

PRELIMINARY REPORT

of the

GEOLOGICAL SURVEY OF THE PORT DAVEY DISTRICT

Location and Access

The Port Davey District is situated in the extreme south-western part of the State of Tasmania.

The best means of access is by boat from Hobart. There is no permanent settlement in the district and therefore no boat service exists. Boats have to be hired for the trip and the types usually used are small sailing vessels (barges, fishing boats etc.) with auxiliary engines.

Port Davey is a splendid harbour and landing can be made at almost any place desired. No other reliable harbour exists in that part of the State and landings can only be made at localities along the coast fronting the Southern Ocean in favourable weather.

Area Examined

The area examined consisted of the greater portion of the country between the southern shores of Port Davey and the western and southern coasts of the State as far east as Cox Bight. This area includes the greater part of the reserve of 250 sq. miles at present exempted from the operations of the Mining Act.

Topography

The topography is for the most part a very youthful one, but small portions of the district exhibit a much more mature type.

The highest mountains in the south-western portion are the complex system of small ranges and spurs which extend north-wards from the South West Cape towards Port Davey. The mountains become higher towards the east, some of the most prominent being New Harbour Range (1680 feet), Bathurst Range (2626 feet), Ray Range (approximately 3000 feet), Spero Range, etc., until finally the highest, such as the Authur Range (3668 feet), Ironbound Bluff (4000 feet) occur. To the north of Port Davey the most prominent are Mt Perry (2132 feet), and Mt. Rugby (2520 feet).

The amount of plain like country is small and is restricted to that between Cox Bight and New Harbour Creek, and also Moulter Bay valley.

The largest streams occur on the northern and eastern sides of Port Davey and include the Davey, Spring, North, and Old Rivers. Those which enter the southern shores of Port Davey and Bathurst Harbour and the Southern Ocean are relatively small. Of this latter group the largest streams are New Harbour Creek and the Ray River (which enters Moulter Bay).

GEOLOGY

Proterozoic schists - The greater part of the district is occupied by schists and allied rock types. The most plentiful type is a white quartz schist, usually containing mica along the schist planes and which an increase in the mica content causes a gradation into the quartz-mica schist type. Another prominent type, and one which is usually associated with the quartz schist is a dense, compact white quartzite. These two types are hard, resistant types and form the major headlands along the coasts and the ranges trending inland from them.

Mica schists and argillaceous schists of many types are also plentiful. They may be of light or dark colour according to the mica content (muscovite or biotite). Graphitic and possibly talcoas schists occur to a much less extent, being restricted apparently to the vicinity of Ketchem Bay.

Hard quartzite conglomerates occur at Mts Berry, Misery, MacKenzie, and Balmoral Hill. Soft argillaceous conglomerates occur north of Balmoral Hill and east of Mt Beattie.

These rocks have strikes ranging from north and south to east and west, but the general one is north-north-west. The harder types such as quartzites etc. have more regular strikes than the softer types, which are much crumpled and have very irregular strikes. The dips are with only a few minor exceptions, to the south-south-west at high angles. The series, therefore, appear to be a thick uniformly dipping one, but unrecognized overfolding may be present.

The series occupy a tract of country at least 20 miles wide and extend in a northerly direction beyond the district examined. They, therefore, represent a very thick series of rocks which, judging by the types, must have been almost entirely of sedimentary origin.

Devonian Granite - Two areas of granite occur within the district. One of these is that which has long been known to occur at Cox Bight. This is a medium grained type containing quartz, feldspar (plagioclase and orthoclase) and biotite. Some portions are extremely soft due mainly to weathering and possibly also to mineralising agencies. Veins of quartz and greisen occur in the granite. Some exposures prove the granite to be intrusive into the schists.

The other area of granite occurs at the South West Cape. This occurrence has been known to prospectors and others, but has not previously been officially verified. It is a hard slightly porphyritic type containing quartz, plagioclase and probably both biotite and muscovite. Veins and nodules of quartz and tourmaline are very common. Veins of quartz extend into the adjoining schists and it would appear that the granite intrudes the schists.

On account of its intrusive nature and the association of the tin ore with it at Cox Bight, the granite is regarded as being contemporaneous with the intrusions of Devonian age in other parts of the State.

Pleistocene Gravels - Gravels of this age occur in the plateau in the eastern part of Cox Bight; in the plains between Cox Bight and New Harbour Creek; in the valley of the Ray River; and possibly to a less extent in other localities. These gravels generally form a plateau or terrace in a wide valley with steep sides. The surface of the plateau has a uniform slope from one side of the valley towards the other. The gravels are generally coarse in grain and contain pebbles and boulders of quartz, quartzite and quartz schist. Thin beds of peaty sand and peat may occur interbedded with the gravels.

This series of rocks is a thin one ranging up to 30 feet in thickness. They are regarded as being of Pleistocene age.

Recent - The recent deposits consist of the alluvium and gravels along the courses of the streams, and the sand dunes along portions of the coast.

ECONOMIC GEOLOGY

The only ores found in quantities of commercial importance have been those of tin. Small quantities of molybdenite, wolfram, stibnite, chalcopyrite, and gold also occur, cassiterite (oxide of tin) occurs in the Cox Bight and Moulter Bay districts. Its occurrence at Cox Bight is associated with, but not restricted to the granite. The granite contains quartz veins, and greisen veins (quartz mica types) some of which have been proved to be tin-bearing. The greater part of the alluvial tin ore at Cox Bight has been shed from those sources in the granite. In the eastern portion, however, alluvial tin ore exists which could not have been shed from the sources in the granite owing to the configuration of the ground. It is evident, therefore, that the ore must have been shed from other sources in the schists. These undoubtedly consist of quartz veins in the schists. A belt of country containing such veins extends northwards from near Black Bluff through Quartz Hill towards Weber and Tolman Cks. The veins have not been located further north, but must extend in that direction as tin ore occurs in Weber Ck and to a less extent in Tolman Ck. The same conditions exist in the head of the Moulter Bay Valley where tin ore can be washed from the alluvial deposits along the streams and the country is occupied wholly by schists.

It is evident, therefore, that the primary deposits of tin ore occur as :-

- (1) Quartz and greisen veins in the granite,
- (2) Quartz veins in the schists. This latter occurrence is especially important as the area of tin-bearing country is much greater than would be the case if the primary deposits were restricted to the granite.

The small amounts of molybdenite, wolfram, and chalcopyrite occurring at Cox Bight are associated with the quartz veins in the granite and schists and are genetically connected with the granite. So also is the small amount of stibnite found on the eastern bank of Long Bay.

The origin of the gold at Mt. MacKenzie is not so definitely ascertainable. This is the only occurrence of it known in the area examined and as it occurs in the vicinity of the only conglomerate outcrops in the district it is possible that it may represent alluvial gold shed from the conglomerates. However, the gold obtained is not water worn and is associated with a small quantity of native lead, and it is possible that both these metals have been chemically deposited in the detrital deposits in which they occur.

THE MINING FIELDS

Cox Bight - This field was discovered about the year 1891 and has been worked on a small scale by individuals and small companies continuously up till the present time. The total amount of ground sluiced is however relatively small. The field was reported upon by the late W.H. Twelvetees in 1906, and by the writer in 1927, and it is not proposed to describe it fully in this preliminary report.

The possible tin-bearing ground comprises:-

(1) The Plateau Area - This is a sloping plateau or terrace on the western portion of the eastern side of Cox Bight. The greater part of the workings have been carried out near the eastern extremity. The eastern part of the plateau is practically untested and prospecting is certainly warranted. Nearly the whole of this area is held under lease or prospecting areas by the Cox Creek Tin Sluicing Co. N.L. Active sluicing operations have been commenced and the water race is being extended from Cox to Burke Creek.

(2) The flat between the Plateau and the coast - This is a long narrow tract of flat land about 10 feet above sea level. It has been tested by shafts at the extreme ends and found to be tin-bearing in some places at least. The central portion has not been tested and no working has been undertaken in any portion of the flat.

(3) Western Area - Four leases totalling 304 acres are held by B. Miller on the western part of Cox Bight. These comprise the foothills of Foley Pimple and the flat land between them and the sea and the lagoons. Narrow tracts have been worked up the gullies and quantities of tin ore obtained. Considerable amounts of ore must also have entered the flat land which is therefore worthy of being prospected. A systematic scheme of boring and shafting was started by the Port Davey Tin Mines Co. in 1913 or 1914, but was not completed. Several of the shafts and bores were bottomed and the values of the ground determined. During the past two years several of these old shafts have been unwatered and the results obtained by fish prospects generally support the copies of the logs available.

Further testing is required to determine the extent and value of the payable ground.

(4) Small areas of tin bearing land occur in Pender Creek between Cox and Burke Creeks. Part of that in Pender Creek has been tested by shafts and small workings opened up on it. Good prospects can be washed from some of these faces. N. Hack holds an 80 acre lease along this Creek. The Cox Creek Co. held an 80 acre lease between Cox and Burke Creek. An old working exists near

Burke Creek and one in Webber Creek. No testing of the ground has been undertaken beyond a few old shafts ahead of the former.

(5) Ray River Valley - The Ray River rises by means of numerous creeks on the eastern flanks of the Bathurst Range; on the divide between Moulter Bay and Cox Bight; and on the western flanks of the Ray Range. The valley has a length of 6 or 7 miles with a general north-north-westerly trend.

A flat plain extends along the Ray River from Moulter Bay as far as the Gorge. Above the gorge, another tract of narrower flats and terraces extends for a further 2 or 3 miles.

Some of the headwater streams, viz, the Ray River itself and Raphael Creek cross nearly at right angles any northern extension of the belt of country which appears to shed tin ore in the extreme eastern part of Cox Bight (pender Ck - Webber Ck.) It was therefore decided to test this part of the valley. Prospects from some of the streams give small quantities of cassiterite and as a result three shallow shafts were sunk in the narrow part of the valley of Raphael Ck.

Lowe shaft was 7'6" deep with 1'6" of peat and 6'0" of sandy wash with sub-angular pebbles and boulders up to two feet in diameter. The bottom was a hard rounded schist one sloping to the south-east. Small quantities of cassiterite were obtained throughout its depth, but not in payable quantity.

Lees No.1 shaft was sunk 9 $\frac{1}{2}$ chains to the north east of Lowe Shaft. It was six foot deep and bottomed on soft brown-ish schist, the bottom sloping to the south-east. The shaft passed through 1'6" of surface sand and gravels and other 4'6" of brown cemented wash with boulders up to 20 inches in diameter. The cemented wash contained cassiterite throughout its depth, but increased in content towards the bottom. The value was probably such that the ground would be payable if worked by hydraulic sluicing methods.

Lees No.2 shaft was sunk midway between the above two. It passed through 1 foot of peat and 8 feet of sandy wash with pebbles and boulders up to 18 inches in size. The bottom was a soft mica schist sloping to the north west. The wash yielded fair prospects of cassiterite from top to bottom. The content was uniform throughout the wash and the ground is probably payable.

The cassiterite in the above three shafts was black in colour and similar to that in Webber Ck. It occurred as pieces up to one eighth of an inch in size but generally about one sixteenth of an inch.

In addition to the above many of the small creeks such as Martin Ck. Rule Ck. and numerous others as far north as the Navaho Creek all yielded small amounts of cassiterite from prospect holes. It was in Rule Creek that J. Lowe, when prospecting in 1926, discovered small quantities of cassiterite. He was not sure of the mineral being cassiterite and did not carry his operations further, not only on account of the above fact, but also because it was the wet season and unsuitable for prospecting satisfactorily. As far as can be ascertained this represents the first discovery of tin ore in the district.

It is evident therefore that not only is the flat along Raphael Creek tin-bearing but that numerous other creeks must have carried tin ore into the flat of the Ray River near its head.

The ore in these creeks must be shed from veins in the schists on the eastern flanks of the Bathurst Range. None of these veins were actually discovered but on the southern bank of the Rule Creek coarse pieces of cassiterite attached to quartz could be picked up on the surface, while half a pound of tin ore could be washed from the surface soil. This undoubtedly indicates a vein of quartz and cassiterite which could be readily located by trenching. Other similar occurrences may be located by careful prospecting. It is to be noted that the tin ore from the above vein is greyish in colour and quite different from the black ore in Raphael Creek. Further the ore from the creeks entering Ray River appears to be a lighter colour than that in the veins. There is thus at least three types of ore present indicating probably three sources at least for it.

The Creeks between Navaho Creek, and the saddle at the north end of the Bathurst Range were not tested, but small quantities of cassiterite were obtained from several small ones on the south side of the saddle. Some of these drain into Moulter Bay and others into Melaleuca Lagoon.

The above descriptions show that tin ore occurs in the head of the valley of the Ray River, and in almost payable quantities in the alluvial deposits of Raphael Creek. The valley is therefore one which is well worthy of being prospected. It is suggested that the flat country and terraces along the Ray River and its tributaries be tested first as far north as the gorge, then if results are favourable the flats between the gorge and Moulter Bay should be tested.

(6) Melaleuca Lagoon Area - It has already been referred to above that some of the creeks entering this Lagoon yielded prospects of tin ore. While only a small amount of testing was carried out, it is certainly suggestive that the flat country around the lagoon may contain tin ore, and is therefore worthy of being further prospected.

Conclusions

The most important result arising out of the geological examination of the Port Davey District was the discovery of what may prove to be a new tin field. This field comprises possibly the whole of the valley of the Ray River and perhaps Melaleuca Lagoon.

The presence of tin ore has been proved by prospecting the creeks and sinking three shafts in the shallow part of one of the flats. The results of this testing are such that the field is recommended as being worthy of further prospecting.

Its future depends upon the result of such prospecting.

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28th March, 1928