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PRELIMINARY REPORT ON ERIC LAKE AREA, SAGUENAY ELECTORAL DISTRICT

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**Énergie et Ressources
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DEPARTMENT OF MINES

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A.-O. DUFRESNE, DEPUTY MINISTER

GEOLOGICAL SURVEYS BRANCH

PRELIMINARY REPORT

ON

ERIC LAKE AREA

SAGUENAY ELECTORAL DISTRICT

BY

DUNCAN S. McPHEE



QUEBEC
1958

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INTRODUCTION

The Eric Lake area was mapped during the summer of 1957. It comprises approximately 320 square miles, bounded by longitudes $65^{\circ}35'$ and $65^{\circ}50'$ and latitudes $51^{\circ}45'$ and $52^{\circ}10'$. The southern and northern boundaries lie at Mile 122.5 and Mile 154, respectively, on the Quebec North Shore and Labrador railway. The distances given are from Sept-Iles, a town on the north shore of the Gulf of St. Lawrence.

The Quebec North Shore and Labrador railway, used to haul iron ore from Knok Lake to the port of Sept-Iles, roughly bisects the map-area and provides the easiest means of access.

The area may also be reached by aircraft. An excellent airstrip lies near the railway at Mile 134, and float aircraft may land on Eric and St. Patrick lakes and on several sections of the Magpie river.

Topography

The area lies within the Laurentian uplands at a general elevation of 2,000 feet above sea-level. It has a flat, gently rolling topography with several ridges and monadnocks which give a local relief of rarely more than 300 feet.

The topography of this area differs strikingly from that to the south, where the uplands are deeply dissected by river valleys and stand at an elevation of 3,000 feet. The headwaters of these rivers and of Embarasse river, which flows to the north, are within the map-area. The highest point on the Quebec North Shore and Labrador railway, elevation 2,066 feet above sea-level, is at Mile 149.

The area is largely covered with morainic deposits and overburden, particularly in the southern half. Much of the morainic material is arranged in elongated ridges and troughs that parallel the direction of ice movement. The central part of the area, paralleling the railway, is a flat, extensive sand plain. Kettle lakes and depressions, erratics, eskers, and boulder trains are common.

General Geology

All the consolidated rocks of the area are of Precambrian age. Listed in order of abundance they are: metasedimentary gneisses, granite gneisses, gneissic granite, gabbro and diorite, and various minor dykes.

The following table of formations is based on field relationships. Where contact features were not indicative or could not be seen, inferences on age relationships were drawn from geological work in areas to the south.

Table of Formations

Cenozoic	Recent and Pleistocene	Sand, gravel and erratic boulders
Unconformity		
	Intrusive Rocks	Pegmatite and lamprophyre dykes (not shown on map) Pink biotite granite Gabbro, diorite and related rocks Gneissic Granite
Precambrian		<u>Mixed Gneisses</u> Quartz-biotite gneiss Biotite-Hornblende gneiss Clotty hornblende gneiss Garnetiferous Gneiss Amphibolite
	Sedimentary rocks and associated igneous rocks	

Metasedimentary Rocks and Associated Igneous Rocks

Metasedimentary Rocks

Highly metamorphosed sedimentary rocks, possibly of Grenville age, outcrop mainly in the west and south of the area over a distance of 30 miles. The more abundant types are: quartz-biotite gneiss, biotite-hornblende gneiss, garnetiferous gneiss, clotty hornblende gneiss, and amphibolite.

The paragneisses are characterized by fairly distinct layering, commonly the result of varying mineral composition. The layers are from a fraction of an inch to more than a foot in thickness. Although the main paragneiss bands were traced for considerable distances, the diversity of rock types prevented their subdivision into smaller continuous lithological units at the present scale of mapping.

The most common paragneiss is the quartz-biotite type. This rock consists essentially of quartz, biotite and feldspar. It is fine- to medium-grained and has alternating biotite-rich and quartz-feldspar rich material. It is light to dark grey depending on the content of biotite. Although gneissosity is general it may be poorly developed and, in places, the rock is massive over widths of several feet.

Biotite-hornblende gneiss is closely associated with the quartz-biotite gneiss. The rock is medium- to coarse-grained, medium to dark greenish-grey, and usually strongly gneissic.

Several bands of clotty hornblende gneiss are found within the paragneisses. This rock is medium- to coarse-grained, medium grey, and contains scattered aggregates of hornblende. The gneissic structure is not as well developed as in the other paragneisses.

The garnetiferous gneiss is composed of biotite, quartz, feldspar, a little hornblende and garnet. The garnet occurs as scattered grains and as aggregates.

Associated Igneous Rocks

The paragneisses contain a large number of granitic layers of varying lengths and thicknesses. Many exposures show more than 50 per cent granitic material, although the paragneiss host-rock is in thick and continuous layers. The granitic layers associated with the paragneisses show the following transitions: paragneisses, mixed gneisses or migmatites, granite gneisses, and augen granite gneisses.

The mixed gneisses or migmatites are the result of lit-par-lit injection of pink granite into the paragneisses. The contacts between the granitic material and paragneisses are gradational. The granitic layers consist of pink feldspar, quartz, biotite, and hornblende.

Layers of amphibolite are closely associated with the paragneisses. The amphibolite is medium- to coarse-grained and dark grey. The poorly developed gneissosity is parallel to that of the paragneisses. The amphibolites probably, in part, represent basic igneous sills.

Intrusive Rocks

Gneissic Granite

Gneissic granite occurs in the southern part of the area and in two distinct bands in the east-central and northeastern parts of the area. The rock is pink and medium- to coarse-grained. The gneissic structure, not always pronounced, is produced by parallel arrangement of biotite. The gneissic granite consists of pink feldspar, quartz, biotite and hornblende.

Gabbro, Diorite and Related Rocks

Several medium-sized, irregular bodies of gabbro were found in the northern part of the area. The rock is massive, coarse-grained, and black, and consists of plagioclase, pyroxene and biotite.

Several poorly defined bodies of diorite, not differentiated from the gabbro on the accompanying map, occur in the northeastern part of the area. The rock is coarse-grained and grey and consists of plagioclase, potassic feldspar, hornblende, and biotite.

Granite

Massive granite was found in the southern part of the area, where it cuts two exposures of paragneiss. The rock is pink, medium-grained, and contains pink and white feldspar, quartz, biotite, and magnetite.

Late Dykes

Pegmatite dykes cut all the above rock types. They are pink, very coarse in grain, and consist of pink and white feldspar, quartz, biotite and minor amounts of magnetite.

Basic dykes, probably lamprophyre, cut the other rocks of the area. They consist of feldspar, hornblende, and biotite with, locally, small phenocrysts of feldspar.

Structural Geology

The bands of paragneiss, occupying about one-third of the area, form the main structural unit. The variety of rock types within the paragneisses appears to be due to original compositional differences in the sedimentary beds.

The structural trend of the gneisses, particularly pronounced in the central and northern parts of the area, is northeast. However, asymmetrical and cross folds produce a generally complex structure. Jointing is prominent in some of the gneisses.

The gabbro intrusives in the north are irregular masses which cut across the trend of the gneisses. Small, sheet-like bodies occur in the central and southern parts of the area and generally trend parallel to the regional strike of the gneisses.

Economic Geology

No concentration of economic minerals was found within the map-area, although magnetite was observed as fine disseminations within the gabbro bodies.

Glacial deposits have been exploited to provide fill for the Quebec North Shore and Labrador railroad.

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