

PRELIMINARY REPORT ON RIVETT-CARNAC TIN ORE
PROPERTIES NEAR BRANXHOLM, TASMANIA.

Introduction

The ore-bodies within the confines of these properties were unearthed from their thin cover of detrital and alluvial materials during that period of development when sluicing was the only method of operation. At times 400 to 600 men were so engaged in this quarter of Branhholm district; today eight men only are employed. (Hydraulic sluicing is favoured by miners because each party can be equipped at a low initial outlay, and because each Miner's claim can be brought to the production stage with little preparatory work). Many of the old workings are now almost completely obscured by scrub and little disfigurement remains to mark the places where the superficial deposits have been removed and sluiced for their content of tin ore. The source of the tin ore has been revealed at many points by the removal of the overburden of detritus which was made up largely of the disintegrated materials of the ore-bodies.

At this stage of development Rivett-Carnac and his partner arrived and commenced operations on the ore-bodies. An account of the result of their work is given in the following pages.

Area, Situation etc.

The holdings of the party include:

mineral lease 9517M of 40 acres charted in the name of
E.L. Andrews.
mineral lease 9646M of 5 acres charted in the name of
E.L. Andrews.
mineral lease 9986M of 5 acres charted in the name of
H.M. Rivett-Carnac.
In addition an extended prospecting claim of 80 acres
is held in the name of H.M. Rivett-Carnac.

The deposits lie in the narrow but extensive tin-bearing granite belt from which the greater part of the alluvial beds of North Eastern Tasmania have been derived. They are situated on the west side of Cascade River, five miles south of east of Branhholm, and six miles south east of Derby. Branhholm is a small mining and agricultural settlement on the North Eastern Railway and about 45 miles by rail from Launceston. The ground held under lease is at elevations of 1500 to 2000 feet above sea-level near the head-waters of Cascade Rivers and Black Creek and about 800 feet above Branhholm. The mine is reached from Derby and from Branhholm by narrow steeply inclined mountain roads and tracks. These ways of access could be improved to allow of motor traffic and the consequent cheap and rapid transport of ore and materials.

Topography

This area is the Western extension of Blue Tier range of mountains. The country is particularly rugged and the relief is accentuated by the numerous V-shaped valleys of fast-flowing tributaries of the main water channels. On the North side of the range Ringarooma River receives the drainage; on the South side Georges River collects the larger portion of the run-off. The summit of the dividing range is narrow but has not been completely intersected by any valley. Tributaries of

Ringarooma and Georges Rivers, however, overlap at their headwaters. The whole range is occupied by Devonian granite which is readily decomposed and disintegrated by agents of erosion, but on the southern fall in main valley of Georges River the intruded Ordovician slates and sandstones remain. Apparently no very great depth of granite has been removed from the sandstone-denuded mountain summit, but in the valleys the granite has been deeply incised and in places the ore-bodies have been reduced several hundred feet. From their concentrated waste have been formed the numerous rich alluvial and detrital deposits.

Geology

Throughout this area the occupant rocks are various types of granite. The general type is an even-grained biotite granite with the normal variations to granite-porphry and finer grained types. In the normal type the white and pink feldspars show a marked tendency to graphic intergrowths with quartz, so much so in parts that the rock may be described as agraphic granite. It is remarkable in the amount of alteration and mineralisation throughout the whole body of it; where the ore bodies are the feldspars have been replaced by aggregates of quartz, topaz, tourmaline, and black mica; and in certain parts, especially where mineralisation has been intense, conversion to pearly massive mica or pinite is complete. Quartz veins and stringers of quartz are common and many of these also carry tin ore. In the mineral belt the most striking feature is the dominance of the feldspars over quartz and mica. Some of the latter intrusive bodies consist of feldspars (chiefly orthoclase) and imperfectly formed biotite. This rock is so decomposed that the black component is difficult of determination. In its present condition the outlines of the minerals appear irregular, and without definite crystalline form at any point indicating incomplete differentiation.

This is a section of that very extensive belt of tin-bearing granitic rock from which the materials of the valuable alluvial and eluvial deposits of the north-eastern district have been shed.

Structural Geology

Apparently the structural planes of the granitic rocks of this area bear from 80 to 90 degrees and dip northward at 70 to 80 degrees. Along these planes are many parallel, thin, extensive tin-ore-bearing veins the walls of which are sharply slickensided. Some bodies of quartz greisen course normal to them, others are parallel; and dykes of tin-bearing microgranite intersect them at angles of 45 to 55 degrees.

The north-trending greisen bodies dip east and the microgranite bodies dip south-east.

From the east side of the main microgranite several smaller offshoot dykes branch at angles of 15 to 30 degrees southward and southwestward. The main dykes are very extensive.

The area examined is too small to allow of a

through survey of the structural relations and of their interpretation. The general trend of the tin-bearing formations as a whole is northeastward and the dips are south-easterly. This belt is wide and is made up of graphic granites, granite porphyry, microgranite, and aplite, the whole forming an extraordinarily complex formation of intruded and intruding igneous rocks.

The Ore-bodies

The following types of ore-body are represented:

1. Microgranitic or aplitic dykes;
2. Quartz greisen veins;
3. Kaolin veins in joint planes.

1. These tin ore-bearing dykes vary from 2 to 20 feet in width, and are proved to extend over 500 feet in length and one over 1200 feet. They intrude graphic granite and granite porphyry and are marked by sharply defined walls. The materials of which they are composed (felspars, and muscovite and a little quartz) are similar to those of the intruded rocks, but the proportion of each of the components varies considerably from point to point in the one dyke. In the wider parts the rock consists almost wholly of kaolinised felspars; in the narrow parts muscovite is abundant and quartz is prominent, and the proportion of cassiterite is relatively higher. The cassiterite is distributed through the rock as an original component and is of equal grainsize to that of the felspar and mica components. Where the dyke rock is felspathic the cassiterite is more generally found in bunches and veinlets of short length. But in the higher felspathic parts the dykes are poor and in places almost barren of tin ore. The reason of the paucity of tin ore in the kaolinised felspar sections is that pneumatolytic action has not been intense. Where, however, the felspars have been converted into yellowish-green massive mica or pinitite by emanations from cooling magma and where chlorite and quartz are prominent tin ore is abundant. The presence of those secondary minerals is an indication of the presence of tin ore. In places the whole dyke-rock is converted into quartz mica greisen. Black tourmaline in radiating columnar bunches is sometimes prominent, but generally is remarkable because of its rarity.

As to the average value of these intrusive bodies an estimate based on the rather meagre information at hand cannot be made. In places the materials are rich in tin ore; in other places, especially where the dykes widen they are poor and almost barren. Alterations of rich and poor sections are common to such ore-bodies as these.

2. Greisen veins of quartz and mica traverse the belt in all directions. Some are continuous over long distances and are quite separate from other types of ore-body; others are of short-length and depth and are contained in the dyke bodies and kaolin veins. As a rule they vary much in size and richness both along the strike and the dip; but some are of uniform width and extend hundreds of feet in length. Such a one is the Caledonia lode which has been exposed in a shaft (20 feet deep) and in trenches at points over a distance of 400 feet. The average width of this body is two feet and it consists of quartz and mica with chalcopyrite,

black oxide of copper and cassiterite. It courses 74° and dips north at 70° . Where this vein joins the felspar lode in the western open-cut it is richer than in other parts, but the average value of the exposed ore is fairly high. At the point referred to vein quartz accompanies greisen and iron-stained kaolin is a prominent associate. In Western open-cut the felspar lode and the associated quartz-mica greisen and other parallel bodies are contained in graphic granite. Where the graphic granite itself is rich in tin ore it is seen that incipient greisenisation is evinced by the partial alteration of felspar to fine pearly yellowish-green mica.

3. Along certain west-trending kaolin veins, which follow joint planes in granite porphyry and graphic granite, tin ore is found in variable proportions. Parallel veinlets of tin ore are found in the containing graphic granite and also in the associated quartz-mica greisen, the former with chlorite material and limonite probably after chalcopryrite. These decomposed bodies have been opened about 300 feet in length, 20 feet in width, and 15 feet in depth. Tin ore distribution is very erratic; generally the ore is in sporadic bunches and veinlets with almost barren kaolin intervening. In some parts they consist almost wholly of kaolinised felspar flecked with black oxide of copper - an alteration product of original metallic mineral component chalcopryrite.

Method of Operation

The shallow alluvial and eluvial deposits have been worked by the aid of water under pressure or hydraulicking processes. No attempt has been made to utilise the water the highest pressure obtainable but under a head of 50 feet only. The amount of material removable by water under such lower head is obviously very small. In consequence the operations of the lessees of these lands have not been productive of particularly good results. However, the main objective has been the exposing of the ore-bodies for investigation as to their value and size, and this in some degree has been reached.

By opening a long tail-race to Cascade River and using the water supply to the best advantage the whole of the detrital material could be profitably removed and the numerous ore-bodies could in the same operations be exposed to view in order to ascertain their actual value. Ultimately open-cut and underground mining methods will be the means of removal of the ore.

Water Supply

The lessees hold three sluice heads of water (first right) in Blue Stocking Creek and two sluice heads (second right) in Tin Pot Creek. The water from both sources are connected by races to the workings. It is estimated that the races at the out-take ends are 200 to 250 feet above the present workings.

The dam now in use impounds 1,000,000 gallons of water. It is situated in the 40 acre block, and received its water from Shamrock Creek. A bigger dam estimated to hold 3,000,000 gallons of water is enclosed in a 5 acre block on Blue Stocking Creek. In addition

to the supplies mentioned an option is held over 5 sluice heads of Britannia Creek. With careful conservation these supplies should prove sufficient for washing purposes throughout the year. Normally the wet season starts in May and continues five or six months, but during all seasons rain falls at fairly regular intervals and replenishes the depleted supplies which are regulated by conservation in dams and drawn upon as required.

General Remarks

It is estimated by the lessees that an expenditure of \$3000 will be necessary in order to provide all the equipment required for the sluicing of the overburden and the soft upper portions of the ore-bodies. That sum should prove sufficient for the purpose, and allow also of the cutting of a tail race from Cascade River to the workings. The proposed method of development is regarded with favour. It is easiest and cheapest means of under-cutting the large stumps of trees and expediting their removal with other vegetable cover.

The operators by ordinary sluicing methods concentrate the tin ore from 70 to 74 per cent. tin grade and report that on the present small scale they show a profit over working expenses. That information leads encouragement to the idea that by using the available supply of water to the greatest advantage profitable operation will result.

Further exploration is desirable and is warranted by the results already obtained.

DIRECTOR OF MINES

Mines Department.
HOBART. 29/4/27
