

composition of Laurentian and Keewatin. Quartz and great degree of chemical decomposition. Quartz and feldspars are the chief constituents, while chlorite and micas are more abundant in dark colored types. Calcite is seldom found except in the vicinity of veins and apparently did not play an important part in cementing the sand grains.

It has been stated³ that these rocks are the debris of Keewatin rocks and so play a similar role in formation of the ore deposits, especially in supplying the calcite gangue. The rocks are indeed of such a character that they represent more nearly than do some sediments the composition of the rocks from which they were derived. The very process of their formation, however, would remove some of the more soluble constituents in solution, thus making a deposit relatively inactive, since of more stable and less soluble constituents. Perhaps a more important cause of difference is that the acid igneous rocks of the Laurentian must have contributed largely to the Huronian sediments. It follows, therefore, that if, in virtue of their mineralogical composition, the Keewatin volcanics play an important role in the ore deposition, the Huronian sediments play the same role in but a minor way, if at all.

It is sometimes stated⁴ that there is reason for believing that much of the Huronian rocks is of volcanic origin, and represents consolidated ash. If this were true there would be doubtless present many constituents that are unstable in the zone of weathering. Permeating waters would cause many chemical changes, and resulting solutions would be important factors in ore deposition. The rock specimens examined, however, do not show fragments of glass nor minerals characteristic of volcanic tuffs, and there is no conclusive evidence of igneous material introduced contemporaneously with the Lower Huronian sediments.

There is evidence⁵ that some of these sediments are glacial deposits. Such material represents very closely the composition of the original rocks. The chief difference between these deposits and the Keewatin rocks would be in their disintegration (and consequently greater ease of decomposition) and admixture with debris of the Laurentian. The examination of a large number of unconformities shows that the basal conglomerate and the underlying surface are by no means similar to that of glacial deposits, while the regular gradation from feldspathic quartzite to the upper conglomerate beds is also not easily explained by that hypothesis. On the other hand, the boulders of the upper conglomerate may be the erratic deposits of drifting ice. It seems likely that glacial debris, if present at all, forms but a small proportion of the sediments.

These rocks then, although not extreme types of weathering, are composed largely of minerals that are stable in the zone of weathering and are far less active than the Keewatin volcanics in ore deposition.

Keewatin.—In Coleman Township this formation is chiefly represented by dark colored, fine grained, basic volcanic rocks. In Harris and in Tudhope there are outcrops of the same nature. Sedimentary types, as well as igneous, are represented at Larder Lake by the auriferous carbonates and at Temagami by carbonates and iron-bearing cherts. The writer has not yet seen cobalt deposits in diabase or carbonates where these are closely associated. This suggests that the volcanic rocks supplied elements other than the carbonate gangue.

The numerous rich veins in Keewatin at Cobalt are not far distant⁶ from the diabase sill, while in some cases a vein traverses both formations. The veins in Huronian are in no case more than a few hundred feet from Keewatin. On the other hand numerous areas of greywacke in contact with diabase where there are no Keewatin exposures have always proved barren, even though the diabase is known to be cobaltiferous, as at Lake Wendigo. The same is true of the feldspathic quartzites of Anvil Lake and James Township. The conclusion is that the Keewatin volcanics are an important factor in the ore deposition.

Conclusion.—The ores originate in the diabase. While it has been shown⁷ that silver is deposited later than cobalt minerals, the occurrence in aplite indicates that there was no great time interval. Keewatin volcanics assist in the ore deposition, while the Lower Huronian sediments are relatively inactive. The part played by the Lower Huronian is primarily that of a recipient for the ores, and, by virtue of their regular vertical jointing, they carry more valuable deposits than do the irregularly fissured Keewatin rocks.

Prospecting should be fruitful in areas which show Keewatin volcanics in association with the Diabase sills, and especially so where Lower Huronian sediments are also present. There is little doubt that there are many such occurrences between Lake Temiskaming and Lake Huron.

References.

- ¹Lane, A. C. Geol. Rep. Isle Royal. Mich. VI. Pt. I., pp. 219, et seq.
- ²Lawson, A. C. Bull. No. 8 Geol. Sur. Minn., p. 47.
- ³Van Hise, C. R. Jour. of the C. M. I., X., 1907, p. 51.
- ⁴Bell, R. Jour. of the C. M. I., X., 1907, p. 63. Miller, W. G., Rep. Bur. Mines, Ont., 1905, Pt. II., pp. 47-48.
- ⁵Coleman, A. P. Jour. Geol., XVI., 2., Feb., 1908.
- ⁶See Prof. Miller's map of Cobalt area.
- ⁷Campbell, C., and Knight, C. W., Econ. Geo., I., 1906.

THE CHAMBERS-FERLAND MINING COMPANY'S PROPERTY.

A long protracted dispute as to the ownership of the Chambers-Ferland property was settled last year. The title was secured to the present owners; but the government imposed a royalty of 25 per cent. on the future output of the mine. Last summer a certain amount of surface prospecting was performed. Otherwise, beyond two shafts now being sunk, there is no development work done.

The organization of the Chambers-Ferland Company and the announcement that shares are soon to be placed upon the market, have created much interest. Following hard upon the heels of the La Rose flotation, Chambers-Ferland will undoubtedly receive much attention.

Because of this, the "Canadian Mining Journal" has got together all available information and, is presenting it to its readers, with the object of giving them as impartial an account of the property as it is possible to obtain.

The holdings of the company comprise 124 acres practically surrounding La Rose. As will be seen by the cut accompanying this article, the property is bounded on the south and east by La Rose extension, on the southeast and north by the O'Brien and La Rose, on the west and south by the Right of Way, Nipissing and O'Brien mines.