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A BRIEF NOTE ON THE GEOLOGY OF THE COUNTRY IN THE VICINITY OF THE OLD HUMBOLDT MINE

INTRODUCTION:

These notes were prepared after a brief examination of the old workings of the mine, from May 10th to the 14th 1939, in connection with an application for financial assistance under the Aid to Mining Act, 1927, to further propsect the mine. In the course of the examination, the opportunity was taken to examine the country in the immediate vicinity, as far as was practicable; altogether an area of approximately four square miles was examined.

PREVIOUS LITERATURE:

The only Departmental report available on this mine is one prepared by W.H. Twelvetrees early in 1908, the then Government Geologist, in the course of a Geological exploratory expedition, in connection with the proposed Great Western Railway; this report was published in the Annual Report of the Secretary for Lands 1907-8.

In 'Osmiridium in Tasmania' - Tasmanian Geological Survey Bulletin No. 32, 1920, A.M. Reid makes brief reference to the Humboldt area in dealing with the osmiridium deposits of the Gordon River district.

LOCATION AND ACCESS:

The Humboldt mine is situated at the foot of an eastern spur of the Needles , or Mt. Mueller, approximately five miles west-north-west from the Kallista railway station which is at the head of the Derwent Valley line, about 60 miles from Hobart.

Access is not difficult and the mine can be reached in many ways. Probably one of the easiest ways at the present time would be by way of one of the numerous fire-control tracks cut from the main Adamsfield pack-track by the Forestry Department in recent years, either the one just west of where the western end of the short cut across the Sunshine Spur meets the main pack-track or the one (F.D.11) about one mile west of Chrisp's Huts.

The original pack-track to the mine from Tyenna has been cleared for a distance of approximately four miles beyond Kallista, about half way to the mine; beyond this the track is passable only with difficulty.

The route taken by the writer was by pack-horse to Churchhill's Hill, about ten chains west of Badger Creek, along the Adamsfield track, about twelve miles from Junee. The horse could not be taken beyond this, so equipment and supplies were then man-packed to the mine a distance of approximately four miles. From the peg marking the turn-off, the staked track turns south easterly up a button-grass ridge, which runs for nearly three-quarters of a mile from the Adamsfield track. Here the track enters a belt of horizontal scrub extending for little more than a quarter of a mile. Emerging from the scrub high up the valley, the track, by way of a sideling around the northern side of the head of the valley and then across a button-grass plain,

continues to the Needles divide, between Mt. Stephens (Tim Shea) and the Needles or Mt. Mueller, to connect with Innes' (1896) old track from Tyenna to the South Gordon. From the divide it is about half a mile to the Government hut. It is, then, only one and a half miles to the mine; the track follows the creek down for a short distance and crosses the creek to climb over a quartzite ridge, then down to the valley. This latter part of the track being the most difficult to follow owing to the regrowth of scrub and fallen timber.

PHYSIOGRAPHY:

The area is one of high relief, consisting as it does of a glacial valley, encircled on the northern, western and southern sides by Mounts Stephens (Tim Shea) and Mueller (or the Needles). Mount Stephens rises to a height of 2,900 feet while Mount Mueller is at least 700 feet higher.

The present configuration of the area is due to faulting and differential erosion modified to some extent by Pleistocene glaciation.

The drainage is effected by a small stream which rises in the Needles Saddle and forms the northern branch of the Russell Falls River, uniting with the southern or main branch about three quarters of a mile north of the Kallista railway station.

GEOLOGY:

The whole of the rocks exposed within the area examined are sedimentary and without exception are unfossiliferous. Therefore, as there is no direct evidence of precise age, the tentative age, assigned to the various series represented, is based on purely lithological grounds with the exception of the Mt. Stephen congolomerate which unconformably overlies the slate and quartzites.

PROTEROZOIC:

Two areas of rocks assignable to this era occur within the area; one on the western side of the Needles and the other a narrow but persistent bar extending from a ridge north of mineral section 10931/M across the valley to Mt. Stephens. The former occurs in faulted relationship with the quartzite and slate series described below as Cambrian while the latter appears to be wholly enclosed within the same series of rocks - an inlier.

The rock types are typical white quartzites and quartz schists which show regional metamorphism to a marked degree; the strike is roughly meridional with a high angle of dip westwards.

CAMBRIAN:

With the exception of the small areas of Proterozoic and Silurian sediments, the whole of the rocks within the area are referrable to this system. The age of these rocks is based on the palaeontological evidence of trilobites found just north of the area being examined, although lithologically, there is a strong resemblance to

the Dundas series. In view of the lack of any direct evidence of age other than that they are older than the Mt. Stephens conglomerate, thought to be basal Silurian, there appears no justification for regarding their age as being otherwise than that already assigned to them.

The rocks consist of buff to chocolate-coloured slates and greyish quartzites; the general strike is north-west; ranging from N 35°W to N 80°W, with dips from practically vertical to very high angles to the north east.

The quartzites occur in close proximity to the major faults of the area and appear to be an intense silicification of the original slate series as a final phase of mineralisation, suggesting that the faulting was probably contemporaneous with the granitic igneous intrusion (not exposed in this area) and, therefore, pre-mineralisation in age, which, in keeping with occurrences elsewhere in the State, is regarded as being Devonian.

SILURIAN:

The rocks referred to this system occur on Mount Stephens unconformably overlying the Cambrian slates and quartzites and also on the western side of Mount Mueller in probably the same relationship. They are reddish, fine-grained conglomerates and coarse grits; although regarded as basal Silurian they are not the typical West Coast Range Conglomerate series. The strike is generally north east with the dip to the north west at relatively low angles.

PLEISTOCENE:

The valley fill consists of tillite and morainal material deposits at successively higher level by the retreating glaciers. Large erratics of rocks occurring within the area are scattered around.

ECONOMIC GEOLOGY:

The mine workings have been described in detail by Twelvetrees (1908) so that only the work that has been undertaken since then will be described. The amin adit, on section 6004/M, described by Twelvetrees (1908) has collapsed and was inaccessible; the bush fires of 1929 have burnt several sets of timber near the portal causing the collapse.

The shaft was dry, but was not examined owing to the lack of travelling facilities; an examination of the spoil dump showed only ferro-manganese gossan. The occurrence is of such limited extent that even if it did carry appreciable amounts of gold it is extremely doubtful whether sufficient tonnage could be proved to warrant the cost of a treatment plant. As pointed out by Twelvetrees there is no connection between the relative size of the gossanous body and sulphide body from which it most assuredly was derived. Therefore, there is no reason to believe that the sulphide vein would be bigger than those already exposed; that they are very limited in length is apparent by the fact that extensions have not been located on the other side of the ridge.

The only new work is a shaft that has been sunk about ten feet in purely slate country with no evidence of mineralisation at all; this is located on top of the ridge

a few chains north of the junction of Innes' (1896) track with the mine pack-track from Tyenna. It is impossible to visualise the purpose of this work.

The only other work, that could be seen, was a short adit that has been driven on a series of veins on Slide's old reward section, recently held as mineral section 10931/M - 40 acres, by F. Peacock and T.G. Marshall.

The adit has been driven a distance of approximately 45 feet on a bearing of north 60° east, then for another 15 feet on a bearing of south 70° east; it was driven on a series of five narrow quartz-siderite veins; practically no metallic minerals were observed, the only ones being pyrite and a little chalcopyrite. The slates between the veins are intensely silificied and are almost cherty.

The veins strike north 80° east and dip at a high angle; the maximum width of any one vein is three inches while the maximum width of the whole series is 30 inches.

CONCLUSIONS:

From the nature of the veins they appear to represent the extreme limit of mineralisation, that is, in the zonal arrangement of ore-bodies around a granite massif, the type which occurs at the greatest distance from the centre; therefore, unless conditions are extremely favourable, the occurrence would be of limited extent.

It is apparent that the veins exposed are too narrow and low grade to be of economic importance and, in view of the nature of the deposits, further work in the hope of locating richer and bigger veins cannot be justified.

The ferro-manganese gossanous body also is of such limited extent that further work in attempting to develop it would be futile.

Q. J. HENDERSON,
A/GOVERNMENT GEOLOGIST.

Mines Department,
HOBART.

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