

GEOLOGY OF THE PORT DAVEY DISTRICT.1. DISTRICT EXAMINED.

The district examined include the greater portion of the country between the southern shores of Port Davey and the western and southern coasts of the State from Port Davey as far east as Red Point (east of Cox Bight). Certain localities on the northern shores of Port Davey and the Old River as far as its junction with the Solly River were also examined.

2. 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 northwards 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), Spiro Range etc., until finally the highest such as the Arthur Range (3668 feet). Ironbound Bluff (4000 feet) occur. To the north of Port Davey the most prominent are Mt. Berry (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).

The inlet of Port Davey is a fine example of a drowned river valley.

3. GEOLOGY.

(a) SUMMARY. - The oldest rocks of this district are the Proterozoic schists which occupy a very large proportion of the surface. Small intrusions of granite occur in the above and are referred to the Devonian period.

Small thicknesses of gravels of Pleistocene to Recent age overlie the above, while Recent alluvium is forming along the course of the present streams.

(b) PROTEROZOIC SYSTEM. - 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, an increase of which 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 light or dark in colour according to the mica content (muscovite

or biotite). Graphitic and possibly talcose 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 conglomerates show large differences in strike as they are followed along the outcrop. From Mt. Berry to Mt. Misery the strike is north and south. The rocks then trend to the south-east through Mt. MacKenzie to Balmoral Hill, but cannot be traced further.

(c) 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, felspar (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 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 schist and it would appear that the granite intrudes the schists.

On account of its intrusive nature and the association of 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.

(d) 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 grains 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 and as being related to the Pleistocene glacial epoch. The gravels represent deposits from numerous small streams flowing from the adjacent hills. Small fan deltas were built around the locality where the streams emerged onto the more level country at the foot of the hills. The small streams and gullies were closely spaced and the deltas coalesced with adjacent areas eventually giving the sloping plains. During periods of less rainfall,

the beds of sand and peat were formed, the latter by button grass growths while deposition was not active.

(e) 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.

#### 4. GEOLOGICAL HISTORY AND DEVELOPMENT OF PHYSIOGRAPHY.

It would appear that the district has been a land surface since the close of the Proterozoic sedimentation as no later sediments are known except the Pleistocene gravels of fluvial or glacio-fluvial origin. It is possible that Cambro-Ordovician and Silurian sediments were deposited over the district and were later completely removed by denudation.

During the Devonian period, large intrusions of igneous magma occurred throughout Tasmania. In the Port Davey district the intrusions were of granite magma and the crystallisation of which resulted in the granite at Cox Bight and South West Cape.

In almost every part of the State marine and fresh water sedimentation occurred during the Permo-Carboniferous Period and estuarine to lacustrine during the Triassic Period. There is now no evidence of such near Port Davey and if rocks of these systems existed they have since been entirely removed by denudation.

The district has remained a land surface from the close of the Triassic sedimentation (if such occurred). The geological events and in particular the development of the physiography since the Triassic are not known with certainty. The topography existing during the Pleistocene was apparently similar to that of today and a very youthful one. This perhaps suggests considerable relative elevation of the land prior to the Pleistocene.

During the Pleistocene, shallow thicknesses of gravels &c. were formed under fluvial or fluvio-glacial conditions on the more low lying country at the foot of the mountains.

In post-Pleistocene time relative depression of the land or rise in sea-level to the extent of approximately 200 feet resulted in the formation of the drowned river valley of Port Davey.

Recent events include probably a slight elevation of the land to the extent of 10 - 20 feet resulting in the raised beach at Cox Bight.

#### 5. ECONOMIC GEOLOGY.

The minerals of commercial value which have been found in the Port Davey District include cassiterite, Molybdenite, wolfram, chalcopryite, stibnite and gold.

The only one, however, which occurs in deposits of economic importance is cassiterite in the alluvial deposits of Cox Bight and Ray River. The molybdenite, wolfram, chalcopryite, and stibnite (partly) occur in association with the cassiterite in the primary deposits of tin ore. Stibnite also occurs as narrow veins in the Long Bay District. Gold occurs in detrital deposits at Mt. MacKenzie.

(a) TIN DEPOSITS. - Tin ore occurs in both primary and secondary deposits.

- (1) Primary - The Primary deposits include greisen veins and quartz veins. The greisen veins are of the quartz greisen verging towards the quartz-mica (muscovite) type. Mica greisen veins occur to a less extent.

The quartz veins are of the normal reef quartz type.

The greisen veins are restricted to the granite. Quartz veins occur in the granite and also in the schists. The veins in the schists are restricted as far as is known to the eastern side of Cox Bight and the head of Ray River.

The cassiterite is generally much coarser in size in the quartz veins than in the greisen veins. In the veins at the head of Ray River it has a peculiar bluish sheen.

The Molybdenite, Wolfram and Chalcopyrite and stibnite are associated with the quartz rather than the greisen veins.

The veins are generally short narrow and erratic in values and none has been proved to be of economic importance. They have of course contributed the cassiterite occurring in the more important secondary deposits.

- (2) Secondary Deposits. These include the gravels of Pleistocene age at Cox Bight and the gravels formed along the courses of present streams at Cox Bight and Ray River. They have been worked at Cox Bight and have recently been prospected at Ray River. The depth of ground does not generally exceed 10 feet except on the west side of Cox Bight.

(b) STIBNITE - Narrow veins of stibnite occur in the schists on the eastern side of Long Bay. It is stated that a certain amount of stibnite was mined at this locality, but the excavations are small and only the traces of narrow veins are now visible.

(c) GOLD. - Small quantities of gold occur in the detrital and alluvial deposits in the gullies on the eastern flank of Mt. MacKenzie. Small quantities of lead were also found and although the occurrence is apparently natural it is not impossible that the lead has been derived from shot.

The origin of the gold has not been definitely proved as no primary deposits are known. The summit of Mt. MacKenzie is occupied by conglomerates and it is possible that the gold has been derived from these rocks.

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July, 1930.