MININD1913_2

PROGRESS OF THE

# MINERAL INDUSTRY OF TASMANIA

FOR THE QUARTER ENDING 30TH JUNE, 1913.

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Hobart, 20th August, 1913.

THE following table shows, as far as can be ascertained, the quantities and values of metals and minerals raised during the quarter ending 30th June, 1913, as compared with the previous quarter ending 31st March, 1913:—

| | During the Quarter ending 30th June, 1913. | | During the Quarter ending 31st March, 1913. | |
|---|---|---|---|---|
| | Quantity. | Value. | Quantity. | Value. |
| | | £ | | £ |
| * Gold won ..... oz. | 8299·733 | 35,255 | 8829·901 | 37,507 |
| Silver-lead Ore produced tons | 26,209·39 | 95,966 | 22,897·098 | 74,644 |
| † Blister Copper produced ,, | 923 | 74,113 | 351 | 30,440 |
| Copper Ore and Copper produced..... ,, | 354 | 2030 | 423 | 2109 |
| Tin Ore produced..... ,, | 897·26 | 129,835 | 787·48 | 116,830 |
| ‡ Coal raised..... ,, | 16,382 | 7491 | 11,188 | 5417 |
| Wolfram Ore produced... ,, | 23·5 | 2436 | 7·4 | 784 |
| Bismuth ..... ,, | 1·35 | 300 | 0·75 | 270 |
| Osmiridium ..... oz. | 358·7 | 3070 | 257·45 | 2143 |
| Shale ..... tons | 10 | 10 | 10 | 10 |
| | ... | 350,506 | ... | 270,154 |

* Fine gold, including gold contained in blister copper and silver-lead bullion.
† Value of gold contents deducted.
‡ Value at pit's mouth.

B51601

## GOLD.

During the past quarter 2435 oz. gold were obtained from quartz, 130·6 oz. from alluvial, 2643·65 oz. by means of the cyanide and chlorination processes, 1664 oz. from blister copper from the Mt. Lyell Mining and Railway Company Limited, and 1437 oz. from the silver-lead bullion from the Tasmanian Smelting Company's Works, Zeehan, valued at £35,255.

The following table shows the quantities obtained from the various sources on the different fields during the period under review, together with the totals for the corresponding period for 1912, and the previous quarter ending 31st March, 1913:—

| | Gold obtained during the Quarter ending 30th June, 1913. | | | | | | Totals corresponding Quarter, 1912. | Totals for Quarter ending 31st Mar., 1913. |
|---|---|---|---|---|---|---|---|---|
| | From Quartz. | Alluvial. | Cyanide & chlorination. | From Blister Copper. | From Silver-lead Bullion. | TOTAL. | | |
| | oz. | oz. | oz. | oz. | oz. | oz. | oz. | oz. |
| Beaconsfield | 2427 | . | 2479 | ... | ... | 4906 | 5897 | 6034 |
| Mathinna & Mangana. | ... | ... | 164·65 | ... | ... | 164·65 | 11 | 167·35 |
| Mt. Victoria, Warrentinna, Mt. Cameron | ... | 100·95 | ... | ... | ... | 100·95 | 56 | 39·55 |
| Lefroy ..... | 8 | ... | ... | ... | ... | 8 | 36·95 | ... |
| Lisle ....., Lilydale....., Golconda ... | ... | 26·65 | ... | ... | ... | 26·65 | 12 | 12 |
| West Coast. | ... | 3 | ... | 1664 | 1437 | 3104 | 7748 | 2583 |
| TOTALS | 2435 | 130·6 | 2643·65 | 1664 | 1437 | 8310·25 | ... | ... |
| Totals corresponding Quarter, 1912..... | 3304·95 | 88 | 2653 | 2001 | 5714 | ... | 13,760·95 | ... |
| Totals for Quarter ending 31st Mar., 1913..... | 3345 | 74·55 | 2856·35 | 1084 | 1476 | ... | ... | 8835·9 |

Value, £35,255; equal to 8299·733 oz. fine gold.

BEACONSFIELD.—The quarter's statistics for the district are as follows:—

| | Gold produced oz. | Men employed. |
|---|---|---|
| Tasmania Mine..... | 4906 | 421 |



*Tasmania Mine.*—Twelve thousand four hundred tons of quartz crushed, and 4906 oz. of gold obtained (by amalgamation and cyanide process), which makes a total of 1,012,229 tons quartz crushed, and 819,195 oz. of gold obtained since the mine was first started.

LEFROY.—The quarter's statistics are as follows:—

| | Gold produced. oz. | Men employed. |
|---|---|---|
| Golden Crest ..... | 8 | 8 |
| Others ..... | — | 12 |
| Total ..... | 8 | 20 |

LISLE, GOLCONDA, &c.—26·65 oz. of gold have been won from these fields. Thirteen men have been employed.

RINGAROOMA.—93·9 oz. were obtained from this district by 10 men.

*Alluvial Gold and Dredging Companies.*—Gold has been obtained by the following companies in streaming tin:—

| | Standard Gold. oz. |
|---|---|
| Briseis Co. ..... | 7·05 |
| Total ..... | 7·05 |

MATHINNA AND MANGANA.—The quarter's statistics are as follows:—

| | Gold produced. oz. | Men. |
|---|---|---|
| | 164·65 | 9 |

WEST COAST.—Mr. Inspector Curtain reports:—

At the Coupon Mine, Hall's Creek, a half-mile of 2 ft. 6 in. iron tramline has been constructed, and 32 tons of stone, averaging 8½ dwt., despatched to the Mt. Lyell Company's Reduction Works; 2 men.

(NOTE.—The value of this gold will be included in the returns of the Mt. Lyell Company.)

*McDowell Prospecting Syndicate.*—Mr. Michael Cunningham, the secretary, reports that a total length of 264 feet has been driven in the tunnel, by two men.

*Alluvial.*—Messrs. Ellison and Nicholson, respective gold-buyers at Linda and Queenstown, report having purchased 1 oz. of gold from Messrs. Adams, Jackson, and Blum, valued at £3 9s. 6d.

LONG PLAINS AND SAVAGE RIVER.—Two oz. were obtained, by two men.

## TIN.

The statistics for this metal for the past quarter are as follows:—

| | Ore won. tons. | Value. £ | Men employed. Europeans. | Chinese. |
|---|---|---|---|---|
| Northern and Southern Division | 19 | 2200 | 34 | ... |
| North-Eastern Division ..... | 349·15 | 54,550 | 501 | 44 |
| Eastern Division ..... | 108·7 | 16,279 | 367 | 25 |
| North-Western Division ..... | 346·25 | 47,006 | 577 | ... |
| Western Division ..... | 74·16 | 9800 | 188 | ... |
| Totals ..... ..... | 897·26 | 129,835 | 1667 | 69 |

### NORTH-WESTERN DIVISION.

The output has been as under:—

| | Ore won. tons. | Men employed. |
|---|---|---|
| Mt. Bischoff ..... | 280 | 414 |
| Mt. Bischoff Extended ..... | 55·5 | 108 |
| Weir's Bischoff Surprise..... ..... | 3·4 | 9 |
| Wombat ..... | — | 5 |
| Ringtail..... | 2·85 | 7 |
| Mt. Cleveland ..... ..... | 4·5 | 34 |
| Totals..... ..... | 346·25 | 577 |

### NORTH-EASTERN DIVISION.

PIONEER AND GLADSTONE DISTRICTS:—

| | Tin ore won. tons. | Men employed. Europeans. | Chinese. |
|---|---|---|---|
| Pioneer Tin Mine ..... | 101 | 60 | ... |
| Aberroe ..... | 0·5 | 6 | ... |
| South Mt. Cameron ..... | ... | ... | ... |
| Garibaldi..... | 3·8 | 12 | ... |
| Clifton Creek ..... | 53 | 32 | ... |
| Yee Gee ..... | 8·7 | 6 | 7 |
| Other Claims ..... | 17·3 | 43 | 17 |
| Totals ..... | 184·3 | 159 | 24 |



RINGAROOMA DISTRICT:—

| | Tin ore won. tons. | Men employed. Europeans. | Chinese. |
|---|---|---|---|
| Bell's Hill..... | ·8 | 3 | ... |
| Other Claims ..... | 1·7 | 20 | 1 |
| Totals..... | 2·5 | 23 | 1 |

DERBY DISTRICT:—

| | | | |
|---|---|---|---|
| Briseis Tin Mines..... | 135 | 147 | ... |
| Clyde ..... | 2·5 | 4 | ... |
| Waverley ..... | ·85 | 3 | ... |
| Other Derby Claims ..... | 6·65 | 39 | 13 |
| Totals ..... ..... | 145· | 193 | 13 |

BRANXHOLM DISTRICT:—

| | | | |
|---|---|---|---|
| Arba Tin Mine..... | 8·5 | 46 | ... |
| New Ruby Flat ..... | — | 12 | ... |
| Other Claims ..... | 2·5 | 33 | 6 |
| Totals..... ..... | 11· | 91 | 6 |

MOORINA DISTRICT:—

| | | | |
|---|---|---|---|
| Wilberforce Pump Co. ..... | 3 | 6 | ... |
| Weld Tin Mine ..... | 1·35 | 10 | ... |
| Other Moorina Claims ..... | ·95 | 4 | ... |
| Totals ..... | 5·30 | 20 | ... |
| Straits Islands..... ..... | 1·05 | 15 | ... |
| *Totals for North-Eastern Division* ..... | 349·15 | 501 | 44 |

### Eastern Division.

| | Tin ore won. tons. | Men employed. Europeans. | Chinese. |
|---|---|---|---|
| *Weldborough, Lottah, and Blue Tier Mines.* | | | |
| Anchor Mine | 35·9 | 127 | ... |
| Others | 13·35 | 37 | 25 |
| Totals | 49·25 | 164 | 25 |
| *St. Helens Mines.* | | | |
| Pioneer Co. | 15·75 | 10 | ... |
| J. C. Macmichael | ·80 | 4 | ... |
| C. Miller | ·75 | 3 | ... |
| Others | ... | 14 | ... |
| Totals | 18·45 | 31 | ... |
| *Avoca Mines.* | | | |
| Royal George | 32·1 | 96 | ... |
| Gipp's Creek | 1·8 | 7 | ... |
| South Esk | 1·15 | 6 | ... |
| Foster's | 1·45 | 12 | ... |
| New Roy's Hill | ... | ... | ... |
| Story's Creek | 3·45 | 36 | ... |
| Rex Hill | ·5 | 3 | ... |
| Desire Tin Mine | ·55 | 12 | ... |
| Totals | 41·00 | 172 | ... |
| *Totals for Eastern Division* | 108·70 | 367 | 25 |

### Northern and Southern Division.

| | Tin ore won. tons. | Men employed. Europeans. |
|---|---|---|
| Shepherd and Murphy Mine | 19 | 31 |
| Iris | — | 3 |
| | 19 | 34 |

### Western Division.

| | Tin ore won. tons. | Men employed. Europeans. |
|---|---|---|
| Boulder | 11·75 | 23 |
| Renison Bell | 39·30 | 50 |
| Montana Tin Syndicate | 7·23 | 16 |
| Heemskirk Tin Syndicate | 4·30 | 24 |
| Others | 11·58 | 75 |
| Totals | 74·16 | 188 |



## SILVER.

**West Coast.**—The registered output of silver ore in the Western Division for the quarter ending 30th June, 1913, is given below:—

| | Ore. | Tons. | Value. | Men. |
|---|---|---|---|---|
| *Zeehan Mines:* | | | | |
| Zeehan-Montana | galena | 359·2 | £7592 | 120 |
| Zeehan-Western | ,, | 46·58 | 767 | 18 |
| Ditto | slimes | 146 | 82 | |
| Zeehan-Queen | galena | 29 | 488 | 8 |
| Ditto | pyrites | 264 | 95 | |
| Mt. Zeehan (Tas.) | galena | 96 | 1736 | 20 |
| Ditto | flux and tailings | ... | ... | ... |
| Oonah | pyrites | 158 | 118 | 22 |
| Ditto | galena | 25 | 228 | |
| Florence | ,, | 12·43 | 170 | 2 |
| South Comstock Block 10 | pyrites | 710 | 262 | 6 |
| Tas. Smelting Coy. | galena | 7·3 | 92 | 3 |
| Queen Extended | ,, | 48·6 | 676 | 14 |
| Austral Valley | flux | 1391 | 491 | 6 |
| Queensberry | galena | 49·5 | 544 | 5 |
| Block 10, 5-mile | ,, | ... | ... | 6 |
| *Dundas Mines:* | | | | |
| Adelaide | iron flux | 1213·2 | 1895 | 18 |
| Hercules | sulphide | 7417 | 24,645 | 128 |
| Zeehan-Dundas | galena | 179 | 3886 | 37 |
| Comet | iron flux | 3778 | 3103 | 30 |
| Ring Valley | antimonial ore | 60 | 1100 | 12 |
| Mount Read | ... | ... | ... | 2 |
| Hercules, North | ... | ... | ... | 4 |
| Bon Accord | galena | 28·08 | 256 | 4 |
| *Rosebery Mines:* | | | | |
| Tasmanian Copper | sulphide | 3169 | 11,359 | 25 |
| Primrose | ,, | 2418 | 9261 | 30 |
| Metals Extraction Co. | ... | ... | ... | 140 |
| *Mt. Farrell Mines:* | | | | |
| N. Mt. Farrell | galena | 546·3 | 6422 | 83 |
| Sterling Valley | ... | ... | ... | ... |
| *North Pieman:* | | | | |
| Chester Mine | pyrites | 2326·85 | 830 | 45 |
| *Mt. Lyell:* | | | | |
| Tasman & Crown Lyell Extd. | | ... | ... | 1 |
| *Sundries:* | | | | |
| Dunkley Bros. | | ... | ... | 300 |
| Tasmanian Smelting Co. | | ... | ... | 126 |
| Total | | 24,478·04 | £76,098 | 1215 |

MT. READ DISTRICT.—*Hercules Mine.*—Mr. C. H. Moxon, manager, reports:—During the period under review 7417 tons of ore were mined and treated, and the deliveries to the Tasmanian Smelting Company have continued without interruption. About two-thirds of this quantity was obtained from the various stopes above the No. 4 level, the remainder coming from Nos. 3A and 3 levels. Exploratory work has been carried on chiefly in No. 3 level, where a large tonnage of ore has been opened up by means of the north drive, which also provides a new outlet from the mine. The diamond-drilling plant has been received, and will shortly be put into commission.

*Mt. Read Mine.*—Mr. John Moyle, superintendent, reports:—Extended west crosscut to 209 feet., At this point a mineralised formation was disclosed, carrying galena and zinc blende. The average bulk values of these metals are not yet determined.

NORTH DUNDAS.—*Ring Valley Mine.*—Mr. John Moyle, agent, reports:—Developments during the past quarter comprise extensions of the 50-feet and 130-feet levels south of shaft, also stoping north of shaft. The lode proved very patchy, but occasionally produces fair pockets of good to medium ore, alternating from rich fahl ore to a poorer grade, with antimony in association.

*Tasmanian Smelting Company.*—Mr. H. Harris, manager, reports:—Ore bought during the quarter, 10,821 tons, containing 1269 tons lead, 152,082 oz. silver, 1430 oz. gold. Exported 1171 tons bullion, containing 1135 tons lead, 128,350 oz. silver, and 1437 oz. gold.

NORTH-WESTERN DIVISION.

| | Tons. | Value. | Men. |
|---|---|---|---|
| Magnet Mine..... ..... | 1640 | £18,564 | 160 |

NORTHERN AND SOUTHERN DIVISION.

| | Tons. | Value. | Men. |
|---|---|---|---|
| Round Hill Mine ..... | 91·35 | £1304 | 16 |

## COPPER.

*Mt. Lyell Mine.*—Mr. Robert Sticht, general manager, reports:—Ores and metal-bearing fluxes treated at Reduction Works:—

| | Dry Weight. tons. | cwt. | qr. | lb. |
|---|---|---|---|---|
| Mt. Lyell Mine ore ..... | 42,700 | 1 | 2 | 6 |
| North Lyell Mine ore ..... | 9862 | 7 | 0 | 2 |
| Metal-bearing flux from Lyell Tharsis Mine... | 4084 | 7 | 1 | 13 |
| Lyell Comstock Mine Ore ..... | 7174 | 16 | 2 | 25 |
| | 63,821 | 12 | 2 | 18 |



Number of men employed:—

| | | | | |
|---|---|---|---|---|
| At the Company's | Mt. Lyell Mine ..... | 363 | | |
| " " | North Lyell Mine..... | 361 | | |
| " " | Crotty Leases ..... | 27 | | |
| " " | Lyell Tharsis Mine ..... | 6 | | |
| " " | Lyell Comstock Mine..... | 161 | | |
| | | | 918 | |
| " " | Reduction Works..... | | ... 694 | |
| Railway Department— | Mt. Lyell Railway ..... | 162 | | |
| " " | North Lyell Railway... | 19 | | |
| | | | 181 | |
| | Total..... | | 1793 | |

Quantity and value of metal produced:—

| Blister copper, 923 tons, containing— | £ | s. | d. |
|---|---|---|---|
| Copper, 910 tons, valued at..... ..... | £65,383 | 10 | 0 |
| Silver, fine, 76,298 oz., valued at..... | 8729 | 15 | 3 |
| Gold, fine, 1664 oz., valued at ..... ..... | 7072 | 0 | 0 |
| Total ..... | £81,185 | 5 | 3 |

Mr. Inspector Curtain reports:—

*Mt. Lyell Mining and Railway Company's Group.*

*Mt. Lyell Mine.*—Apart from the unwatering of the North Lyell Mine, probably the next matter of note was connecting the deepest, or No. 8 level of this mine with the old South Lyell workings. They were in good order, chiefly owing to the quality of the timber (gum) selected at their induction, 10 years ago, which, being stripped of bark, no doubt tended to prolong its efficiency. The dimensions of this (south) ore-body are approximately 250 feet by 60 feet, with every likelihood of extension, so that such an additional supply of pyritic ore, both for smelting and other purposes, must be of the greatest moment and importance. The balance of the stopes through the different levels provides a daily average of 700 tons, that can readily be increased by half when the customary or usual production from North Lyell again comes forward.

At the latter and Lyell Tharsis Mine surface open-cut work was continued in order to keep the reduction works going during the unwatering of the former, but as this has been accomplished their services, beyond providing "filling" for the depleted parts of the undergound workings, can be dispensed with. The latter, after a thorough examination of the various levels, were found in excellent condition, including the main shaft, and when cleaned up, and the truck roads which came under the influence of the surcharged "copper water" replaced, will be suitably fit for the resumption of mining. This is so steadily advancing that the usual routine should prevail during the ensuing quarter.

At the Lyell Comstock Mine a number of men are employed on the surface and underground. The work of the former consists chiefly of railway and transit construction, in order to bring the mine and reduction works in better communication, while the later is directed to the exploitation of six different adit levels, ranging over a sectional or vertical height of 600 feet, that in all instances have presented and provided appreciable prospects and developments.

In connection with this last mine a new hamlet that promises to add another town to the district has sprung up, there being fully 40 dwelling-houses, including a five-room "batch" or accommodation house, erected by the company.

At the Reduction Works three furnaces have for some time been in blast, and it is reasonably evident, with the increasing output, another will be early added, thus bringing the number up to maximum efficiency.

At the Lake Margaret Hydro-Electric Station work is rapidly advancing, and at present chiefly centred in the erection of the power plant and its accessories, that it is surmised will be supplying current (energy) towards the end of the present or early part of the coming year.

*Flux and Limestone Quarries.*—Another silica face has been opened on the west branch of the Queen River towards Howard's Plains, while preparations are also being made to procure additional limestone from the vicinity of Hall's Creek.

*Railway Department.*—Both the main lines between the Reduction Works and Strahan, and Linda and Kelly's Basin, and the auxiliary or 2-feet gauge, receive necessary attention; the bridges in connection with the latter, and generally used by pedestrians, being provided with hand rails, for greater safety and protection.

*Mt. Lyell Blocks Copper Mines.*—Mr. Robert Ferguson reports:—I have been engaged sinking the main shaft and opening out a chamber at the 1100-feet level; in addition to which the shaft is being skidded and made ready for the cage and tank to work on the completion of the pent-house and cistern, after which sinking will be resumed; 26 men.

*Mt. Jukes Prospecting Syndicate.*—Mr. James Souter reports:—During quarter 30 feet has been added to the intermediate tunnel, in addition to packing timbers for building purposes, with an average of two men.

*Guy's Prospecting Syndicate*, Queenstown, is operating a copper proposition on the outskirts of the town, with two men.

North Dundas.—Copper-nickel sections, 10 men.



### North-Western Division.

| | Tons. | £ | Men employed. |
|---|---|---|---|
| Murray's Reward (Balfour)... | 354 | 2030 | 35 |
| Others (estimated) (Balfour) | ... | ... | 80 |
| Totals ..... | 354 | 2030 | 115 |

## COAL.

The output this quarter was 16,382 tons, against 11,188 tons the previous quarter. The output of the respective collieries was as follows:—

| Colliery. | Tons raised. | Value at mine. £ | Men employed. |
|---|---|---|---|
| Cornwall Colliery ..... | 6468 | 2911 | 63 |
| Mt. Nicholas ,, ..... | 9218 | 4148 | 68 |
| Spreyton ,, ..... | 390 | 253 | 9 |
| York Plains ,, ..... | 186 | 119 | 2 |
| Illamatha ,, ..... | ... | ... | ... |
| Catamaran ,, ..... | ... | ... | ... |
| Mt. Cygnet ,, ..... | 120 | 60 | 2 |
| Totals ..... | 16,382 | £7491 | 144 |

## SHALE.

Three men were employed at the Railton-Latrobe shale oil works. Ten tons of shale were obtained, valued at £10.

## BISMUTH.

The output of bismuth during the quarter was as follows:—

| | Tons. | £ | Men. |
|---|---|---|---|
| Shepherd and Murphy Mine ..... | 1·35 | 300 | ... |

## WOLFRAM.

The output of wolfram during the quarter was as follows:—

| | Tons. | £ | Men. |
|---|---|---|---|
| Avoca Mines..... | 13·30 | 1516 | * |
| Shepherd and Murphy Mine ..... | 9 | 800 | * |
| Squib Mine ..... | 1·20 | 120 | 9 |
| Totals ..... | 23·50 | 2436 | 9 |

* Shown in tin returns.

## OSMIRIDIUM.

The output of osmiridium during the quarter was as follows:—

| | ozs. | £ | Men. |
|---|---|---|---|
| Savage River District | 358·7* | 3070 | 33 |
| Wilson River | ... | ... | 30 |

* 21·75oz. of this were won in 1911, and 63·75oz. during 1912, but particulars have only now been received from the purchasers.

The following return shows the average number of men employed in or about the mines during the quarter ending 30th June, 1913:—

| District. | Europeans. | Chinese. | Total. |
|---|---|---|---|
| Northern and Southern | 529 | ... | 529 |
| North-Eastern | 511 | 44 | 555 |
| Eastern | 507 | 25 | 532 |
| North-Western | 917 | ... | 917 |
| Western | 3242 | ... | 3242 |
| Total | 5706 | 69 | 5775 |

Value of mineral output per man:—£60 13s. 10·48d.

Dividends paid by mining companies during the quarter ending 30th June, 1913:—

| | £ s. d. | £ s. d. |
|---|---|---|
| From Copper Mines:— | | |
| Mt. Lyell Mining & Railway Co. Ltd. | ... | Nil |
| From Tin Mines:— | | |
| Mt. Bischoff Tin Mining Co. | 18,000 0 0 | |
| Pioneer Tin Mining Co. Ltd. | 4031 12 0 | |
| Arba Tin Mining Co. N.L. | ... | |
| Briseis Tin and General Mining Co. Ltd. | ... | |
| South Mt. Cameron Tin Mining Co. N.L. | 800 0 0 | |
| Renison Bell Pros. and Mining Co. | 1847 6 0 | |
| The Montana Tin Pros. Syndicate | 480 0 0 | |
| The Royal George T.M. Co. | 1250 0 0 | |
| | | 26,408 18 0 |
| From Coal Mines— | | |
| Cornwall Coal Co. | 906 6 6 | |
| | | 906 6 6 |
| Total | ... | £27,315 4 6 |



APPENDIX I.

State Mining Engineer's Office,
Zeehan, 5th May, 1913.

## REPORT 5.

The following is the report for the month ending April 30, 1913.

### *General.*

The usual office work has been carried on at Zeehan. Eighteen assays were completed, and two mineral determinations. Investigation was made of the country in the vicinity of McLean's Falls, and of the possibilities of Lake Rolleston as a source of water-power, and special reports will be forwarded shortly on these subjects.

### *Zeehan Prospecting.*

(1) *South Zeehan.*—On Section 4802, 114 feet of trenching have been done. On the Victoria Zeehan a deep trench 91 feet in length has been cut through an ironstone formation. On sections west and adjoining the Victoria Zeehan 166 feet of trenching have been done, and two mullocky pyritic formations uncovered. They were sunk on for a few feet, but showed no improvement.

On the Britannia section, 1231 feet of trenching have been done, and near the south boundary a pyritic lode 32 feet wide has been cut. It contains one seam of iron pyrite 14 feet wide, another 2 feet wide, and several smaller seams. This discovery may prove to be of value. Spanish pyrites, of which considerable quantities are imported into Australia, is valued for customs purposes at about 40s. per ton. If this price could be obtained for the local product there would be a considerable margin of profit.

(2) *Central Zeehan.*—On the Mt. Zeehan (Tas.) sections 242 feet, and on the adjoining Queen Extended section, 1934 feet of trenching have been done; on the Oonah, near the Queen boundary, 462 feet. No lodes were found.

(3) *North Zeehan.*—On the Zeehan Western Beauty section, 196 feet of trenching have been cut, and four shallow shafts, aggregating 43 feet, have been sunk on two siliceous lode-formations. Only splashes of galena were shown. On Barnett's section, 100 feet of trenching was done. North of Barnett's 100 feet of trenching was done, and a shallow shaft sunk on a siliceous formation, which carries a little galena. On the east slope of the Oonah Hill 228 feet of trenching was done, and one shallow shaft sunk.

### *Prospecting.*

(1) *North of Pieman.*—Both parties here have pushed on farther north during the past month. One party will shortly open up a track to the Chester Mine, giving access here to the railway. Good land

has been passed through, but no mineral discovery of economic value has been made.

(2) *West from Zeehan.*—Prospecting has been continued along the Little Henty River, and the party is now approaching the Comstock district. Nothing of importance has been discovered. One creek flowing from the Comstock was found to contain a little gold.

(3) *Point Hibbs.*—A large pyritic lode has been located by the party working here. The overburden is heavy, and its removal entails considerable work to disclose the true nature of the lode. A deep trench is being put in to prove it conclusively.

(4) *Mt. Darwin.*—This party has been moved west to Flannigan's Flat, and is prospecting south and west thence to trace out the source of the gold found in the alluvial.

(5) *Stanley River.*—This party has been withdrawn, and work temporarily discontinued here.

*Port Davey Track.*—Work has been carried on steadily here, and progress has been satisfactory. A compass survey of the track to the sea coast has been completed, and a commencement is being made with the track along the coast. So far no decision has been received from the postal authorities as to the erection of the telephone line. The cost of this work, more especially the providing of the posts, will be materially reduced if it can be carried on in conjunction with the track-construction.

*Water-Power.*—A preliminary examination of the Lake Rolleston district was completed, and will be reported on separately.

HARTWELL CONDER, State Mining Engineer.

The Secretary for Mines, Hobart.

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State Mining Engineer's Office,
Zeehan, 5th May, 1913.

## REPORT 6.

The following is the report for the month ending May 31, 1913.

### *General.*

During the month 28 assays were completed at Zeehan, and special reports sent in on the Lake Rolleston water scheme and other matters.

### *Zeehan Prospecting.*

(1) *South Zeehan.*—On Section 5226, 486 feet of trenching were completed, and 144 feet on Section 4802. Nothing of value was disclosed. On the Britannia section the pyrites lode has been tested by three shallow tunnels, aggregating 85 feet of driving; and by 207 feet of trenching. The work done shows that the lode does not rise on its strike into the hill, and owing to the surface topography to get even 50 feet of backs 250 feet of tunnelling will be necessary. A shaft 10 feet deep was sunk on the lode in pyritic material, when water checked further progress. This formation and several others encountered could be more cheaply tested by a small hand-power diamond-drill than by any other method.

Near the western boundary of the section 132 feet of deep trenching have been completed.

(2) *Central Zeehan.*—On the Queen Extended sections 297 feet of trenching have been done.

(3) *North Zeehan.*—On the east slope of the Oonah Hill a pyromorphite lode was uncovered in one of the trenches. It was tested by a shaft 10 feet deep, and also by several trenches. It proved to be poor and irregular, the best assay obtained giving 16 per cent. lead and 1 oz. of silver. In the vicinity 616 feet of trenching were completed.

(4) *North-East Zeehan.*—One thousand six hundred and two feet of trenching have been done. A lode of 18 inches in width has been uncovered. The lode carries bunches of galena and iron carbonate gangue, and is now being further opened up. The country here is flat, with much surface water.

(5) *South-West Zeehan.*—Work has been mostly confined to testing a large formation which was discovered in the bed of the creek. When opened up it proved to be a regular deposit of galena disseminating through gabbroid rock. An assay of the best of the rock gave 38·5 per cent. of lead, and 13·6 oz. of silver. The country here unfortunately is both wet and flat, and further testing of this formation is likely to be difficult and expensive.



### *Prospecting.*

(1) *North of Pieman.*—The work in this direction has been carried on steadily from January last. Its objective has been to test a block of country bounded to the south by the Pieman River, to the west by the Huskisson River, and to the east by the Emu Bay Railway. The Chester Mine, of the Mt. Lyell Company, is situated towards the northern corner of the block, about 1 mile west of the Emu Bay Railway.

After examining the southern portion one party pushed north, skirting the valley of the Huskisson, while the other party kept further east near the valley of the Fraser River, which joins the Pieman below the railway bridge. The western party worked back about 15 miles, and the eastern party broke through and connected with the Chester Mine.

The result from the work has been disappointing. It was hoped that a continuation of the Renison Bell or Rosebery mineral belt might be disclosed in the area, but beyond a little gold and osmiridium in unpayable quantity no minerals of economic value have been disclosed. Serpentine and limestone formations were encountered, with sandstones and slates alternating with them. The

country in many parts is thickly covered with scrub, rendering it difficult to trace out the limits of each class of rock.

The work is now extended so far back that it has become too arduous for the short days and rough weather of the winter months, and the western party has been withdrawn.

The communication with the Chester Mine will be opened up properly, and then the other party will be withdrawn. If it is decided to carry the prospecting further north here the country can be better approached from the Emu Bay Railway or from Mt. Ramsay.

(2) *Point Hibbs.*—Further developmental work was done on the pyritic lode exposed in this district, and a trench was brought in at water-level. The ground is still broken here, and it will be necessary either to sink a shaft or to bore in order to prove the value of the lode. This will not be possible until the pack-track is through, and meantime the men have been working over the surrounding country.

(3) *Mt. Darwin.*—This party has been prospecting the flanks of Mt. Strahan and the western fall of Mt. Sorell. A little gold has been met with, but no payable discovery has been made. The weather conditions are too severe to allow this mountain work to be continued much longer.

*Port Davey Track.*—The survey of this track gave a distance of 7½ miles from Double Cove to the coast, in a direction nearly south-west. The track is being pushed forward down the coast, and a pack-horse has been sent out to relieve the men from the burden of carrying supplies. The climatic conditions along the coast here are more favourable than in the mountain, and the track will be sent forward during the winter months, with the hope of completing it in the summer.

*Water-Power.*—A preliminary report was furnished with regard to the harnessing of the waters of Lake Rolleston country. During the month two parties have been exploring the valleys of the Anthony and Henty, and collecting further information in regard to their possibilities. There is no doubt that a good scheme is available here.

HARTWELL CONDER, State Mining Engineer.

The Secretary for Mines, Hobart.

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State Mining Engineer's Office,
Zeehan, 8th July, 1913.

## REPORT 7.

SIR,

The following is the report for the month ending June 30, 1913.

*General.*—The usual office work was carried on at Zeehan, and 16 assays were completed for the month. Special examinations were made of the osmiridium field at the Savage River and of the country around Beaconsfield.



### *Zeehan Prospecting.*

(1) *South Zeehan.*—Trenching to the extent of 2724 feet has been done in the vicinity of the Britannia and T. L. E. sections. The country prospected has been of a favourable nature, but nothing was met with except two mullocky pyritic formations. A shaft was sunk on one of these to the depth of 8 feet.

(2) *North Zeehan.*—One hundred and sixteen feet of trenching and 6 feet of tunnelling have been done, and a lode exposed in three places on its strike. The lode proved to be very poor, containing only specks of galena and a little pyrite.

(3) *West Zeehan—North of Comstock.*—A tunnel approach of 22 feet has been cut and a tunnel driven 16 feet on a well-defined lode which carries a fair percentage of galena intermixed with pyrites and blende; the lode will be further tested by continued driving. A trench 52 feet in length has been cut, and a shaft sunk to 15 feet on the course of the lode.

(4) *West Zeehan.—Little Henty.*—Prospecting has been confined mainly to the creek beds. Some nice specks of fairly coarse gold have been found in some of the creeks, but not in payable quantity. The source of the gold has not yet been traced.

(5) *East Zeehan.—Dunkley Town.*—One thousand four hundred and twenty feet of trenching have been cut, and some creek bottoms chipped up. A little pyrite has been found in two places, but no galena.

(6) *East Zeehan.—Five-Mile.*—Work has been confined mostly to testing a large iron carbonate lode on reserved section 4614. The lode has been trenched across in several places, and three shallow shafts sunk on it. Wherever opened up it proved to be too poor to work. The country is low-lying and very wet. Altogether 893 feet of trenching and 19 feet of shaft-sinking have been done in the vicinity.

### *Prospecting.*

(1) *North of Pieman.*—Only one party of two men was at work here, who completed the track-connection between the Pieman Cage at the X River and the Chester Mine. The track is well cut out, and of easy grade, until the gorge of the Holloway River is reached, about 4 miles from the Chester Mine. Here the shortest route is taken, which is too steep for a permanent track. The distance can be traversed in about five hours' easy walking. A big belt of good land lies between the Hollway and Huskisson Rivers, which could be readily tapped from the Emu Bay Railway, just north of the Pieman Bridge.

(2) *Mt. Darwin.*—The work here has been extended from Flannigan's Flat up the slopes of Mt. Sorell and Mt. Strahan. A little gold was encountered in several places, but not in payable

quantity. The rough weather and short days rendered it advisable to withdraw this party on the 14th.

(3) *South of Macquarie Harbour.*—The country within a short distance of Point Hibbs has been examined along the coast, and for several miles inland. Some pyrites have been found, but nothing of economic value. This party will be moved inland near the D'Aguilar Range until the track is completed further down the coast.

*Port Davey Track.*—This track has been pushed forward steadily down the coast. A hut is being erected at the 7½-mile, where the track reaches the coast, and will be used as a depot for fodder and stores.

*Water Conservation.*—Work during the month was restricted from several causes, and confined to an examination of the Henty Gorge. This work was not completed, but appears to point to the Anthony River providing the more suitable location for the power scheme. A party has been sent out to the Anthony huts, and survey work will be carried on here to provide more accurate data.

HARTWELL CONDER, State Mining Engineer.

The Secretary for Mines, Hobart.

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## Appendix II.

## PRELIMINARY REPORT ON THE JUKES-DARWIN MINING FIELD.

The Jukes-Darwin mining field is situated on the southern portion of the West Coast Range, and thus lies to the south of Mt. Lyell, the centre of the field being distant therefrom about 12 miles. Mts. Owen and Huxley are the peaks intervening between Mt. Lyell and the mountain ranges of this field, which comprise Mts. Jukes, Darwin, and Sorell. From these mountain masses, the peaks of which reach a height of 3800 feet above sea-level, the country slopes steeply downwards towards Kelly Basin, which forms the southern boundary of the area examined. The whole region is extremely rugged and precipitous.

There are two main means of access to the field, both of which involve the utilisation of the North Lyell Railway from Kelly Basin to Linda. The first route is *via* Queenstown, thence by road to Linda, from which point the railway is available (at present on two days in the week) to either Crotty (12 miles) or Darwin (16 miles), whence the approach to the mining properties may be made by steep mountain tracks. The second means of access is *via* Strahan, thence by boat to Kelly Basin, whence Darwin or Crotty can be reached by rail, being distant respectively 13 miles and



17 miles from Kelly Basin. There is another route available by pack-track from Lynchford. This track, starting from the latter station on the Mt. Lyell Railway, crosses the King River by a bridge near Harris' Reward, and then ascends the northern end of Mt. Jukes as far as the Mt. Jukes Proprietary Mine.

The field was first prospected in 1897. In 1900 Mr. W. H. Twelvetrees (Government Geologist) paid a short visit of examination to the district, and in 1903 Mr. G. A. Waller (Assistant Government Geologist) reported on Findon's sections on Mt. Darwin. These two reports comprise the whole of the investigations which had been undertaken up to the time of the present geological survey.

Great activity was displayed, whilst the North Lyell Mining Company's smelters at Crotty were under construction and during their operation. The failure of these smelters and the amalgamation with the Mt. Lyell Company, and the consequent concentration of smelting operations at Queenstown, brought about a paralysing effect on the field. This, together with the other causes of the stagnation of the field, are described at the conclusion of this report.

At present there is only one property on the field where active work is being carried on. This is the Mt. Jukes Proprietary, which is at present employing three men.

The whole of these mountain masses is composed of various members of (1) the porphyroid series, and (2) conglomerate and breccia. The former series (the porphyroids) consists of an interesting and varied assemblage of quartz-porphyries, felspar-porphyries, felsites, schistose felsite, chloritic and talcose (?) schists. Granite is developed on Mts. Darwin, and forms a rather extensive plateau on the southern end of that mountain. This is not the Devonian granite, but belongs to the older series of igneous rocks which have been designated collectively as the porphyroids. The whole of these rock types are more or less mineralised, but the mineralisation is confined more especially to those rocks, the softness and general permeable character of which have been favourable to the circulation of ore-bearing solutions. The more promising ore-deposits are therefore found in the schistose felsites, chloritic and talcose (?) schists.

The conglomerate is the same rock as occurs generally on the West Coast Range, almost invariably capping the mountains. It occurs over the greater part of Jukes, and covers the whole of the long ridge of Sorell, but is missing from Darwin with the exception of two isolated patches. The evidence obtained during this survey has conclusively shown that the conglomerate is younger than the felsites, granite, &c. The lower members of the conglomerate series consist of breccias composed of angular fragments of felsite, granite, &c. These pass upwards by an increase in the number of quartz and quartzite pebbles into the normal conglomerate.

The comparatively flat country on the east and west flanks of

these mountains consists of Silurian sandstones, slates, and limestones, in part overlaid by glacial morainal deposits.

An occurrence of scientific interest is the discovery of irregularly-shaped fragments of acid glass on the eastern side of Mt. Darwin, the origin of which is a mystery, as it has been conclusively proved not to be of artificial origin.

The whole district shows abundant evidence of glaciation in quite recent times.

There are four general types of ore-deposits developed in this field, viz.—(1) detrital gold deposits, (2) the copper-silver-gold ore-bodies, (3) hematite and magnetite deposits, and (4) deposits in fissure lodes.

(1) *Detrital Gold Deposits.*

These deposits occur exclusively on Mt. Darwin and in the valley of the Clark River between Mts. Darwin and Sorell. A peculiar feature is the absence of alluvial gold in the alluvial deposits at the foot of the mountain, the gold being confined to the higher parts of the range. It occurs in creeks and terraces, especially in Sections 5207-M, 3295-M, 2581-M, 3196-M, 1203-M, and 3352-M. The occurrences are very irregular, a notable feature being the absence of gold in wash of any thickness, the precious metal being confined mostly to the portions of the alluvial deposits which are thinnest. The gold is generally waterworn, and is remarkable in being uniformly in coarse grains, fine gold being absent. The largest nugget obtained up to the present weighed 6½ oz., the commonest size being from 1 to 2 dwt. The gold is very pure. Altogether, somewhat more than 500 oz. have been won from these alluvial workings, which are not yet exhausted, although no work was being done at the time of the writer's visit.

(2) *The Copper-Silver-Gold Ore-bodies.*

These are the most important ore-deposits of the field. They occur exclusively in the rocks of the porphyroid series (felsites, &c.), being widely spread throughout these rocks, but being concentrated into deposits of possible economic value only in those portions of the rock system which have been rendered schistose. The copper ore is almost always chalcopyrite, bornite being developed in one deposit only (Lake Jukes), while metallic copper occurs in small amount throughout the field. The associated minerals are quartz, iron pyrites, hematite, and magnetite, whilst galena and fahl-ore are occasionally present in small amount.

The following are short descriptions of some of the properties on which formations of this type are known to exist.

*Mt. Jukes Proprietary Sections.*—(J. Souter, lessee and manager).—This property now consists of one 80-acre section (6012-M). An ore-formation is seen on this section on the surface, being clearly indicated by the deep brown colour of the weathered rock-surface. This formation has been exploited by means of two adits, and the



present owners are at present engaged in driving a third. The upper, or No. 1, tunnel has been driven in a westerly direction for 200 feet. At 18 feet in, an ore-body 22 feet wide was met with. A winze has been sunk on this ore-body for a depth of 122 feet. At 52 feet down a drive was put out along the lode, and at 26 feet a crosscut was driven through the ore-body, which is here shown to be 24 feet wide. A sample taken across this 24 feet is stated to have assayed—copper, 4·1 per cent.; silver, 0·53 oz. per ton; gold, 0·27 oz. per ton. The bottom of the winze is still in good ore. The ore is chalcopyrite in veins and impregnations in dark chloritised schist.

About 300 feet below this tunnel is No. 2 adit, which has been driven with the object of intersecting the northern extension of this ore-body. The first 500 feet of this tunnel is in hard, dense felsite, showing splashes of mineralisation. At 515 feet a crosscut was put out in a south-south-east direction, following a well-defined "head." An ore-body, 4 feet wide, showing good average values, was passed through in this crosscut, but cut out towards the end, which is in hard, pink felsite, almost devoid of mineralisation. The end of the main drive is in green and pink felsite, showing iron pyrites, but very little copper.

At a point 127 feet below No. 1 tunnel an adit is at present being driven in a south-west direction, with the object of intersecting the ore-body shown on the surface and in No. 1 tunnel to have a strike north-east—south-west. This should require 130 feet of driving. The intention is then to follow the hanging-wall until a point is reached directly below the winze, when a rise will be put up to connect therewith. This will give a certain amount of information as to the extent and value of the ore-body at that depth, as crosscuts can be put in at intervals while following the hanging-wall. The adit at present has been driven for about 35 feet.

A parcel of 20 tons of ore was taken from the dump at No. 1 tunnel and sold to the Mt. Lyell Company, and is stated to have assayed almost exactly the same as the sample mentioned above as taken across 24 feet of the ore-body. This constitutes the only output from the mine to date.

*King Jukes Section.*—Originally consisting of two sections, this property now consists of one, namely 5936-M, charted in the name of E. Slater. No work is being done at present. Two tunnels were originally driven. The upper one shows no mineralisation. In the lower tunnel, however, a band of mineralised chloritic schist is seen showing copper pyrites.

These two properties—viz., the Mt. Jukes Proprietory and King Jukes—really include the greater portion of an area, roughly 20 chains wide, which consists of mineralised schistose and non-schistose felsites. This mineralised area is indicated by the general brown limonite-stained rock-surface, and has been exposed by surface trenching in several places on the Jukes Proprietary sec-

tions, but the only place at present exposed which shows payable ore is in the No. 1 tunnel and winze of the latter workings.

*Lake Jukes.*—These sections are now vacant, and comprise one 80-acre section (4812-M), and one 40-acre section (4811-M); both last held by T. F. Ryan. The ore deposits here occur on a razor-back spur, and consist of veins of bornite in hard quartz-felsite associated with hard, dense hematite. The hematite here occurs in veins, and the bornite occurs as veins and blebs in it. One vein in a vertical fissure near the top of the ridge consisted of 2 feet of practically pure bornite, and assayed over 50 per cent. of copper in bulk samples. This vein, however, petered right out, both when followed into the hill, and when traced under foot. Several tunnels have been put in at the foot of the ridge with the object of intersecting these veins at a depth, but in every case failed to find any ore worth mentioning. This verifies Mr. Twelvetrees' prediction that in all probability the veins would meander through the country irregularly rather than fill any defined fissure.

On the failure to disclose the existence of defined veins of bornite attention was paid to a rather well-defined quartz lode, dipping to the north-west at 40°. This was proved to carry gold, and a five-head battery was erected under the belief that the lode material would average 10 dwt. of gold per ton. The first and only crushing put through gave a yield of about 2 dwt. per ton. After this, operations were suspended.

Some of the bornite veins near the top of the ridge were gouged out and small parcels of ore sent away.

*Section* 5925-M (R. S. Taylor, lessee).—Originally known as the Hal Jukes, and later as Hyde's show. There is here shown a belt of greenish felsite about 100 feet wide, with veins of chalcopyrite, in places 2 inches wide, abundantly distributed throughout practically the whole width. Two adits have been driven to intersect this mineralised belt, which strikes north and south. The upper tunnel is 50 feet long, driven N. 60° E., and shows some splashes of mineral. The lower tunnel is 120 feet long in a north-east direction. Splashes of pyrites are seen at intervals, and the average for the whole length of the tunnel is said to have been 1 per cent. copper. Neither this tunnel nor the previous one intersected the belt of mineralisation mentioned above. The lower tunnel should have been driven in an easterly direction to cut the formation in the least distance, and even then about 250 feet of driving would have been necessary, whereas work was abandoned when only 120 feet of driving had been accomplished.

*Mt. Darwin Proprietary and South Mt. Lyell Darwin Sections.*—These comprise three 40-acre sections, now charted in the name of J. Wood—4655-M, 4654-M, and 4615-M. They are situated on the eastern slope of Mt. Darwin, being about 700 feet above the North Lyell Railway, which traverses the flat at the foot of the mountain. They are reached by a pack-track from the Darwin township.



The country-rock in the eastern portion of these sections is green schistose felsite. In the central portions of the sections occurs a belt of grey schist, which macroscopically resembles the North Lyell schist, and microscopic examination will most probably prove these two rock types to be identical. This grey schist runs in a belt having a north and south strike, and the planes of schistosity are vertical or dip at a high angle to the west. Westward of this schist belt occurs hard, dense, red felsite, the line of contact being sharp and well defined.

The ore-body in the most northerly of these three sections occurs in green felsite and quartz schist, and consists of chalcopyrite in veins and as impregnations. This ore is remarkably high in gold, the following being assays of good ore, as quoted by Mr. Twelvetrees:—

(1) Copper, 17 per cent.; silver, 10oz.; gold, 19 dwt. per ton.

(2) Copper 12 per cent.; silver, 9 oz.; gold, 14 dwt. per ton.

An adit has been driven to intersect this formation at depth, and was completed for 130 feet, when the water from the creek above broke into the workings. The ore-body had just been cut in the end. A south drive was put in for 100 feet, and then a crosscut driven parallel to the main adit. Bunches of good copper ore were met with all the way.

On Section 4654-M is Pearse's tunnel, driven in a south-west direction for 450 feet in grey schist. Drives have been put in from the end of this tunnel in both north and south directions, and crosscuts driven across an ore-body which is shown to be 40 feet wide. This ore-body consists of a metasomatic replacement of the grey schist by iron and copper pyrites in close proximity to the contact of this schist with the hard, red felsite. This same ore-body is shown in trenches above this tunnel, and the stage to which the replacement of the schist by pyrites has advanced is evidenced by the ore-body in places assaying as high as 33 per cent. sulphur in bulk samples.

The same belt of mineralisation extends to Section 4615-M (the most southerly of J. Wood's three sections), where it has been exploited by three tunnels, two of which were put in by the original owners, and the third at a lower level by the present lessee. In the first two tunnels (Dillon's No. 1 and No. 2) the ore-body is shown to be about 28 feet wide, and is said to assay 4 per cent. copper. In the lowest tunnel (Souter's tunnel) the total length of drives and crosscuts is 580 feet, and the whole of these workings are in grey schist. Bands of ore occur in schist from 2 feet to 12 feet wide, showing good copper values. These makes of ore are generally wider on the floor of the drive than they are above. Fahlore and galena occur in these ore-bodies to a small extent.

The belt of grey schist extends to the southwards of this section.

The following lots of ore have been sent out from these sections, and according to Mr. J. Souter assayed as follow:—

2 tons from Section 4655-M—Cu 6·35 per cent.; Au 8 dwt; Ag trace.

5½ tons from Section 4654-M—Cu 4·66 per cent.; Au trace; Ag 0·5 oz.

2 tons from Section 4615-M—Cu 9·0 per cent.; Au trace; Ag trace.

*Findon's Section.*—This is now vacant. It is situated on the western slope of the ridge, rising from the Intercolonial spur to the summit of Mt. Darwin. It was reported on by Mr. G. A. Waller in September, 1903. Since his visit the only work done is the driving of a tunnel with the object of intersecting the body of schistose felsite carrying chalcopyrite, shown on the surface. This tunnel had been driven for 130 feet in a south-west direction when work was suspended. The ore-bearing belt was not cut.

### (3) *The Hematite and Magnetite Deposits.*

These deposits occur widely distributed throughout the Jukes-Darwin district, but more especially towards the south end of Darwin, in the neighbourhood of the granite intrusion in that locality.

There are apparently three distinct varieties of hematite developed in this field. One variety occurs on Mt. Jukes in felsite, and may be classed as red hematite. Another variety is that at Lake Jukes, associated with the bornite veins, and is bluish-grey in colour. The third variety includes specular iron and micaceous hematite. These three varieties apparently have different modes of origin, but require the more minute investigation which will accompany the compilation of the complete bulletin on this field before any definite statements thereon can be made.

The magnetite and hematite deposits of South Darwin are most probably connected with the granite intrusion. There are a large number of these occurrences, constituting well-defined "blows." Some of these deposits contain iron and copper pyrites. The following are examples of these sulphide-bearing magnetite bodies.

*Prince Darwin.*—This section is now vacant. It is an 80-acre section, originally known as the Prince Darwin Copper Mine. There are two tunnels driven here. One is only 50 feet long. in a north-east direction, but has not cut the magnetite body. The main tunnel was started at the outcrop of a magnetite ore-body, and is 140 feet long. Throughout the whole length of this tunnel there is seen what has every appearance of being a replacement of a felsite or quartz-porphyry by magnetite, through which are disseminated iron and copper pyrites. The tunnel has been abandoned for some years now, and leachings of copper sulphate occur along the drive. Assays have been obtained, as quoted in Mr. Twelvetrees' report,



up to 7 per cent. copper, but the formation as exploited up to the present is low grade. No figures are available as to bulk assays. The end of the tunnel is still in the ore-body.

*Herman Hessenauer's Sections.*—There are two 40-acre sections in the name of H. Hessenauer, which really include the former Tasman Darwin section. On these two sections there are quite a number of magnetite and hematite bodies, but they have had no work done on them, with the exception of a few shots in odd places. One body of magnetite is seen on the surface to be 5 chains long and about 30 feet wide, and shows disseminated iron and copper pyrites.

### (4) *Fissure Lodes.*

There are very few true fissure lodes on this field. The only undoubted deposits of this type are the lodes of barytes which occur in the felsites and granite and certain quartz lodes on South Darwin. These latter carry a very small amount of iron pyrite and some chalybite, and a very small amount of gold, but otherwise appear to be devoid of metallic contents.

*W. H. Taylour's Barium Sulphate Reward Section*, 3868-M.—This section is situated at the southern end of the Intercolonial Spur, which forms a connecting saddle between Mts. Jukes and Darwin. A vertical lode of barytes occurs here. having an east and west strike. It can be traced for a total length of 35 chains; the width varies from 1 foot to 8 feet, but averages about 3 feet 6 inches. The walls are hard felsite. The barytes is very pure, and is white to pale pink in colour. Pure samples are stated to have assayed up to 97 per cent. of $BaSO_4$, while bulk samples have given 80 to 86 per cent. Towards the western boundary of this section, however, a quite appreciable amount of iron and copper pyrites is developed. Attempts have been made to find a payable market for this material, which has an extensive commercial application, but the heavy cost of transit prohibits the establishment of a profitable industry at present. The lode has been opened up in several places to a maximum depth of 8 feet.

### *General Considerations.*

The field as a whole is in a comatose condition, and has been so for some years. The causes which, in the writer's opinion, have been instrumental in bringing about this state of things are the following:—

(1) The difficulties of access to the mining sections.

(2) The closing down of the North Lyell Smelters at Crotty, and the consequent removal of a convenient market for copper ores. This gave the field a distinct set-back, which was accentuated by the resultant withdrawal of the incentive to North Lyell investors to persevere in the attempt to locate sources of ore adjacent to their smelting works.

(3) The mistaken assumption, based on the fortuitous juxtaposition of hematite and the pyritic ore-body at Mt. Lyell, that all outcrops of hematite constituted the capping of pyrite deposits. This resulted in the waste of money in exploiting bodies of hematite, which are in no way connected with the pyritic copper deposits.

(4) The formation of small syndicates with small capital to exploit observed outcrops. Whether or not the surface indications show geological features which would justify the expenditure of capital, the result in the case of the majority of these small syndicates has been the same, viz., the cessation of operations before they had proceeded far enough to prove anything at all, either favourable or otherwise, owing to the exhaustion of the capital. These remarks are undoubtedly applicable to this district, which, with the exception of the alluvial gold deposits, is distinctly not a poor man's field.

The failure of these small syndicates to obtain results and the non-success of the larger companies to disclose ore-bodies of exceptional value, have been instrumental in inculcating in the minds of the mining community generally a very poor opinion of the potentialities of the field.

The Jukes-Darwin field, therefore, is one which requires much capital for its development, and calls for the attention of the broad-minded and courageous mining investor with large resources of capital. The only factors which will influence or bring about the expenditure of this essential capital are the deductions from geological investigations as to the nature of the observed ore deposits, and the possibility of their developing into deposits of adequate economic importance. If in any case such deductions are favourable, then work on that deposit should be proceeded with on bold, but scientific and systematic lines.

Since this report has been compiled, immediately on the writer's return from the field, it is not possible to express at the moment a definite opinion on every ore occurrence; the more minute investigations which will accompany the preparation of the complete bulletin are necessary before final conclusions can be formulated. In several cases, however, the evidence is such as to justify the writer in forming favourable opinions. The Mt. Jukes Proprietary (J. Souter, lessee), the Darwin Proprietary, and South Mt. Lyell Darwin sections (J. Wood, lessee), and the Hal Jukes (R. S. Taylor, lessee) all present features which would warrant the adoption of a progressive policy of development work.

LOFTUS HILLS,, M.Sc.,
Assistant Government Geologist.

17th May, 1913.

JOHN VAIL,
GOVERNMENT PRINTER, TASMANIA.