

PRELIMINARY REPORT ON BESSEL REWARD GOLD PROSPECTIntroduction

Gold was discovered in this area by C. Bessell in the year 1877, eighteen months before he found the more important alluvial deposits of the Lisle Basin. The discovery was made in the process of sluicing the gravels lying near the headwaters of Cradle and Tobacco Creeks, and nearly 2000 oz. of gold was produced as the result of the later operations. The presence of occasional gold-quartz specimens in the alluvial material gave credence to the idea that the gold found in the beds of those streams was shed from some of the numerous quartz veins that traverse the country rock of the area. The early operators with this idea in mind carefully explored the area, but failed to discover the source of the gold.

Last year R. Bessell of Lisle renewed the search and was successful in his efforts. The subsequent operations of this prospector and his partners form the subject of this report.

Area, Situation etc.

The property of the syndicate consists of Reward Claim 1649G of 20 acres and a Prospecting Area of 20 acres north and adjoining it. Lisle lies two miles to the south-east and the Golconda Field two miles to the north-west. The north-eastern Railway passes within three miles of the prospect to which access is easy from Golconda, Gretna, or Nabowla Stations. By rail Launceston is 35 miles distant.

Topography

The area is one of gently moulded hills which rises to 700 feet above sea-level. To the south and south west the walls of Lisle Basin rise to 1400 and 1800 feet but to the north there is a general evenness of outline broken here and there by the numerous tributaries of the Denison and Little Forester Rivers. All the streams are north-flowing and rather sluggish in their movements.

A conspicuous feature of the area as a whole is the formation of topographic basins where granite and granite porphyries have been exposed. Those igneous rocks decompose readily and are more easily removed by erosive agents than the metamorphosed slates and sandstones that fringe them, the result being the development of basins corresponding in size to the areas of the protruding granite bodies. The formation of such basins is well illustrated at Lisle, Golconda, Panama and Lone Star.

General Geology

The oldest rocks and those occupying the greater part of the area under review are the Cambro-Ordovician slates and Sandstones that form the sedimentary series of the gold belt in Tasmania. The general strike of these sediments and the associated tuffs is N 60° W and the dip is uniformly in a north-easterly direction at angles of 55 to 80 degrees. The slates are of various hues, lilac-coloured, purple, grey, and greyish-blue to black. Interbedded with them are friable sandstones so soft in some parts that the component grains can be

can be separated by pressure of the fingers. These sandstones are easily permeable to aqueous solutions. Associated with the slates and sandstones are rocks of igneous origin of the same age. Whether they represent tuffs or lavas or rocks of other types cannot be definitely determined. They are of basic character, of fine and even grain size, and are apparently persistent throughout this formation in Tasmania. At surface they are soft and completely decomposed, but there is evidence in their texture and composition that they are of basaltic character, the outlines of the constituent minerals being clearly preserved in some specimens.

The members of this formation of rocks were intruded in Devonian time by granite or granite porphyries which resulted in their complete transformation, the metamorphic effects being noticeable to a distance of several hundred feet from the contact line. This granitic intrusive is a less acid variety than that with which the tin ore deposits are associated in neighbouring districts, consisting of quartz orthoclase and oligoclase, plagioclase, biotite and hornblende. It is the characteristic variety of the gold belt and from it the gold bearing solutions forming the quartz veins and some other deposits were derived.

Economic Geology

As the origin of the gold in this area is closely related to the formation of the deposits in the Lisle and Panama Basins, and the orebodies of Golconda the salient points of each will be referred to in review.

It is reported that a quarter of a million ounces of gold has been won from the alluvial and detrital bed of Lisle Creek Valley. The bulk of this was obtained from a section of the bed of the creek one mile in length, the remainder from west-flowing small tributaries and from the northern end of the field. The richest and most important concentrations were found in the Creek bed, but very rich deposits were found also in the beds of small tributary streams below the mantle of talus material that covers the eastern contact formations. Sulphide orebodies are unknown here and traces only of gold have been found in the many quartz veins that traverse the area. Traces only of gold have been found in the talus material, in all rich concentrations occurring below it. Except in Lisle Creek bed and banks the gravels show little sign of attrition and the gold is generally jagged. In the sub-talus deposits organic matter consisting of leaves, twigs and charcoal are strikingly evident and suggest a casual connection between it and the gold. Some of the gold is certainly of secondary formation and probably the greater part is. This is further confirmed by the presence in and below the talus material of much manganese oxide which by catalytic action is instrumental in the dissolution of gold by chlorine solutions. Organic matter is competent to precipitate gold from such solutions. It appears evident, therefore, that a considerable portion of the gold is of secondary origin. However, further research is necessary before this can be definitely established.

At Panama some of the quartz veins that occur in the slates and sandstones are gold-bearing. The most important bodies, however, are those quartz veins on the north side of the area containing much arsenopyrite. These occur at or near the junction of granite and the superincumbent strata. At Golconda the gold-bearing lodes occur at the granite contact and consist largely of quartz with chalcopyrite and arsenopyrite in abundance.

The Bessell Reward deposits differ from those described in many respects, yet the original bodies were all formed during one period of mineralisation and were of the one origin. Tobacco and Cradle Creeks, from the beds of which the alluvial gold was won, take their rise in the properties of the Bessell Reward Syndicate. In the alluvial gravels many quartz-gold specimens were found and on that evidence it was considered that the gold was shed from quartz veins. The subsequent exploratory operations showed that many of the quartz veins were barren and that others contained traces only of gold. Later it was found by R. Bessell that the bulk of the gold was shed from narrow beds of sandstones exposed on the hill that divides the headwaters of the two creeks. These sandstones are soft friable and porous and all the gold found in them is of very fine grainsize. The only outward evidence of mineralisation is that provided by iron oxide discolouration and by the development of secondary mica. It is worthy of note, however, that some of the richest prospects have been obtained from pure white sandstone. Neither the sandstones nor the slates with which they are interbedded shows any appreciable sign of metamorphism as the result of the granitic invasion or of the accompanying mineralisation. It seems that during the initial stages of ore deposition (when the quartz veins were formed) comparatively little gold was precipitated and that during the waning stages of mineralisation or during a subsequent period the greater part was deposited. It is quite possible that the gold in the sandstone beds is of secondary deposition.

The Ore-bodies

1. Alluvial Deposits.
2. Bedded Deposits.
3. Quartz Veins.
1. Alluvial Deposits.

The gold-bearing gravels of Tobacco Creek are 6 to 18 inches in thickness and are overlain by 6 to 8 feet of clay. These gravels consist of angular quartz, slate and sandstone, and the gold in them is not waterworn. About 20 chains of the creek bed has been worked. It is stated that the gold in this creek is coarser than at Lisle and that nuggets up to 15 dwts. have been found. Nearly all the large specimens consist of gold and quartz.

In Cradle Creek the gold is much finer and the concentrations are smaller. Here the gravels consist predominantly of quartz, but gold quartz specimens are rare.

2. Bedded Deposits

These consist of narrow beds of sandstone intercalated with beds of purple, grey, and bluish-black slates. The strike is N. 50°W to N. 63°W and the dip is at a high angle to the N.E. They vary in thickness from one to six feet and are uniform both along the strike and dip. Where opened these seams are at every point gold-bearing but the content varies considerably. A number of samples taken from the trenches yielded an average gold content of 2 dwt. 3 gn. per ton two containing gold in the proportions of 9 dwt. and 11 dwt. per ton. One sample recently analysed yielded gold at 17 dwt. per ton. These beds (6 in number) have been traced over a mile south and nearly a mile north. Southward they do not appear to be gold bearing, but northward occasional samples have shown fair prospects of gold. The beds on the strike and dip persist almost indefinitely but not sufficient exploratory work has been performed to determine the continuity of the gold. At the point of intersection of the middle seam by Tobacco Creek a development of secondary mica is seen in association with quartz. Here it is reported the content of gold was exceptionally high but samples taken during the recent visit were not confirmatory of that report.

3. Quartz Veins

Quartz veins form cross courses to the gold-bearing sandstones trending N 45°E to N. 65°E, and dipping N.W. The quartz is commonly of the milk-white variety, mineralised in places, and as a rule, is barren. The veins vary in thickness from 1 to 4 inches and are remarkably persistent.

Development - Lease 1649G

Very little development work has been performed on the sandstone seams, but the narrow quartz veins have been thoroughly explored. In their search for the source of the gold the early explorers drove many cross cuts and sank many shafts without important results. The early work is valuable, however, in exposing to view a fine section of the sedimentary and intrusive rocks.

The recent work of R. Bessell consists of a series of trenches along the course of the several sandstone beds, and a deep trench across them. The result of this work, though encouraging, is insufficient to determine the prospective value of the property.

On the south west bank of Tobacco Creek near the S.W. corner of the section an adit-crosscut (Titmus') has been driven S 70°W a distance of 150 feet through yellowish grey slates and two narrow beds of sandstone. Manganese oxide is prominent in these sandstones but gold is present in minute quantities only.

Towards the NW corner Eastman's adit on a bearing N 30°W has been driven 120 feet obliquely across the strike of the strata which consist of greyish yellow to white slates and sandstones coursing N 55°W and dipping N 35°N. A number of quartz-limonite veins 2 to 3 inches in width coursing N 45°E and dipping NW at 80° were cut in driving the adit. These veins contain a little gold. The adit was driven towards a shaft (35 feet deep) which was sunk on a gold-bearing quartz vein (2 inches) contained in sandstone. Some of this material contained gold in the proportion of 2 oz. per ton, but samples taken from the dump yielded 2 dwt. of stone only. The main sandstone seam was cut through and departed from near the entrance to the adit. The stone contains a little gold.

On the bank of Tobacco Creek and near the entrance to Eastman adit a shaft has been sunk on a "pipe" of gilberlite (secondary mica) and quartz which it is said contained gold in higher proportion than anywhere on the property. Very little of the material remains on the sump. A few pieces were collected and assayed and gold at 3 dwt. per ton was found in them.

Prospecting Claim

On the Cradle Creek fall of the hill two adit crosscuts have been driven at a shallow level across the rock formations.

No. 1 adit was driven S 15°E a distance of 40 feet, thence 17 feet on a bearing S 170°W. This adit is wholly in a dyke of white to yellow coloured, fine grained porphyry now completely decomposed, the porphyry is barren.

No. 2 adit enters the hill nearby and on a bearing of S 40°E passes through the dyke at 137 feet and penetrates sandstone and slate 122 feet. Several north-east quartz veins 1 to 2 inches wide were intersected in the porphyry but most of them occur in the sandstone. They contain a little gold and the sandstone also.

Farther eastward of these adits are two sandstone seams one of which contains much limonite. The other, however, exposed in shallow trenches is the richer. A grab sample taken from a trench recently sunk on the side of the track yielded gold in the proportion of 3 grains per ton.

General Remarks

Insufficient data are available upon which an estimate of value can be based. It is necessary to further explore the richer seams and this can be performed by crosscutting from Tobacco Creek Valley. A crosscut of 400 feet would cut the seams at a depth of 75 feet.

These seams persist far beyond the confined of the property, but the average gold content is not known. The gold is free and the material can be mined and crushed at half the cost of a quartz vein. If it is found that the average content of recoverable gold is 4 dwt. per ton this will prove a valuable property. Much exploratory work is necessary, however, to determine the value per ton and the length of the several seams. If the gold is of later secondary origin it should persist in depth in proportion to its continuance in length.

The prospect is worthy of careful attention.

A. McIntosh Reid
GOVERNMENT GEOLOGIST.

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