RP 326(A)

PRELIMINARY REPORT ON MANITOU RIVER AREA , SAGUENAY COUNTY

Documents complémentaires

Additional Files

Licence

License

Énergie et Ressources naturelles
Québec

P. R. NO. 326

PROVINCE OF QUEBEC, CANADA

DEPARTMENT OF MINES

HON. W. M. COTTINGHAM, MINISTER A.-O. DUFRESNE, DEPUTY MINISTER

GEOLOGICAL SURVEYS BRANCH
I. W. JONES, CHIEF

PRELIMINARY REPORT

ON

MANITOU RIVER AREA

SAGUENAY COUNTY

BY

JOHN T. JENKINS

QUEBEC
1956

P. R. NO. 326

PRELIMINARY REPORT

on

MANITOU RIVER AREA

SAGUENAY COUNTY

by

John T. Jenkins

INTRODUCTION

The Manitou River area, mapped during the summer of 1955, covers approximately 190 square miles, bounded by longitudes 65°05' and 65°20' and latitudes 50°30' and 50°45'. Des Eudistes lake, in the southwest corner of the area, is 70 miles northeast of Sept-Iles, a town on the north shore of the Gulf of St. Lawrence, 325 miles northeast of Quebec City.

The best means of access to the area is by sea-plane from the base at Des Rapides lake, near Sept-Iles. Landings can be made on Des Eudistes, Nazaire, Bobo, Canot, Boudreau, Caribou, Wilbert, Brézel and Gad lakes, and also on the part of Manitou river between Brézel and Des Eudistes lakes.

The area may also be reached by a wide, well kept portage that runs from the sea-coast at the mouth of Manitou river to the south end of Des Eudistes lake. From here, Manitou river can be ascended by canoe. The southern, extreme eastern, and northeastern parts of the area are easily reached from Manitou river, but access to the northern, central, and western portions is possible only by arduous portage or by sea-plane. The writer's party cut or cleared portages between Des Eudistes, Nazaire and Bobo lakes, also between Gad and Manitou lakes, the latter two miles north of the area, Canot and Wilbert lakes, and portages linking Wilbert, Moses, Armand and Laura lakes.

Topographically, the area is an upland which has been highly dissected, especially along the course of Manitou river. Here, several steep cliffs rise to 1,500 feet above the level of the river, and rarely is the local relief less than 1,000 feet. The central part of the area is the least rugged, and here local relief is from 500 to 700 feet. Manitou river, which is at an elevation of 510 feet at the northern boundary, drops to 430 feet where it joins Des Eudistes lake. The greatest elevation, 2,100 feet, is south of Gad lake.

Manitou river drains most of the area. The western part is drained by Tortue river, and the northeast portion by Sheldrake river, through the Wilbert-Moses-Armand chain of lakes. The scarcity of swamps attests to the excellence of drainage in the area. The gradient of Manitou river is

gentle (approximately 1 foot in 1,000 feet). Although there are several short stretches of rapids, the river is navigable by motor canoe over its whole length.

The river flows in a deep valley, the position of which has been determined by jointing. Weathering along joints has also controlled the pronounced linear pattern of lakes and streams in the central part of the area.

Over most of its length Manitou river is flanked by well sorted, stratified terrace deposits. Ground moraine is found throughout the area, and erratics, up to 15 feet in diameter, occur even on the highest ridges. Glacial striae indicate a south direction of movement of the Pleistocene ice-sheet.

GENERAL GEOLOGY

All the consolidated rocks of the area are Precambrian. Listed in order of abundance they are: granitic rocks and mixed gneisses, paragneisses, syenitic rocks, anorthosite, gabbro and mafic composite gneiss, and various minor intrusions.

Relationships among the rock units are difficult to establish in this map-area. Thus, where evidence is lacking, age relationships have been inferred from geological work done in nearby areas.

Table of Formations

Cenozoic: Recent and Pleistocene		Clay, sand, gravel, erratic boulders
Great unconformity		
Precambrian	Intrusive rocks	Pegmatite, aplite and basic dykes (not shown on map) Porphyritic biotite granite Syenitic rocks Mafic composite gneiss Anorthositic and gabbroic rocks Granitic gneisses
	Mixed gneisses	Granitic gneisses with metasedimentary rocks
	Metasedimentary rocks and associated igneous rocks	Hornblende-biotite gneiss, graphite gneiss, crystalline limestone, impure quartzite, biotite and chlorite schists

Precambrian

Metasedimentary Rocks and Associated Igneous Rocks

Metasedimentary rocks are the oldest rocks known in the map-area, and they underlie about one-third of it. They crop out mainly in the east-central part of the area and as an irregularly shaped band near the western boundary. A few small patches of paragneiss are exposed to the north, where they are surrounded by the granitic gneisses. Isolated exposures of paragneiss, too small to be shown on the accompanying map, occur in many places in the granite gneisses.

Nearly all the metasedimentary rocks contain some granitic material. Where the proportion of granite present is less than 25 per cent the rock is mapped as paragneiss.

A distinct layering characterizes these metasedimentary rocks. Most of the layers are from a fraction of an inch to several feet thick, but some up to 20 feet thick occur. A gneissic structure is usually well developed, except in the hornblende-biotite gneiss, which is locally massive. Nearly all types of paragneisses show round grains of pink garnet.

The hornblende-biotite gneiss is the most abundant type of paragneiss and is interlayered with other metasedimentary rocks. It is dark grey to black, weathers to a dark, dirty grey colour, and is fine- to medium- grained. It generally has a distinct gneissic structure, but in places the rock is massive through several feet. Hornblende and biotite are the chief constituents, with feldspar forming 30 per cent and quartz up to 10 per cent of the rock.

Biotite gneiss and hornblende gneiss are varieties of the hornblende-biotite gneiss. These rocks are fine- to medium-grained, dark grey, and are the most strongly gneissic members of the paragneisses. They consist of about 50 per cent mafic minerals, chiefly biotite or hornblende, with feldspar, garnet and a little quartz. They contain more garnet than the other paragneisses.

A quartzo-feldspathic facies is the dominant gneiss within the east-central paragneiss zone. This rock is fine-grained, light grey, and weathers to a dark rusty brown colour to one inch below the surface. The rock contains about 85 per cent of quartz and feldspars in roughly equal amounts, with some biotite and a little muscovite.

Around Bobo lake, the quartzo-feldspathic gneiss grades into a graphite gneiss containing a few grains of pyrite. This rock is very similar to the quartzo-feldspathic gneiss in appearance and composition, but its weathered surface is more rusty. The graphite gneiss weathers deeply and crumbles readily.

A few lenses of crystalline limestone crop out on the northwest shore of Brézel lake. The limestone is white to light grey and medium- to coarse-grained. Calcite comprises more than 95 per cent of the rock; graphite and garnet are present in very minor amounts. The lenses are highly contorted, but none is more than 30 feet long and 10 feet thick.

A light grey, impure quartzite is found as small, scattered bands throughout the paragneisses. Its most extensive occurrence is in thin layers in the crystalline limestone. This quartzite is recrystallized, and the impurities, forming about 10 per cent of the rock, are chiefly biotite and pink garnet.

Biotite and chlorite schists occur in a few places as very thin lenses in the previously described paragneisses. These rocks are medium- to coarse-grained, and highly schistose. Quartz, feldspar and garnet are the chief accessory minerals. Dark-coloured, medium-grained, massive, amphibolitic rocks form small bands within the paragneisses in several places. Some of the amphibole-rich rocks are conformable with the layers of paragneiss whereas others cut across them. It is thought that some of these amphibolites were basic igneous rocks.

Mixed Gneisses

Mixed gneisses, or migmatites, are found throughout the area, commonly near the contacts between granitic gneisses and paragneiss, but also within the granitic gneisses themselves; however, few well defined zones of these mixed gneisses could be outlined. Numerous isolated exposures of migmatite also occur far from any exposed granitic rocks.

The mixed gneisses consist of a metasedimentary host, in which granitic material is present in amounts between 25 and 75 per cent of the volume of the rock. This granitic component is one of three types: (1) A leucogranite, which contains more than 95 per cent of quartz and feldspar. It always occurs in lit-par-lit fashion within the paragneiss bands. (2) A pink gneissic granite, into which quartz blebs have been introduced parallel to the gneissosity. This granite sometimes occurs in lit-par-lit fashion with the paragneiss, but it also cuts and veins the host rock in many exposures. (3) A massive granite, fine- to coarse-grained, or locally pegmatitic (as around Boudreau lake). This granite everywhere has discordant relationships with the host component.

Intrusive Rocks

Granitic Gneisses

Three distinct rock types have been included in this group. In order of abundance, they are: (1) gneissic granite, (2) granite gneiss, and (3) augen gneiss. The intimate relationships among these rock types, as well as the variations in mineralogical composition and in the degree of gneissosity, have prevented their separation into distinct units on the accompanying map.

(1). The gneissic granite is the dominant granitic rock in the northern half of the area. It is composed of alkali feldspars, quartz, biotite, and rare hornblende. Pink garnets are present locally. The rock is generally pink, but deeply weathered portions appear yellowish pink. The grain size varies from fine to coarse, and in a few exposures the rock appears granulated. All degrees of gneissosity can be found. Near Gad lake, the pink gneissic granite contains a few small blebs of magnetite, which are concentrated along some layers. Elongated blebs of quartz, which parallel the gneissic structure, are present in places.

(2). Most of the granite in the southern half of the area is a granite gneiss. This rock is very gneissic and has lamellae of biotite, a fraction of an inch thick, alternating with layers of quartz and feldspar of similar thickness. Hornblende, garnet, and locally a little pyrite, are present in minor amounts. Where rich in biotite, this granite is dark coloured and distinctly layered, whereas the biotite-poor varieties are uniformly light grey to black and show little or no layering. Grain size varies from fine to coarse.

(3) Pink augen gneiss is found south of Boudreau lake and in a few isolated exposures. The augen are composed of potassic feldspar and are from ¼ to 1½ inches in diameter. The augen are slightly lenticular, and elongated in a direction parallel to the strongly developed gneissic structure. The fine- to medium-grained groundmass is composed of quartz, feldspar and biotite, with hornblende and garnet as minor accessories. Pods of syenitic augen gneiss are found in the granitic augen gneiss. The augen gneiss is probably a facies of the gneissic granite.

Anorthositic and Gabbroic Rocks

A body of anorthositic rocks occupies the southeast corner of the area, south of Brézel lake. It varies in composition from pure anorthosite to anorthositic gabbro. Plagioclase is predominant, and hornblende and pyroxene make up from 2 to 30 per cent of the rock. A few grains of magnetite-ilmenite occur. The rock varies from dark bluish grey to dirty yellow-grey and the weathered surface is white to grey. The grain size is from medium to coarse. Near its contact with the syenite, the anorthositic rock is characterized by a porphyritic texture, with laths of plagioclase up to 6 inches long.

A thick sill of gabbro occupies part of the northwest corner of the area and extends eastward across the southern arm of Gad lake. This gabbro has been extensively altered, and is much intruded by gneissic granite. It is fine- to coarse-grained, and generally massive. The fresh surface is black to grey, and the weathered surface a mottled, rusty, greenish black or yellow. Pyroxene, now almost completely altered to hornblende and biotite, and plagioclase are the chief minerals. Accessory garnets are noted. Isolated exposures of gabbro are found throughout the area, and these small bodies are always concordant with the containing rocks.

A small body of amphibolite, probably a highly altered gabbro, is exposed near the southwest shore of Canot lake.

Mafic Composite Gneiss

The gabbro sill about Gad lake has been intruded by gneissic granite. This intrusion has produced a hybrid rock, here called a mafic composite gneiss, which has been mapped with the gabbro. This rock is massive in places, but usually has a well developed gneissic structure. It shows thin layers of metagabbro which are injected both lit-par-lit and transversely by granitic stringers. Porphyroblasts of pink feldspar in many places make up 40 per cent of the metagabbro.

Syenitic Rocks

A band of syenite gneiss lies between the anorthosite and the paragneiss in the southeastern corner of the area. Other bodies of syenite gneiss are found in the extreme southwest corner of the area, and north of Des Eudistes lake. This rock is beige to greenish grey, and fine- to medium-grained. It is characterized by a fine gneissic layering, but a few massive lenses are found. Perthite and plagioclase feldspars, pyroxene and amphibole are the main constituents of the rock. Quartz and garnet are nearly always present as accessories. Near the contact with the anorthosite, the syenite gneiss contains augen of plagioclase, forming as much as 50 per cent of the rock.

A body of massive syenite and quartz syenite occupies part of the northeast corner of the area. Two smaller bodies of this rock are found to the south of this main mass. The syenite is pink and medium- to coarse-grained. It is composed of alkali feldspar and hornblende, the latter almost completely altered to biotite. Plagioclase and quartz are always present in subordinate amounts. The quartz content is in places as much as 20 per cent, making it a quartz syenite, or even a granite.

Porphyritic Biotite Granite

This rock occurs throughout the area as isolated exposures. It is included with the granitic gneisses on the accompanying map as no separate body of mappable size could be traced out. The granite is pink and slightly porphyritic. The phenocrysts of potassic feldspar are up to half an inch long. The groundmass, which is fine- to medium-grained, consists of pink feldspar, plagioclase, quartz and biotite, with accessory pyrite and sericite.

Pegmatite, Aplite and Basic Dykes

Numerous pegmatite dykes of several ages cut the rocks of the area. The pegmatite consists of pink potassic feldspar, quartz, and small amounts of biotite, and in places magnetite. The aplite is a pink, fine-grained rock consisting of feldspar, quartz and very little biotite.

Basic dykes, probably lamprophyre, cut all the other rocks of the area. They consist mainly of feldspar, amphibole and biotite. They are aphanitic to fine-grained, and locally slightly porphyritic, having small phenocrysts of feldspar.

STRUCTURAL GEOLOGY

The overall structure of the map-area is complex. Few original structures, such as bedding, were noted in the paragneisses, but in the central zone of paragneisses, folds were traced out by employing gneissic structure. The strike of the rocks in the northern part of the area is east-west, and the dips are from 40°S. to vertical. In the southern part, the strikes are from northeast to northwest, and the dips are from steep to gentle. In the gneissic facies of the anorthosite, dips are vertical or steeply north, whereas in the adjacent rock units, dips are south. Strikes and dips vary greatly in the central part of the area.

The contact between the anorthosite and the syenite gneiss is well exposed on the two southern arms of Brézel lake. The rock along this contact is highly sheared.

Evidence of small scale rotational faulting is found in several of the valleys north of Des Eudistes lake and east of Boudreau lake.

Joints are found in all the rocks of the area, and several sets are represented.

ECONOMIC GEOLOGY

Galena

Galena was found at a locality, shown on the accompanying map, 900 feet from the mouth of a small stream, which reaches the east shore of Canot lake about a mile from its south end. Here, four veins, which are nearly parallel and are from one-quarter to two inches thick, contain coarse-grained galena, quartz and calcite. The longest vein is exposed for a length of four feet. The galena-bearing veins are in the cores of thin, lenticular pegmatite dykes cutting migmatite country rock. Floats of galena-bearing pegmatite were found as far as 300 feet downstream from the showing. A grab sample of the galena assayed 61.23 per cent lead and $0.30 per ton silver.

Magnetite

In a stream bed a mile and a quarter west of Manitou river and one-quarter of a mile south of the northern boundary of the area, magnetite layers, up to one foot thick, occur in gneissic granite. As exposed in a cliff face, the magnetite-rich zone is 25 feet long and 3 feet thick.

A grab sample of the magnetite assayed 53.50 per cent of iron, 0.92 per cent of titanium, 0.20 per cent of sulphur, and 2.40 per cent of phosphorus.

Pyrrhotite

Stringers of pyrrhotite and pyrite occur locally in migmatitic or mixed gneisses at a locality a mile north-northwest of the junction of Manitou river and Brézel lake.