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PRELIMINARY REPORT ON POMMEROY - BELLEFEUILLE AREA, TEMISCAMINGUE ELECTORAL DISTRICT

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PROVINCE OF QUEBEC, CANADA  
DEPARTMENT OF MINES  
HON. W. M. COTTINGHAM, MINISTER  
GEOLOGICAL SURVEYS BRANCH

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PRELIMINARY REPORT  
ON  
POMMEROY-BELLEFEUILLE AREA  
TÉMISCAMINGUE ELECTORAL DISTRICT

BY

R.-J.-E. SABOURIN



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Preliminary Report  
on  
Pommeroy-Bellefeuille Area,  
Témiscamingue Electoral District,  
by  
R.-J.-E. Sabourin

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INTRODUCTION

The Pommeroy-Bellefeuille area was mapped during the summer of 1959. It comprises 305 square miles bounded by latitudes  $47^{\circ}00'$  and  $47^{\circ}15'$ , and by longitude  $78^{\circ}30'$  on the east and by Ostaboningué lake on the west. It includes all of Pommeroy township, slightly more than half of Bellefeuille and Lanoué townships, and smaller parts of Couturier, Darveau, Guay, and Bruchési townships.

The southwest corner of the area is about 25 miles northeast of the town of Témiscamingue on the Ontario-Quebec interprovincial boundary.

Most of the area is accessible the year-round by air from Kipawa, 8 miles northeast of Témiscamingue. Travel by canoe from Kipawa lake to Pommeroy, Saseginaga, Cinq Milles, and Ostaboningué lakes provides easy access to the area. Only a few short portages are necessary, and these larger lakes are connected to most of the other important lakes by portages. A truck road of the Booth Lumber Company crosses the southeast corner of the area.

The terrain is undulating, and the orientation of the ridges reflects the structure of the bedrock. Local relief is of the order of 550 feet.

The area drains into Kipawa lake, part of the Ottawa river basin, mainly through Ostaboningué lake. Some of the water drains through Pommeroy lake and a few small lakes in the southeast part of the area.

Glacial striae indicate that the direction of flow of Pleistocene glaciers varied between  $S.15^{\circ}W.$  and  $S.65^{\circ}W.$  A few southwest-trending eskers were observed in the eastern part of the area. Cerise river flows through a sandy outwash plain.

Lumber and fur are the main resources, although many tourists visit the area during the hunting and fishing seasons.

Lyall (1959) mapped the area immediately to the south, Retty (1932) mapped Ostaboningue lake, and Henderson (1936) mapped the area to the north.

#### GENERAL GEOLOGY

All the consolidated rocks of the area are Precambrian. The oldest, outcropping in the northwest corner, consist of fine-grained hornblende and biotite schists and gneisses with possibly some volcanics. Biotite and hornblende paragneisses, some of which are garnetiferous, outcrop as continuous bands in the south-central part of the area and as lenses and layers in the grey granite gneiss and pink granite. Quartzite forms a continuous band that outlines the basin structure of the southern part of the area; it also occurs on the west side of Saseginaga lake. Associated with the paragneisses are some bands of garnetiferous pink granitic gneiss. A grey biotite granite gneiss, the most extensive rock of the area, intrudes these formations and is in turn cut by pink granite. Gabbro sills and dykes, more or less altered, are widespread. Northwest-trending diabase dykes are the youngest intrusive rocks.

TABLE OF FORMATIONS

Pleistocene and Recent	Till, sand gravel
PRECAMBRIAN	Diabase dykes
	Gabbro
	Pink biotite granite, massive to gneissic; megmatite
	Syenite
	Grey granite gneiss
	Garnetiferous pink granitic gneiss
	Garnetiferous hornblende and biotite gneisses
	Hornblende and biotite gneisses, amphibolite
	Quartzite, quartz-sericite schist
Fine-grained biotite and hornblende gneisses and schists, possible volcanics	

PRECAMBRIAN

Fine-grained biotite and hornblende gneisses and schists;  
possible volcanics

Fine-grained, biotite and hornblende gneisses and schists occur in an east-northeast-trending band as much as 4 miles wide near the northern boundary of the area. The band crosses the north end of Ostaboningué lake and leaves the area north of Cinq Mille lake.

These rocks are markedly schistose, fine-grained, and dark grey on both fresh and weathered surfaces. They consist of white feldspar, quartz, and abundant biotite and hornblende. Small garnets occur sporadically, and disseminated pyrite is common.

Near the north end of Ostaboningué lake, these gneisses and schists are much injected by pink, biotite granite which, in places, has thoroughly permeated them.

Immediately north of Cinq Mille lake, very fine-grained to aphanitic, dark grey or dark green rocks with phenocrysts of pink or white feldspar trend northeast in a zone about one mile wide. These rocks may be volcanic, although no diagnostic structures were seen. The weathered surfaces, which are light buff, in places, show what may be flow lines. This formation is associated with fine-grained hornblende plagioclase schists and is locally injected by fine-grained pink granite.

Quartzite, quartz-sericite schist

Quartzite and quartz-sericite schist crop out as two separate bands in the area. One follows the basin structure of the south-central part of the area and outcrops just east of Petit Lac à la Truite and south of Pommeroy lake and Petit Lac Bouleau. The other band may be followed west of Saseginaga lake for 3 miles.

Gradations between massive quartzite and friable quartz-sericite schist exist. The quartzite and schist are light grey to almost white, both on fresh and weathered surfaces, with some mottled iron oxide stains. These rocks consist of varying amounts of quartz and sericite with minor iron oxides. The radioactive minerals of Hunter's Point in the area to the south (Lyall, 1959) occur in this formation.

Hornblende and biotite paragneisses: amphibolite

Hornblende and biotite paragneisses with some amphibolite layers occur throughout the area as mappable units and as inclusions in the granite gneisses.

These rocks all are well layered, and mineral alignment is observed in all except the amphibolites. The fresh hornblende and biotite gneisses are varying shades of grey in colour, depending on the tenor of the ferromagnesian minerals: rusty brown tints are found in the more weathered exposures. Grain size varies from fine to medium. The rocks consist of quartz, white feldspar, and varying proportions of biotite and hornblende, the hornblende-rich type predominating. Small garnets occur sporadically. The amphibolite is more massive than the gneisses and is fine- to medium-grained. It consists of white plagioclase and more than 50 per cent hornblende with occasional flakes of biotite.

#### Garnetiferous, hornblende and biotite paragneisses

Fine-grained and markedly schistose, garnetiferous hornblende and biotite paragneisses occur as mappable units in the basin structure of the south-central part of the area. They differ from the hornblende and biotite paragneisses by the presence of a greater proportion of garnet, crystals of which are up to  $\frac{1}{2}$  inch in diameter. Isolated exposures of this rock, too rare to be mapped separately, were observed in the hornblende and biotite paragneiss bands.

#### Garnetiferous, pink, granitic gneiss

Garnetiferous, pink, granitic gneiss is the field name applied to a fine-grained rock consisting of quartz, microcline, white plagioclase, biotite, and up to about 3 per cent pink garnet. This rock type is exposed in mappable units in the south-central part of the area and is the northward extension of the garnetiferous paragneiss and garnetiferous injection gneiss mapped by Lyall (1959). In this northern extension, the granitic gneiss definitely predominates, and paragneiss is present only as minor inclusions. Thin layers of this granitic gneiss were also observed as injections in nearby paragneiss.

#### Grey granite gneiss

Grey granite gneiss is the most extensively exposed rock type of the area and outcrops mainly in the eastern and central sectors.

This rock is medium-grained, light grey on fresh and weathered surfaces but with rusty stains in deeply weathered exposures. It consists mainly of quartz, white feldspar, biotite, and hornblende. Some facies contain minor pink feldspar and magnetite. The tenor in ferromagnesian minerals is generally low except near inclusions.

The granite gneiss is intrusive into the paragneisses, and more or less digested inclusions and layers of the latter are common, particularly in the sectors around Ostaboningué and Saseginaga lakes.

Gneissic structure is poorly developed in the less contaminated exposures, but may everywhere be determined by the orientation of the ferromagnesian minerals.

Some pegmatite dykes in the paragneisses and in the grey granite itself are probably derived from the same magma.

### Syenite

Rare, scattered exposures of syenite found throughout the area are too small to indicate on the accompanying map.

The syenite is massive, generally medium- to coarse-grained, and light pink to salmon red in colour. The main constituent is a pink, potassic feldspar. This is accompanied by minor white plagioclase and partly chloritized amphibole or pyroxene.

### Pink biotite granite, pegmatite

Pink biotite granite and associated pegmatite are the youngest acidic rocks of the area.

Exposures in which this granite cuts other formations, mainly in the form of dykes and injections, are widespread, but the larger, mappable bodies are concentrated in the western half of the area. The largest single body is south of Cinq Mille lake.

This granite is pink on both fresh and weathered surfaces. Grain size is from fine to coarse. The finer facies generally shows more marked gneissic structure than the coarser. The granite consists of quartz, pink potassic feldspar, white sodic plagioclase and generally much less than 5 per cent biotite.

The possibility of two different pink granites is suggested by the presence of dykes of pink, fine-grained, biotite granite cutting pink pegmatite and granitized schists in an exposure on the east shore of Ostaboningué lake. Pegmatite also cuts the gabbro northeast of Brown lake.

### Gabbro

Gabbro occurs as small lenses and sills in the southern half of the area and as northeast-trending exposures, possibly parts of three distinct dykes, in the northern half of the area.

This gabbro is rusty brown, medium to coarse in grain, massive, in part ophitic, and generally quite altered.

It consists mainly of brownish plagioclase and pyroxene, with magnetite as a common accessory and, in places, garnet. The greater degree of alteration served to distinguish it from the diabase of the area.

Exposures on the west shore of Saseginaga lake as well as those between Regenzie and Pommeroy lakes are more basic facies of this gabbro. Such facies are light to dark green on fresh surfaces and weather to a light brown. They now consist almost entirely of lamellar or fibrous amphibole, probably cummingtonite or actinolite, as needles up to two inches long, with minor light brown mica and magnetite. One exposure on the west shore of Saseginaga lake at the latitude of Dugal lake shows relics of large cummingtonite crystals in a fine-grained, greenish black serpentine with some magnetite crystals and a few thin veinlets of chrysotile.

#### Diabase dykes

Scattered exposures of diabase are so arranged that they may represent three or four major northwest-trending dykes. These are the youngest consolidated rocks of the area.

The diabase is generally medium-grained, although some chilled edges were observed, dark green on fresh surface and brown weathering. Ophitic texture is well developed.

#### STRUCTURE

Foliation is marked in most of the rocks of the area and serves to delineate the various structures. Dips are moderate. Joints are common.

The largest structural unit is the north half of a basin structure that extends southward (Lyall, 1959) and for which the quartzite serves as a good marker horizon. The basin is reflected also in the shapes of Pommeroy lake and of other lakes to the south. To the northeast, this structure passes into a large syncline, somewhat deformed, whose axis would cross Dugal lake and continue to the south end of Ecarté lake. The grey granite gneiss east of Saseginaga and Kikwissi lakes is deformed in a series of small, north-trending folds.

A domical structure, about  $3\frac{1}{2}$  miles in diameter, occurs just east of the south end of Ostaboniquue lake. Erosion has cut through the grey granite gneiss in places and exposed a sill-like mass of pink granite. This structure passes into a northwest-tilting syncline that terminates against the east-trending schists and gneisses of the northern part of the area.

No major fault was observed in the area.



ECONOMIC GEOLOGY

The Hunter's Point showing of radioactive minerals is south of the southwest corner of the area (see Lyall, 1959). This discovery, made in October 1957, sparked a staking rush in the district. The writer visited the prospect in the summer but no work had been done since the preceding year. The quartzite band in which the radioactive minerals occur extends into the present area but no concentration of radioactive minerals was found.

Disseminated sulphides, mainly pyrite, are common in the schists and fine-grained gneisses of the northern part of the area.

A few pits were dug by prospectors west of the road that passes through the paragneiss lens on the southwest side of Saseginaga lake. These pits are in weathered and perhaps loose blocks of material similar to that of the basic facies of the gabbro that occurs on the west side of the lake. Prospectors considered the fibrous amphiboles as possible asbestos.

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