

PRELIMINARY REPORT ON REX HILL TIN MINEIntroduction

The earliest record of this deposit dates prior to 1890, when, owing to the presence of galena and sphalerite, it was regarded as a lead-zinc lode. A little later the Rex Hill Silver Mining Company, in opening the ore-body, found that the tin content was greater than the lead, and thereafter became producers of tin ore but on a small scale only. In 1893 the Rex Hill Tin Mining Co. Ltd. acquired the lease rights and carried on mining operations intermittently until 1900, when they sold the mine to J.C. Macmichael and E. Gaunt for £3,500, retaining a share interest. A company known as the Mt. Rex Tin Mining Co. N.L. was then organized in Launceston for the purposes of adding to the equipment and developing the ore-bodies at deeper levels and producing tin ore on a commercial scale.

This Company erected a 20 head battery of stampers and concentrating and calcining plants, and opened the ore-bodies at 140 foot, 215 foot, and 290 foot levels. During their operations a large amount of tin ore was produced and sent to the smelters. In 1909 the Company ceased operations and let the mine on tribute to a local party who carried on successfully until 1913. The tributors found that the cylindrical body represented a great bulge in a 4 foot lode coursing closely with the magnetic north. This supposed new lode yielded material of high grade and allowed them to carry on successfully a long time.

The present lessee (J. Stevenson) from information obtained at first hand during the period of his long association with the operators of this mine, and from information furnished by the tributors, holds the opinion that in the north and south extensions of the material as much tin ore remains as that already removed from the big section of the deposit. On the information thus gleaned from the several sources he is preparing plans for the re-opening of the mine and its equipment.

At the times when the writer visited the mine the workings were inaccessible owing to inflow of water. However, he was enabled to examine that portion of the ore-body exposed in the open-cut and also the north and south extensions thereof. Information relating to the main workings has been drawn from old official reports prepared by A. Montgomery and by G.A. Waller and from statements submitted by the members of the tribute party. Based on the data thus provided his findings supports that of J. Stevenson.

Leases

The mine is embraced in consolidated lease 9485/M of 83 acres, charted in the name of J. Stevenson. A water race (2317/W) connects the mine with dam site 2332/W of 20 acres and dam site 2317/W of 40 acres situated near the head of Buffalo Creek.

Location and Access

The mine lies 5 miles north-west of Avoca, and is connected with that township by two roads. One, six miles in length, leads past Buena Vista Coal Mine; the other, 12 miles in length, joins Story Creek road

at the plateau. The first is one of rather steep grades, but suitable for motor transport.

Avoca, on the Fingal Railway, lies 49 miles from Launceston, the nearest seaport.

### Production

The records of the production of ore by the early operators are not available. According to local authorities the amount of concentrated tin ore produced prior to 1900 may be put in round figures at 300 tons. Between 1900 and 1913, but mostly between 1900 and 1905, the Mt. Rex Tin Mining Company produced 650 tons of the tin ore. Apparently, therefore, the total production amounted to 950 tons.

### Geologic Relations

The ore-bodies are contained in granitic rocks of Devonian age. The normal rock appears as a porphyritic granite with large idiomorphic phenocrysts of felspar set in quartz and felspars and a very little biotite. Graphic granite composed almost wholly of felspars and quartz appears intrusive in the normal rock where the ore-bodies are richest. To the north the granitic rocks are overlain by basal strata of the Permo-Carboniferous system. The western boundary of the granite marks the line of a great fault plane trending north-westward and with a downthrow to the south-west. Permo-Carboniferous rocks and Mesozoic diabas $\phi$  abut the granite on the downthrow side of the fault.

### The Ore-Bodies

The ore-bodies are closely associated with a graphic phase of the granitic rocks. They represent the infillings of fissures and the action of mineralizing vapours and solutions upon the felspars and micas of the fissured rock. There are illustrated gradations in ore formation; showing, first the deposition of tin ore and quartz under high temperature conditions, second under waning conditions quartz, tin ore, pyrite, and chalcopryrite, and the third and final stage showing the deposition of quartz, chalcopryrite, sphalerite, and galena.

Thus it is found that the richest natural concentrations of tin ore with quartz occur in and along a fissure coursing almost due north. Light brown to black tin ore, coarsely crystallized fills joints in and is disseminated through greisen; and in the fissure filling, tin ore may be seen filling geodes in quartz and with sphalerite and pyrite implanted on it. On the crystallized vein-quartz a coating of secondary quartz appears in parts of the ore-body. Secondary mica (gilbertite the more common variety) and pinite, with fluorspar in light green to dark purple cubic crystals, embedded in quartz are of common occurrence. Occasional specimens show glaena, chalcopryrite, pyrite, sphalerite, and secondary mica and quartz in intimate association.

The sulphidic minerals came at a stage later than the bulk of the tin ore and are found with quartz and mica filling lateral joints in the wallrock of the fissure. It is possible that the sulphides of lead, zinc, copper, and iron will become less prominent with depth, but they will not peter out altogether.

On the evidence available it appears that the ore-

body is a north-south one, 3 to 4 feet wide, passing through the middle of the large greisen body opened in the main workings. The lode proper is much richer than the associated greisen as shown by the saving of 81 tons of tin ore from 1160 tons of stone whereas the big body as a whole contained tin ore in the proportion of  $1\frac{1}{2}$  per cent only. The great lateral extent of the ore-body at this part was due to the development of flat joint planes in the wall-rocks which provided easy means of access by mineralising solutions.

The northern and southern extensions of the ore-body have been defined along certain sections by means of trenches, but at surface it is not continuous. In the underground workings, however, the body according to report, is strong and sharply defined and continuous as far as explored.

Tin ore shows freely in the stone where opened in the trenches.

#### The Mine Workings

The ore-body in the early days of the mine was attacked by way of an open-cut which now exposes a section 15 feet wide, 30 feet long, and 15 feet deep. At one end a shaft was sunk to 33 feet, and an adit was driven in a North north east direction to connect therewith.

The results of early developments appeared so encouraging that the Company decided to sink a main shaft from a point about 50 feet south-east from the open-cut. Crosscuts were driven from the shaft at levels of 140, 215 and 290 feet, and all the richest ore over a length of 80 feet and a width of 30 feet was then stoped to surface.

In the later days of the Company's operations, they were so fully occupied in breaking ore to keep the 20 head mill going that no attention could be given to development, with the inevitable result that no developed ore remained to be broken. The mine was closed and let to a party of miners on tribute. These men had not the capital to enable them to sink the shaft, and therefore, concentrated their attention on a small body of rich stone at one end of the large chamber at the 300 foot level. This they regarded as a distinct ore-body, but apparently it belongs to an extension of the main lode and identical with that part intersected by diamond drill some time before the cessation of operations by the Company. The tributers did not drive far along its course nor rise on the ore-body, but gouged the richest ore where easy of removal. They report that the last parcel of  $4\frac{1}{2}$  tons yielded 8 bags of concentrated tin ore.

#### Trench Workings

What appears to be the southern extension of the ore-body is opened in trenches between 300 and 400 feet from the open-cut workings. Here the stones consist of greisen and quartz veins in which tin ore is visible, the body being two to three feet wide.

On the southern side of the open-cut the body of greisen has been opened in pits and trenches over a distance of 300 feet. The greisenisation of the graphic quartz-felspar rock is in places indistinct and elsewhere not wide. From the main body a vein leading south-westward has been opened in a long deep trench to a depth of 10 feet. It is reported that the material thereof was of average richness.

Not in one of the superficial workings does the ore-body exhibit any extraordinary feature, yet where opened at depth it is evidently well-defined, massive and of high grade. If that can be accepted as an indication of improvement throughout its length the prospect appears encouraging.

The shaft has three compartments and is in good order. The mine may be regarded as a dry one, as it drains very little water from the rock.

#### The Grade of the Ore

On the authority of G.A. Waller, late assistant Government Geologist, the Mt. Rex Tin Mining Company crushed 1160 tons of stone for 81 tons of ore containing 68 per cent tin. The tin content of that stone therefore was in the proportion of 4.75 per cent. It came from the lode proper and not from the greisenised wallrock which also contains a fair amount of tin ore.

In 1902 the Manager of the mine reported the average grade of stone to date as 2.1 per cent. Treatment returns in 1904 and 1905 showed tin contents of 1.3 and 1.4 per cent. According to the report of the Battery Manager the falling off in the grade of the ore from the 300 foot level may be held to the account of the Mine Manager, who sent unprofitable stone to the mill in order to keep it in continuous operation.

The late tributers stated that the new "make" of ore at the 300 foot level over a width of 4 feet yielded tin in the proportion of 4 per cent.

Apparently the quality of the stone is above the average of the district.

#### Ore Reserve

No official data are available of computative value. The report may be accepted, however, that almost all the ore of value down to the 300 foot level has been removed from the bulged portion of the ore-body, but no ore has been taken from the lode on the north and south sides thereof.

#### Water Supply

A water-race, 280 feet above the shaft, delivers water from two large dams. At little cost the race and dams could be repaired and enlarged in order to provide sufficient water for the driving of milling and concentrating plants and the supply of the necessary wash water.

#### General Remarks

The history of development of this mine shows that the companies attempted its development and equipment with very little capital. In consequence of this they found themselves in difficulties almost from the beginning and were throughout their careers unable to keep development well ahead of mining.

Although they failed they demonstrated the value of one section of the ore-body producing in the process over £100,000 worth of tin ore. That fact lends credence to the reports of the engineers and miners regarding the property as quoted herein.

Mines Department  
Hobart.  
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DIRECTOR OF MINES