

ROY HILL TIN MINE.

One of the ore-bodies on the Roy Hill property - a free-hold of 2560 acres - was discovered in 1890, another in 1892, and both were opened to shallow depths in 1893. During that and the following year, the Roy Hill Freehold Proprietary Company, working on a small scale, produced several parcels of ore from shafts sunk on the richest shoots of the western ore-body. The grade of the ore there at depths of 30 to 40 feet becoming too low to allow of transport of the stone to other centres for treatment, a small milling and concentrating plant was erected at the top of the hill for that purpose. Records of later work are not available now, but it is known that the Company ceased operations in 1895.

Subsequently the mine was let on tribute to Fritz Rubenach, who worked in open-cut along the deposit to the depth of water-level (30 feet) until 1898. Rubenach carted the material to St. Pauls River and there separated and concentrated the tin ore in sluice boxes. Such methods of handling and treatment could have been applied only to ore of high grade, yet, according to report, the remuneration was quite satisfactory. Very little work has been performed since that time.

Situation and Access -

Roy Hill freehold is bounded on the north side by St. Paul River and lies nine miles by road south-east of Avoca which is 49 miles by rail from Launceston. The Avoca to Swansea road passes through the property and branch roads lead to the several mine openings.

Production -

The records of the production of tin ore from this mine are rather meagre. A little information, gleaned from official files, is given in the sub-joined table, but this does not contain the complete record of production of any company or party.

The information may prove of interest is showing that the richest ore only has been mined and treated.

The tributors cleaned up some of the old excavations and extended the open-cut to 360 feet in length and 10 to 40 feet in width. At a few selected places they sank below the floor of the cut and obtained a little ore by stoping, but nowhere to a greater depth than 50 feet from the surface. They did not work systematically, but confined their operations as much as possible to the soft ground that could be treated by ordinary methods of sluicing.

It should be pointed out that a portion of the tin ore has been derived from tin bearing basal conglomerate of the Permo-Carboniferous system which rested directly upon the quartz-mica rock composing the ore-body. The returns, certainly, have been largely increased by the contents of this basal conglomerate. Nevertheless, some shoots in the ore-bodies were remarkably rich.

It is estimated by local residents that the total output from the western workings amounts at least to 100 tons of concentrated tin ore.

TABLE OF PRODUCTION

No. of Parcel	Parcel taken from	Treated by	Weight of Stone treated	Weight of Tin ore obtained				Tin Content of Concentrate.	Tin Content of Crude Material.
				Ton.	Cwt.	Grs.	Lbs.		
1.	No. 2 shaft	Parke & Lacy's Works Sydney	12 tons 12 cwt.	1	17	0	13	67.6%	12.1%
2.	No. 4 "								
3.	3 "	Clyde Smelting & Concentratg. Works. Syd.	9 tons 16 cwt. 2 grs.	3	10			62.0%	22.1%
4.	3 "	T. Bateman, L'ton.	4 tons 18 cwt.	1	19	3		73.3%	22.2%
5.	Open-cut	Company	15 tons	2	9			74.1%	12.4%
6.	"	"	40 tons	4	18			70.1%	8.6%
7.	"	"	100 "	3	2	2		70.2%	2.2%
	"	F. Rubenach & others	803 "	45				65.6%	8.68%

### The Ore-bodies

A large number of ore-bodies have been unearthed on this property - mostly greisen veins - but of these only four will receive special mention, namely:-

1. Main ore-body near the western boundary of the property.
2. Dyke Lode exposed in trenches and cuts on the east side of Snow Creek and about 30 chains south of the road,
3. Royal George group of ore-bodies that extend into Roy Hill property, and
4. Lea Creek lode outcrops on low hills about 20 chains from the eastern boundary.

### Main Ore-body

This is a large quartz-mica greisen body lying along the curved line of contact between granitic rocks and Cambro-Ordovician quartzites. It crops out on a low ridge from a mantle of Permo-Carboniferous conglomerates, grits, and sandstones disposed in horizontal beds, and, on the sides, from sandstone detritus and quartz gravel. Where the conglomerates and grits repose on the quartz-mica greisen of the ore-body they contain tin ore in variable proportion, in some places so high as to allow of profitable operation. Going south the ridge rises higher and higher with the addition of other members of the formation, thus completely hiding the extension of the ore-body in that direction.

This ore-body is a deposit of greisen following the -- sinuosities of the line of contact between quartzites and a modification of the intrusive granite. It is of horseshoe shape formed at the intersection of two lines of mineralization and therefore irregular in both strike and dip, and the distribution of the tin ore is erratic. The average dip of the contact plane is 50° westward, but at the north end it is northward and at No. 2 shaft eastward. Almost the whole of the outcropping granitic rock appears as greisen in various forms, but main underlay shaft exposes unaltered aplite and porphyritic material consisting of orthoclase quartz and a little muscovite, this being the extension of the dyke rock further eastward.

Greisen in its many varieties (quartzose, quartz-mica, and quartz-mica-pinite) has been opened 10 to 30 feet in width, 360 feet in length, and 20 to 50 feet in depth. Its full width and length have not been determined, nor has it been thoroughly explored below 20 feet from the surface. In parts the altered rocks consists of secondary mica, pinite, and kaolin, and in that variety tin ore is most abundant, but tin ore is prominent also in the hard granular quartz stone. Black and brown tourmaline in patches, blebs, nodules, and veinlets stud and ramify not only the greisen but the unaltered granite, veinlets of white quartz with cassiterite fill irregular cracks in the greisen; and the cassiterite (tin ore) itself exhibits a similar irregularity of distribution. The greatest amount of rich ore was taken from the actual line of contact.

The most northerly shaft (No. 4) is vertical and 50 feet deep. From the bottom a drive, bearing N. 20° W.,

reaches the quartzite wall at 34 feet. This wallrock dips at an angle between  $15^{\circ}$  and  $17^{\circ}$  on a bearing N.  $35^{\circ}$  W. At the point of contact the rock consists of soft muscovite granite and contains very little tin ore. At the bottom of the shaft a soft quartz-felspar rock appears which likewise contains only a small amount of tin ore. This shaft seems to be beyond the line of intersection of the lodes, one of which is north westerly in conformity with the true strike of the lodes of the area, the other having a more westerly strike.

Thirty five feet east of No. 4 shaft the northern side of the dyke formation has been exposed in the open-cut where soft rubbly micaceous greisen containing tin ore may be seen. At the end of the cut the quartz-mica greisen is much harder. Eighty feet farther eastward a long shallow trench cut southward across the dyke exposes similar tin-bearing quartz-greisen.

No. 5 shaft (32 feet) sunk on the underlay, followed a soft layer of lode stuff, one to five feet wide, lying against the quartzite wall. This material is rich but the quartz greisen immediately on the east side is poor. Between shafts 4 and 5 the stone has been open-cut to a depth of 20 feet.

No. 3 shaft (32 feet deep) lies 97 feet from No. 5 on a bearing S.  $50^{\circ}$  W. The rich ore has been removed to a depth of 22 feet. In the bottom of the shaft hard quartz-mica greisen appears containing tin ore, but in proportion not comparable with that up the shaft.

Between Nos. 3 and 2 shafts the ore-body has been open-cut to a depth of 20 feet.

No. 2 shaft (35 feet) lies 119 feet on a bearing S.  $15^{\circ}$  E. from No. 3 and follows the quartzite wall. From surface to 12 feet the wall dipped westward, then turned over to the east on a dip of  $80^{\circ}$ . Rich tin ore was found to a depth of 12 feet in a flat vein dipping westward. This rests upon hard quartz-mica greisen containing a little ore.

No. 1 shaft lies 119 feet S.S.E. from No. 2 and is 50 feet deep. From the bottom of it a drive westward cuts the wall at 30 feet. The shaft followed the quartzite wall to 30 feet on a westerly dip of  $78^{\circ}$  whence the dip flattened to  $11^{\circ}$ . The tin ore distribution through the hard quartz-greisen exposed in this shaft is very erratic, rich and poor sections alternating.

East of No. 1 shaft about 40 feet main underlay shaft has been sunk through unmineralized dyke rock (quartz-felspar) into the hard greisen. Ore from this shaft was delivered direct to an eight-head stamp battery and concentrating plant. Material on the dump consisting largely of hard quartz-mica greisen contains tin in the proportion of 0.3 per cent., this evidently being discarded as too poor for treatment.

North and south of the site of the old milling plant shafts expose quartz-mica greisen, and to the south-east two shafts (one 40 feet) have been sunk through the basal beds of the Permo-carboniferous formation into similar greisen.

Reviewing the results of the works performed here by the several operators it appears evident at once that systematic exploration was beyond the means of any of them. Moreover, none had a true conception of the nature of the ore-bodies nor of their connection with the containing granitic rocks.

It should be noted first that what appears to be a true contact lode is actually an intersection of two lines of lode near the contact between granite and quartzite, thus causing a complex extraordinary in mineral occurrence. One ore-body bears N. 15° W., the other and larger, No. 67° W., and they meet at Roy Hill. The larger is that known as the dyke deposit exposed 20 chains to the eastward.

Dyke Lode is exposed in two deep trenches and a long open-cut. Whether each of the three openings has been made into a distinct and separate body is open to question, because no definite wall has been disclosed anywhere. The ore-body or bodies consist of greisenised quartz porphyry jointed along a strike of 288° and a dip southward at 75°. The quartz greisen is veined with quartz and flecked with tourmaline (green and black), and the joint faces are implanted with coarsely crystallised tin ore. Tourmaline appears also in nodules, pegmatites, and veinlets. Secondary mica is a prominent component, and pinite is present. Tin ore is distributed through the body of the greisen rock also.

Grab samples of the materials on the dumps, including the closely jointed stone, contained tin in proportion as follows:-

No. 1 sample	0.68 per cent
" 2 "	0.32 " "
" 3 "	0.32 " "
" 4 "	0.44 " "

Those results convey an idea of the average quality of the greisen opened in the several trenches and cuts.

This apparently is a very large body, loose lode stone strewing the ground over a width of 200 feet and a length of 800 feet. It is exposed in the floor of the valley of Snow Creek, but rises eastward into low hills where the conditions for development may prove more favourable.

This promises to be an important ore-body. It is undoubtedly a very large one, though not explored sufficiently to form an opinion of its value. If the results of the rough sampling may be accepted as an indication of its average value then the ore-body becomes worthy of the closest investigation.

Another ore-body similar to that just described outcrops on the low hills to the west of Lea Creek. This also contains tin ore and more tourmaline, but it has not received much attention.

Yet another and important ore-body is the north-western extension of the Royal George lode system. This has been opened in a number of trenches spaced at intervals over a length of 300 feet. The several veins of quartz greisen that make up this system represent the upward projection of the north-pitching Royal George bodies. It is found in the adjoining property that the veins are much stronger, more

heavily mineralized, and more clearly defined at a depth of 100 feet.

This body can be tapped at a depth of 150 feet by way of a crosscut 800 feet in length from Lea Creek. It is obvious that from an economic point of view this ore-body should be worked with the Royal George. An idea of the tin ore content of the stone may be gained by reference to the following table of analyses:-

No. of sample	Place taken from	Tin content %
1	Dyke Lode	0.13
2	" "	0.98
3	" "	0.30
4	" "	0.42
5	" "	0.40
6	" "	0.80

Alluvial deposits composed largely of the waste of the coal measure strata and diabase occupy a very large part of Roy Hill estate. Some people held to the belief that the Tertiary filling covers tin ore leads, but their ideas have been dispelled as a result of exploratory works recently performed by Warner Hook, an English Engineer.

In places Recent drifts built up of the waste of granitic materials are tin-bearing, but they are not of any real value.