand employed was 0.226, and the rate per thousand injured was 12.197. The fatal accident occurred to a mine official, who was found dead in a stope lying between a bulk and a reared ladderway. There was no evidence as to the occurrence, but the injuries would indicate that they were due to falling from the ladderway on to the filling, a distance of about 9 feet. The occurrence was unfortunate, and every possible precaution appeared to have been taken to prevent such an accident. Of the 57 persons seriously injured, 30 met with accidents underground and 28 at the surface. Twenty-two of these accidents caused fractures or permanent injury, the remaining 35 only slight injury, but sufficient to cause loss of employment for more than 14 working days. Great difficulty was experienced in obtaining winding ropes, which necessitated increased care and responsibility on the part of those concerned. That there was no record of a rope being broken under these adverse circumstances demonstrates clearly the great care taken by those responsible.

A large amount of attention has been given to the improvement of health conditions, and it is pleasing to note the great improvement made on many of the mines in connection with this problem. The housing of employees, provision for boarding single men, reduction of explosive fumes, and the allaying of dust, show great improvement. The introduction of special crib places, with washing facilities underground, at one mine, is a great improvement on the old system. Concrete chambers have been made at each level; these are whitewashed, fitted with electric light, tables, and seats. It is intended to introduce electric tea-warmers. The boarding of truck-roads is also a great improvement, and renders trucking conditions more healthy and congenial.

There were several settlements of ground in mines during the year. This matter is receiving special attention in the form of a close study of the lines of weakness and structural occurrence of the ore-bodies, with a view of at least reducing such occurrences. It is pleasing to note that no accident to persons was attributable to these settlements, but such occurrences must be considered very dangerous. A very extensive settlement occurred in an open-cut—about 50,000 tons of earth covering two adits slipped from the hanging-wall into the open-cut. The slip was foreseen, and all the men removed from the danger before the occurrence.

The question of ventilation is one which will require special attention in the future, and it is intended to closely check the quantity and quality of the air circulated through the mines. Owing to the extremely favourable natural conditions, the distribution of air has not received the attention which it merited, but some of the mines are now reaching such a depth, and have large areas of worked ground, that this will now be found indispensable. In two cases the circulation of air has been found defective in the working places. A sufficient quantity of air passed into the mine and passed out of the return airway, but it did not circulate to the working places, having short-circuited through old workings.

The prescribed code of signals worked satisfactorily. Two accidents occurred during the year owing to defective signaling, but the mishaps could not in any way be attributed to the code of signals, but were due to the non-compliance with the signals as prescribed.

During the year proceedings were instituted against eight persons. In four cases convictions were obtained, two cases were withdrawn, and two were dismissed. Attached please find the reports of the inspectors.

I have, &c.,

J. O. HUDSON, Chief Inspector of Mines.

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

*COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892, to 31st December, 1919.*

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 1892	3295	28	4	25	29	8·8001	1·214	7·586
" 1893 " 1893	3403	25	7	20	27	7·934	2·057	5·877
" 1894 " 1894	3789	26	4	24	28	7·390	1·058	6·332
" 1895 " 1895	4160	22	7	16	23	5·529	1·682	3·847
" 1896 " 1896	4303	36	7	31	38	8·831	1·627	7·204
" 1897 " 1897	5530	36	13	33	46	8·318	2·351	5·967
" 1898 " 1898	6180	35	9	34	43	6·957	1·456	5·501
" 1899 " 1899	6834	18	7	16	23	3·365	1·024	2·341
" 1900 " 1900	7017	29	8	23	31	4·417	1·140	3·278
" 1901 " 1901	6438	38	7	35	42	6·524	1·088	5·437
" 1902 " 1902	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	1·585	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

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

Rate per 1000 men employed.

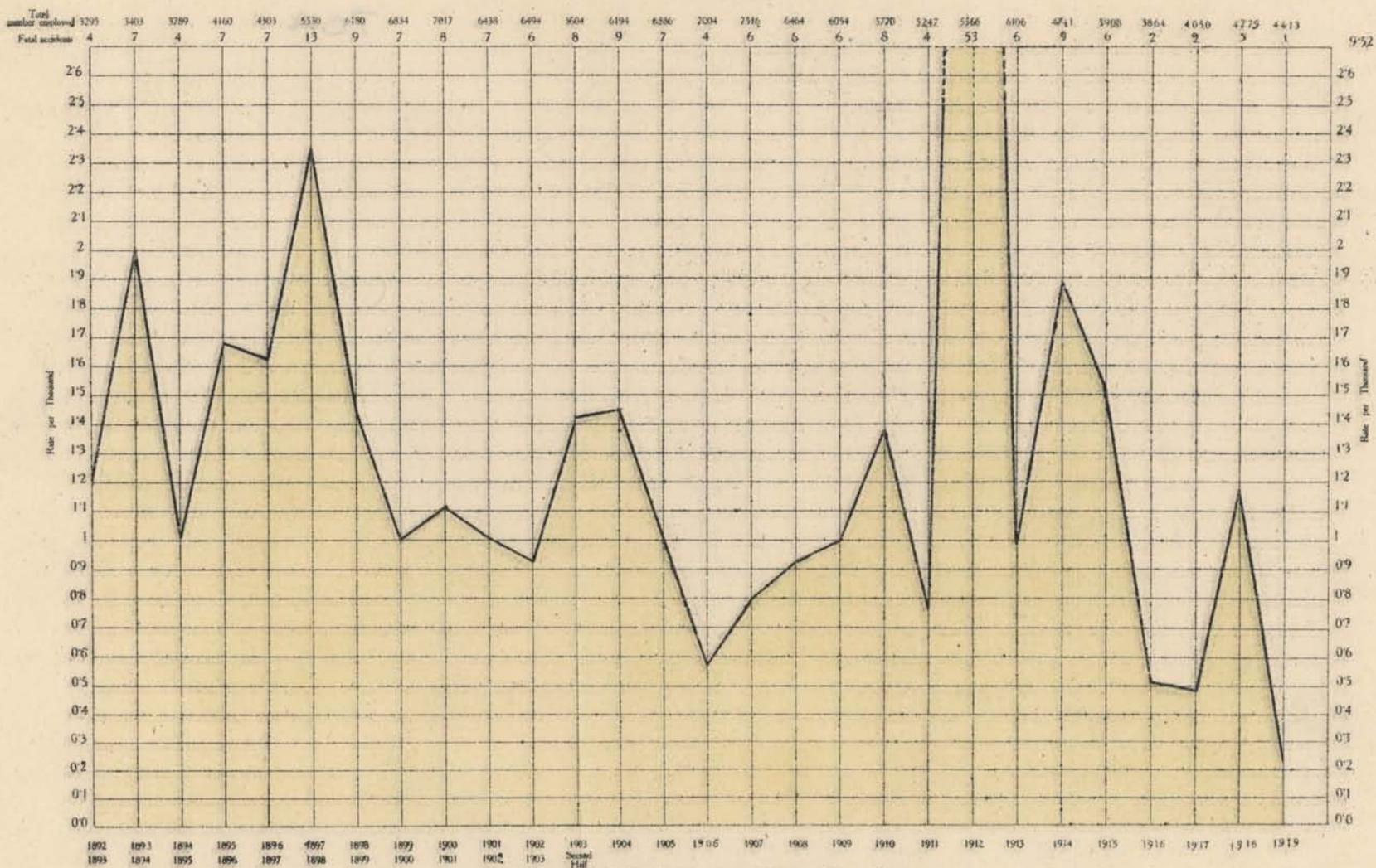


Photo Mygraphed by John Vail, Government Printer Hobart Tasmania.

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*ANALYSIS of Statistics for 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 .....	1572	32	1	31	32	20.356	0.636	19.72
Zeehan, &c. ....	474	1	—	1	1	2.109	—	2.109

*TABLE showing Rate per Thousand Killed and Injured in different Divisions for the Year ending December, 1919.*

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 .....	647	6	—	6	6	9.119	—	9.119
North-Eastern .....	475	8	—	8	8	16.842	—	16.842
Eastern .....	525	9	—	9	9	17.123	—	17.123
North-Western .....	720	2	—	2	2	2.777	—	2.777
Western .....	2046	33	1	32	33	16.129	0.448	15.640

TABLE showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Year 1919.

PLACE OR CAUSE OF ACCIDENT.	INSPECTION DISTRICTS.													
	Northern and Southern Division.		North-Eastern Division.		Eastern Division.		North-Western Division.		Western Division.				TOTAL.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Zeehan and Districts.		Lyell District.		Killed.	Injured.
UNDERGROUND—														
Falls of ground .....	...	...	...	...	...	2	...	...	...	...	...	6	—	8
Shaft Accidents—														
Falling down passes and shafts .....	...	...	...	...	...	...	...	...	...	1	...	...	...	1
Total .....	...	...	...	...	...	2	...	...	...	1	...	6	...	9
Miscellaneous (underground).														
Haulage .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Trams, &c. ....	...	...	...	...	...	3	...	...	...	...	...	2	...	5
Sundry accidents .....	...	...	...	...	...	1	...	...	...	...	1	7	1	8
Explosives .....	...	...	...	...	...	...	...	...	...	...	...	1	...	1
Total .....	...	...	...	...	...	4	...	...	...	...	1	10	1	14
Total Underground ....	...	...	...	...	...	6	...	...	...	1	1	16	1	23

ON SURFACE—

Smelting-works .....	...	...	...	...	...	...	...	...	...	...	1	...	1
Machinery .....	...	1	...	...	...	...	...	...	...	...	...	...	1
Tramways .....	...	1	...	...	...	1	...	...	...	...	6	...	8
Falls of persons .....	...	...	...	...	...	...	...	...	...	...	4	...	4
Explosives .....	...	...	...	1	...	...	...	...	...	...	...	...	1
Miscellaneous.....	...	4	...	3	...	2	...	2	...	...	4	...	15
Sluicing .....	...	...	...	4	...	...	...	...	...	...	...	...	4
<b>Total .....</b>	...	<b>6</b>	...	<b>8</b>	...	<b>3</b>	...	<b>2</b>	...	...	<b>15</b>	...	<b>34</b>
<b>Gross Total .....</b>	...	<b>6</b>	...	<b>8</b>	...	<b>9</b>	...	<b>2</b>	...	<b>1</b>	<b>1</b>	<b>31</b>	<b>1 57</b>

## REPORTS OF INSPECTORS OF MINES.

MR. INSPECTOR CURTAIN (Launceston) reports :—

*Accidents.*—The list submitted contains the number of accidents that have taken place in this extensive district during the past 12 months, and which incapacitated the sufferers over 14 days. All the sufferers returned to work, except one, who is still incapacitated.

*Ventilation.*—One of the collieries has recently called for extra attention, but with the completion of connections now under way and stowing of disused workings this, if not already overcome, will soon be remedied; otherwise the requirements of the Mines and Works Regulations have been reasonably complied with all round.

*Dust.*—All mines using rock-drills have pressure water supplied, and its use is generally availed of.

*Health of Miners.*—The majority of the men under my observation pursue their calling in the open, and are consequently liable only to the ordinary ills which all are subject to. The underground workings are invariably cool and reasonably ventilated, and possess no menacing features that exception might be taken to.

*Changing-houses.*—These are provided on most of the metaliferous mines, but none of the collieries favour their erection, and while the men make no demand the managers consider there is no need for them.

*Equipment.*—The mines generally are provided with serviceable requirements, and where cages are used by the employees, tests regarding their safety have been regularly made by the officials.

*Magazines and Explosives.*—During the year those registered have been examined and found clean and satisfactory. A sample of explosive in one of the mines was found exuding, and the affected quantity was subsequently removed and destroyed. In another instance, through faulty storage, exception had to be taken to the state in which the explosive was found, and the manager was ordered to improve his magazine and to provide a more suitable method of thawing the frozen plugs, both of which have been satisfactorily attended to. Accidents to youths and children, principally in the farming districts, continue through the carelessness or lack of ordinary supervision in the storage of explosives, especially detonators; but in all cases investigated, either through fear or reticence, it has been impossible to definitely trace the source from which the explosive was obtained.

*Inflammable Oils.*—Seventy persons have applied for licences to store inflammable oils, extending along the coastal and inland towns from Stanley to Gladstone, and as circumstances permit their premises are visited and brought up to the requirements of the Act.

*LIST of Accidents in Inspector Curtain's District for the Year 1919.*

Fatal 0, Serious 23.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature of Injuries.	Killed.	Injured	Particulars.
1919. Jan. 24	Mt. Nicholas Colliery	Mt. Nicholas	Fall of clod	Louis Eugene Ford	Married, 29 years	Head cut, two ribs broken	—	1	Fall of roof took place and before he could escape the fall was injured as stated
Jan. 30	Briseis Mine	Derby	Chainblock	Cecil Samuel C. Rose- years	Married, 47 years	Left thumb jammed	—	1	While lifting a pipe bend with a chain block, latter jammed finger
Feb. 10	Scheelite Mine	King Is.	Fall from dray	George C. Brooks	Married, 64 years	Fractured rib	—	1	While loading concentrates on dray, overbalanced, and fell to the ground; fractured rib
Feb. 13	ditto	ditto	Truck overturned	Edward Chas. Butler	Married, 42 years	Muscles of leg bruised	—	1	Truck overturned and while righting it with a horse, wheel knocked against leg, bruising muscles
Mar. 4	ditto	ditto	Loose pin in brake-wheel	Edward Love- ridge	Married, 47 years	Fractured arm	—	1	While adjusting loose pin in brake wheel, wheel suddenly rotated quickly, catching arm in spokes, fracturing it and bruising shoulders
Mar. 15	Una Mine	Derby	Fall of earth	Samuel North Harper	Married, 44 years	Fractured ribs	—	1	While moving stump in face, fall of earth took place, striking his back, fracturing ribs
Mar. 18	Arba Mine	Branxholm	ditto	Morris Hay- ward	Single, 21 years	Skin lacerations & bruised hip	—	1	While working on a ledge of a bench fall from face knocked him down

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

Date of Accident.	Name of Mine.	Locality	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Nature or Injuries.	Killed.	Injured.	Particulars.
1919. April 14	Briseis Mine	Derby	Adze hit foot	Eric Chas. John Pinner	Married, 23 years	Tendon on left foot severed	—	1	While trimming piece of timber the adze slipped
May 31	Miners Claim	St. Helens	Explosion	Leslie Robt. McGuiness	Married, 27 years	Lost right eye	—	1	Premature explosion resulting in loss of eye
June 28	Mt. Nicholas Mine	Mt. Nicholas	Fall of roof	Bernard Salter	Married, 29 years	Cut head	—	1	Roof came away and struck head and shoulders
July 1	Mt. Nicholas Colliery	ditto	Sprag stick broke	William Britton	Married, 61 years	Fractured right wrist	—	1	The sprag stick used by Britton broke and permitted the partly loaded skip to come back and jam him against the face
July 7	Miners Claim	Cascades	Fell on pick	Stephen Kerrison	Married, 63 years	Left eye injured	—	1	Kerrison, whilst using a double-ended pick, slipped, and falling on its exposed point, injured his left eyeball
July 11	Mt. Nicholas Colliery	Mt. Nicholas	Loaded truck	Roy Gatty	Single, 19 years	Side bone of right foot injured	—	1	Gatty, a tipper at the screens, slipped, and a loaded truck ran over his foot
July 22	ditto	ditto	Slipped and fell	Bernard Lehner	Married, 30 years	Rib broken	—	1	Lehner, whilst passing a full skip, stood on a loose rail and fell
Aug. 8	Briseis Tin & General Mining Co.	Derby	Rotary emery wheel	Percival McWatters	Married, 34 years	Index finger crushed	—	1	McWatters, whilst grinding a piece of iron, got the index finger of his left hand caught, that necessitated the amputation of the top and second joints

Aug. 20	Mt. Nicholas Colliery	Mt. Nicholas	Jammed between truck and skip timbers	Arthur William Davern	Single, 20 years	Crushed finger	—	1	Davern, whilst wheeling a full truck along the road got his finger crushed between it and the side
Sept. 5	Briseis Tin & General Mining Co.	Derby	Flying rivet	Cecil Samuel Rosevears	Married, 48 years	Contused forehead	—	1	Rosevears was assisting to cut a rivet off the flange of a waterpipe that on severance flew and caused his injuries
Oct. 30	Mt. Nicholas Colliery	Mt. Nicholas	Fall of coal	Charles Noble	Married, 40 years	Crushed left hand	—	1	Noble was engaged filling a slip when some top coal fell from the face, and knocking him down produced his injuries
Oct. 24	Scheelite Mine	King Is.	Falling stone	Charles Alfred Lewis	Married, 39 years	Abrasions to forehead	—	1	While attending the navy boiler, small stone rolled from the roof of navy and struck Lewis on forehead
Nov. 5	Mt. Nicholas Colliery	Mt. Nicholas	Fall of stone	Louis Barr	Married, 40 years	Bruised left leg	—	1	While hauling timber he stumbled over a fallen stone, bruising calf of leg
Dec. 4	ditto	ditto	Log slipped	Edward C. Newman	Married, 35 years	Bruised ankle	—	1	While placing timber into position to split, log rolled and jammed ankle
Dec. 16	Scheelite Mine	King Is.	Spark from hammer hit eye	William Cornelius, jun.	Single, 20 years	Bruised eye	—	1	Spark from hammer bruised eye
Dec. 19	ditto	ditto	Stone rolled on to leg	Frederick William Webb	Single, 32 years	Cut knee	—	1	While working in face of open cut, stone rolled on to leg, cutting him under the knee

**MR. INSPECTOR VAUDEAU (Zeehan) reports:—**

I HAVE the honour to submit my report as inspector for the year ending 31st December, 1919.

Until the end of April I was stationed at Mt. Lyell, and was then transferred to the Western and North-Western Division.

Work proceeded on the usual lines at Mt. Lyell until the time of my departure, and Mr. W. H. Williams will no doubt give you full reports of this and of the accidents which happened till that time, as all particulars were left with him.

I came to Zeehan in May last, and took over from the previous inspector, Mr. J. Harrison, after visiting the Waratah district together.

*Accidents.*—It is pleasing to be able to state that the list is very low.

In compliance with Section 26 of "The Mines and Works Regulation Act, 1915," only two men were reported as having lost 14 working days or over from their usual occupation, and neither of these accidents happened underground.

The first, which happened on August 18, was to a man who was splitting firewood. He had one of his fingers caught and crushed. At the time he did not expect to lose more than a few days at most, but lost 16 working days.

The second occurred to a man while shoeing a horse in a blacksmith shop. The horse knocked him down, cutting his arm and injuring his leg, but not very seriously.

At the Magnet Silver Mine one of the pump-men dropped dead, but the doctor gave a certificate stating that death was due to hemorrhage of lung, following asthma and chronic bronchitis, and that death was not due to any accident.

Tabulated list attached.

*Ventilation.*—Apart from one mine, in which steam is used underground for hoisting and pumping purposes, the ventilation is fairly good. In the near future it is expected that electricity will take the place of steam, and once the workings cool down working conditions will be considerably improved.

A little CO<sup>2</sup> gas is being given off out of the ground at one mine at Zeehan and one in the Whyte River district. Air is being blown into each of these workings to diffuse it, and to bring it within the quality allowed under the Act.

*Health of Miners.*—Without medical testimony this is a hard matter to pronounce on, but as far as I can judge the mines in this district, apart from that mentioned above, worked by steam underground, should compare with the usual run. The miners look to be a fine healthy lot of men.

I only found one mine in which water was not supplied for rock-drilling in the stopes, and this has been promised attention.

*Ropes and Cages.*—Three ropes were condemned, owing to internal corrosion and crystallisation. The remainder were reasonably satisfactory. The safety appliances on all cages, when tested, have been within the requirements of the Act.

*Magazines.*—Taken on the whole, apart from two mines, the magazines were reasonably satisfactory; these two are being attended to.



*LIST of Accidents in Inspector Vaudeau's District.*

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single, and Age.	Killed.	Injured.	Particulars.
1919. Aug. 18	Mt. Bischoff Extended Tin Mine	Waratah	Wedge flew out of log	Thomas Shaw	Married, 42	—	1	The man was engaged cutting firewood: He was splitting a log, the wedge flew out, and his finger got caught in the log, crushing the same
Aug. 20	Mt Bischoff Tin Mine	Waratah	Knocked down by horse	John Thomas	Married, not given	—	1	The man was shoeing a horse, it kicked and knocked him down, injuring his leg, and cutting his arm

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 of 1915," "The Explosives Act, 1916," and "The Inflammable Oils Act, 1910," within the Lyell Inspection Division for the year 1919.

During the year I was appointed an Inspector of Mines and Explosives for Tasmania, and finally allocated to the Lyell Division as from the 1st May, in succession to Mr. H. A. Vau-deau, who was transferred to Zeehan.

From my appointment to the position considerable attention was directed to the principal mines and their respective open-cut and other surface workings, as, apart from a necessary acquisition of early acquaintance with local conditions, initial visits of inspection disclosed that several matters of importance were considerably below a reasonable categorical standard, and, with due attention to the policies of mining and quarrying being pursued. These discrepancies were considered and promulgated for rectification in order of importance, with a view to the production of such conditions as did not obtain hitherto. Therefore, in addition to matters, such as the attainment of greater security of working places and the effectual allaying of dust arising from rock-drilling and other operations, the desideratum of this office has been the improvement of ladder and travelling-ways, more adequate protection of passes and other openings, improved handling and storage of explosives, and improved conditions governing health and sanitation, by the introduction of well-arranged and cleanly-maintained "crib" places and latrine accommodation, and improved drainage and road formations underground. To describe the existing arrangements as being below a mean standard of adequacy or reasonableness is not to exaggerate, and although a campaign of reconstruction and inauguration of new systems was commenced subsequent to the demands of this office, finality in those matters was not attained at the close of the year owing to the large amount of work entailed.

As opportunity permitted, the work of inspection was extended to the smaller mines and works in operation, and observed discrepancies in practices and in the application of the provisions of "The Mines and Works Regulation Act of 1915" were dealt with.

*Accidents.*—Thirty-two accidents, entailing a like number of casualties, were reported and recorded under the provisions of Section 26 of "The Mines and Works Regulation Act of 1915." In several instances the injuries were not of a serious nature, but as the periods of disablement were 14 or more days, these were recorded, and as circumstances demanded special investigations were devoted thereto.

There was 1 fatality and 31 casualties attended with non-fatal injuries, as against 3 of the former and 26 of the latter recorded during the previous year.

When the nature of mining operations and the number of men employed are reviewed, the number of registered accidents is to be regarded as comparatively low.

The following is an analysis of the accidents, which have been subject to a classification based upon the primary causes of the injuries sustained, and showing the percentage proportion of the casualties under each heading:—

Classification.	Accidents.	Casualties.		Total Casualties.	
		Killed.	Injured.	No.	Per Cent.
<i>Below Ground—</i>					
Falls of ground .....	2	...	2	2	6·250
Falls from stagings .....	1	...	1	1	3·125
Shaft accidents .....	1	...	1	1	3·125
Truck and wagon accidents...	2	...	2	2	6·250
Miscellaneous .....	10	1	9	10	31·250
<i>Above Ground—</i>					
<i>About mines only—</i>					
Explosive accidents .....	1	...	1	1	3·125
Falls from stagings .....	1	...	1	1	3·125
Truck and wagon accidents	1	...	1	1	3·125
Miscellaneous.....	5	...	5	5	15·625
<i>At Reduction &amp; Other Works—</i>					
Truck and wagon acci- dents .....	4	...	4	4	12·500
Miscellaneous .....	4	...	4	4	12·500
Totals .....	32	1	31	32	100·000

Fifty-nine per cent. of the accidents were, therefore, of a miscellaneous character, while 22 per cent. were primarily connected with truck and wagon operations. "Falls from stagings" and "falls of ground" each accounted for 6 per cent. of the accidents, while the remainder was equally distributed to "shafts" and "explosive" accidents, being 3 per cent. of each class.

Although a majority of the accidents have been cited as instances of misadventure, subsequent inquiries and investigations disclosed that, with the exercise of more care on the part of those concerned, in 32 per cent. of the cases the results recorded would in all probability have been averted.

The one fatality was associated with exceptional circumstances, inasmuch that a definite cause for the accident was not disclosed. In this case a level-boss was found dead, lying in a somewhat protected position on the filling, between a bulk and a reared ladderway, in a rill stope which was in the course of being filled. Death was due to internal hæmorrhage from the right subclavian artery, which was penetrated by a spicula of bone from a comminuted fracture of the sternal clavicle.

The ladderway arrangements offered reasonable facilities for safe travelling, and there was no concrete evidence to suggest a cause for the accident. It was assumed that deceased was proceeding to the stope to view the progress of filling operations, and fell from the top of the reared ladderway into the stope, a distance of 9 feet. At a subsequent coronial inquest nothing of a definite character was elicited, but the jury found that death was due to accidental causes.

Of the non-fatal accidents, 15 occurred below ground and 16 on the surface, 8 of which latter number were associated with operations at reduction and other works. The injuries sustained and the causes thereof are summarised in the tabulated list accompanying this report, consequently a general résumé only is devoted thereto.

Falls of ground accounted for 2 non-fatal accidents, involving 2 casualties, but these were not regarded as of serious moment, and from the precautions that were attested to have been observed, such could only be instanced as cases of misadventure. In one case a miner was rigging a machine-column when a small flake of ore "kicked" from the roof nearby and struck him on the right foot, fracturing two toes. In the other case three miners were cleaning up part of a "stope strip," when a small quantity of soft ore fell from the roof, which was asserted to have been thoroughly examined and rendered safe, and a portion struck one of them, inflicting a partial fracture of the small bone of the right leg and a bruised back.

An additional 2 accidents were due to falling ground, but these have been classified as "miscellaneous accidents." Both of these occurred during "barring down" subsequent to blasting operations, and were due to unprecedented deflections in the direction of the falling ground from that operation. Consequently, it cannot be stated that the ground fell, as implied by the classification "falls of ground."

Considerable attention has been directed to campaigning against this class of accident, as with the systems of mining in vogue a maximum degree of vigilance is essential to obtain a reasonable minimum of accidents.

The "explosive accident" occurred during the preparation of primers at an open-cut workings, and was due to an explosion of a detonator. The injured person, the only witness to the accident, asserted that he was tapping the detonator upon a wooden bench to remove the sawdust, when it exploded and seriously injured his right hand.

Owing to an error in the transmission of a life signal, a person riding on a cage was lowered into 6 feet 10 inches of water on the bottom level of a mine, and sustained minor injuries.

Two accidents were due to "falls from stages," and in each of these the exercise of more care in connection with the work in progress would probably have averted the results recorded.

Seven accidents occurred in connection with truck and wagon operations, four of which might be regarded as preventable accidents, while the remainder were instances of misadventure.

Eighteen non-fatal accidents have been classified as "miscellaneous," in fourteen cases of which the injuries appeared to have been attended with accidental causes. The most serious of this class occurred during constructional work at surface orebins. While a flooring strut was being slung into position, a piece of marline securing the sling-hitch severed, and allowed

the sling to release the strut, which crashed into one of the persons employed and fractured both his thighs and injured his left hand. Callousness in the mode of adjusting the sling-hitch contributed to this accident. Apart from this accident and the two mentioned under "falls of ground," the injuries sustained in the remainder of the accidents under this heading were not of serious moment, and these, together with the causes thereof, are shown in the tabulated list.

*Settlements of Ground.*—Five extensive settlements of ground were recorded, one of which occurred in an open-cut working, while four occurred underground. Although slight to extensive damage was inflicted upon the workings correlated therewith, no person was injured thereby.

The first mentioned occurred in the open-cut workings at the Mt. Lyell Mine on the 14th October, when an extensive slip of ground, estimated to approximate 55,000 tons, ensued on the hanging-wall side. The movement extended from the bottom level bench to the top of the workings, and the fall completely blocked the main entrance to the underground workings, entirely disorganising all operations until such had been driven through and the former means of access, through No. 5 tunnel, restored. Certain characteristics of the ground, together with the angle of batter and a pronounced cleavage-plane, which formed a line of "let-go," were the sources of weakness. An extensive movement was imminent several days prior to the fall, in consequence of which all employees were removed from the open-cut workings and due precautions were taken in respect to travelling and other matters likely to be affected thereby. In connection with this occurrence it is opportune to record that on the 4th July special attention was directed by this office to that area of ground, owing to such being somewhat broken, lying against the cleavage-plane, and overhanging towards the lower benches, where the ground was fretting with conspicuous fracturing on the upper benches. The opinion was then expressed that such ground was a weakness in the open-cut workings, and it was recommended that every consideration be directed thereto, as, with cumulative weakening towards the base, a slip of ground was possible.

Subsequent to blasting operations in No. 4 stope, No. 6 level, Mt. Lyell Mine, on the 29th April, a wedge-shaped body of ore, covering a base area of approximately 50 feet by 100 feet, and varying in thickness from a "feather-edge" up to about 30 feet, "let go" from a comparatively flat head, in the back, and the schist hanging-wall, and settled upon filling which had been completed to the immediate proximity of the roof previously.

The three other settlements of ground occurred in the North Lyell Mine during the early part of the year. One involved the collapse of section of a stope, with movement to the level above, while in each of the other two large areas of ground "let go" from lines of weakness in the backs of rill stopes.

In addition, there have been several "flakings off" of ground, mostly influenced by blasting operations, in sections of friable ore with the presence of lines of weakness, and although specific record was not made of these, such occurrences are indicative of necessity for extreme care in respect to details of mining policies pursued.

*Prosecutions.*—Legal proceedings were instituted in six instances, four of which concerned the allaying of dust from rock-drilling operations. One person was prosecuted for riding on a cage with an empty truck; while the sixth case concerned the testing of some apparently bad ground, which was refused to be done or caused to be done by a mine official, in response to a request by the Inspector of Mines. In two cases the complaints were dismissed, while convictions were obtained in the remainder. The proceedings in one case covered an alleged offence committed during the previous year. In one instance, not only was the person committing the offence prosecuted, but proceedings were also taken against the person in charge, for failing to enforce the matter complained of.

The following tabulation shows the alleged contraventions and the results of the proceedings instituted:—

Contravention.	Result.
Section 16, Clause 2.—Refusal to test or cause to be tested a quantity of apparently bad ground in response to the lawful order of an inspector given in the execution of his duty.	Mine Official: Complaint dismissed, with £3 3s. costs for defendant.
Rule 13 of the Schedule.—Failure to use, when necessary, appliances for the prevention of dust from rock-drilling operations.	Miner: Complaint dismissed, without costs. Miner: Convicted, Fined £2, and ordered to pay costs amounting to £2 10s. Open-cut Machineman: Convicted, and ordered to pay costs amounting to £2 12s. 6d.
Section 23, Clause 1.—Failure to enforce the provisions of Rule 13 of the schedule as relating to the prevention of dust from rock-drilling operations.	Manager: Convicted, and ordered to pay costs amounting to £1 1s.
Rule 37 of the Schedule.—Riding on a cage with an empty truck.	Mine Official: Convicted, and ordered to pay costs amounting to £1 1s.

*Health and Sanitation.*—Considerable attention has been directed to conditions governing health and sanitation. At the principal mines existing arrangements in respect to "crib" places and latrine accommodation, drainage and underground road formations, and disposal of food scraps and other waste were deplorable and not conducive to good health and sanitation. To describe the conditions associated with those matters as deplorable, and to state that such have been severely neglected,

sufficiently indicates existing conditions without entrance upon details. Apart from other considerations, the contentment that ensues amongst employees with well-arranged and cleanly-maintained appointments in those respects should be sufficient incentive for those concerned to produce the best that is reasonably possible. Consequent upon the unsatisfactory conditions in respect to those matters a campaign for the inauguration of improved arrangements to obtain at least reasonable conditions was commenced, with good results, and although the work was continuous, such was not finalised at the close of the year, but the results thus far obtained are conspicuous.

Food scraps, in varying stages of decomposition, carelessly strewn about in different parts of the mines, have been observed. Pollution of mine atmospheres from this cause requires no enumeration. To some extent this has been attributable to uncomfortable and insanitary conditions prevailing at places which appear to have been set aside for meals. Not only will the new systems of "crib" places produce desired results in this and other directions, but a congregation of all persons in places deliberated will avert individuals venturing to places which may not offer desired safety.

Ordinarily damp to wet conditions prevail in the principal mines, owing to soakage and water introduced, but the beneficial effects of improved drainage and road formations so far undertaken are apparent to those formerly associated with severe lodgments of slush and water containing copper and iron salts on the underground roadways.

Unfortunately a record has to be made of wilful damage to the new arrangements, as apply to the latrine accommodation. To maintain continuous cleanliness a system of duplicate seats provided with well-constructed lids was required and obtained; but in several instances persons, unknown, have wilfully damaged both lids and seats to stages of uselessness. There may be reasons why an individual will not make average use of the means provided, but wilful destruction thereof is inexcusable. However, it is hoped that this will be overcome, either by the education of an individual to a standard beyond his present perception, by more care on the part of those not desirous of making an average use thereof, or by action against any offender located. It is relevant to mention that the A.W. Union has extended assistance to overcome this malignant practice.

Several irregularities were observed in connection with the allaying of dust arising from rock-drilling and other operations in mines, open cuts, and quarries. Four persons were prosecuted in respect to breaches of the Act covering this matter. In one case action was taken against the person in charge of operations for failing to enforce a use of the means provided for allaying the dust arising from boring operations in an open-cut working. Inquiries into several instances of failure to allay dust, mostly during the removal of broken material, were satisfied with cautionary measures. The last prosecution was instituted consequent upon a case reported by a mine official which, in one respect, is of considerable importance, as such exhibited a desire on the part of officials to assist in overcoming this nuisance. Latterly personal observations indicated that instances of failure to allay dust arising from rock-drilling operations were not so rife as indicated by previous records.

Due attention was given to the bathing and changing accommodation at the mines and works requiring such provision. Employees in this respect were reasonably well provided for, but all do not take advantage of the facilities offered, particularly those working in the Lyell mines and residing at Queenstown. When the humid mine atmospheres of varying temperatures and, in instances, the wet conditions that underground employees tolerate, are viewed, with frequently severe surface conditions, the possibility of constitutional affections is not to be ignored, and those persons would do well to realise that present failure to allot the small amount of time necessary in making a change of clothing may be a source of regret ultimately.

On the 15th July the main change-house at the Mt. Lyell Mine was totally demolished by fire, a definite cause of which was not ascertained. Temporary provision was made, and the construction of a new change-house was commenced almost immediately. The new building is of reinforced concrete, and is superior in every respect to that existing previously. The new change-house should be completed for occupation early in the new year.

*Ventilation.*—Natural ventilation is the rule at the various mines, and personal sensations have not indicated oppressive thermometrical conditions or temperatures that have exceeded the maximum provided for in the schedule to the Act. No record has been made of the quantities of air circulating, but the control and distribution of air currents are negative, and although high temperatures have not been encountered, it cannot be stated that the circulation of air to all working places has been efficient. Alteration in direction of air currents in response to varying surface conditions is to be observed, and the absence of positive ventilation in the large mines is a discrepancy. Several cases of lingering smoke and fumes from blasting operations, producing uncomfortable conditions for employees, have been observed and recorded. Apart from other considerations, the possibilities of positively controlled ventilation in case of emergency are not to be ignored. At one small mine, although temperatures were comfortable, the atmospheres were vitiated and impure through stagnation. Latterly, the sinking of a small air-shaft from the surface to the underground workings was undertaken, and this, when completed, should produce desirable results.

*Explosives.*—Considerable attention was directed to the handling and storage of explosives, principally underground, as initial observations disclosed irregularities and anomalies which it was desirable to overcome. At one mine a system of distribution was in operation which, with minor improvements, offered sufficient advantages to make it applicable to the principal mines. Conditions of storage were inferior, and demanded entire reconstruction of the systems of storage in operation. The minimum requirements of this office in respect to handling and storage of explosives underground were presented to the principal mines, and an exclusive adoption of these is of pleasant moment. At the close of the year inauguration of the new systems was not finalised, but at one mine the arrangements were advanced sufficiently to exhibit considerable improvement upon those existing previously.

Nitro-compounds, principally of Cape manufacture, were used, and no direct complaints were made to this office relative to the quality thereof. Several small quantities of nitro compounds and detonators were condemned, and ordered to be destroyed, the former mainly owing to extreme saturation from moisture-absorption. Occasional traces of exudation only were observed.

In addition to the "explosive" accident referred to, one slight mishap occurred in connection with blasting operations in a mine. Two miners were engaged spitting the fuses of eight pops when one pop exploded prematurely and before the spitting was completed. No fuse was less than 4 feet in length, and the spitting occupied a few seconds only. Those concerned attributed the occurrence to faulty fuse, but investigations discredited this, and produced a possible cause from coiling and knotting of the fuses which were adopted.

Frequent tests of the fuse in use were made, both by this office and the persons appointed in charge of the explosives at the various mines, open-cuts, and quarries, and in no instance was faulty fuse encountered.

An incident portraying a dangerous practice, and one contrary to the provisions of the Act, came under direct observation. The person in charge of blasting operations at an open-cut workings bulled a machine-hole and almost immediately proceeded to load the main firing charge. Inquiries disclosed that such person had pursued this practice for years, but cautionary measures were adopted, and should avert such a practice throughout the district in future.

*Machinery.*—Due attention was directed to the efficient maintenance of ropes, brakes, cages, safety-catches, and attendant appliances. Where doubt existed in respect to the efficiency of these appliances, special examinations and tests were obtained, but only in minor instances were defects promulgated for attention. Entries in the various record books indicated that these matters were regularly attended to.

Three ropes were condemned and ordered to be replaced by new ones, while several new ropes were installed to replace those in use before condemnation of the latter by this office became necessary.

Exclusive of the mishap in connection with winding operations owing to incorrect transmission of a life signal, dealt with under "accidents," one machinery mishap of importance was recorded. This occurred at a surface haulage, and was due to failure of the link connecting the load with the rope nozzle, followed by failure of the truck-hooks serving as an emergency connection, when a rake of loaded trucks was being lowered down a gradient of 1 in 2. A flaw in the link-weld was the primary cause of the mishap, but results indicated inefficient emergency connections, and, in consequence, the company concerned was requested to make efficient those connections. This work was subsequently undertaken, but was not completed at the close of the year.

*General.*—Casualty wards and facilities for rendering first aid to injured persons appeared to be equal to former standards.

Records indicate that four complaints of consequence were received and investigated. One alleged a dangerous condition of a stoping section, and was, apparently, substantiated by a subsequent removal of the miners until necessary precautions were adopted. A second complaint concerned insanitary latrine

accommodation in a mine. Attention was directed to this, and a request was made for certain improvements, but nothing of consequence materialised until the question of latrine accommodation generally was dealt with, as previously referred to. Since then no complaints have been received. The third complaint was in connection with fumes and dust arising from sintered concentrates being delivered to converter vessels at a reduction works; while the fourth concerned smoke and fumes from blasting operations during the progress of shifts in a mine. Initial investigations appeared sufficient to overcome these nuisances, as before definite action was taken by this office those concerned indicated that the matters complained of had been rectified.

There appears to have been no modifications or alterations of previously adopted systems of mining, but altering conditions at one mine are necessitating a more extensive application of sectional mining with square set timber and attendant filling. During the course of inspections careful attention has been directed to obtaining safe working conditions as are reasonably possible with the policies of mining being pursued. Numerous recommendations have been made to attain this objective, but it cannot be recorded that all recommendations have been adopted, particularly in respect to rill-stoping of extensive sections of friable ore associated with schistose walls, slicken sides, and other lines of weakness. Hesitancy to attempt systemisation of excavation support when such is reasonably possible, or to erect supporting timber, until danger becomes imminent is observed.

Serious irregularities in connection with the reporting of accidents and other occurrences, and the preservation of scenes of accidents, as covered by the provisions of Section 26 of the Act, were, to a large extent, overcome.

At the latter end of the year the establishment of special rules under Section 53 of the Act at the principal mines was agreed upon, and it is expected to bring these into operation during the new year.

*Surface Explosive Magazines and Inflammable Oil Premises.*  
—Due regard was given to the administration of the Acts and regulations covering the above matters. In several instances minor improvements upon existing arrangements were requested and obtained, but these generally have been well cared for. Small quantities of nitro-compounds and detonators were condemned, and ordered to be destroyed under the provisions of Section 9 of "The Explosives Act," owing to observed defects. No new magazines or premises were established during the year. Licences and registrations were regularly renewed as such fell due.

*LIST of Accidents in Inspector Williams' District for the Year 1919.*

Fatal, 1; non-fatal, 31; total, 32.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1919 Jan 15	Mt. Lyell M. & R. Co.	Queens-town	Premature explosion	Patrick McKendry	Married, 47 yrs.	Loss of two fingers and part of thumb	—	1	While tapping detonator on wooden bench to clear the sawdust, detonator exploded
Feb. 20	"	"	Truck jammed finger	Henry Hunt	Married, 27 yrs.	Amputation of finger	—	1	Was pushing a truck of ore into a tipler, when finger got caught against truck
Mar. 14	"	"	Truck ran over foot	T. J. Colgan	Single, 26 yrs.	Great toe crushed	—	1	Truck ran over great toe of right foot, crushed badly
Mar. 17	North Lyell Mine	N. Lyell	Fall of machine-bar	R. Coombes	Single, 26 yrs.	Bruise hand	—	1	Was assisting to rig machine bar, it fell on hand
"	Mt. Lyell M. & R. Co.	Queens-town	Fall of ore	G. Ives	Single, —	Injured foot	—	1	While spawling ore, piece broke off and fell on foot, causing abrasions thereto
Mar. 22	"	"	Fall of timber	H. Butler	Single, 22 yrs.	Bruised back	—	1	Was plate-laying, when piece of timber fell, striking back
Mar. 31	"	"	Truck hit chest	G. D. Tabart	Married, 53 yrs.	Abra-sions to back and chest	—	1	While tipping mortar into converter bins, truck came back unexpectedly and knocked him into bins

Apr. 2	"	"	Roofing-iron overbalanced	J. R. Dobbie	Single, 51 yrs.	Jammed leg	—	1	Was stacking cases of roofing-iron one case overbalanced and sprained leg
Apr. 18	"	"	Fall of timber	A.W. Clark	Married, 53 yrs.	Thigh & left hand injured	—	1	While slinging a flooring-strut into position, timber became loose and struck Clark on thigh, and injured left hand
Apr. 23	North Lyell Mine	N. Lyell	Fall of ore	D. Herighty	Married, 35 yrs.	Injured knee	—	1	Was barring down, when piece of ore hit knee
Apr. 29	Mt. Lyell M. & R. Co.	Queens-town	Bearer fell on foot	R. H. McAlister	Married, 41 yrs.	Injured foot	—	1	While placing wooden bearer into position it dropped on and crushed great toe of right foot
May 8	North Lyell Mine	N. Lyell	Over-balanced into box	S. McKendry	Single, 16 yrs.	Cut finger	—	1	Was removing scrap iron from precipitate box, when he overbalanced into it and sustained a cut finger
May 8	"	"	Slipped on timber	W. Gardiner	Single, 26 yrs.	Sprained ankle	—	1	Slipped on piece of timber, and sprained ankle
May 21	"	"	Pinch-bar jarred hand	F. J. Cooper	Married, —	Jarred hand	—	1	Was preparing fractured hand for a sand blast with a pinch-bar, sustained a jarred hand
June 9	Mt. Lyell M. & R. Co.	Queens-town	Slipped on rail	J. Hopewell	Married, 61 yrs.	Fractured left rib	—	1	Was pushing truck off lift, when he slipped on rail and fractured left rib
June 19	"	"	Defective signalling	H. Hill	Widower, 55 yrs.	Injured nose and back	—	1	Shaft accident—lowered into well owing to faulty signalling
June 22	"	"	Slag fell on foot	H. Love	...	Loss of toe nail	—	1	Was loading chipped slag, when piece of slag fell on foot and toe
July 3	North Lyell Mine	N. Lyell	Timber jammed finger	A. Elfsen	Single, 56 yrs.	Crushed finger	—	1	While handling timber got finger badly jammed

LIST of Accidents in Inspector Williams' District for Year 1919—continued.

Date.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single and Age.	Nature of Injuries.	Killed.	Injured.	Particulars.
1919. July 21	Mt. Lyell M. & R. Co.	Queens-town	Tie-rod slipped eye-bolt	C. Somers	Married, 26 yrs.	Fractured skull	—	1	While anchoring uprights of orebins with iron tie-rods, tackle-hook slipped from eye-bolt, and timber struck head, fracturing skull
Aug. 5	"	"	Faulty brake	S. McIntyre	...	Lacerated forearm	—	1	Was riding on a small hand-trolley, and, owing to frost, brake failed to act, and in attempting to jump off, he slipped and injured arm
Aug 6	"	"	Chain became loose	P. Kelly	Married, —	Bruised knee and ankle	—	1	Chain from wagon became loosened, causing log to roll out, which fell on leg
Sep. 1	"	"	Cart "slewed"	B. Hayes	Single, 16 yrs.	Fractured finger	—	1	Was backing ore into lift, cart "slewed" and jammed and fractured little finger
Sep. 2	"	"	Fall of ore	A. Kerrison	Married, —	Abrasions to face, body, & legs	—	1	Was working in No. 4 stope of No. 8 level, when fall of earth took place, causing injuries to face, body, and legs
Sep. 9	"	"	Fall of earth	A. Tonks	Married, 37 yrs.	Two right toes fractured	—	1	While barring-down, piece of ore rolled on to foot, and fractured toes

Sep. 22	"	"	Fall of case of rope	F. Curio	Single, 19 yrs.	Jammed hand	—	1	Was unloading case of wire rope, when it fell and jammed hand
Sep. 24	"	"	Truck ran over hand	T. Williams	Widower 67 yrs.	Crushed fingers	—	1	While moving stones from under truck wheels, truck ran over hand, crushing fingers
Sep. 27	"	"	Fall from ladderway	J. P. Hennessy	Married, 42 yrs.	Internal hæmorrhage	1	—	Was found dead in north stope of No. 9 level, and it is believed he fell from ladderway, which caused internal hæmorrhage, to which death was attributed
Oct. 7	North Lyell Mine	N. Lyell	Fall from lip of ore-chute	C. McKnight	Single, 21 yrs.	Concussion of brain	—	1	Was cleaning-up galleries, when pipe to which he was holding gave way, causing him to fall 3 ft. 8 in., causing injuries stated
Oct. 10	"	"	Fall from staging	H. Gearing	Single, 51 yrs.	Fractured ribs & collar-bone	—	1	Spanner slipped and caused him to fall from staging, and resulted in fracturing right collar-bone and two right ribs
Oct. 23	Mt. Lyell M. & R. Co.	Queens-town	Fall of ore	M. Maher	Married, 27 yrs.	Fractured toes	—	1	He was barring-down, when small fall of ore took place, and fractured two toes
Nov. 7	"	"	Fall of ground	H. Taylor	Married, 38 yrs.	Injured small bone in leg and bruised back	—	1	While cleaning-up, fall of ground took place, striking man on back and leg
Dec. 10	"	"	Fall of ore	W. Gunsser	Married, 53 yrs.	Jammed leg	—	1	Was placing strut into position, piece of ore slipped out of broken wall, and jammed leg against the square-set timber

## REPORT OF THE CHIEF INSPECTOR OF EXPLOSIVES.

Chief Inspector of Magazines and Explosives,  
Hobart, 15th April, 1920.

DEAR SIR,

I HAVE the honour to submit my annual report in connection with "The Explosives and Inflammable Oils Acts" for the year 1919.

The imports for the year were:—	Lbs.
Monobel ... ..	27,000
Gelignite ... ..	229,500
Blasting gelatine ... ..	7,600
Gelatine dynamite ... ..	14,150
Ligdyn ... ..	6,000
Blasting powder ... ..	21,050
Detonators ... ..	165,000

The quality of the explosives landed in the State was very satisfactory. It was found necessary to condemn a good quantity of nitro-compound owing to deterioration, mostly due to stocking for a considerable period under damp conditions. Attention has been drawn to the necessity of using explosives stored under these conditions within a reasonable time. During the year there were seven accidents due to explosives. A boy seven years of age obtained his father's tin of sporting powder, and placed a match in it, causing serious injury. A boy playing with a detonator caused it to explode, which resulted in painful injury. A boy 11 years of age placed a lighted match in a detonator, which caused serious burns. Two men employed at a sawmill had 3 lb. of powder in an open tin; when passing a boiler a spark ignited the powder, causing slight injury to both men. A man employed charging holes with powder was injured by the contents of the canister exploding, the cause of which was not ascertainable. A miner was seriously injured by the explosion of a detonator. He stated that he was tapping the detonator on a wooden bench to clear it from sawdust. A miner ignited a short fuse to which a plug of explosive was attached, and endeavoured to insert it in the hole, but it exploded, causing the loss of one eye.

The provisions of "The Inflammable Oils Act" have been fairly well observed. It was found that reasonable care was not being exercised in unloading from ships, and that the men employed carried matches and smoked. Steps have been taken to prevent these very dangerous practices.

Prosecutions were instituted in two cases for storing on unregistered premises, convictions being obtained in each case. In several cases it was found necessary to caution offenders who were acting in ignorance.

		<i>Revenue.</i>		£	s.	d.
Magazine licences ... ..	82	...	82	0	0	
Licences to store ... ..	28	...	32	0	0	
Permits to import ... ..	12	...	24	0	0	
Permits to sell ... ..	148	...	37	0	0	
Permits to convey ... ..	24	...	6	0	0	
Registration of premises... ..	110	...	27	10	0	
			<hr/>			
			£208	10	0	

Magazine rents, £149 14s. 11d. Total revenue, £358 4s. 11d.

I have, &c.,

J. O. HUDSON,  
Chief Inspector of Explosives.

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