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PRELIMINARY REPORT ON BRODEUR - BASSERODE AREA, TEMISCAMINGUE AND ROUYN-NORANDA COUNTIES

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PRELIMINARY REPORT

ON

BRODEUR-BASSERODE AREA

TÉMISCAMINGUE AND ROUYN-NORANDA COUNTIES

BY

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Preliminary Report

on

BRODEUR-BASSERODE AREA

Témiscamingue and Rouyn-Noranda Counties

by

Jean-Y. Chagnon

INTRODUCTION

The Brodeur-Basserode area is mainly within the granitic terrain south of the Noranda - Val d'Or mining district. Its centre is about 40 miles south-southeast of Noranda and 25 miles northwest of Belleterre.

The area, mapped in 1960, covers about 430 square miles of the 500 included in the map-area bounded by longitudes 78°45' and 79°00' and latitudes 47°25' and 48°00'. Parts of Basserode, Beaumesnil, Caire, and Clérion townships are in Rouyn-Noranda county, and parts of Bauneville, Brodeur, Blondeau, Latulipe, and Villars are in Témiscamingue county.

The southern part of the area is accessible by roads branching from highway 46, which passes through Ville-Marie on the east shore of Témiscamingue lake. Also, the main road between Ville-Marie and Belleterre passes near the southern boundary. Roads from Moffet, the only village within the area, lead to the south-central and southeastern parts of the area.

The northern part is most easily reached by float-plane but may be reached from Rouyn by road to Caron lake, near the northern boundary, and thence by canoe and private road to Roger lake. The central part of the area may be reached most easily by float-plane.

The entire area is wooded except for small strips of farm land near the village of Moffet and along the road to the village of Laforce, east of the area. Much of the wooded area has been burned over in recent years.

Local relief is 300 feet at the most. The average elevation is 1,050 feet above sea-level. The area drains into Simard, des Quinze, and Roger lakes, which are connected by rivers

and smaller lakes, and eventually into Témiscamingue lake.

Bedrock along the shores of the large lakes in the southern part of the area is mantled by a thick cover of sand and clay.

GENERAL GEOLOGY

The consolidated rocks of the area are Precambrian. Granitic rocks are by far the most abundant; some of them are gneissic, whereas others, particularly in the south, are massive. In the north and in the south, biotite granite generally predominates. The granitic rocks of the central part of the area include hornblende granite, albite-microcline granite and other varieties.

Altered sedimentary and volcanic rocks outcrop in the north. They have been folded into a north-trending syncline and are intruded by, and mixed with, the granitic rocks. These rocks, which are tentatively assigned to the Pontiac group, are possibly correlatives of the paragneisses of the narrow belt that trends east across the southern part of the area.

Pegmatites and aplites are common in the north and are the youngest acidic rocks. North-northeast trending dykes of diabase and gabbro cut all other rocks in the area.

Glacial and fluvioglacial deposits are abundant in the south, particularly in regions of low relief.

Table of Formations

PLEISTOCENE AND RECENT	Glacial and fluvioglacial deposits	Boulders, gravel, sand; Varved clays
PRECAMBRIAN	Dykes	Diabase and gabbro
	Acidic intrusive rocks	Granite, pegmatite and aplite Albite-microcline granite Porphyritic albite granite Hornblende granite Hornblende syenite Biotite granite Granite gneiss Granodiorite Granodiorite gneiss
	Intermediate and basic intrusive rocks	Diorite Gabbro
	Pontiac group	Biotite gneiss Biotite schist Amphibolite
	Pontiac group(?)	Paragneisses

PONTIAC (?) GROUP

Paragneisses

Paragneisses outcrop in a narrow east-trending band along the road to Laforce, south of Simard lake. This band is on the westerly extension of the "Keewatin" in the area adjacent to the east (Denis, 1936). The paragneisses are fine-grained, layered rocks with quartz and feldspar present in nearly equal amounts. The layers are up to ½ inch thick. They are commonly accentuated by differential weathering, and can also be recognized by faint colour differences that reflect the proportion of mafic minerals, mainly amphibole. They are regular over short distances, but commonly are crumpled, stretched, and discontinuous in tight secondary folds and near minor faults. Thin veins of feldspathic material also occur within the belt. Locally the paragneisses are recrystallized to, or intruded by, a medium-grained diorite.

PONTIAC GROUP

Biotite Gneisses and Schists

Biotite gneisses are abundant northwest of des Quinze lake and north of Simard lake where they form strike ridges. Elsewhere, they crop out as small irregular bodies in or between the intrusive masses. The schists occur on the north shore of Simard lake and along the road north of Grassy Narrows.

The biotite gneisses are fine to medium grained and light to dark grey. They are characterized by alternating layers up to 1/8 inch thick carrying different proportions of quartz, feldspar, and biotite. Hornblende is also found in some varieties. The rocks are friable and break into slabs. In the northern part of the area, the gneisses are generally enclosed by igneous rocks, and locally lit-par-lit injection gneisses have developed.

The schists are intermingled with the biotite gneisses. They are easily identified by the abundant secondary folds and by the oriented mica flakes which give a characteristic lustre to foliation surfaces. They are medium grained and grey and weather in grey and brown colours.

These rocks are similar to the biotite schists of the area to the north, described by M.E. Wilson (1915). They are termed gneisses here because they are in alternating layers of different compositions; to the north the schistosity is commonly well developed and the composition is more homogeneous.

Amphibolites

A few exposures of amphibolites occur in the granitic rocks of the central part of the area, near Brodeur lake. The rock is generally black, granular and medium grained. It is made up of about 80 per cent stubby (3 x 5 mm.) grains of amphibole with biotite and minor feldspar and quartz. Secondary minerals include chlorite and epidote.

Intermediate and Basic Intrusive Rocks

Gabbro

Gabbro outcrops in three different places in the area: west of Gaboury and Rondelet lakes, and along the eastern limit of the area south of the road to Laforce. It is usually massive, medium grained, and dark grey weathering. It consists of about equal amounts of pyroxene and plagioclase feldspar with some hornblende and biotite.

Diorite

Diorite underlies about 12 square miles on either side of the northern end of des Quinze lake and a small area near the shore of Simard lake. It is also found in lenticular bodies throughout the biotite gneisses.

The diorite is usually closely associated with, and grades into, granitic rocks. It is medium grained, dark grey, and generally massive. It may be gneissic in places. Resistant hornblende grains stand in relief, causing a rough weathered surface. South of Grassy Narrows, the diorite has crystals of pink feldspar as much as ½ inch across in a medium-grained groundmass of hornblende and feldspar.

Acidic Intrusive Rocks

Granodiorite, Granodioritic Gneiss

A small body of granodiorite occurs in the granite near the southeastern limit of the area, along the road to Belleterre.

The rock is medium to coarse grained, pale grey to medium grey, and commonly gneissic. It consists of potassic feldspar, plagioclase feldspar (20%), hornblende (20%), and small amounts of quartz. Some of the plagioclase feldspar is in rectangular grains with polysynthetic twinning striations.

In the gneissic variety aligned prismatic grains of hornblende stand out on the weathered surface.

Biotite granite, granite gneiss

Biotite granite and biotite granite gneiss underlie most of the area. They form massifs of batholithic dimensions in the south and north. Elsewhere they occur as lenses intruded into the biotite gneiss. In the northern part of the area, the granite is intimately mixed with muscovite-bearing pegmatitic material to which it is probably related, and inclusions of biotite gneiss are common. The granites are usually massive in the north and gneissic in the south. Gneissic structure is easily visible in the alignment of biotite flakes.

The rock is generally fine to medium grained, and pink to grey in colour whether fresh or weathered. It consists of between 1 and 10 per cent biotite and between 20 and 25 per cent quartz, along with potassic and plagioclase feldspars. Accessory sphene, apatite, and allanite are commonly present. Quartz is commonly interstitial and occurs as grains about 1/8 inch in diameter in the medium-grained rocks. The weathered surface of the finer-grained granite is smooth, whereas that of the medium-grained rock is rough.

Hornblende granite, hornblende syenite

These rocks crop out east and north of Brodeur lake as large elongated bodies, which underlie the higher hills.

The granite is generally medium grained and massive, but, in places, hornblende grains show a preferred orientation. The fresh rock is pink and the weathered surface is pinkish grey. The granite is composed mainly of pink feldspar, plagioclase feldspar, hornblende, and quartz. The hornblende content is about 20 per cent, and the quartz content, between 10 and 15 per cent. Accessory minerals are sphene, pyrite, and magnetite.

West of Simard lake, the rock has a different appearance, with quartz less abundant to absent and the hornblende aligned. The rock seems to grade, by decrease in quartz, into a dark green hornblende syenite. The strong lineation, which is a characteristic feature of the hornblende syenite, trends northeast in the south, or parallel to the direction of elongation of the bodies.

Inclusions of biotite gneiss are present in some places as small, elongated lenses. Small, dark schlieren, which are composed almost entirely of hornblende, are locally numerous and are elongated parallel to the trend of the lineation.

Albite-microcline granite, porphyritic albite granite

Exposures of these rocks are numerous in the central part of the area, particularly close to, and south of, Chevreuil lake.

The rock is generally medium grained, but coarse-grained varieties are present north of Brodeur lake. The granite is commonly massive, granular, and pinkish grey. It consists of 10 to 15 per cent quartz and an equal amount of hornblende, along with potash and plagioclase feldspar and a little biotite and muscovite. Magnetite, sphene, and apatite are accessory minerals. Potash feldspar, with pink microcline and microcline-perthite predominant, occur in grains averaging 1/8 inch across. Plagioclase feldspar occurs in euhedral grains with good cleavage and polysynthetic twinning striations.

North of Brodeur lake, the granite contains porphyroblasts $\frac{1}{4}$ to 1 inch long of pink potassic feldspar carrying inclusions of some of the minerals contained in the rock. This facies of the granite has a rough weathered surface.

Pegmatite and aplite

Pegmatites and aplites of diverse texture are abundant in the northern part of the area. They occur as dykes and sills in the biotite gneiss and in the granite and also as fairly large bodies west of Gérin-Lajoie lake. The larger bodies are essentially homogeneous, although, in places, aggregates of larger crystals form small irregular masses in them. Some dykes are zoned, as is shown by differences in mineralogy or texture close to the walls.

The pegmatites and aplites are generally massive, but, in places, they are layered. Grain size varies from fine to very coarse, with coarse varieties being predominant.

The essential, and generally the only, minerals in these rocks are microcline-perthite, quartz, and muscovite. Quartz commonly forms graphic intergrowths with microcline. Accessory minerals locally are albite, biotite, magnetite, garnet, and apatite. The size of muscovite crystals varies; in most exposures they are one centimeter in diameter, but crystals as much as 6 inches across were found.

North of Roger river and on the east shore of Roger lake, in the north, plumose and "en chevron" intergrowths of muscovite in quartz were observed. Garnet is found in a few pegmatites, mostly those on the shores of Basserode lake.

The pegmatites are not all of the same age, but most seem to be related to the biotite granite. No dyke was observed in the hornblende granite, and only a few were found in the albite-microcline granite.

Diabase and gabbro

Exposures of diabase and fine-grained gabbro are relatively numerous in the area, and represent several dykes striking north or a few degrees east of north. The thickness is from a few inches to 400 feet.

The rock is dark green, generally medium grained, and has a sub-ophitic to truly ophitic texture. The smaller dykes and the margins of all dykes are fine grained. The diabase is composed of pyroxene and calcic plagioclase with local olivine and with pyrrhotite and magnetite as accessory minerals.

PLEISTOCENE AND RECENT

Deposits of sand and gravel are widespread in the area. They are found near the shores of the large lakes in the southern part of the region. The shore of Simard lake is covered by a thick layer of sand, gravel, and clay, and many small islands in this lake are gravel ridges. The east shore of des Quinze lake is also largely covered by such material.

In the northern part of the area, sands and gravels are less common, but ridges of gravel are present east of the northern end of Roger lake. Two eskers trend northeast: one is north of Grassy Narrows, and the other is southeast of Moore lake in the southwestern part of the area. Varved clays have been observed along the shores of most of the major lakes.

Glacial striae generally trend S. 10° E. in the northern part of the area, and S. 15° W. in the southern part. Large erratics and boulders are widespread in the central part.

STRUCTURE

The extensive cover of sand and gravel and the abundance of intrusive rocks in the area make it difficult to analyze the structure.

In the biotite gneiss, the layering is assumed to be parallel to the original bedding. Most of the small lenses of gneiss in the granite in the northern part of the area seem to have retained their original position.

Reversals in the attitude of the gneisses of the Pontiac group are quite common, particularly along a line striking south from the larger mass of diorite that extends to the east shore of Roger lake. There, westerly and easterly dips seem to indicate the presence of a syncline. The sharp swing in the direction of foliation and the dips to the north just west of Grassy

Narrows suggest that it may be an open and slightly asymetrical syncline.

The intrusive rocks in the south show traces of gneissic structure, and it can be assumed that this is parallel to the general trends of the older formations. However, as the dips and strikes are irregular, considerable distortion of the general trends of the older formations is inferred.

Joints striking north, northeast, and southeast are common in all the rocks. Horizontal joints are abundant in the pegmatites.

A few minor faults with slight horizontal displacement were observed. Linear elements, such as topographic depressions and narrow elongated lakes, may mark faults, but no evidence was observed that would lend support to this assumption.

ECONOMIC GEOLOGY

Although granite pegmatites are exposed in many places in the area, economic minerals commonly associated with them elsewhere are rare. The principal localities where ore minerals were found are indicated by numbers on the accompanying map.

Sulphides

Disseminated pyrite, chalcopyrite, and galena occur in quartz-feldspar-biotite gneiss, in lot 29 or 30, range I, Brodeur township (locality 1). These minerals occur in a thin zone that could not be followed for more than a few feet. A grab sample assayed 0.01% copper, 0.49% lead, and 0.180 ounce of silver.

Molybdenite

Some prospecting was done in range VII, Beaumesnil township, on the northwestern shore of Gérin-Lajoie lake (locality 2). Blasting exposed some sulphides, including molybdenite and pyrite, in a very coarse-grained pegmatite dyke near its contact with biotite gneisses. A grab sample assayed 0.62% MoS_2. The dyke trends north and is approximately 25 feet thick.

Gold, copper

Gold and copper were found disseminated in a granodiorite along the road to Belleterre at the southeastern boundary of the area. A grab sample assayed 0.01% copper and 0.001 ounce of gold per ton. This exposure is about 5 miles west of the property of Belleterre Quebec Mines Limited.

Pegmatites

Pegmatites are abundant on the west shore of Gérin-Lajoie and Roger lakes. No significant minerals were seen in these rocks, except the above-mentioned molybdenite. However, it is highly probable that more detailed work would show that some of these rocks contain beryl, as in the adjacent area to the east.

Gravel and sand

The sand and gravel deposits are adequate for local requirements and are being used extensively for road building.

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