

MANGANESE DEPOSITS IN THE VICINITY OF THE DIAL RANGE

LOCATION AND ACCESS -

Two localities in this district where manganese occurs, are known. The first is situated on the northern foothills of Mt. Duncan, an outlier on the eastern side of the Dial Range. It is on the south-eastern side of Dial Creek, just over 5 miles in a direct line, S.S.W. of Penguin.

A metalled road is followed for about 5 miles as far as Spinks' farm. From here a cart track continues to Dial Creek a distance of one mile.

Just across the Creek the track junctions with the old pack track from the Leven River to the Manganese Deposit.

HISTORY -

A Manganese Reward Lease was granted in 1908 to R.O. Jones. From 1915 to 1922 the lease was held by J. Payton and J. Revell; but little exploratory work was undertaken and only sample for testing were removed.

A lease of 10 acres 71M/38 was granted to A.C. Black and J.F. Debbins in 1928, and this is still current.

In 1939, some prospecting was carried on by A. G. Black, in the form of trenches, shafts, and open cuts.

The extent of this work is shown on the accompanying plan.

In 1919, the deposit was reported on by W.H. Twelvetrees, Government Geologist, in Mineral Resources Tasmania, No. 6. The only other report is by F. Blake - Report on Manganese Deposits, Dial Range, March 1940. (Typewritten Report, Geol. Surv. Tas.)

GENERAL GEOLOGY:

The rocks consist of an interbedded series of mudstones, breccias and breccia conglomerates of Cambro-Ordovician Age. These are overlain unconformably by the West Coast Range Conglomerates which form a capping on the mountains. Porphyries, massive and sheared, intrude these rocks.

The general strike of the beds is a little east of north and the dips of the Cambro-Ordovician rocks varies rapidly from nearly vertical to low angles to the south-west.

Within the boundaries of the lease no folds were observed due to the fact that the exposures are limited in extent, but sharp asymmetrical folds were observed in contiguous areas.

### ECONOMIC GEOLOGY:

Four separate bodies of Manganese ore are present on the lease. The largest of these is roughly elliptical in shape and is approximately 350 feet long and 200 feet wide.

The other three bodies are very small, but indicate trends from N.E. to S.W. The elongation of the ore bodies is roughly parallel to the strike of the beds, and as far as can be gathered the ore occurrences are associated with beds of breccia-conglomerates. The small deposits on the track near the eastern boundary of the lease suggest that the manganese ore is in the form of localised concentrations at the bases of the breccia-conglomerates of the Cambro-Ordovician Rocks. No prospecting has been done along the extension of these beds at these horizons so that no information is available concerning the possible recurrence of similar enrichments.

### PROSPECTING AND MINING -

Most of the prospecting has been done on the main ore body.

In open cuts Nos. 2 and 3 (see plan and section) thin limonitic bands and iron manganese seams partly replace the bedrock. The action of meteoric water on these is to concentrate the manganese near the surface, which becomes strewn by boulders rich in manganese.

The various mine openings show how the manganese-iron deposits replace certain bands of the breccia conglomerates and a diminution in the relative amount of manganese occurs in depth. The primary ore is essentially limonitic with a little manganese which increases in concentration near the surface. Most of the surface of the hill slope is covered by detritus rich in manganese, but the mine openings show this to be merely superficial.

The only additional prospecting since the lease was reported on by F. Blake (1940) is an adit driven from a small gully near where it is crossed by the pack track. This adit is 65 feet long, on a south-westerly direction. The portal is in a bed of breccia conglomerate dipping west at 45°. No manganese is observed on it here although the outcrop on the track one hundred feet to the south is probably on this bed. This adit is badly directed for effective exploratory work as it is at too oblique an angle to the strike of the beds and thus to the probable direction of continuation of the ore occurrences. If the adit is to be continued, the direction of the drive should be altered to north-west to intersect the probable continuation of the two bodies which outcrop on the track.

The workings on the main body for a distance of 220 feet in a general north and south direction. No. 1 open cut is the most northerly and is of two benches which have a total length of 81 feet, and a maximum depth of 14 feet. The excavation in clayey soil through which are distributed boulders of manganiferous iron. Near the floor of the opening are masses of breccia conglomerate which are partly replaced by limonite.

No. 2 open cut is 50 feet long with a maximum depth of twelve feet at the south end. This cut exposes manganese iron ores in limonitic clays, with much less manganese to the bottom of the cut.

A shallow trench extending 73 feet south of No. 2 trench shows similar conditions to the above, and is part of No. 3 open cut, which shows thin limonitic bands and iron manganese seams partly replacing the bed rock. In the north end of the cut, a shaft has been sunk to 27 feet, passing through the breccia conglomerate into the underlying mudstones at 18 feet. At the time of inspection, this shaft was partly filled with water and could not be examined in detail. Nearly 50 feet further south another shallow shaft also penetrates through the iron manganese ore beds into the underlying mudstones. It should be noted that the above workings are slightly oblique to the general strike, and there is an absence of prospecting at right angles to this direction.

There has been insufficient prospecting to form even tentative estimates of the total amount of ore that is available, but the evidence from the various cuts suggest lack of vertical extension of the ore.

#### GRADE OF ORE -

As there are no new exposures since Blake's sampling (1940) no useful purpose could have been served by collecting samples for assaying especially as there is obvious diminution of the manganese content at shallow depth.

The manganese content of available departmental assays of channel samples shows a range of 14% - 25% manganese, and 27% - 32% iron. Silica ranges from 9% - 17% and alumina 8% - 12%. The total moisture content varies from 13% - 15%. Picked samples indicated that by beneficiation the manganese content of the ore could be raised to at least 44% with 10% iron, 3% silica, 9% alumina and 14% moisture. Beneficiation of the ore could thus give a concentrate conforming to market requirements.

#### NATURE OF ORE -

The nature of the ore is the controlling factor in any scheme of beneficiation. Modern work on manganese-oxide minerals has demonstrated that X-ray powder photographs supplemented by chemical tests have proved to be the best means of identifying these minerals. The term psilomelane should not be used to refer to any hard massive unidentified manganese mineral, but only as a general term covering several distinct manganese minerals or mixtures of them. These minerals are now referred to as being of the psilomelane-type. All massive soft material of low apparent specific gravity not examined in the laboratory should be referred to as wad. Following the above nomenclature both wad and psilomelane type ores are present.

#### CONCLUSIONS AND RECOMMENDATIONS -

The present investigation indicates : -

1. That there are four distinct occurrences of manganese ore;
2. The ore bodies occur as concentrations in the breccia conglomerate.

Even the largest of these bodies has been insufficiently prospected to form estimates of the total amount of ore that is available. The evidence of the various cuts does not suggest that the ore extends to depth. Exploratory work to prove the extension of the bodies should be directed along the strike of the beds and down the dip of the beds, rather than by vertical shafts. The structural factors controlling the formation of the deposits are such that hold possibilities of repetition of similar ore bodies beyond the limits of the present lease.

#### RUSSEL'S MANGANESE PROSPECT

This area about one mile south-east of Mt. Duncan, is held under Prospecting Licence. It is situated on an old mineral lease No. 3240/93M on the spur of an incised meander on the Leven River. From the limited exposure and the rock types present, it exhibits close relationship to the type previously described at Black's.

#### PROSPECTING -

A shaft at least 20 feet deep has been sunk on a gossanous outcrop which contains some manganese ore. A shallow trench extends from the shaft.

In the shaft very little ore was seen and seams of limonitic iron and cellular quartz are more abundant than the seams containing manganese.

#### RECOMMENDATIONS -

It was recommended that further prospecting be undertaken in order to establish the true nature and extend of the deposit.

This could be best accomplished by cutting a series of parallel shallow trenches across the ridge. These would reveal the width of the ore occurrence, and the value of its contents, and would determine whether further prospecting is justified.

There appears to be structural relationship between this occurrence and Blake's Prospect, and there may be other occurrences along this general line, which may be revealed by further prospecting.

The intrusive porphyries which occupy part of this belt should be excluded from this search as the particular type of ore occurrence is closely related to the breccia conglomerates of the Dundas series.

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