

# RP 341(A)

PRELIMINARY REPORT ON DARLENS - CHABERT AREA, ROUYN-NORANDA ELECTORAL DISTRICT

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P. R. NO. 341

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PRELIMINARY REPORT

ON

DARLENS-CHABERT AREA

ROUYN-NORANDA ELECTORAL DISTRICT

BY

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QUEBEC  
1957

P. R. NO. 341

PRELIMINARY REPORTONDARLENS-CHABERT AREA

by

Peter V. Freeman

INTRODUCTION

The Darlens-Chabert area, 200 square miles in extent, is bounded by latitudes  $47^{\circ}45'$  and  $48^{\circ}00'$  and by longitudes  $78^{\circ}30'$  and  $78^{\circ}45'$ . It was mapped during the summer of 1956, the work being a continuation of mapping done in areas to the east during the summers of 1954 and 1955 (Freeman, 1956). The area covers most of Darlens and Chabert townships, the eastern halves of Basserode and Clérion townships, and narrow strips of Montanier and Vaudray townships. The northern boundary of the map-area abuts on the Cléricy and Kinojevis (James and Mawdsley, 1924) and Kinojevis (MacLaren, 1952) map-areas.

The Hydro-Quebec power station at Rapid 2, Ottawa river, 28 miles southwest of Cadillac, is easily reached by road. From this point most of the western parts of the area can be reached by canoe along the Ottawa and Kinojevis rivers and Clérion creek, and the northern parts along the Ottawa and Darlens rivers. The eastern and southeastern parts are accessible along the new Canadian International Paper Company road from Rapid 7, Ottawa river, to Expanse lake. A branch road from Finger creek north to Rapid 2 is under construction and should be completed shortly. The south-central part can be reached by float-plane.

Most of the bedrock is mantled by lake clay. The smaller streams flow on the gently sloping surfaces of the clay along meandering courses. Rocky uplands are confined to three, irregular, northeast-trending belts, in the southeast, central, and northwest parts of the area.

GENERAL GEOLOGY

The consolidated rocks of the area are Precambrian in age. The oldest, made up of altered sedimentary with some volcanic types, are included in the Pontiac group. These have been intruded by, and mixed with, the granitic and syenitic rocks that underlie much the greater part of the area. Pegmatites and aplites are the youngest of the acidic types. Dykes of diabase and gabbro cut all other rocks in the area.

Table of Formations

CENOZOIC	Recent and Pleistocene	Peat, talus, alluvium Fluvioglacial deposits, varved clays
LATE PRECAMBRIAN		Diabase and gabbro
	Intrusive Contact	
EARLY PRECAMBRIAN		Granite, pegmatite and aplite Albite-microcline granite
	Intrusive Contact	
		INTRUSIVE ROCKS Porphyritic hornblende syenite Porphyritic biotite granodiorite
	Intrusive Contact	
	Pontiac Group	Biotite schist Coarse-grained amphibole rock

PONTIAC GROUP

Biotite Schist and Related Rocks

The oldest rocks, which are assigned to the Pontiac group of Wilson (1956), are biotite schists with some lenses of biotite-staurolite schist and hornblende schist.

Exposures of the schist are most numerous in the northern quarter of the area, where they form low ridges parallel to their strike. Elsewhere, small lenticles or more irregular masses occur in or between the intrusive rocks. The largest of these masses extends northeast and south of Head lake. The low-lying strip of land extending north from Sturgeon rapids along the

Ottawa may be underlain by the schists, although no exposures were found there. The best exposures of biotite schists are along the Rapid-2 road and Darlens river.

The biotite schists are grey and weather into slabs. In places, thin biotite-rich and quartz-rich layers alternate to give the rock a laminated appearance. Elsewhere, the layers are many feet thick.

The schists have biotite, quartz, and plagioclase in approximately equal amounts. Hornblende is locally abundant in thin layers, and staurolite occurs in places as porphyroblasts. Minor minerals are pyrite, magnetite, sphene, and apatite.

In many places small masses of schist are included in the igneous rocks, and locally lit-par-lit injection gneisses have been formed.

The schistosity is, at most localities, parallel to the layering, which is presumed to be original bedding. Thin, fluted veins of quartz, pegmatite, or granite are parallel to the schistosity.

#### Amphibole Rock

About one mile west of Clerion lake a thin layer of coarse-grained amphibole rock occurs between biotite schist and pegmatite. It appears to be parallel to the schistosity of the Pontiac rocks. Green hornblende is the principal mineral, but in places there are blebs of plagioclase feldspar. Pyrrhotite and epidote are visible in hand specimen.

#### Hornblende Syenite and Related Rocks

##### Porphyritic Hornblende Syenite

Six masses of hornblende syenite crop out toward the northwestern corner of the area, and another straddles Ottawa river some 5 miles to the south. All are in Basserode township. Elongation of the individual masses varies from northwest to northeast.

The rock is a coarse-grained aggregate of dark-green hornblende and pinkish feldspars, and is in places gneissic. Most of the feldspars are idiomorphic and contrast strongly with the ferromagnesian minerals. Biotite is locally abundant. Epidote forms veinlets, and coats joint faces in the rock.

Dykes and irregular masses of granite or pegmatite cut the syenite. Inclusions of Pontiac schist are present in places. Small, dark ~~schlieren~~ <sup>inclusions</sup>, composed almost wholly of hornblende, are locally numerous and are commonly elongated parallel to the gneissic structure in the rock.

At the mouth of Kinojevis river and in the pegmatite on Darlens river to the northeast, there are small lenses of dark "augen gneiss". Although these have been correlated with the hornblende syenite, they may have a metasomatic origin. The matrix is a schistose aggregate of dark minerals, principally hornblende, and the "augen" are rounded or elongated blebs of white altered feldspar.

### Porphyritic Biotite Granodiorite

Lenses of porphyritic biotite granodiorite occur in the granites west of the Ottawa in ranges III to V, Basserode township, and in the Pontiac schists west of Rapid-2 road. Small masses of this rock are found in the granites north of Seahorse lake and in many other places in the map-area. The rock is best seen along the banks of the Ottawa below Rapid-2 in range VI, Darlens township, where a long, thin lens in pegmatite forms a high cliff.

The rock is greyish-white and locally gneissic. It consists of plagioclase feldspar as phenocrysts, with subordinate amounts of quartz, feldspar and biotite in the groundmass. In some outcrops, inclusions of Pontiac schist pass gradationally into the porphyritic granodiorite, but in a few places east of Seahorse lake dykes of the granodiorite cut schist inclusions.

### Granite and Granite Pegmatite

#### Granite

The granites form large masses except in the northeastern part of the area where they occur as dykes or small lenses. They are commonly pink, with some pinkish-grey and grey facies. Most of the rock is massive and medium-grained, but fine-grained and coarse-grained varieties are found, and here and there the micaceous minerals show a crude preferred orientation.

Microcline and microcline perthite are the dominant feldspars, with plagioclase (probably albite) abundant in places. Plagioclase-rich and microcline-rich varieties are so mingled that it is difficult to separate them. Quartz forms more than 15 per cent of the rock, and biotite, with or without muscovite, makes up from 3 to 10 per cent or more of the rock. Magnetite is an important accessory in the Seahorse Lake granite. Spinel, apatite, allanite, monazite (?), chlorite, garnet, sericite, and zoisite are minor minerals.

The granite is intimately mixed with and intruded by pegmatitic material to which some of the granite is probably related genetically. Small inclusions of Pontiac schist, in all stages of assimilation, are generally abundant near contacts with the schists.

#### Granite Pegmatites

Pegmatites and associated aplites of diverse textures are extremely abundant in the area. Not only do they form dykes and sills in the schists of the Pontiac group and in the syenitic rocks, but they also crop out over areas with the dimensions of stocks. The largest mass is 6 miles in diameter, centred south of Rapid 2. Large tongue-like extensions of this pegmatite mass trend northeast to Darlens river and beyond, and southwest to Clérion lake, making a zone 6 to 7 miles wide and over 15 miles long in which pegmatite and pegmatitic granite are the predominant rocks.

The large pegmatite masses are essentially homogeneous. Locally aggregates of larger crystals of some minerals form small irregular masses in the larger masses. Some of the smaller lenses and dykes are zoned. This is reflected in differences in mineralogy or texture or both around a central core or on the walls.

Microcline-perthite forms the bulk of the pegmatites and aplites, and is accompanied by quartz, which occurs in graphic intergrowth with it or as large anhedral. Albite, biotite, muscovite, garnet, magnetite, tourmaline, beryl, and apatite are accessory and occur in different combinations not only in different masses but also within one mass. Muscovite is common and is the only accessory mineral in some pegmatites. Some crystals are as much as 6 inches in diameter, but most of them are less than 1 centimeter. In the pegmatite masses north and south of Rapid 2, yellowish-green aggregates of microcrystalline muscovite are abundant. These appear as coatings on joint faces, as twisted lenses and as porphyroblastic segregations. Plumose intergrowths of quartz and muscovite are common in most of the pegmatites, and biotite is generally associated with muscovite. Garnet is found in a few pegmatites, particularly in the aplitic parts. Tourmaline, which occurs in some pegmatites on Clérion lake and east of Darlens river, is associated mainly with quartz veins. Rounded grains or octahedra of magnetite are common in the pegmatites east and west of Seahorse lake.

Most of the pegmatites are massive, some are layered, and some are streaked and folded. Locally inclusions of Pontiac schist, in all stages of assimilation, are numerous.

#### Diabase and Gabbro

Several dykes of diabase or gabbro represent the youngest consolidated rocks in the area. They vary from a few feet to 300 feet thick. Only the thicker dykes (three) are shown on the map. All strike north or a few degrees east of north.

Dark-green augite and white labradorite form a megascopically visible ophitic or sub-ophitic texture in the larger dykes. The smaller dykes and the margins of all dykes are commonly fine-grained. Magnetite and pyrrhotite are accessory.

#### Pleistocene and Recent

Glacial striae on the rock surfaces show that the ice moved approximately S. 20° W. across the area. Debris left during retreat of the ice includes large erratics, concentrations of boulders, ground moraine and fluvio-glacial deposits.

A large area of sand extends south from the mouth of Darlens river toward Head lake. Ridges of boulders, gravel and sand project through the sand plain here and there. A conspicuous delta-esker ridge trends northeast from the bend in the Canadian International Paper Company road in Chabert township. A broken ridge of sand, gravel and boulders extends about 10 miles north from Sturgeon rapids.

Varved clays are common throughout the area, and most of the smaller streams follow meandering courses on these clays.

## STRUCTURE

The extensive covered areas and the abundant intrusive rocks make difficult a satisfactory analysis of the structure. In the schists of the Pontiac group the schistosity and the layering, the latter probably parallel to original bedding, are essentially parallel and are used interchangeably in structural determination. Most of the intrusive rocks show some traces of gneissic structure, and it is surmised that at least some of this is parallel to the schistosity of the metasedimentary rocks. However, the intrusive rocks have produced some, if not considerable distortion of the general trends of the older formations.

The schists of the Pontiac group in the northern part of the area generally strike east-northeast to southeast and dip  $30^{\circ}$  to  $75^{\circ}$  to the north. A broad plunging fold in these rocks is suggested. The dips and strikes in the southern part of the area are irregular and perhaps the attitude of the formations was determined by stresses originating during the introduction of the intrusive rocks.

Only minor faults with slight displacement were recognized in the field. Chlorite schist on the west side of a large quartz vein in range IV, lot 50, Clérion township, may mark a fault, but there is no evidence of displacement of formations on either side of the zone. No evidence for the Smoky Creek fault, the trace of which projected from the Kinojevis map-sheet should cross the north boundary of the present area, was seen. A depression which may mark its location is partly filled with glacial material. Linear topographic depressions in many parts of the area may mark faults, however, there is no other evidence of them.

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

## ECONOMIC GEOLOGY

### General Statement

Although granite pegmatites crop out extensively in the area, economic minerals commonly associated with them are rare. The principal localities where economic minerals were found are indicated by numbers of the accompanying map.

### Radioactive Minerals

A sample of magnetite-bearing granite from Locality (1), east of Seahorse lake, containing monazite and some metamict zircon gave 0.01 per cent  $U_3O_8$  equivalent. Readings higher than normal were obtained with a Geiger counter at a few other localities on the magnetite-bearing pegmatites and granites near Seahorse lake.

### Beryl

Beryl was found at Localities (2) and (3):



(2) as small crystals in thin quartz veins cutting pegmatite on the line between ranges IX and X, lot 1, Darlens township, on the east side of a chlorite-amphibole schist.

(3) as one large crystal associated with quartz in a pegmatite in lot 40, range V, Basserode township.

### Sulphides

Disseminated pyrite, chalcopyrite and magnetite occur in thin, iron-stained, northeast-trending quartz veins in a shear zone, 5 to 6 feet wide, in a sericitised granite in lot 46, range V, Clérion township (Locality (4)). The zone was traced 200 feet along strike.

### Quartz Veins

A large, fractured, quartz vein, 100-200 feet wide and 1½ miles long, with a zone of chlorite schist on the west side, trends slightly west of north in lot 49, ranges IV and V, Clérion township. The vein is on the east side of a zone of chlorite schist. The fractures in the quartz are filled with a dark-green chlorite stained with malachite. A few specks of pyrite are visible. The quartz is predominantly milky, but parts are chalcidonic.

On the east side of Darlens river, range VII, lot 40, Darlens township, narrow veins of quartz-tourmaline striking northeast cut the pegmatite.

### Gravel

Gravel from a delta-esker ridge is used by the Canadian International Paper Company as road material.

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