

# RP 158(A)

PRELIMINARY REPORT ON MONTREAL AREA

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Énergie et Ressources  
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Québec 

PRELIMINARY REPORT  
ON  
MONTREAL AREA

Province of Quebec, Canada

DEPARTMENT OF LABOUR, MINES AND MARITIME FISHERIES

Honourable Edgar Rochette, Minister      L.-A. Richard, Deputy-Minister

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BUREAU OF MINES

A.-O. Dufresne, Director

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DIVISION OF GEOLOGICAL SURVEYS

I.W. Jones, Chief

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PRELIMINARY REPORT

ON

MONTREAL AREA

by

T.H. Clark

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QUEBEC

1941

P.R. No 158

## MONTREAL AREA

by T.H. Clark

### INTRODUCTION

The geological investigation of the Montreal area, begun in 1938, neared completion with the work done during the summer of 1940, when the southeastern part of the Island of Montreal, Ile Perrot, and the mainland south of and adjacent to Lake Saint-Louis and the Saint-Lawrence river, were examined. Little ground now remains to be covered to complete this study, which deals with the region comprised in the Laval and Lachine sheets of the Federal topographical series. These two sheets cover, respectively, the northern and the southern half of the area, the separating boundary being at latitude ~~45~~<sup>45</sup>°30'N.

During part of the 1940 season, as during the preceding years, the writer was assisted by Father L.G. Morin, C.S.C.

### STRATIGRAPHY

The following Table of Formations gives a summary of the nature, thickness, and stratigraphical relations of the various formations encountered in the entire area. Likewise, the accompanying map indicates the positions of stratigraphical boundaries between the geological formations and the positions of the more important faults in all the area that has been examined from 1938 to 1940, inclusive. The remarks that follow the Table of Formations, however, deal mainly with observations made during the work of 1940. All the recordings here given, it is well understood, are subject to some revision until the entire investigation will have been completed.

The work of 1940 showed that the Potsdam, Beekmantown, and Chazy formations occupy wide areas on the mainland south of Lake Saint-Louis and that the southeastern part of the Island of Montreal is underlain mainly by rocks of the Trenton and Utica formations. The Trenton and Utica formations also occur on the mainland to the south of the Island.

A good deal of work was done to establish a satisfactory subdivision of the Trenton limestone, not only because this limestone underlies the greater part of the Island of Montreal, but because it is, at present, one of the most valuable natural resources of this area, and also because, without an understanding of the nature and distribution of its component formations, the structure of the Trenton limestone cannot be fully understood. For example, until it is determined to which divisions of the Trenton Group the outcrops in Lachine belong it will not be possible to draw the north-westward extension of the Lachine fault with assurance. Also, many details of the structure and distribution of the beds in the immediate vicinity of Mount Royal depend upon the correct determination of their contained fossils and the assignment of the outcrops to the lower, middle, or upper part of the Trenton Group.

Table of Formations

PERIOD	GROUP, ETC.	FORMATIONS	THICKNESS IN THE MONTREAL AREA (feet)
Quaternary	Recent	Fluvial sands and gravels Saxicava sand Leda clay	
	Pleistocene	Glacial till	
Tertiary (?)	Monteregian intrusives: alkaline gabbro, nepheline syenite, and many types of dykes and sills		
Devonian	Helderberg-Oriskany Limestone		?
Ordovician	Lorraine Limestone, etc.		100 +
	Utica Shale		200
	Trenton Limestone	Tetreauville Rosemount St. Michel	800
	Black River Limestone	Lowville Leray Famelia	75
	Chazy Limestone		300
	Beekmantown Dolomite		1,100
Cambrian	Potsdam Sandstone		1,700
	Total thickness of sedimentary rocks--		4,275
Precambrian	Granite, gneiss, etc.		

In addition to the formations previously mapped, two new ones were added during 1940. The Lorraine formation outcrops on Ile à Boquet and on the neighbouring mainland; it occurs extensively farther to the east, in the neighbourhood of Chambly, but it had not previously been reported from the vicinity of Montreal. The second additional rock unit is the Helderberg-Oriskany limestone formation (or formations), blocks of which have long been known to occur in the breccia of Saint-Helen Island. Because this limestone does not occur in situ, it is not entered on the accompanying map.

Igneous rocks in the form of dykes and sills are common in the vicinity of Mount Royal, and apparently all belong to the Monteregian alkaline suite. Mount Royal itself consists of two main masses of intrusive rock: an alkaline gabbro, commonly termed essexite, and a later intrusive, nepheline syenite. Offshoots and outliers of these were mapped during 1940. In addition, countless dykes and sills were recorded, most, if not all, of them belonging to the same alkaline suite as the two main igneous types. Alnoite, mentioned in the 1939 report (1), is only known to occur in the western part of the area.

#### STRUCTURE

The pattern of sedimentary rocks in this area indicates a series of beds dipping very gently to the east and southeast, complicated on Ile Jesus and the Island of Montreal by very gently folded, northeastward plunging, synclines and anticlines. These tilted and folded structures have been cut by a number of E.-W. and S.E.-N.W. faults, the most important of which have been recorded on the accompanying map. The most striking of the faults discovered in 1940 is one which runs from Delson northwestward through Lachine, and separates the Utica and Lorraine on the north from the Chazy on the south. It is this fault which, coupled with the presence of a transfluvial sill, is responsible for the narrows at the lower end of Lake Saint-Louis. The extension of this fault northwestward is as yet a matter of uncertainty and depends upon the palaeontological examination of extensive collections made in the vicinity of Lachine. It may even be shown to be a continuation of the Ile Bizard fault. In all probability, the White Horse Rapids fault must be extended eastward to pass north of, but probably not much beyond, Mount Royal.

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(1) Que.Bur.Mines, P.R. No. 147, 1940.

## ECONOMIC GEOLOGY

Potsdam sandstone is being actively quarried in Melocheville to be used in the manufacture of ferro-silicon. Otherwise, this formation is of little importance. Beekmantown dolomite is today being quarried for building-stone at De Lery and elsewhere. Wherever solid beds six inches or over can be found, they provide a building stone superior to the Chazy limestone. Chazy, Black River, and Trenton limestone are utilized as described in the 1939 report. The Utica shale at Delson is one of the important ingredients in brick making and has been continuously utilized for that purpose for a score of years. No commercial use is made of the Lorraine or of the Helderberg-Oriskany formation. The igneous rocks, because of their superior hardness, are usually avoided by quarrymen. The Canada Cement Company utilizes some of the basic dykes to increase the percentage of iron and of silica in their cement.

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