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THE WELCOME HOME COPPER AREA, VICINITY OF THE DOVE RIVER

Introduction:

With the object of determining the possibility of locating new ore positions and probable extensions of known occurrences in this zone of mineralization, a detailed geological examination was undertaken during November last year. Furthermore, consideration was to be given to the more purely geological factors which have a vital bearing on the supplies of ore and methods of prospecting.

The area under review is located about a mile south-east of the south-west corner of the old Middlesex Plains Block of the V.D.L. Company and approximately three quarters of a mile north east of the junction of Pencil Pine Creek and the Dove River. It is connected with the main Moina-Cradle Mountain Chalet road by means of a rough, badly graded, bush road, a distance of about two miles; grades of approximately one in ten exist in the vicinity of the prospect.

Physiography:

The area is one of high relief consisting as it does of a deeply dissected peneplain, modified by intense block faulting. The Dove River flows through the area in a general north-easterly direction, entrenched in a narrow gorge at least 200 feet deep topped with steep hills which rise a further 600 feet with very precipitous banks. Fault scarps abound particularly on the western side of the river generally with a meridional trend.

The plateau country is open button grass plains with occasional clumps of peppermints and scrub while along the gorge to the north it gives way to almost impenetrable horizontal scrub.

Geology:

For the purpose of this report the area may be regarded geologically as consisting of members of a great series of micaceous, quartzitic and argillaceous schists, which are apparently conformable throughout.

Quartz schists represent the bulk of the rock exposed and usually consist of dense, fine grained rock, which in places assumes the appearance of a greatly contorted, thickly bedded, white opaque coloured type. Intercalated with the quartz schist member are thinner beds of the argillaceous siliceous and micaceous type. They range in colour from grey to black although shades of grey dominate. The lenticularity of these intercalated beds is most pronounced.

This series of rocks is folded into a series of long, roughly parallel folds, the axial direction of which is approximately east and west. Sharper folds are observed where the intercalated thinly bedded members occur while the massive quartzite offers greater resistance to deformation. The dip of the beds is variable according to their position in relation to the folds and the disposition of the block faulting.

No igneous rock, which could be genetically associated with the ore deposition, is exposed in the immediate vicinity of the area examined; the nearest being approximately six miles north-east in the vicinity of the Devon mine where granite porphyry occurs; this rock is a hard siliceous rock, with a holocrystalline quartzo-felspathic groundmass in which are porphyritic crystals of biotite and turbid felspar and the usual crystals of quartz with rounded outlines.

To the west a thin covering of Tertiary basalt exists on the plateau.

Structural Geology:

Limited exposures prevent a complete picture of the geologic structure being obtained but sufficient facts were observed to substantiate the inferred general structure. The structure consists of a series of overturned folds, with east-west axes, modified by subsequent block faulting on a large scale; these faults are generally meridional and at least three, bold escarpments can be observed, with numerous minor faults, south-west from the Welcome Home prospect.

Apparently, at least two periods of faulting exist; one pre-mineralization or more probably contemporaneous with the Devonian granitic intrusions, the other accompanying the Mesozoic dolerite intrusions.

The transverse fissuring in which the ore veins occur is undoubtedly due to the Devonian diastrophism which accompanied the granite intrusions and the weaknesses developed then were further accentuated by the persistence of latter faulting to adopt the meridional direction.

The most important factor is the nature of the encasing rocks both as to physical character and chemical compositions. The massive quartzite and quartz schist are much more easily fractured than the relatively softer, dense, composite micaceous schists and consequently they provide more suitable loci for ore positions. The fractures are irregular but persistent.

Mineralogy:

The mineralogy of the veins indicates that they belong to the deep-seated, hydrothermal type and it should be noted that extensive copper deposits are rarely found under such conditions.

While copper is not the dominant metallic component it is the only one of economic importance. Pyrite is the most ubundant of the metallic minerals; pyrrhotite and haematite are plentiful, while chalcopyrite the only copper bearing mineral, apart from possibly some covellite of secondary origin, is quite subordinate.

There appears to be little evidence of mineralogical changes other than chloritization.

Prospecting and Development:

The prospects are located on mineral sections 15M/39 and 27M/39 each of 50 acres; they consist of an approximately meridional system of ore veins and impregnations. The main one, which is exposed in the banks of the Dove River, is known as the Welcome Home prospect. Most of the creeks are

subsequent and follow fracture lines with the result that should any mineralization follow such fracturing it is readily observable in the bare rock bottom of the creeks, the Cataract Creek prospect, which occurs about five chains south-west of the north-east corner of mineral section 27M/39 is one such occurrence.

The mineralization appears to be confined entirely to the north-south fissuring, although slight impregnation has taken place in the chloritised crush zones. They possess the distinctive features of vein fillings of true fissures, which existed previously to the introduction of the mineral-bearing solutions. The west wall of the fissures is clean and hard while the eastern one is not always so well defined. The sulphide masses are apparently lenticular in shape due to the influence of the intercalated micaceous beds; this is evident at the Welcome Home open-cut where in the vertical plane the vein has increased from a mere track to at least ten inches in approximately ten feet, while in the horizontal plane, the northern limit has not been reached but the southern end shows the pinching out of the lens and an abrupt turning to the west along the apical area of a fold. The total length exposed in these cuts is 84 feet, of which, at least half is occupied by the deep channel of the Dove River.

The vein as exposed consists essentially of pyrite, chalcopyrite, quartz and haematite with a well developed salvage of chlorite. Apart from the solid sulphide vein which strikes north east and dips east at 85° there is on the eastern side a chloritised crush zone about 15 feet wide on the northern side, diminishing to approximately 10 feet on the southern side; in this zone occur veinlets, facings on cleavage planes, blebs and impregnations of sulphide ore, but sparsely developed.

About a hundred feet north of the northern cut a small cut has made apparently on line, exposing splashes of pyrite, but it is, at least, 20 feet above the level of the lens exposed in the open cut and, therefore, serves only to indicate that the line of mineralization is persisting north, being too shallow to give any definite information as to the behaviour of the prospect in depth.

The Cataract Creek prospect is exposed in the bed of the creek which drops by way of a series of almost sheer cascades, at least a hundred feet to the river below; it is about 20 chains east north-east of the Welcome Home prospect.

The strike of the main fissure is north 20° east with a practically vertical dip. The chloritised crush zone is only four feet wide with very slight impregnations while the vein of sulphide is less than two inches in width. Although the fissuring is shown to exist over a distance of at least one chain only two places show any development of ore.

Other indications do occur in the immediate vicinity but no attempt has been made to prove their extent and value.

The only other prospect worthy of note is that occurring about one chain west of the Welcome Home prospect where a very narrow quartz chlorite vein with splashes of copper strikes north 25° west and dips easterly at 70°.

Regarding the quality of the ore it was deemed unnecessary, in view of the limited exposures of ore, to undertake a sampling campaign, until such times as the prospecting had reached a suitable stage.

It is reported that a bulk sample five tons forwarded by the Welcome Home Syndicate to the Mount Lyell Mining Railway Company Limited gave the following return:-

Dry weight:	4 tons 7 cwt. 1 qr. 25 lbs.
Assay:	Copper 4.21%, Silver 1.56oz. Gold 0.02oz.

Conclusions and Recommendations:

It is apparent as a result of the geological survey undertaken that the mineralization is almost wholly confined to generally north-south fissuring with slight impregnations in associated chloritised crush zones.

The limited exploratory work undertaken has failed to locate payable ore reserves and the future of the area depends entirely upon the proving of them, if any exist, by prospecting and development.

It should be understood that those deposits characterised by the presence of chlorite will consist of sulphides in a relatively larger proportion of barren rock although at a greater depth suitable conditions may have existed for the occurrence of massive mineralization. On this consideration therefore there is encouragement for testing at a greater depth.

At this stage in the development of the prospects it is too premature to consider any comprehensive scheme of development, as much prospecting and generally proving the extent and value of the vein system remains to be done before such a stage is reached.

Further prospecting is justified and should include:-

(1) Surface prospecting along the strike of the known veins to determine if any increase in width, to workable dimensions, occurs.

(2) Sinking to determine the behaviour of the veins in depth.

(3) Surface prospecting for other veins.

The area is not faviourably situated as regards means of communication, but the provision of ready means of access should be delayed until sufficient ore-reserves are proved to warrant such an outlay.

Q.J. Henderson,
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