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REPORT ON THE COUNTRY IN THE VICINITY OF THE RIO TINTO AND SPECIMEN REEF MINES WITH SPECIAL REFERENCE TO ALLUVIAL GOLD

INTRODUCTION

The object of the present brief examination of the Rio Tinto-Specimen Reef districts was to determine the value and probable extent of the alluvial gold occurring in various creeks within that area. We took the opportunity of observing the geology of the country between the Nineteen Mile on the Waratah-Corinna Road and Specimen Reef, and owing to the gradually increasing knowledge with regard to the Palaeozoic rocks of the State the results of our observations are being recorded in somewhat greater detail than is necessary in a report of this nature.

PREVIOUS LITERATURE

The following list includes all Departmental publications in which reference is made to the district:-

1. Report on the Mt. Cleveland and Corinna Goldfields. G. Thureau, 1884.
2. Report on the State of the Mining Industry on the West Coast. S. Montgomery, 1890.
3. On the Mining Districts between Corinna and Waratah. J. Harcourt Smith, 1897.
4. On the Mineral Fields between Waratah and Corinna. W.H. Twelvetrees, 1900.
5. On the Mineral Fields between Waratah and Long Plains. W.H. Twelvetrees, 1903.
6. Iron Ore in Long Plain and Zeehan Districts. A.M. Reid, 1919. Mineral Resources No. 6.
7. Osmiridium in Tasmania. A.M. Reid, 1921.

Of the above reports Nos. 1, 2 and 3 deal with the Specimen Reef Mine; No. 4 deals mainly with the general geology; Nos. 5 and 6 contain descriptions of the Rio Tinto lodes; and No. 7 describes the osmiridium deposits.

GEOLOGY

The rock types examined and mapped during our brief stay in the district may be subdivided as shown in the following table.

TABLE SHOWING SEQUENCE OF ROCK TYPES

Sedimentary

Cambro-Ordovician	Slates and Quartzites.
Tertiary	Gravels, Sands and Clays
Recent	River Gravels.

Igneous

Devonian	Pyroxenites and Peridotites.
Tertiary	Basalt

Metamorphic

Devonian (or Pre-Cambrian?)	Gabbro Amphibolites. Chloritic and Quartz-Sericite-[illegible]. Chlorite-schists

The Sedimentary Rocks

Cambro-Ordovician:- These consist mainly of white and dark coloured quartzites with interbedded black, greyish and greenish coloured slates. The quartzites are usually weathered at the surface and hence resemble sandstones. The slates are generally sheared and contorted. Both rock types, but particularly the quartzites, are freely impregnated with quartz veins. They extend from a point about twenty five chains west of the 19 Mile Hut to Webster Creek, and, according to A.M. Reid's mapping reappear on the western side of chloritic schists etc. which form the country rock of the Rio Tinto iron deposits. At the 21 Mile Peg the strike was 170° to 180° and the dip was 60°W. No other strikes and dips were observed.

In his mapping of the Long Plain district, A.M. Reid (Bulletin 32) has subdivided the slates and quartzites into two major groups, one being classed as Pre-Silurian and the other as Ordovician. We could see no lithological or structural differences in support of this subdivision and have mapped these rocks as one great series. Neither the slates nor the quartzites are fossiliferous but, as similar rock types appear to underlie the Dundas slates and breccias (Ordovician) in other parts of the State, they are being referred, tentatively, to the Cambro-Ordovician.

Tertiary:- Gravels, sands and clays of Tertiary age were observed outcropping on the Waratah-Corinna road on either side of Alford's Creek. These are thought to be older than the basalt.

Recent:- These consist of river gravels containing either gold or osmiridium or both. They occur mainly along the beds of the principal streams.

The Igneous Rocks

Devonian:- Ultra Basic:- These consist mainly of pyroxenites and peridotites containing occasional bands of serpentine. They extend from the vicinity of the 19 Mile Hut eastwards for a distance of at least two and one half miles and are probably continuous with similar rocks outcropping on the Waratah-Corinna road near the Heazlewood River. A detailed description of the several varieties is given in Bulletin 17, by W.H. Twelvetrees.

Tertiary:- Basalt:- Two fairly extensive outcrops of basalt occur along the northern portion of the ridge which extends between the Savage River and Specimen Creek. The approximate elevation of the outcrops above sea level is 1000 feet.

Under the microscope this rock is seen to consist of phenocrysts of olivine set in a fine grained groundmass composed of a plexus of felspar laths with interstitial grains of augite and olivine. Small grains of magnetite and ilmenite occur abundantly throughout the section.

The Metamorphic Rocks

Devonian (or Pre-Cambrian?)
Gabbro Amphibolites:- Among the chloritic schists etc. described below, two outcrops of an altered gabbroid rock were noted. One of these occurs about twenty chains south of the Rio Tinto hut and the other to the north of the Savage River on the Specimen Reef track.

The specimen from the south of the Rio Tinto hut is a fine to medium grained, pale greenish rock of gabbroic texture. Under the microscope the rock is seen to consist mainly of hornblende, chlorite, epidote and zoisite with minor quantities of quartz and felspar. Accessory constituents are magnetite and limonite. Hornblende is the most abundant mineral; it occurs as irregular fibrous crystals with frayed out ends or as irregular plates showing the characteristic intersecting cleavages. Chlorite occurs as irregular flakes and grains and is probably an alteration product of hornblende. Epidote occurs as small granular aggregates and may be recognised by its high refractive index and high order polarisation colours. Zoisite is not an abundant constituent; it occurs as small irregular crystals and appears to be closely associated with epidote. Quartz and felspar appear as tiny crystals through the section and occasionally form small veinlets. The latter occurrence suggests that they are largely of secondary origin. Magnetite occurs throughout the section in the form of small euhedral crystals; the limonite is probably an oxidation product of it. The rock may be described as an amphibolite or possibly as an epidote - amphibolite.

The specimen from the north of the Savage River is similar to that described above but is somewhat coarser in grain. Under the microscope its mineralogical constituents are seen to be almost identical but it contains much more epidote and less hornblende. Some of the limonite shows intersecting cleavages denoting the presence of ilmenite in the unweathered rock. The rock is an epidote amphibolite.

Chloritic Schists etc.:- Extending from the head of Webster Creek across the Savage River and thence northwards to the headwaters of Halls Creek is an extensive belt of chloritic and quartz-sericite - chlorite schists. These form the country rock of the Rio Tinto iron deposits. In the northern portion of the area, i.e. towards Specimen Creek, they are traversed by numerous quartz veins some of which contain magnetite. Quartz reefs occurring in the schists to the west of the iron deposits contain no magnetite. On the north side of the Savage River bridge the schists contain a large lens of dolomitic rock which is probably genetically associated with the iron ores.

When examined under the microscope the schists are seen to consist essentially of chlorite and quartz, or

of chlorite, sericite and quartz. They also contain abundant oxides of iron, chiefly magnetite, and occasional small areas of calcite. In a section of a specimen obtained from the south side of the Savage River an indeterminate mineral was observed which appeared to resemble epidote.

It seems probable that the schists represent the extreme stages of alteration of the epidote amphibolites described above, and this view is in accord with the expressed opinions of both Twelvetrees and Reid. Both writers have tentatively ascribed these rocks to the Pre-Cambrian mainly on account of their extreme metamorphism when compared with the Devonian gabbros, pyroxenites and peridotites occurring in the neighbourhood. While this view may be the correct one, extreme cases of metamorphism are not uncommon among the Devonian igneous rocks, e.g. the alteration of the porphyries in the vicinity of Rosebery, Mt. Read and Mt. Lyell. The degree of alteration in these latter occurrences is quite as intense as that which would result in the conversion of fresh gabbros into schists such as those at the Rio Tinto iron deposits; the alteration is effected by a combination of dynamic and hydrothermal metamorphism.

A considerable amount of evidence obtained during the past few years has tended to show that the bulk of the metamorphosed igneous rocks of Tasmania are of Devonian age, and, while the present brief examination has not thrown any further light on the origin of the Rio Tinto schists, the suggestion is put forward that they may be of Devonian age. Moreover, in the Paradise, Rocky and White Rivers iron deposits, A.M. Reid has noted a transition from schists similar to those described into fresh gabbro not distinguishable in appearance from gabbro of Devonian age.

The time at our disposal did not enable us to investigate the relationships between the schists and the Cambro-Ordovician sediments.

ECONOMIC GEOLOGY

Iron Deposits:- These are dealt with in detail in "Mineral Resources No. 6".

Alluvial Gold:- This is found in recent gravels occurring in the beds of the present streams. During the past thirty or forty years a considerable amount of alluvial gold has been won from the Savage River and from various creeks in the vicinity of Specimen Reef. While some alluvial gold yet remains to be won it is fairly certain that the majority of the creeks, in which alluvial gold has been found, have been worked out.

Our attention was confined chiefly to creeks heading in towards Specimen Reef, and, acting on the advice of prospectors acquainted with the district, only two streams were tested. These were Halls Creek between Brodrick's Creek and Fulford's Creek, and a small branch of McPhee Creek flowing through section 34.

Several small gravel beaches along Halls Creek were tried without obtaining a single colour of gold, At the junction of Hall's Creek and McAuliffe Creek a test hole on the west bank was tried. This yielded

from 2 to 4 fine colours of gold to the dish, the average depth of the wash being 3 to 4 feet. Small quantities of alluvial gold are said to occur in some flats on the east bank about five chains or more above Fulford's Creek but two dish prospects failed to reveal any colours of gold.

The small tributary of McPhee Creek was tested at the old track crossing on section 34. A number of dish prospects yielded an average of 2 to 5 fine colours of gold to the dish. The gold occurred in angular quartz wash about 6 inches to 1 foot below the surface. The bottom consisted of soft black and greyish slates.

Since our return to Hobart a statement has been made by a former prospector of this district that he found both gold and osmiridium occurring in high level terraces about 500 feet above the bed of the Savage River. The locality is given as being in the vicinity of Batty's bend. This information is recorded for what it may be worth.

In conclusion it may be stated that the alluvial gold prospects in and around the Specimen Reef district are far from promising. Most of the creeks have been worked out and, although occasional prospectors may eke out a living from time to time there appears to be little justification for an optimistic outlook.

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