REPORT ON SOME TIN MINES IN THE ST. PAUL'S RIVER VALLEY, NEAR AVOCA.

Government Geologist's Office,
Launceston, 28th October, 1899.

SIR,

IN accordance with your instructions I examined the deposits of tin ore in the St. Paul's River Valley on the 10th, 11th, 12th, and 13th instant, and have the honour now to hand you my Report on the same. The properties inspected were the Roy's Hill and St. Paul's Tin Mines.

ROY'S HILL MINE.

This is situated in the south-west angle of the Robert Hepburn 2560-acre block. It is on a low hill 6 miles east of Avoca, and about half a mile south of the Avoca to Swansea Road, which runs eastward along the southern bank of the St. Paul's River. This river flows through the St. Paul's Valley, which near the mine is flanked by St. Paul's Dome on the north, and the Snow Mountain Range on the south. Avoca itself is built on a basalt area: the river there flows in a basalt channel. On the way out to the mine, on the north side of the bridge over the St. Paul's River, a granite spur comes down across the road, showing large weathered boulders and enormous flat surfaces of granite rock in the grass. The hog's back form of some of these boulders reminded me of glaciated roches montounés, but I could not detect any ice-scorings. On the south side of the river, immediately on crossing the bridge, vesicular basalt is seen overlying soft tertiary sandstone with concretionary ironstone. The St. Paul's River Valley here widens into a broad grassy plain (the Benham Plains), thickly strewn with cellular tertiary basalt, which continues for a mile or two eastwards. The valley of the St. Paul's was no doubt originally scooped out of the granite. In its deeper portions, and in the upper part of these, it has been filled with detritus from the Permo-Carboniferous and Trias-Jura rocks, and this, perhaps, covers up an earlier lead or gutter containing the stanniferous waste of the granite.

Turning off to the south, and taking the bush track which leads to the base of Roy's Hill, the soil appears to consist of the tertiary waste of Permo-Carboniferous sediments. About a thousand yards along this track brings the traveller to the mine hut at the foot of the eastern slope of the low hill. Standing at the back of the hut, and facing the west, we see a hill in front of us, in the form of a ridge, running, roughly, north and south. This hill is covered with Permo-Carboniferous sandstones, grits, and conglomerates lying in horizontal beds, mostly concealed by sandstone detritus and quartz gravel. The sandstones at the top of the hill overlie some 20 feet of stanniferous wash and conglomerate. Geologically, this occurrence of tin-bearing alluvial of Permo-Carboniferous age is highly interesting. Works in the wash have shown the existence beneath it of a band of tin-bearing quartz-mica rock or greisen. This greisen is sometimes quite typical, but for the most part has too little mica to be altogether normal. It is often very dense and hard, consisting then mainly of quartz spangled with silvery-white and bronze-yellow mica, and, in this state, is a poor carrier of tin ore. In other places the mica becomes more abundant, and the rock softer and more favourable for metal. The mica mineral apparently belongs to the Lithia group, either lithionite—a lithia-iron mica, or lepidolite—a mica in which potash is partly replaced by lithia. The latter can only be safely distinguished from muscovite by the lithia reaction. I have not been able to detect any crystals of felspar in the rock, but the kaolin which occurs occasionally would point to orthoclase. Tourmaline in short, slender prisms, is a constant accompaniment, and sometimes the rock is wholly a quartz-tourmaline one of bluish hue. I searched a good deal for granite, but was unsuccessful, though I found a tourmaline quartz-rock much resembling granite, but without felspar. The Permo-Carboniferous strata southwards from the mine repose on the granite of the higher hills, and though I could not see granite *in sitû* on Roy's Hill, I have no doubt that it underlies it, and is, in fact, immediately below the sedimentary beds. It was, moreover, discovered by Mr. Montgomery at some spot which we could not find.

The remarkable horse-shoe form of the workings was sufficient to suggest to me that they are not on the line of a fissure lode. The great feature of this property, from a tin-miner's point of view, is that the tin-bearing rock is a greisen or quartz-mica mass. Wherever we have to do with greisen we are dealing with a modification of granite, altered granite, if you will. It is not necessary to look for true lodes as a *sine quâ non* for tin ore. The plane of contact of one rock with another is sufficient to constitute a direction of least resistance, or a line of easy escape for the fluoride. Thus the marginal part, and not the central part, of a granite mass (except along joints) is the part most likely to be "greisenised." Assuming tin to have been brought up in combination with fluorine, tiny crevices admitting the fluoride are all that is requsite for introducing solutions which exert a destructive action on granite. Once the enemy is admitted, it finds its way through the rock mass, altering and corroding, removing original mineral, and depositing tin oxide along the path of its ramifications wherever the conditions of deposition exist. That tin was introduced as a fluoride is probable, from its constant association with minerals containing fluorine. Thus, both lithionite and lepidolite micas contain fluorine. Tourmaline does the same; likewise topaz, which is associated with tin ore at Mount Bischoff, Bell Mount, and elsewhere. The tin, separated from its fluorine, which passed over to combine with silica, &c., encountering water in rock interstices, combined with oxygen, and would then be precipitated as oxide. For this process, as said above, no wide fissure is required, nor molten lode rock; consequently, the owners need not be discouraged by the mere fact that the Roy's Hill deposit is not a lode. It calls for a little more circumspection than true lode-mining, but that is all. The tin deposit is not quite so easy to trace as if it were contained in a channel between properly defined walls. It will follow the sinuosities of the margin of the underlying granite, and will necessarily be somewhat troublesome to work, but if the metal is there the wit of man will devise the means of winning it.

No one who knows the history of mining on this hill will be disposed to doubt the existence here of tin ore in considerable quantity. A good deal has been sent away, both from the wash and the greisen rock. I am not able to state the exact quantity raised, but, from what I was told, I should imagine it to be between 50 and 100 tons. Four or five tributors have been at work for the past fifteen months, but want of water has interfered greatly with their operations, making alluvial mining a business mainly for the winter season. They have won three or four tons of ore, but are now relinquishing work for the season, owing to deficiency of water.

Mr. Montgomery's Report of 5th October, 1893, deals fully with the work on the hill to that date, and I need only touch on what has been done since. The tributors have confined their work to the alluvial on the western side of the hill. A trench about 150 ft. long, south of No. 1 shaft, has been deepened to 14 ft. A 24-ft. shaft here has been sunk 20 feet in sandstone and wash, the remainder in dense quartz-mica rock, with a little tin. At the S. end of the trench, a 30-ft. shaft is sunk. The first 6 feet are in bedded sandstone, below which are 10 feet of decayed conglomerate, with angular tin crystals in the matrix. This gives place to the underlying solid rock, which is composed of granular quartz, specked with tourmaline, and carries veins of tin ore. Northwards, in this trench, we have another section of the same ancient conglomerate. The surface soil is studded with angular white quartz detritus. Below this come 6 feet of sandstone, lying on twenty feet of conglomerate, containing large blocks of sandstone and rounded quartz and quartzite pebbles, some 7 inches in diameter, embedded in a wash of quartz detritus and lithia mica. This stanniferous wash is also seen further N. In a cutting N. of No. 1 shaft, underneath 6 feet of solid yellow sandstone, is the same tin-bearing conglomerate. In one of these trenches I noticed beds of micaceous grit and sandstone overlying a wash of rounded quartz pebbles in a sandy matrix, resting on quartz-mica rock. On the ledges here some good nuggets of tin ore have been found. The lower part of the wash consisted of about twelve inches of tin-bearing quartz cement.

A few hundred feet lower down on the western slope are some trenches in the surface soil, yielding stones of quartzite, sandstone, etc., and Mr. Fritz Rübenach, the tributor, told me that some good tin had been obtained from this wash. This tin has evidently come down from the hill-crest: there is none *in sitû*.

On the top of the hill is an old shaft said to be 40 feet in the conglomerate and wash, and from which a drive E. is stated to have been advanced in the same formation for some distance. In this case the shaft is not deep enough to be of any use.

The tributors have cleaned up some of the old excavations on the N.W. portion of the hill. As may be supposed, they did not work systematically, and avoided blasting ground as much as possible. From ground left by them in one of the shafts I obtained some rich bulky samples of tin ore. The crosscuts E. at the top of the hill, recommended by Mr. A. Montgomery, do not seem to have been put in, and we are as much in the dark as ever with reference to the exact width of the greisen band. This greisen forms the contact between the granite and the (Silurian?) slates, etc. to the west, but even if the stone nearest to the Silurian contact is usually the most favourable for metal it is not necessarily always so, and until the stone on the granite side has been tested we do not know how it behaves.

As all the shafts were full of water, and no one at hand with reliable information respecting old work, I had to be content with what I could see, and am somewhat at a disadvantage when approaching the question of recommendations for future work. However, the abandonment of the shafts may be safely taken as an indication that the ground ceased to be remunerative, but none of these shafts exceed 50 feet in depth, and no one can seriously regard that as sufficient. If the greisen modification of granite had been the result of the action of meteoric waters percolating from above, these superficial explorations might possibly have sufficed. But greisenisation is due to deep-seated pneumatolytic action, and is undeniably and absolutely independent of proximity to the surface. We may go to any depth and find it still. Although it is a disease of the granite it is not a disease of superficial degeneration and decay; it is a transformation of the rock under the influence of vapours and solutions carrying tin. Admitting the plutonic origin of the rock, the supporters of the lateral secretion theory of lodes contend that the metal has been derived from the adjoining country-rock. They point to the fact that the rock-forming minerals entering into the composition of tin-bearing granites contain a little tin themselves, and they then conclude that the metal in the tin-stone has been brought from this source. The inference is that, when these minute quantities have been exhausted from the adjacent country, the lode will become barren. It is perfectly true that small quantities of tin ore have been found in the felspar and mica minerals of granite. Thus Scharizer found 0·064% SnO_2 in lithionite, and 0·157% in lepidomelane. Niemeyer found 0·10% in Zinnwaldite (lepidolite, lithia mica). Schroeder found 0·223% in dark mica, and Schulze even 0·32%. A. W. Stelzner had samples of felspars from stanniferous granite in the Erzgebirge very carefully isolated and analysed, giving 0·016%, 0·018%, 0·0191%, 0·03%, 0·0301%, 0·0748%, 0·083% SnO_2.*

But we need not assume that the accumulations of tin binoxide which are mined have been concentrated from original homes in the mica and felspars; the reverse is conceivable. These minerals have more likely received their quota of metal from the solutions which permeated the granite, often penetrating within felspars, attacking their very substance, and precipitating the tin in the crystals whose interiors they had ravaged. The silicon and fluorine will account for most of the destructive action evidently exerted on granite wherever we find it tin-bearing. Pseudomorphs of cassiterite after felspar often occur in such granite: the muscovite or potash mica is found altered to stanniferous lithia mica; and, while the felspar has been removed, quartz increases to the extent familiar in most tin-bearing granites.

The tin has been brought up from below, and hence there is no reason to fear that the rich tin ore found in the superficial portion of the rock on Roy's Hill will not be found also in depth. Along the horse-shoe line, for some 400 or 500 feet, good tin ore has been found near the surface; but I am told that the matrix in the shafts which were sunk became harder, and poor in metal. I do not know that the greisen band has been fully tested in these workings. The stone may be now richer on the hanging wall or contact side, and now on the granite or footwall side, though the word "wall" is perhaps a misnomer. It is true the dense quartz-rock, with a little mica in it, thrown out of the shafts, does not look encouraging, but then the stuff has been all picked over,

* J. H. L. Vogt. Ueber die relative Verbreitung der Elemente in Zeitschrift für praktische Geologie. Sept., 1898., p. 315.

SECTION OF STRATA
AT
ROYS HILL MINE

0 5 10 20
Scale of Feet.

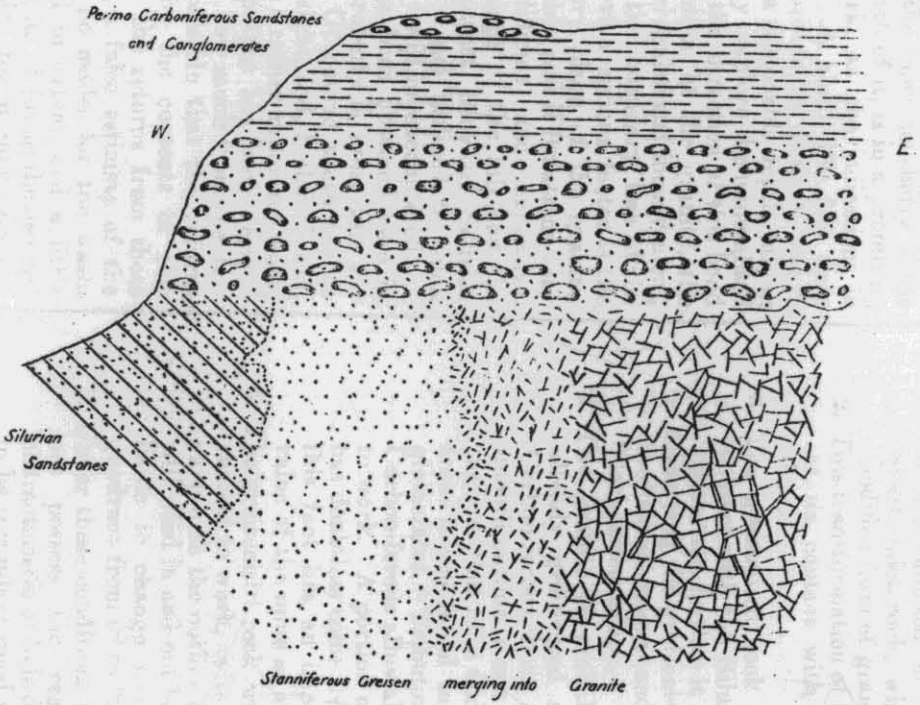
VERTICAL SECTION
OF SOUTHERN SHAFT
ROYS HILL

20 10 5 0
Scale of Feet.

Six feet of bedded Permo-Carbo-niferous Sundstone.

Ten feet of decayed conglomerate with angular Tin ore crystals in its matrix.

Greisenised Granite, consisting of Granular Quartz with a little Mica and Tourmaline. and carrying small bands of Tin ore (Cassiterite). Proved here to 14 feet.



W. H. Twelvetrees.
Government Geologist.

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and it is not easy to judge now the value of the stone extracted.

I think surface exploration has been conducted quite far enough along the line in a southerly direction. Deeper work is now required to develop the mine. This can only be carried out by shaft-sinking. For convenience of working, the most suitable place for a shaft would be somewhere about midway along the N. and S. line on the western edge of the hill; but, apart from considerations of convenience, the most southerly of the existing shafts, or the shaft north of it, is in a promising position for remunerative work, as the indications in both of these shafts are good. A shaft 150 feet deep would place the owners in a position to drive N. and S. along the metalliferous line at a reasonable depth, taking care to crosscut and thoroughly explore the mineralised band. As mentioned already, the direction of this band being conditioned by the contour of the granite, the underground workings will be irregular and inconvenient, for they will wind about with the boundary line of the eruptive rock. What may prove a serious factor is the underground dip of the boundary plane of the granite. There can be no regularity in this, and if it flattens very much work will become difficult and expensive. Judging, however, from the slope of the hill and the depth of the wash and apparent body of Silurian sediments on the western side, I am inclined to think that no insurmountable difficulty will be encountered.

Seeing that such good tin has been obtained here in the past, it is a pity that the property is lying idle for want of courage and capital. Of course there are no really remunerative returns in sight, and, I should add, that I have no information upon a rather important point, namely, how much of the past output has been derived from the quartz-mica rock, and how much from the tin-bearing conglomerate? It is possible that the returns have been largely increased by the contents of this conglomerate or wash. Unless the returns from these two sources are kept separate, a false estimate of the value of the mine may easily be made, for the wash, richer than the rock, is limited in extent, and a little steady work would soon exhaust it. I invite the owners' attention particularly to this point, for it may turn out that the reputation of the mine as a tin-producer rests mainly upon the conglomerate which holds the concentrated tin ore of the underlying greisen; consequently, it is a matter of first importance to prove the value of the solid stanniferous rock. This rock has apparently given some good ore in the past, and it is probable that exploratory work, carried out judiciously, and on the lines suggested above, would discover further patches or bodies of payable stone. A long line of the greisen rock having been traced at surface carrying patchy tin, there is no reason why similar rich patches should not be met with at various levels and points below. Such patches are eminently characteristic of greisenised granite, and the deposit will certainly be of this nature. Under these conditions it is useless to expect continuous payable stone.

Prospecting on the E. part of the hill ought not to be neglected, but serious attention should be confined to the western works, where payable stone has been extracted.

The water difficulty will have to be overcome for dressing purposes, but no expense for machinery should be incurred before sufficient exploratory work has been done. The adventurers will be guided by the result of this. I am told that the Snow Creek will not give sufficient water for machinery purposes throughout the summer, but I daresay a site might be selected for a dam and storage reservoir as an auxiliary. To bring in a race from the St. Paul's River would mean a length of perhaps three miles, but it would be the most efficient way of obtaining the necessary power for a crushing and dressing plant.

The conclusions drawn from the examination of this mine are as follows:—

1. The tin ore is not deposited in a fissure lode, but is disseminated in free crystals through a quartz-mica rock, which is a metamorphic or modified form of granite = greisenised granite.
2. This transformation of the granite has taken place at its contact with Silurian sandstones and slates.
3. The greisenised rock is richest in tin near its contact with the Silurian strata, and becomes poorer the further it recedes from the contact.
4. Overlying the greisenised rock are horizontally bedded sandstones and conglomerates of Permo-Carboniferous age.
5. The granite is probably Devonian, and was already greisenised and denuded in Permo-Carboniferous times, as shown by its rounded smooth outline in one of the trenches, and by the fact that mica and tin-ore crystals liberated from it are found in the matrix of the conglomerates. Tributors have found this Permo-Carboniferous alluvial tin deposit rich enough to work. A portion of the output of the mine has doubtless come from this conglomerate, and this fact has an important bearing upon the value of the mine as a whole.
6. The greisenised rock will be excessively inconvenient to work, as its direction will continually vary with the outline of the granite mass. It will wind in and out horizontally, and its dip is liable to change irregularly all through the quadrant from 0° to 90°.
7. Under these conditions the deposition of ore does not possess the regularity and constancy characteristic of lode deposits, but will be found to be irregular; good patches will be separated from one another by barren, or at least unremunerative, ground.
8. The best way of testing the ground will be by a shaft or shafts of moderate depth, and then exploring underground by drives and crosscuts.

It is evident that mining profit or loss depends upon the ratio of good patches to dead work. Future trial alone can show whether the richer parts of the rock will pay for the barren ground. A good deal of desultory surface work has been done, but all the shafts were stopped when the rock became barren. The deposit, therefore, has not been adequately tested, and should not be abandoned before deeper prospecting has been tried. There is nothing in the geological conditions to prevent the deposit, as a whole, from living down to a great depth.

St. Paul's Tin Mine.

This mine is ten miles east of Avoca, on a Mineral Lease No. 1683-93M, covering 40 acres, with an additional area of 200 acres held under a prospecting licence. Its position is a mile and a half south of St. Paul's River, opposite to the Brookstead estate and S.E. from St. Paul's Dome. The Avoca-Swansea Road passes the property a mile to the north, and a bush track, practicable for carts, connects the mine with the road. The mine was worked in

5/8

the eighties by the old St. Paul's Tin Company, by whom it was held till the end of 1893. It was then forfeited, and was subsequently taken up by the present owners.

Geology.—The St. Paul's Valley here shows corresponding rocks on the N. and S. sides, and is evidently a valley of erosion. The lofty St. Paul's Dome and the mountain range on the N. side of the river are capped with mesozoic dolerite (diabase is the altered form; greenstone in the vernacular), flanked below with sandstones and shales of our Trias-Jura coal measures, beneath which are Permo-Carboniferous mudstones and limestones reposing upon granite, the foundation rock of the district. Further west, the coal measures overlie Silurian strata, the latter disrupted by granite. The same general succession is observable on the S. side of the St. Paul's River. Leaving the road, and striking due south towards the St. Paul's Mine, the surface soil is seen to be full of detrital quartz; once on rising ground, loose blocks of country granite, and finally the granite itself, *in sitû*, are met with. This rock is the same coarse-grained granite, with biotite, mica, and large porphyritic felspars, which occurs at Brookstead, Roy's Hill, St. Paul's Bridge, and elsewhere in the tin districts of the north-eastern part of the Colony. Some of the felspars exceed an inch in length, and are sometimes equally broad. The river basin has been formed in this granite rock. A mile to the S.W. fossiliferous Permo-Carboniferous limestone occurs, surmounted by Trias-Jura sandstones, above which towers the diabase crest of the high E. and W. range to the south of this valley. To the S.W., however, the granite sometimes abuts directly on the diabase (dolerite), which is younger than the former, though in this direction, too, I found Permo-Carboniferous mudstones. In this part of the St. Paul's Valley I did not find any basalt.

Mine.—Confining my remarks at first to the 40-acre central section of St. Paul's, I may say that the general mining features of the hill which forms the block are the numerous lines of outcrop of quartz-tourmaline, granitoid tourmaline-quartz, and tourmaline-mica-quartz courses traversing the property and intersecting in different directions, the country rock being the coarse porphyritic granite abovementioned. The dense bluish bands of tourmaline rock specked with quartz are very striking. These are either poor in tin or contain none at all, but are generally associated with the occurrence of tin ore. Sometimes they run through the coarse country granite, sometimes they form bands in the more quartzose modifications of granite. This quartzose granite is in a form somewhat resembling that of a dyke traversing the ordinary granite, and contains tin ore, sometimes disseminated through its mass, at other times developed in its joint planes. Some of these hard tourmaline courses can be traced half through the property or more, but more frequently they form short "makes," parallel or inclined to each other. On examining several of these tourmaline courses minutely, I found that no wall or sharp line of separation marked their junction with the country-rock, but that the tourmalinisation of the adjacent granite was shown by an irregular extension of the tourmaline into the granite, and of the granitic quartz into the tourmaline. In some cases the granitic quartz rock is imperfectly tourmalinised, so that we have a rock partly granite, partly blue tourmaline. I very much doubt the propriety of calling these tourmaline courses "lodes." I believe them to be products appertaining strictly to the granite rock. In other words, they are probably due to a fluoride permeating the country-rock along the planes of jointing. The same action caused the silicification of the granite in the neighbourhood of the joints and the deposition of the tin ore. I believe this will account for most of the tourmaline and quartzose courses on this property. The ore is, accordingly, very free and beautifully crystallised: crystals of amber and ruby tin are not uncommon. In the tin-bearing granite a bronzy lithia mica is often developed, converting the rock into an imperfect greisen, another fact in support of the above idea. An important support of this interpretation is to be found in the way in which the apparent lodes intersect. If these were true lodes we should find heaves or lateral displacements at many of the crossings; but though they sometimes cross at right angles, or nearly so, the tourmaline bands keep on their course without a break or deviation, or, failing that, come to an abrupt end.

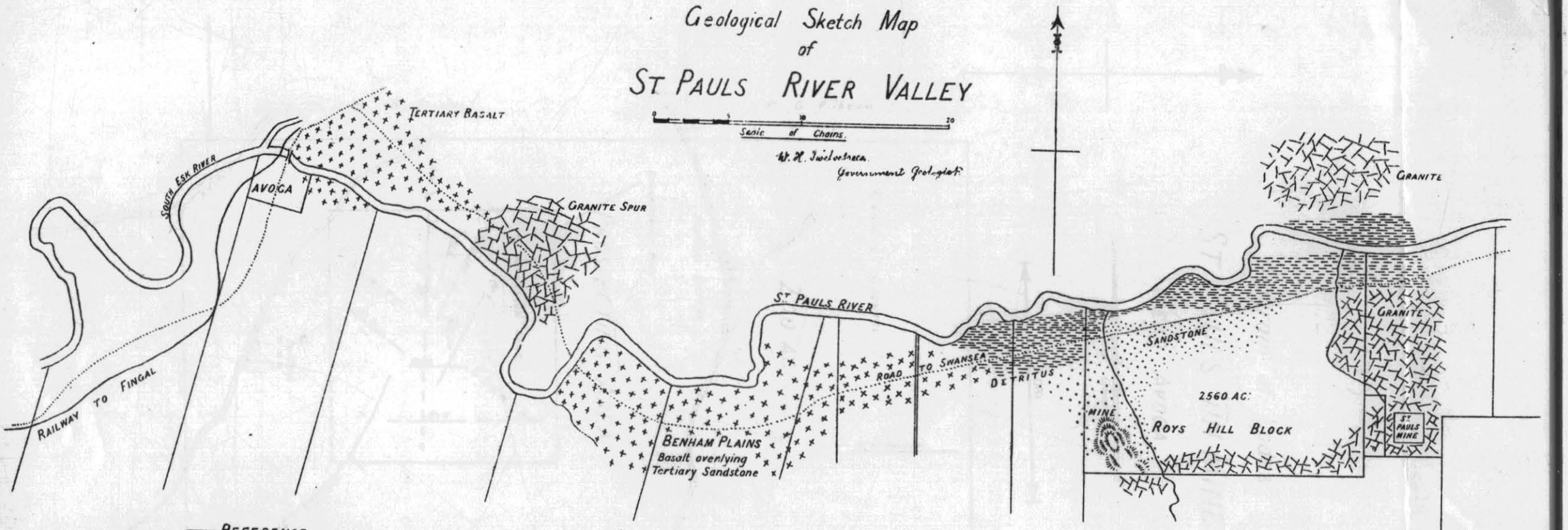
As underground work has not been carried on lately the shafts are not unwatered, and I could form no opinion of the ore-courses by inspection of underground. My remarks must therefore be taken as based entirely on a surface examination.

What is called No. 1. lode is an E. and W. course of tin-bearing stone which has been sunk upon in the western part of the property. Here there are two shafts, one 70 feet, the other 50 feet deep. The lode in the bottom is said to be from three to four feet in width; this I could not verify. I examined the stone at the mouth of the shafts and found it to be a tourmaline-quartz rock with a little mica of the lithia variety, and some of it containing nicely-crystallised cassiterite. Some of the rock is coarse and more granitoid; some nearly pure tourmaline. I believe the entire phenomena to be those of a modification of the granite. At the bottom of the hill on the W. side an adit level has been begun, and driven E. a distance of 150 feet, I am told, to pick up the lode and follow it into the hill. It would come about 30 feet under the bottom of the 70-feet shaft, and nearly 100 feet below the bottom of the 50-feet shaft higher up the hill to the E. To open up this course of stone I should advise the 50-feet shaft to be deepened to about 150 feet, so that the long adit could be continued, and communication effected; a crosscut N. could then be driven to intersect parallel ore-courses in that direction. The course immediately to the N. has not been tested sufficiently for me to express any opinion of it, but the course further north, No. 4, or Red Lode, as it is called, seems to be more important. It looks as if it would junction with the No 1 lode at the top of the hill. From its surface bearing it appears to run into that lode from the N.W. at an angle of about 25°. A shaft 30 feet deep has been sunk on it. It is stated to have given the best ore of any of these lodes. Naturally, the richest stuff has been disposed of, but tin-bearing samples can be selected from the heap at the mouth of the shaft. Some fine ruby and ember tin crystals are met with. The stone is tourmaline quartz, often coloured red with iron oxide. Good tin-bearing wash covered it up until it was discovered in sluicing.

The above seem, so far, to be the most important ore-courses on this block. The rest, which are numerous, are mainly lines of blue tourmaline stone, with a little tin ore on its faces now and then, as well as in the granite which immediately borders it.

To the N. of the 40-acre block is an alluvial flat, and further N. is a rather steep hill, called the Razor-back, some 100 to 120 feet in height. At the top of this is a course of stanniferous granite, which has been sunk upon to 30 feet. This is about 3 feet wide, and resembles an elvan course. The rock is granitoid in character,

Geological Sketch Map of ST PAULS RIVER VALLEY



REFERENCE

- Recent and Tertiary detritus and alluvium
- Tertiary basalt, often vesicular
- Permo-Carboniferous sandstone
- Granite, the basement rock of this field.

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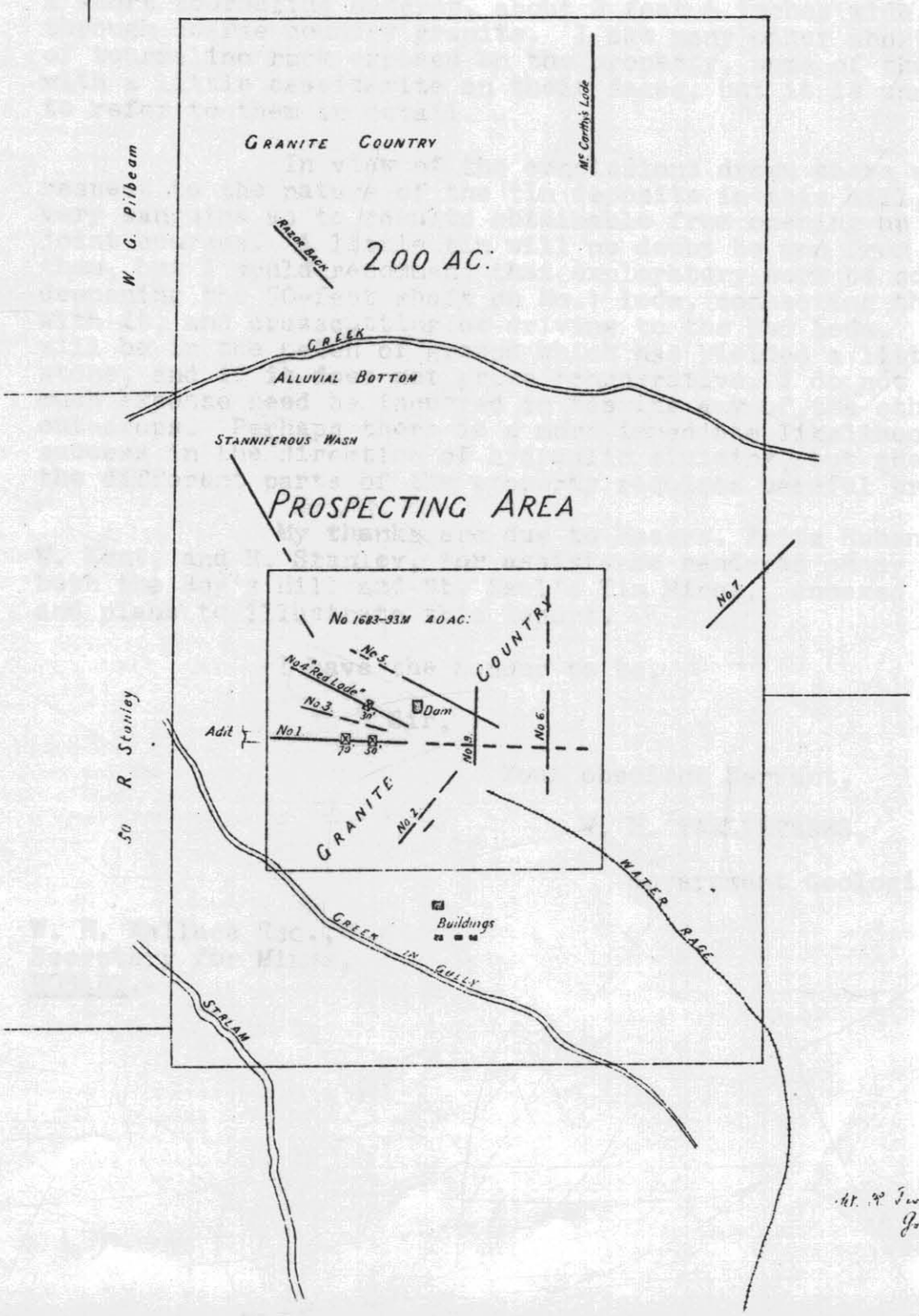
Diagram of Lodes

ST PAULS TIN MINE

NEAR AVOCA

0 5 10 20
Scale of Chains

5 cm



H. P. Twelvetrees.
Government Geologist

consisting of quartz and felspar, with some tourmaline, and carries a little tin ore. The bearing of this course is N.W. - S.E.

On the southern side of the Razor-back there is some promising alluvial, but towards the base of the hill, near the flat, the coarse bedrock granite shows itself. This alluvial flat may possibly yield some tin, but, from its position, is sure to hold a good deal of water. On the south side of the flat the sluicers have left good ground behind them: here a long outcropping line of tourmaline rock, 4 to 6 inches wide, has been uncovered. This line bears N.30°W.; it has no definite walls, but is bounded by coarse stanniferous granite, into which it often merges gradually. I noticed occasional tin crystals on the granite faces. Further to the S.E. a close-grained yellow granite appears, and further on a short tourmaline outcrop, about 2 feet 6 inches wide, runs through coarse country granite. I saw many other short courses of tourmaline rock exposed on the property, some of them with a little cassiterite on their faces, but it is unnecessary to refer to them in detail.

In view of the conclusions drawn above with respect to the nature of the tin deposits in this hill, I am not very sanguine as to results obtainable from opening up these joint courses. A little tin will no doubt be won from most of them, but I would recommend that exploratory work be confined to deepening the 50-feet shaft on No.1 lode, connecting the adit with it, and crosscutting or driving to the Red Lode. This work will be in the patch of ground which has yielded a little tin-stone, and if it does not prove remunerative, I do not think much expense need be incurred in testing any of the other out-crops. Perhaps there is a more immediate likelihood of success in the direction of hydraulic sluicing, but the wash in the different parts of the property requires careful prospecting.

My thanks are due to Messrs. Fritz Rubenach, W. Kent, and R. Stanley, for assistance rendered on my visits to both the Roy's Hill and St. Paul's Tin Mines. Annexed are map and plans to illustrate this Report.

I have the honour to be,

Sir,

Your obedient Servant,

W. H. TWELVETREES,

Government Geologist.

W. H. Wallace Esq.,
Secretary for Mines,
HOBART.