

AR1904

TASMANIA



REPORT

OF THE

SECRETARY FOR MINES

FOR

YEAR ENDING DECEMBER 31

1904

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



Tasmania

JOHN VAIL, GOVERNMENT PRINTER, HOBART

1905

B4757

## TABLE OF CONTENTS.

---

	PAGE
Annual Report of the Secretary for Mines.....	1
Diamond-drills : Statement of Work done .....	20
Gold : Comparative Statement of Gold won .....	22
—— Quantity obtained from Quartz.....	23
Coal : Quantity raised, Value .....	24
Tin : Comparative Statement of Export.....	25
Silver Ore : Quantity and Value.....	26
Copper, Blister :        "        .....	27
Copper Matte :         "        .....	27
Copper Ore :            "        .....	28
Iron Ore :               "        .....	28
Asbestos :              "        .....	29
Wolfram :               "        .....	29
Silver-Lead and Copper Ore smelted .....	30
Miners Employed : Number .....	30
Leases in Force : Comparative .....	31
Net Revenue : Comparative Statement .....	32
Leases in Force : No. of, for various Minerals.....	33
Miners Employed : Average Number of .....	34
Mining Companies Registered.....	34
Land applied for : Total Area.....	35
Total Revenue .....	36
Dividends paid .....	36
Report of the Mount Cameron Water-Race Board .....	37
Mining Managers' Examination Papers .....	39
Annual Report of the Government Geologist .....	44
Annual Report of the Chief Inspector of Mines .....	49
Mining Accidents, 1892, to 31st December, 1904.....	54
——— Year ending 31st December, 1904 .....	52
Annual Reports of the Inspectors of Mines .....	55
Table showing rate per 1000 killed and injured for Year 1904.	51
Notes on some additional Minerals, by W. F. Petterd .....	83



## REPORT OF THE SECRETARY FOR MINES.

*Mines Department, Hobart,  
3rd September, 1905.*

SIR,

I HAVE the honour to submit my Report upon the Mines Department and the progress of the Mining Industry for the Year ending 31st December, 1904.

The preparation of the Report has been delayed, owing to the very great demand made upon my time during the present year in preparing, by your instructions, suggestions for the Mining Bill, 1905, and in collaborating with yourself and the Parliamentary Draftsman in connection with the Draft Bill, and also in attending at both Houses of Parliament for the purpose of rendering assistance to Ministers and Members of Parliament during the debate upon the Bill.

### GENERAL REMARKS.

The aggregate value of minerals and metals raised in 1904 was £1,411,192. Owing to Federation, returns of quantities and values exported ceased to be obtainable from the Commonwealth Customs, and this, to some extent, dislocated the system of compiling the statistics of the industry. Owing, doubtless, to this cause, there was in the third quarter of the year a sudden fall of £80,000 from the totals of the previous quarter. The industry now is unable to take credit for the higher values of

metallic exports, the figures being restricted to statistics furnished by mine owners and managers. These statistics are obtained in a variety of ways, and there is reason to fear that they are not absolutely complete, and that some of the mineral won by prospectors, tributers, and others is not accounted for in the official returns. With a view to providing a remedy for this, a section has been introduced into the new Mining Bill, making it obligatory on mine owners and managers to furnish a quarterly return of output and value to the Department.

There has been no diminution in the number of men engaged, the figures being 6194 in 1904, against 6017 in 1903; and as the market prices for metals ruled higher last year than in 1903, there is some reason for believing that if the same system of compilation had continued, a decided increase in the value of mineral returns would have been shown.

Work has continued regularly at the established mines in different parts. The mines in the Zeehan District have fully maintained their output. Increased activity has of late prevailed in the utilisation of low-grade material, which has been disposed of in large quantities to the Tasmanian Smelting Company. The Federation Company has secured the introduction of British capital into the Heemskirk District. The Western Mine at Zeehan has been re-started. The Primrose Mine at Rosebery has entered the productive list. An unfortunate strike at the Hercules Mine has interrupted the work there. This interruption still continues, but the shareholders in the company passed a resolution at the last half-yearly meeting recommending the resumption of work if it could be carried on at a profit. At the Mount Lyell Company's works, though the grade of ore treated has been lower, profits have increased, owing to metallurgical improvements and economies, as well as to the higher price for copper, which, at the beginning of last year, was £57 per ton, and is now £65.

It seems as if the mining work carried on at Lake Jukes, and recent discoveries of loose gold on Mt. Darwin, will attract more attention to the country south of Lyell. A battery is now being taken up to the Lake Jukes Mine. In the opinion of those qualified to judge, Mts. Jukes and Darwin are likely to become, in the future, important centres of mining.

The task which the new Tasmania Gold Mining Company, Limited, at Beaconsfield, has set itself in equipping its mine with powerful pumping plant, to enable it to cope with the heavy water and to exploit the reef efficiently and on a large scale, has been commenced, with strong auguries of success. The water is being kept under control, and the output of gold is highly satisfactory.

Some discoveries of gold at Lefroy have stimulated interest in this well-known field. There can be no question that the gold resources of the district are far from being exhausted, even at shallow levels.

The Mathinna District has its ups and downs, as is common to all goldfields, but it still boasts of the deepest gold mines in the State.

The market price of tin, which at the close of 1901 and 1902 was £103 per ton, reached £133 at the end of 1903, and £134 at the end of 1904. This improvement has been a prime factor in developing a gratifying increase of activity on all our tinfields. Those of the North-East and East Coasts are now receiving serious attention from Victorian and other investors.

Although continued and necessarily exhausting drafts have been made for many years on many of our best alluvial deposits, there is no doubt that there still remain extensive areas of drift which, with the actual market prices and the improved saving methods of to-day, can be worked profitably. The large, and it would seem almost inexhaustible, store of metal still locked up in the low-grade rock of the Blue Tier can only be satisfactorily

realised by operations of a certain magnitude, combined with judicious arrangements respecting the motive power. It is worthy of note that some preliminary investigations of the problem are at present being made. Things have moved slowly in the Stanley River field on the West Coast. It is a district of great promise, but the difficult nature of the country and the surrounding conditions make successful prospecting a matter of time. In the Mt. Farrell District another silver-lead mine has been placed on the active list; and on the N.W. Coast, a few copper mines have been started, but are still only in their infancy.

Coal-mining has received an impetus, a few new properties having come to the front. Owing to favourable prices, wolfram has been mined in different parts of the State, and will doubtless continue steadily on a limited scale, so long as the market continues satisfactory.

#### APPENDICES.

Appended will be found the following Reports:—

Annual Report of the Mount Cameron Water-race Board.

Report of the Government Geologist.

Report of the Chief Inspector of Mines.

Reports of the Inspectors of Mines.

Report of the Registrar of Mines, Waratah.

#### GOLD MINING.

The production in 1904 was 65,921 ozs. fine gold, being 6033 ozs. in excess of that in 1903.

*Beaconsfield.*—This district returned 18,798½ ozs. retorted gold, and gave employment to an average of 616 men. A determined effort has been made to provide for thorough control of the water in the Tasmania Mine. The new pumping engines have a capacity of 6½ million gallons per 24 hours at normal working speed, or 8 million gallons at high speed, compared with about 3 million gallons of the

old plant. In the exhaustive reports which have appeared on the mine, from 160,000 to 180,000 tons of quartz are estimated to exist above the 1000-foot level, and this quantity, it is hoped, will supply the batteries with 5000 tons a month for the three years required to sink and reach the reef at a depth of 1250 feet. It is pleasing to be able to note that the developments in the mine since the new company assumed control have been quite up to anticipations. The mine has, since its commencement, returned 598,168 ozs. gold from 530,451 tons of quartz. The total sum paid in dividends is £772,071 15s. There are indications that some of the outside mining propositions at Beaconsfield may be revived. Some of these have been neglected for some time. It is high time for a resuscitation of work on them. The North Tasmania has been in the hands of tributers for a long period, but the company is now arranging to resume control. There are rumours that the Tasmania West Extended is being refloated in London.

*Lefroy.*—The New Pinafore Company has definitely ceased deep work, after a long and persevering career, during which it has won 50,506 ozs. of gold, and distributed £71,500 in dividends. It is now engaged in shallow prospecting.

The quite recent discovery by prospectors of a gold-bearing reef at Lefroy has put new heart into the workers on the field, where mining has been languishing, in spite of pretty steady prospecting.

*Mt. Victoria.*—Continuous work on a small scale has been going on in this auriferous belt, but the destruction of the New Mercury battery by fire is a deplorable occurrence. Two batteries have now been burned down at Alberton. A little prospecting is always proceeding, but outside money is sorely needed to develop some of the numerous reefs on the mount.

*Mathinna.*—At the New Golden Gate Mine considerable trouble has been experienced in searching for the faulted reef, but when it is found the reserve of dividend-paying stone is expected to be greatly increased. This mine has yielded 214,544 ounces of gold, value £817,000, and divided £353,600 among its shareholders. The total quantity of quartz crushed by the company is 249,771 tons. Though gold-mining at Mathinna has not progressed so rapidly the last year as might have been anticipated, it is in a healthy condition. Outside capital, mainly British, has been introduced, and so far mainly expended in main shaft sinking, with a view of getting well below surface influences.

The British companies, the Tasmanian Consols, the City of Hobart, and the Tasmanian Gold Estates are engaged in sinking; the firstnamed is sinking below the 1300-foot level. The New Zealand company, the Eldorado, is also sinking a main shaft. English capital has recently been raised for working the O'Brien's group on the Dan Rivulet, and for the Queen of the Earth property on Hogan's Track.

*Mangana.*—The principal producer has been the Golden Entrance Gold Mine. This mine was let on tribute, and produced 658 ounces of gold from 352 tons of quartz.

The only other producers were the Golden Prince Mine, 6 ounces; Miami, 12 ounces; and the Tower Reefs, 23 ounces.

*West Coast.*—The usual alluvial mining in the Lyell District has continued. On Mt. Darwin good specimens of rough gold have been found, and this has stimulated prospecting. The source of the gold is not known definitely, but it is surmised to be some of the quartz and hematite formations which are met with on that mountain. Mt. Darwin, from its size, will absorb a vast amount of prospecting energy before any impression is made upon it;

but it is believed to have possibilities, the value of which it is impossible at present to estimate.

#### SILVER-MINING.

*Zeehan.*—This field not only holds its own, but is in an exceedingly sound and healthy condition. The active mines of Zeehan proper are the Mt. Zeehan (Tasmania), Zeehan-Montana, Zeehan-Western, Zeehan-Queen, Florence, Oonah, Silver King, Nubeena, Watt & McAuliffe, Silver Queen Extended, and New Mount Zeehan. The first two are the premier mines. The Western Mine has been unwatered, and is being opened up in depth. The discovery of a vein of clean galena at a depth of 800 feet, though not much in itself, is important as showing the persistence of the deposition of silver-lead ore below shallow depths on the Zeehan field, and furnishes additional confirmation of the favourable views expressed by competent authorities on the permanency of the ore deposits of this district. At Dundas and Mt. Read are the Comet, West Comet, Ring Valley, Red Lead, and Hercules Mines; at Rosebery, the Primrose Mine; and at Mt. Farrell are the North Farrell and the Murchison River Mines.

The Hercules Company raised about the same tonnage of ore in 1904 as in the preceding year, but the metallic values of the already low-grade and refractory sulphides have fallen off, in addition to which the European zinc market has failed it. The directors decided to suspend operations unless the mine could be made profitable. The now well-known attempt to reduce the wages rate resulted in a strike and the closing down of the mine for the time being.

The Primrose Mine is sending ores to the Tasmanian Smelting Company on, as it is understood, profitable terms, and arrangements have been made for a renewal of operations on the adjacent Tasmanian Copper Mine.

The North Farrell Mine has entered the profit-earning stage, and is yielding good returns. The Murchison River Mine in that district has commenced serious work, and is erecting a mill for the concentration of its ore.

The Tasmanian Smelting Company has been busily engaged smelting the ores of the field, and has introduced improvements in plant and metallurgical methods which will enable it to treat profitably larger quantities of the zinc-lead sulphides from the surrounding mines. It is also receiving large quantities of low-grade material from mine tips and tailings heaps, a step which is widely welcomed.

*North-Western Division.*—The Magnet Mine sent away 11,287 tons of silver ore for smelting during the year, and has employed an average of 120 men. A new mill for concentrating has been recently erected and started. The mine is being developed in depth, and the outlook is a favourable one. To date, 40,000 tons of ore have been raised and shipped.

In this district work has proceeded at the Long Tunnel, Washington Hay, and Godkin Mines. The Heazlewood and Whyte River localities are favourable for silver-lead ore, and can furnish employment for a good deal more capital than is being expended on them.

Silver-lead mining generally is in a prosperous state, and the markets are in favour of a continued bright outlook. The prices of lead and silver at the beginning of 1904 were £11 per ton and 2s. 2d. per oz. respectively, and at present are still firm at £12 15s. per ton and 2s. 3d. per oz.

#### COPPER-MINING.

The values of production of copper and copper ore have been on the up grade for 1904, exceeding the figures for the previous year by £105,467. The amalgamation of the Mt. Lyell and North Mt. Lyell Companies has proved

itself to be sound policy. The furnaces have been supplied regularly with the usual quantities of ore (1100 tons a day), and the ore bodies on the various properties leased by the company have been systematically explored. The company is about to add the manufacture of sulphuric acid and superphosphate, &c., in Victoria to its operations, and for this purpose will ship the raw material from its mines in Tasmania. During the year the company smelted 406,433 tons of ore, producing 8371 tons of blister copper, which contained 8266 tons of copper, valued at £492,650 10s. 9d.; 816,643 ounces of silver (fine), valued at £89,875 12s. 3d.; and 23,391 ounces of gold (fine), valued at £99,411 15s. 0d.; a total value of £681,937 18s. 0d.

The amount paid in dividends by the company was £150,000.

The Lyell Blocks Company has developed its valuable deposit of clay charged with native copper. A concentrating mill for the treatment of the ore stuff has been erected, and was running the last four months in the year. During this time 17,154 tons of copper-bearing clay were produced, containing 212 tons of native copper, valued at £14,416.

Five or six other mines have been operating on the cupriferous schist formations at Lyell, but their work has been purely of a prospecting nature.

Copper-mining has been started on the North-West Coast, notably in the Stowport and Blythe Districts, where the Rutherford and Copper King Mines have been putting out ore. Development at these mines is still at an early stage, but vigorous work seems to be fully warranted. The ancient metalliferous schists and slates crop out in these localities from below the edge of the basaltic sheet which has formed the soil of the farm lands, so that agricultural and mineral areas exist side by side, a condition of things favourable for both industries. Other prospecting shows have come into existence, most of them along the same line of lode, but nothing of note has resulted from any of

them as yet. The immediate future of the district as a centre of copper-mining apparently depends upon the success of the two mines named. Hardstaff's Copper Mine at the Dial Range is being developed; and some indications of copper ore at Rocky Cape and Boat Harbour have received a little attention.

#### TIN-MINING.

Owing to the rising market, matters have been very active in this branch of the industry. The largest producer has been, as usual, the Mt. Bischoff Mine, raising 1272 tons, and bringing the total production of this mine to 63,502 tons, and dividends amounting to a gross total of £1,967,500 have been declared.

The Briseis Mine raised 424 tons during the year; the Pioneer, 326 tons; the Anchor, 238 tons; Mt. Rex, 178 tons; the Scotia, 94 tons; the Arba, 81 tons. These, with Mt. Bischoff, are our most important individual mines, and are responsible for two-thirds of the tin output of the State.

The Pioneer Mine has increased its plant, and is in every respect in a flourishing state. The quantity of tin ore obtained during the year was 326½ tons. During the period dividends amounting to £17,550 were distributed among the shareholders, making a total of £49,725. The Anchor has been running on very low-grade stone, but working very economically. If the Blue Tier stone is to be treated successfully, the cheapest and most improved methods of mining and milling are indispensable.

The Mt. Rex Mine has maintained its output of ore, which it disposes of in the English market, and is carrying on exploration, with the view of locating the extension of its ore body.

The Briseis Extended Tin Mines, situate in the Ringarooma Valley, between the Briseis and Arba Mines, have recently begun work with a pumping plant of similar type

to that at the Pioneer. The ground to be worked is stanniferous drift—believed to be a portion of the Ringarooma lead. It was partially worked 12 or 13 years ago by the Ringarooma Valley Company.

The South Mt. Cameron Company is also operating on drift near Gladstone. Results, which at first made success rather doubtful, have lately greatly improved.

The Gladstone Tin Development Company is preparing to dredge several miles of the Ringarooma River, below Gladstone. It has taken measures to prove the value of the ground by boring, and the result of actual work will be eagerly looked forward to. The Gladstone District is witnessing a general revival of activity. Work is being carried on on the Mussel Roe Fall by the Cybele Company, and the Inspector of Mines, who recently visited the locality, reported as follows:—"Two hand-boring plants are at work on this property in the vicinity of the old Garfield face. At the working-face several holes have been put down, to prove the depth of wash below the present floor, or working level. These vary in depth from 8 to 16 feet, and have proved the existence of rich tin gravels overlying the soft granite bed-rock. I am pleased to note that this prospecting work has proved something else besides the existence of good tin, viz., that the Government bores crossing this face towards the west end, and in which no payable tin was obtained, were true to the register, which shows that each bore was bottomed in soft granite bed-rock, and that the drift passed through was not of a payable nature. There are blanks in the Cybele Mine as well as in the other rich mines, and singular though it may appear, our line of bores struck one of these blanks, where the ground is poor and the bed-rock comes within a few feet of the surface. Mr. F. Krushka undertook to show that the Government bores were unreliable. Several bores were put down by him with, it is said, highly satisfactory results. Some of the Directors of the Cybele Company were not exactly satisfied with the nature of the

soft granitic stuff that Mr. Krushka described as 'false bottom.' A party of men were put to work, and shafts or pits sunk near the bores, and bottomed at depths as already stated from 8 to 16 feet. In every instance it was shown that Mr. Krushka's bores had gone from 16 to 26 feet into the soft granite bed-rock. No tubing was used, and each succeeding auger carried down with it tin from the rich wash lying on the bed-rock; and thus did Mr. Krushka obtain excellent prospects from what he terms a 'false bottom.' I refer to this question of 'bed-rock,' or 'false bottom,' at the Cybele Mine because a great deal has been said, and some disparaging remarks made, about the way in which the Government boring operations were carried out. Even the press referred to the matter, and pointed out the difference in the results obtained by the Cybele Company boring with tubing, and that of the Government bores without tubing. It was the other way about, but newspaper correspondents ('Our Own') cannot always be trusted in matters of this kind. As we Civil Servants are not allowed to write to the press on matters of this kind, I respectfully submit that the Mines Department should contradict statements made by persons who do not hesitate to attempt to bring discredit on the Department or its officers when it suits their purpose to do so."

Good tin has been won from the old Lochaber Mine.

Boring work in deep ground has been proceeding in the neighbourhood of the Pioneer and west of Mt. Cameron; and sections at Mt. Stronach are receiving attention.

Similar activity prevails all over the tinfields of this part of the island, and given moderately seasonable weather, the effect must be felt in an increased output. Fortunately, these great areas of mountainous country and alluvial plain were wisely proclaimed by former Governments as mineral areas, and allotted to the mining industry for the benefit of the State; and within these boundaries no one can doubt that for generations to come the raising of tin ore will continue. Only, in course of time the allu-

vial deposits must inevitably become exhausted, and all the resources of the mining science of the future will have to be applied to the extraction of the mineral from the rock of the mountain ranges.

*West Coast.*—Eighty-nine tons of tin ore have been raised on the West Coast, an advance on the previous year by 15 tons. Large alluvial and lode tin deposits have been prospected on the Stanley River by the Stanley River Tin Mines Company and the Parson's Hood Mines Company, and more recently by the Maskell Company and others. Alluvial tin of great richness and in considerable quantity exists, and large lodes have been discovered, but a good deal of prospecting is still requisite before suitable sites can be selected for work. The country is heavily timbered, and the sources of the richest alluvial are still beingsought. The district is one that can be recommended to the attention of investors.

Heemskirk is a district which is only now recovering from the effects of the foolish expenditure of the old days. Mayne's Mine is producing steadily, and the Federation property, which has large bodies of payable stone, has recently been put on a firm basis by the introduction of capital from outside. In the Heemskirk field there are numerous opportunities for both lode and alluvial mining.

The large undeveloped tin ore properties of North Dundas have been prospected of late less intermittently than has been the case in recent years, but it is rather difficult to forecast their value until work upon them, and on an adequate scale, has proceeded further.

For the tin contained in some of the ore raised on the Zeehan field (at the Oonah and Queen Mines), little or nothing is received, the silver and copper alone being paid for. It thus happens that some of this ore only commands in the local market less than half the gross value of the metal contents. Metallurgists in Europe might with advantage devote some attention to these complex ores, especially now, while the prices of metals are so favourable.

The tin-bismuth-wolfram lodes of the Shepherd and Murphy property have not been worked this year, but there can be no question that they afford an opening for metallurgical skill. An attempt is being made to raise capital in London for their development.

A little tin-mining has been going on at Cox's Bight, near Port Davey, of importance only as indicating a line in the western country along which search might be made for this metal. Tourmaline, the well-known companion of tin ore, has been found (by Mr. T. B. Moore) on spurs between Port Davey and Macquarie Harbour, and it may be that discoveries are in store for us when this *terra incognita* comes to be opened up.

#### IRON.

The Penguin mines have raised 6840 tons of red hematite of exceptional purity, which was shipped to smelting works in New South Wales for fluxing purposes. The large deposit at the Blythe is still unworked, and the intentions of the owners respecting it are not known. It is believed that a decision is on the eve of being made.

The deposits of iron ore near Beaconsfield are also still neglected. Most of this ore is contaminated with chrome, which renders it unsuitable, except for special purposes, but for those purposes it makes a good metal. The time would seem to have arrived when further experiments with these ores could very well be initiated. Once iron manufacture is established in the State or Commonwealth, more than one of the extensive deposits of iron ore in Tasmania will be turned to profitable account.

#### COAL.

The quantity raised in 1904 was 61,109 tons, against 49,069 tons in 1903. This is the largest output that has

ever been recorded in Tasmania, and there are signs of a further increase in the present year. During the past year two new collieries have been added to the list, viz., the Sandfly and the Catamaran; and since the beginning of this year, the Brightburn Coal Mine at Railton has commenced operations. Prospecting work is proceeding at the Preolenna Mine, and a 12-foot seam of coal is now being tested at Mt. Rex. Some seams on the Denison River have also been brought under the notice of the public.

A dispassionate review of the coal trade suggests that the local supplies are sufficient to meet the demand which exists for such qualities of coal as are offering, but that an increased market is available for any coal which will show an advantage, however slight, over the existing brands. The different seams already worked yield coal of various qualities, and there are grounds for believing in the possibility of discovering in more than one part of the island varieties still more advantageous from a consumer's point of view. Moreover, in course of time, as population increases, some of the more remote places in which good coal is already known to exist will become more easily accessible, and it will be possible to utilise much that cannot now be touched.

#### POTTERY CLAY.

The announcement that delegates from the Staffordshire Potteries were about to visit Australia, for the purpose of seeing whether that industry could not be started somewhere in the Commonwealth, led the Department to institute enquiries as to whether clays suitable for fine ware did not exist in sufficient quantities for the purpose. The Geologist visited St. Helens, where there are valuable deposits of granitic clay, and collected a good deal of information, with samples, from various quarters, but the announced visit of the delegates has not yet taken place.

The following return shows the quantity and value of mineral products for the State of Tasmania during the year ending 31st December, 1904:—

Mineral.	Quantity.	Value.
		£
Gold .....	65,921 ozs. (fine)	280,015
Copper (native) .....	212 tons	14,416
Copper Ore.....	104 "	1640
Copper (Blister) .....	8371 "	582,540*
Silver-Lead Ore.....	51,138 "	203,702
Tin (exported) .....	2071½ "	255,228
Tin Ore (exported) .....	245 "	10,893
Wolfram.....	15½ "	1147
Zinc Ore .....	1931 "	1982
Flux Ore .....	9869 "	4697
Coal.....	61,109 "	51,942
Iron Ore.....	6840 "	2975
Bismuth .....	6 cwts.	15
Total Value.....	...	£1,411,192

\* Value of gold contents deducted.

The amount paid in dividends was £281,126 18s. 10d.

#### GEOLOGICAL BRANCH.

During the year the Government Geologist has prepared reports upon the clay deposits at George's Bay and elsewhere, the goldfields of Mount Victoria and South Mount Victoria, the coal near George Town, and the slate near Badger Head.

The Assistant Geologist prepared reports upon the Stanley River tinfield, the Zeehan silver-lead mining field, and the Mount Farrell Mining District.

The quarterly progress reports of the mineral industry have been issued, as usual. For these, as well as for the special district reports, there is a considerable demand from abroad, and from visitors arriving in the State. Our publications lying upon the tables of public libraries and institutes throughout the world may be regarded as of distinct service in directing the attention of investors to the mineral resources of Tasmania.

## INSPECTION OF MINES.

The three Inspectors have satisfactorily discharged their duties in the districts severally allotted to them.

## MINING MANAGERS' EXAMINATION.

The annual examination of candidates for mining managers' certificates was held in March. Two candidates only presented themselves for examination. One candidate succeeded in obtaining sufficient marks to entitle him to receive a second-class certificate, but the other failed in his examination.

Copies of the papers set at the examination are appended.

## DIAMOND-DRILLS.

The diamond-drills were not in operation during the period under review.

## MOUNT CAMERON WATER-RACE BOARD.

The report of the Board is appended.

## SCHOOLS OF MINES.

There are three schools in the State, outside the Technical Schools in Hobart and Launceston, in which metallurgical and mining instruction is given, viz., at Zeehan, at Queenstown, and at Beaconsfield. The principal one is the Zeehan School of Mines and Metallurgy, affiliated to the University of Tasmania. It possesses a fine building, with the necessary conveniences for lectures and laboratory work. Its mineralogical museum is a useful feature. The studies embrace a course in metallurgy and one in metallurgical chemistry and assaying; the former is specially designed for those who wish to qualify for appointments as mining managers, the latter for assayers or metallurgical chemists. The Government

Board of Examiners for mining managers' certificates recognise the diplomas won by students in this school, by granting certificates to the holders of the school diploma without further examination. During 1904 there were 17 classes in operation, and there was an average attendance of 58 students. Several students left the district during the year. Three of these hold the diploma of the school, and are occupying remunerative positions in Western Australia; others, holding certificates in various subjects of the course, are filling responsible positions in other States. This school is doing quietly and unostentatiously good and useful work.

#### DEPARTMENTAL STAFF.

Mr. C. H. Curtain, Inspector of Mines, stationed at Queenstown, who was retired in 1903, was re-appointed to the same office in July, 1904, *vice* Mr. Geo. A. Waller (also Assistant Government Geologist), who retired in April, to take up a position in Queensland.

The other changes made during the year were the removal of Mr. W. A. B. Birchall, Registrar of Mines, from Queenstown to the Law Department, Hobart; Mr. T. E. Rule, Registrar of Mines, Strahan, removed to Queenstown; and Mr. Geo. K. Simmons, removed from the Hobart Office to the Office of Taxes, Launceston.

Mr. H. L. Thomas, Registrar of Mines, Scottsdale, died in November, 1904, and the office has been discontinued.

#### REVENUE.

The revenue for the year amounted to £16,631 8s. 2d. This amount does not include a sum of £2854 1s. 5d. deposited as survey fees with applications for leases.

#### CONCLUSION.

The outlook for the present year is a favourable one. The registered value of minerals raised during the first quarter of 1905 exceeds that for the corresponding quarter

of 1904 by £32,000. Mining is very active all over the State on thoroughly legitimate lines, and the condition of the industry generally may, in the strictest sense of the word, be described as sound.

In conclusion, I desire to thank the officers of the Departmental Staff for the loyal and efficient manner in which they performed the duties allotted to them, especially during the several months I was compelled to absent myself from office, owing to ill-health.

I have the honour to be,

Sir,

Your most obedient Servant,

W. H. WALLACE, *Secretary for Mines.*

*The Hon. C. LENNOX STEWART, Minister of Mines.*

---

## DIAMOND - DRILLS.

*Statement of Work done to 30th June, 1904.*

Year.	Locality.	Direction of Bore.	No. of Bores.	Total Distance Bored.	Average cost per foot, inclusive of Labour and Fuel.
	No. 1 DRILL.			feet.	£ s. d.
1882-3	Back Creek—For Gold .....	Vertical	7	1330	0 10 9
1883	Lefroy—For Gold .....	Ditto	4	1011	0 5 3
1884	Tarleton—For Coal.....	Ditto	1	401	0 5 6
1886	Longford - For Coal .....	Ditto	2	1585	0 4 0½
1886-7	Harefield Estate—For Coal .....	Ditto	1	725	0 6 5
1887	Cardiff Claim, Mount Malcolm—For Coal.....	Ditto	1	562	0 17 11¾
1888	Killymoon Estate—For Coal.....	Ditto	1	504	0 4 7¾
1888-9	Seymour - For Coal .....	Ditto	5	2266	0 7 8½
1889 } 1890 }	Beaconsfield (Phoenix G.M. Co.) - For Gold .....	Ditto	1	781	2 0 2
1890	Beaconsfield (East Tasmania G.M. Co.)—For Gold	Ditto	1	978	0 14 9½
1891	Spring Bay—For Coal .....	Ditto	4	937	0 6 10
1891	Ravensdale—For Coal .....	Ditto	1	114	0 11 1½
1891-2	Back River, Prosser's Plains—For Coal.....	Ditto	2	854	0 6 1¾
1892-3	Lefroy (Deep Lead Syndicate)—For Gold.....	Ditto	4	979	0 15 9
1893	Lefroy (East Pinafore Co.)—For Gold .....	Ditto	1	317	0 10 3
1895-6	Sandfly—For Coal .....	Ditto	4	2130	0 11 5
1898 } 1900 }	Blue Tier (Anchor Co.)—For Tin .....	Ditto	9	876½	0 9 1¾
1901-2	Llandaff—For Coal.....	Ditto	3	1944	0 7 4
1902	Recherche (Catamaran Co.)—For Coal .....	Ditto	2	956	0 9 3
1903	Ditto (Moss Glen Co.)—For Coal .....	Ditto	2	667	0 7 6
	TOTAL.....	...	54	19,917½	

		No. 2 DRILL.			
1882	Beaconsfield—For Gold .....	Horizontal, underground	1	68	No record.
1883	Mangana—For Gold .....	Ditto	1	546	0 15 1
1884	Guy Fawkes Gully, near Hobart For Coal.....	Vertical	1	612	0 5 6
1885	Malahide Estate, near Fingal—For Gold .....	Ditto	5	1397	0 5 6
1886	Carr Villa, near Launceston For Coal .....	Ditto	1	571	0 5 4
1886-7	Waratah (Mount Bischoff Alluvial T.M. Co.) For Tin .....	Ditto	7	1548	0 6 1½
1887	Waratah (Mount Bischoff T.M. Co.)—For Tin ....	Ditto	7	841	0 11 8
1887	Ditto .....	Horizontal, underground	1	53	0 7 8
1888	Old Beach—For Coal .....	Vertical	1	593	Abt. 0 10 9
1888	Campania—For Coal .....	Ditto	1	600	0 7 7½
1888	Richmond—For Coal .....	Ditto	1	500	0 5 1¾
1889	Back Creek—For Gold .....	Ditto	4	787	0 8 5½
1891	Macquarie Plains—For Coal.....	Ditto	2	989	0 4 5½
1891	Jerusalem—For Coal .....	Ditto	1	344	0 4 9½
1892	Langloh Park - For Coal .....	Ditto	4	1249	0 5 3¼
1893	Southport—For Coal .....	Ditto	1	612	0 5 3
1894	Zeehan (Tasmania Crown S.M. Co.)—For Silver ...	Horizontal, underground	2	319	1 0 2½
1902	Eden—For Coal .....	Vertical	2	566	1 0 7½
1902-3	Farm Cove—For Coal .....	Ditto	1	571	0 5 6
TOTAL.....			44	12,766	

Aggregate number of bores ..... 98  
 Total Distance bored .. ..... 32,683½ feet.

W. H. WALLACE, *Secretary for Mines.*

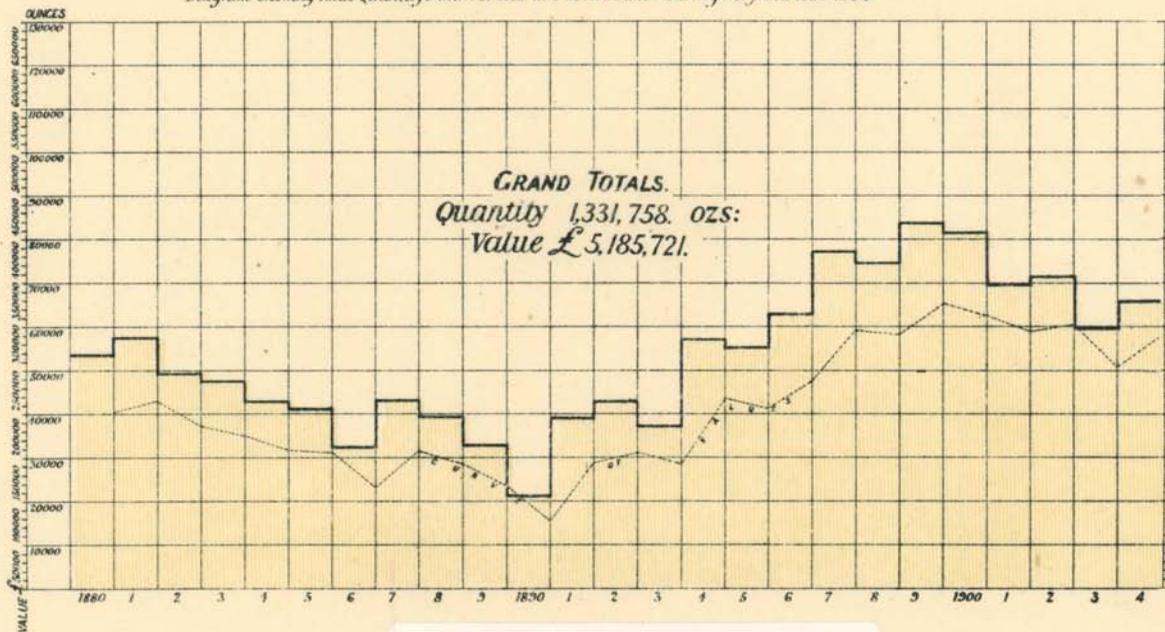
## No. 1.

*RETURN showing the Quantity and Value of Gold won during the Years 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, and 1904.*

Year.	Quantity.	Value.
	ozs. dwts.	£
1880.....	52,595 0	201,297
1881.....	56,693 0	216,901
1882.....	49,122 6	187,337
1883.....	46,577 10	176,442
1884.....	42,339 19	160,404
1885.....	41,240 19	155,309
1886.....	31,014 10	117,250
1887.....	42,609 3	158,533
1888.....	39,610 19	147,154
1889.....	32,332 13	119,703
1890.....	20,510 0	75,888
1891.....	38,789 0	145,459
1892.....	42,378 0	158,917
1893.....	37,687 0	141,326
1894.....	57,873 0	217,024
1895.....	54,964 0	206,115
1896.....	62,591 0	237,574
1897.....	77,131 0	296,660
1898.....	74,233 0	291,496
1899.....	83,992 0	327,545
1900.....	81,175 0	316,220
1901.....	*69,491 0	295,176
1902.....	*70,996 0	301,573
1903.....	*59,891 0	254,403
1904.....	*65,921 0	280,015
	1,331,757 19	5,185,721

\* Fine Gold.

Diagram showing Total Quantity & Value of Gold won in Tasmania during the years 1880-1904



5 cm

## No. 2.

*RETURN showing the Quantity and Value of Gold obtained from Quartz during the Years 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, and 1904.*

Year.	Quantity.	Value.
	ounces.	£
1880 .....	34,345	130,622
1881 .....	45,776	174,956
1882 .....	36,215	137,183
1883 .....	36,672	138,060
1884 .....	30,540	114,630
1885 .....	33,266	124,234
1886 .....	25,004	87,516
1887 .....	33,427	123,453
1888 .....	34,156	126,139
1889 .....	33,069	116,517
1890 .....	17,829	64,184
1891 .....	33,659	126,221
1892 .....	34,386	128,947
1893 .....	30,163	113,111
1894 .....	52,239	195,396
1895 .....	51,628	193,605
1896 .....	59,453	222,948
1897 .....	74,937	288,432
1898 .....	72,080	283,422
1899 .....	81,751	319,141
1900 .....	79,977	311,580
1901 .....	*68,779	292,155
1902 .....	*70,440	299,212
1903 .....	*58,868	250,054
1904 .....	*65,159	276,779
	1,293,818	4,638,997

\* Fine Gold.

## No. 3.

*RETURN showing the Quantity and Value of Coal raised during the Years 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, and 1904.*

Year.	Quantity.	Value.
	Tons.	£
1880 .....	12,219	10,998
1881 .....	11,163	10,047
1882 .....	8803	7923
1883 .....	8872	7985
1884 .....	7194	6475
1885 .....	6654	5989
1886 .....	10,391	9352
1887 .....	27,633	24,870
1888 .....	41,577	37,420
1889 .....	36,700	33,030
1890 .....	50,519	45,467
1891 .....	43,256	38,930
1892 .....	36,008	32,407
1893 .....	34,693	27,754
1894 .....	30,499	24,399
1895 .....	32,698	26,159
1896 .....	41,904	33,523
1897 .....	42,196	33,757
1898 .....	47,678	38,256
1899 .....	42,609	38,349
1900 .....	50,633	44,227
1901 .....	45,438	38,451
1902 .....	48,863½	41,533
1903 .....	49,069	41,709
1904 .....	61,109	51,942
	828,370½	710,952

24A

Diagram showing Total Quantity & Value of Coal raised in Tasmania during the years 1880-1904

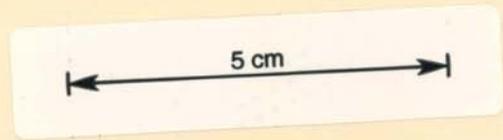
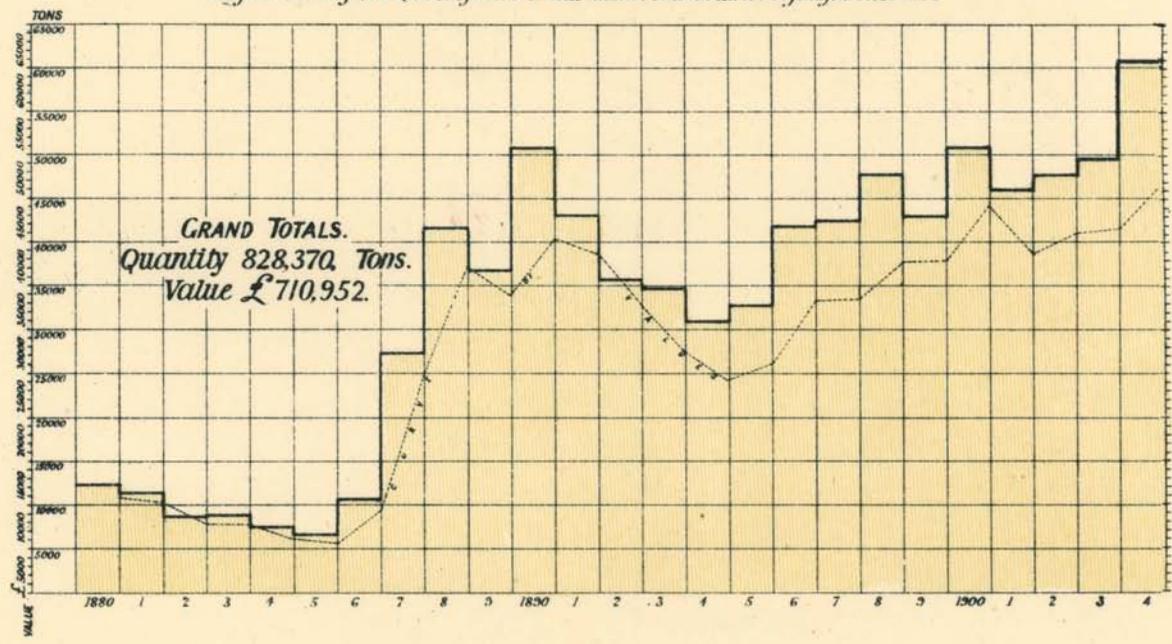
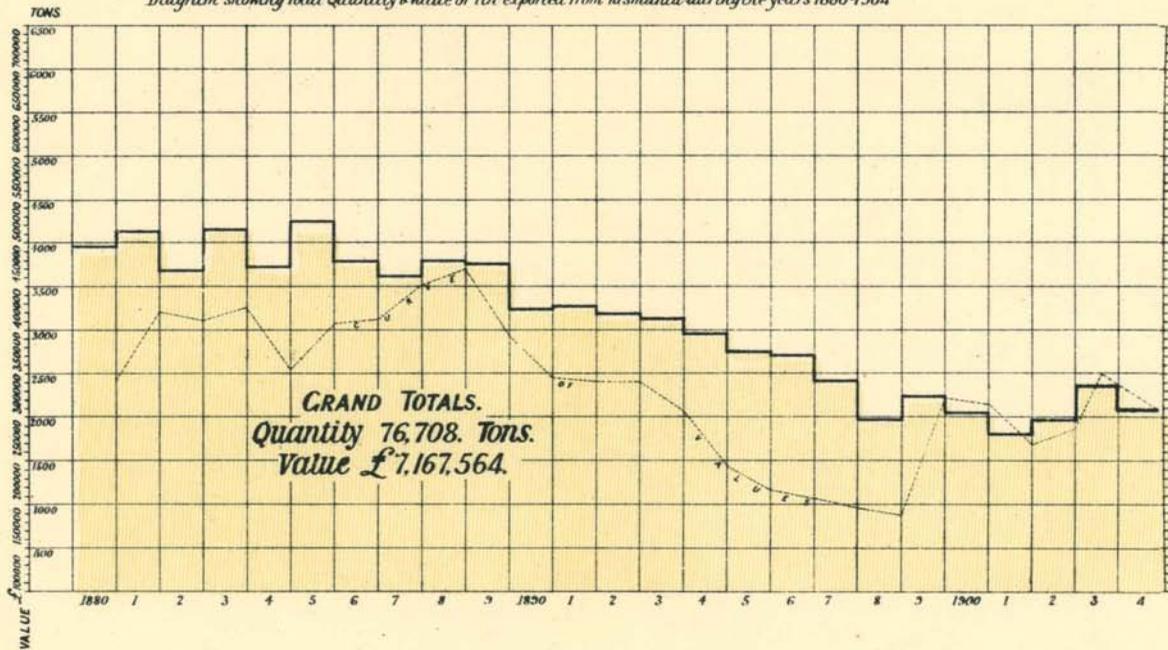


Diagram showing Total Quantity &amp; Value of Tin exported from Tasmania during the years 1880-1904



5 cm

*RETURN showing the Quantity and Value of Tin exported from Tasmania during the Years 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, and 1904, compiled from Customs Returns only.*

Year.	Quantity.	Value.
	Tons.	£
1880 .....	3954	341,736
1881 .....	4124	375,775
1882 .....	3670	361,046
1883 .....	4122	376,446
1884 .....	3707	301,423
1885 .....	4242	357,587
1886 .....	3776	363,364
1887 .....	3607 $\frac{1}{2}$	409,853
1888 .....	3775 $\frac{1}{4}$	426,321
1889 .....	3764	344,941
1890 .....	3209 $\frac{1}{4}$	296,368
1891 .....	3235	291,715
1892 .....	3174	290,083
1893 .....	3128 $\frac{1}{2}$	260,219
1894 .....	2934	198,298
1895 .....	2726 $\frac{3}{4}$	167,461
1896 .....	2700	159,036
1897 .....	2423 $\frac{1}{2}$	149,994
1898 .....	1972	142,046
1899 .....	2239 $\frac{1}{4}$	278,323
1900 .....	2029	269,833
1901 .....	1789 $\frac{1}{2}$	212,542
1902 .....	1958 $\frac{1}{4}$	237,828
1903 .....	2376 $\frac{3}{10}$	300,098
1904 .....	2171 $\frac{1}{2}$	255,228
	76,708 $\frac{3}{20}$	7,167,564

## No. 5.

*RETURN showing the Quantity and Value of Silver Ore produced during the Years 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, and 1904.*

Year.	Quantity.	Value.
	Tons.	£
1888 .....	417	5838
1889 .....	415	7044
1890 .....	2053	26,487
1891 .....	4810	52,284
1892 .....	9326	45,502
1893 .....	14,302	198,610
1894 .....	21,064	293,043
1895 .....	17,980	175,957
1896 .....	21,167	229,660
1897 .....	18,364	200,167
1898 .....	15,320	188,892
1899 .....	31,519½	250,331
1900 .....	26,564	279,372
1901 .....	28,774	207,228
1902 .....	46,480	218,864
1903 .....	42,422	192,492
1904 .....	51,138	203,702
	352,115½	2,775,473

## No. 6.

*RETURN showing the Quantity and Value of Blister Copper produced during the Years 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, and 1904.*

Year.	Quantity.	Value.
	Tons.	£
1896 .....	41½	1245
1897 .....	4700	322,500
1898 .....	4955½	400,668
1899 .....	8598	735,305
1900 .....	9449	907,288
1901 .....	9981	879,625
1902 .....	7745	*462,151
1903 .....	6684	*478,023
1904 .....	8371	582,540
	60,525	4,769,345

\* Value of Gold contained deducted.

## No. 7.

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

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

## No. 8.

*RETURN showing the Quantity and Value of Copper Ore produced during the Years 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, and 1904.*

Year.	Quantity.	Value.
	Tons.	£
1896 .....	34	1020
1897 .....	75	2250
1898 .....	394	8128
1899 .....	1695	26,833
1900 .....	4221½	63,589
1901 .....	11,221	130,412
1902 .....	5994	65,270
1903 .....	102	790
1904 .....	104	1640
	23,840½	299,932

## No. 9.

*RETURN showing the Quantity and Value of Iron Ore produced during the Years 1897, 1898, 1899, 1900, 1901, 1902, 1903, and 1904.*

Year.	Quantity.	Value.
	Tons.	£
1897 .....	894	812
1898 .....	1598	1598
1899 .....	3577	3474
1900 .....	5375	5995
1901 .....	612	417
1902 .....	2386	1075
1903 .....	5980	2905
1904 .....	6840	2975
	27,282	19,251

Diagram showing the Annual Value of Minerals & Metals raised in Tasmania from 1880-1904



5 cm

## No. 10.

*RETURN showing the Quantity and Value of Asbestos produced during the Years 1899, 1900, 1901, 1902, 1903, and 1904.*

Year.	Quantity.	Value.
	Tons.	£
1899 .....	200	363
1900 .....	128	113
1901 .....	46½	45
1902 .....	—	—
1903 .....	—	—
1904 .....	—	—
	374½	521

## No. 11.

*RETURN showing the Quantity and Value of Wolfram produced during the Years 1899, 1900, 1901, 1902, 1903, and 1904.*

Year.	Quantity.	Value.
	Tons.	£
1899 .....	9½	99
1900 .....	53¾	2058
1901 .....	—	—
1902 .....	—	—
1903 .....	—	—
1904 .....	15½	1147
	72¾	3304

## No. 12.

*RETURN showing the Quantity of Silver Lead and Copper Ore smelted for period 25th June to 31st December, 1896, and 1st January 1897, to 31st December, 1904.*

Year.	Ore Smelted.	Products.			Yield.			
		Silver Lead Bull'n.	Blister Copper.	Matte.	Copper.	Silver.	Gold.	Lead.
	Tons.	Tons.	Tons.	Tons.	Tons.	Ozs.	Ozs.	Tons.
1896	26,028 $\frac{1}{2}$ $\frac{3}{10}$	—	—	2417 $\frac{6}{10}$	1235 $\frac{1}{20}$	75,951	4707	—
1897	90,773 $\frac{1}{2}$	—	3476 $\frac{1}{2}$ $\frac{2}{10}$	257 $\frac{1}{2}$ $\frac{6}{10}$	3583 $\frac{1}{2}$ $\frac{4}{10}$	334,349	16,485	—
1898	170,933	—	4992	—	4783	606,123	24,418	—
1899	275,239	2295	8463	89 $\frac{8}{10}$	8362	1,089,657	27,615	—
1900	363,113	4817	9449	—	9341	1,215,036	26,255	—
1901	355,528	1839	9982	50	9880	800,317	21,717	—
1902	411,736	6825	7727	2882	8841	1,674,816	24,719	6654
1903	399,032	7560	6683	3413	8094	1,855,158	25,238	7529
1904	433,366	—	8371	—	8265	1,896,134	26,809	7754

## No. 13.

*RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 to 1904 inclusive.*

Year.	Number.	Year.	Number.
1880.....	1653	1893.....	3403
1881.....	3156	1894.....	3433
1882.....	4098	1895.....	4062
1883.....	3818	1896.....	4350
1884.....	2972	1897.....	4510
1885.....	2783	1898.....	6052
1886.....	2681	1899.....	6622
1887.....	3361	1900.....	7023
1888.....	2989	1901.....	6923
1889.....	3141	1902.....	5934
1890.....	2868	1903.....	6017
1891.....	3219	1904.....	6194
1892.....	3295		

No. 14.

RETURN showing the Number and Area of Leases held under "The Mining Act, 1900," in force on 30th June in years 1898 to 1903 inclusive, and on 31st December, 1903, and 31st December, 1904.

Nature of Lease	In force on 30th June, 1898.		In force on 30th June, 1899.		In force on 30th June, 1900.		In force on 30th June, 1901.		In force on 30th June, 1902.		In force on 30th June, 1903.		In force on 31st December, 1903.		In force on 31st December, 1904.	
	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
For Minerals, Silver, Tin, &c.	1290	Acres. 66,981	1207	Acres. 64,339	1487	Acres. 70,500	1388	Acres. 60,865	1063	Acres. 45,399	950	Acres. 40,068	826	Acres. 33,325	868	Acres. 33,824
For Coal, Slate, Shale, &c.	41	5943	39	6002	52	7258	55	7566	52	7819	66	10,767	54	9119	47	7546
For Gold Dredging Claims	702	7190	652	6725	647	6623	566	6091	425	4166	310	3117	243	2505	222	2268
Mining Easements	—	—	—	—	—	—	—	—	—	—	—	—	15	124	29	469
Water Rights Mineral and Gold	—	—	—	—	—	—	—	—	—	—	—	—	34	225	39	234
	159	784 sluice-heads.	200	933 sluice-heads.	225	1004 sluice-heads.	267	1318 sluice-heads.	300	1691 sluice-heads.	299	1514 sluice-heads.	281	1460 sluice-heads.	346	1495 sluice-heads.

No. 15.

*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 1880 to 1903, and for Six months ending 31st December, 1903, and for the Year ending 31st December, 1904.*

Year.	Amount.	Year.	Amount.
	£ s. d.		£ s. d.
1880.....	8944 5 11	1893.....	16,971 9 2
1881.....	20,936 5 5	1894.....	16,732 7 7
1882.....	23,077 1 9	1895.....	15,323 1 9
1883.....	15,439 14 5	1896.....	20,901 13 2
1884.....	6981 11 10	1897.....	25,631 0 3
1885.....	11,070 5 7	1898.....	33,661 13 9
1886.....	12,523 10 4	1899.....	24,696 10 5
1887.....	14,611 11 5	1900.....	28,380 11 10
1888.....	23,502 8 4	1901.....	21,569 5 2
1889.....	17,254 9 0	1902.....	19,471 0 1
1890.....	26,955 4 9	1903.....	17,776 14 3
1891.....	37,829 16 5	1903, 1 July to 31 Dec. ....	14,758 17 1
1892.....	17,568 18 4	1904, Jan. to. Dec. ....	16,631 8 2

The above Statement does not include Stamp Duties upon Transfer of Leases and Registration of Companies, or the Tax payable upon Dividends, from which sources large sums are derived.

## No. 16.

*RETURN showing the Total Number and Area of Leases in force on 31st December, 1904.*

Minerals.	Number.	Area.
		Acres.
Gold .....	222	2268
Minerals .....	118	7134
Silver .....	164	8392
Copper .....	34	1822
Tin .....	528	15,430
Coal .....	34	5503
Limestone ...	5	386
Iron .....	12	534
Slate .....	1	200
Wolfram .....	1	20
Asbestos .....	4	232
Precious Stones .....	1	80
Lithographic Stone .....	1	97
Marble .....	1	317
Shale .....	4	1040
Phosphate of Lime .....	1	3
Nickel .....	6	180
Machinery Sites .....	21	75
Dredging Claims .....	29	469
Mining Easements .....	39	234
Water Rights .....	346	1495 sluice-heads, & 729 acres dams

## No. 17.

*RETURN showing the Average Number of Miners employed during the Year ending 31st December, 1904.*

	Europeans.	Chinese.
Northern and Southern Division .....	786	...
North-Eastern Division.....	510	130
Eastern Division.....	786	64
North-Western Division .....	394	...
Western Division .....	3524	...
	6000	194

## No. 18.

*RETURN showing the Mining Companies registered during the Year ending 31st December, 1904.*

Number of Companies.	Capital.
16	£18,200

In addition to the above, 11 Agents for Foreign Companies, and 8 Syndicates, under 60 Vict. No. 51, were registered.

## No. 19.

*RETURN showing the Total Area of Land applied for during the Year ending 31st December, 1904.*

Mineral.	No. of Applications.	Area.
		Acres.
Asbestos .....	3	162
Antimony .....	1	40
Coal .....	10	1960
Copper .....	17	795
Galena .....	2	158
Gold .....	58	577
Iron .....	1	5
Minerals .....	46	2608
Nickel .....	5	197
Silver .....	9	540
Tin .....	185	5702
Wolfram .....	11	527
Machinery Sites .....	3	5
Dredging Claims .....	56	1511
<b>TOTAL .....</b>	<b>407</b>	<b>14,787</b>

In addition to the above, 19 applications for Mining Easements, and 86 applications for Water Rights (300 Sluice-heads and 69 acres Dam and Dump Sites) were received.

## No. 20.

*RETURN showing the total Amount of Rents, Fees, &c., received by the Mines Department during the Year ending 31st December, 1904.*

Head of Revenue.	Amount.		
	£	s.	d.
Rent under "The Mining Act, 1900," for Gold and Minerals .....	15,486	12	11
Fees, ditto ditto .....	1,194	15	3
Survey Fees .....	2,854	1	5
Rent of Diamond-drills .....	—		
<b>TOTAL</b> .....	<b>19,485</b>	<b>9</b>	<b>7</b>

## No. 21.

*RETURN showing the Amounts paid in dividends by Mining Companies during the Year ending 31st December, 1904.*

Mines.	Dividends.		
	£	s.	d.
Copper .....	150,000	0	0
Gold .....	21,774	14	6
Tin .....	76,735	0	0
Silver .....	32,617	4	4
<b>TOTAL</b> .....	<b>£281,126</b>	<b>18</b>	<b>10</b>

REPORT OF THE MOUNT CAMERON WATER-RACE  
BOARD FOR THE YEAR ENDING 31ST DECEMBER,  
1904.

---

3rd March, 1905.

SIR,

WE have the honour to present the report of the Board for the year ending 31st December, 1904.

*Water.*—The quantity of water at present available is 18 sluice-heads only, which is always over applied for. The carrying capacity of the race is 50 sluice-heads, which quantity, if available, could be readily disposed of. Applications for water have considerably increased lately, but owing to the limited supply available, the present consumers have had to submit to a reduction, and the Manager has had to refuse several applications from new customers.

*Flumings.*—There are 24 flumings on the race, of an aggregate length of 1969½ yards, the longest being 352 yards and the shortest only 14 yards. They are in such an advanced state of decay that many of them are beyond repair, and cannot possibly last through the winter. It is only owing to the constant care and attention bestowed upon them that they have been maintained so long. Those requiring immediate attention are Nos. 1, 2, 8, and 9, and should be replaced by cuttings and embankments, the estimated cost of which is £414 6s. 3d. The scarcity of water and the consequent exposure of the boards to the present dry weather is causing them, in places, to crumble away, and during the winter months when the water-supply increases the additional weight may be expected to cause a total collapse of one or more of these flumings, through the rotten condition of the trestles and boards. The Board again strongly recommends having the works above referred to carried out without further delay.

*Syphons.*—The number of bands which had to be made and placed around the breaks which occurred in the syphon-pipes was 242, the cost of repairs being £90 13s. 5d. It is owing to the constant and increasing attention of the Manager and channel-keepers that the pipes have been maintained so long, and the time is fast approaching when the renewal of these pipes will have to be undertaken.

On account of the recent revival in the tin-mining industry of the Gladstone District, and the large area of ground which has been taken up and is being prospected with very encouraging results, the Board feels warranted in again drawing the attention of the Government to its report for the year ending 30th June, 1903, and asking that favourable consideration may be given to the recommendations therein contained. Feeling the urgency of the renewals referred to in that report, the Board, during the past year, applied to the Government for an advance, on loan, of the sum of £500, which may be considered as a first instalment of the £3000 required for the purpose of replacing all the flumings by permanent earth and stone work.

The statistics for the year are as follows:—

Average per week of claims supplied, 9.

Greatest number supplied in any one week, 12.

Total number of heads supplied:—

Under fixed or cash scale ... ..	5009½
Under royalty or credit scale... ..	136½

TOTAL ... ..	5146
--------------	------

Tin ore raised, 1 ton 10 cwts. 2 qrs. 19 lbs., royalty scale;  
117 tons 4 cwts. 3 qrs. 9 lbs., fixed scale; total, 118 tons  
15 cwts. 2 qrs.

Average number of miners employed:—Europeans, 30;  
Chinese, 6; total, 36.

Total receipts for the year:—Fixed scale, £2442 17s. 1d.;  
royalty scale, £30 11s. 6d.; total, £2473 8s. 7d.

Expenditure: Cost of maintenance and management:—

	£	s.	d.
Salary and wages ... ..	675	19	10
Repairs to syphon-pipes ... ..	90	13	5
Repairs to flumings ... ..	8	6	0
Travelling expenses ... ..	37	17	0
Stores and tools... ..	6	6	7
Insurance... ..	3	6	0

TOTAL ... ..	£822	8	10
--------------	------	---	----

Paid to Public Debts Sinking Fund, 1904 (including moiety  
of rents of mineral land served by the race), £646 2s. 8d., being  
the profits made for the half-year ending 30th June, 1904.

Total amount paid to Public Debts Sinking Fund to 30th  
June, 1904, £8890 11s. 11d.

Total cost of purchase and construction, £34,281 19s. 0d.

W. H. WALLACE, *Chairman of the Board.*

EDWARD L. HALL,

W. H. TWELVETREES,

S. HAWKES,

JOHN SIMPSON,

} *Members of the Board.*

*The Hon. the Minister of Mines, Hobart.*

## MINE MANAGERS' EXAMINATION.

22ND MARCH, 1904.

*Questions set.*

### SUBJECT A.—MINING.

1. A reef 3 feet wide is being stoped between two levels 80 feet apart vertically. It is required to sink a shaft (which is 12 feet long by 4 feet wide, and divided into three compartments), and make provision for cutting the reef by means of crosscuts at two deeper levels each 80 feet apart, without hindrance to other work. The mine is equipped with suitable winding gear and baling tanks, 200 gallons capacity; also air compressor, air winch, and rock drills. Country, hard slate. Water at bottom level 1000 gallons per hour, and at bottom of shaft (20 feet below plat) 50 gallons per hour. Explain by description and diagrams the methods you would adopt, having due regard to safety of men engaged, ventilation, disposal of mullock and water, and economy in working.
2. How would you re-timber a drive the original timbers of which are much shattered by downward and lateral pressure, with a swelling bottom? Give rough sketch of timbers you would use. The original sets were placed 4 feet between centres, and lined at back and sides with 5-foot laths.
3. In a winze connecting two levels 60 feet apart the payable ore (12 inches wide) was found to extend downwards from top level to a depth of 40 feet, the rest being blank. Show by diagram two methods of working the payable ore out—"underhand and overhand stoping." Assume that the payable ore continued for 100 feet from end of winze, and that both levels were driven beyond that point. State which method you would adopt, and why.
4. In overhand stoping, how would you take out the last stope immediately under a main drive, at the bottom of which the reef was the full width of the drive. Illustrate your answer by sketches.
5. Name some of the advantages and disadvantages of rock drills when compared with hand labour—under what conditions you would recommend their use—and give a diagram of holes you would bore in face of a main drive  $6' \times 5'$ .
6. What style of timbering would you adopt when driving—
  1. Through ground with greasy heads.
  2. Through running ground with a little water.Illustrate your answer with sketches.
7. Explain, with sketches, the construction and action of any form of machine drill.
8. What are the different explosives used in mining? Give their composition, uses, and relative merits.

9. A lode 10 ft. wide runs lengthwise through a property for a distance of 2000 feet, and underlays at an angle of  $45^{\circ}$ . State
  - (a) What kind of a shaft, vertical or underlay, and of what size, you consider most suitable for working this proposition.
  - (b) Where it should be placed.
  - (c) Position and size of crosscuts.
 Give careful reasons for your statements.
10. Describe in detail the method of constructing a dam to impound water in a crosscut, the country rock being a hard schist.
11. Give dimensioned sketches of a headgear suitable for hauling from a 3-compartment shaft 1000 feet deep, the maximum load being 2 tons.
12. Describe any efficient form of centrifugal ventilator.

SUBJECT B.—ORE-DRESSING AND SAMPLING.

1. Describe and sketch any form of automatic sampler for estimating the value of tailings from a stamp-mill in operation.
2. Explain the construction, principle, and action of the Wilfley or Frue Vanner.
3. Describe and sketch a Harz Jig. Explain how its work can be affected by variations in (a) the speed; (b) length of stroke; (c) nature of material in feed.
4. Describe what you consider the best method of treatment by cyanide of the following, and give strength of solution you would use in each case—
  - A. Leachable tailings direct from battery.
  - B. Slimes direct from battery.
  - C. Old oxidised tailings and slimes, the latter in layers of 6 inches thick and in proportion of 80 per cent. of sand and 20 per cent. slimes, all very acid.
5. Having a sample of 10 lbs. of quartz containing iron pyrites and gold, how would you determine the following, practically?
  - 1st. Percentage of gold to be saved by battery treatment (box, plate, and ripples).
  - 2nd. Percentage of concentrates and gold to be recovered by chlorinating same.
  - 3rd. Percentage of gold to be saved by cyaniding tailings.
  - 4th. Total estimated extraction.
6. How would you coat copper plates with quicksilver, keep same in good order during a crushing, and remove all the gold and quicksilver when required?

SUBJECT C.—MINING GEOLOGY.

1. Mention how you would identify and distinguish the several minerals of a deposit in which wolfram, iron oxide, zinc blende, and tourmaline are associated with cassiterite.
2. Discuss some of the theories which have been advanced to account for the origin of metalliferous veins.

3. Describe the phenomenon of cleavage as observed in slates, and give an explanation of its cause.
4. Give an account of the different kinds of faults by which lodes are disturbed, and show how you would recover lodes which have been lost in consequence of faulting.
5. What do you understand by the term "schist"? How does schist differ from slate? Name some of the varieties of schistose rocks.
6. Name the essential minerals which form the following rocks:—Granite, Basalt, Serpentine, Diorite.
7. Place the following names of geological systems in proper order, beginning with the most ancient:—Permo-Carboniferous, Silurian, Tertiary, Cambrian, Devonian, Jurassic, Triassic.

SUBJECT D.—MINING SURVEYING.

1. Find the length and bearing of the closing line of the following traverse:—

Line.	Bearing.	Distance.
<i>A to B</i>	N. 60° W.	360 feet
<i>B to C</i>	N. 41° 38' E.	173 ..
<i>C to D</i>	S. 89° 15' E.	237 ..

2. Find the area of the figure *ABCD* in Question No. 1.
3. The figure *ABCD* in Question No. 1 is to be divided into two equal parts by a straight line parallel to *AD*. At what distance from *A* will this line cut *AB*?
4. Describe fully the adjustments of the Surveyor's transit. Show the effect of an error of
  - (a) The horizontal axis;
  - (b) Collimation.
5. Explain in detail the method of setting out a circular curve to connect two straight portions of a tramway.
6. Reduce the following levels, and show how the reduction may be checked:—

Back Sight.	Intermediate.	Fore Sight.	Reduced Level.
10·58			100·00
	9·73		
1·29	...	6·21	
	3·98		
8·38	...	5·77	
	7·52		
		9·01	

7. Describe fully what precautions must be taken in order to secure accuracy in chaining in rough country.
8. Describe the method of connecting the survey of two levels in a mine through a winze—
  - (1) Of regular underlay;
  - (2) Of irregular underlay.

SUBJECT E.—SURFACE WORK.

1. A Cornish boiler is 26 feet long by 6 feet 6 inches diameter; the flue is 3 feet 6 inches uniform diameter; the shell and flue plates are  $\frac{3}{8}$  inch thick; end plates  $\frac{9}{16}$  inch thick; single riveted throughout, rivets  $\frac{3}{4}$  inch diameter by 2 inches pitch. There are 4 gusset stays each end, and 6 Galloway tubes in the flue. All material steel. Calculate the approximate weight of this boiler.
2. Calculate the safe working pressure for the above boiler.
3. If you required to parbuckle the above boiler down a fairly smooth incline of 1 in 3, what would be the smallest diameter of steel wire rope you would consider it safe to use?
4. What would be the approximate weight of the brick-work required to set the above-mentioned boiler in the usual manner?
5. If you wished to place a safety-valve of the lever and ball type on this boiler, which would be so made that each 1 lb. on the end of the lever would exactly balance each 1 lb. pressure in the boiler, how would the different parts be proportioned relatively to each other? Neglect friction and the weight of the lever and valve.
6. A tin drift consisting of sand is overlaid by partially-decomposed basalt, all of which can be removed by hydraulicking. Assuming a certain amount of overburden and drift removed daily, give dimensioned sketches of fluming suitable for carrying away (a) the drift, (b) the overburden.
7. Describe and sketch an approved form of hydraulic nozzle or "gun," showing in detail the arrangements for giving vertical and horizontal movement.
8. Give dimensioned sketches of a bridge suitable for carrying a tramway over a ravine 30 feet wide and 60 feet deep. The weight of the locomotive employed on the tramway is 8 tons.
9. Discuss the relative merits of cast iron and wrought iron pipes for carrying water, paying attention to the following points:—Strength, weight, jointing, cost, method of construction.
10. Give a careful specification of a timber dam for impounding water 10 feet high in the centre and 25 feet along the crest. The nature of the surface may be assumed.

SUBJECT F.—BOOK-KEEPING AND MINE ACCOUNTS.

1. The length of a square paddock is 50 yards; what will it cost to asphalt it at 6 $\frac{1}{2}$ d. per square foot?
2. Extract the square root of 106929.
3. What would be the cost per cubic foot of driving a heading 9 feet wide by 8 feet high at the rate of 30s. per lineal yard?

4. If a man earns £5 18s. 6d. plus an increase of 2½d. per cent., what is the total amount due to him?
5. Name, describe, and give illustrations of the accounts and statistical returns which a mining manager might be expected to send periodically (say monthly) to the head office.
6. What entries are made on the Dr. side of a Cash account, and why?
7. What rule do you follow in posting from the Cash Book to the Ledger, and how do you make the entries in the Ledger?

SUBJECT G.—MINING LAW.

1. What is the minimum age at which a boy may be employed in any mine?
  2. What is the maximum quantity of gunpowder or other explosives which may be stored in any mine, and what distance should same be stored from any travelling road?
  3. What is the maximum quantity which may be taken for use into the workings of a mine, and how should same be carried?
  4. What is required to be done to abandoned shafts or excavations near roads to prevent accidents?
  5. How are leased claims required to be marked during the term of the lease?
  6. What constitutes a "sluice-head" of water under the Mining Regulations?
-

## REPORT OF THE GOVERNMENT GEOLOGIST.

*Government Geologist's Office,  
Launceston, 31st December, 1904.*

SIR,

I HAVE the honour to submit my Report as Government Geologist for the year ending 31st December instant.

During the year I have prepared the following reports:—

1. On deposits of clay at George's Bay and elsewhere, 1st March, 1904.
2. On the South Mount Victoria mining field, 9th May, 1904.
3. On the Volunteer Consolidated Gold Mine, at Mathinna, 14th September, 1904.
4. On the Mount Victoria goldfield, 7th October, 1904.
5. On coal near George Town and slate near Badger Head, 2nd December, 1904.

Besides these, several Departmental reports have been prepared.

Mr. Geo. A. Waller, then Assistant Government Geologist, has submitted reports on—

6. The prospects of the Stanley River tinfield, 25th January, 1904.
7. The Zeehan silver-lead mining field, 10th April, 1904.
8. The Mt. Farrell Mining District, 14th April, 1904.

The reports cover the mineral fields on both sides of the island, and contain, in the aggregate, a fund of information about our mineral resources.

While matters of scientific interest have not been ignored, the chief aim in preparing these reports for publication has been one of a directly economic nature. The object in view has been to furnish useful information and guidance to those who are interested in our mining industry.

### *Deposits of Pottery Clay.*

A visit of delegates from Staffordshire to the States of the Commonwealth, with a view of establishing pottery works, having been announced, I was instructed to inspect and report on certain deposits of kaolinic clay near St. Helens. A thick stratum of felspathic clay outcrops on the eastern side of George's Bay, of a very good quality, and proved to a depth of at least 30 feet for about a quarter of a mile along the bank. It is suitable for the manufacture of high-class pottery. An excellent light-coloured kaolinic clay occurs also about three miles from the Bay, underlying the tin-wash worked at the lower Royal Ruby Mine.

A similar clay appears in the drifts of the Pioneer Mine, between Moorina and Gladstone. A refractory fireclay, 2 to 6 feet thick, overlies the coal at the Dulverton Colliery; and this class of clay occurs at nearly all the coal mines on the Mt. Nicholas Range. At the Sandfly Coal Mine, the No. 3 seam rests upon a bed of white clay, which has been penetrated to a depth of 19 feet. There is also a body of good silicious clay in the Silurian slates on the Den Hill, of a character suitable for terracotta manufacture.

The clays of the Launceston Tertiary basin embrace every variety in quality, from brick-earth to pipeclay, and exist in great quantity. All over the island deposits of workable clay are known to be present, but those most suitable for chinaware and fine pottery are found in the tinfields, being due to the disintegration of the granite.

It may be predicted that, sooner or later, the clays which are in the most favourable positions for markets will be subjected to careful working trials, to which they may be expected to respond satisfactorily, and form the foundation of a stable and profitable industry.

#### *South Mount Victoria.*

I visited this field, which is from 8 to 12 miles north of Mathinna, and comprises the area traversed by Dan's Rivulet and its tributaries. The Alberton Track passes through it, and past the various mines. The country consists of slates and sandstones, which are the northerly prolongations of the strata of the Mathinna goldfield. Several mines in the district are idle, some having been abandoned for an indefinite period, others shut down only temporarily. The Havelock Mine, which had a good shoot of stone in shallow levels, will probably start again before long. The Hinemoa was started in April, 1903, and preliminary work was carried on for some time. Attempts are now being made in New Zealand to float it in conjunction with the Una group. The King Edward and Carnegie Mines were working at the time of my visit, but on a small scale. On the Starlight, Strickland, Lady Havelock, Laranda, and O'Brien's Company's sections work was suspended. Work throughout has been confined to shallow depths (maximum 140 feet), and the shoots of stone, though payable for certain distances, have not been followed down. The several mining enterprises appear to have been started with insufficient capital for carrying on exploratory and dead work, and died a natural death when the gold shoots came to an end horizontally, or water was encountered with increasing depth. There is no reason for despairing of this field; its future may be said to depend upon the introduction of capital for the development of the reefs at a depth.

#### *Volunteer Consolidated Mine.*

This mine belongs to a group of enterprises at Mathinna which are developing ground parallel with the New Golden Gate ridge, and in which considerable interest is centred. Owing to slides having displaced one of the most promising reefs in the mine, I was directed to examine the geological and underground conditions. My conclusions were that the faults should be driven through and the drive continued. Subsequent work has justified this view, which is satisfactory, as the mine has considerable chances of success, if funds are forthcoming to continue opening up.

#### *Mount Victoria Goldfield.*

This important district was examined for a north and south distance of nearly 4 miles. Its slates and sandstones are a continuation of those at South Mt. Victoria, so that one

uninterrupted belt of auriferous country continues from Fingal and Mathinna to North Mt. Victoria.

Large numbers of gold-bearing reefs have been found, and upwards of £50,000 worth of gold extracted; but some of the old shoots were worked out, and investors are now rather timid about venturing much.

None of the reefs (with the exception of the Bright Star, where a shaft was sunk 50 feet) have been followed down to ground water-level; and this fact encourages further work, for at shallow depths, and at the outcrops, the makes of stone, though often short, have in numerous instances proved to be rich in gold. The Long Struggle, New Mercury, and McCaul's were the only ones at work and producing gold at the time of my visit.

The Reform and Mammoth were endeavouring to obtain capital for development. This part of our eastern gold belt will in all probability become the seat of a great gold-mining industry once investors can be induced to face the preliminary outlay and risks of development.

#### *Coal near George Town.*

I visited the Reward section at Musk Vale, where some coal was found in 1888. A few shallow shafts have shown an irregular seam, about a foot thick, in soft sandstone, and resting upon a dark tenacious clay. Both sandstone and clay belong to the series of Tertiary deposits very abundant along the Tamar. The coal is a rather superior brown coal, intermediate in character between lignite and true coal. The seam, where struck, is not of a workable thickness. A good deal of work has been done on the banks of the Tamar at different places between Launceston and the mouth of the river, where indications of coal were thought to exist, but in every instance in the ligneous clay beds of Tertiary age. The opinion is freely expressed that if work is pushed on, and more cover obtained, the quality of the coal will improve; but this is a false lure. As long as work is confined to the Tertiary sands and clays, only brown coal or lignite can be looked for. The Jurassic or Permo-Carboniferous Coal Measures may exist at a greater depth; but this is speculative, and can only be settled by boring through the Tertiary into the underlying strata.

#### *Stanley River Tinfield.*

Mr. Waller has reported on this area, within which tin has been traced north and south for 5 miles, occurring both as heavy alluvial and in the form of large lodes. Rich boulders of tin-stone are found in great quantity in the alluvial, which is taken as pointing to the presence of strong shoots of ore in the quartz-tourmaline reefs. The heavy timber has retarded exploration, and, until recently, not much work has been done in the way of discovering the sources of the alluvial ore. Some strong syndicates have lately taken up a good deal of the ground, and prospecting work is being carried on.

#### *Mount Farrell.*

Mr. Waller also reported on this mineral district. The North Mt. Farrell and Murchison River Mines were being worked. The former is the premier mine of the field, and has

a lode with good shoots of first-class ore (galena) and large quantities of concentrating ore.

The Murchison River Mine is a promising one; its ore, zinciferous galena, will have to be concentrated, in order to overcome the heavy freight charges. The Mackintosh Mine has also a promising lode.

On Kittson's section, 4 miles from the Farrell township, a wide formation has been traced and cut into, charged with iron and copper pyrites, and containing seams and bunches of rich silver and bismuth ore; assays from different points on the course of the lode returning from 100 to 350 ozs. silver per ton.

#### *The Zeehan Silver-lead Field.*

The report on this field, made by Mr. Waller, is comprehensive and instructive. It is accompanied by the map referred to in my last annual report, and which exhibits the principal lodes and topography very clearly. In the report, the lodes are connected genetically with the Heemskirk granite. The geology of the district is dealt with at length, and the individual mines are described with great care and judgment.

#### *Mineral Areas.*

In November I made an examination of the tin-bearing granite country round Branhholm, Derby, Moorina, Pioneer, Weldborough, Lottah, and Blue Tier, in order to report upon the nature of the lands for the purchase of which numerous applications have been made lately. This country is the great storehouse and source of the tin ore which is now being so busily worked. The conclusion which I arrived at was, that grazing leases would answer every requirement, but that it would be highly undesirable to part with the fee simple of land which is the mainstay of our tin-mining industry in this part of the island.

#### *Progress Reports.*

I have compiled four Quarterly Reports on the mining industry during the year. I am at all times ready to acknowledge thankfully any information respecting work and prospects which mining or legal managers may be able to send me. I do not think it is generally known how widely these publications circulate, and how useful a channel they are for distributing knowledge respecting the mines of the State. Unfortunately, the Customs' returns of mineral exports are no longer available, and consequently the figures which represent the quarterly production of mineral have to be obtained from those in charge of the various mines. It is hoped that all companies and managers will co-operate in furnishing the statistics required.

#### *Office.*

During the year, eight geological and four progress reports were issued. The correspondence has comprised 2800 letters in and out. The office library has been enriched by 106 bound volumes of the United States Geological Survey, monographs, and bulletins, donated by the United States Government, as well as by the annual and other publications of the

Mining Departments of the various States in the Commonwealth and kindred institutions throughout the world.

A representative collection of Victorian rocks has been received from the University of Melbourne, under direction from Dr. Gregory, late Director of the Geological Survey of Victoria, for which grateful acknowledgment is tendered. Mr. W. R. Bell, of Burnie, has kindly donated various minerals to the office collection.

A collection of Tasmanian rocks and minerals has been prepared (by request) for the Workingmen's College, Melbourne, and will be forwarded shortly. A collection of Tasmanian tin ores and rocks was got together for an English author, who is preparing a work on the world's tin deposits.

Mr. F. S. Grove has continued to discharge his duties with efficiency.

*Government Drills.*

The diamond-drills have not been at work this year. The alluvial boring plant, which was lent to Messrs. Medwin and Traill for testing coal measures on the River Tamar, was used for boring into the lignite clays and sands. These were penetrated to a depth of 200 feet, without any signs of the appearance of underlying coal-bearing beds.

*Geological Surveyor.*

Mr. G. A. Waller, having obtained a private position in Australia, retired from the Service on the 16th April. He was an officer who always discharged the duties which were confided to him in a painstaking and efficient manner.

I have the honour to be,

Sir,

Your obedient Servant,

W. H. TWELVETREES, *Government Geologist.*

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

---

## REPORT OF THE CHIEF INSPECTOR OF MINES.

*Inspector of Mines' Office,  
Launceston, 31st December, 1904.*

SIR,

I HAVE the honour to present my Report on the inspection of mines for the year ending 31st December instant.

I beg to append statistical tables relating to accidents which have occurred at the mines during the past year, and the annual reports of Mr. M. J. Griffin, Inspector of Mines for the Northern and Southern, Eastern and North-Eastern Mining Divisions; of Mr. Jas. Harrison, Inspector of Mines for the Western and North-Western Divisions; and of Mr. Con. H. Curtain, Inspector of Mines for the Lyell District.

Mr. G. A. Waller, who was charged with the inspection of the Lyell District at the beginning of the year, left the State for a more lucrative appointment in April, and Mr. Curtain was reinstated in his old position.

The number of persons engaged this year in mines and smelting works was 6194. Nine persons were killed; and other serious injuries were 65. The death-rate from accidents was 1.453 per thousand, compared with 1.428 the preceding half-year. The fatal accidents were distributed as follows:—Northern and Southern Division, 1; North-Eastern, 2; Eastern, 2; and Western, 4. In the Western Division, 2 occurred in the Lyell District and 2 at Mt. Read.

Although the fatality-rate has not increased appreciably, the number of accidents proportionately to men employed has exceeded that in any of the twelve preceding years. The great majority of the accidents have happened in the large mines of the State; those belonging to the smaller mines being comparatively few. The circumstances of every serious accident have been carefully examined by the Inspectors, and proceedings have been instituted where good grounds for doing so appeared to exist. Numerous suggestions have been made for the prevention of accidents. The nature of the accidents registered will be gathered from the annexed tabular statements and the reports of the Inspectors. It was deemed necessary to take proceedings with respect to three accidents attended or caused by breaches of The Mining Act. In each case a verdict was obtained.

A gratifying approach to uniformity in recording accidents for the future has been made possible, as the result of correspondence with the other States of the Commonwealth. All the States, excepting New South Wales, which has not yet come to a decision, have practically agreed to register accidents which entail a fortnight's disablement, and from the 1st January this rule will be adhered to in Tasmania.

An alteration in the wording of Section 89, providing for the notification of accidents attended with serious injury to any person is desirable, in the direction either of having all accidents reported, however trivial, or of defining the term "serious injury." In Indian mining legislation, this means any injury which involves, or is likely to involve, loss of or permanent injury to any limb, or to the sight or hearing, or

which occasioned fracture of the head or of any limb, or a dislocation of any limb, or enforced absence from work for fourteen days, or any injury which is declared by any medical officer to be serious. Personally, I should prefer all accidents to be notified, but there seems to be a consensus of opinion that a definition of serious injury would be more acceptable. It will do away with the present inadequate wording of the section, which allows managers to defeat the obvious intention of the Act by interpreting the terms from their own standpoint.

Inspector Griffin has been removed from Gladstone to Launceston. This position, being more central, is more convenient for inspection journeys, which can be arranged on a better plan, and will have better results, so far as these depend on efficiency of inspection.

Correspondence with the Inspectors has been carried on with a view of suggesting improvements which might be introduced into Part VI. of The Mining Act. Several matters of importance have been discussed, but a personal conference with the Inspectors on the West Coast is necessary before finality can be reached. The results of discussions, with numerous suggestions, will be submitted to you, with the view to the amendment of that part of the present Act which deals with the working and regulation of mines.

To the Inspectors, this year again, as usual, is due an acknowledgment of their unremitting attention to, and conscientious discharge of, the important duties which devolve upon them.

I have the honour to be,

Sir,

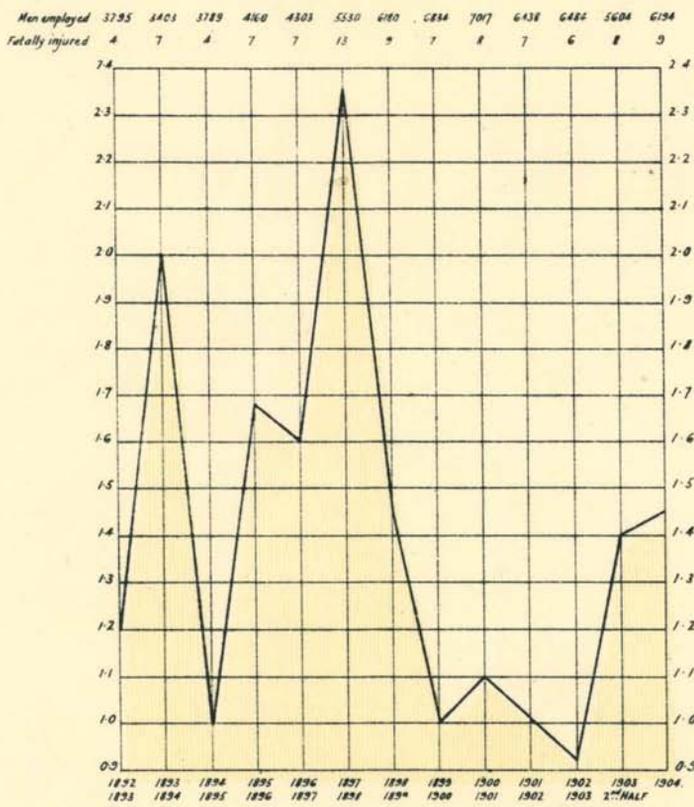
Your obedient Servant,

W. H. TWELVETREES, *Chief Inspector of Mines.*

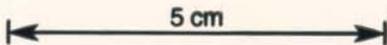
W. H. WALLACE, *Esq., Secretary for Mines, Hobart.*

---

Diagram showing the ratio of fatal accidents in mines in Tasmania  
Rate per 1000 men employed



JOHN VAIL, GOVERNMENT PRINTER, TASMANIA.



*TABLE showing rate per thousand Killed and Injured in the different Mining Divisions for the Year 1904.*

Period.	Division.	Average number of men employed.	Number of Accidents.	Number of Persons.		Total Killed & Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
				Killed.	Injured.			Killed.	Injured.
1 Jan. to 31 Dec., 1904	Northern and Southern	785.5	17	1	16	17	21.642	1.273	20.369
Ditto	North-Western	394.0	1	—	1	1	2.538	—	2.538
Ditto	North-Eastern	640.0	13	2	11	13	20.312	3.125	17.187
Ditto	Eastern	850.0	12	2	10	12	14.128	2.363	11.765
Ditto	Western	3524.5	30	4	27	31	8.796	1.135	7.661
		6194.0	73	9	65	74			

*Analysis of Statistics for the Western Division.*

Division.	District.	Average number of men employed.	Number of Accidents.	Number of Persons.		Total Killed & Injured.	Average per 1000 Killed and Injured.	Average per 1000.	
				Killed.	Injured.			Killed.	Injured.
Western	Mount Lyell	2119.5	18	2	16	18	8.492	0.943	7.549
	Zeehan, &c.	1405.0	12	2	11	13	9.253	1.423	7.829

*TABLE showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Year 1904.*

PLACE OR CAUSE OF ACCIDENT.	INSPECTION DISTRICT.													
	Northern and Southern Division.		North-Eastern Division.		Eastern Division.		North-Western Division.		Western Division.				TOTAL.	
									Zeehan and other Districts.		Lyell District.			
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
UNDERGROUND—														
Falls of Ground .....	...	1	...	...	1	1	...	...	...	5	...	2	1	9
<i>Shaft Accidents—</i>														
Suffocation by natural gases .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Overwinding .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ropes or chains breaking .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Machinery .....	...	1	...	...	...	...	...	...	...	2	...	...	...	3
Falling in or into shafts .....	...	2	...	...	1	1	...	...	...	1	...	1	1	5
Things falling into shafts .....	...	1	...	...	...	1	...	...	...	...	...	...	...	2
Explosives .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Miscellaneous .....	...	...	...	...	...	...	...	...	...	...	...	1	...	1
Total .....	...	4	...	...	1	2	...	...	...	3	...	2	1	11

<i>Miscellaneous (underground).</i>														
Explosives .....	...	...	...	...	...	1	...	...	2	...	...	...	2	1
Suffocation by natural gases	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Haulage—														
On inclined planes .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ropes or chains breaking	...	...	...	...	...	...	...	...	...	...	...	...	...	...
By trams and tubs .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Machinery .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sundries .....	...	6	...	...	...	...	...	...	...	...	...	2	...	8
Total .....	...	6	...	...	...	1	...	...	2	...	...	2	2	9
Total underground . . .	...	11	...	...	2	4	...	...	2	8	...	6	4	29
ON SURFACE—														
Electrical .....	...	...	...	...	...	...	...	...	...	...	1	...	1	2
Smelting Works .....	...	...	...	...	...	...	...	...	...	2	...	...	1	5
Machinery .....	1	1	...	...	...	2	...	...	...	...	...	2	1	5
Boiler explosions .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tramways .....	...	...	...	2	...	1	...	...	...	...	...	1	...	4
Explosives .....	...	...	...	...	...	2	...	...	...	...	1	3	1	5
Falls of ground.....	...	...	1	1	...	...	...	...	...	...	...	...	1	1
Miscellaneous.....	...	4	1	8	...	1	...	1	...	1	...	4	1	19
Total on surface.....	1	5	2	11	...	6	...	1	...	3	2	10	5	36
GROSS TOTAL .....	1	16	2	11	2	10	...	1	2	11	2	16	9	65

*COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892, to 31st December, 1904.*

Period.	Number of Miners employed.	Number of Accidents.	Number of Persons.		Total killed and injured.	Average per 1000 killed and injured.	Average per 1000.	
			Killed.	Injured.			Killed.	Injured.
1 July 1892, to 30 June, 1893	3295	28	4	25	29	8·8001	1·214	7·587
" 1893 " 1894	3403	25	7	20	27	7·934	2·057	5·877
" 1894 " 1895	3789	26	4	24	28	7·300	1·058	6·332
" 1895 " 1896	4160	22	7	16	23	5·529	1·682	3·847
" 1896 " 1897	4303	36	7	31	38	8·831	1·627	7·204
" 1897 " 1898	5530	36	13	33	46	8·318	2·351	5·967
" 1898 " 1899	6180	35	9	34	43	6·957	1·456	5·501
" 1899 " 1900	6834	19	7	16	23	3·365	1·024	2·341
" 1900 " 1901	7017	29	8	23	31	4·418	1·140	3·278
" 1901 " 1902	6438	38	7	35	42	6·524	1·087	5·437
" 1902 " 1903	6484	44	6	43	49	7·557	0·925	6·632
30 June, 1903, to 31 Dec., 1903	5604	27	8	20	28	4·997	1·428	3·569
1 Jan. 1904, to 31 Dec. 1904	6194	73	9	65	74	11·947	1·453	10·494

## REPORTS OF INSPECTORS OF MINES.

Mr. INSPECTOR GRIFFIN (stationed at Launceston) reports:—

I have the honour to submit my annual report for the Divisions Northern and Southern, North-Eastern and Eastern, inspected by me during the year ending 31st December, 1904.

*Accidents.*—Five fatal and thirty-six non-fatal occurred during the year. Of the non-fatal accidents, some five or six were serious, with broken limbs, and in two cases loss of eyesight, caused by explosions of gelignite, the remainder being of a trivial nature. The fatal accidents were purely accidental, and no blame was attachable to anyone for them.

*Fatal Accidents.*—Henry Wilson, a married man, was employed at the New Golden Gate Mine, Mathinna, trucking mullock from one pass to another at the No. 1 level. He worked by himself, and was last seen alive about 2 o'clock in the afternoon of the day of the accident by J. Street, who worked, also trucking, on the next or adit level above, and who called Wilson to help him to free the pass, which was hung up. Two hours later, at change of shift, Wilson was missing. The man that went to relieve him found his coat, waistcoat, and billycan about 4 feet back from the mouth of the pass, into which Wilson was tipping the mullock. A search was made, and his dead body found in this same pass 380 feet down from the top. He could not possibly have fallen into the pass during the time he was tipping the truck, as the latter completely covered the top opening. It would seem that he pulled the empty truck back some 6 feet past a recess, into which he would have to step, as there was only room for getting past it in this way, and then, in some way, got into the pass. It has since transpired that he was subject to fainting fits; also, that on leaving his home to go to work on that morning he seemed absent-minded and troubled, having only on the previous day returned from attending the funeral of a brother. The drive was well lighted at different places; the candle nearest the pass was found lying on the ground, but not alight.

Michael Conlan, a single man, aged 24 years, was engaged as leader of shift in the open-cut workings of the Briseis Tin Mine, at Derby. Basaltic rock and stones were being trucked out. Conlan went up the wet, slippery pile of stones to bar down, lost his footing, and fell or rolled down some few feet. A large stone rolled against his side as he lay prostrate. He was, apparently, not much hurt at the time, nor did he feel particularly bad the next day. On the third day, however, alarming symptoms set in, and the local doctor advised his removal to the Launceston Hospital, where he was received on the 30th April. An operation had to be performed at once, but he never rallied, and died a few hours after this took place, from inflammation caused through, it is stated, twisting of the bowels.

Thomas Richard Miller, a lad 16 years of age, was engaged as apprenticed fitter at the fitters' shop of the Tasmania Gold Mine, Beaconsfield. He had only been a few days at the works. Part of his duty was to oil the machinery, but he was cautioned not to attempt to do so while it was in motion. Even on the day of the accident the foreman, McSkimmney, called him back as he was about to ascend to the counter shafting close up to the roof. He must have gone into another compartment, and ascended from there. A fitter, James Cannon, noticed something wrong, and ran to stop the machinery, but before he could do so the unfortunate lad's body was dragged violently between shafting and pulleys running close together and his neck dislocated. Death was instantaneous. No person was to blame. The shafting was rather awkwardly placed for getting at, but could be attended to with perfect safety when not in motion.

Alexander John Lang, a single man, aged 21 years, one of a party of six contractors, was engaged driving at south drive, No. 13 level, New Golden Gate Mine. The face was about 20 feet in advance of the timbering. The manager, Mr. Andrews, was below on the day before the accident happened. He noticed the ground in the backs was unsafe, and ordered the men then on shift to take down some loose rock and make the drive secure. Lang and his mate, Wm. Fox, followed on the next shift, and they, in turn, proceeded with the pulling down of the unsafe rock; but for some reason, did not complete the work. When questioned as to why they did not do this by the shift boss, Moses, Lang replied that it was no use trying to get it down until a certain bump further back and 5 feet from the timbering was removed, as he said that was the key to the whole thing. Nothing further appears to have been done until Lang and Fox came on again on day-shift the following day, when Fox proceeded to pick down the bump already referred to by Lang as "the key to the whole lot"; but, marvellous to relate, he (Lang) knowing the danger, stood watching his mate, and immediately beneath baulked ground, until he was caught and killed by the falling mass of rock. Fox, too, was knocked down, and partly buried by rock, some legs that were uprighted and the trolley he was standing on having broken the fall and saved him from being instantly killed. The injuries he received were severe, and he was eight weeks off work, but is now all right. This is the second narrow escape of death he has had. In June, 1901, he made a brave attempt to rescue his mate, Wm. J. Thomas, who was suffocated by foul gas in the Moonlight-cum-Wonder, at Beaconsfield, and was himself overcome.

Francis Joseph Robinson was employed loading trucks with stone in the upper cascade open-cut face of the Briseis Tin Mine. The face, from 25 to 30 feet in height, is composed of columnar basalt, generally very hard and difficult to break down; some portions are, however, decayed, and treacherous. A fall, extending from the bottom upwards for about 10 feet by a width of 12 or 13 feet, came suddenly away, a large stone striking Robinson on the right leg just above the ankle. He was thrown backwards with great force, the back of his head coming in contact with a stone, causing a fracture of the

base of the skull, from which he died within a half-hour from the time of the accident. The verdict of the Coroner's jury was, "Accidentally killed, no blame attachable to anyone," a verdict in which I entirely concur. Every reasonable precaution for the safety of the men employed is being taken by the management of this mine, and although it would seem that the face where the accident happened was worked too near to the vertical, yet, from its very structure, this columnar basalt is so worked, as a rule, without incurring any great risk. Close inspection three hours before the accident happened revealed no flaw or sign of danger.

*Serious Accidents.*—Samuel Lee-Count was engaged at top of full pass of quartz, at stope in Golden Gate Mine; stone in pass suddenly dropped a few feet, letting him down, when the stone from the rill rolled in about him. He was soon discovered, but it took three hours to extricate him. He was much bruised, but no bones were broken, and he was enabled to return to work within a week or so.

Lewis Bear was charging a hole with gelignite at the Volunteer Consolidated Mine, Mathinna. When pressing the first plug into the drill-hole with a wooden tamping-bar, it exploded. He received a severe scorching and laceration of the hands and arms, but no further injuries. So far as can be ascertained, the gelignite being used was in a normal condition, and it is difficult to understand what caused the explosion, unless it was friction from a dirty tamping-stick used as a rammer to force the plug in a tight hole. The injured man denies that any undue force was used, and says the plug of gelignite did not stick in the hole.

Hugh Parry, assistant tin-dresser at the Anchor Tin Mine, relieved one of the battery-feeders for a few minutes at crib time, and during the absence of the latter, attempted to put the belt on a driving-pulley to start a five-head set of stamps. He failed to pull the slip-knot of a lace tying the belt on to the driving-pulley loose at the first revolution after the machinery started. The belting was jerked off the large cam-shaft pulley overhead, and falling, caught and dragged Parry against the driving-pulley, breaking both his legs below the knees; other injuries received were of a trifling nature. Prompt action on the part of J. Edwards, who was at the starting-valve, in stopping the machinery, saved Parry from being killed.

John Eager was working in a gullet-rock cutting at the Anchor Tin Mine. A lift was being taken off 15 feet higher, from which men were wheeling out stone; a barrow-load was accidentally tipped, some of its contents rolling down into the cutting. One piece of stone struck Eager, and broke his left leg just above the ankle.

Charles Berwick was engaged as powder-monkey at the Anchor Tin Mine, and whilst charging a number of drill-holes (pops) in boulders, a premature explosion took place, causing severe injuries to his hands and face, and completely destroying the sight of both eyes. The gelignite he was using was in a frozen state, and should not have been used without having first been thawed or softened in a proper vessel for the purpose. According to the statement of the injured man, he had put one plug into the drill-hole without difficulty;

a second one stuck, and when he attempted to force it home with a wooden tamping-stick, it exploded, causing the injuries referred to.

Thomas Imlach was employed at No. 1 face, Anchor Tin Mine, jumping holes in boulders and large blocks of rock. Some twenty of these holes were charged, and fired late in the evening by chief foreman Herrick and assistant powder-monkey Mills, who, according to their own statements, satisfied themselves that all the charges had exploded. Imlach returned to work the following morning, and noticing that one block of rock, in the midst of those charged and exploded the night before, and in which there was a drill-hole, remained unbroken, and thinking that this was overlooked and not charged at all by Herrick or Mills, proceeded to clean out the drill-hole, which was partly filled with dirt. In doing so he used the steel jumper he had in his hand. The first blow struck caused an explosion, from which he received two nasty cuts on the left thigh and temple respectively, together with a severe peppering of dust and small particles about the face and head, resulting in the loss of the sight of his right eye. There was, he (Imlach) asserts, no sign of fuse, or anything to indicate that the hole contained explosive. It is quite likely that in charging a number of holes close together that a plug of gelignite was dropped into the one from which the accident proceeded, and that no primer or fuse was added. Such a thing could easily have happened, but there is no excuse for the persons who charged and fired the holes not discovering, by careful inspection after the explosions, that this one was left unexploded. Had they done so, the accident could not have happened.

David Macrostie, employed at the Tasmania Gold Mine, Beaconsfield, was mending a sieve. A long piece of wire sprang out, one end striking him in the right eye, and completely destroying the sight.

John Goodman, employed at repairing work in the Florence shaft at the Tasmania Gold Mine, slipped, and fell across a tie-lath, breaking one rib. He worked two shifts after the accident, but had to desist, and was off for some considerable time.

Richard Thomas Beswick, while taking off a valve from a pipe at the Briseis Tin Mine, slipped, and fell, twisting and breaking the small bone of one arm. He was off work for three or four weeks.

H. Gough was preparing to put a head on a stamper-shank in the Anchor Tin Mine battery. The shank slipped in the slings, and jammed three of his fingers badly. Amputation was not, however found necessary, and having to remain off work for some considerable time was the greatest loss to the sufferer.

Wm. Fox was severely, but not permanently, injured by a fall of rock in the south drive, No. 13 level, of the New Golden Gate Mine, in the same accident that caused the death of his mate, Alexander J. Lang, referred to in this report under heading "Fatal Accidents," and where particulars of this accident to Fox are already given.

Henry Wilson was jumping a hole in a large lump of cement in the Pioneer Tin Mining Company's open-cut face. The boulder, or lump, suddenly split open, letting him fall

between, where he was jammed by one half rolling on him and causing injury to one arm, which necessitated his keeping off work for about four weeks.

Oliver Miller was horse-driving, trucking stone from stone-breaker to battery at the Anchor Tin Mine. The empty truck came off the rails; when trying to get it on, the horse started suddenly, and the wheel caught Miller on the leg, bruising it badly. The doctor thought the bone was splintered. The sufferer was conveyed to the Launceston General Hospital.

*Accidents of a less serious or of a trivial nature.*—John Simpson was repairing at 718-ft. level in the Tasmania Gold Mine. A run of ground occurred. He was partly buried, and received some bruises, but not of a serious nature.

Joseph Goldsworthy (pitman), while attending to lift in pump-shaft at the Tasmania Gold Mine, put his foot too far through, and got his toes jammed by a descending cage; not very serious.

William Dobie, while lifting a cap and placing it in position at the Tasmania Mine, got his hand rather badly jammed.

Frank Cook, while placing stope-timber in position at Tasmania Gold Mine, lost his footing and fell down the underlay footwall about 7 feet, and jarred his back. He was off work for a few days.

Henry Grachan slipped down ladder-way in stope at Tasmania Gold Mine, fell on his shoulder, and ricked his neck; was off work for some days with stiff neck and shoulder.

Grainger Williams was going down ladderway into stope at Tasmania Gold Mine; he slipped, and fell some 10 feet, getting a shaking; not serious.

William Underhill was hurrying out a last truck at the Briseis Tin Mine. It left the rails; he got a fall, but was at work again the next day. On the third day he complained of pains inwardly. The doctor saw him, and advised rest. He returned to work after a week's absence, apparently all right.

James Goodman was struck in the eye by a splinter of rock flying from the pick-head while working in the Tasmania Gold Mine. He was off work for a few days. No serious results.

James Johnstone, while putting a chock behind a lath in a drive at the Tasmania Gold Mine, had the first joint of one finger taken off; he thinks, by the tomahawk he was using, but is not sure of this. He returned to work within a week.

Wm. Albert O'Connor was attending to a nozzle at the Briseis Tin Mine open-cut face. In endeavouring to pull it round, he slipped, and fell off a low staging, receiving a shaking and some injury to his face, but not serious.

George Banks was coming down a low ladder at open-cut at the Briseis Tin Mine; slipping, and falling on a peg, received some injury that necessitated a visit to Launceston. He is now all right again.

Wm. Isaac Arnold, while lifting a truck back on to the rails, at the Briseis Tin Mine, jammed his hand rather badly against a piece of cement.

Frederick Clarence Peck was horse-driving at the Briseis Tin Mine. He allowed the truck to run on to the horse's

heels, and was, himself, knocked down and had his leg badly bruised.

Lewis Blulle was dismantling a fluming at the Briseis Mine, and in the act of drawing a nail, slipped, and fell back against the side of the race. He got a severe shaking.

Henry Cottareill was helping to remove a heavy case of machinery at the Tasmania Gold Mine, when he slipped, and jammed his leg against the skids.

James Willey is some way jammed his finger at the Tasmania Gold Mine, and had to leave work for some days, the injury resulting in a poisoned finger.

Cecil Russel Holland, while working at hopperings on the Briseis Mine, was accidentally struck with a pick on the back of the head, the point cutting to the bone. He was attended by a doctor, who said the wound was not dangerous, it being on the thickest part of the skull where the pick struck.

Wm. Gracham, while working at main pump at the Tasmania Gold Mine, let the clack-door fall on his toes. No bones broken; soon all right again.

Frederick Holroyd, while shifting cases of machinery at the Tasmania Gold Mine, twisted his ankle, breaking the small bone.

George Pearson, while acting as temporary ganger on surface at Tasmania Gold Mine, inadvertently walked into an ash-pit, and broke one rib in the fall.

Edward Green fell down a mullock-pass at the Tasmania Gold Mine, and got a good shaking, but was soon all right again, although he did not return to work for three weeks.

James Mulville was helping to carry a water-pipe at the Briseis Tin Mine. He slipped and fell, the pipe end striking him on the chest. He seemed little the worst for the mishap, and worked on for a week, when he complained of pain in the chest. The doctor could, at first, find nothing seriously wrong, but said the man was not in good health, or robust, at best; later on he discovered a broken rib, that was the cause of the pain felt. Mulville was six weeks off work.

Wm. Jeffries was erecting a barricade to prevent stones, hopperings, &c., from rolling into a face where he was working at the Briseis Mine. He was struck on the shin by a stone, receiving a nasty wound. Was off work, and attended by the doctor, for a week.

Of the foregoing accidents reported during the year, the Tasmania Gold Mine has 18 out of 41; but this is brought about by the fact that all accidents, no matter of how trivial a nature they may be, occurring on that mine are reported to the Inspector. If the same course were followed on all the mines, it would be seen that the rate per 1000 men employed would not be greater on this mine than it probably is on any of the other mines in these Divisions. Many of the mine managers have an aversion to reporting accidents that occur on the mine of which they have charge, and content themselves by reporting only accidents of a very serious nature, should such occur. It would, I consider, be an improvement if the wording of Section 89 of the Act were altered, so as to require all accidents occurring on a mine to be reported to the Inspector. It often happens that accidents, apparently of a very trivial nature at the time of their occurrence, are, after all, only narrow escapes from what might easily have

been attended with serious consequences, and if not reported, there would be no opportunity for investigation as to the cause, or as to whether anyone was to blame for the accident.

*Inspection Duties.*—Since my removal from Gladstone to Launceston, and being relieved of the management of the Mount Cameron Water-race, I am enabled to visit oftener and give more attention generally to the inspection of mines in the Divisions under my charge. The principal mines, and those requiring most attention from the Inspector, can be visited at intervals of two months, exclusive of special visits when serious accidents occur. Most of the others are visited quarterly, and some few, such as the coal mines in the South, twice a year. Having the inspection of magazines, outside mining fields, takes a good deal of my time.

Safety-cages and hooks, ropes, chains, shackles, and hauling appliances generally have been inspected and tested regularly. One safety-cage was condemned; others were found defective, and ordered to be replaced by spare ones on hand. Two windlass-ropes were condemned; also one engine-hauling rope. As a rule, the hauling-ropes on the large mines receive careful attention, being overhauled every week, frequently cleaned and oiled, or removed altogether should there be any defects that shortening or reversing would not overcome. One horse-whim used for hauling from a shaft over 400 feet in depth was found unsafe, and was condemned.

*Ventilation.*—This was generally satisfactory. There is still room for improvement at the Tasmania Gold Mine, Beaconsfield. No doubt, when the new machinery is erected and the mine unwatered to the 1000-foot level at Hart's shaft, and a connection with the old workings made, the ventilation can easily be improved. At the New Golden Gate Gold Mine a rise (south) from the bottom, 1600-foot level, has been carried through to the surface, and a great improvement in the ventilation effected. It is, however, disappointing to find that the new connection is working as a down-cast, and that the up-cast is in the main working shaft; thus, the whole of the ventilated air from the mine escapes to the surface in this direction. The principle is wrong, as, in the event of a fire in the mine getting a hold of the dry timbers in the upper levels, the smoke and fumes would travel to the main shaft, which is the only means by which the men could escape in a cage to the surface. The rise airway, if carried up about 30 feet above its present surface-level, which is about the same as the main shaft brace, could be easily converted into an up-cast; the main working shaft would then be the down-cast, and the risk above referred to obviated.

*Complaints Made.*—Only one formal complaint in writing, as required by Section 97 of the Act, was made. This received prompt attention. In this case shaft-sinking below a 200-foot level had been commenced after one of my visits. The complaint received was to the effect that the 4-h.p. single-cylinder engine used for hauling was not powerful enough, nor to be depended upon to get the men away after firing; that there was no proper ladder-way from the plat downwards, or chain-ladder at bottom; that the braceman employed was under

the required age; and finally, that the enginedriver worked over 8 hours per day. I found, on investigation, that these charges were mainly correct, the worst feature being that not only was there no proper provision made for the men to ascend to the plat when shots were fired, but that the main ladder-way was blocked in such a way—the steam-pump being placed in it—as to leave no room for men to get up or down. The defects had to be promptly remedied. The miner from whom the complaint was received deserves credit for having reported dangers that, if not remedied, might easily lead to bad accidents.

*Prosecutions.*—It was found necessary to proceed against the mine manager, two foremen, and one employee of the Anchor Tin Mine, under two separate and distinct charges; the first of these being against the mine manager and one of his foremen, for having failed and neglected to provide proper means for thawing a nitro-glycerine compound (gelignite) when in a frozen state, and for allowing it to be used in such frozen state, contrary to Section 94, Sub-section II., (k), (l), of "The Mining Act, 1900." A very serious accident occurred on the mine, by which an employee, one, Charles Berwick, had the sight of both of his eyes completely destroyed, and received other injuries, when, as powder-monkey, he was charging a drill-hole with frozen gelignite, and a premature explosion took place. Both defendants pleaded guilty to a technical breach of the Act and Regulations, through their counsel, who informed Mr. Commissioner Hall, before whom the charges were heard, that his clients in no way admitted that the frozen state of the gelignite caused the premature explosion by which Berwick was injured. In the other case, the chief foreman and an assistant powder-monkey were charged with having failed to take necessary and reasonable precautions in the charging and firing of several holes, to ascertain whether all of such charges had exploded, and further, with not having discovered and reported as a misfire one of the charges so laid, thus causing an accident by which a person was injured. In this case the person injured was one, Thomas Imlach, whose duty it was to drill pop-holes in boulders and blocks of stone in the face-level, and who, having returned to his work on the day following the evening in which the holes above referred to were charged and fired by the defendants, discovered one hole in a block of stone which, to all appearance, there being no sign of fuse visible or of partial explosion having taken place, he believed was overlooked and not charged at all. He proceeded to clean out the hole, partly filled with dirt, and prepare it for charging, using a steel jumper which he carried in his hand, when an explosion occurred by which he lost the sight of one eye and received other injuries. A plea of guilty was obtained from the person assisting as powder-monkey; the charge against the chief foreman was then withdrawn. The penalties and costs awarded against the defendants in these cases amounted to about £20.

I very much regret the necessity for taking action in the foregoing cases, but there was undoubted evidence of a great want of care and absence of necessary precautions for the

safety of the men employed. Had proper precautions been taken, the unfortunate accidents, causing life-long injuries to two men, would in all probability have been avoided.

*Magazines.*—The storing of explosives at the surface is generally satisfactory. The magazines are well protected, and kept clean, dry, and well ventilated. Underground, however, things are not, as a rule, so good, and a good deal of trouble is experienced in getting proper provision made for the storing of the quantity allowed by the Regulations. Even when such provision is made by the management, the men cannot always be got to observe the rules—naked lights are taken into the magazine, package-papers and other inflammable substances are left strewn about, &c.; contract parties must each have their own box or locker, and think they have a perfect right to carry and place such boxes, irrespective of the quantity of explosive they may contain, to and in any part of the level they work at. I do not know that the final paragraph in Sub-section XLIII., Section 94, of the Act, "Every miner on being engaged is to be supplied with a copy of the Rules," has in any way improved matters. Year by year the percentage of accidents due to carelessness on the part of the men themselves is on the increase.

#### COAL MINES.

*Cornwall Colliery.*—Some trouble was experienced through the thickening of a 3-inch band in their 6-foot principal working seam, which rendered the profitable working of the coal below the band (about 18 inches) useless. It was therefore decided to work the upper portion of the seam, about 4 feet of coal, between the band and the roof, and this has been done since the early part of the year, with good results. The working of the colliery, so far as safety is concerned, was generally satisfactory. Ventilation, at times, was rather dull, but this will be improved in a very short time, so soon as a new back-heading, giving a more direct and roomy return airway is connected. The main heading is still being carried forward, and is now in 45 chains from the entrance. No faulting of the seam has been met with during the year. Twenty-six places, cord and pillar, are being worked for coal.

*Mt. Nicholas Colliery.*—The working of this colliery for the year was generally satisfactory. Faulting of the seam still continues, and makes "long-wall" working difficult. These faults have an approximately north and south strike, and cross the main heading, which is going about north-easterly at a long angle. For some time past they occurred as rolls of from 2 to 3 feet; latterly, however, a greater difference of level is noticeable, the last one cut by the main heading being a "down-throw" of about 8 feet. Both drainage and ventilation are made more difficult by these faults, and the roof being broken makes it bad for long-wall working. A drive has been extended from the first right-hand working place to daylight on the south-east slope of the hill; this was mainly for drainage purposes, but can be used as a means of escape,

if required, and also to assist ventilation. Most of the working places (there are 16 in all) are now on the west or north-west side of the main heading, the faulting of the seam being less troublesome on this side.

*Dulverton Colliery.*—I have had a good deal of trouble in enforcing a reasonably safe system of working at this colliery. Orders given for improving and properly securing the main adit-heading were at first ignored; it was only when a peremptory order prohibiting further work in the coal faces until this heading was made secure was given that an improvement was effected. This was in the early part of the year; later on, it would appear that the old careless and slovenly system of working was reverted to, and it was found, on the men going to work one morning, that a large portion of the tunnel-roof had collapsed. The manager reported that it had been tampered with by some person during the night. Much noise was made about this by the proprietors. I was unable to get into the heading or tunnel when a visit to the colliery was made later on, but from what could be seen of a subsidence at the surface, and knowing the bad system of timbering usually adopted at the mine, I have not the least doubt that this was the cause of the accident, and that it was not tampered with by outsiders. Work has since been carried on in an old tunnel; here, again, there was danger of accident, and necessary repairs had to be insisted on. I have to complain of repeated evasions on the part of the owner, for, although called a company, this mine is controlled by one Launceston gentleman and the mine manager, both of whom are bent on getting coal as cheaply as possible, and without a proper regard for the safety of the men employed.

*Teasdale Dulverton Mine.*—Not much doing at the Teasdale Dulverton Mine. Rolls and faulting are the trouble there. It is, however, worked in an intelligent and fairly safe way.

*Spreyton.*—Not much doing at Mr. Allison's pit. The new works west of the valley had to be abandoned for a time, on account of an influx of water. A return to the old workings on the east side was made; even here, not much was being done at the time of my last visit.

Mr. Bound is getting some coal out of his Illamatha Colliery, and the workings are in fairly good order.

*Sandfly and Mount Cygnet Collieries.*—My last visit to these was about the end of September.

At the Sandfly, the main heading was in 260 feet, working to the dip. The system of working, although safe enough, is by no means the most economical way of opening up a new coal mine. A want of experienced coalminers is no doubt the cause of this. The coal is evidently of good quality, and the prospects of the mine warrant more skilful engineering to commence with.

*Mount Cygnet Colliery.*—Did not find much to complain of at this mine, with the exception that man-holes as places of refuge in the tunnel engine-hauling inclined plane, ordered on a previous visit, had not been attended to. The manager's

contention that there is ample room for men to escape injury from the skips passing will not do, and proper places must be provided. The dip of the seam is considerable, and haulage, therefore, more difficult. A year ago a new winding-engine was provided. The working places had passed into more settled country, faulting of the seam was less frequent, and a better time generally for the colliery was anticipated; unfortunately, however, another down-throw fault met with has seriously interfered with coal-getting.

*Colebrook.*—Nothing doing at this place at time of my last visit in September. A caretaker, who was in charge, informed me that the pit was idle, pending some settlement of a dispute between the owners and the tributors.

The Marialva Company has taken over Morrison's Glenleith Coal Mine, and will work it in conjunction with the Marialva should the latter ever commence operations again.

*York Plains Coal Mine.*—The property on which this is situated has recently been purchased by Mr. J. C. Gregg, who for some years has occupied it for pastoral purposes. It is, I understand, his intention to work the coal on a more extensive scale than has hitherto been the case. The coal (anthracitic) being almost smokeless, is mainly used by brewers, and its sale is therefore limited. The seam is worked to the dip by means of tunnels from the south-west and west side of the hill. The method of working is not always satisfactory. At time of last visit I found the roof, where men were working in a bord off an old tunnel, in a very bad condition, and had to order timbering, and better precautions for safety to be taken.

*New Mines Opened.*—Only a few mines have been added to the list for inspection during the year. At Blythe River, the Copper King (Clarke & Sice) has been started, and promises to come permanently on to the list of working mines. The Commonwealth Copper Syndicate, in the same locality, made a commencement by putting in a tunnel, but was not working at time of my last visit. The Blythe Iron Company had men prospecting for copper on its leases, where some tunnelling was going on. At Beaconsfield no new mine has been opened. The King Victor, working in the early part of the year, has shut down. The Tasman United, Tasmania West Extended, and Moonlight-cum-Wonder are all idle. Only two have been added to the list at Mathinna, the South Miner's Dream and the Victorian New Golden Gate, both of which are tunnelling. The Golden King Mine has recently ceased operations.

LIST of Accidents in Inspector Griffin's District for the Year 1904.

Fatal, 5 ; non-fatal, 37 ; total, 42.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
1904. 7 Jan.	Tasmania G.M.	Beaconsfield	Fall of earth	John Simpson	Married	Bruises on body	Was repairing 715-foot level. When removing cap-piece a run of earth took place, and Simpson was partially buried. He only received a few slight bruises.
23 Jan.	New Golden Gate	Mathinna	Fell into quartz pass	Samuel Lee-Count	Ditto	Bruises on shoulders and legs	Was raking quartz into pass ; filled pass to collar and stood on top of the quartz, which dropped about 6 feet. Other quartz from the rill fell into pass and buried him.
22 Feb.	Tasmania G.M.	Beaconsfield	Struck by cage in shaft	Joseph Goldsworthy	Ditto	Bruised foot	Attending to lift in main shaft ; put his foot into cage compartment, and had it grazed by descending cage.
5 Mar.	Ditto	Ditto	Crushed by timber	Wm. Dobie	Single	Crushed hand	Was lifting cap-piece into position, and got his hand jammed between cap and leg.
18 Mar.	New Golden Gate	Mathinna	Fall down pass	Henry Wilson	Married	Fatal injuries	Was trucking mullock at No. 1 level and tipping it into main pass. Wilson, by some means, got into the pass, and was found lying dead on the mullock, 380 feet below. No evidence as to how he got into pass.
15 Mar.	Tasmania G.M.	Beaconsfield	Fall in stope	Frank Cook	Ditto	Injury to back	Was placing stope timber in position and lost his footing, slipping about 7 feet down the foot-wall and jarring his back.
6 April	Volunteer Consolidated G.M.	Mathinna	Explosion of gelignite	Lewis Bear	Ditto	Hands and arms lacerated and scorched	Was charging a hole, and, when putting in first plug of gelignite, an explosion occurred.

14 April	Tasmania G.M.	Beacons- field	Fall off lad- der in stope	Harry Grachan	Married	Ricked neck	Was going down ladder-way to stope; slipped on log at bottom of ladder, falling on his shoulder.
25 April	Briseis T.M.	Derby	Fall in open cut	Michael Con- lan	Single	Injuries to abdo- men	Was barring down loose boulders; slipped and rolled down over sloping pile of boulders about 12 feet, one large boulder strik- ing him on back and side. This caused a twist of the intestines. Conlan died 30th April.
2 May	Tasmania G.M.	Beacons- field	Caught in machinery in motion	Thos. Richard Miller	Ditto	Dislocated neck, &c.	Was oiling machinery in motion and became caught in it.
11 May	Ditto	Ditto	Fall in stopes	Wm. Grainger	Married	Bruised shoulder, &c.	Going down ladder into stopes; missed his footing and fell about 10 feet.
21 May	Briseis T.M.	Derby	Fall off truck	Wm. A. G. Underhill	Single	Severe shaking	Was hurrying out last truck from face. Truck left line and Under- hill fell off.
2 June	Tasmania G.M.	Beacons- field	Piece of stone fly- ing from pick	James Good- man	Married	Injury to eye	Was working in stope, and a piece of stone flew back from the pick and struck him in the eye.
13 June	Ditto	Ditto	Tomahawk slipped	James John- stone	Ditto	Joint off first fin- ger left hand	Was putting a chock behind a lath, and took off top joint of first finger of left hand.
7 July	Anchor T.M.	Lottah	Machinery in motion	Hugh Parry	Single	Both legs broken below knees	Was about the machinery and got caught in one of the bat- tery belts, being drawn under the pulley. Had no right near the machinery.
11 July	Ditto	Ditto	Struck by rolling stone	John Eager	Ditto	Left leg broken above ankle	Was working in open cut. A stone rolled from a higher bench and struck him on the leg.
14 July	Briseis T.M.	Derby	Fall from stage	Wm. Albert O'Connor	Ditto	Broken jaw	Was on nozzle-stage shifting nozzle and fell off.
21 July	Anchor T.M.	Lottah	Explosion of gelig- nite	Charles Ber- wick	Married	Injuries both eyes, cuts, bruises	Was charging a hole with gelig- nite, which was frozen and hard. In pushing the plug home with a wooden rammer an explosion took place. Doctor says sight of both eyes will be completely lost.

*LIST of Accidents in Inspector Griffin's District for the Year 1904—continued.*

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
23 July	Briseis T.M.	Derby	Fall from ladder	George Banks	Single	Bruised testicles	Coming down ladder about 4 feet high ; slipped and fell on to peg in sluice-race.
29 July	Anchor T.M.	Lottah	Explosion of gelignite.	Thos. Imlach	Married	Injury to left temple and eye.	Was cleaning out a hole which, unknown to him, had a charge of gelignite in it, with a steel jumper. After the second blow an explosion occurred.
29 July	Briseis T.M.	Derby	Lifting truck on to road	William Isaac Arnold	Single	Jammed hand	Was lifting truck on to road and jammed his hand against a piece of cement.
30 July	Ditto	Ditto	Runaway wagon	Fred. C. Peck	Ditto	Bruised leg	Was driving a horse, and allowed empty wagon to run on to horse's heels. Peck was knocked down.
30 July	Ditto	Ditto	Fall against side of race	Louis Bulle	Ditto	Shock	Dismantling a race. Whilst drawing a tight nail fell back on to side of race.
3 Aug.	Tasmania G.M.	Beaconsfield	Fall of box of machinery	Henry Cotterell	Married	Bruised leg and small bone of ankle broken	Was assisting to move a case of machinery ; the case slipped and jammed his leg against skids.
26 July	Ditto	Ditto	Piece of wire springing	David Macrostie	Ditto	Sight of right eye destroyed	Was fixing up a loose piece of wire in his sieve. The wire sprang back and hit him in the eye.
8 Aug.	Ditto	Ditto	Poisoned finger through a jam	James Willey	Single	Poisoned finger	Was fitting machinery and jammed his finger.
22 Aug.	Ditto	Ditto	Fall in shaft	John Goodman	Married	Broken rib	Was repairing shaft, and fell on his side across a lath.
25 Aug.	Briseis T.M.	Derby	Struck by pick	Cecil Russell Holland	Single	Wound on back of head	Was working at hopper with another man, who accidently struck him with a pick.

7 Sept.	Tasmania G.M.	Beaconsfield	Moving machinery	Fredk. Holroyd	Single	Broken ankle	Was lifting a heavy case of machinery and twisted his ankle, breaking small bone.
7 Sept.	Ditto	Ditto	Fall of clack-piece in pump-shaft	Wm. Grachan	Married	Bruised toes	Was working in main pump-shaft and dropped pump clack on his toes.
10 Sept.	Ditto	Ditto	Fell into ashpit	Geo. Pearson	Ditto	Broken rib	Ganger on night shift. Through not looking where he was going slipped and fell into an ashpit and broke a rib.
20 Sept.	Briseis T.M.	Derby	Slipped and fell	Richd. Thos. Beswick	Ditto	Small bone of arm broken	Was turning off a valve when he slipped and fell, bruising his arm and breaking small bone.
27 Sept.	Anchor T.M.	Lottah	Machinery slipping	H. Gough	Single	Fingers jammed	Was preparing to put a head on a shank which was hanging in sling-chains; shank slipped and jammed three of his fingers in the hole of the head.
8 Oct.	New Golden Gate	Mathinna	Fall of stone	Alexander J. Lang	Ditto	Injuries to chest	Was working in drive at No. 13 level when a fall of stone took place, and a portion of it struck him on the shoulders causing internal injury, from which he died a few minutes later.
8 Oct.	Ditto	Ditto	Ditto	William Fox	Married	Cuts and bruises head and body	Was working in No. 13 level with abovementioned man Lang, and was injured by the same fall of stone.
14 Oct.	Pioneer T.M.	Derby	Fall of earth	Henry Wilson	Ditto	Bruised arm	Standing on top of lump of cement, jumping hole into it. The lump broke in two. Wilson fell in between the two pieces, and portion of the cement rolled on to his arm.
14 Oct.	Tasmania G.M.	Beaconsfield	Fall in mullock pass	Edwd. Green	Single	Shock	When going down mullock pass slipped and fell, receiving a shaking.
21 Oct.	Briseis T.M.	Derby	Fall whilst carrying a pipe	James Mulville	Married	Broken rib, and severe pains in chest	Was helping to carry a pipe, and in doing so slipped and fell, receiving a blow on the chest.

*LIST of Accidents in Inspector Griffin's District for the Year 1904—continued.*

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
7 Dec.	Anchor T.M.	Lottah	Run over by truck	Oliver Miller	Married	Fractured leg-bone and bruises	Was horse-driving on tram from tunnel to battery. He states that an empty truck ran off the line; whilst he was endeavouring to get it back again the horse started, and truck wheel passed over his leg.
8 Dec.	Briseis T.M.	Derby	Fall of rock	Francis Jos. Robinson	Single	Fractured skull and broken leg	Was loading stone into truck at a face about 25 feet high. A part of the lower portion of the face came away unexpectedly, and a large stone from it caught Robinson's leg and broke it. The force threw him down, and his head struck a stone with such force as to fracture the base of the skull.
3 Dec.	Briseis T.M.	Ditto	Rolling stone	Wm. Jeffrey	Married	Bruised shin	Erecting barricade to keep hoppers from rolling into face, and was struck on shin by a piece of rolling basalt.
7 Dec.	New Golden Gate	Mathinna	Fall of stone	Joseph Street	Ditto	Cut head and slight fracture of skull	Was trucking at 800-ft. level, and whilst trucking a small stone came down a chute which he was passing and struck him on the head.

Mr. INSPECTOR HARRISON (stationed at Zeehan) reports:—

In submitting my annual report, I beg to state that the accident list is as follows:—Fatal, 3; serious, 5; non-serious, 6.

Two men were killed instantaneously in the Hercules Mine, Mt. Read, while charging a number of holes bored in the face of No. 6 adit. Another met his death by falling down a winze in the Spray Mine. He was drowned in about 5 feet of water which was in the level at the time.

#### ROPES AND CAGES.

Ropes and cages are in good working order. In several instances the old ropes have been replaced by new ones.

#### VENTILATION.

The ventilation of the various mines is good, and the managers find it to their interest to keep a good supply of fresh air for the workmen.

#### MAGAZINES.

I have now 25 magazines on my list. So far, nothing has been done towards removing the two within the precincts of the town to the area set apart for them.

#### LEGAL PROCEEDINGS.

Only in one instance was it necessary to take action, and this was through the negligence of one of the gangers of the open cut, Mt. Lyell Mine. One of the workmen lost the sight of one of his eyes. A verdict was obtained against the ganger.

There has been an increase in the output of mineral during the year, whilst the substantial increase in the price of metals has caused more attention to be given to the poorer lodes of the district. Extensive progressive work is being undertaken by the managers of the principal mines of the district; and I am confidently looking forward to a further increase in the output of minerals from this field for the coming year. Following is a short report on the various fields and principal mines:—

*Zeehan Field.—Mt. Zeehan (Tas.) Mine.*—This property is looking first-class throughout. The manager has prepared plans for new main shaft and powerful pumping plant on the Spray section; and this work, I understand, is to be taken in hand without any unnecessary delay.

*Zeehan-Montana.*—Manager busy sinking from the 600-foot level; present depth, 650 feet. Proposed to sink to 800 at No. 2 shaft. Plunger workings have been put in at the 200-foot level, and sinking started. It is intended to open out at 400 feet. The usual output is being kept up.

*Zeehan-Western.*—Manager has opened out at the 800-foot level. A few parties are kept breaking ore in the higher levels.

*Zeehan-Queen.*—The prospects of this mine have improved very much during the last quarter. Manager has now a good payable shoot of ore in Clarke's lode, consisting of galena and stannite.

*Florence Mine* is opening up very well. The result of last quarter's work is 188 tons of ore, yielding 13,530 ozs. silver

and 97 tons lead; net value £1857. Concentrating mill has been started and is doing good work, and a good output can be expected.

*Oonah.*—Matters at this mine are rather quiet. The directors have parted with their dressing-mill to the Murchison Mine, at Mount Farrell.

*Nubeena.*—This mine is on tribute, and is being worked with very good results.

*New Mt. Zeehan.*—Several small parties are working on this lease on tribute.

*Silver King.*—On this property I regret to say there is hardly anything doing, only 45 tons of low-grade ore having been won for the last quarter.

*Comstock District.—South Comstock Mine.*—Several tribute parties at work on galena and zinc blende. Two of them are erecting small pumping plants. Their prospects are good.

*Dundas District.—Comet Mine.*—On tribute, giving employment to 40 men. Over £2000 worth of ore (net) has been won during last quarter. Mining is confined to the upper levels, where new ground is being opened up.

*West Comet.*—This mine is supplying the local smelters with low-grade fluxing ore at a profit.

*Mt. Read and Ring River.—Hercules.*—This mine is now turning out larger quantities of galena and zinc blende ores. The former goes to the local smelters, and the latter is exported. Output for the year—galena, 9420 tons; blende, 7625 tons; and gossan, 50 tons. A new plant has been erected for separating the galena from the blende; it is working very satisfactorily.

*The Mt. Read Company* is still driving a deep adit for the lodes.

*The Ring River Company* has taken out a few parcels of copper ore, which have been disposed of to the Mt. Lyell Company.

*Fahl Ore Company* is working on high-grade fahl-ore, which is disposed of to the Mt. Lyell Company.

There are a few parties working on the Curtin-Davis hill.

*Mt. Farrell District.—North Farrell Mine* is opening up very well indeed. Arrangements are being made for sinking a winze from the No. 4 adit.

*Murchison Mine.*—The directors have purchased a dressing-mill, which is to be erected without delay. The mine is looking very well, and there is a large heap of milling ore ready for treatment.

*Macintosh Mine.*—A small party of tributors has taken this mine on tribute, and is now getting out a parcel of ore.

*Heemskirk District.—Mayne's Tin Mining Company* is still working with payable results.

*Federation Mine.*—Some new developments have taken place lately. A lode has been laid bare, the capping of which has given prospects up to 5 lbs. tin to the dish. The property is about to be floated in London.

*Tasman River Mine* is working on payable alluvial tin wash. Several small parties are at work on the small alluvial flats; all are getting tin.

*Stanley River District.*—This extensive tin-field is opening up very well. Fresh finds are being made in the hills every few days. The prospects of the field for both lode and alluvial

tin are very bright. An outlet, either by road or tram, is badly required. The only means of communication at present is over 20 miles of pack-track, and an aerial cage over the Pieman River.

*White River, Hazlewood, and Mt. Stewart.*—At the Whyte River a few men are working on the tin-grounds.

*Washington Hay Mine.*—The owner of this mine is breaking high-grade galena ores, and is about to erect a small dressing-mill to treat the seconds.

*Long Tunnel Mine.*—A 5-mile tramway is under construction to connect this mine with the main road to Waratah. An agreement has been entered into between the directors and the Tasmanian Smelting Company for the supplying of 1000 tons of ore. Most of this is stacked on the surface, and there are large quantities of ore showing in the stopes.

*Magnet Range.—Magnet Silver Mining Company.*—Nearly 3000 tons of gossan ores, carrying about 31 ozs. silver and 11 per cent. lead per ton have been exported to Dapto and Cockle Creek during the last quarter. The main shaft is being sunk another lift. The new dressing-mill is about ready to start. Mine looking well.

*Mt. Bischoff.*—*Mt. Bischoff Tin Mine* is working away as usual, and employing a large number of men.

A few small companies are working in this district.

*General.*—There is a large number of prospectors out in several directions, including N.E. Dundas, where tributors have taken up the Renison Bell Mine; Mt. Heemskirk; and the Professor Range. Annexed is the list of accidents for the year.

*LIST of Accidents in Inspector Harrison's District for the Year 1904.*

Fatal, 3 ; non-fatal, 11 ; total 14.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
1904. 19 Feb.	Zeehan-Montana	Zeehan	Fall of stone	James Grady	Married	Compound fracture of right leg	A large piece of rock came away from hanging wall of stope where he was working.
22 Feb.	Tas. Smelting Works	Ditto	Hot slag exploded	Thomas Hines	Ditto	Injuries to eyes	Was keeping slag clear at the Smelters when an explosion took place in the shoot, splashing some of the hot slag on to his eyes.
8 Mar.	Zeehan-Montana (No. 2)	Ditto	Fall of stone	Frank Combes	Ditto	Bruises	Portion of face of drive came away.
8 Mar.	Hercules G. and S.M.	Mt. Read	Piece of flying steel	John Harris	Single	Injury to eye	Spark from blacksmith's anvil.
18 April	Tas. Smelting Co.	Zeehan	Explosion of slag	Thomas William Hudson	Ditto	Injuries to eyes	Was engaged in turning the water on and off in the granulating shoot, and an explosion occurred.
25 June	Hercules G. and S.M.	Mt. Read	Explosion	Frederick Breheny	Ditto	Mutilation, causing instant death	} Were charging a machine-bored hole when a premature explosion took place. Both men were found dead.
Ditto	Ditto	Ditto	Ditto	Bertie Ayton	Ditto	Ditto	
4 July	Mt. Bischoff T.M.	Waratah	Splash of molten metal	William Kenworthy	Ditto	Injuries to eyes	Was assisting moulder, and some of the molten metal flew and struck him on eyes.
29 Aug.	Oonah S.M.	Zeehan	Fall of rock	John Price	Married	Scalp wound	Was working in stope, and part of hanging-wall came away, some part of which struck him.

10 Sept.	Zeehan-Western	Zeehan	Caught by descending cage	Frederick Radford	Married	Right leg broken	Was working in bottom of shaft; cage descended, and he did not get out of the way quickly enough; his leg was caught by cage, and broken.
12 Sept.	Silver Spray, Mt. Zeehan, Tasmania	Ditto	Fall down winze	Henry Thomas Carey	Single	Cut on head	Was engaged looking after steam pump. His body was found at bottom of winze, in about 4 feet of water; but no one knows how he got there.
22 Sept.	Zeehan-Montana	Ditto	Fall of stone in stope	Joseph Rush-ton	Married	Bruised shoulder, arm, and side	A piece of stone came from roof of stope as he was crawling under it.
1 Oct.	Ditto	Ditto	Fall of stone	John Lacey	Ditto	Bruised side	Was crawling into stope after shot, and a piece of stone came down on him.
9 Nov.	Zeehan-Western	Ditto	Lowering of cage in shaft	George Webb	Ditto	Cut head, and shock to nerves	Was engaged sinking in bottom of shaft. Cage was about 15 feet up from bottom, hanging. Driver started engine wrong way, and lowered cage on to Webb.

Mr. Inspector CURTAIN (stationed at Queenstown) reports:—

*Casualties.*—The first half of the period under review having belonged to Mr. Waller's term of office, I simply transcribe the minutes that were entered by him. The balance of the period being free from any fatal or grievously serious accident, can be most favourably compared with any other Australasian mining centre of equal magnitude. The death of the youth Arthur Tibballs, which took place in the concentrating mill of the Lyell Blocks Mine on the morning of the 29th of December, being by the medical testimony and subsequent finding of the coroner's jury ascribed to natural causes, is for that reason omitted. Apart from this, the list of accidents is as follows:—

*Mount Lyell Mining and Railway Company, Limited.*—

(1) Albert Cox, single, aged 23 years, powder-monkey, North Lyell Mine. A premature explosion of gunpowder caused injuries to head and body; followed by death within two hours.

(2) John Cauley, single, 42 years, navy, Mt. Lyell open-cut mine. Fell from one bench to another while arranging tram-line. Collarbone broken and disjointed hip; has resumed work.

(3) Frederick Occleshaw, married, aged 40 years, head foreman bricklayer. Electrocuted at the reduction works, in consequence of coming in contact with uninsulated electric metals.

(4) Henry Lee, married, aged 40 years, head foreman ganger at the Mount Lyell open-cut mine, was charging a hole with rackarock, when it prematurely exploded, causing burns to his hands and face. He is again on duty.

(5) William Coady, 39 years, ganger Mount Lyell open-cut mine, lost his eyesight by an explosion through stooping over a charged hole of powder, into which a lighted primer had been dropped for the purpose of "bulling" it.

(6) J. Quinn, single, aged 22 years, miner, North Lyell Mine, was struck on the stomach by a stone coming away from an unprotected back; internal injuries resulted. On becoming convalescent he left for Victoria.

(7) Peter Petersen, single, aged 40 years, navy at the Mt. Lyell open-cut mine, lost an eye by driving a gad into a drill-hole that contained a charge of lithofracteur. He is convalescent.

(8) John Robinson, married, aged 34 years, aerial filler at the Mt. Lyell Mines bins, had both bones of his right leg broken above the ankle by an empty truck that was being shunted for repairs being bumped off the travelling way, and falling on him. He is still incapacitated, though out of the hospital.

(9) William Anderson, single, aged 26 years, miner, North Lyell Mine, had his eye injured by a chock which he was driving home springing back (rebounding), and causing the injury. He is again at work.

(10) Richard Holmes, married, aged 28 years, navy at the Mt. Lyell open-cuts mine, had his second toe broken, also his great and third toes and portion of instep on right foot jammed by a piece of dislodged pyrites rolling over on them. He is still confined to his home.

(11) Dennis Dowling, married, aged 55 years, labourer, while engaged emptying ore-trucks at the reduction works, fell into an ore-bin. After a week's attention at the hospital he left, well towards recovery, for Hobart.

(12) Charles Creed, widower, aged 50 years, was engaged filling limestone at the No. 2 plant, when some stone came down the bin in which he was working, and struck him on the shin and jammed his thumb. The thumb had to be amputated.

(13) John William Miley, married, aged 25 years, engine-driver, was cleaning one of the engine columns, when his foot slipped from the bed-plate, and was struck and crushed by the crank. He is back again at his work.

(14) Robert Gray, single, aged 23, was engaged on a drilling machine, at the 400-feet level, main stope, when a piece of stone dislodged by a workman near him struck him in the eye and caused its loss.

*Lyell Blocks Copper Corporation.*—(1) William King, married, aged 46 years, shift boss, was assisting in erecting timber on the top of the underground bin-floor, when stepping on a floor-slab that had, unknown to him, been displaced, he was precipitated into the ore-bin, and broke his right leg, in addition to receiving a severe shaking. He is again at work.

(2) Denis Nugent, single, aged 29 years, was engaged feeding a puddling machine, and while endeavouring to free its overflow was knocked into the trough by one of the revolving arms. He instantly regained his feet, and throwing himself out, saved his life. Beyond a severe shock he received no other injuries, and resumed work within a week.

(3) John Eddy, single, aged 23 years, miner, was injured in E. 1 section of the "office" tunnel stopes, about the legs and right thigh, by a fall of clay from the roof. This was chiefly attributable to Eddy and his mate withdrawing all the back laths for the purpose of putting in a hole, with the result that the ground (clay) being "winded" came away. He is at work again.

*Crown Lyell Copper Mining Company, No Liability.*—John Tyquin, single, age unknown, was engaged sinking the shaft, and in coming to the flat, fell off the chain-ladder. He received a severe shaking, but was able to leave the State.

*Ropes and Cages.*—Those in use, in addition to my own trials, have, especially in the case of the Mt. Lyell mines, received frequent tests by the owners, and when not up to the locally-recognised standard, were replaced or submitted (as regards the latter heading) to repair and overhaul. The ropes in general use for all classes of transit throughout this

district are in good order and condition. "Miller's" Tasmanian cage predominates, and were a hand-lever, with appliances similar to that of "Cowling's"—without the adjusting spiral spring—added, so that in case of necessity the cage could be stopped by anyone travelling in it, its efficiency would be improved. All surface tests with these cages invariably prove satisfactory; but it is questionable whether, if they were tried at greater depths, or in the event of a fall (tail) of the rope remaining over the pulley, or of an enginedriver losing control of the drum, the results would be equally satisfactory.

*Shafts and Ladder-ways.*—Owing to the corrosion occasioned by acid mine water, it is found necessary, in timbering, to adopt a "lock-joint" or "dove-tailed system," in order to do away as much as possible with any class of support or resistance that may require metal fastenings. The rungs in the ladders of the North Lyell Mine are being replaced with well-turned seasoned hardwood, as the latter possesses greater safety than the ordinary iron rounds, which are constantly wasting away.

*Ventilation.*—This, in all the mines, ranges from adequate to excellent, the air throughout the North Lyell and Blocks main stopes being exceptionally pure and wholesome.

*Open Cuts and Surface Workings.*—These, in all instances, have been carried on with care, and operations having ceased on the South Tharsis, the management had this, and the western side of the North Lyell, securely fenced, to protect the travelling public.

*Uncovered Shafts.*—These are a menace for which the active leaseholders are but in rare instances responsible as I am aware of shafts having had the decking removed and thrown into them. At present there are a number of shafts open, but the properties are deserted, and belong to no one.

*Skilled Labour.*—The North Lyell and Blocks Mines are training a class of labour which, for the purpose in view, must eventually prove superior to any that may be imported; and for that reason it is a great mistake the men do not recognise the value of obtaining from their employers a certificate of service and merit, like any craftsman in other callings. At present the only possessors of these are young students from the neighbouring States; while the "bone and sinew" look upon such recommendations with indifference.

*School of Mines and Mechanics' Club.*—Both of these institutions have been in existence for some time, and, thanks to the liberality of Mr. Sticht and the Mount Lyell Company, satisfactory progress is being made in the most useful branches of mining and mechanics, which are taught and demonstrated by a staff of practical instructors and lecturers. Classes meet twice a week in the State schoolroom, while assaying and analytical chemistry are taught in the commodious laboratory of the Mount Lyell Company.

*Inspections.*—Inspections and duties pertaining thereto have been attended to, as follows:—Lyell Blocks, 25; North Mount Lyell Mine open cuts, 25; North Mount Lyell Mine, underground, 23; Iron Blow Mine, 18; Crown Lyell Mine, 16; Mount Lyell clay faces, 16; Mount Lyell flux quarries, 16; reduction works, 8; Comstock-Tasman Mine, 4; Tasman and Crown Lyell Extended Mine, 4; May's Mine, 4; Coronation Mine, 3; Lake Jukes Mine, 2; Lyell-Tharsis Mine, 2; magazines, 15; enquiries, 6; inquest, 1.

*Prospective.*—The year just entered promises to be a busy and prolific one, as in addition to extensive prospecting at the mines, several parties are being equipped for further exploration in the bush, whence reassuring reports are already to hand in reference to Jukes, Darwin, and the Lynchford districts.

---

*LIST of Accidents in Inspector Curtin's District for the Year 1904.*

Fatal, 2 ; non-fatal, 16 ; total, 18.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
1904. 27 Jan.	Mt. Lyell M. and R.	Mt. Lyell	Explosion of powder	Albert Cox	Single	Injury to brain and body, causing death	Fired a powder blast, which exploded almost instantly, causing injuries from which he died about two hours afterwards.
2 Feb.	Ditto	Ditto	Fall off ore bench	John Cauley	Ditto	Collar bone broken, and hip joint put out	Was working at tram, heaving on a bar ; the bar slipped, and Cauley fell over on to next bench, about 40 feet.
27 Feb.	Ditto	Ditto	Touching uninsulated electric metals	Frederick Occleshaw	Married	Electric shock, causing instant death	Was opening the switch of the sampling works motor, and touched some bare metal parts.
18 April	Ditto	Ditto	Explosion of powder	William Coady	Single	Face burnt	Was stooping over a hole charged with powder, and into which a lighted primer had been dropped ; charge exploded.
23 June	Ditto	Ditto	Fall of stone	J. Quinn	Ditto	Internal injuries	Was working in stope, and stone came away from the face and struck him in the stomach.
2 July	Crown Lyell Copper Co.	Ditto	Fall in shaft	John Tyquin	—	Ditto	Was engaged in sinking shaft. In climbing chain ladder, slipped, and fell about 18 feet.
10 Mar.	Mt. Lyell M. and R.	Ditto	Explosion of rackerock	Henry Lee	Married	Slight burns, hands and face	Was charging holes with rackerock, when a charge exploded prematurely.
6 July	Ditto	Ditto	Explosion of nitroglycerine (lithofracture)	Peter Peterson	Single	Loss of one eye	Was working on No. 2 bench ; drove a gad into a hole in a stone. There was a charge of lithofracture in the hole, and an explosion took place.
15 Aug.	Mt. Lyell Blocks	Ditto	Fall through floor of stope	Wm. King	Married	Right leg broken	Was helping to place some timber in the mine and fell through one flooring to the next (about 4 feet). One of the floor laths also fell and struck him on leg.

9 Sept.	Ditto	Ditto	Fall into puddling machine	Denis Nugent	Single	Shock and bruises	Was feeding and attending puddling machines; discharge holes of one got chocked, and in leaning over to set matters right he was knocked into the trough and dragged round.
1 Oct.	Ditto	Ditto	Fall of stone	John Eddy	Ditto	Cut on forehead, bruises legs and thighs	Was working in an adit when a portion of the face came away and struck him.
13 Oct.	Mt. Lyell M. and R.	Ditto	Aerial truck left track	John Robinson	Married	Right leg broken	Was engaged at mine-bins as filler to main aerial ropeway. A bucket got out of order, and in process of shunting from working track for repairs, it fell on Robinson's leg and broke it.
29 Nov.	Ditto	Ditto	Rolling of piece of ore	Rd. Holmes	Ditto	Bruised instep and broken toe	Was filling truck on No. 3 ore-bench when a piece of ore rolled for about a yard and caught his foot.
7 Dec.	Ditto	Ditto	Fall into ore-bin	Denis Dowling	Ditto	Bruises and shock	Was emptying ore-trucks, and in passing from one truck to another he fell into ore-bin.
5 Nov.	Ditto (N.)	Ditto	Flying piece of wood	Wm. Anderson	Single	Injuries to right eye	Erecting timbers in stope; driving in a chock, which sprang back and struck him in eye.
24 Dec.	Mt. Lyell M. and R. (Smelters)	Ditto	Falling stone	Chas. Creed	Widower	Crushed thumb	Was filling limestone to No. 2 plant when some stone came down the bin and jammed his thumb.
8 Dec.	Ditto	Ditto	Machinery in motion	John William Miley	Married	Crushed toes	Cleaning one of the columns of blowers engine his foot, which was on bed-plate, slipped under the crank, which struck it and crushed it against bed-plate.
25 Nov.	Mt. Lyell M. and R.	Ditto	Flying piece of stone	Robert Grey	Single	Loss of one eye	Was engaged on drilling machine. A piece of stone flew from adjacent works and struck him in the eye.

Mr. REGISTRAR DONOHUE (stationed at Waratah) reports:—

I have the honour to submit my report on the mining industry in the Waratah Division for the year ending 31st December, 1904.

*The Mount Bischoff Tin Mining Company.*—During the whole of the year the Goldfields Diamond-drilling Company continued boring operations. Several holes were put down in different parts of the mount, the deepest being 1600 feet, and, I am given to understand, none of them proved very satisfactory. Other parts of the mine continue to look well, and the usual output of 106 tons of ore per month is easily maintained, with an average of 230 hands employed.

The *Waratah* and *Stanhope* alluvial claims have, during the year, sent away 12 tons of tin ore, with six hands employed.

At Badger Plains, the *Wombat* is now being worked on tribute with a hydraulic sluicing plant, and a fair amount of tin is being won.

*The Bischoff-Taylor* has for some time past had a number of men employed in cutting a water-race for a distance of three miles, to bring water on to its tin sections, which are situated about three miles north-east of Waratah. The race will be completed in a very short time; the company will then start sluicing operations.

Sections situated about three miles north of Waratah, and known as *Weir's Bischoff Surprise*, are about to be put into a strong company, to work the bed of the Waratah River and flats adjoining the old *Phoenix*.

*The Magnet Silver Mining Company.*—The output of ore has been steadily maintained at about 1000 tons per month. The grade has been good and uniform. The greatest part of ore has been sent to Dapto and Cockle Creek, N.S.W. The principal underground work has been the stoping out of the block of ground above No. 5 level. The sinking of the main underlay shaft was resumed towards the end of the year, and is now about 50 feet below No. 5 level. On the surface, the erection of a concentrating mill has been pushed ahead, and is now well advanced. Average number of men employed, 120.

*The Godkin Mine.* Whyte River, has been put under the management of Mr. T. H. Jones, and a good deal of prospecting work is being done in the old workings, and they have a good quantity of milling ore stacked at grass.

*The Long Tunnel Syndicate* (formerly Mount Stewart) has about 1000 tons of high-grade silver-lead ore stacked at grass, and is waiting the completion of a wooden tramway, which is being constructed by C. B. M. Fenton & Co., contractors, from the 14-mile Waratah-Corinna Road to the mine, a distance of about five miles. When the tram is completed, the syndicate will send about 60 tons of ore weekly to the Tasmanian Smelters, Zeehan. There has been an average of 30 hands employed during the past three months.

*The Washington Hay, Whyte River.*—During the year about 10 tons of first-class metal was sent from this mine to the Smelters at Zeehan, realising £22 per ton. There is about 100 tons of good milling ore stacked at grass.

On the whole, the district has improved during the past few years. There are more men employed on the different mines, and a good deal of prospecting is being done at and around Waratah.

NOTES ON SOME ADDITIONAL MINERALS  
RECENTLY DETERMINED, WITH NEW LO-  
CALITIES FOR SPECIES KNOWN TO OCCUR  
IN TASMANIA.

By W. F. PETTERD.

THE present contribution to the mineralogy of this State is of somewhat unusual interest, inasmuch as it describes for the first time an apparently new compound, which, although of no commercial value, is of some scientific interest. It is in its way a humble congener of the more imposing crocoisite, for the occurrence of which, in such magnificent developments, this island has obtained a great repute among mineralogists in all parts of the world, but, like it, is simply of scientific importance.

The Lefroy meteorite, now mentioned for the first time, is, although of such remarkably small size, worthy of special note, and its detection in the prospector's dish adds another to the romantic discoveries of such objects from unknown space. The already long list of the different minerals recorded from time to time as being found in this State is still further augmented by the addition of no less than eighteen not heretofore published; respecting these concise notes are given. Several of these are of some scientific interest, and two or three would be of industrial importance if they could be discovered in sufficient quantity. Notes on additional localities for a few others which are already on record are given, with some remarks on peculiar features presented by some few others.

I have to record my obligation to Mr. J. D. Millen, A.S.T.C., M.S.C.I., Lond., metallurgical chemist, for so generously undertaking the analysis of Bellite and Hercynite, for without this work, especially difficult as regards the first mentioned, my task would have lost its most important features.

1 BARRANDITE.—(*Hydrous aluminium and iron phosphate.*)

Occurs as brown dull amorphous masses of small size, associated with vivianite, Lyndhurst, North-East Coast.

2 BELLITE.—(*Chromo-arsenate of lead.*)

This extremely interesting and, it may be said, attractive new substance usually occurs in delicate tufts aggregated together, and velvet-like coated surfaces thickly lining and clustering in drusy

cavities in somewhat soft iron-manganese gossan. The coated surfaces are often met with of reasonable size, and have been obtained covering several square inches of the gossan, more especially where vughs and fractures occur. More rarely bunches of galena are wholly or partially covered by the substance. It is often in crypto-crystalline incrustations, occasionally pulverulent, and more rarely in bunches of hexagonal crystals of almost microscopic dimensions. The largest crystals so far observed were but three millimeters in length, but the outline was sharp and very distinct. The crystals are of adamantine lustre, and a remarkably bright red to crimson colour. Minute acicular patches of crystals are common, and under the lens are perfectly distinct, and thus afford very fine microscopic objects of considerable attractiveness. The bright crimson colour of the general mass is very characteristic, and by this feature it is noticeable by the most casual observer, even when not directly interested in mineralogy. It sometimes occurs in aggregates of extremely minute needles, much like velvet, of a distinct and bright yellow to orange colour, and in this form it also occasionally coats somewhat large surfaces. Chromiferous cerussite and more rarely crocoisite and mimetite are intimately associated with it. Although so noticeable, the coating of the substance is usually of such extreme thinness that it was only with the greatest difficulty and by using the utmost care that enough was secured to make a complete analysis. This was undertaken by Mr. J. D. Millen, A.S.T.C., M.S.C.I., Lond., metallurgical chemist to the Mt. Bischoff T. M. Co. The following is the result:—

Pb	O	=	61.680	per cent.
Cr	O <sub>3</sub>	=	22.611	"
V <sub>2</sub>	O <sub>5</sub>	=	0.106	"
P <sub>2</sub>	O <sub>5</sub>	=	0.045	"
As <sub>2</sub>	O <sub>3</sub>	=	0.017	"
Al <sub>2</sub>	O <sub>3</sub>	=	0.012	"
Cl		=	0.516	"
So <sub>3</sub>		=	0.054	"
Ag		=	trace	"
Si	O <sub>2</sub>	=	7.587	"

Moisture not determined. The hardness is 2.5; specific gravity approximately 5.5. Streak, pale yellow. Crystallographic system hexagonal. Before the blowpipe on coal it readily affords a bead of metallic lead with arsenical coating and odour. Imparts to salt of phosphorus bead in OF and RF a fine green, thus absolutely masking the reaction of  $V_2O_5$  in the OF with this reagent. In the wet the reaction of  $V_2O_5$  was only obtained with difficulty, following the method of Ohly (analysis of the rare metals). The powdered substance was mixed with sodium carbonate, then fused, and after the addition of potassium nitrate lixiviated with water, filtered, and the clear solution boiled with ammonium carbonate. Acidified with hydrochloric acid, and hydrogen sulphide passed through the filtrate, the precipitate gave arsenic and green solution. The filtrate with concentrated ammonium of equal volume and treated with hydrogen sulphide gave a black precipitate which on filtering the solution left a cherry-red solution = vanadium. This new mineral species has been named in compliment to my old and respected friend, Mr. W. R. Bell, the veteran prospector, whose exertion has done much to advance the mining industry of this State, and who moreover has always taken a great interest in its mineralogy and geology.

Locality—The upper workings of the Magnet Silver Mine, Magnet.

**3** CLOANTHITE.—(*Nickel diarsenide.*)

A greyish white isometric nickel ore, remarkable for readily altering or sweating on the surface, when specimens are in a moist atmosphere, to the hydrated arsenate, which on giving off its excess of hygroscopic moisture apparently becomes annabergite. It occurs in limited quantity with other nickel minerals in the lower levels of the Long Tunnel Mine, Rocky River.

**4** ENERGITE.—(*Copper sulpharsenate.*)

Occurs in limited quantity with other ores of copper. North Lyell Mine, Mt. Lyell.

**5** EXCHERITE.—(*Basic calcium aluminium and iron silicate.*)

- This variety of epidote appears to be somewhat abundant on the margin of the Upper Emu River, opposite the north-west shoulder of Valentine's Peak. The crystals are at times quite half an inch in length, but are commonly broken and decomposed. Flakes of molybdenite sometimes occur disseminated in the masses of the substances.
- 6 GENTHITE.**—(*Hydrous basic nickel and magnesium silicate.*)  
Found sparingly on Pentlandite, near Trial Harbour.
- 7 GIBBSITE.**—(*Aluminium hydrate.*)  
Forms a thin seam on what is apparently the wall of a copper-bearing lode. Clarke and Sice's Copper Mine, Blythe River.
- 8 HELIOPHYLLITE.**—(*Arsenate of lead with chlorine.*)  
In small crusts lining druses with crystalline glimmering and wax-like surfaces. Comet Mine, Dundas.
- 9 HERCYNITE.**—(*Iron aluminate.*)  
Occurs as fairly large lumps in tin drift. It is amorphous, dull, of a bluish black colour and fine granular.  
Analysis by Mr. J. D. Millen.
- |                 |                |   |       |
|-----------------|----------------|---|-------|
| Fe <sub>2</sub> | O <sub>3</sub> | = | 46.91 |
| Cu              | O              | = | 0.05  |
| Si              | O <sub>2</sub> | = | 0.892 |
| Ca              | O              | = | 0.86  |
| Cr <sub>3</sub> | O <sub>3</sub> | = | 0.49  |
| Al <sub>2</sub> | O <sub>3</sub> | = | 41.69 |
|                 |                |   | 99.37 |
- Sp. gravity, 3.765. Hardness, 3.9. Locality Moorina. (J. Rundle.)
- 10 HYDROMANGANOCALCITE.**—(*Hydrous carbonate of calcium and manganese.*)  
Occurs as a soft pink substance which readily absorbs moisture, and is thus easily reduced to powder. Heazlewood Silver Mine, Whyte River.
- 11 IRON.**—(*Lefroy meteorite.*)  
A small meteoric siderite was obtained by a prospector in testing a dish of alluvial drift for

gold in 1904. Its weight is 3.328 grains. Specific gravity, 7.847. It has the characteristic pittings and crust of such objects, and is beyond doubt of meteoric origin. Locality, Lefroy.

**12 LEUCOPHANITE.**—(*Silicate of calcium sodium glaucina with fluorine.*)

It would appear that this mineral, which has been hitherto overlooked, is fairly abundant at or in the vicinity of the Shepherd and Murphy Tin-Bismuth Mine, Bell Mount, Middlesex. It is closely associated with pyrite, both copper and iron, in the examples which have come into my hands. It crystallises in the orthorhombic system, with a constant hemihedral habit, and twinning is an occasional feature. The crystals are, as a rule, well-developed in clusters on the margin of a spheroid amorphous mass of the substance. They commonly average a centimetre in length, and are consequently recognised with extreme ease. The general mass presents a fairly uniform colour of a somewhat peculiar shade of olive green, with a vitreous lustre and glimmering reflection. The crystals are usually of a rather darker shade. A pronounced character of this mineral is that when heated it becomes highly phosphorescent with a distinct bright light, in which respect it resembles chlorophane. It is about 4 in hardness, with a white streak. To the petrologist this is a find of unusual interest, as the mineral is considered peculiar to the ecloelite-syenites of Southern Norway, the classic locality for this remarkable series of rocks; and this has hitherto appeared to be its only recorded association. The identification thus tends to show a wider distribution in this island of igneous rocks related to the varied complex so pronounced at Port Cygnet, and which have been fully described from time to time in the proceedings of this Society.

**13 MANGANITE.**—(*Hydrous manganese sesquioxide.*)

In small bunches of well-formed crystals. Hampshire Silver Mine, Hampshire Hills.

**14 MINIUM.**—(*Lead plumbate.*)

Obtained as small encrusting patches of the usual bright red colour in the superficial workings of the Long Tunnel Mine, Castray River.

- 15 NICCOLITE.**—(*Nickel Arsenide.*)  
This ore has been obtained in small quantity near Trial Harbour, West Coast.
- 16 PILOTITE.**—(*Hydrated silicate of aluminium and manganese.*)  
An altered variety of actinolite, known as "rock cork." It occurs in felted fibrous masses of a pale grey to almost white, in considerable quantity east of the "Red Face" at the Mt. Bischoff Tin Mine, Mt. Bischoff.
- 17 PLINTHITE.**—(*Hydrous aluminium silicate.*)  
An amorphous clay-like substance of a brown colour, with conchoidal fracture. Near Falmouth, East Coast.
- 18 PIMELITE.**—(*Hydrated magnesium and nickel silicate.*)  
As an incrustation attached to other nickel minerals. Near Trial Harbour, West Coast.
- 19 PROUSTITE.**—(*Silver sulpharsenite.*)  
At the Oonah Mine, Zeehan, this mineral, which is commonly known as "ruby silver," has been obtained in bunches of minute perfectly-formed rhombohedral crystals of remarkably bright red colour. They are implanted on cavernous masses of pyrites, and are readily detected by the contrast of colour. Under the low power of the microscope they form most attractive objects, the crystals being extremely sharp and distinct. They rarely exceed two to three millimetres in length. Minute crystals have also been noticed at the Magnet Mine.
- 20 PYRARGYRITE.**—(*Silver sulphantimonite.*)  
At the Magnet Silver Mine this mineral has recently been obtained in small but perfectly-formed characteristic rhombohedral crystals nestled in cavities in the lode gangue associated with galena and blende in the southern working of the mine. They are dull black in colour, due to tarnish, but readily give the bright red streak as well as the conchoidal fracture when broken. The mineral in its compact and investing forms is not by any means rare, but the crystals are extremely so; in fact they appear to be first detected in this state.

**21** PYROSTILPINITE.—(*Silver sulphantimonite.*)

A rare ore of silver (containing 59.44 per cent. of ag) known as "fire-blende." It crystallises in the monoclinic system and is sometimes tabular, but its common habit is in imperfectly terminated sheaves or irregular bunches—like stylbite—but of almost microscopic dimensions. It is of a hyacinth-red colour, but is generally tarnished to an almost black discolouration. When free from discolouration it has an adamantine lustre and decided red streak. In minute vughs it may be detected in association with nests of small quartz crystals. When coating cleavages in its extremely silicious gangue it soon arrests attention by its peculiar habit of occurrence in radiating and irregular bunches, by which feature it may be known from proustite, although both have the same bright colour. Before the blow-pipe it fuses easily, giving off white antimonial fumes, and with soda affords a bead of silver. It occurs in limited quantity, but quite enough to make an appreciable difference in the bulk silver assays. Locality, the Long Tunnel Mine, Heazlewood. Associated with this is another silver mineral of an orange yellow colour with yellow streak. It affects a frondose habit, and is found in exceedingly limited quantity as aggregates in the cleavages of the gangue. It may be xanthoconite (a silver sulpharsenate, crystallising in the rhombohedral system), but the quantity is too small to make reasonably certain of its exact identification.

**22** QUARTZ.—(*Silicon dioxide.*)

Mr. D. A. Porter, of Tamworth, N.S.W., has recently drawn my attention to an interesting occurrence of this mineral in a specimen associated with freibergite. Many of the extremely minute crystals attached thereto are "left handed" and others "right handed," and many of these show besides the "W" and "Y" trapezoids the rhombic face "S." This habit has not been detected in larger crystals from the same locality. The Hercules Mine, Mt. Read.

**23** SCORODITE.—(*Hydrous ferric iron arsenate.*)

This mineral was obtained by Mr. W. R. Bell in clusters of beautifully formed orthorhombic

crystals of remarkably high lustre. They were of small size, pale green in colour, and almost translucent.

- 24** SICILIOPHITE.—(*Silicified serpentine.*)  
This peculiar altered substance is extremely variable in colour, and occasionally almost opalescent. Near the Long Tunnel Mine, Castray River.
- 25** SMECTITE.—(*Hydrous basic aluminium silicate.*)  
Obtained in patches of extreme softness almost gelatinous, but soon becomes somewhat harder. It has a metallic, almost silvery sheen. It separates into folice of extreme tenuity. North Lyell Mine, Mt. Lyell.
- 26** STEARGILLITE.—(*Hydrous basic aluminium silicate.*)  
A pale yellow to almost white substance with strongly conchoidal fracture, and slightly opalescent and smooth surface. Derby.
- 27** STEPHANITE.—(*Silver sulphantimonite.*)  
Brittle silver ore. It is black and dull in general appearance, with a black streak. Found in thin irregular patches, implanted on a silicious gangue with "fire blende." Long Tunnel Mine, Castray River.
- 28** STIBICOLITE.—(*Hydrous antimony dioxide.*)  
In limited quantity as a pale yellow pulverulent mass. British Zeehan Silver Lead Mine, Zeehan.
- 29** TOURMALINE.—(*Boron aluminium iron silicate.*)  
The variety zeuxite, which is rich in iron and of an intensely dark green colour, occurs in remarkably large felted masses at the Castray River.
- 30** WURTZITE.—(*Hexagonal zinc sulphide.*)  
A rare zinc mineral differing in crystallisation from sphalerite. It is hemimorphic in habit, and by that character it may be recognised when in crystals. Usually it occurs in columnar masses. Hercules Mine, Mt. Read, and Magnet Silver Mine, Magnet.