

REPORT ON DISTRICT BETWEEN MAINWARING AND WANDERER RIVERS.(1) INTRODUCTION:

During the first half of 1935 a party of five men employed by the Mines Department and led by A. Stubbings was landed at Mainwaring River, with instructions to prospect an area between that stream and Wanderer River and to cut and mark out tracks suitable for access. Alluvial gold prospects were obtained in several streams, but only one small creek was found in which it was considered that payable concentrates were present. This creek had been worked to some extent previously but on completion of their period of employment the party re-sluciced the ground and obtained sufficient gold to show a profit.

Between February 2nd and March 16th of this year a geological reconnaissance was undertaken with the object of investigating the further possibilities of the district, with particular regard to gold.

In conjunction with this survey a prospecting campaign was carried out in the parts which had not previously been prospected.

(2) LOCATION & ACCESS:

The district is located on the west coast of Tasmania, half-way between Port Davey and Macquarie Harbour. It consists of a tract of country bounded on the west by the sea coast and on north and south by Wanderer and Mainwaring Rivers respectively. Inland the district extends to the east for a distance of ten miles and covers an area of approximately 90 square miles. On Mainwaring River boundary it joins Low Rocky Point district as mapped geologically by P.B. Nye in 1926.

Access may be gained in several ways -

1. From Strahan by boat to head of Birch Inlet, and thence by following Moore's (Birch Inlet to Port Davey in 1900) route in a southerly direction for a distance of 18 miles to a branch of Wanderer River.
2. From Fitzgerald along South Gordon track to junction with Marsden's Port Davey track south westerly along the latter to Huon Plains in vicinity of Scott's Peak, and then westerly by way of Jones (1881) route through Jones' Pass, across Doherty Ground and Rookery Plain to View Hill. From the latter the route turns northerly and passes over open country to the east of Moore Look-out, about the headwaters of Mainwaring River.
3. By means of small boats to Mainwaring River where landing is effected at the entrance in suitable weather only. Where quantities of provisions &c. have to be transported this is the best method of obtaining access to the district, but hire of boats is expensive and much wasted time is often experienced in transit, owing to unfavourable weather.
4. The coastal track from Macquarie Harbour (Double Cove) traverses the area and this portion was recently re-cut where it could be traced; otherwise a new track was formed. Outside the district this track, which was constructed between 1912 and 1915, is much overgrown and difficult to locate.

(3) PHYSIOGRAPHY:

(a) The Coast Line. - The sea coast is exceedingly rugged, being rock bound for the whole of its length with the exception of a few small sandy beaches at intervals, while numerous islets and reefs fringe the strand line. The erosive action of the sea has been the direct cause of the rough outline of the coast. It is found that the igneous rocks, being more resistant to erosion, stand out as headlands, while the sedimentary rocks which offer less resistance constitute the intervening bays and less rugged coast line.

Shelter for boats is absent along this coast except for a small cove at the entrance to Mainwaring River and this can only be used by small boats in calm and moderate weather.

(b) The Peneplain. - The surface of the district is represented by a peneplain, which has been raised considerably above sea level. The uplift appears to have been in the vicinity of 600 feet and the surface is now sloping gently westward to within $\frac{1}{2}$ a mile of the coast. It there becomes more steeply inclined for the last 150 feet of fall and at the headlands appears as cliffs from 100' to 150' in height. No hills rise above the plain surface and when viewed from the sea a general flat appearance is maintained throughout.

This peneplain is evidently an extension of what has been known as the Little Henty Peneplain, on the north side of Macquarie Harbour; and it extends southerly from the latter to within a few miles of Port Davey. In the region of Mainwaring and Wanderer Rivers it stretches inland for at least 15 miles, but narrows considerably south of Lewis River and gradually contracts to a width of from one to two miles at its southern confine.

In the district under review the country is densely timbered with myrtle, sassafras, gum etc. for 9 miles inland. In the upper reaches of Mainwaring River, and to a less extent in Wanderer River, Huon pine grows profusely. In numerous places a thick undergrowth of baura, horizontal and cutting-grass greatly impedes progress. Few trees flourish within a $\frac{1}{2}$ mile of the coast-line where the vegetation consists of a tangled growth of wind-blown shrubs and bushes. To the east the timber belt gives place to a wide zone of open button-grass and heathy country over which T.B. Moore located his route from Birch Inlet (Macquarie Harbour) to Port Davey in 1900.

(c) Drainage. - Drainage is effected by means of Wanderer, Mainwaring and Urquhart Rivers, Cypress Creek, Edwardsen Creek and numerous smaller creeks running in general west-south-westerly directions to the sea.

The streams have produced deep and steep-sided valleys which in several instances are cut down almost sheer for many hundreds of feet. The waters of Wanderer River, the largest stream, are both deep and wide and they flow slowly in deeply entrenched meanders at grade level for the last 12 miles along its course. A sand bar occupies the river mouth and at certain periods completely dams the outlet. Mainwaring River, next in size, is subject to tidal influences for a distance of two miles inland, and, like the Wanderer River, has penetrated the peneplain in sharply incised meanders for many miles.

Waterfalls are frequent occurrences in the beds of streams and are met with up to heights of from 10 to 20 feet in Mainwaring and Urquhart Rivers, Rhenben Creek, Edwardsen Creek and Fletcher Creek.

As the present cycle of erosion has only advanced sufficiently to produce deep steep-sided valleys a youthful topography is exhibited throughout the district.

(4) GEOLOGY.

(a) Sedimentary Rocks. - Cambrian:- The rocks ascribed to this period are the oldest occurring in the district and they also occupy by far the largest area. They consist of a series of slates, quartzites and schistose breccias. The slates are fine-grained and well laminated types which vary from almost black to grey and brown in colour. Generally the slaty cleavage is conformable with the bedding but in places it occurs at nearly right angles thereto. The quartzites consist of fine-grained slightly argillaceous types as a rule but more arenaceous and siliceous varieties are also present. The breccia beds are neither thick nor numerous, but wherever seen they occur as a distinct type. The matrix of this rock consists of dark coloured argillaceous material in which are set numerous whitish and flattened blebs of siliceous matter, giving a distinctly mottled appearance to the rock. It has a schistose structure and occurs interbedded with the slates and quartzites. The series is well exposed and outcrops with great regularity in strike along the greater portion of the coast line, and is also exposed to a less extent in the valleys of most of the streams. A few miles inland the argillaceous rocks in several places appear as schistose slates and chloritic and talcose schists interbedded with slates and quartzites. Though these may represent passage beds between the Cambrian system and the Proterozoic group it is thought advisable, as they appear to be conformable with the less metamorphosed strata as exposed along the coastal belt, to place them tentatively in the Cambro-Ordovician period.

In the valley of Wanderer River, at 5 miles in a direct line from the mouth, slate beds occur which are similar in lithological appearance to slates of the Dundas Series of slates, cherts and breccias as developed at Smithton, Magnet, and elsewhere. They are massive unclesed rocks varying from grey green to light brown in colour which on weathering break easily with a choncoidal fracture into small pieces. Another characteristic feature is a distinct black stain showing along certain planes of fracture. Pieces of chert and felspathic breccia similar to those rock types in the Dundas Series occur in the river gravels in this vicinity, but were not observed in situ.

The general strike of the series is from 310° to 360° although in several localities it is slightly to the east of north. In the main the strata dips at angles from 70° to 85° towards the south-west but dips to the east do occur.

Ordovician:- On the open country in the eastern part of the area occurs a thick series of quartzites with interbedded bands of conglomerates. The quartzites are distinctly arenaceous types and when weathered appear at surface as light coloured sandstones. The conglomerates which are white in colour consist of a siliceous matrix studded with numerous waterworn quartz pebbles. These rocks have a regular strike of 25° and dip to the north-west at angles from 25° to 30° . Lithologically the sandstones agree with similar rock types of Silurian age as developed in other parts of Tasmania. The low angle of dip, together

with the general north-easterly strike of these rocks, appears to mark a disconformity with the Cambro Ordovician series further to the west, and although no fossils or casts of any kind were found it is deemed advisable on lithological grounds to correlate the quartzites and conglomerates with the Tubicolar series of the Silurian system.

Pleistocene:- On the north side of Wanderer River, commencing at 6 miles from the coast a thick deposit of gravels occur over a wide area. They consist of rounded pebbles of quartz, sandstone, conglomerate and quartzite of various sizes from small pebbles to large boulders in different stages of consolidation. The deposit has a thickness of several hundreds of feet and extends northerly and easterly from the valley floor to the level of the peneplain. The general characteristics of the deposit, and the fact that little grading according to the size of the pebbles appears to have taken place, suggests that it represents a glacial moraine.

Along the coast line about $\frac{1}{4}$ of a mile north of High Rocky Point sandstones are well exposed on a cliff face to a height of 50 feet. The rock can be traced from 20 feet above sea level to a vertical height of 150 feet. It is a medium grained rock and consists mainly of quartz grains, together with minor amounts of comminuted shells. The rock is generally horizontally bedded but some cross bedding occurs. Many of the beds are well consolidated and stand out in relief, while others are softer and have yielded to the influence of weathering agents to a much greater extent. Originally this sandstone appears to have been a sand dune deposit, but has since been consolidated by infiltrating solutions and raised to its present position.

A somewhat similar occurrence is exposed on the face of a headland about 2 miles north-west of Mainwaring River where a small raised boulder bed appears on a cliff face at a height of 50 feet above the sea.

The boulders are waterworn and consist of dolerite and small pieces of quartz.

Recent:- Glacio fluxatile deposits in the form of gravels occur along the beds of Wanderer River and creeks flowing southerly thereto in the vicinity of the glacial morainal deposits. The gravels have been denuded from the latter and carried down stream by aqueous action during flood periods.

Thin layers of gravels and alluvium are being formed along the lower portions of the larger streams in the district and sand dunes occur in places along the coast line.

(b) **Igneous rocks:-** Devonian:- Numerous small dykes and several larger bodies of basic igneous rocks intrude Cambro Ordovician slates, quartzites, and schistose breccias.

The typical rock type is a dolerite but local variations in lithological character and composition occur. Slightly porphyritic varieties are present in some localities usually in the form of augite porphyrite or dolerite porphyrite.

The larger intrusive masses are exposed along the coast line from High Rocky Point to Wanderer River and between Mainwaring River and Rheuben Creek. Small dykes

occur at other points along the coast and in the vicinity of Mainwaring and Wanderer Rivers, Fletcher Creek and Edwardsen Creek.

Veins and irregular patches of reef quartz occur in various places through the rocks and extend outwards into the surrounding Cambro Ordovician sedimentary rocks. The latter are much indurated along the contact of the igneous rocks and in numerous localities along the coast line large blocks of partly digested slates and quartzites are included within the body of dolerite masses.

There is a general similarity between the dolerites of this district and those found near Smithton in the north-west of the State, even to the inclusion of small flakes of native copper and patches of epidote. At Smithton the dolerites are intrusive into the Dundas series of slates and breccias, and other similar rocks between Zeehan and Queenstown intrude Silurian rocks. These have been considered to be of Devonian age. In conformity with this designation the dolerites and porphyrites of Mainwaring - Wanderer River district are ascribed to the same age.

(5) ECONOMIC GEOLOGY.

(a) Primary Deposits:- Only one type of lode occurs in the district and is demonstrated by the presence of quartz veins traversing the Cambro Ordovician rocks, and to a less extent the dolerite intrusions. They are numerous along the coastal belt and in the central and southern portions of the district.

The great majority of these appear as gash veins, irregular bunches and large masses of quartz, which appear to be barren of economic minerals. However, several of the veins appeared to have more continuity than the remainder and these were broken into and samples obtained. After crushing and panning small specks of gold were obtained in three instances, details of which are as follows:-

1. On the east side of Horsburg Creek about 12 chains above the track crossing a quartz reef 2'6" wide is exposed at surface over a length of 2 chains. The quartz is the white milky variety showing much crystallisation. No minerals are visible to the naked eye, but at the northern end the quartz is honey-combed to a large extent and contains some iron oxide. The reef appears to be vertical and the walls consist of Cambro Ordovician quartzites. It trends on a bearing of 310° on which bearing, if continuous to the north, it should be visible in the bed of Horsburg Creek. Bedrock in the creek has been exposed by sluicing but the reef cannot be found at the expected point. A representative sample of quartz taken from the reef gave the following results by assay -
 * X Gold 0 oz. 3 dwts. 10 grs.
11. A much oxidised quartz reef, 15 inches wide is exposed in the track cutting on the northern bank of Rheuben Creek. Owing to a covering of soil and vegetation this can only be followed along the strike for a short distance. A sample of quartz and oxide of iron taken across the reef showed a trace of both gold and silver by assay.
111. On the steep northern slope of Mainwaring River valley, south of the track, at 1 mile and $\frac{1}{4}$ from the mouth, a quartz reef 12 inches in width was opened up over a length of ten feet. The strike

is north-north easterly and it dips to the north-west at an angle of 45° . It consists of white milky quartz and contains much earthy oxide of iron in cavities. On assay a clean representative sample of the material gave a trace of gold and silver.

(b) Origin of the Primary Deposits:- The primary deposits without doubt owe their being to the basic igneous rocks as exposed in the district. Mineralising solutions issuing from the dolerite and porphyrites during the final stages of their consolidation from the molten magma entered the adjoining slates, quartzites &c., and were deposited along lines of weakness which in most cases corresponded with bedding planes. To a minor degree the solutions were also deposited in contraction planes in the igneous rocks.

(c) Alluvial or Secondary Deposits:- These compose the gravels deposited in the beds of the present streams and are shallow and in no instance extensive.

Several prospecting campaigns including the one undertaken during the present examination have proved that gold in small quantities exists in alluvial deposits at numerous localities within the area. It now appears conclusive that with the exception of Horsburg Creek no payable concentrates of gold are present.

No other minerals of economic importance were encountered but the gold was found to be associated in the small quantities of ilmenite, and in one place with a little hematite and magnetite. with gravels/

HORSBURG CREEK DEPOSIT.

Location:- Horsburg Creek is a small south-west flowing tributary of Fletcher Creek crossing the coastal track about two miles south-south-east of Urquhart River mouth.

History:- In 1914 when the coastal track from Double Cove to Port Davey was being constructed Messrs. Horsburg and Stubbings were prospecting in the area. Inspector of Mines C. Curtain inspected their operations and reported that in the stream now known as Horsburg Creek they obtained prospects of gold equal to not more than one grain to the dish and that an area 33 feet long by 10 feet wide had been worked for 5 dwts. of good quality gold. It was stated that a vigorous experienced man might make two dwts. per day with possibility of improvement. No record of the total gold obtained is available. It is said that a man named Marks also worked the creek, but he may have been a member of Horsburg's party.

In 1928 J.E. Bulman and party prospected the area within a few miles of the coast line and although a little fine gold was obtained by dishing no workable concentrates were found

From May to November of last year a party comprising A. Stubbings, M. Fletcher, N. Pegg and J. Dale, tested numerous creeks in the western portion of the district. Fine gold was washed in a number of the streams but, with the exception of Horsburg's Creek, the results were discouraging. The old workings in Horsburg's Creek were re-sluciced by them and maiden ground further upstream was worked by ground sluicing methods. The party here obtained 16.9 ounces (fine) of gold in all.

Contiguous with the geological reconnaissance in February and March of this year all suitable streams were

tested which had not been prospected the previous year. Gold was proved to exist in a number of localities but in unpayable quantities only.

The Workings - These commence a few chains above the junction with Fletcher Creek, cross the track at 20 chains, and extend up Horsburg Creek for a total distance of half a mile. The deposit consists of gravels made up of waterworn pebbles of quartz, quartzite, slate and small amounts of dolerite. The average thickness of the gravels is 18 inches and the pebbles chiefly range from $\frac{1}{4}$ inch to 3 inches in size. The gold was generally confined to the main creek gutter and seldom extended for more than 10 feet laterally.

Bedrock is composed almost wholly of slates and quartzites but a narrow dolerite dyke crosses the creek below the track.

Much of the gold was found to have penetrated the weathered and softened slates and quartzites in the creek bed and this necessitated breaking into the rock surface for several inches to loosen the contained metal.

The bulk of the gold, occurring as ragged and slightly waterworn pieces of coarse grain size, was won from lower end of workings to vicinity of the quartz reef already described. The largest nuggets obtained from this vicinity weighed 43, 22 $\frac{1}{2}$, 22 $\frac{1}{2}$, 18, 7 $\frac{1}{2}$, and 5 dwts. respectively. Further upstream smaller amounts were obtained and the grain size was fine. Above the sluiced area colours of gold can be washed by dishing, but the deposit becomes unpayable to work.

Water supplies during rainy seasons were sufficient for ground sluicing purposes, but in dry periods the stream does not flow.

(6) CONCLUSIONS:

The geological reconnaissance of the district has shown that the rocks consist of Cambro Ordovician slates and quartzites etc., and Silurian quartzites and conglomerates and that the former are intruded by Devonian dolerites and porphyrites.

These conditions have proved favourable for the deposition of minerals and it is demonstrated that quartz veins carrying traces of gold and silver have been formed.

The examination has also proved the existence of shallow patches of alluvial gravels containing minute amounts of gold and that in one locality a deposit of coarse gold occurred and had been profitably worked.

In conclusion I would like to record my appreciation of the able and willing assistance rendered by Messrs. F. Edwardsen, Mr. Fletcher, and R. Fenton, as field assistants and prospectors.

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