PRELIMINARY REPORT ON MT. LINDSAY TIN MINE, TASMANIA

Preliminary statement

This report deals with the result of a four days investigation of the Mt. Lindsay orebodies where exposed in trenches cut across the outcrop and in the underground workings. At the time of the visit some of the workings were inaccessible owing to the collapse of supporting timbers and to accumulation of water. In main adit, for instance, the earlier workings have caved, and in the later workings one section of timbers is on the brink of a cave and is difficult of passage. The shaft workings are under water and the available information relating thereto is meagre and that not quite reliable. The information upon which this report is based, therefore is not all that could be desired.

In the survey of the underground workings and location of superficial openings a prismatic compass was used. The orebodies containing a high proportion of the magnetic minerals pyrrhotite and magnetite are likely to have seriously deflected the needle of the compass from its natural course and thereby have indicated wrong directions. Although all ordinary precautions were taken errors have likely been recorded. However, it is safe to state that the relative positions of the working are substantially correct.

History

The main orebody of the Lindsay Mine was discovered by David Jones when engaged on a surveying expedition through that portion of the western district. It was then thought that the chief components were nickel and antimony ores and this idea held until the time of its location by Thomas McDonald many years later. A Syndicate of McDonald's supporters was formed in Launceston to strip the orebodies of its covering of clay and to ascertain the prospective value of the lode. One, Cameron, was charged with this work, and the trenches and adit he cut across the body revealed tin ore of fairly high grade. A.E. O'Brien succeeded him in 1910 and inaugurated a systematic policy of development.

Prospecting by cutting adits and crosscuts, rises and shafts, was continued steadily until 1923 when active operations ceased. After O'Brien left, the mine was let on tribute to Blaney and Woolcock, who in twelve months obtained 54 tons of concentrated tin ore. At the expiry of the tribute the Company resumed the operations of mining and development and were successful in locating other shoots of rich ore. But the surplus proceeds of mining were sunk in development and the Company ultimately found itself at the end of its resources. (At this time ore of less than 5% tin value was regarded as of low quality and could not be treated at a profit - moreover, oxidised ore only was sought). The leases were allowed to lapse and the ground was relocated by G.D. Gardner. At present one tributor only is employed.

Production

Complete records of production are not available. During the period October 1916 to January 1921 the Company, working on a small scale produced 2156 bags of concentrated tin ore containing 68 to 71 per cent tin, at 20 bags per ton. This amounts to 107 tons 16 cwt. Since that time a tributor has produced about 10 tons.

This is a remarkable record when it is considered that an average of five men only have been employed and that the necessary development work was performed during the same period by the same men. Of course the bonanzas only were attacked much to the detriment of the mine and its future operation. In order to convey an idea of the richness of the orebody in certain parts, the output of eight men and bags is given in the subjoined table:-

Period	Yardage	Bags of tin ore concentrate
1917		
July 24	16	11
August 4	16	11
" 11	12	12
" 18	12	13
" 25	13	12
September 1	13	12
" 8	13	12
" 15	11	11
" 22	12	11
" 29	13	14
October 6	13	13
" 13	13	13
" 20	14	13
" 27	14	12
November 3	12	11
" 10	13	12
" 17	13	13
" 24	12	12
December 1	12	12
" 8	9	12
" 15	General clean up	23
" 22	10	10
	266	275

This is a record of the amount of ore saved in the operation of sluicing oxidised materials only. The amount saved could represent not more than 50 per cent of the total ore content of the lode stuff because the most primitive appliances were used in its concentration. Under these conditions ore of less than 5 per cent grade could not be mined and treated at a profit. Before completing this chapter it is desired to record an output of 3890 bags or 194.5 tons from the adjacent Stanley River area.

Situation and Access

Mt. Lindsay area is situated in the Stanley River mineral district and 16 miles by pack track NW of Renison Bell, a tin mining settlement along the line of Emu Bay Railway. The only practicable way of reaching Lindsay is by the aforesaid track which during winter is with difficulty, accessible by horse. The track was laid out without regard to grade and is very steep in parts. It is corded almost the whole way and is about five feet wide. An easy grade could have been obtained the whole way via Wilson River Valley and Salmon Creek. Pieman River is spanned by a swing bridge five feet in width.

At present by this route the cost of packing provisions is two pence per pound and of tin ore and mining requisites $11-00 per ton. These rates of transport and the long journey afoot have deterred all but the most hardy and venturesome from going to Stanley district. As motor vehicles are supplanting every other means of transport provision should be made for road connection now - it is futile to expend money on tracks. The best and easiest route appears to be that by way of Yellowbank Plain through Mt. Stewart area to join the road from Waratah at the Jasper Settlement. But another route to junction with the Ramsay Track is worthy of attention. A road along either of these courses would prove of inestimable value to mining. Connection could be made in 15 miles. An extraordinary freight tax of $11-00 per ton is too heavy a burden for any Company and is economically unsound. This is an instance of the disabilities under which Western District Mining Companies are endeavouring to carry on. But the difficulty in this case can be provided against the construction of a road, which would serve in addition one of the richest districts in the Western Division.

Topography

Lindsay area lies along the S flank of Parsons Hood - one of the extremities of the granite mass of Meredith Range. The mountain rises to a height of 2849 feet above sea level, 1500 feet above Lindsay mine, 2000 feet above Pieman River crossing. It is therefore a prominent landmark in a district of high mountains and deep valleys and is not eclipsed by any peak in the neighbourhood. The country is drained by two main lines of channel, namely, Stanley River and Wilson River. The first mentioned rises in Meredith Range at the point when the N ends of Parsons Hood and Mt. Livingstone meeting form a fork and it flows directly to Pieman River, the second with its tributaries drains the E and S slopes of Parsons Hood and reaches the Pieman about 12 miles upstream from the Stanley confluence. All the streams are fast flowing and are far above the base level of erosion. The region is one of heavy and regular rainfall (90 to 110 inches per annum) therefore fluctuations of flow are not very great. Its valleys and mountain slopes are well timbered with beech, pine, blackwood and sassafras, but the higher summits to the N are bare. Generally the topography is favourable to mining.

General Geology

A large portion of the area is occupied by the Dundas series of slates, sandstones, quartz conglomerates, tuffs and volcanic breccia with interbedded lava and other igneous rocks of Cambro-Ordovician age. This series is well exposed in the track cuttings all the way from Renison Bell where likewise it is the main formation of the district. At Colebrook, Waratah, North Pieman, Dundas, Exe Valley, Lisle, Mathinna and Mangana, almost all members of this formation are represented, but in places showing local variations.

The slates are grey, greenish-grey, chocolate, and purple in colour in their unaltered state. They weather to a brownish clay, and near the granite contact the slates are converted to cherts and the sandstones to quartzites. The conglomerate member consisting of quartz pebbles cemented with silica is not prominent at many points. It is much more exposed in the Dundas area where it is about five chains in width. Tuffs, commonly of greenish hue, and volcanic breccia are quite prominent members of this formation and are of particular interest in the Lindsay area. (Reference will be made to them again later.) Apparently the lava form of these effusives has not been noted heretofore for no reference is made to it in earlier publications. It is well exposed in the tramway cutting near Crimson Creek where it exhibits all the physical characteristics of a lava. To the unaided eye, it closely resembles a basalt. It weathers to a brownish clayey soil which supports heavy vegetation. In the process successive rounded scales about half an inch in thickness peal off and rapidly disintegrate (a similar occurrence was observed but not recorded by the writer when examining this formation in the road cuttings on the western fall of Magnet Range).

In places some bodies of this igneous series appear to be intrusive for they are not continuous but end abruptly. Their general greenish hue is due to the alteration of the original ferromagnesian components into actinolite. In fact actinolite is now the dominant compenent of these tuffs, lavas, and breccias. (It is worthy of note here to refer to the conversion of the original hornblende component of these rocks into actinolite and axinite and perhaps datolite at Colebrook Hill, Commonwealth Hill and Pine Hill).

Under the microscope another observer has noted the presence of quartz, albite, actinolite, biolite, and alusite, and sillimanite. The NW part of the area is occupied by an outcrop of Devonian granite which with its apophyses (two narrow dykes of granite porphyry) intrude the Dundas series of rocks. The granite is of the normal type common to the tin ore districts of Tasmania. Its metamorphic effects on the various rocks of the older formation are rather remarkable. The tuff member has in some parts, been converted into a hard, brittle, basalt-like rock with conchoidal fracture. It breaks into long splintery crescent forms with sharp cutting edges and when tapped on steel emits a sharp metallic ring. In other parts a variant of this type, in its fresh condition consisting largely of actinolite, has been converted into a soft clayey rock of yellowish brown colour by the decomposing effect of mineralising solutions, emanating from the granite.

Other contact metamorphic effects are the transformation of slates into cherts, sandstones into quartzites.

The altered tuffs and associated slates are the hosts of the important deposits of ore.

Structural Relations

The main bodies lie in two groups; one known as the 'magnetite' lode because of the prevalence of that mineral; the other referred to as 'main' lode because it is larger, more extensive, and richer. Although they are dissimilar in many respects there are many features in common. Both have been affected by local disturbances and on examination their structural relationship becomes clearly evident. The most striking difference is in their composition: one contains rich shoots of tin ore, the other (apparently) is comparatively poor. Both are of the replacement - fissure type. Replacement is clearly shown and selective replacement is evident in every section of the orebodies. The rock structures are retained in the replaced portions and are preserved in the unreplaced portions. Crustification appears in the infullings of the narrow fissures, the major ones coarsing parallel to the bedding planes of the rock the minor ones intersecting the planes. All the phenomena of this type of deposit are exemplified here. Selective replacement of the tuff bands in preference to the slate is one of the most striking features. Another particular feature is that many of the gangue minerals are secondary after the ferromagnesian and aluminous components of original tuff as will be indicated later. (Similar associated gangue minerals have been observed at Renison Bell, Exe River, North Dundas, and other parts where these tuffs are the containing rocks of tin orebodies).

From the foregoing statement it will be seen that the orebodies are sheeted zones in the tuff-slate series of rocks and that they conform in strike and dip with those rocks, that the boundaries coincide generally with the bedding planes and locally with small pre-mineral fractures either in the direction of bedding or cutting across the planes; also that the ores show much greater replacement of the tuff member than the state, with less regularity of outline.

Faults occupy an important place in the structure of the deposits. Their presence was indicated first by the abrupt change in direction of the orebodies in main adit workings from S58°E to S85°E. An examination revealed the fact that in that section the general strike of the unreplaced strata remained unaltered. A closer examination showed an offsetting of the walls into irregular steps; and the other component of the faults is marked by the strike and dip of the scheelite lode and its encasing bands of white and black, soft argillaceous material. The faults course NE and dip SE; the scheelite lode SE and dips NE. Certain small but rich tin orebodies cutting across the bedding planes in a north easterly direction mark pre-mineral fractures.

This suggests the idea that the major faults or displacement occurred prior to mineralisation, and the extension of the deposits beyond the lines of faulting is confirmatory of that idea. Moreover, the richest ore is found in proximity to the faults as in the Renison Bell area a fault plane was intersected in No. 1 W crosscut bearing N55°E and dipping SE. The displacement is stated to be 70 feet, and affects the orebody and the adjacent granite porphyry dyke alike. It is noticeable that the magnetite section of the orebody abruptly ends at the fault but the phyrrhotite extends across it.

Other parallel faults of much less lateral displacement have been observed in main adit workings.

The Orebodies and their Origin

The ore consists of irregular bodies of variable constitution replacing tuffs and slates. The common primary metallic minerals are magnetite, pyrrhotite, pyrite, cassiterite, siderite and chalcopyrite, some of their alteration products are hematite, limonite, marcasite (after pyrrhotite) malachite, melanterite, etc., and some of their gangue minerals are hornblende, biotite, quartz garnet, vesuvianite and lime silicates.

In these deposits there is a great development of magnetite and bodies of this mineral with its associates calcite, wollastonite, garnet and other lime silicates are found coursing parallel to narrow but extensive dykes of granite porphyry. They are essentially contact metamorphic deposits. It is clear that the original fissures occupied by the magnetite ore provided the channels for the introduction of later mineralising solutions. (It appears that the magnetite bodies and the later sulphidic replacement bodies represent progressive stages of contact metamorphism). From these fissures the solutions worked out in such favourable localities as slate-tuff contacts while smaller fractures and bedding planes admitted them into the slate-tuff on either side. Following the magnetite stage deposition proceeded in this order:-

1. Pyrrhotite-chalcopyrite-cassiterite
2. Quartz-pyrite-cassiterite
3. Quartz-pyrite.

It is possible that pyrrhotite took part in the magnetite-hornblende deposition, but it is certain that the bulk of the pyrrhotite came later. In massive pyrrhotite ore cassiterite is rarely discernible, yet it often is in high proportion. Its alteration product marcasite shows the cassiterite very plainly and when the marcasite has been completely oxidised and removed the residue consists of spongy cassiterite and cellular quartz. Cassiterite and quartz as infillings of geodes in magnetite are common, and also as veins traversing blocks of that material.

Quartz-pyrite-cassiterite bodies have proved the most important thus far developed. The latest quartz-pyrite, however, are poor in tin ore. They occupy the latest fissures, in some places filling fractures in pyrrhotite-magnetite, hornblende deposits or in massive pyrrhotite.

The quartz pyrite bodies admit meteoric waters more freely than the others and thus are in a more oxidised condition.

Mine Workings

The mine workings consist of the main openings E of Tullock Creek and the many exploratory adits and trenches along the course of main lode on the W side of the creek. That section of the orebody exposed in main workings will first be dealt with.

At the mouth of main adit the orebody is oxidised except a band of ore on the footwall, yet a few feet westward it is unaltered. The oxidation is due to the near presence of a fault which provides a channel of ingress for meteoric waters and other oxidation agents. An open cut exposes here a gossanous body over 30 feet in width and of fairly high quality. The old adit opening on the footwall side collapsed and a new one has been cut through gossan on the hanging wall side on a bearing of 110° a distance of 44 feet. From this point the bearing is 66 degrees to 29 feet, also in gossan. The ground N and underneath the drive has collapsed. Very rich ore was taken from the caved section and a large quantity of less rich ore remains to be removed. The drive continues on a bearing 105 degrees closely following the hanging wall to 70 feet on the N side, pyrite-quartz carrying a varying proportion of tin ore has been wind-stoped overhead in parts the poorer remaining. From this point No. 1 crosscut extends 27 feet northward through 7 feet of gossan containing a 2 inch rim of cassiterite and also disseminated ore. At this point a rise was cut 62 feet to surface. Along the crosscut is 10 feet of decomposing pyrite and quartz with hard bands of unreplaced slate and crystallised quartz. The remaining 10 feet is in sulphidic ore and bands of hard slate carrying garnet, lime silicates, a little fluorite and siderite. The sulphidic ore consists of pyrrhotite with a little chalcopyrite and pyrite, sets in a magnetite, hornblende and biotite gangue. No. 1 South crosscut has been driven 51 feet into the hanging wall through yellow and brown clays with veins of limonite into hard slates containing disseminated pyrite.

From the No. 1 crosscut main drive continues 53.5 feet on a bearing 97 degrees. It is in gossan 18 feet, then in semi-oxidised pyritic ore and pyrrhotite-magnetite-hornblende with slate bands. At 50 feet a cuddy on the S side exposes 4.5 feet of gossan. Between this station and No. 2 crosscut the drive bears 112 degrees through 47 feet of altered state and tuff containing lime silicate minerals.

No. 2 crosscut S on a bearing 185 degrees passes through 21 feet of clay and limonite, then intersects a 12 inch lime silicate vein containing crystals of vesuvianite and scheelite. This vein bears 155 degrees and dips NE contrary to that of the main orebody. At 25 feet the proportion of scheelite which had been 2% fell to a very small amount and this work was discontinued. No. 2 crosscut N extends 35 feet into pyrrhotite-magnetite-hornblende ore with hard bands of slate carrying pyrite, garnet and calcite and quartz-pyrite bands with cassiterite, fluorite, chalcopyrite and passing main drive continues 51.5 feet on a bearing 118 degrees to No. 3 crosscut passing through pyritic slate, much crushed and broken and intersects a major fault. No. 3 crosscut enters the faulted orebody on a bearing of 15 degrees passes through quartz-gossan, then clay, and at 40 feet enters pyrrhotite-magnetite-hornblende and penetrates it 11 feet. At 35 feet a rise is cut to surface; at 25 feet an E drive has been cut 50 feet through clay, from the end of which No. 4 crosscut opens 31.5 feet of chloritic clay and pyrrhotite-hornblende ore.

Battery adit level is only 25 feet below main adit. It bears 37 degrees a distance of 75 feet passing underneath main adit workings and crosscutting the orebody. At 30 feet from the entrance hard pyrrhotite-magnetite-hornblende ore is entered. This with occassional quartz-pyrite bands 8 to 12 inches wide continues to 50 feet where a wide band of clay, quartz, pyrite, and chlorite has been opened in a drive to the shaft. At 60 feet hard pyrrhotite-hornblende-magnetite ore again comes in but gives place to gossanous clay near the end of the crosscut. The drive leading therefrom bears 94° a distance of 49.5 feet to a winze which was sunk to connect with a crosscut from shaft level 48 feet below. The timbers of the drive have collapsed and these workings are now not open for inspection. Little information relating thereto can be gleaned from the reports of the mine managers.

On the advice of Hartwell Conder the Company sank an 11' x 4' shaft of three compartments to a depth of 70 feet. The shaft commences about the level of main adit and the crosscut from the shaft at 70 feet from surface. The crosscut passed in a north easterly direction through hard pyrrhotite-magnetite ore towards the winze.

Before turning to other workings it is advisable to point out that the richest bodies of ore lie close to faults and that those of the quartz-pyrite type are the most favourable.

The outcrop of the orebody from main adit to Tulloch adit has been stripped in parts of its overburden and is well exposed for examination. There the ore is of the usual banded character and partially replaces slates and tuffs. Little oxidation is apparent the sulphidic ores appearing right at surface. Many minor fissures filled with crystal aggregates of quartz and pyrite contain cassiterite in fair proportion, and veinlets of tin ore are not unusual.

Cameron trench across the orebody on the left bank of Tulloch Creek exposes 40 feet of chlorite-siderite-magnetite containing 3-4% tin. Pyrrhotite with chalcopyrite is abundant also.

Tulloch adit has been driven 30 feet along the course of a massive pyrrhotite-magnetite band in the centre of the body, siderite, fluorite and calcite are subsidiary components.

No. 2 W crosscut has been driven from the N side 20 feet into the lode on a bearing 230°. Bands of mineralised rock and of ore alternate. The ore consists essentially of pyrite or pyrrhotite with horn-blende, and a little biotite and magnetite. Chalcopyrite and arsenopyrite in small blebs occur. In the face the lode is of pyrite and magnetite with some garnet.

No. 1 W crosscut has been driven on a bearing 214° through 25 feet of gossan (half per cent tin oxide), 37 feet of hard magnetite-biotite ore, then 13 feet of semi-oxidised pyrite-magnetite with pockets and veinlets of cassiterite. From this point a drive bears 300° a distance of 94 feet through 60 feet of yellowish-brown clay. At 60 feet a fault plane (70 feet displacement) coursing NE was intersected; from that point is exposed 34 feet of crushed pyritic slate. The adit then turns abruptly on a bearing of 206° and passed through 62 feet of pyritic or slate.

Western adit lies on the other side of the ridge and 140 feet below it. The adit has been driven 200 feet on a bearing of 106° along the course of the orebody, and crosscuts have been driven N and S therefrom. The first section of 60 feet is through yellowish-brown clay, then 6 feet of gossan, and again 30 feet of clay. Four feet of gossan is exposed at the crosscuts N and S. The N crosscut exposes 22 feet of gossan and clay, S crosscut bearing 197° has been driven 50 feet. The first section of 30 feet exposes gossan and clay with some magnetite and veinlets of quartz. This is followed by 7 feet of semi-pyritic ore and magnetite. At 37 feet is a fault coursing north eastward. The materials of the orebody here are much affected by water action. Main adit continues 35 feet to No.2 N crosscut which courses 21° a distance of 36 feet. It cuts across 31 feet of gossanous clay, 3 feet of lime silicate rock (prisms of vesuvianite common), into 2 feet of gritty clay. On the same bearing as before the main adit continues 65 feet to No. 2 S crosscut. Between these crosscuts the ore is essentially a magnetite-pyrrhotite ore to a point within 20 feet of the end where 20 feet of pyrite-siderite ore commences.

These bodies are traversed by several cross fissures a few inches in width containing decomposed pyrite and quartz and chalcopyrite and fluorite. Near the face the formation is much disturbed; much limes, silicate rock with abundant garnet and calcite is here. No. 2 S crosscut has been driven 38 feet through banded pyritic ore containing a little cassiterite.

It is reported that the gossan in the other crosscuts 30 feet in width contain over one per cent tin.

The main orebody has been cut in SE Creek and again in a section one time leased by Roberts & Conroy. The ore exposed in these places is not rich.

Magnetite lode is opened in one place only; near the summit of the ridge at the head of a tributary of Tulloch Creek. It is in all essentials similar to that exposed in No. 2 W crosscut of main lode. Further south eastward the ore is predominantly a magnetite ore at outcrop. It is worthy of more attention especially at the lines of the faults.

Water Supply

The provision of an ample supply of water is one of the first and one of the most important considerations of the lessees. Water is essential for the milling and concentration processes; it is hereof extraordinary advantage also for the generation of power.

Supplies may be obtained for both purposes from two large and perennial streams, namely; Stanley and Harman Rivers. During the short summer (January to April) the volume of waters of these streams falls to one third the normal flow, yet without conservation - which would not repay the outlay - sufficient should be available from both sources for milling and power purposes.
Water races connecting these streams to the works would tap tributary streams - some perennial - of Wilson River and thereby greatly augment the supply. A water race capable of conducting 20 sluice heads from Stanley River has been cut about 3½ miles to the lake, Stanley Reward Company's ground. This could be continued about 3 miles to Lindsay Mine without encountering serious obstacles.

Both Stanley and Harman Rivers receive their waters from the granite country of Meredith Range and Parsons Hood and have a quick run-off, but the volumes fluctuate very little because of the short intervals between successive rainfalls. The average annual rainfall is about 100 inches, fairly evenly distributed throughout the seasons except summer.

If it is found that these supplies are insufficient for milling, concentration, and motive power, another and much larger supply may be obtained, namely; Wilson River. In this river is an abundance all the year round.

Mining Economics

In the past the Company operating this mine started with little capital to explore and develop the orebodies and soon found that a much larger sum was necessary to enable them to carry out a thorough test. On the advice of the mine manager it was decided to obtain the necessary money by sale of the mine products through the work first of tributors and second of their own efforts.

By these means a fairly large sum was obtained but insufficient for the purpose. The result is that the mine was abandoned and the workings are in a condition of collapse.

The work performed has proved the extent of certain rich shoots, the nature of the occurrence of the ore, the presence of faults, and the structural relations. A greater extent of development is necessary, however, in order to ascertain whether the bodies as a whole are of commercial value or whether the profitable sections are limited to certain widely separated parts.

The position now is that a fairly large tonnage of ore of madium grade (1% tin) has been opened. Ore of this grade under good conditions could be worked at a profit to the operators. The mining conditions are decidedly favourable. Sufficient ore could be open cut to keep a ten-head milling plant with the attendant concentrating appliances in continuous operation until the necessary underground developments have been performed. But the cost of transportation of machinery and other equipment would equal the purchase value, and the cost of provisions is proportionately high, moreover, at present developments have not been advanced far enough to warrant the provisions of a water power generating plant, again, special treatment plant is essential to success for the ores though not complex are intimately mixed and some are of almost equal specific gravity. Their separation, however, is not a matter of extraordinary difficulty. The first essential to success is the opening of a motor road.

One particular advantage is that from a centrally situated crosscut of no great length these very large lodes can be attacked along their courses to the limits of the ore shoots. Parts of the orebodies are very hard and to drill them power driven machine drills are necessary.

In this part where labour is costly and scarce machinery should be used wherever it is possible.

Summary

The orebodies thus far developed and exploited in the Lindsay Mine, therefore, consist largely of the oxidised portions of sulphuric replacement deposits in tuffs and slates. The ores were derived from the nearby intrusives forming the remotest and latest phases of contact metamorhpism. Well defined cross fissures have apparently admitted the solutions to the strata (tuff and slate) most susceptible to their action and along the borders of these favourable beds irregular deposits replaced the soluble portions of the rocks. But the lineal extent of these deposits was predetermined by lines of fissures running closely parallel to the strike of the bedding planes of the strata. Where the lode fissures and fault fissures intersect the richest concentrations of tin ore are found. There also quartz and pyrite are most abundant; and there oxidation has been of greatest effect. In the structural geology of the deposits are to be found the clues to the successful development of the mine. In this connection a careful study of the accompanying maps, although admittedly not accurate - will enable the future operators to design their plans.

Although this is one of the most extensive orebodies known in Tasmania comparatively small sections only have been proved to contain profitable concentrations of tin ore. It is desirable that much more development work be performed before embarking upon any definite scheme of operations. A small plant may serve a small party a considerable time; but not a company; a large plant is not warranted yet.

(A. McIntosh Reid)
DIRECTOR OF MINES.

Department of Mines,
Hobart.

24th May, 1927.