

| | <u>PAGE NO.</u> |
|--------------------------------|-----------------|
| Introduction | 1 |
| Previous Reports | 1 |
| General Geology | 1,2 |
| Economic Geology | 2 |
| (1) Replacement Ore Bodies | 2 |
| (2) Veins or Fissure Fillings | 2 |
| (3) Impregnations | 3 |
| (4) Detrital Deposits | 3 |
| (5) Alluvial Deposits | 3 |
| (1) Replacement Ore Bodies: | |
| (a) Gossan Face | 3 |
| (b) The Slaughter Yard Face | 4 |
| (c) The Brown Face | 5 |
| (d) The White Face | 6 |
| (2) Veins or Fissure Fillings: | |
| (a) North Valley Vein | 7 |
| The North Valley Workings | 7 |
| North East workings | 10 |
| Happy Valley Gully Workings | 10 |
| (b) Queen Vein | 10 |
| (c) Flat Make | 11 |
| (d) Cross Lode | 12 |
| (e) South west vein | 12 |
| (f) Kayser vein | 13 |
| (g) Giblin vein | 13 |
| (h) No. 6 vein | 14 |
| (i) Thompsons vein | 14 |
| Alluvial Deposits | 14,15 |
| Ore Reserves | 16 |
| Sluicing | 17 |
| Power and Water Supplies | 17 |
| Treatment of Ore | 18/22 |
| Statistics of production | 19 |
| Conclusion | 19,20 |

MOUNT BISCHOFF TIN MINES

INTRODUCTION:

Tin in commercial quantities was first produced at Mount Bischoff in the year 1873. From that date for an extended period, the Mount Bischoff Mine was the greatest producer of all lode-tin mines of the world. From its inception until the year 1900, production was maintained at a high rate with a record high production, in the year 1885, of 2,746 tons of tin. For a further period, the mine occupied the head of the list, and must still be regarded as one of the leading tin mines of the State; its production for the year 1941 being the third highest of the 20 mines for which individual figures are recorded.

Since the year 1900 the grade of ore has fluctuated considerably but a high rate of production was maintained until 1920 by the treatment of large tonnages of ore, the average grade of which over the four years preceding that year ranged from .257% to .353% tin.

Prior to the year 1920, little or no attempt was made to treat sulphidic ores, but with the exhaustion of supplies of oxidised (clean) ore, attention was directed towards their treatment. Calciners were erected and their use has since been part of the treatment of ore won. Their introduction has, however, been practically the only improvement in treatment methods since the erection of the new batteries and milling plant in the year 1914.

Further fluctuation in grade of ore has taken place since the year 1920 and production has deteriorated until the present yearly rate is less than 100 tons of tin.

PREVIOUS REPORTS:

A comprehensive report dealing with the General Structural and Economic Geology of the field was published by the Mines Department in the year 1923 as Bulletin 34 of the Geological Survey of Tasmania. With that publication was given a complete list of previous reports and literature dealing with the early discovery and conditions of the field together with the operations of the various mining companies and their holdings.

GEOLOGY:

The sedimentary rocks of Mount Bischoff belong to the Bischoff series of the Cambro-Ordovician and consist of a series of slates, sandstones and quartzites which have been subjected to contortion and displacement as the result of folding and faulting.

To the south of the Mountain, a series of Tertiary gravels and mudstones occur over a limited area of Don Hill.

Both basic and acidic igneous rocks occur as dykes and sills which have been intruded into the Bischoff series.

The older, Basic, igneous rocks have undergone considerable alteration and occur as a series of pyroxenites and peridotites which have been almost completely altered to dolomite. The only observed occurrence of the original rocks is in the eastern end of the Brown face where it has, in part, been replaced by the pyrrhotite. Chlorite occurs also as an alteration product. The dolomite alteration product occurs over an extensive area in all the open cut workings, and it is evident that to a large extent it has occurred in sill formation for mine openings in slates and quartzites occur at levels below known outcrops of dolomite.

The acidic igneous rocks are represented by a series of porphyry dykes and sills. The porphyry varies in mineral composition enabling its subdivision into Quartz porphyry, Felspar Porphyry and Topaz Quartz porphyry, the variation in mineral composition being due to alteration of the original felspar by the action of fluoric and boric vapours which accompanied the intrusion. This variation has been fully described by Pettard and Twelvetrees in a paper communicated to the Royal Society of Tasmania in 1897, quoted in Bulletin 34 (p. 88).

The main porphyry dyke trends in a northerly to north easterly direction with minor branch dykes trending normal to its course. A series of small off shoots of the minor dykes trend irregularly through the strata.

ECONOMIC GEOLOGY:

Both primary and secondary ore bodies are represented at Mount Bischoff.

The primary ore bodies include the Replacement ore bodies, the veins or fissure fillings and impregnations.

The secondary ore bodies include the remaining areas of detrital matter and the alluvial deposits.

Replacement Ore Bodies: Of the several types represented, the most important have been the replacement bodies. These have, throughout the history of the Company, yielded the greatest proportion of the total output both with respect to tonnage of ore and tin concentrates produced.

The replacement bodies are in general well defined, their lateral limits being marked by either major faults or porphyry dykes. Within their limits further faulting has occurred, the resultant fracturing facilitating the replacement of the rocks by mineralising solutions which have been liberated into them either directly or along fissures from the consolidating porphyries. All stages of replacement, to complete replacement of the rock, have occurred, with massive pyrrhotite and pyrite ore bodies being exposed and seams of almost pure cassiterite being won from the extensive open cut workings. Except for the high grade seams, however, the grade of ore has been comparatively low, the large tonnages of easily mined ore enabling production to be maintained at a high rate.

The Veins or Fissure Fillings: With exhaustion of ore supplies from the replacement bodies, greater attention has been directed towards the fissure fillings or veins.

These occur as a series of sub-parallel features striking in a general north westerly direction. They invariably dip towards the south west, generally at a low angle. Junctioning of veins occurs with little if any enrichment at the junctions. The veins cut across both the sedimentary rocks and the porphyry dykes without variation in strike or thickness of vein. Occasionally, splitting of the vein occurs in bands of quartzite with formation of hanging wall and footwall veins, which, however, junction and resume the original trend and dimensions on leaving the quartzites.

Branch veins occur, with, at the North Valley workings, the high grade tin ore being confined to one only of the veins in these sections where both have been opened.

As the veins extend outwards from the mountain, their outcrops are lost as the result of splitting and divergence as a number of narrow leaders.

Impregnations: Impregnations are relatively unimportant, and are represented by those sections of the porphyry dykes and the adjacent sedimentary rocks where minerals have been deposited along joint planes or have been distributed through the body of the porphyry or the rocks themselves.

The tin ore occurs generally in a finely divided state but is in an easily recoverable form. Impregnations have been worked in the various dyke workings where, in general, the average grade of ore, except for narrow, high grade seams, is low.

Detrital Deposits: Of the secondary tin-ore deposits, the detrital bodies have been more or less exhausted. Only minor areas of residual material now remain and no work is being carried out on them.

Alluvial Deposits: The chief source of alluvial tin in the Bischoff area is the Waratah River. A lesser amount is being won from Tinstone Creek in the vicinity of the site of the old Battery of the Bischoff Extended Mine.

Detailed descriptions of the various workings follow:-

The Gossan Face:

The Gossan Face covers an extensive area at the southern end of the main workings of Mount Bischoff. It is bounded in the north by the Western Dykes and on the east by the White Face Dyke. It is terminated in a westerly direction by a faulted junction between slates and the dolomite formations.

In the northern section of the faces the dolomite has been more or less completely replaced by pyrrhotite, portions of which are high grade in tin. The pyrrhotite mass extends from the western limit of the face easterly almost to the white face dyke and occurs as a fairly continuous mass as far east as the main tunnel. Both at its western extremity and above the Main Tunnel, high grade ore has been won from workings of limited extent.

In the Main Tunnel level a section of the dolomite shows all stages of replacement from complete replacement, represented by the pyrrhotite mass, to the unaltered rock. Veining is common with some of the veins containing high grade ore. The partly replaced rocks shows abundant pyrrhotite and quartz with lesser amounts of pyrite. Talc Fluorspar and Siderite.

Replacement has taken place along planes more or less parallel with a series of faults which strike in a westerly direction, i.e. parallel with the western dyke, and dip at low angles to the south.

Sampling of the main tunnel level indicates that a total width of 80 feet has been effected and though tin occurs throughout this width an appreciable grade extends only for 50 feet of which 32 feet is indicated as being of a grade of 1.02%.

Samples from the workings above the main tunnel level yielded grades of 1.37% and 2.16% tin. Mine openings situated 200 feet to the west of the main tunnel have yielded high grade ore from the western end of the pyrrhotite mass. The intervening section has not so far been tested.

The tribute held by O. Phillips and Party over the period 2nd December, 1936, to February 1938, produced 1130 tons of concentrates valued at £1,901.13.3. This is equivalent to a recovery of .93% concentrates or .65% metallic tin equivalent at ruling prices, to a value of 42/1 per ton of ore.

For the three years, 1940 to 1942, E. Allen's tribute has treated 20824 tons of the low grade ore for a recovery of 59.14 tons of tin concentrate or an average recovery of .28% concentrates or .252% metallic tin.

The southern section of the Gossan Face has been shown by recent operations of tributors to yield approximately .25% tin.

Although the extreme southern section has been almost denuded of ore and the irregular surface of unaltered dolomite is outcropping, quantities of low grade ore are still available and occasionally higher grade ore has been won from the deeper sections of the irregular surface. The higher grade bodies are due probably to the occurrence of high grade veins in the dolomite.

Between the lowest level on the south and the pyrrhotite mass on the north, low grade ore extends for a distance of 500 feet varying in height to 54 feet, No. 4 Gossan Face bench. It is considered that this low grade material would lend itself to treatment by water either as a sluicing proposition or as a means of reducing the bulk prior to treatment by battery.

The Slaughter Yard Face:

The Slaughter Yard face is situated to the north of Gossan face and lies between it and the Brown face opencut. It extends for upwards of 500 feet in a westerly direction and for 250 feet in a southerly direction from the Brown Face to the Northern side of the Western dyke.

The Slaughter Yard ore body is similar in general character to the Gossan face ore body and, like it, has been denuded of its high grade ore. Recent operations in the lower benches have proved unprofitable.

Early reports suggest that high grade ore was associated with porphyry dykes within the face. Both the high grade ore and the porphyry have been removed by mining; the porphyry occurring as a sill and evidently marked the downward limit of the high grade ore.

For the past three years the tribute party working in this face has recovered 34.07 tons of concentrate from 9830 tons of ore, a recovery of .34% tin concentrate or .306% metallic tin. The earlier operations were, however, carried out in the Slaughter Vein for which no details are available.

On the western side of the Face there is an occurrence of pyrrhotite which rises to a height of 75 feet above the general level and extends in a southerly direction to abutt against the northern side of the Western dyke. Stopping on this mass suggests that high grade shoots of ore occur and further testing is warranted.

The Brown Face:

The Brown Face opencut is the most extensive of all the opencut workings at Mount Bischoff. It has an overall length of 1,000 feet at the top is 550 feet and at the bottom 140 feet. Its greatest depth is approximately 300 feet.

The Brown Face has been the Company's most productive ore body, its output having been increased by the winning of large quantities of ore from veins of almost pure cassiterite, varying up to 18 inches in width, which have occurred in the ore body itself.

The Brown Face is bounded, and the ore body limited, both on its northern and southern sides, by major faults which converge to meet at the western end of the cut. As these faults dip towards each other, the ore body has become progressively smaller with depth.

Though apparently unconnected with any of the other open cut workings, this ore body is similar to them in that it has resulted from the replacement of dolomite which occurs in each of the remaining benches in the opencut.

The downward extension of the ore body does not reach the main tunnel level which is about 30 feet lower than the present bottom of the cut. Below the opencut, veins have been worked by stoping.

In the main section of the opencut, three benches have been worked. The upper bench consists chiefly of gossanous material reported as very low grade or barren of tin. On the south eastern side of this bench there is an occurrence of peridotite which has been replaced almost wholly by pyrrhotite. It is possible that this pyrrhotite body originally extended throughout the full length of the open cut and was associated with porphyry previously mapped as a dyke. Recent mining has, however, removed both the pyrrhotite and the porphyry. Remnants of both these bodies now occur on the western side of the cut.

The uppermost bench is 380 feet in length and 180 feet in width. In the wall at its eastern edge, a band of pyritic material extends for more than half its length, to abutt against the northern wall of the opencut. The band is reputed as being barren of tin.

The middle bench is 40 feet lower than, and is similar in character to, the uppermost bench. To the south of this bench a body of pyritic material burnt for a

considerable period after ignition as the result of decomposition. It was close to this point on the southern wall of the cut that a body of high grade marcasite ore defeated early attempts at mining until lately the overburden, consisting of some 40,000 tons of gossanous material, was removed, and the ore won by open cut methods.

Below the lowest bench of the open cut open stopes in the Brown Face Vein are visible and in the southern wall of the cut a narrow flat dipping vein is seen junctioning with the brown face vein. This flat vein is regarded as being the continuation of the Flat Make ore body, on the eastern side of the main tunnel, from which high grade ore has been won.

To the east of this position, a fault occurs striking northerly and dipping westerly. Similar parallel faulting is observed on the northern face of the open cut.

Near the western end of the open cut a small body of relatively high grade ore was won from a level driven westerly from the lowest bench. The ore was soft in nature resulting from the decomposition of the pyrrhotite mass close at hand.

On both the northern and southern walls of the open cut, large quantities of low grade ore still remain. These have at times been tested and attempts made to exploit them. In all instances, though mining costs are low, transport to the present mill has proved difficult and costly enough to prevent profitable operations.

In several instances, occurrences of almost pure cassiterite have been found in the faults forming the walls of the Brown Face. It is considered advisable that the walls should be further tested, and in particular, that the western end of the cut, where the major faults junction, should be tested by continuing the drift from the lowest bench westward until the intersection is cut.

With less costly transport or easier access to a treatment plant, large quantities of low grade ore are available for treatment from this cut.

The White Face:

The White Face ore body is bounded on its western and northern sides by the White Face and Little Stanhope dykes, respectively. The ore body has been worked by open cut or quarrying methods to a maximum depth of 170 feet over a maximum length of 700 feet in a north-easterly direction and a width of 480 feet.

Near the north-western corner of the open cut, junctioning of the White Face, Western and Little Stanhope dykes has taken place, and has resulted in considerable minor and some major faulting. The easterly extension of the Gossan Face fault is shown in the slate wall fronting the porphyry dyke in the northern end of the cut and faulting with a W N W strike has caused moderate displacement of the western dyke.

The body of slates enclosed in the dyke system has been subjected to much minor faulting. It was here that high grade ore was won from the Gray Face. Small veins of cassiterite have been worked to shallow depths in the porphyry dykes.

The bottom level of the open cut is 350 feet in length in a north-easterly direction, and has a width of 280 feet. It is covered by a mass of decomposed pyritic ore of low grade which increases in thickness towards the white face dyke on the western boundary of the open cut. High grade ore has been won from a seam of cassiterite dipping westerly towards this dyke.

The White Face dyke dips at a low angle towards the west. This is shown by mine workings from the Happy Valley face, in which a vein 2 feet in width has been proved on the contact between the porphyry and the dolomite, and at the southern end of the open cut where the dip of the dyke is observable.

To the south of the main cut, on the eastern side of the dyke, deeper workings occur and connection with the surface near the North Valley road has been established. These workings are not now accessible but it is reported that high grade ore was won.

Present operations are directed towards the winning of low grade ore from the pyritic mass on the southern edge of the lowest level of the cut.

The tribute held by Fraser and Party have during the past 3 years treated 10,930 tons of ore for a total yield of 32.49 tons of concentrate, an average yield of .29% concentrate or .243% metallic tin; the highest yield .279% metallic tin being for the present year.

The high grade bodies of ore won from this cut invariably were dipping towards the west, and recent operations have shown a vein, striking northerly and dipping westerly, near the porphyry in the south western corner of the cut.

It is, therefore, desirable that future development be directed towards testing the ground on the western side of the face adjacent to the White Face dyke, where the existence of further bodies dipping westerly under the dyke may be proved.

The large quantity of pyritic material may, on further testing, prove profitable with efficient handling.

The North Valley Vein:

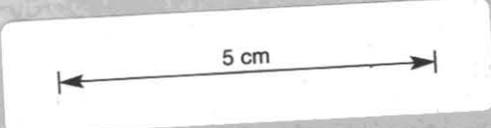
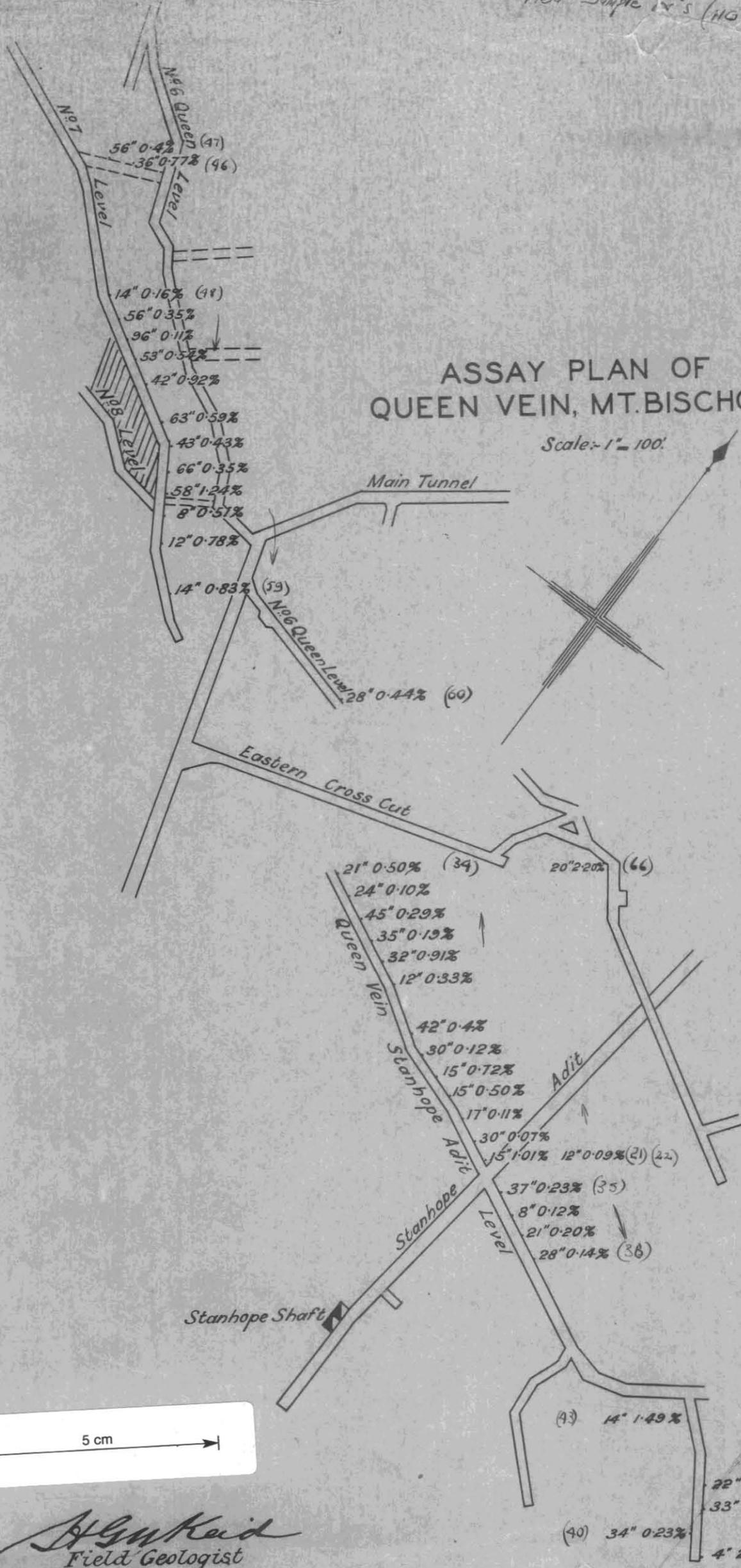
The North Valley Vein strikes north-west and dips south-west. In its most northerly section, the dip is steep but becomes less so as it is traced southwards. This vein is the most persistent of all the veins of the area, and is considered to extend in a south-easterly direction from the North Valley workings almost to the Waratah River on the south-eastern end of the mountain.

Over a considerable portion of this distance, its occurrence is indefinite. By mine workings and outcrops, it has been proved to extend from the North Valley workings as far as the Stanhope adit where it is dipping at a low angle to the south. South-east from the Stanhope adit, there is a section where it has not been traced, but mine workings and outcrops occur on the southern side of the Queen Dyke which makes its continuity a reasonable assumption.

849-44

ASSAY PLAN OF QUEEN VEIN, MT. BISCHOFF

Scale: 1" = 100'



H. G. Keid
 Field Geologist
 Date: 20-1-43.

For persistence over this distance, junction with the Queen Vein at its eastern end, must be assumed for the course of the two veins is such that they would meet near the junction of the Queen Dyke with the Stanhope Dyke.

Development has been carried out at several points along the line of the vein, and of these the North Valley workings are the most important. Of lesser importance are the North East Workings and other less extensive ones further south.

The vein has been subjected to faulting and displacement is marked in the vicinity of the northern end of the Main Tunnel

North Valley Workings: In the North Valley workings the vein has been developed by a series of adits driven in a south-easterly direction along its course. These adits vary in length up to 1700 feet, and together have proved the vein for upwards of 3000 feet in a lateral direction, and approximately 800 feet in a vertical direction. The earlier development was directed towards the winning of the oxidised ore and those adits in which sulphide ore was revealed, remained idle for a considerable period. Recently the higher level adits were driven, and oxidised ore from that section of the vein was taken.

The present work is directed towards the winning of sulphide ore.

The vein varies in width to a maximum of 16 feet and sections of more than 500 feet in length have been stoped. The present stopes vary up to 150 feet in length in the wider sections of the vein.

In these workings, the vein is essentially a quartz-pyrite-pyrrhotite one with some fluor spar and siderite and arsenical pyrite as subsidiary minerals. The presence of arsenical minerals is evident when the concentrates are being calcined. The vein is generally vertical but occasionally dips steeply to the west.

In general, the pyrrhotite is confined to the central portion of the vein with pyrite near the walls, or absent in the narrower portions. The tin content is evenly distributed through the vein.

The vein cuts across both slates and quartzites with no apparent variation in width although in some of the quartzite bands splitting of the vein takes place to form both hanging and foot wall makes. The splits reunite in the slate zone.

Branch veins or fissure fillings occur in the North Valley workings and one such vein has been developed. In levels Nos. 2, 3 and 4, the workings are referred to as the east and west levels. Where the two levels occur, the western level appears to follow the main fissure and keeps to the general strike of the vein. The eastern levels have been driven in branch veins striking more nearly north. Where the two veins occur in levels 3 and 4, the tin has been confined to the eastern vein and pillars of ore of a grade too low to be profitable have been left in the main level. At No. 2 level, both veins carried ore of a profitable grade.

It is probable that a repetition of this feature occurs. In No. 4 and No. 2 levels, a widening of the vein takes place at points 670 feet and 500 feet

respectively from the portals. Limited development only is necessary to prove the existence or otherwise of a second branch vein.

Although the eastern vein has been proved at levels 2, 3, and 4, it has so far not been identified at No. 5 level. In any intended extension of development this factor is worthy of consideration. At positions in No. 5 level, corresponding to that of the two veins in the levels above, the grade of ore is low. If the eastern vein persists to the level of No. 5, it would probably be of a higher grade than the western vein.

Estimates of ore reserves in these workings must be regarded only as probable. Measurements of the vein along the levels suggest that a widening of the vein occurs as shoots of ore which pitch in a southerly direction within the vein. Between these wider shoots, the grade of ore has occasionally been profitable but pillars have been left. In each of the levels present operations are confined to zones where the vein is particularly wide, and with the exception of No. 1 level, is showing a tendency towards even greater width.

In No. 2 level, underfoot and towards the portal from the position of present operations, the vein is narrow and suggests that the ore body at No. 2 level is distinct from that at Nos. 3, 4 and 5 levels. The lower ore body is pitching to the south. The upper ore body, at No. 1 level is, therefore, likely to adopt similar characteristics and the ore body should lie in a position ahead of the present workings on No. 3 level.

Production from the North Valley Workings during the past three years has yielded 164.27 tons of tin concentrate from 19220 tons of crude ore. This is equivalent to 114.99 tons of metallic tin or a percentage recovery of .59%.

Sampling of the vein at its various levels gave the following results :-

| No. | Vein or Workings | Level | Width Sampled | Grade % | Position |
|-----|------------------|-------|---------------|---------|---------------------------------------|
| 1 | North Valley | 5 | 27" | .62 | 1270' from Portal |
| 2 | " " | 5 | 55" | 1.07 | 17' North of 1 |
| 3 | " | 5 | 29" | 1.15 | 17' North of 2 |
| 4 | " | 4 | 42" | 1.64 | 894' from Portal West side of lode |
| 5 | " | 4 | 42" | 1.5 | 894' Complement of 4 |
| 6 | " | 4 | 42" | 1.63 | 904' East side |
| 7 | " | 4 | 36" | .49 | 904' West side Complement of 6 |
| 8 | " | 4 | 36" | 1.4 | 864' West side |

| No. | Vein or Workings | Level | Width Sampled | Grade % | Position |
|-----|------------------|-------|---------------|---------|------------------------------------|
| 9 | North Valley | 4 | 36" | 2.05 | 864' East side Complement of 8 |
| 10 | " " | 4 | 36" | 1.79 | 780' East side |
| 11 | " " | 4 | 30" | 2.01 | 780' West side Complement of 10 |
| 12 | " " | 4 | 36" | 1.21 | 750' in stopes (pillar) |
| 13 | " " | 3 | 48" | .67) | Face 681' from Portal |
| 14 | " " | 3 | 48" | .66) | sampled in 4 sections |
| 15 | " " | 3 | 48" | .44) | each of 48" from |
| 16 | " " | 3 | 48" | .24) | East to West |
| 17 | " " | 1 | 48" | .66 | West side of Stope) Ver) app |
| 18 | " " | 1 | 48" | .64 | East side of Stope) 13 to 16 |
| 19 | " " | 4 | 42" | 1.3 | 670' from Portal |
| 20 | " " | 2 | 54" | 1.15 | 500' from Portal |

No. 1 North East Workings:

Three adits have been driven in a north westerly direction to cut what is considered to be the southern extension of the North Valley Vein.

The main adit has been driven for a distance of approximately 240 feet before it cuts the vein. The vein is narrow and dips at a low angle to the south west. Some stoping has been carried out on a fairly narrow section of the vein, the ore from which is reported to have been high grade.

Happy Valley Gully Workings:

In several trenches situated between the North Valley road and Happy Valley Gully, the continuation of the North Valley vein has been exposed, and at the Happy Valley Gully, three short adits have been driven in the vein.

Two of the adits have been driven in a southerly direction, whilst the third has been driven in a northerly direction.

The southern adits have been driven as cross cuts for a few feet to cut the vein which has then been followed. Neither adit is more than 50 feet in length. In the upper adit, 5 feet of pyritic ore has been exposed which in sampling showed an average grade of .48% tin.

The Queen Vein:

The Queen Vein outcrops on the northern side of the Queen Dyke. It dips at a low angle to the south and cuts across the porphyry dyke and the slates and quartzites. Mine workings extend for almost the entire length of the known outcrop which was of high grade ore.

The vein has been worked by both the Mount Bischoff and Stanhope Companies, but in each case, only the oxidised ore has been worked. Except for levels Nos. 7 and 8, of the Queen Workings, and the level from the Stanhope Adit, operations have not extended below the level of the Main Tunnel, but together they have proved the vein over a lateral distance of 1400 feet. In all accessible working faces, the vein has become narrow.

Neither Company has attempted to exploit the sulphide ores of the vein; the level from the Stanhope adit being their only development.

Practically all the ore above the level of the main tunnel has been won. Pillars have been left and these with the stoping show that gossanous quartz ore of the vein varied in width from a few inches to upwards of 6 feet, with occasional bulges of 10 feet or over. The grade of ore ranged from 2% to 20% tin.

In the sulphide zone, the vein has deteriorated both in grade and width. It is composed almost entirely of fine grained pyrite with some quartz. Both copper and arsenic occur as impurities, with copper ranging to .3% of the ore. A white exudation on the hanging wall of the vein in the Stanhope level contains 35% oxide of arsenic.

In the Stanhope level, the vein varies in width from a few inches to 45 inches over a distance of 630 feet. On the eastern end of this level, it is estimated that 2590 tons of ore have been won by stoping where the vein over a length of 100 feet had an average of 21 inches and an average grade of .55% tin.

In the western level from the Stanhope adit, sampling has shown that two sections of the vein, each 100 feet in length, have average widths of 24 and 29 inches with average grades of .34% and .39% tin respectively. Should these conditions persist upwards to the next level, Main Tunnel level, 178' on the vein, 6000 tons of ore of a grade .36% tin tin would be available.

As transport of the ore already won from this level necessitated triple handling prior to its treatment, it is suggested that with the high ruling price of tin and with treatment more conveniently situated, this ore could be profitably won and would justify further development towards the west to gain access to the ore below Nos. 7 and 8 Queen levels.

On the western side of the below the main tunnel level, the vein has been developed by Nos. 7 and 8 Queen levels. No. 8 level, about 120 feet in length, is inaccessible. Sampling of No. 7 level shows the grade of ore to be .61% tin whilst a pillar about No. 7 level and containing 1900 tons of ore, has a grade of .42%.

A distance of approximately 220 feet separates the western end of the Stanhope level from the eastern end of No. 7 Queen level. At each of these positions the vein is narrow. The only data available relative to this section, is obtained from the eastern crosscut and the eastern extension of No. 6 Queen level, both at Main Tunnel level, where the vein has been exposed. The grades of ore at these positions are 2.2% and .44% tin over widths of 20 and 28 inches respectively.

Variation in width of vein must be expected in this undeveloped section. It is regarded as an additional ore reserve of the vein, development of which would enable ore below Nos. 7 and 8 Queen levels to be won.

An assay plan of these levels is attached.

The Flat Make:

The Flat Make occurs as a more or less horizontal vein which has been shown to extend from a point midway along the southern wall of the Brown Face Opencut, in an easterly direction, to a position about 300 feet to the east of the Main Tunnel. It has been subjected to faulting, and mine workings have been opened at three levels.

Immediately to the south of the Brown Face open cut and about midway along its southern face both the Brown Face Vein and the flat make have been opened. The flat make in these workings is narrow, dips at a low angle to the east and is reported to have been high grade in tin. The Brown Face Vein (Kaiser Vein) is situated below the Flat make and dips in a westerly direction at a comparatively high angle. The mine workings show the junction between these two veins.

About 100 feet to the east and about 35 feet above the former workings, an adit has been driven in a southerly direction on the flat make to finally make connection with Tilley's rise from the main tunnel. A similar junctioning of veins is exposed with the steeper vein being uppermost. It appears, therefore, that the fissures filled by these two veins have crossed each other but for a distance were coincident. Faulting has occurred in the common section to displace both veins.

To the east of the Main Tunnel the greatest development on the Flat Make has been carried out. Extensive stoping has been done on this vein to show junctioning to the north with the Queen Vein and to the south with the Cross Lode.

After junctioning to the north, the vein assumes the course of the Queen Vein, but to the south it maintains its course after the junction with the cross lode and lies above that formation.

Further development of these workings may prove additional reserves of ore, but transport to the treatment plant is difficult and expensive.

The Cross Lode:

This vein was referred to in Geological Survey Bulletin No. 34 as the Brown Face Vein. Since that publication was written, the vein has been developed both above and below the main tunnel level.

Below the main tunnel, four levels have been driven on the vein, the lowest of which is 50 feet below the Stanhope adit level or 228 feet on the vein below the main tunnel. These levels have been driven to connect with either the Stanhope shaft or the Stanhope adit. Above the main tunnel and on its eastern side, the vein has been worked to its junction with the Flat Make.

The vein strikes a little north of west. It is sub-parallel with the Queen Vein with which it probably junctions at a point approximately 400 feet to the west of the main tunnel, on No. 6 Queen level where a short drift has been driven on a vein 6 inches in width.

In the workings, the vein varied in width to a maximum of 3'6" and in an easterly direction has, in all cases, become narrow. At the Stanhope adit level it has split into a number of leaders where it enters the porphyry of the Stanhope dyke.

In a westerly direction falls of earth prevented an examination of the vein.

Practically all the ore has been taken from this vein in that section extending from the main tunnel to the Stanhope adit in a lateral direction and from the lowest level upwards to the Flat Make. Any future development will of necessity be at greater depth or in a westerly direction.

The South West Vein:

The outcrop of the South West Vein has been traced almost continuously from the south west adit workings in a northerly direction until it crosses the porphyry mass forming the summit of the mountain. For some distance northerly from this point, its outcrop is concealed by talus on steep broken ground, but, further north, at what are known as Allen's workings, the vein has been opened by a series of adits.

At these northern workings, the vein has split into a number of narrow leaders on which the adits have been driven. The main adit has been driven for a distance of 100 feet in a south-easterly direction showing a maximum width of 8 inches of ore at a point 80 feet from the portal. The ore here was sufficiently high in grade to warrant the sinking of a winze. No further development has taken place.

On the southern end of the outcrop the south west adit has been driven in a north westerly direction, for upwards to 500 feet. The vein varies to a maximum width of 3 feet at a point 200 feet from the portal. Stopping has yielded a small quantity of ore from a shoot which is pitching in a southerly direction.

The vein traverses both quartzites and slates with noticeable splitting in the quartzite bands. At the end of the adit the vein has crossed the western dyke of porphyry. Near the porphyry the vein shows marked splitting but in the face immediately to the north of the dyke, the vein has become 2 feet 4 inches in width with quartzite walls. At this point, the vein has a grade of .65% tin.

From the previous reports, Bulletin No. 34, A.M. Reid, it is suggested that this vein has been cut as the eastern lode at No. 6 level of the mine workings of the Bischoff Extended Tin Mining Company.

Future development should be directed towards extending the south west adit, and should results prove profitable, greater depth could be gained by cross cutting from the Bischoff Extended Workings.

The Kayser Vein:

The Kayser vein was first developed from a cross cut driven in a westerly direction from the Main Tunnel. Development consists of a winze of 150 feet on the vein with levels driven both to the north and the south. Reid reports that "the quartz is tin bearing to a depth of 50 feet and that it contains gold near the bottom of the winze." At the Main Tunnel level, the vein is dipping westerly at a low angle and where it was sampled, was of a grade .45% tin.

In driving the main tunnel, three small veins were cut a little to the south of the Magazine Crosscut. It is considered that the most northern of these veins is the southward extension of the Kayser vein which also extends in a northerly direction as the Brown Face vein.

The vein is generally narrow, except at the Brown Face where it reaches a width of 3 feet and where most of the development has taken place.

The GIBLIN Vein:

The Wheel or Giblin vein occurs on the western slope of Mount Bischoff. It strikes in a general north westerly direction and dips in a southwesterly direction generally at a low angle, although in places the dip steepens considerably. The vein cuts across both the sedimentary rocks and the porphyry dykes of the area. In the vicinity of the porphyry dykes splitting of the veins is common and several minor veins occur. Both the Wheel Bischoff and the Bischoff Extended Companies have operated on this vein which has been proved over a lateral distance of 1600 feet and a vertical distance of 1000 feet.

Geological Survey Bulletin No. 34 deals with operations on this vein for the period ending 1922, in detail. Since the year 1923, operations have been spasmodic but have resulted in the junctioning of the two sets of workings.

What ore remains occurs as pillars left as either too difficult to mine or as being too low in grade to warrant treatment. As the Bischoff Extended mill and treatment plant has now been dismantled, ore from the mine has to be transported to the Bischoff mill for treatment. The future of the mine, therefore, would depend on the results of sampling the pillars to determine the grade and quantity of the ore remaining.

Production from the mine during the past four years was 3.828 tons of metallic tin valued at £963.

No. 6 Veins

The outcrop of No. 6 vein occurs to the west of the Giblin vein but a little to the east of the Wheal Bischoff road. A number of cross cut adits have been driven to cut the vein from positions both above and below the road. Short levels only have been driven on the vein which in all cases is narrow. The limited amount of stoping carried out suggests that operations were in all cases unprofitable.

Thompsons Veins

Thompsons Vein occurs on the southern slopes of the mountain immediately to the south of the Silver Cliffs road. It strikes West North West and dips South South West at a low angle. The outcrop is limited in extent and in a northerly direction, the vein splits, and is lost as small leaders on the north of the Silver Cliffs road.

The vein cuts across both slates and quartzites. It has a maximum width in the workings of 15 inches with an average width of 8 inches.

Originally the vein was worked from a vertical shaft which cut it at a depth of 40 feet. Since then three cross cut adits have been driven to cut the vein. From the highest adit levels have been driven to both the north west and the south east and some ore has been stoped from a shoot of ore pitching in a south-easterly direction.

The immediate level was inaccessible due to falls of earth.

The lowest adit has been driven to cut the vein. There has been no development and the vein where cut was narrow.

It is possible that with the southerly pitch of the shoot of high grade ore worked in the top level, the lower adit has cut the vein at a position to the north of the shoot of ore.

ALLUVIAL DEPOSITS:

Large areas on the southern bank of Waratah River, have been treated for the recovery of alluvial tin by the Company originally operating in the North Valley area. The position of these workings, situated high above river level, was such that they lent themselves to easy treatment by ground sluicing. The extensive areas worked suggest that returns were profitable.

The present operations in the North Valley section of the river are confined to low level alluvial deposits in which high grade ore occurs in moderate quantity, in wash, heavy in boulders, resting in a difficult slate bottom. Operations, in which the removal by hand of large boulders is necessary, have been in general unprofitable.

A previous attempt was made to exploit the lower benches at and below river level by means of dredging. These operations proved costly and unprofitable and were terminated by the loss of the pontoon on which the machinery was installed.

The most important source of alluvial tin is that section of the Waratah River which extends downstream from the site of the Main Battery. From their inception the waste products of the various mills have flowed into the river. These tailings have been subjected to concentration by the stream and have been raised in grade sufficiently for the profitable extraction of the tin.

The resultant product from operations on this material is a considerable proportion of the total output of the Mount Bischoff Company.

In the main section of the Waratah River three tribute parties are operating to produce approximately .5 tons of tin concentrates per week. The tributes are held by A. Packett, W. Housego and V. Crampton, and extend for approximately 1.5 miles along the river. Portions of this section of the river bed have already been treated for the recovery of large quantities of tin concentrate but there still remains to be treated, sections equally as extensive.

The methods of treatment adopted by the tributors differ only slightly from each other. The finer materials from the river bed are treated by crushing in light stamper batteries prior to concentration on tables. The main difference in operation lies in the preparation of the material to be crushed. While Packett and Crampton transport all except the large boulders to the mill prior to screening, Housego screens the material at his working face and claims to transport not more than one fifth of the total material.

Both Housego and Crampton provide their own power by installation of water wheels whilst Packett's plant is electrically driven, the power being purchased from the Company.

In each case the method of treatment is then the same. The material is crushed to pass through 12 mesh screens on to concentrating tables. A pyritic concentrate is obtained, which after calcining is re-crushed to pass a 30 mesh screen to be re-treated, by tabling. The resultant product is then of marketable grade.

In Tinstone Creek, ground sluicing of low grade wash is yielding a profitable return for two men engaged there.

On Don Hill some alluvial tin has been won from sluicing operations. Later methods of recovery involved both sluicing and mill treatment; the tailings from the sluicing operations after screening, being crushed by battery and treated by tabling for the recovery of additional tin concentrates.

Present operations on Don Hill are on a small scale only. The wash occurs as a narrow band under the Tertiary mudstones and is recovered after the removal of the overburden, by quarrying. It is then transported to the mill at Waratah for crushing and tabling.

There is available only a limited quantity of wash, the grade of which from recent mill returns is .6% tin.

ORE RESERVES:

The present condition of the mine workings and the absence of an assay plan make any estimate of ore reserves one of probable reserves only. In the year 1922, the Bischoff Company estimated their total reserves at 528,750 tons of which 257,800 tons were regarded as ore in sight and 279,000 tons as probable ore. Complete returns for the period since 1922 are not available, but the Mines Superintendent claims that ore in excess of this amount has since been treated. Records, which are fairly complete, for the period 1930-1942 inclusive show that 222,730 tons of crude ore were won during that period.

In the Mount Bischoff Extended workings extensive pillars and some virgin ground have been left from earlier mining operations, but without preliminary sampling, the grade of ore cannot be stated. Present mining operations are confined to small shoots which have yielded minute tonnages of ore reported of 3% grade in tin.

Of the Mount Bischoff workings those on the North Valley vein are the most important. This vein has been traced for a considerable distance, but present operations are confined to the North Valley workings. In these workings between Nos. 5 and 2 levels, ore partly blocked out varies in width from 2 to 16 feet with an average width of 6 feet. It has been developed over a length of 500 feet along the shoot to prove a reserve of 40,000 tons of ore, whilst assay results indicate a grade of .92% tin.

In addition, a similar body of ore is suggested extending from No. 2 level, but operations are sufficiently advanced to prove it.

In the Queen Vein, data on which to base estimates is even more indefinite.

On the Stanhope level of the Queen Vein, sampling has shown a grade of .34% and .39% tin over two sections of the vein each 100 feet in length with average widths of 24 and 29 inches respectively. As virgin ground extends from this to No. 6 Queen level, a distance of 178 feet, a reserve of 6,100 tons is available.

On the western side of the Main Tunnel, sampling of No. 7 Queen level shows a grade of .61% tin over a length of 100 feet with an average width of 23 inches or a reserve above No. 7 level of 1,700 tons. A further reserve of 1,900 tons has been left above No. 6 level in oxidised ore. Below No. 7 level, except for the short No. 8 level, the ground is still undeveloped.

The distance between the western end of the Stanhope adit level and the eastern end of No. 7 Queen level, is 220 feet, and as the faces of the existing levels show only a few inches of ore, this section has been left. About midway between the two positions and at the main tunnel level, the grade of ore was .44% and 2.2% over widths of 28 and 20 inches respectively. Further development should, therefore, prove additional reserves in this section.

As the replacement ore bodies have been regarded by the Company as having been worked out, knowledge of assay values is there even more limited than is the case with vein fillings.

The Gossan Face covers an area of approximately nine acres over which tin bearing material is distributed. The depth of this material varies from 2 to 50 feet and would probably average 20 feet in depth. Recent records of production are those relative to the tributaries of Allen and Paine, who have each made recoveries of .23% tin from the low grade material. It is considered that with more economical handling, this grade would be profitable.

In the northern section of the Gossan Face high grade ore has been won at two points. At the main tunnel level, a width of 32 feet showed an average grade of 1.02% tin. At a point 200 feet to the west, and about 45 feet above main tunnel level, high grade ore was won from underhand stopes in a pyrrhotite mass. A further reserve is assured from this mass but further testing is necessary to estimate both grade and quantity of ore.

SLUICING:

With the exception of the veins, the ore bodies of the southern slopes of the mountain are replacement ore-bodies. Although most of their high grade ore has already been won, there is left a considerable tonnage of low grade ore representing the discarded material from earlier operations and the original low grade material of the ore body. In almost every instance this material has undergone decomposition and is now occurring as a mass of soil-like material. At the workings of both Paines' and Allen's tributaries, the tributaries endeavour to discard, as being barren of tin, as much as possible of the oversize material consisting of boulders of porphyry and dolomite.

It is considered that this material would lend itself to treatment by water either as a sluicing proposition or by the use of water to separate the boulders from the fine-grained material which could then be readily transported by fluming for treatment.

If treated as a sluicing proposition it is claimed by the Company's Superintendent that tin, of fine grained size, would be lost, although in their present alluvial workings at North Valley, a considerable proportion of the tin being recovered by sluicing is fine grained and pyritic material is held without difficulty in the boxes. Even if some fine tin was lost, the increased tonnage treated would more than compensate by giving a greater quantitative return.

In the second instance, should preliminary testing prove sufficient quantity and grade of ore to warrant the erection of a mill or below the Happy Valley face by treatment with water, the boulders would all be removed from the ore and the remaining fine grained material of an improved grade, transported by fluming to the mill site.

Incidental to these operations may be the discovery of additional veins which are at present covered by the low grade ore.

Water for battery purposes is pumped from the level of the water race to dams in Stanhope face. The pump has a capacity of 9,000 gallons per hour and is at present used over an average of one shift of eight hours per week. The dams could at low cost be enlarged sufficiently to provide for continuous pumping and sufficient water for limited operations would be available.

POWER AND WATER SUPPLIES:

Electric power, generated at the Company's hydro-electric station about one mile below the town, in Waratah River, is used for all the power requirements of the Company, the water necessary for its generation being conserved in dams to the south-east of the town. The capacity of the main Magnet dam is 500,000,000 gallons which capacity, as stated by the Mine Superintendent, could be cheaply increased by raising the level of the dam. Additional water could be made available from Fossey River by repairing Fossey's water race.

The water supply has been found adequate for the Company's requirements throughout its operations, except for short periods in summer seasons of exceptionally low rainfall. It should be more than adequate for the present restricted operations.

The power house is equipped with four Turbine Generators capable of the production of 1400 Electric Horse Power. Of the four units, one of larger size is not in commission, but could be readily made available.

The generators are of two sizes of which the smaller pair are each capable of generating 150 K.W. or 200 E.H.P. The larger generators use each of 375 K.W. capacity or 500 E.H.P. As the present maximum consumption of power seldom exceeds 140 K.W. it is obvious that ample power is available for all likely future requirements, although the present maximum output is limited to 700 E.H.P. until additional or larger pipe lines are installed to supply the generators.

TREATMENT OF ORE:

The early history of Mount Bischoff Company reveals the fact that for the first recoveries of tin, sluicing methods were used. Soon after its discovery, a small stamp battery was introduced and crushing of ore was commenced. The concentrate was recovered by classification for jigs and tables. Water power was used for the early mill. Increase in size of treatment plant continued until a maximum of 115 head of stamps was installed.

In 1914, a new mill of 40 stamps, each 1000 lbs. in weight was erected, and electric power generated at the Company's hydro-electric station was used. Recovery of concentrates was still effected by use of classifiers, jigs and tables. Portion of this mill is still operating at its original site, but portions have been removed to be installed as subsidiary plants at North Valley Workings. At the original site, only 15 head of stamps remain.

In 1920, to treat sulphidic ores, calciners were erected for roasting the pyritic concentrate from the ore. This innovation is perhaps the only improvement in treatment introduced by the Company since its inception. At present, all concentrates must of necessity be transported to Waratah for calcining.

Though the mill has been maintained in reasonable condition, a falling off in output from the calciners is indicated from records which show that in the year 1928 the calciners treated 8,332 tons of pyritic concentrate, or, based on a year of 50 weeks, an average of 23 tons per day. The present maximum output is quoted by the management at 12 tons per day.

It has been claimed by the Tributors, that, for the efficient treatment of the North Valley product, calciners should be erected near the mine. As operating costs of a small calcining unit are comparatively high, it is suggested that, prior to their erection, experiments should be made to determine the suitability, or otherwise, of the ore for treatment by flotation methods. Laboratory tests suggest the possibility of successful treatment by flotation methods.

STATISTICS OF PRODUCTION:

With Geological Survey Bulletin No. 34, a table was published showing "Production of Tin Ore" in which the yearly production was shown for the period 1874 to 1920, inclusive. Other statistical tables also appear in that publication.

The following data is supplied to complete the statistical record for the period since 1920.

Full details of the records are not available but an analysis of the available figures show that :-

During the period 1921-1929, inclusive, 1860.34 tons of metallic tin were produced of a total value of £442,917.

For the period 1930-1942, inclusive, 247,589 cubic yards of alluvial material were sluiced to yield 385.38 tons of tin oxide having a metallic content of 250.75 tons which was valued at £45,493. The average yield from the wash was 3.48 lbs. of tin oxide per cubic yard.

For the same period, the treatment of crude ore, together with tailings re-treated yielded 1892.968 tons of metallic tin valued at £385,044.

The total product, therefore, from all operations for the period 1921-1942, was 4138.688 tons of metallic tin valued at £873,354.

For the period 1935-1942 the records are in greater detail and show that:-

170,373 tons of crude ore yielded 866.858 tons metallic tin valued at £199,328 or 79.6% of total production.

60,797 tons of sands re-treated yielded 155.661 tons metallic tin valued at £35,621 or 14.2% of total production;

82,857 cubic yards sluiced yielded 75.817 tons metallic tin valued at £15,456 or 6.1% of total production.

The detailed figures are shown in the accompanying table.

CONCLUSIONS:

Production from the Mount Bischoff Mine can be increased only as a result of improvement in methods of mining and milling. The earlier operations of the Company

have removed practically all the high grade ore of the mine and future operations must be directed towards treatment of low grade ore previously regarded as unprofitable.

That the low grade ore can be profitably treated has been demonstrated by Paine's tribute, who, with a recovery of .23% tin had a net return much in excess of award rate of wages after paying royalty to the Company. In this instance ore after being loaded into trucks was transported one mile to the mill at Waratah.

It is considered that production could be stimulated by the introduction of more economic methods of handling the ore.

With the mill in its present position, mechanical shovels would improve production by increasing the tonnage of ore to the mill which at present does not work, on an average, more than one shift per day.

As the tin content of this ore has been shown to be contained in the fine grained material, and the boulders to be barren, it is considered that the ore would lend itself to successful treatment by ground sluicing.

With the erection of a mill in the old Happy Valley Face workings; by the use of water, the boulders could be separated from the fine grained material which could then be transported by fluming to the mill for treatment. Water for Battery purposes is at present pumped to the top of the hill at the Stanhope Face. With increased storage and continuous pumping, sufficient water for these purposes could be assured.

The quantity of low grade ore available justifies consideration of more economic methods of handling the ore.

The pyrrhotite mass situated to the west of the Main Tunnel in the Gossan Face, and the similar mass in the Slaughter Yard face should be further tested either by boring or by mine workings. For the mass in the Slaughter Face, no grade has been determined, but the Gossan Face pyrrhotite, where sampled in the Main Tunnel, was of a grade of 1.02% tin over a width of 32 feet. It is possible that further testing will prove the possibility of open cut methods of mining the ore.

The ore from the Queen level off the Stanhope adit should yield a profitable return with a treatment plant situated near the adit mouth.

In the North Valley workings, the vein has a maximum width of 16 feet with an average width of 6 feet. The grade of ore is approximately 0.9% tin. The vein occurs between good walls which are vertical or having a slight dip to the west. The ore is mined by overhead stoping and delivered for treatment to a Battery of 10 stamps each of 1000 lbs. weight. The larger boulders of ore are spalled by hand before feeding to the Battery.

| Year | Crude Ore Crushed Tons. | Sands & Slimes re-treated Tons. | Sluiced c. yds. | Tin Concentrate won. Tons. | Total Concentrate won. | Metallic Tin Tons | Total Metallic Tin Tons | Coy's Valuation | Total Coy's Valuation | Standard Valuation | Total Standard Valuation |
|---------------|----------------------------|------------------------------------|--------------------|-------------------------------|------------------------|-----------------------------|----------------------------|-----------------------|-----------------------|--------------------------------|--------------------------|
| 1921 | | | | | | | 192.63 | | 32041 | | |
| 1922 | | | | | | | 115.62 | | 19077 | | |
| 1923 | | | | | | | 194.38 | | 39342 | | |
| 1924 | | | | | | | 222.00 | | 55290 | | |
| 1925 | | | | | | | 275.00 | | 71713 | | |
| 1926 | | | | | | | 293.50 | | 85606 | | |
| 1927 | | | | | | | 222.25 | | 64465 | | |
| 1928 | | | | | | | 222.15 | | 50680 | | |
| 1929 | | | | | | | 120.81 | | 24703 | | |
| 1930 | 222 | | 27968 | 10.51 83.00 | 93.51 | 7.002 54.704 | 62.306 | 613 6000 | 6613 | 872 7705 | 8577 |
| 1931 | 2906.5 | | 36800 | 197.8 81.50 | 279.30 | 130.373 52.104 | 182.477 | 12235 4999 | 17234 | 15680 6351 | 22031 |
| 1932 | 13884 | | 62504 | 395.55 61.00 | 456.55 | 268.240 39.80 | 308.040 | 29012 4952 | 33964 | 36009 6246 | 42255 |
| 1933 | 14695 | 6800 | 21650 | | | | 258.69 | | | | 50313 |
| 1934 | 19651 | 8936 | 16080 | 338.25 16.30 | 354.55 | 232.765 10.077 | 242.842 | 59239 2480 | 61729 | 53730 2225 | 55955 |
| 1935 | 18329 | 8824 | 36200 | 290.25 35.50 45.60 | 369.3 | 194.854 23.395 29.477 | 247.726 | 46946 5530 7039 | 59515 | 44311 5384 6870 | 56565 |
| 1936 | 18982 | 9200 | 10100 | 219.80 30.10 21.00 | 270.9 | 149.976 20.367 13.400 | 183.833 | 33809 4730 2868 | 41407 | 30902 4343 2674 | 37919 |
| 1937 | 17778 | 8589 | 13898 | 146.45 34.95 9.25 | 190.65 | 99.956 23.007 5.827 | 128.888 | 27624 6253 1343 | 35240 | 24326 5494 702 | 31021 |
| 1938 | 19578 | 9056 | 2100 | | 175.75 | 89.851 28.638 2.625 | 121.095 | | | 17185 5393 506 | 23084 |
| 1939 | 25566 | 9630 | 620 | 157.10 35.10 0.90 | 193.10 | 107.922 22.892 .559 | 131.473 | | 33966.869 | 23609.84 5187.32 120.20 | 28917.3 |
| 1940 | 29759 | 7022 | 8490 | 144.03 38.92 19.38 | 192.33 | 99.019 18.606 11.284 | 128.909 | | 32630.77 | 25431.43 4789.77 2935.70 | 33156.9 |
| 1941 | 25664 | 5562 | 6539 | 109.16 18.99 8.51 | 136.69 | 76.377 11.971 5.199 | 93.547 | | 26199.187 | 20045.26 3132.66 1368.54 | 24546.4 |
| 1942 to Sept. | 15717 | 2914 | 2690 | 69.30 11.45 5.17 | 85.92 | 48.239 7.322 3.004 | 58.565 | 3948.11 | 17938.133 | 12517.45 1900.05 779.52 | 15197.0 |

| Sands & Slimes re-treated | Sluiced | Tin Concentrate won. | Total Concentrate won. | Metallic Tin Tons | Total Metallic Tin Tons | Coy's Valuation | Total Coy's Valuation | Standard Valuation | Total Standard Valuation | Average No. of men employed |
|---------------------------|---------|--------------------------|------------------------|-----------------------------|-------------------------|-----------------------|-----------------------|--------------------------------|--------------------------|-----------------------------|
| Tons. | c. yds. | Tons. | | Tons | Tons | | | | | |
| | | | | | 192.63 | | 32041 | | | 115 |
| | | | | | 115.62 | | 19077 | | | 237 |
| | | | | | 194.38 | | 39342 | | | 119 |
| | | | | | 222.00 | | 55290 | | | 205 |
| | | | | | 275.00 | | 71713 | | | 205 |
| | | | | | 293.50 | | 85606 | | | 208 |
| | | | | | 222.25 | | 64465 | | | 214 |
| | | | | | 222.15 | | 50680 | | | 191 |
| | | | | | 120.81 | | 24703 | | | 70 |
| | 27968 | 10.51 83.00 | 93.51 | 7.002 54.704 | 62.306 | 613 6000 | 6613 | 872 7705 | 8577 | 45 |
| | 36800 | 197.8 81.50 | 279.30 | 130.373 52.104 | 182.477 | 12235 4999 | 17234 | 15680 6351 | 22031 | 123 |
| | 62504 | 395.55 61.00 | 456.55 | 268.240 39.80 | 308.040 | 29012 4952 | 33964 | 36009 6246 | 42255 | 156 |
| 6800 | 21650 | | | | 258.69 | | | | 50313 | 173 |
| | 16080 | 338.25 16.30 | 354.55 | 232.765 10.077 | 242.842 | 59239 2480 | 61729 | 53730 2225 | 55955 | 188 |
| 8936 | | | | | | | | | | |
| 8824 | 36200 | 290.25 35.50 45.60 | 369.3 | 194.854 23.395 29.477 | 247.726 | 46946 5530 7039 | 59515 | 44311 5384 6870 | 56565 | 176 |
| 9200 | 10100 | 219.80 30.10 21.00 | 270.9 | 149.976 20.367 13.400 | 183.833 | 33809 4730 2868 | 41407 | 30902 4343 2674 | 37919 | 142 |
| 8589 | 13898 | 146.45 34.95 9.25 | 190.65 | 99.956 23.007 5.827 | 128.888 | 27624 6253 1343 | 35240 | 24326 5494 702 | 31021 | 129 |
| 9056 | 2100 | | 175.75 | 89.851 28.638 2.625 | 121.095 | | | 17185 5393 506 | 23084 | 118 |
| 9630 | 620 | 157.10 35.10 0.90 | 193.10 | 107.922 22.892 .559 | 131.473 | | 33966.869 | 23609.84 5187.32 120.20 | 28917.36 | |
| 7022 | 8490 | 144.03 38.92 19.38 | 192.33 | 99.019 18.606 11.284 | 128.909 | | 32630.77 | 25431.43 4789.77 2935.70 | 33156.90 | |
| 5562 | 6539 | 109.16 18.99 8.51 | 136.69 | 76.377 11.971 5.199 | 93.547 | | 26199.187 | 20045.26 3132.66 1368.54 | 24546.46 | |
| 2914 | 2690 | 69.30 11.45 5.17 | 85.92 | 48.239 7.322 3.004 | 58.565 | 3948.11 | 17938.133 | 12517.45 1900.05 779.52 | 15197.02 | |

4006.731

A considerable saving could be made by the introduction of shrinkage methods of stoping, necessitating the use of less timber than is at present used, and by the installation of a jaw breaker to ensure a regular sized feed to the battery.

Development has not been kept ahead of production which, despite the employment of 28 men, has been insufficient to maintain continuous crushing.

(Sgd. H.G.W. KEID

FIELD GEOLOGIST

Department of Mines,
HOBART.

13th January, 1943.