P. R. NO. 317

PROVINCE OF QUEBEC, CANADA

DEPARTMENT OF MINES

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GEOLOGICAL SURVEYS BRANCH

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PRELIMINARY REPORT

ON

MIGNAULT-AIGREMONT AREA

ROBERVAL COUNTY

BY

A.-F. LAURIN

QUEBEC
1955

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INTRODUCTION

Location and Means of Access

The Mignault-Aigremont area, mapped during the summer of 1955, is bounded by latitudes 49°15' and 49°30' and by longitudes 73°45' and 74°00'. It covers about 200 square miles of Roberval county, and includes most of Mignault township, the northern two-thirds of Aigremont, and small parts of Denault, Gazeneuve, Leber, and Mance townships. The centre of the map-area is about 85 miles northwest of lake St. John and about 30 miles southeast of Chibougamau lake.

The area to the west has been mapped by Laurin (1) and the one to the northwest by Neale (2).

The St. Félicien-Chibougamau highway runs northwesterly across the southern part of the area; it intersects the eastern boundary near mile 85 and the western boundary close to mile 98, both distances being from St. Félicien. Access to the central part of the area is difficult because of the lack of canoe-routes, but it can be reached from the east side by La Loche river and from the west by Chaudière river. Normandin river gives access to the southwest corner of the map-area.

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(1) Laurin, A.F., Preliminary Report on Ducharme-Boutergue Area, Roberval and Abitibi-East Counties; Que. Dept. Mines, P.R. No. 310, 1955.

(2) Neale, E.R.W., Preliminary Report on Dollier-Charron Area, Abitibi-East and Roberval Counties; Que. Dept. Mines, P.R. No. 299, 1954.

Topography

The genreal elevation of the area is about 1,200 feet above sea-level, and the local relief is small, commonly less than 300 feet. The highest elevations are to the north of Aigremont lake and east of Old Pat lake. The area is drained southeastward to the Lake St. John-Saguenay system by Normandin and La Loche rivers and eventually Chamouchouane river.

Much of the area is wooded. Black spruce is the dominant forest tree, but interspersed with trees of this species are a considerable number of jack-pine, balsam, and red spruce. Jack-pine is common in areas of considerable glacial drift. Birch, tamarack, and poplar are also encountered.

Striations show that the direction of flow of the Pleistocene ice-sheet was between S.5°W. and S.5°E. Eskers have a general south-southwest direction.

GENERAL GEOLOGY

Exposures of bedrock are rather scarce throughout the map-area, except east of Old Pat lake, around Aigremont lake, and in the northwestern part of the area.

All the consolidated rocks of the map-area are Precambrian, and their textures and structures suggest that the area belongs in the Grenville sub-province. Most of the area is underlain by orthogneisses and paragneisses, but lenticular bodies of gabbroic rocks crop out here and there among the gneisses.

Table of Formations

CENOZOIC	Peat, beach sand, gravel, glacial till
	Great unconformity
PRECAMBRIAN	Orthogneisses: Biotite gneiss, biotite-hornblende gneiss, hornblende gneiss, pegmatite. Metagabbro Paragneisses: Garnetiferous biotite gneiss, biotite gneiss. Garnetiferous hornblende gneiss, hornblende gneiss.

Paragneisses

About an eighth of the area is underlain by paragneisses, which may be divided into two groups, one characterized by hornblende and the other by biotite.

Hornblende Paragneiss

The hornblendic paragneisses are the commonest paragneiss representative in the map-area. They crop out as a number of irregular bands and zones, the most extensive of which are south of Aigremont lake, in the southwest quarter of Mignault township, and northwest of Mignault lake.

The hornblende paragneisses are slightly to well layered rocks with schistosity somewhat variably developed. In most varieties, hornblende needles make up 60 per cent of the rock. Most types have red garnets, which form 15 to 25 per cent of the rock. Plagioclase is the common light-coloured mineral.

These rocks are probably the altered equivalents of Keewatin-type volcanic rocks, since transitions from similar gneisses into typical Keewatin-type greenstones have been found in areas mapped farther to the west.

Biotite paragneiss

Biotite paragneisses underlie only very little of the map-area. They crop out most extensively in the extreme southwest corner of the area. Lenticular patches northwest and east of Aigremont lake, and south of Mignault lake are underlain by these rocks, and a few isolated small exposures occur here and there elsewhere in the area.

The biotite paragneisses are markedly banded, and the layering is believed to be parallel to original bedding because there are pronounced differences in composition between layers. Some layers are made up of quartz, white feldspars, and minute garnets, whereas others are very rich in biotite and garnets are inconspicuous. The rock is commonly medium-grained. The weathered surface is usually brown and the fresh surface sandy-coloured.

It is believed that this rock is derived from sediments such as are found with volcanic rocks farther northwest.

Orthogneisses

More than 70 per cent of the area is underlain by an orthogneiss characterized by biotite and/or hornblende which has been intruded into the paragneisses.

The orthogneisses are grey to pink quartzose rocks. They are fine- to medium-grained or even, in places, coarse-grained. In places they contain lenticular inclusions which are believed to be altered paragneisses of both biotitic and hornblendic composition. In many localities these rocks are intruded by pegmatites, in places parallel to the gneissic structure, elsewhere tranverse to the structure.

Metagabbro

Three lenticular masses of coarse-grained ophitic gabbro crop out in the northern part of the map-area and a number of smaller exposures are found here and there elsewhere in the area. The outcrops are generally close to, or

within, the hornblende paragneiss. In places, close to its contact with the orthogneisses, the gabbro has apparently been altered to hornblende gneiss, suggesting that the gabbro is older than the orthogneisses.

Structural Geology

Although the trends of the formations, as well as the strikes of the gneissic structures, are rather irregular throughout the map-area, there is a general northeasterly trend to the structure. The gneissic structures, on the whole, dip southeasterly at fairly steep angles. An older structure is seen in places in the paragneisses where the strikes are northerly or northwesterly.

Most of the small folds seen in the area have a northeast striking axis and, with one exception, they plunge southwest at angles steeper than 60°. It is believed that these folds give, on a small scale, a picture of the larger fold structure of the area.

A few minor shears were seen throughout the area, but none of them is very extensive. The longest one, about one-quarter mile northwest of the southwest tip of Aigremont lake and just north of the highway, was traced for about one-quarter of a mile. In general, the strike of the shears is roughly parallel to the gneissosity.

A few small faults were seen in the gneisses, but the apparent displacement along their planes does not exceed a few inches.

ECONOMIC GEOLOGY

No prospecting until two years ago is known to have been done in the area, but by the fall of 1953 more than 55 claims had been staked near Aigremont lake. Since then, all but 15 of these claims have lapsed, 10 on the southwest side of Aigremont lake and 5 on the southeast side. No extensive mineralization was seen on the claims southeast of the lake. On those to the southwest, a quartz vein is found along the quarter-mile-long shear zone mentioned above. This occurrence is in hornblende paragneiss and the shear and vein strike northeasterly parallel to the gneissic structure of the rocks. The vein, which is about three feet thick at the highway and about twenty feet thick a quarter of a mile northeast, contains some pyrite, malachite, and bornite. Of the few samples taken for assay the best analysis was: $0.03 of gold a ton, $0.12 of silver a ton, 0.56 per cent copper, 0.01 per cent zinc, and 0.02 per cent nickel.

There is another slightly mineralized quartz vein in hornblende paragneiss, on Normandin river, at the head of the long rapid. This vein, which also parallels the gneissic structure, has some pyrite and copper stain. It was observed on only one exposure.

Several very narrow quartz veins containing a few cubes of pyrite up to one-quarter inch in size occur on Normandin river, at the big bend near the western edge of the map-area.