

# RP 296(A)

PRELIMINARY REPORT ON CHARPENÉY - COOPMAN AREA, SAGUENAY COUNTY

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PRELIMINARY REPORT  
ON  
CHARPENAY-COOPMAN AREA

SAGUENAY COUNTY

BY

M.A. KLUGMAN



QUEBEC  
1954

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on

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INTRODUCTION

The Charpeney-Coopman area was mapped by the writer during the summer of 1953. It is bounded on the south by the gulf of St. Lawrence and extends inland for about 15 miles to latitude  $50^{\circ}30'$ , and on the east and west it is bounded by longitudes  $65^{\circ}15'$  and  $65^{\circ}35'$ , respectively. The map-area includes about one-third of Rochemonteix township, all of Charpeney, and almost all of Coopman township, as well as a three-mile-wide strip along the northern border that has not yet been subdivided. In all it covers about 220 square miles. The western margin of the area is 35 miles east of Sept-Iles (Seven Islands), a town on the north shore of the St. Lawrence, 325 miles below Quebec City.

The easiest access to the area is by sea-plane from the base at lac des Rapides, near Sept-Iles. Three lakes within the area are suitable for water landings - Boutereau and Delaunay lakes, in the northwestern and central sections of the area, respectively, and lac des Eudistes which partially lies within the northeastern corner of the map-area. Apart from the bay at the mouth of Manitou river, just without the southeastern corner of the area, landings on the gulf are hazardous and should only be undertaken after a windless period of some eight hours, or when a northerly wind is blowing.

The area also may be reached by fishing-boat from Moisie, a small village at the mouth of Moisie river, about twelve miles east of Sept-Iles. Two fairly good anchorages are to be found at the mouths of Bouleau and Manitou rivers.

Travel within the map-area is not easy. Two major rivers flow southward across the area, the Bouleau in the western part and the Tortue in the central sector. A third large river, the Manitou, parallels the eastern boundary a short distance outside the map-area. As the first two rivers have steep gradients and many rapids, and vary seasonally from torrential streams to almost dry water-courses, they are poorly suited to navigation by canoe. The only good portage in the area runs from the sea, at a point near the mouth of Manitou river, northward to lac des Eudistes. This excellent trail is from twelve to twenty feet wide, and most of the creeks along its route are spanned by bridges. Other old portages, which were in poor condition and had to be re-cut by the writer's party before use, act as connecting links along the north-

south water-route across the area formed by Fabien, Boutereau, Grace, Delaunay and Thérèse lakes and Sault-Plat river. Two major portages were cut during the summer. The first, eight miles long, follows closely Bouleau river on the west side. The second trail, three miles long, runs easterly from Delaunay lake to Tortue river.

Most of the area is drained through Bouleau and Tortue rivers and their tributaries. Both these streams have steep gradients, dropping 1,100 feet within a distance of sixteen miles. For the lower six miles of Bouleau and three miles of Tortue, the rivers flow in deep gorges and drop rapidly to the sea through an uninterrupted series of falls and rapids.

That part of the area west of Bouleau river is very rugged, with deep intersecting valleys and very few level stretches. Between Bouleau and Tortue rivers, the northern section is similar to that west of the Bouleau but is more rough. Southward, the relief decreases and the sector south of Delaunay lake is characterized by a more gentle, rolling topography. The portion of the map-area east of Tortue river is especially rugged, particularly in the northeast where the relative relief is about 2,000 feet. The coastal belt, with difference in elevation of about 200 feet, is generally about two miles wide but reaches a width of four miles in the east. Well stratified Champlain sea deposits mantle much of the southeastern corner of the area, producing flat, swampy land through which the underlying bedrock occasionally protrudes.

#### GENERAL GEOLOGY

All the consolidated rocks of the area are of Precambrian age. In order of abundance, they consist essentially of granitic intrusives, paragneisses, amphibolites of doubtful origin, anorthositic and gabbroic intrusives, migmatites, dioritic intrusives, and various minor intrusions.

Apart from the granitic bodies, the contacts and relationships between these rocks are often difficult to determine. Relative age relationships have been resolved, as far as possible, from contact features and, where these are lacking, from the comparative degree of deformation and metamorphism of the various lithologic units.

Table of Formations

Cenozoic	Recent and Pleistocene	Sand, gravel, clay, till
	Unconformity	
Precambrian	Post-Grenville (?) Intrusives	Basic dykes (not indicated on map) Pegmatite and aplite dykes (not indicated on map) Pink biotite granite Pink hornblende granite Dioritic rocks Anorthositic and gabbroic rocks Pink biotite and augen gneisses Pink porphyroblastic hornblende gneiss
		Migmatites and composite gneisses
	Grenville (?) metasedimentary rocks and associated igneous rocks	Biotite paragneiss, grey biotite-plagioclase-quartz gneiss, hornblende gneiss, amphibolites (para and/or ortho), biotite schist, hornblende schist, graphite gneiss, impure quartzite

## Grenville (?) Metasedimentary Rocks and

### Associated Igneous Rocks

The rocks of this group, which are possibly of Grenville age, occupy less than one-quarter of the map-area. They occur predominantly in the southwest, central and northwestern sections of the area and also as scattered exposures along the coast.

In order of abundance, these rocks are biotite paragneiss, amphibolites (para- and/or ortho), grey biotite-plagioclase-quartz gneiss, hornblende gneiss, biotite schist, hornblende schist, graphite gneiss, and impure quartzite.

The paragneisses are well layered; individual strata are from a fraction of an inch to several inches thick, and can be traced for tens of feet with the thickness and composition remaining constant.

A broad band of biotite paragneiss can be traced from the southwestern corner of the map-area northeastward across Bouleau river, where it passes into a complex of composite gneisses and injection gneiss east of Delau-nay lake. The rock is fine- to medium-grained and the layers vary from buff-grey to dark grey, depending on the biotite content. The rock consists essentially of quartz and plagioclase, generally in about equal amount, and from 10 to 45 per cent biotite, with pink garnet, hornblende and graphite as accessories.

The biotite-plagioclase-quartz gneiss is normally grey to light grey. It varies from a banded gneiss to a more massive, but still gneissic, rock. The essential minerals are quartz, feldspar and biotite, in more or less equal amounts, with the quartz and feldspar usually predominant. Throughout the area, the biotite-plagioclase-quartz gneiss is generally associated with the younger biotite and augen gneiss.

The hornblende gneiss is similar in texture and composition to the biotite paragneiss, but has more hornblende. Hornblende and biotite are generally present in approximately equal amount, with hornblende predominating in some of the rock. The gneiss is ordinarily fine- to medium-grained, greenish-grey, and is closely associated with the biotite paragneiss.

A large body of amphibolite underlies the northwestern sector of the map-area. It is also found as scattered exposures throughout the Grenville-like formations, and in places is associated with the gabbroic rocks of the area. Whether these amphibolites are ortho- or para-amphibolites is at present unknown, but indications are that some at least are definitely ortho-amphibolites. The typical amphibolite is dark grey-green to black, and is generally fine- to medium-grained, with a characteristic "salt-and-pepper" weathered surface. The composition is, roughly, hornblende: 60 per cent, and plagioclase: 40 per cent. Biotite and garnet are present in many places and pyroxene is found in small amount in some localities.

Biotite schist is commonly found within the biotite and augen gneisses, particularly where these rocks are in contact with the Grenville-like

formations. It is composed mostly of biotite, with small amounts of quartz and plagioclase. The rock is dark brown to black, and is usually highly schistose.

The hornblende schist outcrops in a few places and is generally associated with the amphibolite. This schistose rock consists essentially of hornblende, with a fair amount of plagioclase and a little biotite.

The graphite gneiss is fine- to medium-grained, has a typical rusty colour, and consists of quartz, plagioclase, biotite and pyrite.

A grey, recrystallized, micaceous quartzite, generally associated with the biotite paragneiss, is found in a few scattered localities.

Migmatites and composite gneisses occupy about half the area underlain by the Grenville-like metasedimentaries and associated igneous rocks. They are commonly associated with nearby granitic intrusive bodies, but also are found far from any exposure of intrusive rock.

#### Post-Grenville (?) Intrusives

##### Pink Porphyroblastic Hornblende Gneiss

Porphyroblastic hornblende gneiss is exposed as a number of large and small patches, all within the southern half of the map-area. The rock is coarse-grained, and pink to reddish in colour. About 60 per cent of the rock consists of orthoclase feldspar, in porphyroblasts up to an inch in diameter. The remainder is made up of quartz, plagioclase, and hornblende, which in places is altered to biotite. The porphyroblasts commonly are rudely aligned, imparting a faint gneissic structure to the rock.

##### Pink Biotite and Augen Gneisses

Pink biotite gneiss and an augen gneiss of similar composition have been grouped together for purposes of mapping as it is difficult to differentiate between them. Together they underlie about one-third of the map-area. Both rocks are pink, medium- to coarse-grained, and consist of feldspar, quartz and biotite, with accessory garnet and hornblende. They are strongly gneissic, and the augen, where present, are elongated parallel to the gneissic structure.

##### Anorthositic and Gabbroic Rocks

These rocks vary in composition from gabbroic to anorthositic. The anorthositic facies occurs mainly in a large mass along the central part of the eastern boundary of the area, and in a small patch on the coast, east of Tortue river. This rock is bluish in colour and coarse-grained, with crystals up to an inch and a half long. It contains a high percentage of calcic plagioclase, with amphibole, biotite, garnet and ilmenite as accessories.

The gabbroic facies is exposed in a narrow belt that parallels Tortue river a short distance east of that stream, and also in smaller patches

elsewhere throughout the area. The typical rock is dark-coloured, coarse-grained, and massive. It consists essentially of pyroxene and bluish plagioclase, with biotite, amphibole and titaniferous magnetite as accessories. Near contacts with surrounding formations the rock is finer-grained, has ophitic texture, and may be mistaken for amphibolite.

#### Dioritic Rocks

Dioritic rocks are exposed in two small patches immediately west of Boutereau lake in the northwest corner of the map-area. The rock is dark green to black, fine- to medium-grained, and massive. It consists of feldspar, pyroxene, biotite, and possibly some amphibole.

#### Pink Hornblende Granite

Three bodies of hornblende granite are found in the northern part of the area - one north and west of Boutereau lake, another west of Grace lake, and the third southwestward from lac des Eudistes.

The granite is pink, medium- to coarse-grained, and varies from a massive type to one that is fairly gneissic. The rock is composed of quartz, potassic feldspar, hornblende and biotite; the relative proportion of the last two minerals is variable and where mica is in excess of amphibole the rock might be termed biotite granite.

#### Pink Biotite Granite

Biotite granite is extensively exposed in the east-central and southeastern parts of the map-area and, in addition, forms a small body south of Delaunay and Thérèse lakes.

The rock is medium- to coarse-grained, and usually massive but in places it is gneissic. The granite is composed of potassic feldspar, plagioclase, quartz and biotite, with disseminated pyrite in some localities. The large mass in the east appears to grade westward into the biotite gneiss, but whether or not these rocks are genetically related is at present unknown.

#### Pegmatite and Aplite Dykes.

Large numbers of pegmatite and aplite dykes cut all the rock types previously described. The pegmatite consists of pink potassic feldspar, quartz and small quantities of segregated biotite and magnetite. In the thicker dykes the feldspar crystals are up to five inches in diameter. The aplite is a fine- to very fine-grained rock consisting of feldspar, quartz and a little biotite.

#### Basic Dykes

Basic dykes, possibly lamprophyre, cut all the other rock types, although they are not as abundant as the acidic dykes. The rock is fine- to very fine-grained, and contains feldspar, amphibole and biotite. Other minerals may be present, but they are unidentifiable in hand-specimens.



## CENOZOIC

Sand and till mantle parts of the map-area, particularly in the southeast. Here, sands are interlayered with pale grey clay, the latter in beds from less than an inch to several feet thick. Cross-bedding was noted at places, especially in raised terraces along the coast. Such deposits are more than 150 feet thick at the mouth of Manitou river. Inland, adjacent to some of the rivers, partially sorted till was seen. Glacial erratics, up to ten feet in diameter, are found on many hill-tops. Glacial striae indicate that the Pleistocene ice-sheet moved nearly due southward across the area.

## STRUCTURAL GEOLOGY

The overall structure of the map-area is almost impossible to decipher, due to the high degree of deformation of the rocks and the complex sequence of intrusions.

In the belt of Grenville-like biotite paragneiss in the southwestern part of the area the original structure has been preserved in the form of well-defined layering. Here the trend is from easterly to northeasterly but south of Delaunay lake it swings abruptly to the east. The dip of the layers is from intermediate to very steep.

The trend of the gneissic structure in the later orthogneisses is variable; in places it is more or less parallel to the contacts of the masses, in other places it is at a high angle to the borders. The granite intrusive bodies are for the most part massive, but are somewhat gneissic around their margins.

Joints are a prominent feature in many of the rocks; they strike in various directions but most of them dip steeply.

## ECONOMIC GEOLOGY

### Sulphides

Very small amounts of finely disseminated pyrite and chalcopyrite are present in most of the granitic rocks. Pyrite, pyrrhotite and chalcopyrite occur in the few outcrops of graphite gneiss that were observed.

### Ilmenite

All the gabbroic rocks show varying concentrations of titaniferous magnetite. The highest concentrations are in the coarse-grained rock of the narrow belt of gabbro that parallels Tortue river on the east. Finely disseminated pyrite and pyrrhotite accompany this mineralization. The more important localities of titanium enrichment are indicated on the accompanying map.