REPORT ON A VISIT TO WESTERN NICKEL
by A.E. Aho in December, 1953.

INTRODUCTION

At the request of Mr. B.B. Greenlee, mine manager, the writer spent five days in discussing problems with R.F. Sheldon, mine geologist, and in trying to develop further ideas on the search for ore. Although there is much leeway in classifying the various rock types and consequently in mapping, Sheldon and the writer are in close agreement on the general treatment of the geology and on ideas of exploration.

ORE LOCALIZATION

There still does not appear to be any more concrete guides to finding new ore other than the following generalizations now in use:

1. Mineralized ultrabasics of varied composition.
2. E-W trending mineralized zones.
3. Enstatitite, and olivine-rich rocks found associated with ore.
4. Concentric patterns of rock variations, indicating zoned pipelike structures which may contain ore.
5. Blebs, patches, and stringers of sulfide especially along contacts where ore is expected.
6. Plunge of rocks associated with ore.

Although the geology appears rather patternless in plan, the structure in a vertical direction seems to be much more trustworthy, therefore more effort might profitably be directed toward determination of plunge of various rock types and of

known ore by determination of attitudes of contacts, by correlation of geology between the 2600 and 3550 levels and the surface, and by study of lineation.

Measurement of plunge of lineation in rocks and ore should give their plunge where there has been differential movement throughout the fabric of the rock or ore during emplacement. This linertion, although visible in places in the mine, can be studied best by cutting or grinding flat surfaces on oriented specimens and by statistical determination of grain orientation by means of a universal stage microscope. Oriented specimens were collected from the Pride of Emory and Brunswick orebodies for research on the applicability of lineation study in the hope that it may provide a basis for a systematized method of determining plunge, thereby saving blind drilling. At least $300 and two months of time will be necessary for this research; results will be provided as they become available.

Plunges of orebodies as worked out by the writer from mapping and drill-hole data are given below:

Brunswick #1 -- N 30°E @ 65° to 75°, parallel to diorite contact to south.
#5, 6 and 7 -- approx. vertical to perhaps steeply northward.
#2 -- N 20°E @ 60°, parallel to diorite contact.
#8 and 9 -- unknown, possibly 60° to NE.

Pride of Emory -- 50° to NE between surface and 3860 level, swinging to 50° NW below 3550 level, apparently following plunging nose of peridotite-pyroxenite contact.

1600 -- unknown, possibly 70° northwesterly if it follows the dicrite-peridotite contact.

1900 -- unknown, possibly westerly.

512 -- about 65° in a general westerly direction (NW to SW).

1370 sulfide body -- unknown.

Trail -- about 70° NNE if correlatable with surface showing.

Sulfidic enstatitite N of Brunswick #1 orebody -- strike N 40°W, dip 70°-80° NE.

BRUNSWICK AND PRIDE OF EMORY AREA

The Brunswick and Pride of Emory orebodies are parts of a steeply northerly-plunging assemblage of ultrabasic rocks which form the westernmost extension of the main ultrabasic complex. From drill-hole data and surface mapping it was found that the southern contact of this assemblage dips north about 80 degrees, the northern contact dips north about 50 degrees, and the western contact may dip west, indicating a widening body of ultrabasics at depth. Peridotites, pyroxenites, and scattered dioritic bodies form steeply northward plunging units within this ultrabasic mass. The orebodies, which are pipelike, parallel the plunge of these rocks and in places may follow contacts between different units of the assemblage.

The Brunswick # 1, 2, 5, 6 and #7 group of orebodies should be the first priority objective in exploration to depth for the following reasons:

1. They contain the largest amount of ore per vertical foot, occurring in several localities, therefore they hold more chance of tonnage and continuity to depth, as a whole, than does a single orebody like the Pride of Emory.

2. Enstatitite associated with these orebodies may provide a strong clue to their whereabouts at depth. Ore finding possibilities of favourable enstatitite west of Brunswick No 2 orebody on the 3550 level have not been exhausted.

Sheldon's idea of a curving crosscut on the sublevel appears to be the best way to explore for the downward extensions of these orebodies.

Since Brunswick No 8 and No 9 orebodies are identical, even to content of norite inclusions, they may be interconnected at depth although they have not been traced by drilling. They are so comparable in size, shape, grade, mineralogy, texture and distribution to the lenses of ore comprising the Pride of Emory orebody at some levels, that their possible downward extensions should not be neglected. It is hoped that study of lineation in and around them may reveal more about their plunge and where they might be found at depth.

The Pride of Emory orebody appears to be localized along a contact between peridotite and pyroxenite. This contact may be a favourable site for deeper exploration.

Open ground to the west of the Pride of Emory and Brunswick area should be staked soon before exploration results arouse the interest of other individuals. Ultrabasics are known to occur in Emory Creek valley in this vicinity. Ground to the east of the camp does not appear to warrant staking at present.

LOCALITIES OF SECONDARY INTEREST

1. The 1900, 1600, and 512 orebodies and associated mineralization are scattered in a westerly-trending direction within a northwest plunging complex of ultrabasic and dioritic rocks. All contacts that could be reasonably projected from the surface to the level of No. 1 tunnel dip 60 to 70 degrees

northwest. Some foliation in the dioritic rocks dips 70 degrees northwest, probably parallel to these contacts. As far as could be determined, the long axis of individual bodies of ultrabasic rocks and dioritic rocks plunge in this direction also. In the 1930's the orebodies, which were discovered by horizontal drilling from No. 1 tunnel, were assumed to plunge northeast but when drilled for in this direction they were not found. They probably conform to the fabric of the surrounding complex and therefore plunge in a general northwest direction. The diorite-crumbly altered peridotite contact along which the 1600 orebody lies may continue from the surface at elevation 4200 feet to the 2600 level at a dip of 70 to 80 degrees northwest. This may be a favourable locality for ore.

2. Some of the mineralization associated with the D pulse anomaly may plunge gently enough to overshoot the 2600 level so the ground north of the 2000N drill station may merit drilling sometime in the future. The local geology seems to support this possibility. Some of the rock of the surface showing resembles enstatitic ore of Brunswick No. 1 orebody and is bounded by common pyroxenite on the east and probably by coarse-grained peridotite on the west.

3. At some future date more drilling might be warranted on the perimeter of the ring of peridotite near the portal of the 2600 level, including the area of high response in E anomaly if geophysical interpretation supports this.

4. A 10-15 foot wide showing of rich-looking sulfides on the southeast corner of the Dolly claim might merit drilling next time a surface drill is conveniently available. The sulfide body is identical to ore of Brunswick No. 1 orebody but its downward extent is unknown. It is easily accessible and topography permits sufficient testing by means of very short drill holes.

5. In spite of low grade results of one drill hole, the magnetometer and pulse anomaly on the west side of the XYZ zone might merit further consideration if more work is planned in this area in the future. Dip of the anomalies as well as trend of outcrop in relation to topography suggest a tabular body of ultrabasics dipping west. An isolated orebody in this area would hardly be economic, unless it were very large.

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Other data and ideas on genesis of the ore and rocks are presented in a Ph.D. dissertation by the writer, a copy of which will be made available to Western Nickel.

Hans E. Hall