

AR1903

TASMANIA.

REPORT

OF THE

SECRETARY FOR MINES

FOR

HALF-YEAR ENDING DECEMBER 31

1903

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



Tasmania:

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## REPORT OF THE SECRETARY FOR MINES.

*Mines Department, Hobart,  
30th June, 1904.*

SIR,

I HAVE the honour to submit my Report upon the Mines Department and the progress of the Mining Industry for the half-year ending 31st December, 1903.

The termination of the financial year having been altered from the 31st December to the 30th June in every year, has rendered it necessary for a report to be furnished for six months only.

### GENERAL REMARKS.

Although the output and value of minerals has been fairly well maintained during the period under review, the time has arrived when something should be done to foster and encourage the industry, and I am glad to find that a Bill is being drafted upon the lines suggested in my Report for the year ending 30th June, 1904, providing for the payment of a monetary reward for the discovery of a payable mining field, such reward to be regulated upon a population basis.

Provision will, I understand, also be made for granting of special leases, entirely eliminating all labour covenants, upon payment of an increased rental. It is thought that this will be an inducement for capitalists to invest their

money in Tasmanian mines, the present insecurity of tenure being a bar to the introduction of capital for the development of some of our mines.

The Northern, North-eastern, and Eastern Mining Districts have been amalgamated, and the services of two old and valuable officers have been dispensed with. Great dissatisfaction throughout the districts has been expressed, and great inconvenience to the Department has been experienced through the retrenchment of the Commissioners referred to. The district is, I consider, too extensive for one Commissioner. I do not wish to say anything disparaging of the Commissioner in charge; he is an excellent officer, and thoroughly competent to perform the combined duties of Stipendiary Magistrate and Commissioner of Mines, but a Resident Commissioner, who can at all times be interviewed by the mining public desirous of obtaining information, is essential for the advancement of the mining industry, and would prevent disputes and litigation.

#### APPENDICES.

Appended will be found the following Reports and Papers:—

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.

Reports of the Commissioners of Mines.

Papers by—

W. H. Twelvetrees, Esq., F.G.S.—Notes on Jacupirangite in Tasmania.

W. F. Petterd, Esq.—Notes on Tasmanian Minerals.

#### GOLD MINING.

*Beaconsfield.*—Not more than 400 men were employed in the district this half-year, principally owing to reduction of hands at the Tasmania Mine, pending the initiation of work

on full scale by the English company which has lately come into possession of that property. Additional pumping-plant has been decided upon; the deep shaft is being enlarged to receive the first unit of pumps, and the main shaft is to be further deepened for the extraction of quartz. Since this mine was first begun, it has yielded 507,661 tons of quartz, which have returned (by amalgamation and chlorination) 579,694 ozs. 8 dwts. 17 grs. gold. Owing to the influx of water at the 1000-foot level in 1902, the total amount distributed in dividends has remained stationary since the close of that year. The total sum paid in dividends is £772,071 15s.

During the present period of comparative inaction of the big mine, the other mines in this field have not received much attention. The Moonlight-cum-Wonder Mine has suspended operations for the present. The Bonanza Proprietary has sunk to 390 feet, and is still confident of ultimately reaching the Tasmania reef. At the Tasman Ophir Mine work has proceeded in the body of wash at the 200 and 400-foot levels; but some difficulty has been experienced in the gold-extraction, and expert advice is being sought before further continuing operations. A little work has been carried on at the North Tasmania, New Tasmania United, King Victor, &c.

At the Blue Tier, the Salisbury and Duchess of York mines have been dormant; while efforts, so far unsuccessful, have been made to introduce fresh capital into them. A good quantity of gold was formerly won from the Tier, but its distribution is somewhat irregular, and deeper work is a desideratum.

*Lefroy.*—The New Pinafore is still the principal company operating on this field. A little gold was won from the workings on the old Point and Crown property, and the company has been driving on that reef, with irregular results; exploratory cross-cutting is going on towards parallel reefs (Richards and Bain's and the Hit or Miss

reefs). This mine has in the past distributed £71,500 in dividends. The old Volunteer Mine has been taken up by the Digney and Casey Syndicate, who are working left ground above the 300-foot level, with profitable results. A few prospecting parties are at work on the field, which, despite its present languishing state, deserves as much attention as ever it did.

*Mathinna*.—A decided revival has taken place on this field, and more prospecting and exploratory work has been going on than for a long time past. At the end of the year, 90 heads of stamps were working in the district, which is an increase of 50 heads within the last two years, and 40 heads within the last twelve months.

At the New Golden Gate, profitable stone has been disclosed south of the main slide, in successive shoots, between faults, and the prospects are considered assured for a long time to come. An electric pumping-plant is about to be installed at the mine by Messrs. Siemens. The total quantity of quartz crushed since the inception of the company is 229,871 tons, which yielded 198,818 ounces of gold, realising £758,377 17s. 9d. Dividends have been paid amounting to £334,400.

Operations at other mines in the neighbourhood are being pushed forward. The Tasmanian Consols, an English company, has sunk its main shaft to 1300 feet, and struck gold-bearing stone at both the 1200 and 1300-foot levels. The Volunteer Consolidated has also found rich quartz at the 450 feet. Stevens and party have made a sensational discovery on the old Pride of Mathinna ground, south of and adjoining the New Golden Gate. Exceedingly rich stone is being worked by them, from the surface down, on a reef about 1 foot wide.

The New Golden King has been crushing 9-dwt. stone, which would pay if it were less erratic and the country not so hard; exploration work is to be continued to the western boundary.

North of Mathinna, prospecting has been going on in the South Mt. Victoria field. Reefs on the old Una properties have been opened into; some work has been done at the Hinemoa, a new mine opened with New Zealand capital. The Carnegie and King Edward mines have been worked on a small scale. In the near future it is anticipated that English capital will be brought in to revive the Havelock, a mine which, compelled to leave off on account of the water, raised very fair-quality stone. The O'Brien, Laranda, Starlight, Stricklands, are other quiescent mines on this field, all deserving further attention. The works in all of them are shallow; and the field is untested in depth. It is an important field, as it is the extension of the Mathinna country, and is composed of the same auriferous series of slates and sandstones. The registered produce of the Mathinna field for the six months was 8585 ozs. gold.

*Mangana, &c.*—Work has not been very productive here during the period under review; only 1570 tons of quartz being crushed, and 57 ozs. gold obtained. After a disappointing crushing at Abbotsford Creek, the company relinquished work; but others are extending the low-level, in order to explore the reef at that depth.

*Mt. Victoria.*—The Long Struggle Mine has continued to raise payable stone. The Ringarooma Company is about to dispose of the New Mercury portion of its property to a private syndicate. The gold-bearing strata here are the northern prolongations of those at South Mt. Victoria and Mathinna.

*Golconda and Panama.*—A few syndicates have carried on exploratory and developmental work. The New Enterprise owners are testing the old mine, by sinking into the untried reef below water-level.

*Lynnhurst.*—Desultory work has proceeded, and hopes are entertained of a permanent revival of this old field.

*The Lisle Dredging Company.*—This company has produced 356 ozs. gold during the six months.

*West Coast.*—Work has been prosecuted actively at the Coronation Mine, a shaft being sunk 42 feet, and the lode driven on for upwards of 100 feet, carrying payable gold. A 5-head battery has been obtained, but the transport of machinery to the mine is difficult.

At the Mt. Ellen Gold Mine a good deal of material has been broken, but the results have not been quite satisfactory.

Prospecting has been proceeding on Flannigan's Flat, Woody Hill, the Queen River, and on Mt. Darwin.

#### SILVER MINING.

In the silver-lead mining district of Zeehan and neighbourhood, operations have resulted in an increased output as compared with the previous year. Among the noteworthy events of the period are the re-starting of the Queen and Western mines. The British Zeehan and the Zeehan Montana mines have been large contributors to the production of the field, the Spray lode of the former mine having proved highly satisfactory. The Oonah has been worked on tribute, and it is believed that the property, if judiciously developed, could be made to be still more productive. These three mines have been the main producers of ore at Zeehan; but, with the addition of the Queen, Western, and Florence, a considerable augmentation of output is anticipated.

*Dundas.*—Work at the Comet Mine has proceeded vigorously, and the output of ore has increased. The West Comet, too, has been a productive mine, and arrived at a dividend-paying stage at the end of the year.

*Mount Read.*—The Hercules has continued to mine its large deposit of mixed ores of comparatively low-grade,

much of which is sent to the Tasmanian Smelting Co., to be profitably dealt with at Zeehan. The balance of the output is shipped to N.S. Wales. The company has declared a dividend of sixpence per share during the half-year. A discovery of high-grade zinc ore was made in the No. 4 tunnel. At first the deposit was thought to be small, but upon extraction for the market, fresh reserves were disclosed; and there are actually several thousand tons in sight. This deposit is rich enough in zinc contents for the greater portion to be sold as zinc ore for export to Europe. The Ring Valley, South, and South-west Curtin Davis mines have also been producers.

*Tasmanian Smelting Company.*—The operations of this company are, to a great extent, an index of the state of mining in the Zeehan, Dundas, and Farrell districts. As production has been on the up-grade, the smelters have received their share of the increase; this is apparent in their statistics, which show a great improvement on the previous year. During the half-year 13,334<sup>6</sup>/<sub>10</sub> tons of ore were purchased and smelted.

*Magnet.*—The Magnet Mine has been steadily developed, and brought on the dividend-list; one dividend of a shilling per share was declared during the half-year. The half-year's shipments consisted of 5746 tons of silver-lead ore, value £14,480 14s. 7d. A deeper level is being opened out 60 feet below No. 4, upon a good lode going very strong under foot; so that the next level may also be expected to prove as valuable as this. It is proposed to erect a concentrating mill, in order to treat the accumulating milling-ore, and to maintain an even grade output.

*Heazlewood and Whyte Rivers.*—Prospecting and developmental work has been continued at the Long Tunnel, Confidence, Washington Hay, Victorian Magnet, and Godkin Amalgamated mines with more or less success. The district is essentially a mineral one, and the known deposits and

indications fully warrant more outlay upon their development.

*Mount Farrell.*—The North Mt. Farrell, Mackintosh, and Murchison River mines have been active; but work in the district has been checked by a lock-out at the North Farrell Mine. When things are settled, the field bids fair to become an important mining centre.

*The Devon Mine*, on the Dove River, has resumed work; its silver-lead lode is being tested by a small association.

#### COPPER.

*Mount Lyell.*—The amalgamation of the Mt. Lyell and the North Lyell companies has furnished important additions to the furnace supplies. Besides the higher-grade of the North Lyell ore, the ores from the two mines are mutually complementary, which has permitted great reductions to be made in the cost of producing blister-copper. During the half-year, the company smelted 178,700 tons of ore, producing 3750 tons of blister copper, which contained 3706 tons of copper, valued at £223,019 0s. 11d.; 364,288 ozs. of silver (fine), valued at £39,973 14s. 6d.; and 10,280 ozs. of gold (fine), valued at £43,690; being a total value of £306,682 15s. 5d.

At the Mt. Lyell Blocks Mine, opening up and equipping work has been pushed on with. Plant is to be installed for treating the extensive deposit of copper-bearing clay which this company is exploring. Prospecting work has gone forward on a few other mines of this field, viz., Tasman and Crown Lyell Extended, Crown Lyell, Mt. Lyell Comstock, and Tasman-Comstock mines.

*Jukes and Darwin.*—Work here has been continued, but without very decided results. This field is in an embryonic state so far; it has large deposits of low-grade ore, and small deposits of high-grade. It is hoped that it may yet be possible to utilise some of these.

*Rosebery.*—Tribute work on the Primrose Mine is being carried on in the gossanous parts of the copper-zinc-lead sulphide lode. The gold and silver contents of the ore are looked upon as making the proposition a payable one.

*Heazlewood.*—The Wealth of Tasmania Proprietary is developing a copper mine in a small but rich deposit of copper ore. The workable part of the deposit is not yet located satisfactorily.

*North-West Coast.*—Some copper ore deposits in the Blythe and Stowport districts have come to the front recently. The Rutherford Syndicate, near Burnie, has opened out on a lode which, in its oxidised upper part, gives favourable assay returns; it is to be vigorously developed. Other deposits exist in the neighbourhood, and will now probably receive attention, as there is no doubt that this belt of country is a copper-bearing one. The district is mainly agricultural, and has been very imperfectly tested for ore deposits. It may yet become as esteemed for its mineral wealth as it is for its farm lands.

#### TIN.

*East Coast.*—Owing to the unusually wet season, the supply of water has been abundant; and this circumstance, in conjunction with favourable market rates, has produced considerable activity throughout the tin districts.

*Derby.*—The Briseis Mine obtained 216 tons during the general work of removing the overburden. This preliminary stripping work is deemed necessary before ore-raising is begun regularly on the scale contemplated by the company.

The Ringarooma Company has explored its ground by means of bores, and is temporarily closed down, pending the consideration and adoption of a more economical scheme of work.

The Arba produced 46 tons; and the neighbouring property is also being tested.

The Ruby Flat, Star of Peace, and other claims have done well. The Mammoth Company, adjoining the Star of Peace, is erecting a battery.

*Moorina.*—The Native Youth, Moorina Tin, Weld, and Moa mines have produced fair quantities of ore.

The Pioneer Tin-mining Company, Limited, at Bradshaw's Creek, has pumped and sluiced during the half-year 157,900 cubic yards of drift, for a yield of 192 tons of stream tin. During this period dividends for £10,300 were declared, making a total of £32,175.

The small claims at the Wyniford River have had profitable yields, as also the Ruby claims at South Mount Cameron.

*Gladstone.*—A good deal of preparatory work was done on the Scotia, but in the last quarter the mine returned 19 tons of ore, and will be a larger producer in future. Owing to the high market price of tin, the Gladstone drifts are receiving more attention from capitalists, and extensive prospecting is impending.

*Weldborough and Blue Tier.*—Mining at Weldborough has proceeded as usual with regularly fair results. In the Blue Tier district the Anchor Mine, at Lottah, produced 116 tons of tin ore. Alterations in the scheme of working have been made, and richer stone made available lately. Attempts have been made to induce capitalists to undertake a programme for turning the extensive tin-bearing ground at the summit of the Blue Tier to profitable account.

*St. Helens.*—The mines here have contributed their share to the tin output of the Coast.

*Mount Rex Mine.*—The production for the half-year has been 86½ tons of tin ore, which is disposed of in England at

satisfactory prices. The stone is not so rich in tin as it was before, but exploratory work is being extended to the north-west, with encouraging indications.

*South Esk Mine.*—No further work has been done on the lode formation, but the alluvial ground has given payable results.

*North-West Coast—Waratah.*—The Mount Bischoff Mine continues to be our largest producer. The tin ore obtained here during the six months amounted to 636 tons, which brings the total production since the formation of the Company to 62,230 tons 18 cwts. 2 qrs. 2 lbs. The Company declared dividends of £27,000 during the last half-year, making a total of £1,912,000 distributed amongst the shareholders. Ground has been worked at the Badger, near Waratah, mostly alluvial or surface, the prospects in the granite not being sufficiently alluring to induce underground mining.

*West Coast.*—Mayne's Tin Mine produced 20 tons; other claims in that district 19 tons. Working parties have been prospecting on and around Heemskirk. Attempts are being made to get capital into the Federation and Bullen's old mine, and it is hoped that there will be a revival of activity here.

Rich alluvial and lode deposits of tin ore have been discovered in the Stanley River district, extending in a long north and south belt. These are about to be taken in hand and developed on a considerable scale.

#### COAL MINING.

The two principal collieries are still the Cornwall and Mount Nicholas. In the Mersey field, Teasdale has opened a new mine on the Dulverton seam; and the Illamahta Mine is a new venture on the same seam. At the Marialva, Colebrook, work is going to be carried on more systematically than heretofore.

Good seams at Thompson's Marshes and near Mt. John cannot be utilised without tramway communication with the seaboard; and the same applies to the excellent coal at the Sandfly.

The first-class coal and kerosene shale at Preolenna is, unfortunately, for the present, too remote from transport facilities to be made use of.

#### IRON.

The Tasmanian Iron Company at Penguin raised 3550 tons of high-grade hematite, which was shipped to New South Wales smelters for fluxing purposes.

#### MINERAL PRODUCTS.

The following return shows the quantity and value of metals and minerals raised and exported during the six months ending 31st December, 1903:—

Minerals.	Quantity.	Value.
		£
Gold won ..... ozs.	31,794·947*	135,072
Auriferous Quartz and Pyrites exported..... tons	311 $\frac{1}{4}$	9410
Silver ore ..... exported tons	7169·14	77,270
Silver-lead Bullion ..... " "	3197 $\frac{1}{2}$	103,861
Galena Ore ..... " "	334 $\frac{3}{4}$	4643
Zinc Ore ..... " "	1154	3536
Copper (Blister) ..... " "	3508 $\frac{1}{2}$	239,190
Copper ..... " "	150 $\frac{1}{2}$	11,288
Copper Ore ..... " "	6 $\frac{3}{4}$	17
Tin Ore ..... " "	183 $\frac{3}{4}$	5128
Tin (Metallic) ..... " "	1262 $\frac{3}{4}$	154,271
Iron Ore ..... " "	3528 $\frac{3}{4}$	2701
Ironstone Flux..... " "	50	100
Coal raised ..... tons	23,961	20,739
Kaolin Ore ..... "	4 $\frac{3}{4}$	14
Total .....	...	£767,240

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

The amount paid in dividends and bonuses was £136,580 17s.

## GEOLOGICAL BRANCH.

During the half-year the Geologist and Assistant Geologist prepared reports upon mineral deposits at Preolenna, Long Plains and Heazlewood, the Dial Range, Sandfly, Mount Darwin, and Rosebery.

The Assistant Geologist has been engaged in the preparation of a report on the Zeehan mines, and a geological sketch-map of the field (to be published in colours, on a scale of 800 feet to the inch).

There were outstanding engagements at the end of the year for examination of the tin field at Stanley River, the silver-lead district of Mount Farrell, and the gold belt of Mathinna and Mount Victoria.

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 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 discharged their duties in the districts severally allotted to them. One Inspector was retired at the end of the year. The auxiliary inspection of mines by workmen is a matter under consideration. It is thought that its introduction would assist in reducing the dangers to which miners are exposed in their work.

## 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.

## DEPARTMENTAL STAFF.

In consequence of the policy of retrenchment, the Hon. C. O'Reilly, Commissioner of Mines for the North-East Mining Division, stationed at Scottsdale, and Mr. E. H. Fowell, Commissioner of Mines for the Eastern Mining Division, stationed at St. Helens, were retired at the end of the year, but the change is not working out satisfactorily, as the amalgamation of the three divisions known as the North, the North-Eastern, and the Eastern, forms an area of such extent that it is practically impossible for the one Commissioner stationed at Launceston to keep in touch with the whole of it. Consequently great inconveniences arise, and much dissatisfaction is expressed at a system which involves the necessity of a journey to Launceston by anyone wishing to interview the Commissioner. The retired officers are both gentlemen of the highest integrity, and their duties were at all times performed in a creditable manner.

Mr. C. H. Curtain, Inspector of Mines, stationed at Queenstown, was also retired, but since the end of the year Mr. Geo. A. Waller, who assumed the duties of Inspector in addition to those of Geological Surveyor, has obtained an appointment in Queensland, and has left for that State, causing a vacancy which will require to be filled. It is proposed to re-appoint Mr. Curtain.

## REVENUE.

The net revenue for the six months amounted to £14,758 17s. 1d. This amount does not include a sum of £1181 16s. 3d. deposited as survey-fees with applications for leases.

## CONCLUSION.

In conclusion, I desire to thank W. H. Twelvetrees, Esq., and W. F. Petterd, Esq., for the papers contributed

by them, also the several officers composing the Departmental Staff for the loyal and efficient manner in which they have performed their duties during the period under review.

I have the honor to be,  
Sir,

Your very obedient Servant,

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

*The Hon. CARMICHAEL LYNE, Minister of Mines.*

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## DIAMOND-DRILLS.

*Statement of Work done to 30th June, 1903.*

Year.	Locality.	Direction of Bore.	No. of Bores.	Total Distance Bored.	Average cost per foot, inclusive of Labour and Fuel.
	No. 1 DRILL.				
1882-3	Back Creek—For Gold .....	Vertical	7	feet. 1330	£ s. d. 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 {	Beaconsfield (Phoenix G.M. Co.)—For Gold .....	Ditto	1	781	2 0 2
1890 }					
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 {	Blue Tier (Anchor Co.)—For Tin .....	Ditto	9	876½	0 9 1¾
1900 }					
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	Mungana—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 .. ..... 32,689½ feet.

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

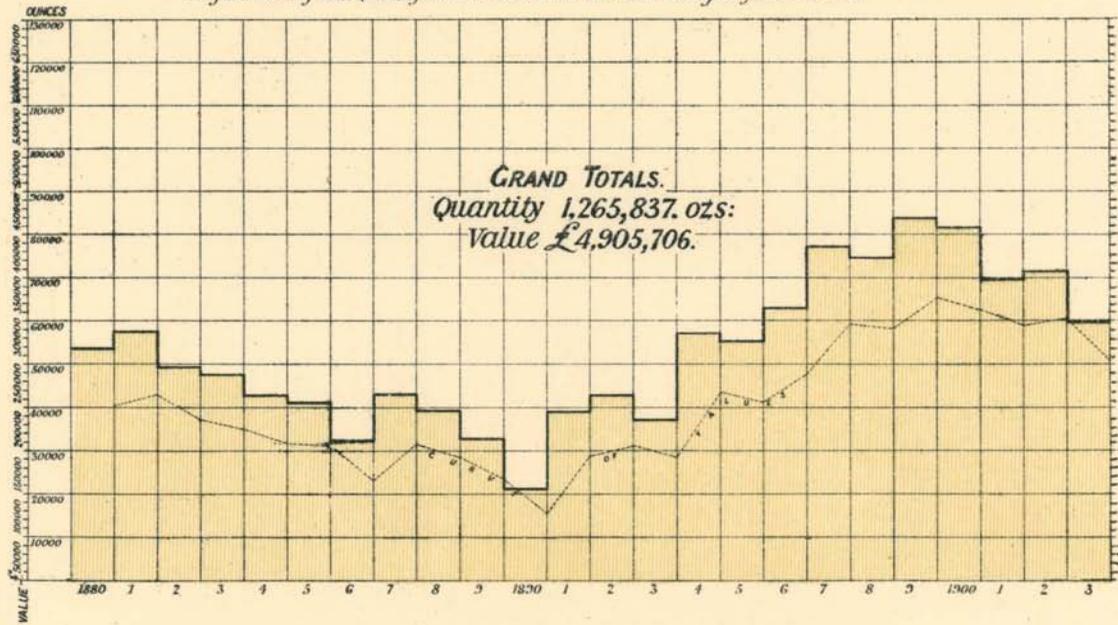
## No. 1.

*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, and 1903.*

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
	1,265,836 19	4,905,706

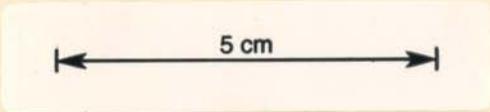
\* Fine Gold.

Diagram showing Total Quantity & Value of Gold won in Tasmania during the years 1880-1903



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## 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, and 1903.*

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	195,896
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
	1,228,659	4,362,218

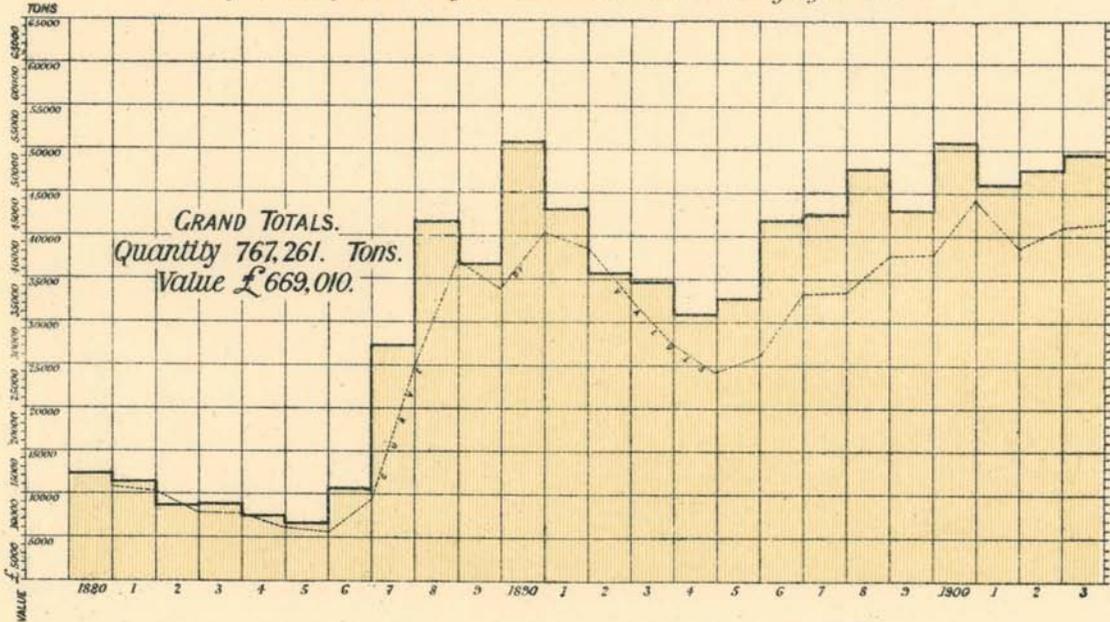
\* Fine Gold.

## 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, and 1903.*

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
	767,261	659,010

Diagram showing Total Quantity & Value of Coal raised in Tasmania during the years 1880-1903



JOHN VAIL, GOVERNMENT PRINTER, TASMANIA.

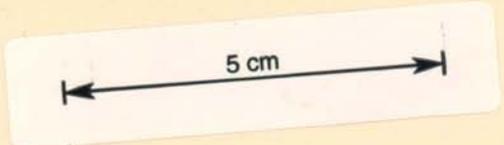
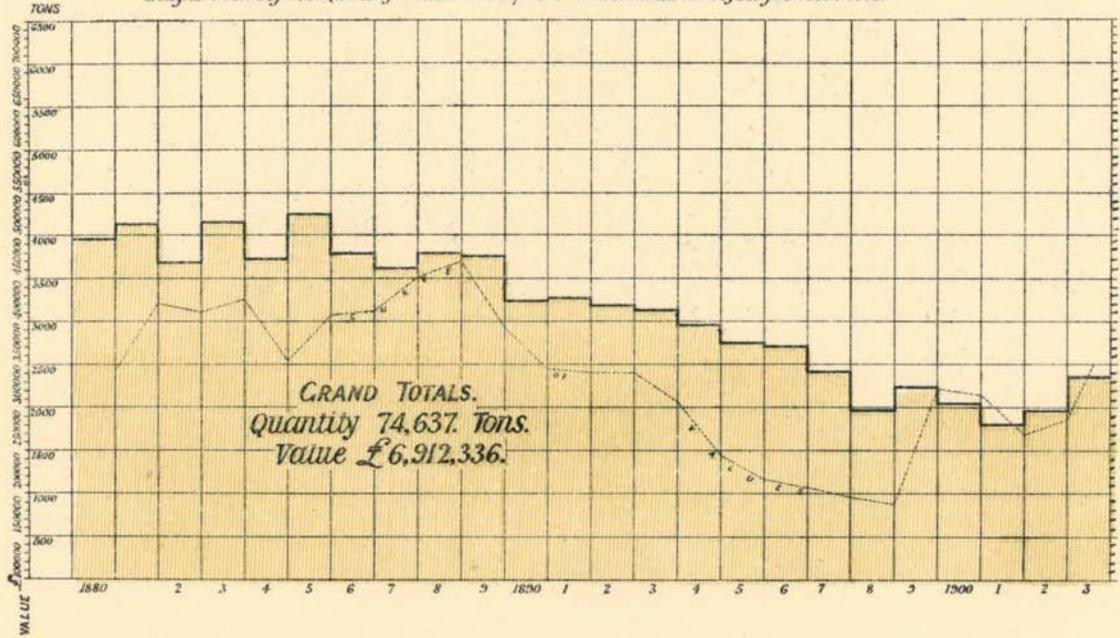
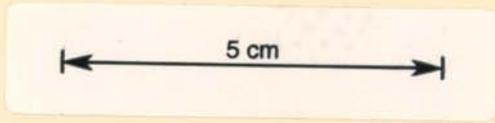


Diagram showing Total Quantity & Value of Tin exported from Tasmania during the years 1880-1903.



JOHN VAIL, GOVERNMENT PRINTER, TASMANIA.



*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, and 1903, 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 $\frac{3}{5}$	300,098
	74,636 $\frac{18}{25}$	6,912,336

## 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, and 1903.*

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
	300,977½	2,571,771

## No. 6.

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

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
	52,154	4,186,805

\* Value of Gold contained deducted.

## No. 7.

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

Year.	Quantity.	Value.
	Tons.	£
1902 .....	2500	50,112
1903 .....	3727	83,624
	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, and 1903.*

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
	23,736½	298,292

## No. 9.

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

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
	20,442	16,276

## No. 10.

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

Year.	Quantity.	Value.
	Tons.	£
1899 .....	200	363
1900 .....	128	113
1901 .....	46½	45
1902 .....	—	—
1903 .....	—	—
	374½	531

## No. 11.

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

Year.	Quantity.	Value.
	Tons.	£
1899 .....	3½	99
1900 .....	53¾	2058
1901 .....	—	—
1902 .....	—	—
1903 .....	—	—
	57¼	2157

## 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, 1903.*

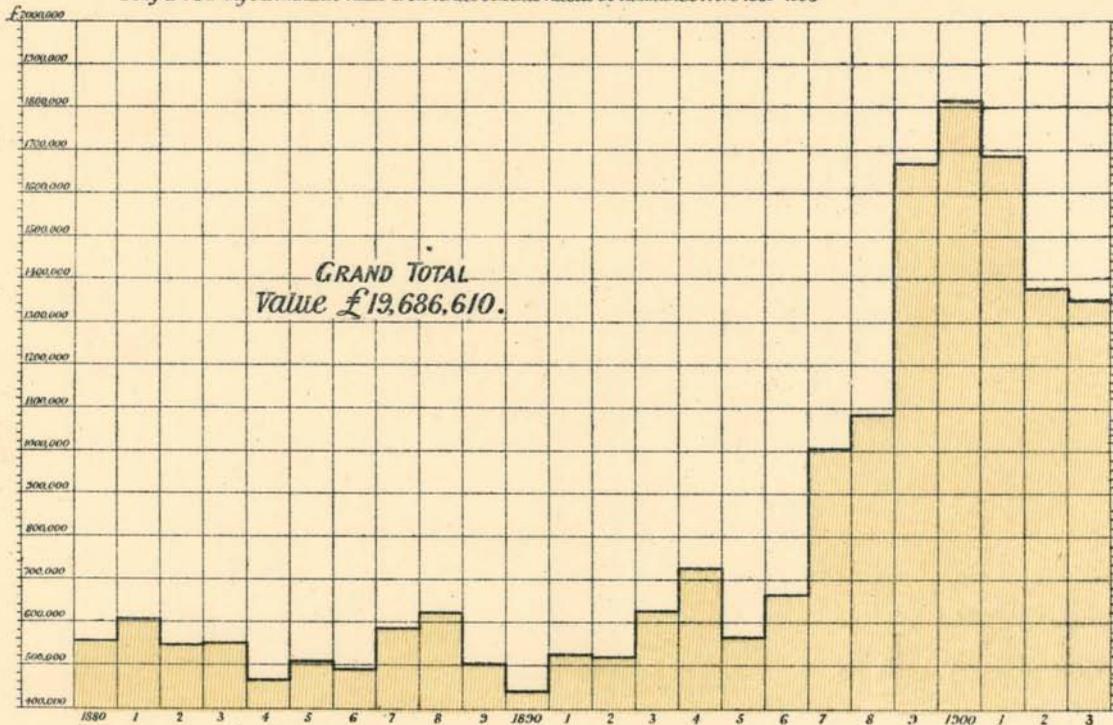
Year.	Ore Smelted.	Products.			Yield.			
		Silver Lead Bull'n.	Blister Copper.	Matte.	Copper.	Silver.	Gold.	Lead.
	Tons.	Tons.	Tons.	Tons.	Tons.	Ozs.	Ozs.	Tons.
1896	26,028 $\frac{13}{20}$	—	—	2417 $\frac{6}{20}$	1235 $\frac{1}{20}$	75,951	4707	—
1897	90,773 $\frac{1}{2}$	—	3476 $\frac{13}{20}$	257 $\frac{6}{20}$	3583 $\frac{14}{20}$	334,349	16,485	—
1898	170,933	—	4992	—	4783	606,123	24,418	—
1899	275,239	2295	8463	89 $\frac{8}{20}$	8362	1,089,657	27,615	—
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

## No. 13.

*RETURN showing the Average Number of Persons engaged in Mining during the Years 1880 to 1903 inclusive.*

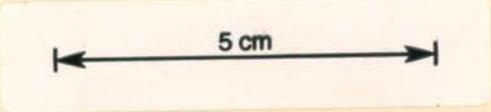
Year.	Number.	Year.	Number.
1880.....	1653	1892.....	3295
1881.....	3156	1893.....	3403
1882.....	4098	1894.....	3433
1883.....	3818	1895.....	4062
1884.....	2972	1896.....	4350
1885.....	2783	1897.....	4510
1886.....	2681	1898.....	6052
1887.....	3361	1899.....	6622
1888.....	2989	1900.....	7023
1889.....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

Diagram showing the Annual Value of Minerals & Metals raised in Tasmania from 1880-1903



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No. 14.

*RETURN showing the Number and Area of Leases held under "The Mining Act, 1900," in force on 30th June in years 1897 to 1903 inclusive, and on 31st December, 1903.*

Nature of Lease.	In force on 30th June, 1897.		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.	
	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.	No.	Area.
For Minerals, Silver, Tin, &c.	1150	Acres. 56,493	1290	Acres. 66,981	1207	Acres. 64,339	1487	Acres. 70,500	1387	Acres. 60,865	1063	Acres. 45,399	950	Acres. 40,068	826	Acres. 33,325
For Coal, Slate, Shale, &c.	38	6105	41	5943	39	6002	52	7258	55	7566	52	7819	66	10,767	54	9119
For Gold	615	5789	702	7190	652	6725	647	6623	566	6091	425	4166	310	3117	243	2505
Water Rights Mineral and Gold	155	774 sluice-heads.	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.

No. 15.

*COMPARATIVE Statement of Net Revenue from Mines, being Rents, Fees, &c., paid to the Treasury for the Years ending 30th June, from 1880 to 1903, and for Six months ending 31st December, 1903.*

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 Dec. 31 ....	14,758	17	1
1892.....	17,568	18	4				

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, 1903.*

Minerals.	Number.	Area.
		Acres.
Gold .....	243	2505
Minerals .....	131	7846
Silver .....	169	8621
Copper .....	58	3358
Tin .....	444	12,029
Coal .....	32	6030
Limestone .....	11	682
Iron .....	15	704
Slate .....	1	200
Wolfram .....	2	80
Asbestos .....	2	140
Precious Stones .....	1	80
Lithographic Stone .....	1	97
Marble .....	1	317
Shale .....	9	2100
Bismuth .....	1	40
Monazite .....	1	80
Nickel .....	1	40
Machinery Sites .....	22	92
Dredging Claims.....	15	124
Mining Easements (under "The Mining Act, 1900") .....	34	225
Dam Sites.....	43	636
Water Rights .....	281	1460 sluice-heads, & 180 acres dams

## No. 17.

*RETURN showing the Average Number of Miners employed during the Year ending 31st December, 1903.*

	Europeans.	Chinese.
Northern and Southern Division .....	582	...
North-Eastern Division.....	504	137
Eastern Division.....	793	69
North-Western Division .....	401	...
Western Division .....	3531	...
	5811	206

## No. 18.

*RETURN showing the Mining Companies registered during the Six Months ending 31st December, 1903.*

Number of Companies.	Capital.
10	£19,440

In addition to the above, 15 Agents for Foreign Companies, and 5 Syndicates, under 60 Vict. No. 51, were registered.

## No. 19.

*RETURN showing the Total Area of Land applied for during the Six Months ending 31st December, 1903.*

Mineral.	No. of Applications.	Area.
		Acres.
Antimony .....	1	80
Coal .....	8	1397
Copper .....	12	770
Galena .....	1	37
Gold .....	58	521
Minerals .....	36	2071
Nickel .....	1	80
Phosphate of Lime.....	1	3
Silver.....	6	345
Tin.....	97	2345
Machinery Sites .....	1	5
Dredging Claims.....	9	140
<b>TOTAL .....</b>	<b>231</b>	<b>7794</b>

In addition to the above, 14 applications for Mining Easements, and 38 applications for Water Rights (92 Sluice-heads and 86 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 Six Months ending 31st December, 1903.*

Head of Revenue.	Amount.		
	£	s.	d.
Rent under "The Mining Act, 1900," for Gold and Minerals .....	14,199	5	7
Fees, ditto ditto .....	559	11	6
Survey Fees .....	1181	16	3
Rent of Diamond-drills ... ..	—		
<b>TOTAL</b> .....	<b>15,940</b>	<b>13</b>	<b>4</b>

## No. 21.

*RETURN showing the Amounts paid in dividends by Mining Companies during the Six Months ending 31st December, 1903.*

Mines.	Dividends.		
	£	s.	d.
Copper .....	72,187	0	0
Gold .....	8000	0	0
Tin .....	37,885	0	0
Silver .....	18,508	17	0
<b>TOTAL</b> .....	<b>£136,580</b>	<b>17</b>	<b>0</b>

REPORT OF THE MOUNT CAMERON WATER  
RACE BOARD FOR THE SIX MONTHS ENDING  
31ST DECEMBER, 1903.

25th May, 1904.

SIR,

WE have the honour to present the report of the Board for the six months ending 31st December, 1903.

The receipts for the six months amount to £742 4s. 11d. and the expenditure to £424 0s. 5d. Of the amount appearing under the head of repairs to syphons, fully half is represented by stocks of iron and other materials on hand at the end of the half-year.

*Water.*—Owing to the good rainfall the supply of water available at the intake was fully sufficient to supply all needs.

*Race.—Syphon Pipes.*—Eighty-three breaks have occurred during the half-year, as against 103 for the preceding twelve months, showing that the syphon-pipes are deteriorating, and breaks are becoming more frequent.

*Flumings.*—During this term one of the old flumings (No. 2) collapsed, and had to be repaired with old boards; and No. 1 (the intake fluming) is in a very bad state.

In its last year's report the Board recommended the replacement of the flumings by embankments, and suggested that the sum of £3000 be advanced for this purpose. This suggestion still appears to the Board to be worthy of consideration, as in the event of a dry summer the supply from the Little Mussel Roe will be reduced, and the flumings are in such a bad state of decay that they will not carry any more water from the main source of supply than they are now doing, which represents only one-half of the total supply brought in by the race.

In support of the recommendation for the replacement of the flumings, the Board draws attention to the increased output of tin ore, viz., 44 per cent., for the half-year, as compared with the previous year's rate. Since the close of the year the increased activity in the district shows a further substantial increase in the output, and the Board, in view of the greater expenditure for maintenance of the race, contemplates making a moderate advance on the present rates charged for water.

The statistics for the year are as follows:—

Average per week of claims supplied, 11.

Greatest number supplied in any one week, 13.

Total number of heads supplied:—

Under fixed or cash scale, 1432, at an average of 8s. 5½d. per head. Under royalty or credit scale, 590, at an average of 4s. 7 3/5d. per head; total, 2022.

Tin ore raised, 7 tons 10 cwts. 2 qrs. 12 lbs., royalty scale; 45 tons 2 cwts. 25 qrs. 2 lbs., fixed scale; total, 52 tons 13 cwts.

Average number of miners employed: Europeans 32, Chinese 6; total, 38.

Total receipts for the half-year : Fixed scale, £605 11s. 2d. ;  
royalty scale, £136 13s. 9d. ; total, £742 4s. 11d.

Expenditure : Cost of maintenance and management :—

	£	s.	d.
Salary and wages ... ..	332	16	0
Repairs to syphon-pipes... ..	62	16	8
Repairs to flumings ... ..	8	14	0
Travelling expenses... ..	13	17	0
Stores and tools ... ..	2	10	9
Insurance... ..	3	6	0
Total ... ..	£424	0	5

Paid to Public Debts Sinking Fund, 1903 (including moiety of rents of mineral land served by the race, £17 7s. 6d.), £620 10s. 8d.

Total amount paid to Public Debts Sinking Fund on the 31st December, 1903, £8244 9s. 3d.

Rate of interest for the year upon the cost of purchase and construction, 1·81 per cent.

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

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

W. H. TWELVETREES,

S. HAWKES,

JOHN SIMPSON,

} *Members of the Board.*

*The Hon. the Minister of Mines.*

## REPORT OF THE GOVERNMENT GEOLOGIST.

*Government Geologist's Office,  
Launceston, 31st December, 1903.*

SIR,

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

During this period I have submitted the following reports on mines and mining fields :

1. On kerosene shale and coal seams in the Parish of Preolenna, 15th July, 1903.
2. On mineral fields between Waratah and Long Plains, 26th September, 1903.
3. On the Sandfly Coal Mines, 12th October, 1903.
4. On the Dial Range and some other mineral districts on the North-West Coast of Tasmania, 19th December, 1903.
5. On the Abbotsford Creek Gold Mine, 22nd December, 1903.

The above is exclusive of Departmental reports. During the same period Mr. G. A. Waller, Assistant Government Geologist, prepared reports on :—

6. Findon's copper sections, Mount Darwin, 10th October, 1903.
7. The Primrose Mine, Rosebery, 2nd November, 1903.

The rest of his time was devoted to the preparation of a report on the Zeehan district, involving an examination of all the accessible mines, and a topographical and geological survey of that field. The field work was completed by the end of the year; and, as nearly all the known lodes are laid down on the plan, I confidently anticipate that the issue of this carefully prepared chart will be of considerable and permanent use to all interested in mining on that part of the West Coast. The report on Zeehan which will accompany the plan will bring all available information respecting the mines up to date, besides elucidating the structural geology of the field; and both the plan and the report should be consulted together.

The particular fields dealt with in the six reports issued during the half-year may be now referred to.

### *Preolenna Shale and Coal.*

The report issued in July covers the results of a visit which I paid to these outcrops the previous half-year. They are situated on the Arthur track, 17 miles south of Wynyard, and this distance from the sea or main road, combined with the smallness of the seams, precludes the coal from being handled profitably at present.

But, as the rich agricultural Flowerdale district is becoming closer settled, and cultivation of the land is being steadily extended southwards, some public tramway or railway will eventually be constructed for the needs of the district, and this will probably bring the seams within a manageable distance.

Two classes of coal occur here, and sometimes in one and the same seam. One 20-inch seam contains 5 inches of first-class kerosene shale, and 15 inches of long-flaming coal, rich in gas. Another seam (if not the same one) shows 20 inches of similar shale. These shales are equal in quality to the export shale of New South Wales, containing 21 to 23 per cent. fixed carbon, 71 to 76 per cent. volatile hydro-carbon, and 2 to 4 per cent. ash. The long-flaming coal averages 51 per cent. fixed carbon and 43 per cent. volatile hydro-carbon. Numerous other seams exist here, the best being 20-inch seams (or groups of same) of the long-flaming coal, which corresponds closely in nature with the Greta gas coals, though yielding about 1000 cubic feet more gas per ton than those. These seams probably extend further to the north, and search should be made for them north and north-west, so as to reduce the present drawback of distance.

*Waratah, Heazlewood, and Long Plains, &c.*

This mineral country was also examined the previous half-year, but the report was written during the term under review.

It is a distinctly mineral area, with several known and payable deposits of ore, and abounding with encouraging indications. Tin, gold, copper, silver, lead, zinc, nickel, and osmiridium are found; and the output of some of these has been a strong buttress to the prosperity of the State. The Mount Bischoff and the Magnet mines are in this part of the Island, and for many years there has been intermittent mining along the Whyte River and Heazlewood line of country. A connecting link between this and the Zeehan field is now being forged by the work in the Stanley River tin district.

Tin-mining was going on at the time of my visit at the Badger, five miles from Waratah, where a good belt of granite country, perhaps a mile in width, exists, and which has shed a good deal of alluvial tin rather widely. In some parts of the granite itself rich concentrations of ore are found, and work was begun on these where they were seen at surface. But tin deposits are very capricious, and a well-considered boring scheme is always advisable as a guide to work on any considerable scale. The good market prices of tin ore were inciting prospecting all over this field.

The Magnet Silver-lead Mine has proved its ore body to descend unimpaired to the level to be opened out below its lowest workings, and continues to send away its output to smelters with uninterrupted regularity.

The Confidence and Washington Hay mines are on the old Godkin tramway along the Whyte River. The former is being worked by Mr. McCreery; the latter is idle, pending inspection for flotation. The silver contents of these ores make them valuable, being, in the Confidence, 2 to 3 ounces of silver per unit of lead; and in the Washington Hay about 1½ ounce. The indications in both of these mines are such as to encourage their further exploration and development.

The Victorian Magnet (formerly Godkin's), Godkin's Extended, Discoverer, and Bell's Reward mines are on a line of contact of granite with sedimentary strata, which is marked by parallel strikes of gossan veins of galena and blende, and disseminations of silver, lead, and zinc ores in the abutting sandstones, slates and limestones. Some very rich silver ores have been met

with here at different times, and everything points to irregular impoverishment of the fractured and gossanous zone above water level, and an enrichment lower down. The Victorian Magnet was advancing a drainage tunnel into the hill to connect with old workings, and work was about to be recommenced at the upper mines.

The Wealth of Tasmania Copper Proprietary is working a mile south of the main road at the 14-mile, along the track to Mount Stewart. The object is to test the deposit of copper pyrites known as Binks' show, which is an outcrop of very pure copper ore. Its strike is ill-defined, but a shaft has been sunk, and a drive put out in a direction calculated to intersect it in depth. The drive is in serpentinous rock, the joint planes of which are occasionally faced with copper pyrites and blende. Some quite good copper ore exists, disseminated in massive cliffs near here, but is distributed in the rock rather irregularly.

Gold-mining was proceeding at Cox's face, on H. H. Gill's ridge, at the Long Plains. Weetman and Crockford made their celebrated gold discoveries on these plains twenty years ago. No gold-quartz reefs have been found here, but a good deal of gold (in nuggets up to 5 ounces) has been won from the creeks, as well as in the angular quartz-hill drift, and in softened zones in the schist. The latter has been generally in ragged, spongy, and semi-crystalline forms, denoting precipitation from secondary solution; this has been found in slugs up to 6 ounces 12 pennyweights. Several tunnels have been driven into the ridge across schist belts, in which this gold has been found sporadically, but they have not been successful in opening up any permanent run of gold-bearing material. I formed the opinion that further adit-driving will leave matters pretty well where they are at present, and that to get to the source of all this precipitated gold it will be necessary to resort to shaft-sinking. The ground above water level is simply a zone of distribution; the primary deposits must be sought for in depth.

I visited the Rio Tinto lodes on the Savage River, which are enormous lenses of magnetite and hematite, encased in hornblende and serpentinous schist, exposed in a bold ridge 700 feet in height, cleft by the Savage. This line of country is known to extend for 14 miles, and all along it, at intervals, are deposits of magnetic iron ores and copper pyrites, accompanied by characteristic minerals (nickel, cobalt, talc, tremolite, asbestos, dolomite, &c.) which point to the action of identical mineralising agents throughout the belt.

Some tunnelling has been done on each side of the river to test the Rio Tinto, in 1896-1898, but a huge formation like this naturally varies in its metallic contents in its different parts, and no payable portions of any size were disclosed, though assays of the capping had shown some fair results in gold and copper. It is not improbable that payable parts of the lode could be located by systematic diamond-drill boring. The copper contents are no doubt being gradually taken down to a zone of enrichment at or near the ground water level, and to get at that zone the work of proving must be taken down below the river. A question which has an important bearing upon the result, and which illustrates how valuable theory may be in governing practice, is whether the iron oxide is the result of the oxidation

of pyrites, or whether it is an independent precipitation, because if the latter were the case we should be prepared to find the re-deposition of metal at water-level on a much more limited scale.

#### *Sandfly Coal Mines.*

I examined these coal seams, which are situate on the divide between the Huon and North-West Bay water systems. Mr. Montgomery reported very favourably upon them in 1893, since when some additional work has been carried out there, though a good deal remains to be done in the way of exposing the different seams along the line of outcrops, and connecting the latter with one another, so that the seams may be properly identified, as well as testing the ground more systematically by boring. The seam on which the most work has been done is a large double one, consisting of excellent household and steam coal. Other seams of workable size exist on the hill, one (also a double one) containing between 3 and 5 feet of coal of an anthracite nature, having fixed carbon contents, varying from 72 to 83 per cent. In fact, all the coal at the eastern end of the range tends to be anthracitic. The really excellent quality of this coal would have ensured its being worked long ago, but for the preliminary outlay necessary for the construction of a tramway from North-West Bay to the mine, a distance of about eleven miles.

#### *Dial Range and Emu Bay Districts.*

I examined several of the mineral deposits in this area. Silver-lead ore and argentiferous copper and iron pyrites occur on the beach at and near the Penguin. The Penguin Silver Mine, The Neptune, Sullock's and Hardy's mines were started in these deposits. The country rock is traversed by small fractures which have been filled with mineral, but are not sufficiently large to work profitably. The aim should be to get below this zone of ramifying veins, where there is a better chance of finding ore in payable quantities.

On the east side of the Dial Range, the Dial P.A. and Keddie's mines are in a crush breccia zone of granitoid rock, the interstices of which are filled with, and the fragments often replaced by, iron pyrites, with which gold and silver-bearing copper pyrites are often associated. The mining has hitherto consisted of adit-driving, but I think the proper plan is to sink on these deposits, and test them in depth. Further south is Hardstaff's Mine, where an adit was being driven to intersect a fissure vein in granite, containing some solid copper pyrites. If the band of this ore increases to a payable width below the outcrop, a nice little mine will be the result.

There are occurrences of mineral still further south, and the country here eminently deserves prospecting.

On the western side of the range deposits of galena also exist. A vein of bright galena occurs at Badger's Mine; in the lode here are some blende and copper pyrites. The indications are that it will be a copper lode in depth.

The Iron Cliff outcrop of brown hematite descends into the Lady Braddon tunnel, and has been partly intersected by the latter, without, however, any change in its contents. The tunnel should be continued right across the lode, and shaft-sink-

ing begun. This lode, too, I think, will be found to be a copper-bearing one.

The Tasmanian Iron Mine, worked by Mr. J. C. Ellis, of the Penguin, is  $3\frac{1}{2}$  miles from the coast. A pure red hematite is being mined and shipped to smelting works in New South Wales for fluxing purposes. The ore as shipped contains 66 to 68 per cent. iron and 2 to 3 per cent. silica. It contains only traces of sulphur and phosphorus, and is suitable for the manufacture of the very best iron and steel.

Massive hematite deposits also occur on Denny and Jones' sections high up on the Dial Range, six miles south of Penguin, but nothing has been done yet in the way of proving them, beyond a few cuts.

#### *Blythe and Stowport Districts.*

I examined two copper mines here—one the Rutherford Mine, two miles south-west of the Blythe Iron Mine; and the other the Blythe P.A.'s mine, on the Blythe River,  $3\frac{1}{2}$  miles from its mouth.

Both of these are in clay slates, which appear to form a belt of copper-bearing country extending north and south for a considerable distance. The copper lodes are approximately parallel with the large iron outcrop at the Blythe, and this, and their contiguity to that deposit, have given rise to a surmise that the latter may be replaced by copper ore at a depth. The absence of lode minerals in it makes this supposition improbable, but the nature of its relationship (if any) with the recent copper discoveries is well worthy of renewed examination. The iron deposit possibly continues south as far as Rutherford's, for similar iron ore exists on that property. My examination led me to the belief that other, and possibly more important, deposits remain to be discovered in this area, which, being an agricultural one, has not received much attention from prospectors.

#### *Abbotsford Creek Gold Mine.*

I inspected this mine, which is situate at Tullochgorum, near Fingal. Three adits were driven on a strong quartz reef, averaging 4 to 6 feet wide; 1500 tons of quartz were raised from it and crushed, but only returned 2.72 grains gold per ton. After examining and sampling the mine, I arrived at the conclusion that, though at or near the surface the reef carried a little gold, as opened up by the levels it is practically valueless. The only prospecting work which offers a chance of any future improvement is to continue the lower level, and to sink.

#### *Findon's Copper Sections, Mount Darwin.*

Mr. G. A. Waller examined this property, which is on the ridge connecting Mount Darwin with Mount Jukes. The deposit consists of iron and copper pyrites, disseminated through chloritic schistose felsite. Bulk sampling indicated percentages of copper varying between 2 and 3; and the Assistant Geologist considers that there is a reasonable prospect of further work, at a moderate depth, disclosing large bodies of stone carrying from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  per cent. copper. From experiments which he made, he is of opinion that the most suitable treatment for the ore would be a combination of the ordinary methods of wet concentration with the Elmore oil process. There are other deposits of a similar type on Mount Darwin, and successful work

on the mountain would be fraught with important beneficial results to the State.

*Primrose Mine, Rosebery.*

Mr. Waller examined this well-known zinc-lead sulphide deposit, which is an extension of the ore-body in the Tasmanian Copper Company's ground. The sulphide ore contains from 9 to 19 per cent. lead, 30 to 33 per cent. zinc, 0.6 per cent. copper, 6 to 11 per cent. iron, 11 to 20 per cent. silica, and carries from 2 to 27 dwts. gold and 7 to 17 ounces silver per ton. This ore has not yet been submitted to treatment; some of it is considered as capable of giving a decided margin of profit over and above mining and smelting charges. Tributors have been stripping the gossanous capping of the lode, and sluicing it for gold. This assayed from 3 to 10 dwts. gold and 11 to 36 ounces silver per ton. Several hundred tons of this gossan were in sight, and it was impossible to say how much more may be exposed as work goes on. Mr. Waller was of opinion that by making two products, one consisting of hard gossan for sale to smelters, and another consisting of the soft friable gossan, for treatment in sluice-boxes, the whole can be profitably handled.

*Progress Reports.*

I have compiled two Quarterly Reports on the progress of the Mineral Industry during the period. These have a fair circulation abroad, and are a useful means of disseminating a knowledge of our mines and mining. I am desirous of improving these in every possible way, and shall welcome any useful suggestions which may be sent to me. If mine managers or agents would furnish me with a quarterly summary of the mine work and its prospects, it would help to increase the value of these reports.

*Office.*

During the half-year seven geological and two progress reports have been issued, and the correspondence has amounted to 1264 letters, &c., in and out. Mr. F. S. Grove has continued his examination of the plans of underground surveys, but owing to his time being otherwise fully occupied, the arrears cannot be further dealt with.

Specimens of minerals, rocks, and fossils for the office collection have been received from Messrs. W. F. Petterd, H. Conder, A. Simson, H. Grant, J. Thomson, and J. J. A. Stitt, which are acknowledged with thanks.

*Government Drills.*

The diamond-drills were not working this half-year. The alluvial boring-plant was let to Messrs. Medwin and Traill, on the Tamar, for testing ground for coal. Work was started here in the tertiary lignitic series of clays and sands; but the coal measures which possibly underly those beds have not yet been reached.

I have the honour to be,

Sir,

Your obedient Servant,

W. H. TWELVETREES, *Government Geologist.*

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

## REPORT OF THE CHIEF INSPECTOR OF MINES.

*Inspector of Mines' Office,  
Launceston, 31st December, 1903.*

SIR,

I HAVE the honor to submit my Report on the inspection of mines for the six months ending 31st December instant.

I beg to attach hereto statistical tables of accidents, and the reports of Mr. M. J. Griffin, Inspector of Mines for the Northern and Southern, Eastern and North-Eastern Divisions; and of Mr. Jas. Harrison, Inspector of Mines for the Western and North-Western Divisions.

Inspector Curtain was retired at the end of the year in pursuance of a policy of retrenchment.

The number of men employed this half-year in the mines and smelting works of the State was 5604, as against 6484 the previous year; of these 207 were Chinese.

The fatalities were 8, and other injuries (serious enough to be recorded) totalled 20. The death rate from accidents was 1·428 per thousand, compared with 0·925 the preceding year. Of these fatal accidents, 5 occurred in the Eastern and North-Eastern Divisions and 3 in the Western Division. This rate is higher than it has been for the last four years. It has been exceeded in five years out of last ten years, attaining a maximum in 1897-8, when it was 2·351. A thorough-going comparison, however, cannot be instituted for this term, as the statistics hitherto have been yearly, and not half-yearly. The serious accidents (other than fatal) have been only 3·569 per 1000, being considerably less than in the two preceding years. But it is impossible to base any serious comparison on this, because injuries which are near the borderland of serious and trivial may be regarded differently by different managers. One manager reports that a workman has grazed his toe; another does not consider it necessary to report an accident which sends a man home disabled from work for a few days. Consequently, the serious accident of one is equivalent to the trivial one of another, and *vice versa*.

The wording of Section 89 of the Mining Act of 1900 contributes to this confusion, for it only provides for the notification of "any accident attended with serious injury to any person." I am in favour of the word "serious" in this section being deleted, and of all accidents being reported and dealt with. The serious ones can then be extracted for purposes of comparison.

Notwithstanding the elaborate statistics referring to mining accidents in Great Britain, it is almost certain that the number of serious accidents which are unreported is sufficient to invalidate the published averages. The Departmental Committee appointed to enquire into the notification of industrial accidents in 1902 suggested that, at mines and quarries, there should be three classes of reportable accidents, viz. :—

1. Fatal accidents. 2. Accidents from special causes (*e.g.*, explosions, electric shock, &c.). 3. Accidents causing more than a

fortnight's disablement. It proposes to continue the present obligation of reporting accidents causing "serious personal injury," the word "serious" meaning fractures of skulls or limbs, dislocation of limbs, and other accidents equally serious.

It is highly desirable that a mutual agreement be arrived at among the Inspectors of Mines in the different States of the Commonwealth, defining accidents which are to be recorded in the tables. In my opinion, a fortnight's disablement, as suggested for Great Britain, is far too wide a limit for the definition of a serious accident; a week, or even three shifts, would be a better time-limit. If we can come to an interstate understanding on this question, the non-fatal accident statistics will have a definite comparison value, which at present they do not possess.

Whatever meaning may be attached to the word "serious," a requirement that even trivial accidents should be reported to the Inspectors, would in some cases possibly result in the investigation of circumstances which, although attending an actually trifling accident, might have produced a more serious one.

The Inspectors have regularly examined ropes, chains, and cages, and the ventilation of mines; in some cases ordering the removal of defective cages and their replacement by safe ones. In one mine further work was prohibited until a better supply of air was provided. Defective ventilation is reported to exist at two mines, both at Beaconsfield, viz., the Tasmania and the North Tasmania. The former company has been endeavouring to improve matters by introducing new appliances, which have not proved quite satisfactory. The North Tasmania suffers frequently from bad air; and, as the tributors have to climb 300 feet of ladders from their work to the surface, there is some risk: Inspector Griffin is calling attention to this.

Work at the Dulverton Colliery had to be prohibited temporarily, until precautions for safety prescribed by the Inspector were taken.

Inspector Griffin mentions in his report the necessity for dwelling in a less remote place than Gladstone. In some cases, owing to the distance, he has been unable to arrive on the scene of an accident within proper time; in other instances it has not been possible to examine promptly occurrences which, though seemingly trivial, yet require investigation at once; and finally, Gladstone is so situated geographically that news of his intended visits often precedes his arrival at particular mines. A more centrally situated place of residence, such as Launceston, would be preferable.

The Hon. the Minister of Mines has brought under my notice the question of auxiliary inspection of mines by workmen. This is practised in the other States of the Commonwealth, and in New Zealand; and its introduction here would be advantageous as not only strengthening the hands of the Inspectors, but in giving the workmen a legitimate remedy when, owing to the distance, the Inspectors' visits are infrequent. Our Inspectors recommend provision being made in this direction.

The regulations submitted last year by Inspector Griffin for the daily and weekly inspection of coal mines have, I understand, been approved of by the Department, and are in the

hands of the Parliamentary draftsman. It is matter for consideration whether, when a new Mining Act is passed, regulations for collieries should not be embodied in it as a separate part or division.

As soon as practicable I should like to have a conference of the Inspectors, in order that we may discuss personally proposed additions to the regulations, and other matters connected with the administration of the Act.

In conclusion, I wish to make mention of the efficient services rendered by the Inspectors in their arduous journeys and examinations during the past term.

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.*

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*COMPARATIVE Table of Statistics of Accidents in and about the Mines of Tasmania from 1st July, 1892,  
to 31st December, 1903.*

Period.	Number of Miners employed.	Number of Accidents.	Number of Persons.		Total killed and injured.	Average per 1000 killed and injured.	Average per 1000.	
			Killed.	Injured.			Killed.	Injured.
1 July, 1892, to 30 June, 1893	3295	28	4	25	29	8·8001	1·214	7·586
” 1893 ” 1894	3403	25	7	20	27	7·934	2·057	5·877
” 1894 ” 1895	3789	26	4	24	28	7·390	1·058	6·332
” 1895 ” 1896	4160	22	7	16	23	5·529	1·682	3·847
” 1896 ” 1897	4303	36	7	31	38	8·831	1·627	7·204
” 1897 ” 1898	5530	36	13	33	46	8·318	2·351	5·967
” 1898 ” 1899	6180	35	9	34	43	6·957	1·456	5·501
” 1899 ” 1900	6834	19	7	16	23	3·365	1·024	2·341
” 1900 ” 1901	7017	29	8	23	31	4·417	1·140	3·278
” 1901 ” 1902	6438	38	7	35	42	6·524	1·088	5·437
” 1902 ” 1903	6484	44	6	43	49	7·557	0·925	6·632
30 June, 1903, to 31 Dec., 1903	5604	27	8	20	28	4·977	1·428	3·569

TABLE, showing the Number of Persons Killed and Injured in and about the Mines of Tasmania during the Six Months, 1st July to 31st December, 1903.

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	...	...	...	3
<i>Shaft Accidents—</i>														
Suffocation by natural gases .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Overwinding .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ropes or chains breaking .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Machinery .....	...	1	...	...	...	...	...	...	1	...	...	...	2	
Falling in or into shafts .....	...	...	1	...	1	1	...	...	1	...	...	1	3	
Things falling into shafts .....	...	...	...	...	...	...	...	...	1	...	...	...	1	
Explosives .....	...	...	...	...	...	...	...	...	...	...	...	...	...	
Miscellaneous .....	...	...	...	...	...	1	...	...	...	...	...	...	1	
Total .....	...	1	1	...	1	2	...	...	1	2	...	1	3	6

<i>Miscellaneous (underground).</i>														
Explosives .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Suffocation by natural gases	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Haulage—														
On inclined planes .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ropes or chains breaking	...	...	...	...	...	...	...	...	...	...	...	...	...	...
By trams and tubs .....	...	1	...	...	...	...	...	...	...	...	...	...	...	1
Machinery .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sundries .....	...	1	...	...	...	...	...	...	...	...	...	...	...	1
Total .....	...	2	...	...	...	...	...	...	...	...	...	...	...	2
<i>Total underground . . .</i>	...	4	1	...	1	3	...	...	1	3	...	1	3	11
<b>ON SURFACE—</b>														
Smelting Works .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Machinery .....	...	...	...	...	...	1	...	...	...	...	...	...	...	1
Boiler explosions .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tramways .....	...	1	...	...	...	...	...	...	...	...	2	1	2	2
Explosives .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Falls of ground.....	...	...	...	...	2	...	...	...	...	...	3	2	2	3
Miscellaneous.....	...	...	1	...	...	...	...	...	...	2	...	1	1	3
Total on surface.....	...	1	1	...	2	1	...	...	...	2	2	5	5	9
<b>GROSS TOTAL .....</b>	...	5	2	...	3	4	...	...	1	5	2	6	8	20

## REPORTS OF THE INSPECTORS OF MINES.

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

I have the honour to submit to you the following report for the half-year ending 31st December, 1903.

*Accidents.*—In doing so, I am pleased to be able to state that the accident list is a very light one, being :—One fatal and five non-fatal. The former was a tributor named M. Maher, who, in climbing up a shallow shaft, fell and ruptured himself. He afterwards succumbed to the injuries received.

*Safety Appliances.*—The mines are well equipped with necessary safety appliances. Ropes and cages have been tested, as required.

*Ventilation.*—The ventilation of the mines is, on the whole, good. In one instance I found it necessary to stop all mining until a better supply of air was provided by the manager.

*Magazines.*—The magazines are being well attended to. A few more have been added to the list. I had one parcel of damaged explosives destroyed.

*Output from the District.*—The output from the district for this term has shown a gratifying increase on the corresponding term of previous year; and it is worth mentioning that the Tasmanian Smelters are now in a position to treat much lower-grade ore to advantage than what they were last year.

In conclusion I may state that we can reasonably look forward to a further increase in the output from the field in the near future.

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*LIST of Accidents in Inspector Harrison's District for the Six Months, 1st July to 31st December, 1903.*

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
1903. 16 July	Zeehan Queen	Mt. Zeehan	Fall from top brace	Male, Isaac	Married	Shock to system	Was putting down new floor on top brace and fell to ground, about 30 feet.
10 Aug.	Sth. Comstock	Ditto	Truck fell over tip.	Easterbrook, Gordon	Single	Bruises	Emptying a truck which ran over end of tip, carrying Easterbrook with it.
21 Sept.	Oonah	Ditto	Fall of stone	Poland, Thos.	Ditto	Hurt about loins	Preparing to timber a rise, piece of stone came away and struck him on side.
6 Sept.	New Mount Zeehan	Ditto	Fall down shaft	Maher, Michl.	Married	Internal ruptures Died 2nd October	Coming up shallow shaft with the aid of a rope, slipped and fell to bottom, 18 feet.
8 Oct.	Zeehan Western	Ditto	Jambled by bucket in shaft	Spencer, Jas.	Ditto	Broken ribs and bruises	Repairing shaft, and in attempting to pass an iron sinking bucket, which was on the stage, he pulled it over on himself.
14 Nov.	Zeehan (Tas.) S.L.	Ditto	Fall of timber in shaft	Hook, Harry	Ditto	Scalp wound	Sinking shallow shaft, bucket knocked piece of timber down, which struck him on head.

Fatal, 1 ; non-fatal, 5 ; total, 6.

*LIST of Accidents in Inspector Curtain's District for the Six Months, 1st July to 31st December, 1903.*

Fatal, 2; Non-fatal, 6; Total, 8.

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
24 July	Mt. Lyell M. & R.	Mt. Lyell	Slip of piece of rock	Collins, Michael	Single	Dislocated ankle	Was engaged shovelling in bench 3A, a slab of schist slid over on to his ankle.
27 July	Ditto	Ditto	Fall of rock	Fogherty, Timothy	Widower	Scalp wound	Laying tramline on 4 bench, when a stone dislodged from 3A struck him on head.
6 Aug.	Ditto	Ditto	Run-away trucks	Wells, Thomas W.	Single	Several ribs broken, and lung injured	Three trucks broke away on haulage-line, and dashed into the ore-bins, carrying them away. Wells was sweeping out the ore-bins, and was carried with them.
6 Sept.	Ditto	Ditto	Run-away truck	Jacobs, Robert	Single	Concussion of brain, causing instant death	Were riding up haulage-line on empty truck; a full truck of firewood escaped from top of haulage, and dashed into truck on which they were riding, smashing it, and killing them.
"	Ditto	Ditto	Ditto	Sturgess, Leonard	Single		

13 Nov.	Ditto	Ditto	Fall of rock	Smith, James	Married	Fracture, both legs below the knee	Barring down face; piece of ore on which he was working canted over, struck ledge on which he stood, and carried the whole away.
17 Nov.	Mt. Lyell Blocks	Ditto	Fall of stump	McPeak, John	Single	Broken rib	Working at concentration site; a portion of a stump, which had been grubbed, rolled from a higher bench and struck him.
18 Dec.	Mt. Lyell M. & R. North Lyell Mine	Ditto	Fall in shaft	Metcalf, William	Married	Sprained ankle	Timbering main shaft at North Lyell; platform on which he stood gave way, and he fell a distance of about 20 feet.

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

I have the honour to submit my report for the Northern and Southern, North-Eastern, Eastern, and North-Western Divisions for the six months ending 31st December, 1903.

*Accidents.*—I very much regret having to report that out of 14 accidents recorded during this period, five were fatal. In connection with these I may state that the accidents were caused through carelessness or want of caution on the part of the injured men themselves, with one exception, that of Edward Treehee, in whose case the accident may be classed as unavoidable.

*Fatal Accidents.*—James Green, a single man, age about 40 years, was employed at the Star of Peace Tin Mine as horse-driver, trucking stone from a short pass connecting a tunnel with the open-cut workings 18 feet above. The pass had been standing full for a week or so. Green worked by himself, and was last seen alive about 2 p.m. on the day of the accident; he was then taking the horse and trucks into the tunnel. He not having returned at the usual time for knocking off work—5 p.m.—a search was made, and his dead body was found lying on the lip of the pass, the head and shoulders being thrust inside the door, and covered with loose stone and dirt. From all the surroundings, and from the fact that the pass was nearly empty when the accident took place, it would appear that the unfortunate man, to make sure that the pass was quite empty (his last truck not being quite full), thrust his head inside the door, knowing that if it were empty he could see daylight through it; was struck on the head by a small stone, and rendered insensible, the loose earth and small fragments of stone—there was still some of this in a fringe round the top entrance to the pass—slowly falling about his head until he was suffocated. The medical testimony went to show that he died from suffocation, and that the cut on the head was not sufficient to alone cause death. No person is to blame for this accident.

Alexander Williams, a single man, aged 40 years, was engaged as shift-boss, at the open-cut face of the Pioneer Tin Mine. After the occurrence of a heavy fall of earth, he went to the top of the face to trim off some overhanging turf and clod, ventured too near the edge, the turf giving away beneath his feet; he fell 30 feet on to broken cement and lumps, and received severe injuries to his back and spine, from which he died a few hours later. No blame attachable to anyone for this accident.

Edwin Dudley Treehee, single, age 29 years, engaged at hammer and drill work in the open-cut face of the Anchor Tin Mine, was putting a hole into the toe of face-rock at the level, when he was struck by a rather large lump of stone, that fell from the face; he received injuries to the right side of his head, shoulder, and body; also a nasty transverse wound above the right knee. The doctor was soon in attendance, and for two weeks Treehee was progressing towards recovery, when he unfortunately insisted on getting out of bed, and in doing so ruptured an injured lung, and died suddenly. The portion of the face where this accident happened was worked at a reasonably safe slope. Treehee himself cleaned down the face, and, as he thought, removed all loose or dangerous stones, just before he

commenced to drill the hole he and his mate, Taggart, were at when the accident happened. The stone that struck him came from a vertical head a few feet in height and about 20 feet above where he was working. Heavy rain was falling at the time, and this probably loosened the fragment of rock that fell. Treehee, when questioned a few days after the accident, said he had no one to blame, and that he thought the face was safe after he cleaned down the loose rock.

John Quinn, a married man, was foreman of shift at No. 2 face, Anchor Tin Mine. Some shots had been fired about half-way up the face—25 feet or so. Edwin Pride, who had charge of this work, told Quinn the shooting had loosened rock higher up, and asked if he (Pride) would go and bar it down. He was told not to mind doing so. Quinn then sent his son, Ernest, and another man to drill a hole in a point of rock below, and a little to one side, of the loosened mass. They were at this work for a little while, when he went up and told them it did not look too safe, and that they had better come away. He then crossed over below the dangerous rock, viewed it from the other side, and then commenced to descend to the level, which he had nearly reached, when he was heard to call out, "look out," and a moment later he was struck and knocked to the foot of the face by a large stone, the mass of loosened rock following and crushing him to death instantly. No one can be blamed for this accident. When men experienced at their work, as Quinn undoubtedly was, will carelessly run into danger that could easily be avoided, it is not surprising to hear of their being killed or injured.

Edward Burles, single, aged 45 years, was engaged shaft-sinking at the Tasmanian Consols Gold Mine, and was, with his mate, Talbot Brooks, working at the 1280-foot bottom on Christmas eve. At 10 p.m. they ascended on the bucket, which was hoisted by an air-winch, to the 1200-foot plat. Brooks got off first. The winch-driver, William Dunn, noticed that Burles did not move for several seconds; he then put out one foot as though in the act of stepping off, but suddenly disappeared down the shaft, and was instantly killed, the fall being 80 feet, on to the bare rock bottom. Burles was known to be one of the oldest and most experienced miners on the field, and was at all times most careful when engaged in the work of shaft-sinking. No blame attachable to anyone for this accident. The hauling equipment was good, and the plat at the 1200-feet, where the men ascended to, was well lighted at the time of the accident.

*Serious Accidents.*—Joseph Solomon, engaged at the New Golden Gate Mine, in open-cut mullock face, was caught and covered up by a run of loose earth. Injuries not very serious; he returned to work in a few days.

Daniel Thorne slipped and fell a couple of ladders in a rise at the New Golden Gate Mine. He got a very severe shaking, and was three weeks off work. Accident unavoidable.

Christian Olsen was working in the Marialva Coal Mine at Colebrook. He improperly removed a prop, after being cautioned not to do so; portion of the roof fell on him, causing severe contusions about the body and legs. He was removed to the Hobart Hospital, from which he was discharged a fortnight later, apparently all right.

William Keltie was working in a winze at the New Golden King Mine. A fragment of quartz flying from the pick-head

struck him in the eye. He went to the Hospital for treatment. When last heard of, a fortnight after the accident, it was feared he would lose the sight of the injured eye.

John Robertson was engaged as foreman of a party, cutting down and enlarging a shaft at the Tasmania Gold Mine, when he was caught by the descending cage. Fortunately, the cage was moving very slowly, almost stopping, when it reached him, otherwise he would have been killed; as it was, he escaped with a few bruises, and was enabled to return to work after a week's rest. Inquiry into cause of this accident disclosed a careless system of working, as there was no definite means by which the brace-man could warn men employed in different parts of the shaft of his intention to lower or raise the cage past them when it was wanted at the bottom, 1000-foot level. The head pitman in charge of the shaft alterations was to blame, for allowing the cage he himself had just ascended to the surface in to be immediately used by a man who wanted to go to the bottom level, and without any warning being given to the men in the shaft. To the engine-driver in charge of the winding-engine is due the credit of having, without any instructions to do so, slowed his engine almost to stopping when the cage was nearing men at work in the shaft; had he not done so in this instance, Robertson would have certainly been killed. A proper system of signalling, by means of bells, which denote a movement of the cage in any part of the shaft in which men are working at alterations or repairs, is now in use, and found to work well.

James Thomas was endeavouring to push a truck on a slight incline at the Tasmania Gold Mine. The effort was too much for him; the truck came back, and he was jammed between it and another one. Sustained contusions of back. Doctor considered injuries not very serious.

Herbert Wellington, at the Tasmania Gold Mine, attempted to jump on to a loaded truck he was running on a brace-tramway, and received injuries that caused an abscess to form in the perineum; was in hospital for a fortnight.

*Accidents less Serious.*—John Tregaskis, at the Tasmania Gold Mine, was dressing a piece of timber; the adze slipped, inflicting a nasty gash on the calf of his leg.

John Irvine, at the New Golden King Mine, was trying to take a kink out of shackle-chain on cage, and got one of his fingers crushed.

Ropes, chains, shackles, and cage-gearings have been regularly inspected, and, as a rule, found in good working order. In some few cases, cages found defective in the safety-gear have been removed, and replaced by safe working ones.

*Ventilation.*—This was good in most of the mines. There are two exceptions, the Tasmania G.M. Co. and North Tasmania, both at Beaconsfield. The former company effected a great improvement in the ventilation of its mine in the early part of the year, by the introduction of a powerful blower, which, however, is not at present doing good work, owing to the defective state of the boxed air-drifts, which were at first constructed with timber frames, covered with rubberoid. The blower-fan being reversed, so as to serve as an exhaust, soon made wreck of the rubberoid, and now, boxes wholly of timber are being put in; meantime, the ventilation in different places, especially winzes, in

the mine is defective. At the North Tasmania Mine the ventilation is very often defective. This mine is generally worked by a tribute party, who are responsible, or supposed to be responsible, so far as the company is concerned, for the safe working of the mine. On the occasion of my last visit, I was informed that no work had been done for several days, owing to the presence of foul air in the mine. A horse-whim is in use for hauling; the men have therefore to descend and ascend by the ladderways to the 300 and 350-foot levels, a practice that is fraught with danger when bad air is present in the mine. I would like to see a new regulation introduced into our mining laws, making it compulsory for all mine-owners working their mine below a depth of 150 feet to provide a safety-cage, to be worked by steam or other suitable power, for the men employed to ascend and descend by. No man should be asked or required to climb over 150 feet of ladderways after his day's work. Apart from other considerations, there is risk of accident, or of a man being overcome by foul air, and no means of getting to the surface except by the whim-bucket. In the case of the North Tasmania Mine, six tributors, men and boys, are working a very small make of stone at the 300-foot level. Good ladderways are provided in the main shaft; there is also an old underlay shaft connecting with the 200-foot level, which, when kept open and in repair, provided a good travelling-way for the men, and improved the ventilation of the mine; this is now out of use. The company refuse to expend any money in keeping it in repair; the tributors cannot afford to do so, so must go on climbing 300 feet of ladders to and from their work, and take their chance of being overcome by foul air.

*Mines Inspected.*—All the mines at or near the following places have been inspected once, many of the principal ones twice, and some few a third time, during the half-year to 31st December, 1903; viz. :—Pioneer, Moorina, Weldborough, Lottah, St. Helens, Mount Nicholas, (coal), Mathinna, Mangana, Abbotsford, Avoca, Beaconsfield, Lefroy, Dulverton, and Spreyton (coal), Penguin Iron Mine, Stowport and Blythe copper syndicates; also York Plains, Colebrook, and Mount Cygnet coal mines. Work had been suspended at Mt. Cygnet Mine for a month or so prior to my visit in November. There is a nice workable seam of coal, worked to the dip. Haulage is by means of a portable engine. The workings east have now reached more settled country, clear of the faulting noticeable near the main heading, and a better and more even roof and floor are obtained. It is, or was, at time of my visit, intended to improve the haulage-line, by extending a branch south-easterly from a point a little way down from the entrance to the present tunnel, when the work of coal-getting will be resumed.

*Marialva Coal Mine, Colebrook.*—No work doing below on the day of my visit, owing, it was alleged, to the enginedriver having left the night before. Strange that this mine should be stopped the very day the inspector arrived. The working of this colliery was most unsatisfactory under the management of Mr. Sutcliff, junior. It is now in the hands of Mr. C. Jack, of Hobart, who gave as an excuse for not having provided a ladder-way and other things necessary for the safe working of the mine ordered by me, that when he took over control of the mine from Mr. Sutcliff, the latter did not give him the mine record-book, in which I had

made entries of things required to be attended to. This carrying off the record-book is often done by managers who do not care to leave written evidence of their neglect, or incapacity to carry out necessary improvements for the safe working of the mine of which they have had charge. The accident to Christian Olsen, which occurred in this mine in August last, points to careless methods of working. Mr. Jack has now full control of this and of the adjoining coal mine, formerly owned by Mr. Morrison, and I anticipate a better and safer system of working in future.

*Mt. Nicholas Colliery.*—This is now being worked in a fairly satisfactory manner; faulting of the seams is less frequent. A succession of these down-throw faults has for some considerable time rendered long-wall working difficult, breaking as they do the continuity of the roof, and also interfering with drainage. When visited in March last, this colliery was working only five days a week, owing to a falling off in the demand for coal.

*Cornwall Colliery.*—This is generally worked in a satisfactory way with regard to the safety of the men employed; ventilation is at times rather dull. The 6-foot seam in main workings is now split up by a band of white sandstone, which, getting broader as the work advanced, interfered a good deal, and made the seam less profitable to work; the bottom coal, about 18 inches beneath the band, had to be left, and work is now carried on the upper portion of the seam in 3 feet 6 inches of good coal. The band, which appears to be lens-shaped, will probably feather out or be reduced to the few inches it represented when first met with. About 76 men and boys, including surface hands, are employed. Output of coal, 90 to 100 tons per week; full time worked.

*Dalmayne Coal Mine*, situated about 9 miles south of St. Marys. I did not see this, as all work was suspended prior to my visit to the locality, failure of negotiations to float the concern being, I am informed, the cause.

*Dulverton and Spreyton Collieries.*—Not very much doing in these localities. At the Dulverton Colliery a new tunnel has been driven parallel to and a few chains west of the old one. The approach to, and opening of this new tunnel, was not being carried out in a satisfactory way; the owners, on being apprised of this, promised that the alterations and improvements required would receive immediate attention. When I again visited the mine, three months later, it was to find things in a most unsatisfactory condition. The tunnel had been driven 88 yards, and six men were employed hewing coal. The tunnel, too low at best, had almost collapsed in places, owing to defective timbering. The drainage was also bad, mud and water covering the floor at the entrance and for over two-thirds of its length. The manager, when spoken to about this, admitted having received instructions from the owners to carry out the alterations and improvements necessary for proper working, and would have done so only that these instructions were almost immediately countermanded, and he was told to proceed with the work in the way in which he commenced it. It was now time to enforce compliance, I therefore gave the owners notice to have the necessary improvements, timbering, drainage, &c., carried out within fourteen days, and that until such time as this work was completed, no men were to

be allowed to work in the coal faces or heading. I returned at the end of the time named, and was glad to find the alterations and improvements necessary for the safe working of the mine had been carried out—if not in the best possible way, at least so as to render the place safe. Am not very well pleased with the action of the owners of this colliery, Messrs. Ockerby & Co., of Launceston, in connection with their countermanding the instructions at first given. They will now perhaps understand that they must not risk the lives or safety of men they employ in their endeavour to get out coal cheaply.

Teesdale and Co. have opened on the same seam as worked in the Dulverton Colliery, but on the opposite side of the valley, and going into the hill, west, the seam is 18 inches, with roof and floor of hard sandstone. Rolls and faulting caused a good deal of trouble at first, but now more settled country is being reached. A tramway from Dulverton Railway Station to this colliery,  $1\frac{1}{2}$  mile, is now in the course of construction.

*Spreyton Colliery.*—The proprietor, Mr. Allinson, has now opened on the west side of the valley, on the same seam as previously worked to the eastward. Here, as at Dulverton, the seam is only 18 inches in width, and accordingly, difficult to work.

Mr. Bound, a small farmer, has opened on the same seam, and close to the Spreyton Colliery, but not much has been done so far. This is called the Illamatha Colliery.

*New Mines.*—At Stowport Road, 9 miles from Burnie, the Rutherford Prospecting Syndicate are opening up what appears to be a good copper show. Their method of working is rather primitive, and leaves lots of room for improvement. Further to the north-east the Blythe Prospecting Association have done some work on what is supposed to be a continuation of the Rutherford lode. Intermediately between these two—Blythe and Rutherford—another syndicate are about to commence work. Altogether, there is promise of payable copper lodes being opened up in the locality.

Hardstaff's and other prospecting shows south of Penguin are not doing much.

*Middlesex.*—Very little doing in this locality. The Devon Silver Mine is the only one that manages to keep going, although not very much has been done for the half-year. Mr. Hartwell Conder, mining engineer, of Launceston, has now control of this property, and preparations are being made for developing the mine. The cost of transit of ore from, and of mining requisites to, this locality is a great drawback. What is required is a light line of railway from Leith, traversing the Wilmot country, and extending to the Bell Mount, Middlesex, and Dove River mineral areas.

*Gold Mining.*—No new discoveries worth mentioning, with the exception of the Miners' Dream, situated south of the New Golden Gate Mine, at Mathinna, and on ground formerly held by the South Gate Co. The prospectors, Messrs. Stevens and Dick, are old and well-known miners and prospectors. Their success in this instance is well deserved. The reef, which is very flat, underlying about 3 in 1, is from a foot to 14 inches thick, and has been

sunk on from 15 to 20 feet. Ten tons of stone crushed yielded 50 ozs. of gold. Latest news received states that extraordinarily rich stone has recently been struck in this mine.

*Magazines.*—Since it has become part of my duties to inspect magazines generally, those outside the mining places as well as those within, a good deal of extra travelling is entailed. I find that but very few of the storekeepers who stock explosives above the 35 lb. quantity allowed, have magazines, or, indeed, any proper means of storing large quantities. Several new magazines have been built, and others are in course of erection. There are some 30 private magazines altogether; two-thirds of these are on mines or mining townships, the remainder in agricultural centres and sea-port places. The Magazines on mines and mining places are all in good order.

*New Rules, and Duties of Inspectors.*—Situating as I am in this extremely out-of-the-way corner of the mining divisions allotted to me for inspection of mines, and with the Mount Cameron Government Water-race to manage, I find it most difficult to perform the duties allotted to me in a satisfactory way. Mine inspection, to be put to its best use, should be performed frequently, and the Inspector should reside in the most centrally-situated place, so that all or any of the mines could be reached with the least possible amount of travelling. Periodical rounds of inspection, such as I make, occupy from four to five weeks, and cost far more in the way of travelling expenses than if I were to return to my home weekly or fortnightly. Recently, questions have been asked in Parliament—"Do Inspectors of Mines notify mine managers of their intending visits to their mines"? Personally, I can say that I do not now, nor have not at any time given notice to any mine manager of my intention to visit and inspect the mine of which he had charge; nevertheless, I know full well that they can find out when I am coming. Coaches travel through most mining places daily, and news of the Inspector's movements travels with them; newspapers also contain this information at times, although they do not get it from the Inspector. Since the close of the year, I am glad to learn that it is the intention of the Hon. the Minister of Mines to relieve me of the management of the Mount Cameron Water-race, so that I may reside in a more centrally-situated place, and devote the whole of my time to mine and magazine inspection.

*Inspection of Mines by Workmen.*—The Chief Inspector of Mines has forwarded me extracts from the Mining Acts of Queensland, New South Wales, and New Zealand, in each of which provision is made for inspection of mines by workmen. I am glad to be able to recommend that a similar provision be embodied in our Mining Act, as I feel sure the introduction of such a principle would be of great assistance to the inspection, and materially aid in securing increased protection for miners. Especially would this apply to cases where the Inspector is unable to make frequent inspection of mines, in which more than ordinary danger of accidents exists. As a rule, miners do not care to complain to the Inspector of dangers or defects that may exist in the mine they work in; formal complaints are seldom made. Again, where accidents not fatal but of a serious nature occur, and are reported to the Inspector by the mine manager, it often happens that he,

the Inspector, is not near enough to investigate the cause of such accident without delay, and determine whether blame for its occurrence is attachable to any one—days may elapse before he reaches the locality; in the meantime, work is going on, and thorough investigation rendered more difficult. Inspection by workmen would obviate this. In New South Wales, where such inspection applies to metalliferous as well as coal mines, and where appointments are made by workmen in a mine choosing two of their number, or any two competent persons, to inspect, the measure seems to work very well. I am not in favour of the New Zealand Act, which provides that not only the workmen employed in the mine, but if any of them are members of a union registered under the Industrial Conciliation and Arbitration Act, this union may appoint two persons, whether employed in the mine or not, to make an inspection of every part of the mine once a month. As inspection by workmen will, if introduced in this State as in New South Wales, mainly apply to collieries or the larger metalliferous mines, I think it would be better for the men in any mine, whether unionists or not, to appoint two of their number, or any two competent persons, to inspect and report to the manager of such mine; he, in turn, to forthwith forward a copy of such report to the District Inspector of Mines.

*LIST of Accidents in Inspector Griffin's District for the Six Months 1st July to 31st December, 1903.*

Date of Accident.	Name of Mine.	Locality.	Cause of Accident.	Name of Sufferer.	Married or Single.	Nature of Injuries.	Particulars.
27 July	New Golden Gate	Mathinna	Fall down ladder-way	Thorne, Daniel	Married	Slight cuts	Fell down about two lengths of ladders in a rise.
27 July	Ditto	Ditto	Fall of earth	Solomon, Joseph	Ditto	Slight cuts to head	Working in open cut mullock face, and was caught by a fall of loose earth.
6 Aug.	Marialva Coal Mine	Colebrook	Fall of rock	Olsen, Christian	Single	Bruises	Removed a prop, which he was cautioned not to do, and some of the roof fell on him.
10 Aug.	Star of Peace T.M.	Ringarooma	Fall of stone in pass	Green, James	Ditto	Cuts on head, &c. ; fatal	Was horse driver, and employed trucking stone from mine tunnel to battery. An ore-pass led from surface to tunnel, and Green was trucking ore from this pass. He was found in the pass with about a ton of stone and dirt on his head, and quite dead.
2 Sept.	New Golden King	Mathinna	Flying fragments of stone	Keltie, William	Ditto	Injury to eye	Working in winze. A splinter of quartz flew from pole of his pick, striking him in the eye.
30 Sept.	Anchor T.M.	Lottah	Falling stone	Trehee, Edwin Dudley	Ditto	Cut head, bruises back, right side, &c ; fatal	Drilling holes at foot of main face ; a large piece of rock came away from face and struck Trehee. He died 11th October.
9 Oct.	Pioneer T.M.	Bradshaw's Creek	Fall down face	Williams, Alexander	Ditto	Concussion of spine and internal injuries ; fatal	Was trimming off overhanging portions of face after a fall of earth ; went too near to edge, and fell over the face on to cement boulders about 30 feet below. Died 13 hours after.

5 Oct.	Tasmania G.M.	Beaconsfield	Caught by cage in shaft	Robertson, John	Married	Contusions to shoulder and back	Working in shaft compartment, Hart's shaft, and was caught by the cage as it descended.
21 Oct.	Anchor T.M.	Lottah	Fall of rock	Quinn, John James	Ditto	Head and body crushed; fatal	Was face-boss at the open cut. When inspecting a part of face considered to be dangerous was caught by falling rock, and crushed to death.
27 Nov.	Tasmania G.M.	Beaconsfield	Jammed between trucks	Thomas, Jas.	Single	Bruised back and loins	Was pushing loaded truck along 718-foot level. The work was too much for him, and the truck forced him back and jammed him against another truck.
7 Dec.	Ditto	Ditto	Cut with adze	Tregaskis, John	Married	Cut leg	Was using an adze to do some carpentering; adze slipped, and cut his leg.
7 Dec.	Ditto	Ditto	Struck by tram	Wellington, Herbert	Ditto	Bruised by truck	Was trucking, and bruised himself whilst jumping on to a truck in motion, resulting in formation of an abscess.
24 Dec.	Tasmanian Consols	Mathinna	Fall in shaft	Burles, Edwd.	Single	Injuries to head and body; fatal	Was helping sink shaft below 1200-foot level; had ascended to level by bucket in ordinary way; in stepping from the bucket he missed his footing, and fell bottom of shaft, 85 feet below.
19 Dec.	New Golden King	Ditto	Machinery	Irvine, John	Ditto	Crushed finger	Taking a knot out of cage chain at surface; engine-driver let cage go before being signalled by Irvine, whose finger was crushed between chain and wheel.

Fatal, 5; non-fatal, 9; total, 14.

*TABLE showing rate per thousand Killed and Injured in the different Mining Divisions for the Six months, 1st July to 31st December, 1903.*

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 July to 31 Dec., 1903	Northern and Southern	535.5	5	—	5	5	9.337	—	9.337
Ditto	North-Western	373.0	—	—	—	—	—	—	—
Ditto	North-Eastern	666.5	2	2	—	2	3.000	3.000	—
Ditto	Eastern	890.0	7	3	4	7	7.865	3.371	4.494
Ditto	Western	3139.0	13	3	11	14	4.460	0.956	3.504
		5604.0	27	8	20	28			

*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	2027	7	2	6	8	3.947	0.987	2.960
	Zeehan, &c.	1112	6	1	5	6	5.396	0.900	4.496

## REPORTS OF THE COMMISSIONERS.

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Mr. COMMISSIONER O'REILLY (stationed at Scottsdale) reports :—

At your request, I have the honour to submit a report for the six months ending 31st December, 1903, upon the state of mining in the North-Eastern Mining District.

### GOLD.

I regret that I am unable to report any substantial improvement in the state of gold mining in this district during the above period. Some very promising reefs were discovered in the Mt. Victoria locality, but the want of sufficient capital for the purpose of mine development retards much the progress of this field. Several claims are mined in a small way by co-operative parties of miners, who obtain remunerative returns.

A good deal of prospecting has been done at the Waterhouse field, which may lead to the development of the reefs in that locality.

### TIN.

I have but little matter to refer to in this short period since my last annual report, but I may observe that steady and very satisfactory progress has been made in the development of the resources of the large deep alluvial claims. There has been an abundant supply of water, and on the whole, the yields have proved highly remunerative.

During the six months 820 tons of tin ore have been won and forwarded from this district, the number of miners employed being 500 Europeans and 135 Chinese.

On the whole, this industry in this district appears in a sound and permanent condition, and may reasonably be expected to continue so for many years.

Mr. COMMISSIONER FOWELL (stationed at St. Helens) reports :—

I have the honour to forward to you my report on the mining industry in the Eastern Mining Division during the six months ending 31st December, 1903.

### GOLD.

*Mathinna.*—I paid a visit to the mines in this portion of the district on the 23rd December last.

*New Golden Gate.*—Work was closing down for the holidays; but the manager was taking advantage of this being done to give a thorough overhaul of the machinery. He also informed me, that his company had determined to erect a thorough up-to-date pumping-plant, which is on its way, and on arrival will at once be erected. It is to be worked by electricity. The slide which threw the reef out of its natural course, still gives considerable trouble; but it means only careful prospecting when it

is found to occur, and patience to pick up the reef again. Altogether, the life of this mine is now extended to an indefinite time, and under the management as at present carried out must prove dividend-paying.

The next most promising mine is the Volunteer Consolidated—this bids fair to rival the New Golden Gate. During the last three months, from 365 tons of quartz 420 ozs. of gold have been obtained, and as it must be borne in mind that during the period this has been done, there has also a very large amount of dead work been effected. If this company will abstain for the present from declaring dividends, and lay by a strong reserve fund to meet contingencies, there is great hope for its future. There are no less than four gold-bearing reefs within their lease, and strong reasons for two, if not more, forming at a depth a large body of stone. The natural features of the surface are excellent for a battery site, and any amount of space for the getting away of tailings. I was shown a splendid cake of retorted gold, 254 ozs., valued at £1000.

*The Volunteer Consolidated Extended*, formerly Yellow Boy, is adjoining the Volunteer Consolidated. Developmental work is being well carried out on this mine, and it should meet with success, as it is on the same line of country.

On the *Volunteer Mine* the battery has been extended by the erection of an extra ten head of stampers, and an additional 40 horse-power engine. This mine is well worked, but the manager has to deal with a low-grade stone. It is to be hoped that, provided the increased plant can be kept working, with decreased expense in treatment, the mine can be made to pay.

At the *New Golden King* 450 ozs. have been won from 1000 tons of quartz. Of course, if this can be maintained, this mine will quite come up to expectations.

Other mines who have had crushings are—*Dan's Claim*, 50 tons yielding 50 ozs. The *Revenue* obtained 6 ozs. I am not able to give the amount of stone crushed.

On other leases, prospecting is being carried on; namely:—*Loanes P. A.*, *City of Hobart*, *Tasmanian Consols* (late North Gate), *Golden Princess*, *No Call P.A.*, *Waterfalls*, *Reliance Claim*, *Kelly's P.A.*, *Tregurtha's P.A.*, and nine *Prospecting Claims*. Stevens and party are reported as having struck rich stone in the neighbourhood of the New Golden Gate, but I cannot say if it is likely to prove permanent; the country about there is broken, as instanced by the Golden Gate.

*Mangana*.—The only leases working are the *Golden Entrance* and the *Sovereign*. The former, from 41 tons of quartz, have obtained 38 ozs. 13 dwts.; and the latter, from 9 tons, 2 ozs. 3 dwts.

#### TIN.

*Avoca*.—The *Mount Rex Mine*.—This mine deserves every encouragement from the Government. Not only being on low-grade ore, they have also to contend with antagonistic metals, namely, iron and copper pyrites and galena. They have been obliged to bring in water from the Ben Lomond Swamp, and take up dam sites, for which they pay £100 per annum, in the shape of rent, to avoid these sites being taken up by blackmailers, who would have to be bought off. The company have raised 41½ tons of tin during the last three months.

*St. Helens.—The South Esk.*—At present it is all alluvial mining in this neighbourhood, although there are indications of lodes, which I hope before long will be struck.

*The Royal Ruby, Thureaw's Deep Lead,* and the *Hunt P.A.* are the leading companies.

*Lottah and Blue Tier.*—At the *Anchor Mine* during the last three months 64 tons 7 cwts. of tin have been raised, against 51 tons 10 cwts. previous quarter.

At the *Australian*, two men tributating have won 10 tons, and tributors on the *Cambria* 17 tons.

At the *Blue Tier*, on two leases, 1 ton 2 cwts.; and on seven miners' claims, 3 tons.

*Weldborough.*—The *Weldborough T.M. Co.*, late Laffer, have won 1 ton 9 cwts.; and the *Weldbrooke*, 1 ton 15 cwts. On R. B. Inglis' lease, 3 tons 3 cwts. by Chinese; and on other leases and miners' claims in this neighbourhood 29 Europeans and 60 Chinese have raised 26 tons 8 cwts.

I have now, Sir, as fully as I can, given you, as I believe, the true state of the mining industry in this district, which I am perfectly satisfied none but a Resident Commissioner could do. I now most reluctantly have to lay down my work, under circumstances over which I have no control. In doing so I have the assurance of the Honourables the Attorney-General and Minister of Mines, that I have performed my duties during the last sixteen years with efficiency, and consequently, feeling it impossible under present arrangements the work can be carried out with efficiency, even by the best men procurable, I trust that, when assistance is found to be necessary, my past services will receive the consideration I feel they deserve, and that I may be re-instated.

Thanking you and all connected with the staff at the Mines Office for great consideration shown to me, and every possible help given me in carrying out, especially for 13½ years, on the West Coast, arduous duties.

Mr. Commissioner CHAMBERS (stationed at Zeehan), reports:—

The work of the half-year under review can only be regarded as highly satisfactory, and the permanency of the Western Mining Fields as beyond question. In many instances a large outlay of capital, in the erection of additional plant for operating on an extended scale with the products of various mines, has been indulged in, and there can be no doubt, I think, that such expenditure has been amply warranted. On the whole, most of the principal mines never looked better than they have done of late, and the market-prices of metals having been fair, considerable activity has been noticeable. One very satisfactory feature has been the introduction by the local smelting company of processes enabling them to treat profitably many low-grade and refractory ores, which previously it was of no advantage to the producers to offer them.

*Tasmanian Smelting Company, Limited.*—From particulars courteously supplied by Mr. P. Kunze, co-manager, it is found that during a period of eleven months, commencing 1st July, 1903, this company's operations principally consisted of the purchase and reduction of lead-ores, the quantities and values being as follows:—Ore purchased, 24,134 tons, containing 7305

tons lead, 1,023,163 ozs. silver, 3406 ozs. gold; aggregate net value, £115,572. Ore smelted, 24,192 tons. Bullion exported, 7137 tons lead, 1,025,963 ozs. silver, 3469 ozs. gold. The company also purchased during the same period for fluxing purposes, 11,473 tons of iron ore, at a cost of £6884. Mining operations on a small scale were carried on by the company on its Owen Meredith and Sylvester sections, winning 86 tons of ore, containing 26 tons lead and 6973 ozs. silver, of the aggregate net value of £610. Average number of men employed in all operations, 170.

As the company's smelting operations are being considerably extended, the erection of additional plant, at a cost of several thousands of pounds, is now about to be undertaken, and the employment of a largely increased number of men at the smelters may be anticipated.

*The Zeehan-Montana Mine.*—The operations for the six months were as follows:—No. 1 shaft.—Winzes sunk 102 feet; rises put up 302 feet; drives and crosscuts driven 1375 feet; stoped 275,130 cubic feet. No. 2 shaft.—Rises put up 54 feet; drives and crosscuts, 1093 feet; stoped 960 cubic feet. The company employed, on an average, 200 men, and raised 1646 tons of marketable ore, of the net value of £20,539.

Upon the half-year's work and the appearance of the mine, the manager (Mr. John Craze) writes me as follows:—"The deepest level operating on the mine is 600 feet. So far, nothing payable has been met with at this level. Operations are being carried on in six levels simultaneously. There is still some years' reserve of stoping ground available, and the prospects, especially at No. 2 shaft, are very encouraging." The returns compare very favourably with those of previous half-years.

*The Zeehan Western Mine.*—A new company to work this mine having been formed in London, the property is now under the charge of Mr. Craze (of the Montana Mine), and operations to unwater the mine were commenced on 12th August last. By 26th November last the water had been taken out to the 600-foot level, and driving to cut the lode has commenced. Considerable additions and repairs to the plant have been undertaken, and the mine has provided daily employment for about 50 men.

*The British Zeehan Mine* continues to yield excellent returns, and is now looking well throughout. For twelve months to 30th June last, from 11,931 tons raised, 7424 tons of marketable ore were sold to the Tasmanian Smelting Company, Limited for £68,184, the ore-contents being, fine silver 536,656 ozs., soft lead 3816 tons. On an average 200 men have been employed, and the year's work principally consisted of the following:—Shafts sunk, 230 feet 6 inches; crosscuts, 996 feet 6 inches; drives on lodes, 3339 feet 9 inches; winzes sunk, 291 feet 3 inches; rises put up, 178 feet 6 inches; ground stoped, 8011 feet; total, 13,047 feet 6 inches.

At the *Oonah Mine*, which is still on tribute, 30 men have been employed, and for twelve months to 31st May last, 989 tons of ore, containing 56,208 ozs. silver, 28 tons lead, 47 tons copper, and 138 tons carbonate of iron, aggregating in value £5574, have been mined.

Three men on an average have been employed upon the *Silver King Mine*, where little work beyond surface prospecting has been done. Twenty-six tons gossan and 20 tons sulphides have been mined, the contents realizing £210.

*Florence Silver Mine.*—Owing to a serious inburst of water, no profitable mining work could be undertaken during the half-year; but since the difficulty caused by water was overcome, some very fair-grade ore, as well as a quantity of lower standard, has been won, 437 tons raised between December, 1903 and June last realizing £4088. Average number of men employed, 32.

The erection of a concentrating mill for treating low-grade ore, and with a capacity of 30 tons per eight weeks, having been determined upon, the construction work is well in hand.

On the *Nubeena Section*, Llewellyn's Imperial Tribute party kept an average of six men employed, and raised about 40 tons of marketable ore, which realised £407 5s. 6d. This mine is developing, and continues to look well. In the past six months some 400 tons of ore have been raised, and increased production in the near future is anticipated.

The work of the other mines in the vicinity of Zeehan does not call for special remark.

At Mount Dundas, the *Comet Mine*, between 1st July, 1903, and 31st May last, yielded an output totalling 6102 tons (concentrates 901 tons, galena 737 tons, flux 4464 tons), and of the aggregate net value of £12,191 14s. 10d. Seventy men, on an average, were employed.

The *Penzance* and *New Dalcouth Tin Sections*, at North-east Dundas, are properties which, during the half-year, received considerable attention. On the Penzance section surface prospecting by 4 men located a tin-bearing formation, after which a tunnel (now in 260 feet) was driven, payable tin being met with and other promising discoveries made. At the New Dalcouth Mine 5 men have been employed, and I am informed that about 300 tons of over 5 per cent. tin ore have been paddocked. The proprietors are industriously prospecting, to determine the size and length of the ore-body, in order to decide upon the capacity and class of machinery necessary to be erected for treating the ore won.

At the *Hercules Gold and Silver Mine*, at Mount Read, a very satisfactory half-year's work may be recorded. The development of the mine at the lower levels is proceeding, and the monthly output of gossan, zinc-lead, sulphides, and zinc ore has averaged 1300 to 1400 tons. A crushing-mill is about to be erected at the company's works at Williamsford. The mine appears to contain enormous reserves of low-grade ore, which, however, under the existing competent management, should continue to be operated upon on an extensive scale for many years, and in a fairly profitable manner. About 150 men, on an average, have been employed, and the number is likely in the near future to be considerably increased, as the company has now in hand contracts for the supply to the Tasmanian Smelting Company, Limited, of 130,000 tons of sulphide ore and 2500 tons of zinc ore, performance of which will involve a greater weekly output, and benefit the district and State generally to a considerable extent. The sum of £5406 18s. 6d. has been distributed in dividends since 1st August last, and the company has £5000 at fixed deposit.

At the *Mayne Tin Mine*, Mount Agnew, the work of developing the mine in a systematic manner has steadily proceeded, and the sluicing operations have resulted in an output for the past half-year of 36 tons 14 cwts. of tin oxide, giving the company a profit

of about £1505. A first dividend of 1s. per share has been paid to the shareholders, and, as a fair weekly output from the mine continues, a good prospect of a further distribution of profits at an early date may be said to exist, as the property is being economically handled. Thirteen men have been constantly employed.

The proprietors of the *Federation Tin Mine*, at Mount Heemskirk, have employed three men in general prospecting, and also in cleaning out and re-laying tram-road in the lowest or 300-foot level, and they anticipate the early flotation of an English company to undertake the development of the mine.

A fair number of prospecting shows and miners' claims in the vicinity of Mount Heemskirk and at Comstock have provided satisfactory wages for several parties of miners.

The highly mineralised country at and contiguous to Mount Farrell must shortly, in my opinion, receive increased attention. Mining operations carried on by the *North Mount Farrell Company*, *The Mount Farrell Company*, and the *Murchison River Company*, and the examinations made by the late Assistant Government Geologist, have given convincing proofs of the possibility of converting more than one of the shows in this locality into highly payable mines—given the expenditure in a judicious manner of a reasonable amount of capital, and the application of the most approved methods of treatment. Up to the present time the *North Mount Farrell and Murchison River* mines have given satisfactory returns, and this portion of the district has provided daily employment for about 150 men.

It is gratifying to report that some activity again prevails in the Rosebery District, where extensive ore-bodies, though of complex nature, are known to exist. Owing to the ability of the Tasmanian Smelting Company, Limited, to now treat these ores at a profit, as well to the producers as to themselves, a contract for the supply by Mr. William John Hodge, tributor, from the Primrose Mining Company, of some 5000 tons of zinc-lead sulphides from the latter company's Rosebery Mine is now being executed. I am led to hope that ere long considerable additional quantities of ore from this district will be under despatch to the local smelting works, and that the various mining properties there, notably the large areas under lease to the Tasmanian Copper Company, which have lain practically dormant for too long a period, will be providing employment for a considerable number of individuals.

During the half-year marked attention has been paid to the Stanley River Tin Field, which extends over portions of Mount Livingstone and the Parson's Hood, and is distant 19 miles from Zeehan. Some 25 sections have been pegged for tin, and it is understood that capital to develop the more promising shows will be forthcoming. At present, the difficulties of access are not inconsiderable.

In the Lyell Division, the mining operations of the *Mount Lyell Mining and Railway Company, Limited*, naturally call for more than passing reference, and it can be said that the company's half-year's work was exceedingly successful and satisfactory. The amalgamation of the Mount Lyell and North Mount Lyell mining and railway interests having been smoothly carried out, since 11th August last both mines, together with the old Mount Lyell Company's subsidiary mining properties, have been under one management, the supreme charge being vested in

Mr. R. C. Sticht, the general manager, whose mine engineer, Mr. W. T. Batchelor, has had supervision of the amalgamated company's various mines. The work of placing the North Lyell Mine in thorough going order was at once undertaken and completed, and throughout the half-year regular daily deliveries of ore to the company's reduction works at Queenstown have taken place. At the latter works, 178,460½ tons of ores and metal-bearing fluxes from the company's mines, and middle products from the Crotty Smelting Works, and 240½ tons of purchased ores, were treated, the whole returning 3750 tons of blister copper. The latter, in turn, produced, approximately, as follows:—

GOLD, FINE.			SILVER, FINE.			COPPER.		
Approximate value.			Approximate value.			Approximate value.		
ozs.	£	s. d.	ozs.	£	s. d.	tons	£	s. d.
10,280	43,90	0 0	364,288	39,973	14 6	3706	223,019	0 11

or a total value for the half-year of £306,682 15s. 5d. The company has found daily employment for, on an average, 1993 men. The general manager's estimates of 19th April last of ore-reserves then in sight were as follows:—Mount Lyell Mine—4,495,310 tons. Average assay value—Copper, 0·59 per cent.; silver, 1·99 ozs.; gold, 0·04 ozs. North Lyell Mine (to 500-feet level)—170,494 tons. Average assay value—Copper, 6·25 per cent.; silver, 2·25 ozs.; gold, 0·005 ozs.

*Mount Lyell Blocks Mine.*—Satisfactory progress has been made towards the equipment of this mine in a manner necessary for dealing on a large scale with the company's deposits of copper-bearing clay. The old tunnels have been repaired, and two new tunnels have been driven. A concentrator, fitted with suitable puddling machinery, has been erected, and trial runs of the new plant have given satisfactory promise for the future. As an evidence of the confidence of the proprietary in the mine, it may be mentioned that during the period under review about £10,000 have been laid out in preparing the mine for a greatly increased weekly output. The concentrator is expected to treat 2000 tons of ore per week, and the mine manager (Mr. Nicholas) speaks in very hopeful terms of the prospects ahead. Number of men employed, 76.

At the *Crown Lyell* and *Tasman and Crown Lyell Extended* mines developmental work has been proceeding, the indications met with being sufficient to induce the management to continue energetic prospecting.

At the *Lake Jukes Mine* very thorough prospecting has been carried on under the supervision of Mr. H. S. Muir, formerly of the North Lyell Mine, and 5 men have been continuously employed. The efforts of the company certainly deserve success.

From Mount Darwin, and from various places in the vicinity of Queenstown, notably the Queen River, Lynchford, and Hall's Creek, rather increased quantities of alluvial gold have been brought in by prospectors, a good many of whom have been making fair wages.

The Zeehan School of Mines and Metallurgy, and the Queenstown Technical School and School of Mines, continue to prove of great benefit to the students of the district. The attendance

is satisfactory, and each Institution is excellently conducted. At present, the Queenstown School is entirely self-supporting.

The geological survey of the Zeehan Mining Field, by Mr. George A. Waller, late Assistant Government Geologist, having been completed, lithographs of the surveyor's sketch-plan have been made available by the Department, and the same are proving very useful to those engaged in mining in the Zeehan Division, the Geologist's work evidencing great care and thoroughness, coupled with a comprehensive knowledge of his subject.

The applications for protection of leases and prospecting claims received during the half-year numbered 27.

Mr. Registrar ДОНОНЕВ (stationed at Waratah), reports:—

I have the honour to submit my report upon the mining industry in the Waratah Division during the six months ending 31st December, 1903.

*The Mt. Bischoff Tin Mining Company* still continue to keep up their usual output of 106 tons of ore monthly, with an average of 220 men employed. The Goldfields Diamond Drilling Company has just erected its boring plant, and it is intended to put several bores down on different parts of the mine, for the purpose of prospecting it at a depth.

*The Mount Bischoff West Tin Mining Company.*—This mine is still idle, pending more capital being raised to start operations.

*The Waratah and The Stanhope* alluvial claims still continue to send out about 1 ton of tin ore each, monthly.

At Badger Plains, the *Wombat Syndicate* has continued prospecting operations on its sections, with very good results, and it is now busily engaged erecting an hydraulic sluicing-plant, which will enable it to work its ground very cheaply. Other sections in the vicinity of Wombat Mine are being worked by different prospectors, with a fair amount of success.

*The Magnet Silver Mining Company.*—The output of ore from this mine has been kept steady at 1000 tons per month for the whole period. The grade has been good, and the whole has been sent to Dapto and Cockle Creek Smelting Works, New South Wales. The principal underground work has been the sinking of a main underlay winze, fitted with a "Cameron" pump, and air-winch. The shaft is now down 70 feet, where they intend to open out for the purpose of cutting the lode. An air-compressor and Pelton-wheel is installed, providing motive power for the machinery at the shaft. There are now 140 hands employed at this mine.

*The Godkin Silver Mine, Whyte River.*—The drainage tunnel has been completed, and they have now started to rise from the 90-foot level to the 45-foot level, on a lode 11 feet wide, and have now about 50 tons of second-class ore stacked in their paddock on the surface.

*The Godkin Extended Silver Mine, Whyte River.*—A crosscut has been driven for 524 feet, and coming into hard country, work was suspended. Have since started working in the winze, on a nice body of metal, showing 3 feet wide.

*The Confidence and Washington Hay* mines are still idle, but are expected to resume operations at an early date.

*The Long Tunnel Syndicate* (formerly Mt. Stuart).—This syndicate has continued operations, and has now about 150 tons of high-grade silver-lead ore stacked in its paddocks. Arrangements are now being made for the construction of a tramway for a distance of about 5 miles, to connect with the Waratah-Corinna road, and it is considered to be the most promising mine in the district.

*The Wealth of Tasmania* (copper, Heazlewood).—The crosscut from the main shaft has been extended 20 feet, making a total to face of 125 feet, when work was discontinued. An open-cut has been put across the lode, and sunk on for about 10 feet, showing some very nice-looking copper ore. There are about 40 tons of ore at grass, of various grades.

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## NOTE ON JACUPIRANGITE IN TASMANIA.

By W. H. TWELVETREES, F.G.S.

THE wonderful aptitude of the alkaline magmas for differentiation is strikingly exhibited by the nepheline rocks at Port Cygnet. The promontory at the Regatta Ground south of the jetty consists of a central spur of elaeolite syenite, varying into alkali syenite, a light coloured alkaline eruptive of the character called leucocratic by Brögger, or salic in the new American terminology. The margins, especially the southern one, consist of the dark elaeolite-pyroxene rock known as jacupirangite. This locality name was given by Derby in 1891 to rocks in Brazil occurring as differentiation products in association with elaeolite syenite, usually laminated in habit and intersected by small dykes of the latter rock. The nepheline-pyroxene varieties pass into magnetite-pyroxene varieties and the latter into nearly pure titaniferous iron. This ore is found in Alnö (Sweden) connected with elaeolite syenite.

Megascopically, the Port Cygnet jacupirangite is a dark, medium-grained rock, speckled with elaeolite, and glistening with small brilliant crystals of augite. Under a magnifying glass a little iron pyrites is visible. The colour of the rock grows lighter as it merges into elaeolite syenite. The specific gravity is 2.89. Microscopically, the respective quantities of augite and elaeolite present do not differ much. The augite is green, slightly pleochroic,  $c : r$  35°. The elaeolite is in large hypidiomorphic plates. Sphene in fair quantity in wedge-shaped crystals. Melanite garnet, which is characteristic of all the Port Cygnet eruptives, is not absent from this, and is occasionally rather plentiful. Apatite is present in the forms of prisms and grains. Magnetite is scattered grains. A little brown biotite. In order of quantity, the minerals are elaeolite, augite, sphene, garnet, apatite, magnetite, biotite.

Professor H. Rosenbusch, in mentioning that this is a quite typical jacupirangite, says that search ought to be made in it for the rare mineral baddeleyite (dioxide of zirconium), which has been found in a Brazilian occurrence of the corresponding rock.

Both Rosenbusch and Zirkel treat this rather peculiar class of rock as a modification of elaeolite syenite. Mr. H. Stanley Jevons includes it in the family of ijolites (pyroxene-

felspathoid rocks), presumably owing to its mineral composition. As a rule, however, ijolites are much poorer in titanic acid and iron than jacupirangite.

At Port Cygnet the rock cannot be called a geological entity. It does not occur as a dyke of later material invading the main mass of syenite. It may rather be interpreted as resulting from differentiation by progressive crystallisation, the marginal parts of the cooling mass receiving concentrations of basic oxides, while the centre was left more acid. The minor variations are interesting; thus, vein-like bands of elaeolite syenite may be seen ramifying in the jacupirangite, and the latter also occurs as segregation spots enclosed in the lighter coloured rock. The central portion of the magma naturally consolidated after the cooling of the periphery.

The concentrations of iron ore into which the Brazilian rock merges have not been noticed at Port Cygnet; in fact, our rock is not at all rich in magnetite or ilmenite. The augite, too, is evidently not titanic. The titanium in the rock would appear to principally reside in the sphene.

## NOTES ON TASMANIAN MINERALS

By W. F. PETTERD.

THE present paper records the more recent results of the continued investigation into the mineralogy of this State, from which it will be found that not only are several unrecorded localities enumerated for minerals which have been previously catalogued in former contributions on the subject to this Society, but also that not less than 13 species are now added to a remarkably long list.

Two peculiar chemical varieties of well-known substances are for the first time described, both of which are from one locality, and owe their unique features to a common cause. Several of the species are of special interest to the geologist, and a few are of commercial importance; but it may be needless to say that mineralogy deals with a variety of substances usually placed under that particular branch of scientific investigation, irrespective of their individual intrinsic value. In fact, by far the major portion but interest the geologist, the chemist, and those in search of some of the most beautiful of Nature's treasures.

So much is now known of the mineralogy of this State that the flood of discovery in this particular field is without doubt past, and it is only by the most strenuous efforts, coupled with close application, that additions to the minerals already known to occur can be made; but, needless to say, as to peculiarities of occurrence and chemical analysis much remains to be done.

I have to express my most grateful thanks to many friends for ready assistance as in the past, and generous donations of both beautiful and interesting material for this addendum, as well as for facilities for collecting and opportunities for the examination of many minerals *in situ*.

To Mr. R. F. Waller, General Manager of the Magnet Silver-mining Company, who is a most enthusiastic mineralogist, I am specially under obligation, both for collecting at his particular locality, as well as for assistance in the identification by blowpipe and other determinations.

### 1 ALBITE.—(*Polysilicate of aluminium and sodium.*)

In solid irregular milk white subtranslucent compact masses, apparently of secondary origin. Locality: Hazlewood River.

**2 ALLOPHANE.**—(*Hydrate silicate of aluminium.*)

Found as irregular, fairly large masses, outwardly coated with a pulverulent white powdery substance of secondary origin. The colour varies from pale yellow to a much darker shade. The general appearance of the mineral is remarkably gum-like. The composition is quite unusual, but there is little doubt about the identification.

Analysis by Mr. Watson, of the Magnet Silver-mining Company:—

Si O <sub>2</sub>	=	19.00
Al <sub>2</sub> O <sub>3</sub>	=	40.40
Fe <sub>2</sub> O <sub>3</sub>	=	4.70
Ca O	=	69
S O <sub>3</sub>	=	1.61
Ignition	=	33.30
		99.70

**3 ANTIMONY** (*Native.*)

Occurs in thin radiating patches, about an inch in diameter, on a silicious gangue. This is the first record of the occurrence of this somewhat rare mineral in this State. I have only seen one specimen, and that is in the collection of Mr. R. F. Waller, although I am informed a slab about a foot square was obtained, practically covered with the radiating metal. Locality: Spray Section, British Zeehan Mine, Zeehan.

**4 APATITE** (*Phosphate of calcium.*)

As very minute crystals, about two millimeters in length, of a pale pinkish colour, abundantly scattered throughout a stanniferous granite. Crystal Hill Mine, Blue Tier.

**5 ARRAGONITE** (*Orthorhombic carbonate of calcium.*)

Occasionally obtained in vughs in basalt as subradiating thin columnar crystals, which do not rarely exceed 2 inches in length. They are highly polished, glassy clear, and colourless. This is by far the finest occurrence of this mineral in the State. Locality: Briseis Mine, Derby.

**6 BERESOWITE** (*Chromate and carbonate of lead.*)

This mineral has been found to be much more abundant at the Magnet Mine than hitherto supposed. It occurs in the decomposed or superficial portion of

the lode, and is confined to cracks and small vughs in the gossan, where it forms coatings of almost microscopic plates and crystals, which often nestle in little bunches. The crystals are bright and sparkling, usually a shade of yellow to orange, but sometimes a bright crimson. It commonly decomposes to a yellow lead oxide. In the abandoned workings of the old Whyte River Silver Mine, Mr. R. F. Waller obtained some nice slabs of a decomposed rock, literally coated with the characteristic crystals of this substance. Its bright colour renders it an attractive object, but the soft base upon which the crystals are usually implanted causes it to be extremely difficult of transport. It has not so far been noticed at any other of our silver-lead mining localities. In fact, its occurrence in the Heazlewood district appears to be the first outside its original locality at Berezov, in the Ural.

#### 7 CASSITERITE (*Dioxide of tin.*)

Occurs of unusual habit at Mayne's Mine, Heemskirk.

The colour varies from a pale dull grey to almost black, and is commonly of a radiated fibrous structure in botryoidal and reniform shapes. Where the concentric structure is well defined, the internal coloration is in bands of regular width, of various shades of grey to brown. In all essential characteristics this occurrence exactly corresponds with what is known as "wood tin" in Cornwall, England.

An acute pyramidal, intensely black variety, representing what has been termed sparable or "needle" tin in the European mining districts, occurs at Welsh's tin find near the five-mile on the Waratah-Corinna-road. The crystals are minute, very pointed, and a good imitation of the old-world form.

A remarkable occurrence of cassiterite has recently been discovered at Mount Bischoff by Mr. Bradford, in which cellular cavities, retaining in most instances the form of orthoclastic felspar, have been lined, and sometimes completely filled, with a mass of minute, well-developed, tetragonal tin crystals, combined with pycnite. The cavities are small, but perfectly distinct. The original porphyry has been almost completely topazised, simply leaving granular interspersed quartz. The replacement of the felspar with cassiterite is not so complete as that recorded from the Mount Rex Mine, where pseudomorphism has gone to the fullest extent.

In the Bischoff specimen the two minerals, pycnite and cassiterite, form a coating in the cavities, and it is but rarely the whole space is filled with the substitution. The intensely black cassiterite, with the milk-white base, forms a striking contrast of considerable interest.

The occurrence forms a remarkable illustration of the probable action on the original rock by chemical changes, by which the topazisation occurred, and the tin crystals were deposited in the cavities of dissolved orthoclase.

At the Stanley River numerous remarkably fine pseudomorphs of compact black cassiterite after orthoclase have recently been discovered. This replacement shews the clearly distinct crystal outline of the felspar imbedded in an almost milk-white porphyritic rock, mainly composed of quartz and felted masses and radiating bunches of short and opaque crystals of tourmaline. This last-mentioned mineral is of an intensely dark-green colour, and belongs to the variety which has been named zeuxite, and which hitherto was supposed to be almost restricted in this island to Mount Bischoff. Pseudomorphs of this mineral also after felspar are somewhat abundant at the same locality.

Mr. R. F. Waller has shewn me a small specimen of topazised porphyry from Mount Heemskirk—a quite new locality for this mineral.

**8** CHALCOPHANITE (*Hydrated manganese and zinc protoxide.*)

In aggregates of well-formed tabular crystals of a bluish-black, and highly polished. Locality: Magnet Silver Mine. Magnet.

**9** CHRYSOBERYL (*Aluminate of beryllium.*) variety *Alexandrite.*

A remarkably fine example of this highly-prized gem stone was obtained by Mr. J. A. Thompson at the Weld River in stanniferous drift, during the ordinary streaming process of dressing tin ore. It is of a somewhat pale but attractive green colour, red by transmitted light, as is characteristic of the variety. It was by the kindness of Mr. Thompson tested with the dichroscope by Mr. W. H. Twelvetrees, Government Geologist, with the result that its identification was placed beyond doubt. It is remarkable that this is the first cut specimen which has come under

notice. In all probability this gem has been looked upon as a pale, transparent corundum, which is comparatively abundant at the locality, as is also the zircon.

10 CHROMIFEROUS MIMETITE (*Arsenate of lead with chromic acid.*)

This variety never assumes the barrel-like shape so common to the typical mineral. It is found in short hexagonal prisms and plates, with basal terminations, usually about 1 millimeter in breadth and length. The colour varies from a decided brownish-green to deep orange; it is shining and opaque. The streak is orange to siskin-green. Before the blowpipe in salt of phosphorus it remains green when cold in both flames. In closed tube with splinter of charcoal and heated intensely it gives very strong and characteristic reactions for As.  $O_2$ ; with cupric oxide gives flame reactions for Cl., and in closed tube with magnesium wire the odour of  $P_2O_5$ . It is reduced to metallic lead with soda on coal. This is a variety sufficiently distinct in composition, colour, and habit to be worthy of record. It is rarely met with at its only locality, and then in comparatively small groups of crystals, but its peculiar colorization, combined with the habit of usually occurring in thin plates, at once arrests attention. The chemical reactions shew that it is more allied to mimetite than to pyromorphite, a chromiferous variety of which has been recorded. Locality: The Magnet Mine, attached to the gossan in the superficial workings.

11 CHROMIFEROUS CERUSSITE (*Lead carbonate with chromic acid.*)

This attractive variety of a common species is, so far as known, confined to the Magnet Mine, in the upper workings of which it is, although local, fairly abundant. It occurs in fractures and vughs in the gossan zone, but in bunches and sparsely attached as beautiful little crystals, generally in close association with crocoisite, but never, so far as observation has gone, intermixed with the normal form; although this is somewhat abundant in its usual adamantine characteristic habit, often shewing remarkably perfect development in stellar and cruciform triplet crystals.

It is noticeable that, while the variety under review is invariably associated with the chromate of lead, the

common type is rarely, if ever, obtained in the vicinity. It is always opaque, with a shining lustre, but not adamantine. The colour is canary yellow, with an occasional tinge of red where the crystal has impinged upon the chromate. The tint does not vary to any serious extent, although paler examples are occasionally met with. It is a most attractive mineral, and soon arrests attention. Its most constant feature is its crystallisation in flatish frondose and spear-headed groups, twinned by repeated angles across different faces of the prism (110). The striated faces of the twinned groups are the brachyprisms O11 and O13; these are commonly deeply grooved, affording a most interesting leaf-like and unfamiliar appearance.

This variety is perfectly distinct, both as regards colour and habit of crystallisation. Moreover, intermediate variations between it and normal type have not been met with. It is undoubtedly one of our most attractive and typical minerals. Under the blowpipe gives reactions for chromic acid.

**12 DOLOMITE** (*Carbonate of magnesium and calcium.*)

A somewhat unusual occurrence, in the form of small attached, doubly-curved or saddle-shaped crystals, which are opaque and white. Magnet Silver Mine, Magnet.

**13 DIOPSIDE** (*Metasilicate of calcium, iron, and manganese.*)

This almost white variety of pyroxene occurs, both massive and crystallised, at the Tenth Legion Mine, Comstock District. Analysis:—

Si	O <sub>2</sub>	=	52.1
Al <sub>2</sub>	O <sub>3</sub>	=	3.0
Mg	O	=	15.0
Aa	O	=	27.7
Fe	O	=	2.3

100.1

Specific gravity 3.23; hardness, about 6. (G. Waller: Report on the iron and zinc-lead ore deposits of the Comstock District, 1st February, 1903.)

**14 DUFRENITE** (*Basic ferric phosphate.*)

Occurs as a thin incrustation of an olive to blackish-green colour on zinc-bearing gangue at the Bell's Reward Mine, Heazlewood.

15 EMBOLITE (*Chlorobromide of silver.*)

In minute but perfectly cubical crystals, which are occasionally octahedrous. Occurs in a seam of gossan at the Magnet Silver Mine, Magnet.

16 FELSPAR (*Polysilicates of aluminium potassium, &c.*)

The following note on this important group is kindly supplied by Mr. W. H. Twelvetrees, Government Geologist:—

*Orthoclase* occurs in our granites, syenites, elvans, and quartz porphyries. The most common combinations are (010), (110), (001).—Carlsbad twins [twinning plane parallel to the orthopinacoid] (100) are frequently seen. The crystals are generally turbid from decomposition into kaolin, or muscovite. Replacement by pinitite, chlorite, &c., has occasionally taken place. Porphyritic crystals of an inch or two in length are common in the granite of the East and North-East Coasts.

*Sanidine*.—This pellucid monoclinic felspar is found in the alkali syenites and elaeolite syenite porphyries of Port Cygnet. It frequently shews zonal structure.

*Plagioclase Felspars*, albite, oligoclase, andesine, labradorite, bytownite, anorthite, form a continuous series, in which, according to Tschermak, albite and anorthite are opposite extremes. The intermediate felspars have been shewn by Schuster to be isomorphous mixtures of albite and anorthite.

*Albite* occurs as replacement of the groundmass of porphyroids or keratophyres at Mount Read; in larger crystals in the actinolitised slates in the North Dundas District. Intergrown with orthoclase, it forms micropertthite; seen in granite at Anderson's Creek and in alkali syenite at Port Cygnet.

*Labradorite* is the felspar of our basalt and dolerite (diabase). Labradorite-bytownite and bytownite-anorthite felspars characterise the gabbros at the Heazlewood, Bald Hill, &c.

*Oligoclase*, with its narrow twin lamellae, is the plagioclastic felspar of our granites. Andesine occurs in essexite at Port Cygnet.

*Microcline*, though chemically identical with orthoclase, is triclinic in crystallisation. Basal sections microscopically shew a characteristic cross-hatched twinning, due to the intersection nearly at right angles of the twin lamellae of two types (albite and pericline). Seen in granite porphyry at St. Marys, and in granite elsewhere.

- 17** GALENITE (*Sulphide of lead.*)  
At the Magnet Silver Mine somewhat fine pseudo-morphs of this mineral, after sphalerite, have occasionally occurred. They are usually in irregular groupings, with drusy surface and glimmering lustre.
- 18** GÖTHITE (*Hydrous sesquioxide of iron.*)  
Occurs sparingly, usually as a coating, at the last named locality.
- 19** HISINGERITE (*Hydrated ferric silicate.*)  
In amorphous masses of an intensely black colour, with a conchoidal fracture.  
In lode matter exposed in the lower tunnel of the Comstock Mine, Comstock District. (Mr. G. Waller, loc. cit.)
- 20** HORNBLENDE (*Bisilicate of various protoxides and peroxides.*)  
The common black amphibole, containing aluminium, or paragasite, with the non-aluminous species tremolite and actinolite, have already been recorded (Catalogue of the "Minerals of Tasmania, 1896"), but there are several others occurring here which have not so far been satisfactorily identified.  
At the Hampshire Hills a remarkably developed black amphibole occurs. It is in large crystals, which often reach several inches in length, and is closely associated with pyrophyllite and amethyst. In thin section under the microscope it is dark sombre green and yellowish-green according to the orientation. Intensely pleochroic  $r = \mu > \alpha$ . Extinction angle about  $14^\circ$ . Crystallisation irregularly prismatic and flaky, structure poecilitic, enclosing apatite, fluor. iron oxide, &c., and pierced with quartz grains; often surrounds felspar plates. Professor Rosenbusch, in a letter under date January 12, 1899, mentions this

mineral as "a peculiar weakly bi-refringent monoclinic amphibole, bluish-green in colour; a grey-green, b brownish-green, c bluish-green to blue, 2 E (the apparent optical axial angle) small, optical character + and with strong dispersion of the axes. It recalls strongly the blue-green amphiboles of the crystalline schists in the Scora Vale, in the centre and north of Norway, and elsewhere."

The series of phonolitic rocks of Port Cygnet afford one and perhaps two species of soda amphibole, but their specific identification is attended with considerable difficulty. Many of the rocks referred to have been microscopically examined by Professor Rosenbusch, and that well-known authority, in a communication to Mr. W. H. Twelvetrees, refers to one of the hornblendes as being barkevekitic. This is the prevailing form which is seen in rock sections from the locality indicated. It is myrtle green in colour by transmitted light, and in the absorption  $b > c > a$ , in this respect appertaining more to kataforite, but differing in the pleochroism. In the fractures and joints of the elaeolite syenite from the same place a black amphibole is occasionally developed, having much the general appearance of arfvedsonite. It is usually plentiful, occurring as long narrow thin laths and aggregates, sometimes reaching a trifle over 2 inches in length; they do not shew terminations, but have an irregular brittle structure. Fragments examined under the microscope shew the substance to be green by transmitted light. It is apparent that the soda hornblendes at Port Cygnet differ in some degree from those recorded from similar rocks in better known localities, and that they require further investigation before they can be satisfactorily determined.

**21 HISTRIXITE** (*Sulphide of bismuth and antimony.*)

This mineral occurs massive at several of the North-East Dundas mines, where it is classed under the common designation of "Fahl ore," a term applied to several very distinct minerals with the general physical characters of tetrahedrite.

**22 HYALITE** (*Hydrated silica.*)

Occurs in cavities of a hard lode gangue in white to pale-green botryoidal masses. Locality: Bell's Reward Mine, Heazlewood.

**23** HYDROCERUSSITE (*Basic lead carbonate.*)

In one of the adits at the Hercules Mine, Mount Read, a white fluidal substance was observed in decomposed lode matter, which, on giving up its hygroscopic water, assumed a silvery-white appearance, and which under the microscope is resolved into very minute scales, but with little or no hexagonal structure. In all essential respects the substance agrees with this species as detailed in "Dana's System of Mineralogy, page 299.

**24** LEPIDOMELANE (*Potassium mica rich in iron.*)

Occurs in large six-sided tables, occasionally 1 inch in breadth, of a black colour, and highly adamantine. Transparent in very thin laminae, shewing a beautiful emerald green colour. The crystals for the species are remarkably fine, and well developed; they are found aggregated together in association with a peculiar amphibole and quartz, and evidently form portion of a contact on the fringe of granite. Locality: Hampshire, near the old silver mine.

**25** PHLOGOPITE (*Magnesium mica with little iron.*)

"This mineral occurs on Section 5367-93M in hornstone, associated with very large bodies of magnetite and zinc-blende. It occurs in large hexagonal crystals, with a very perfect micaceous cleavage. The colour is light green, varying sometimes to greyish-brown." (Mr. G. Waller, loc. cit.)

**27** PYRARGYRITE (*Silver sulph-antimonite.*)

Ruby silver ore has recently occurred at several mines, notably at the Magnet, where it is not by any means rare in patches and blebs in close association with galenite. The mineral is sometimes surrounded by frondose and granular native silver, and the combination, needless to say, adds materially to the silver assay value of the ore. At the Mount Stewart Mine it occurs sparingly, and in small vughs little nests of micro-rhombohedral crystals have been detected, which are probably this mineral. At the Mount Farrell Mine it has been noticed embedded in galena; also at the Confidence Mine, near Waratah, and at the Hercules Mine, Mount Read, it has been seen in micro-crystals attached to filaments of native silver. Reported to have been found at the Oonah and British-Zeehan mines at Zeehan.

The light ruby silver ore (proustite) is sometimes associated with the pyrargyrite; the latter appears to be the more often noticed, but the exact determination of the species has not been made in the majority of occurrences.

**28** RESTORMELITE (*Hydrous silicate of aluminium and iron.*)

As at its original locality, Restormel Mine, Cornwall, this substance occurs as a coating on psilomelane and other manganiferous material. It is white to pale-greyish blue, sometimes almost a clear blue. The incrustation is invariably thin, but quite noticeable and distinct. Locality: The Comet Mine, Dundas.

**29** SILVER (*Native.*)

Some extremely fine examples of this native metal have recently occurred in the carbonate lode at the Hercules Mine, Mount Read. The mineral assumes most attractive nests and layers of extremely fine wire-like filaments, often with fern-like expansions, commonly implanted on a glistening, pure white, fibrous cerussite. The occurrence is by far the finest of its kind hitherto found in this State.

**30** TURGITE (*Hydrous sesquioxide of iron.*)

An iron ore with the general aspect of fibrous hornstone, with a red streak. Hardness = 5. 6. Locality: Blythe River.

**31** XANTHOSIDERITE (*Hydrous sesquioxide of iron.*)

Found as an incrustation, often in silky needles of a bright red colour, but sometimes in the powdery form. Occurs in the lode on gossan and other gangue. Locality: Magnet Mine, Magnet.