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PRELIMINARY REPORT ON HARVENG LAKE AREA, (WEST HALF), NEW QUEBEC

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PRELIMINARY REPORT

ON

HARVENG LAKE AREA (WEST HALF)

NEW QUEBEC

BY

ROBERT BERGERON



QUEBEC
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PRELIMINARY REPORTONHARVENG LAKE AREA (WEST HALF)NEW QUEBECbyRobert BergeronINTRODUCTION

The west half of Harveng Lake area, examined during the summer of 1955, covers approximately 160 square miles and is bounded by longitudes $69^{\circ}45'$ and $70^{\circ}00'$ and by latitudes $58^{\circ}15'$ and $58^{\circ}30'$. The centre of the area is located approximately 55 miles west of Fort Chimo airport and about 16 miles south of Leaf bay, a stretch of water on the west side of Ungava bay.

The work described in this report represents the northern continuation of a geological survey carried out in 1953*.

Geologically, the area forms part of the "Labrador Geosyncline". The bedrock consists of a series of highly folded sedimentary and volcanic rocks intruded by basic sills. All the rocks are of Precambrian age.

The northeastern part of the area is only 200 feet above sea level but elevations increase to 950 and 1,000 feet above sea level toward the south. The topographic features of the area are a direct reflection of the nature of the underlying bedrock. The central portion of the southern part of the area is a plateau supported by volcanic rocks. Gabbro produces a parallel arrangement of elongate ridges whereas sedimentary rocks occupy the intervening valleys. The bottoms of these valleys are occupied by numerous oblong lakes, thus providing easy access to the area by hydroplane. All the drainage is toward the north into Leaf bay.

Glacial deposits, probably morainic, are exposed in the valleys and they also largely blanket the northern portion of the area under examination. A branching system of eskers parallels the east bank of Harveng river. Measurements made in the map-area indicate that the direction of movement of the last advance by continental glaciers was approximately N. 40° E.

GENERAL GEOLOGY

The consolidated rocks of the area occupy more than 40 per cent of the land surface. The oldest rock is a dolomite which is overlain by a thick shale-sandstone sequence whose deposition was interrupted by the

*Bergeron, Robert, Preliminary Report on Gérido Lake Area, New Quebec, Que.
Dept. of Mines, P.R. 291 (1954).

eruption of lava flows that attained a thickness of about 2,300 feet. Gabbro sills are abundant in the sedimentary rocks but are relatively rare within the lavas.

Table of Formations

Pleistocene	Morainic deposits, erratic blocks	
	Gabbro	
Precambrian	Volcanic rocks	Ellipsoidal and massive lavas Volcanic breccias
	Sedimentary rocks	Shales, siltstone, argillite, iron formation, sandstone, dolomitic rocks, phyllite, slate, chlorite schist
	Dolomite	

Precambrian

Sedimentary rocks

The sedimentary rocks may be divided into two formations. The older, a dolomite, is known as the "Abner Dolomite", a name applied by geologists who had previously examined the region south of Leaf bay. It is a massive, whitish rock with a characteristic light grey or buff weathered surface. Quartz veinlets are present as are disseminated secondary quartz grains, which impart a rough weathered surface to the rock.

The upper formation is a shale-sandstone sequence containing some bands of dolomite and iron formation. This formation is particularly well exposed along Larch river, south of the area. The name "Larch Formation" was applied to these rocks during the course of earlier investigations*. The most abundant rocks in this formation are shales, argillites, and siltstones. They are grey, green or black. Under the effects of regional metamorphism these rocks become converted, from south to north in the area, to slates, phyllites and chlorite schists. Muscovite and biotite schists are of scattered distribution. Impure grey quartzites, finely laminated grey or green sandstones, dolomitic shales and sandstones, and iron formation are locally interstratified with all of these rocks.

*Bergeron, Robert, A Study of the Quebec-Labrador Iron Belt Between Derry Lake and Larch River; Doctorate Thesis, Fac. Sc., Laval University, Quebec, 1954.

The iron formations are normally only ferruginous lenses within the other sedimentary rocks. On the other hand, a narrow band, six or seven miles long, outcrops about a mile and a half west of Avoine lake. It is composed of strongly magnetic ferruginous shales containing beds of reddish quartzites, which probably represent recrystallized jaspers.

Disseminated sulphides speckle the cleavage surfaces of the shales and phyllites at the contact with gabbro sills. In a few places the sulphides have replaced more than 50 per cent of the sedimentary rocks.

Volcanic rocks

Volcanic rocks are abundant in the southwest corner of the area. They are intermediate or basic flows composed essentially of altered feldspar, tremolite, and chlorite. Massive and ellipsoidal types are present.

The massive flows are the more plentiful. Their color is variable, ranging from greenish-grey to dark grey. They are of fine to coarse granularity. It is often impossible to differentiate the coarse lavas from the gabbro sills and it is very possible that the rocks mapped as volcanics include some sills.

The ellipsoidal flows are fine or very fine grained, grey-green or dark green in color. The diameter of the pillows ranges from one to 20 feet, but the average diameter is approximately three feet. Each pillow exhibits a chilled margin of approximately one-half inch in thickness.

The tops of individual flows are often characterized by the presence of breccias or scoriae so that it is often possible to measure their thicknesses. They normally measure between 20 and 50 feet thick. A few of them attain 200 feet in thickness. Although a few of the flows consist entirely of pillows, it is more normal to observe a narrow zone of pillows at the bottom and top of each flow, the remainder being massive.

The breccias consist of angular fragments, some four or five inches in length, set in a finer matrix of the same material, accompanied, in some places, by scoriae. The fragments and matrix are of similar composition to that of the lava flows.

Near the contact with the blotchy gabbro, some of the volcanic rocks are porphyritic. They exhibit crystals or crystal aggregates of altered feldspar with maximum diameter of approximately one inch. These phenocrysts never constitute more than five per cent of the rock.

Gabbro

Numerous gabbro sills have intruded the sedimentary rocks, but only a few have invaded the volcanic rocks. The gabbros possess variable granularity, ranging from nearly aphanitic to pegmatitic. The sills range from 20 to 3,000 feet in thickness, but it is certain that the thicker sills are the result of multiple intrusions, as suggested by the presence of fine-grained zones and of sedimentary rocks therein.

The gabbros are light grey to black in color. The most common are actinolite gabbros. The other principal mineral constituents are altered feldspars, a pyroxene, chlorites and, occasionally, bluish quartz.

A quartz-and-feldspar rich gabbro occupies the entire length of the east wall of the valley occupied by Soucy and Moineaux lakes. The contact between this rock and normal gabbro is gradational. It seems as though the rock is a product of granophyric differentiation within a thick sill.

The actinolitic gabbros grade locally into dioritic rocks containing approximately 60 per cent light-colored feldspar. These latter rocks normally occupy the central portion of certain sills.

Blotchy gabbro

This rock is important because it is related to the sulphide mineralization that has aroused considerable interest in the area. It is a dark gabbro of coarse granularity characterized by crystal aggregates of altered feldspar measuring from one-half inch up to 10 inches in diameter. The average diameter, however, is approximately one inch. In several localities these aggregates make up more than 50 per cent of the rock. Locally, the number of spots diminishes and the rock becomes a deep-blue, coarse gabbro, consisting of at least 60 per cent labradorite.

Locally, the matrix of the mottled gabbro has been replaced by pyrrhotite, pyrite, and chalcopyrite. Also present is a slightly micaceous pyrrhotite which is suspected of being nickeliferous.

The mode of formation of this gabbro is still obscure. Nevertheless, the observations made to date indicate the possibility of the rock being a glomeroporphyritic gabbro, that is, a gabbro enclosing clusters of phenocrysts.

STRUCTURE

Folds

A syncline overturned to the west forms the major over-all structural feature of the area. The fold axis trends north-northwest plunging approximately 30 degrees to the south-southeast.

The eastern portion of the area mapped is occupied by an intensely folded sequence of sedimentary rocks and thin gabbro sills but, on the scale of the accompanying map, it is not possible to show all the complexities of this structure. The rocks in this part of the area form part of the west limb of an anticline whose central portion is occupied by the Abner dolomite.

Faults and shear zones

Because the blotchy gabbro occupies, almost exclusively, the base of the volcanic sequence, it is felt that there is only one series of volcanic rocks in the area studied. Thus, it is believed that there is a triple repetition of the volcanic rocks through overthrust faulting in the southwest corner of the area. The rocks along these faults are strongly sheared. In addition to these major features, a large number of transverse faults were observed with a horizontal displacement that seldom exceeds a few tens of feet. The more important ones are shown on the map accompanying this report.

In general the schistosity is more or less parallel to the bedding in the sedimentary and volcanic rocks. Exceptions occur in those localities where the sedimentary beds attain thicknesses greater than a few hundreds of feet.

ECONOMIC GEOLOGY

Several mineralized zones have been discovered in the blotchy gabbro and, as a result, a large number of claims have been staked by the following mining companies: Ungava Copper Corporation Limited, Holannah Mines Limited, and Le Moyne Explorations Limited.

The mineralization consists essentially of pyrrhotite, pyrite, and chalcopyrite accompanied by a small amount of nickeliferous micaeous pyrrhotite. The sulphides locally comprise up to 40 per cent, by volume, of the rock.

The character of the mineralization suggests that it is of hydrothermal origin and that the fractures offered passages for the mineral-bearing solutions.

The investigations carried out to date by the various companies are described below.

Ungava Copper Corporation Limited

The main group of claims held by this company is located in the valley occupied by Soucy and Moineaux lakes. Diamond drilling operations were carried out in 1954. During the 1955 season the company holdings were further investigated by a magnetometer survey.

Holannah Mines Limited

This company controls several groups of claims, the majority of them lying in the southwest corner of the area. During 1955 the holdings were examined in detail and extensive trenching was done in the blotchy gabbro in order to sample systematically the mineralized zones.

Le Moyne Explorations Limited

During 1955 this company staked a large number of claims in the western part of the area and, during the summer of the same year, it made a detailed examination of the ground covered by those claims.