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PRELIMINARY REPORT ON THEVENET LAKE AREA (WEST PART), NEW QUEBEC

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PROVINCE OF QUEBEC, CANADA
DEPARTMENT OF MINES
GEOLOGICAL SURVEYS BRANCH

PRELIMINARY REPORT
ON
THÉVENET LAKE AREA (WEST PART)
NEW QUEBEC

BY

ROBERT BERGERON



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INTRODUCTION

The west part of Thévenet Lake area is located southwest of Ungava Bay and has an area of approximately 160 square miles. It is bounded by latitudes 58°00' and 58°15' and by longitudes 69°15' and 69°30'. The centre of this area is about 35 miles west of Fort Chimo airport, the latter being to the west of Koksoak river, some 32 miles upstream from its mouth.

The field-work of 1954 was a continuation of a programme of geological mapping begun in Ungava in 1953*. During the same summer of 1954, Sauvé** mapped the area immediately west of the one described in this report.

The many lakes of the area make it easily accessible to aircraft. A seaplane base is located on Stewart lake, some four miles northwest of Fort Chimo airport. Aeroplanes of various aviation companies fly to Fort Chimo from various parts of Eastern Canada.

Some ships of a maximum tonnage of 3,000 tons visit Fort Chimo during the navigation season, which is from mid-July to about mid-October.

Geographically, Thévenet Lake area is at the southern limit of the "Barren Lands", where the ground is fairly thickly covered with moss. The main valleys are occupied by a few stunted trees.

*Bergeron, Robert, Preliminary Report on Gériido Lake Area, New Québec; Dept. of Mines, Que., P.R. No. 291 (1954)

**Sauvé, Pierre, Preliminary Report on Gériido Lake Area, (East Part) New Québec; Dept. of Mines, Que., P.R. No. 309 (1955)

From the geological point of view, the area mapped during the summer of 1954 is almost entirely, or entirely, within the eastern part of the "Labrador Trough" where sedimentary and volcanic rocks were injected by concordant masses of basic intrusive rocks.

TOPOGRAPHY

The area has the typical topography of the Labrador Trough where the main topographic features are a faithful reflection of the geological pattern. Gabbro sills and volcanic flows form elongated hills, whereas sedimentary rocks occur in the valleys. The hills of the area are, however, more rounded than those of the adjoining areas to the west. The maximum relief is about 1,050 feet but local differences in elevation are not much more than 400 feet.

Glacial and fluvio-glacial deposits mantle the lower parts of the area. Three large eskers were observed.

The area drains toward Koksok river to the south.

GENERAL GEOLOGY

The consolidated rocks of the area are exposed over more than 30 per cent of the surface which is not covered by eskers. They constitute a group of metamorphosed sedimentary rocks and altered lavas intruded by numerous gabbroic sills. This group is in contact with hornblende-biotite and granitic gneisses in the northeast corner of the area.

Table of Formations

Pleistocene	Moraines, erratics		
Great unconformity			
Precambrian	Gabbro		Hornblende-biotite gneiss, granitic gneiss
	Volcanic and metamorphosed sedimentary rocks	Massive and pillow lavas Volcanic breccias Argillites, phyllites, mica schists, iron formations, crystalline limestones	

Precambrian

Sedimentary rocks

Rocks of sedimentary origin are found as bands alternating with the gabbro sills and lava flows. These rocks show, from west to east, a progressive increase in grade of metamorphism from argillites to cyanite mica schists.

The argillites are dark grey, massive rocks with well developed cleavage. The original bedding is difficult to find. When present, it is made evident by a fine lamination or the presence of concretions. The argillites are exposed mainly in the centre of the syncline in the northwest corner of the area.

To the south of Thévenet lake, a narrow zone is observed in which the argillites grade to phyllites, usually of the sericite or ot-trelite types.

The mica schists are the most abundant rocks of sedimentary origin. These rocks usually have quite regular foliation, although some show very numerous microfolds. The most abundant varieties are mainly constituted of double, triple, and quadruple combinations of the following minerals: muscovite, chlorite, biotite, garnet, quartz, feldspar, and cyanite.

Bands of iron formation were observed in four different places within the area. These rocks are either grunerite schists or rocks composed of alternating layers more or less rich in quartz, grunerite, siderite, and magnetite.

A band of crystalline limestone, a few tens of feet wide, was observed between some biotite-garnet schists and the gneisses in the northeast corner of the area. This impure crystalline limestone is composed of calcite, tremolite, and phlogopite and contains beds of white or light grey tremolite that are up to one inch thick.

Volcanic rocks

The massive and pillow lavas are not indicated as separate units on the preliminary map that accompanies this report. The volcanic rocks, except for the area to the northeast of Rachel lake, constitute but a single band composed of several individual flows not much more than 300 or 400 feet thick. The 20, 30, or 40 feet at the top or bottom of each flow is usually a pillow lava, whereas the central part is massive in character. Nevertheless, a few scattered pillows are observed within the massive lavas.

These grey or greenish volcanic rocks are intermediate or basic in composition. They are much altered and, in several places, strongly schistose. Their composition approaches that of typical greenstones.

Certain parts of the volcanic band show abundant breccias. They are generally surface breccias in which the fragments and the matrix

are of the same composition as the flows. They are evidently flow breccias formed by the consolidation of still mobile lavas.

Gabbro

The gabbros, the intrusive rocks of the area, always occur as sills. Their grain size is variable but generally between two and five millimeters. Their colour is also most variable, from grey to grey-green or to black.

A few sills contain more than 50 per cent feldspar; the rock thus approaches the composition of diorite. Other gabbros show a very basic facies which, when altered, becomes an anthophyllite schist. The gabbros are slightly schistose in several parts of the area. This schistosity is more intense in the sector to the east of Rachel lake, where the gabbros are partially transformed into amphibolites or into schists composed mainly of hornblende and garnet.

Phenomena of silicification and carbonatization are observed in the gabbros at their contacts with the sedimentary rocks and in the neighbourhood of axial zones, at the crest of folds.

Finely disseminated pyrite and pyrrhotite occur in nearly all the gabbro sills close to their contacts and in those parts where the joints are more numerous.

Hornblende-biotite gneiss and granitic gneiss

The gneisses occur in the northeast corner of the area. The predominant type consists mainly of biotite, hornblende, quartz, and feldspar. In this gneiss are observed small aplitic masses which show a gradation from aplite to gneiss. Several layers of a pink, fine- or medium-grained, granitic gneiss occur in the centre of the hornblende-biotite gneiss. The gneissic structure is parallel to the schistosity of the schists that are in contact with the gneisses.

STRUCTURE

The rocks of the area were folded along axes trending NNW. to NW. An anticline, with Thévenet lake in its centre, is the largest single structural unit. Most of the folds plunge to the southeast at an angle generally less than 30 degrees.

The strike and dip of the schistosity are appreciably parallel to those of the sedimentary and volcanic layers. Most of the dips along the eastern margin of the area are toward the east. This indicates a probable overturning of the eastern limb of the syncline which follows this eastern boundary of the area.

A few longitudinal and transverse faults are indicated on the map. Several other transverse faults with horizontal displacements of a few tens of feet were observed.

ECONOMIC GEOLOGY

Iron

Magnetite is fairly abundant in certain parts of the iron formation bands, but no secondary enrichment was observed.

Base metals

Small quantities of pyrrhotite, pyrite, and chalcopyrite are disseminated in several of the gabbro sills and their adjoining sedimentary rocks and lavas. All these mineralized zones deserve close scrutiny in spite of the fact that the specimens collected during the 1954 field season never yielded combined values in excess of one per cent of copper, nickel, zinc, and lead.
