Tin Discoveries at Redrock, near Ballandean, Stanthorpe District.

By E. G. Marks, B.A., B.E., Assistant Government Geologist.

The locality has derived its name from the somewhat mottled tint of a granite precipice forming the head of a deep gorge, on the side of which, and of its tributary, Carpenter's Gully, tin ore has been found. The gorge is 9 miles in a direct line from Ballandean, a station on the Stanthorpe-Wallangarra railway, 14 miles distant from the former township.

The road (the old Sundown road) from Ballandean is excellent to within 3 or 4 miles of the edge of the gorge, where it ascends some 300 ft. The present track is here very rough and steep, but a reasonably good road could be made at small expense. The bottom of the gorge is 1,000 ft. below the saddle to which the road ascends, the new discovery known as the Beehive being about 500 ft. below the saddle, and perhaps 1/4 of a mile distant therefrom. Though the side slope in most places is steep, the ground is soft, and a road without excessive gradients could easily be made by side cuttings right down to the leases which have been applied for.

Redrock Creek has its source on the border of New South Wales, two miles from the head of the Redrock gorge, into which it descends over 500 ft. in two falls. At the upper fall the side of the creek is higher than most if not all of the Beehive applications, so that water for sluicing purposes could, if desired, be conveyed from this to the leases. The creek is said to run for some months in the year, and was trickling at the time of the writer's visit after a prolonged dry spell, in which little or no rain had fallen of sufficient to affect the creeks.

Though the slope of the creek bed is greater than might be desired for dam-making, the site above the falls is certainly the most favourable, if not the only practicable, one for the purpose, as the slope is greater at the bottom of the gorge, which is, moreover, piled up with immense granite boulders.

The occurrence of tin in the neighbourhood of Redrock has been known for many years. Mr. Rands having visited the locality so far back as 1888, when he saw a couple of small trenches cut across a vein of quartz of from 20 in. to 2 ft. in width.

Permission has been granted by the Griffith University Library and the executors of the estate of Dr Elizabeth Nesta Marks for display of Tin Discoveries at Redrock, near Ballandean, Stanthorpe District on the SERF website.

CRICOS No. 00213J


---

Note: The diagram on the page shows the location of Redrock Creek and the approximate position of tin-bearing lodes. The text describes the geographical features and the mining history of the area, mentioning the discovery of tin ore and the suitability of the site for dam-making.

---

Permission has been granted by the Griffith University Library and the executors of the estate of Dr Elizabeth Nesta Marks for display of Tin Discoveries at Redrock, near Ballandean, Stanthorpe District on the SERF website.

CRICOS No. 00213J

Copyright Act 1911.
into a line of quartz veins, being small and unprofitable in appearance. Several may be seen in the gorge near the creek, 500 ft. below the contact, and consist of small, irregular branching veins of dog-tooth quartz carrying, as far as could be seen, little or no ore. On the other hand, the lodes in, and in some cases near, the slate are certainly stanniferous.

Near the contact the granite in places is altered to greisen, and carries tin in (so far as is exposed) irregular veins. In one or two places on the Beehive applications this is certainly very rich, but the extent is probably small. In one place an excavation has exposed the actual contact, and the greisen found on the contact is stanniferous. In several places crystals of cassiterite and of wolfram and molybdenite occur in bunches in the granite away, apparently, from any vein.

In the sedimentary rocks the lodes consist largely of saccharoidal quartz, which has the appearance of being an exceedingly acid granite. It, however, shows any tendency to the pegmatitic structure. The lodes carry a considerable percentage of arsenical pyrites where they have been opened.

It is not without interest to note that the lodes at Sundown (not visited by the present writer) strike north-east—south-west, and are 2½ miles south-west of the Beehive, the Carpenter’s Gully lodes being midway in the same line and possessing the same strike.

The Beehive was inspected on behalf of a syndicate at present holding an option on the ground by Messrs. E. A. Derrick and W. H. Randals previous to the visit of the writer, who has had the advantage of studying the property. This is situated on a spur of the mountain flanking the gorge. At the contact of the granite and slate it is only slightly inclined, its outcrop round the spur forms in places a U-shaped line. Close to the contact, but on the granite or down-hill side of it, the soil is in many places very rich in tin. In the soil, besides the fine tin, boulders of ore occur in places. Being irregularly distributed, as well as varying in size and quality, it would be almost impossible to estimate their value. Samples of the soil were taken around the line of contact by Mr. Derrick, and averaged 1·7 per cent. metallic tin, over a length of some 300 yards.

To observe how the tin content varies in a line at right angles with the contact, the writer took samples of the soil in positions one chain apart. One line of six samples running from north-east to south-west passed nearly down the back of the ridge near Mr. Derrick’s No. 8 position, and included three samples from above the contact, one near it, and three below.

These seven samples contained 0·25, trace, 0·09, 0·15, 0·12, 0·19, 0·32 per cent. of metallic tin, respectively, in descending order, the fourth being situated near the contact, where rich specimens of greisen had been obtained. The average of the above, over a length of 6 chains, is 0·16 per cent., the richest being, strange to say, the farthest from the contact.

Another line of samples was taken, one above and two below Mr. Derrick’s No. 4 position, the line here going east and west, while the top sample is 50 ft. from the second of the previous series. These gave in descending order, 0·48, 2·49, 1·27, and 2·85 per cent. of metallic tin, respectively, or an average of 1·77 per cent. Another sample, taken one chain below (west) Mr. Derrick’s No. 1 position, where he got 0·75 per cent., yielded 0·68 per cent.

The 12 samples of surface dirt taken by the writer, the sites of which were chosen merely by measurement, average 0·74 per cent. of metallic tin. As the samples taken at the lowest points do not show any falling off in tin contents, and the soil elsewhere along the contact in the vicinity is known to carry tin, there is no reason to presume that the area sampled is by any means the total area that will be found to carry payable tin.

The lumps of rich greisen not uncommon in the soil near the contact should help the average of the tin contents. It is possible that the removal of the soil will disclose rich veins of greisen in the solid, such as are exposed in two places in the Beehive property. These as exposed are small in width, and may not extend far, but may possibly be found to contain sufficient rich ore to be of considerable value at the present price of tin.

At one place an opening has been made exposing the contact, and some rich lumps of ore were obtained here. The contact is nearly horizontal, and on it is a thickness of a foot or more of greisen, a sample of which, as exposed, yielded 0·6 per cent. of tin. In the western part of the property, a sample of partly-altered granite yielded, over a width of 7 ft., 0·3 per cent. of tin.

A strong outcrop of greisen and sugary quartz occurs in the Beehive ground, and this runs in the usual north-east direction from Mr. Derrick’s No. 10 position, whence he obtained a sample containing 5·4 per cent. of tin. The outcrop, which had been opened up little after Mr. Derrick’s visit, showed 5 ft. in width of greisen, with quartz and tin crystals and arsenical pyrites. A sample from a width of 3 ft., taken from here by Mr. Randals, contained 5·8 per cent. of tin. The lode here is in the granite. On the same lode, but 3 chains to the north-east, a cutting shows about 8 ft. width of lode material, a sample over
which width taken by the writer yielded 1-0 per cent. of tin. A sample taken by Mr. Rands over a width of 2 ft. 6 in. yielded 3-6 per cent. of tin. From this site, named No. 11, which is near the boundary of the slate and granite, the lode continues in the slate country. Forty feet from No. 11 the writer took a sample chipped from the gossany outcrop at that point, and this yielded 0-2 per cent. of tin. Six chains further to the north-east, portion of the outcrop contains arsenic in considerable quantities, and a sample taken here of chips from the outcrop, 6 or 8 ft. wide, yielded 1-1 per cent. of tin. The lode continues on beyond this, but has not been tried further, though in places the joints in the country rock show, where exposed, crystals of cassiterite.

The lode is worthy of prospecting, and, to judge by the samples taken (in the most likely-look ing places), will probably contain some profitable ore, though the quantity can only be determined by prospecting work. As it occurs near the contact of the two rocks, it is probable, judging by what can be seen of the lodes elsewhere, that it will not continue profitable to any great depth.

A granite wall below the lode bears north-east—south-west, and the soil below it carries in places rich lumps of tin ore. The direction of the joint which has formed the wall parallel to the lode suggests that it may be associated with the occurrence of lumps of ore in the soil.

On the Carpenter’s Gully branch of Redrock Creek, some outcrops of lodes are visible in mineral freehold 523. On one, in the granite but near the contact, the actual outcrop is almost wanting in one place, where a few feet beneath the lode is 1 ft. wide, and has been excavated for rich bunches of ore. Above this in the slate the outcrop is more distinct.

At least four separate lodes can be distinguished in this vicinity, all running roughly north-east—south-west. One of these, to the north-west of the above, forms a distinct outcrop, and has had some work done on it. This was the lode seen by Mr. Ball in 1904, which then showed 6 in. of almost solid cassiterite. This rich bunch has been removed, but the lode as it shows at the present time is clearly stanniferous. Where it crosses the main Carpenter’s Gully it is again in granite, and not very distinct till it reaches the cliff beyond the gully. At the foot of the cliff it consists of poor-looking quartz leaders, but on the top, less than 100 ft. above, a width of 15 ft. of greisen and chloritic material gave the writer a sample yielding 0-7 per cent. of tin. The excavation made here was for the purpose of extracting rich stone, low-grade ore being useless in the absence of a crushing-mill.

The lode continues to the south-west in the slate country, and has been opened in several places, showing an arsenical lode underlying to the north-west. One shaft, sunk by the defunct Carpenter’s Gully Company, is said to be down 100 ft., and is in a claim held by Messrs. Curtain and Pettiford. The lode is about 3 ft. wide between well-defined walls, and, Mr. Curtain informed the writer, carries ore which would be payable if a battery were in the neighbourhood.

Another shaft sunk by the same company, and now in a claim held by Messrs. Johnson and Gilchrist, is said to be down 140 ft., and is situated on another lode some 15 chains to south-east of the above lode. In the bottom 40 ft. the shaft is said to have been in the granite without ore of any value. Good ore is stated to have been obtained in this shaft above the granite, but presumably could not have been located in either of the shafts when the company abandoned them. That tin ore was obtained in them is certain from the nature of their dumps. This second lode, together with another near to it, may be traced for some distance each way, and to the north-east converges somewhat to the lode first mentioned, entering the granite at the bluff overlooking the right-hand branch of Carpenter’s Gully.

A small lode outcrops near an old shepherd’s camp, and other outcrops of dog-tooth quartz veins may be seen in the granite near the cliff on the south side of the gorge and west side of the southern branch of Redrock Creek. Neath this branch is a large outcrop of greisen and quartz striking south-south-west, which has been cased for many years ago. It certainly carries some tin, as occasional rich lumps may be found on the surface, but whether in any quantity can only be determined by mining operations.

Another lode not far from the head of the branch creek received attention years ago, and the tip shows dense arsenical ore.

A shaft has also been sunk on a small lode near the Sundown road, close to the head of Carpenter’s Gully.

These lodes appear well worthy of testing with a view to ascertain whether sufficient ore of profitable grade occurs to justify the erection of a battery. At present, with no working battery in the district, only very rich stone will pay to ship away.

The above complete the outcrops seen by the writer in the neighbourhood of Redrock, though he understands that others have been found which he did not see. Those seen appear to him to offer sufficient inducements to warrant a considerable amount of prospecting work, and may well be found to carry in places ore of a profitable nature. Such, however, can only be
determined by actual development work. On the other hand, there is a considerable known area, and probably a much larger one, not yet tested, in which the surface detritus contains sufficient tin to yield a profit on its treatment, and which should produce a considerable tonnage of the metal. Its position should enable it to be sluiced economically, subject to the capital outlay required for transporting the water a distance of under one mile, and the construction of the necessary sluice boxes, together with some expenditure in increasing the transport facilities.

Note.—Analyses of the samples of lode matter taken by the writer were made by the Government Analyst, who also determined the tin contents of the runnings obtained by the writer from the surface dirt.

Brisbane, 30th October, 1912.

Location.—The mountain lies 13¾ miles west by north from Mount Molloy railway terminus, and 6½ miles south of the mill at Mount Carbine. It is one of the most conspicuous features of the now much-dissected range that extends north-north-westwards from near Mareeba and divides the upper waters of the Hodgkinson and Mitchell Rivers. Its elevation above the nearest part of the latter river should be something like 1,000 ft., and above sea level quite 2,000 ft.

Access.—From Mount Molloy the old Limestone road is followed to within 3 miles of the mine, but after leaving the flood plain of the Mitchell, half a mile south of Charcoal Creek, there is only a pack track, cut with some skill through most precipitous country. It is believed that a wagon road could be constructed without great hindrance up the valley of Little Plumtree Creek, to within a few hundred feet of the lease, with which connection could only be made by inclined tram or aerial ropeway. By this road the distance to Mount Molloy would be greatly by 5 miles than by the pack track in use.

History.—Alluvial tinstone was first found on Mount Holmes seventeen or eighteen years ago, but the lodes or dykes were not exploited till several years later. After much surface work had been done by prospectors, a development syndicate took up a lease of 12 acres (M.L. 139), and put in the adit to be mentioned; but, developments being unsatisfactory, the holding was allowed to lapse. Subsequently, Mr. Pearson pegged out a 5-acre lease (M.L. 3244), taking in the most thoroughly surfaced part of the ore-bearing zone, and including besides his original claim part of M.L. 139 and some abandoned ground on the opposite side of his claim. No other holdings are in force on the hill at the present time, the miners on Mount Alto being Mr. Pearson’s nearest neighbours.

Geological Conditions.

The geology of any particular locality cannot be satisfactorily made out until a complete survey of the surrounding country has been effected, but some inkling of the conditions subsisting at Mount Holmes was derived from my hurried visit.

States and Schists.—The oldest rock showing is a slate, of which the original bedding can seldom be distinguished because of the extreme regional metamorphism it has undergone, the induced schistosity, and the recrystallisation of its constituent minerals. In some places it can be seen that the rock was originally finely laminated, though now much crumpled, but more often it has a superinduced gneissic structure. Again, over large areas it has been changed to ottoline schist, but along one belt to the west of Mount Holmes epideutisation has resulted from the parent rock having been rich in lime and iron.

Syenite and Porphyryte Dykes.—Running with the metamorphises in the vicinity of Mount Holmes are a number of dykes quartz on the one hand and intercrysallised quartz and felspar on the other, in which the felspar may be greatly in excess. It must be noted that these veins and dykes cut across the schistosity, and it is thought the bedding of the country rock, which at the time of their formation was already schistose, as is proved by the keel-like ridges that project from the ore-bodies into the country walls. The schistosity, it has already been noticed, trends north-north-westwards, whereas the dykes and associated reefs strike east-north-east, while, nevertheless, the general trend of the ore-bearing zone is north-eastwards. The longitudinal extent of the veins and dykes is seldom more than a few feet, and doubtfully ever more than a chain. Their persistence in depth has not been actually proved by sinking, but that they do live in depth to the granite massif there can be no reasonable doubt, for they are typical dykes, albeit highly siliceous with constituents residual from the cooling and consolidation of an acid magma.

Wolfram and casseriterite occur in both the quartz and the pegmatite, but the two minerals are seldom in intimate association in any one reef or dyke. In the crops along the crest of the mountain, some wolfram was found on the surface, but a few feet beneath it seems to have given place to casseriterite. Conversely, the reefs on the south-eastern flank of the mountain, though they carry a little casseriterite, have been worked chiefly for wolfram, and they are much poorer in felspar than the neighbouring stanniferous dykes. The wolfram affects short blady forms; it is seldom of any size—that is, more than an inch in length; and it is almost always in the quartz, sometimes surrounding the felspar like a aureole, but actually in the felspar it rarely occurs. The casseriterite is mostly well crystallised, and some of the crystals are more than an inch in diameter. It is scattered through the quartz, with a tendency to form zones near the walls of the dykes; and where the adjacent country wall rock has been greisenised it also has been irregularly impregnated.

Hypothetical Batholith.—Studying the map, as far as I have yet managed to delineate the areas of intrusive granite, it seems to me most probable that a great subterranean spur of this rock extends north-westwards from Mareeba to beyond Mount Carbine; and of this spur the uppermost projections have been exposed by the agencies of denudation in the Southedge Tableland, the Slaty Range, the Lighthouse Mountain, Baker’s Blue Mountain, and Mount Alto, midway between the last two of which lies Mount Holmes. That at Pearson’s lease we overide a subterranean ridge of granite may be accepted as a corollary of the foregoing facts of observation, supported by the further knowledge that pegmatite dykes in the schists surrounding the Slaty Range granite boss carry both wolfram and tinstone.