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PRELIMINARY REPORT ON CHENIER - BEDARD AREA, RIMOUSKI COUNTY

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PROVINCE OF QUEBEC, CANADA

DEPARTMENT OF NATURAL RESOURCES

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PRELIMINARY REPORT

ON

CHÉNIER-BÉDARD AREA

RIMOUSKI COUNTY

BY

JEAN LAJOIE

QUEBEC
1962

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INTRODUCTION

The Chénier-Bédard area includes part of the Appalachian Mountain range of the lower St. Lawrence River region. It is bounded by latitudes 48°00'-48°15' and by longitudes 68°30' - 68°45', except in the southern third where the boundary is about longitude 68°48'. It includes all of Chénier township, most of Bédard and parts of Duquesne, Laroche, and Biencourt townships. The total area of about 210 square miles was geologically mapped by the writer during the summer of 1961.

The southern part of the area may be reached by the Rimouski - Cabano highway. From this highway, several secondary roads branch towards the centre of the area. The northern part is made accessible by the Ric-Touladi Lake road, which, within the area, is maintained by Price Brothers Company Limited.

Most of the area is wooded except near the settlements of Esprit-Saint, and Lac-des-Aigles, the latter being just south of the southern boundary.

The topography is controlled by the composition and structure of the bedrock. Conglomerates and quartzitic rocks make linear ridges trending north-easterly. Valleys are numerous and generally steep-sided, and the maximum relief is 1,000 feet.

Drainage is effected by Rimouski river and its tributaries except for the southwestern corner, which is drained by the Témiscouata Lake system.

Reworked glacial debris up to 50 feet thick or more is found around Lac-des-Aigles, and Touladi lake. The included erratics are from both local and foreign sources.

GENERAL GEOLOGY

The rocks of this area, which are mostly conglomerates, sandstones, siltstones and shales, range in age from Ordovician to Devonian. The oldest are

highly contorted Ordovician detrital rocks and limestone. These are separated from the Silurian-Devonian sequence by an unconformity.

In the greater part of the area, the basal Silurian formation is either the Val-Brillant quartz sandstone or the Robitaille red siltstone and quartz sandstone. In the southeastern corner, however, the Ordovician is overlain by fine, clastic rocks of the Cabano formation. The Sayabec silty limestone overlies conformably the Val-Brillant and Robitaille formations, and grades upward into the greenish grey calcareous siltstone of the Saint-Léon formation. The Lac des Baies, or uppermost, Silurian formation is composed of interbedded, calcareous, lithic conglomerate and sandstones.

The Devonian period is represented by the grey, highly calcareous siltstone of the Cape Bon Ami formation, which crops out only in the northeastern part of the area.

TABLE OF FORMATIONS

ERA	PERIOD		Rock unit (Thickness in feet)	Lithology
Cenozoic	Pleistocene			Drift, erratics; stream deposits.
UNCONFORMITY				
Paleozoic	Lower Devonian		Cape Bon Ami fm. (1500' ±)	Argillaceous limestone; calcareous siltstone.
	Silurian 15,000'	Upper	Lac-des-Baies fm. (4000' ±) or member	Lithic conglomerates and sandstone; minor siltstone
			St-Léon fm. (5000')	Greenish grey, calcareous siltstone; minor sandstone
		Middle	Sayabec fm. (50' - 600')	Argillaceous, silty, fossiliferous limestone.
			Robitaille fm. (1500'-2500')	Red and green siltstone; pink, quartz sandstone; minor conglomerate and limestone
			Val-Brillant fm. (300' ±)	White and pink orthoquartzite
		Lower	Cabano fm.	Grey, slaty siltstone; minor fine sandstone.
	UNCONFORMITY			
	Ordovician		Trinité group (St-Isidore member)	Ribbon limestone; black, phyllitic shale; minor limestone conglomerate. White to pink orthoquartzite.
			Quebec group	Green and red slate; black slates; minor quartzite.

ORDOVICIAN

Quebec Group

The Quebec group crops out in the northwestern corner of the area. It is composed mainly of red and green slates, alternating here and there with black, phyllitic shales and slates. Quartzite of the Kamouraska type makes up about 5% of the exposures.

Trinité Group

The Trinité group (term introduced by the writer, 1960, for the Prime Lake area) crops out in the southeastern part of the area. The best exposures are along the Rimouski - Cabano highway, the Touladi river, and some of the secondary roads.

This unit is characterized by light to medium grey, finely crystalline limestone in beds ½ inch to 3 inches thick. Black, phyllitic shales and slates are intercalated with the limestones as well as rare, finely laminated, slightly calcareous siltstones, and coarse grey sandstones. Also associated, but restricted to the ribbon limestones, are beds of limestone conglomerate up to a foot thick.

The Saint-Isidore member (term proposed here) includes finely laminated, cross-bedded, white and pink orthoquartzite interbedded with the Trinité group lithology. It crops out along the Saint-Guy - Lac-des-Aigles road.

The Trinité group has been dated in the Prime Lake area (1960) as Normanskill, on the basis of graptolites in black slates.

SILURIAN

Cabano formation

The Cabano formation underlies a small part of the southeastern corner of the area. Exposures are rare, and the Trinité - Cabano contact was largely extrapolated from the adjoining, Prime Lake, area.

The formation is composed of dark grey slaty siltstone, interbedded with fine-grained, foliated lithic wacke, in beds ranging from 1 inch to 3 inches thick. It is dated as Lower Silurian in the Témiscouata Lake region on the basis of fossils.

Val-Brillant formation

The Val-Brillant marks the base of the Silurian sequence north of Grande-Touladi river where it rests unconformably on the Trinité. Exposures of this formation are usually large and composed of white, in places pinkish or greyish, fine- to medium-grained, silica-cemented, quartz sandstone. Beds range from 3 inches to 2 feet thick, and the total thickness of the formation is about 300 feet.

No fossils have been found in the Val-Brillant in this area but, to the east, it has been dated as lower middle Silurian in age.

Robitaille formation

The Robitaille formation crops out at the nose of the L'Islet Lake syncline, where it conformably overlies the Val-Brillant, and at the base of the Silurian sequence in the vicinity of Saint-Guy village and Cossette lake. At the second locality, the Val-Brillant may be present, but similar lithologies make it impossible to separate the two units. The best exposures are along roads and on the shores of Cossette and Vingt-Quatre-Arpent lakes.

The formation is composed mostly of green to red siltstones, generally in beds 2 to 4 inches thick, alternating with beds one foot thick of white and (or) red, silica-cemented, commonly cross-bedded, quartz sandstone. The sand grains range from fine to medium in size, have a high sphericity, and are well rounded.

At a few localities, as at the fire-tower section near Saint-Guy, pink quartzitic rocks are interbedded with a quartzite-pebble conglomerate. The latter makes up 10%-20% of the rock. The pebbles average 1½ inches in size, are well rounded, and are usually red but may be white or green.

Thin and lenticular zones of dark grey, argillaceous, highly silty, fossiliferous limestone occur near the base and the middle of the formation.

Beds in the Robitaille range from 2 inches to 2 feet thick. Generally, the red or green siltstones are 2 to 4 inches thick and the white or pink quartz sandstones are one foot thick. The latter are commonly cross-bedded.

The Robitaille ranges in thickness from 1,500 to about 2,500 feet. Fossils are abundant but have not yet been identified. The formation is tentatively considered to be Middle Silurian.

Sayabec formation

The distribution of the Sayabec is similar to that of the underlying Val-Brillant and Robitaille formations. The best exposures are on a ridge south of Pins lake and north of Landry lake in the centre of the area.

The formation is composed of dark grey, argillaceous, highly silty limestone that commonly shows pinch and swell structures. The beds are, generally, about 6 inches thick.

The formation is 500 to 600 feet thick. Fossils are abundant, particularly brachiopods and corals. Pending identification of the collections, the formation is tentatively correlated with upper Middle Silurian sequences to the east.

Saint-Leon formation

The distribution of the Saint-Léon is similar to that of the underlying Sayabec, and the contact between the two formations is transitional. The best exposures of the Saint-Léon are on Rimouski river and on the Saint-Guy - Lac-des-Aigles highway.

The formation consists of greenish grey, in places red, buff-weathering, calcareous siltstone in beds ranging in thickness from 1 inch to 25 feet.

The siltstone is laminated in places, but most of it is massive. Interbeds 2-4 inches thick of black shale are common, and 1-foot beds of greenish grey, impure sandstones are found at several horizons.

The Saint-Léon is believed to be about 4,000 feet thick and lower Upper Silurian in age.

Lac des Baies formation or member

The Lac des Baies formation or member rests conformably on, and in transitional contact with, the Saint-Léon formation. The best exposures are found on the shores of Baies and Touladi lakes.

The unit consists of alternating conglomerate, sandstone and siltstone. The conglomerate is composed of granules, pebbles, cobbles and boulders, all of sedimentary origin and made up mostly of white or red quartzitic sandstone, greenish grey siltstone and dark grey argillaceous limestone. The fragments are well-rounded and sorted, with low sphericity. The matrix, which is sandy and generally highly calcareous, makes up 15% to 40% of the rock.

Two types of sandstone are intercalated with the conglomerate. One is greenish to grey, calcareous and made up of well-rounded, poorly cemented, quartz grains. The second, and more abundant, is a greenish grey, lithic sandstone*. Both sandstones are medium to coarse grained.

Greenish grey, calcareous siltstone constitutes a minor part of this unit. Locally, as at Touladi lake, it is interbedded with the sandstones.

The beds in the Lac des Baies unit range from 6 inches to 6 feet thick. As a rule, the conglomerate beds are 2 to 4 feet thick, the sandstone beds 2 feet, and the siltstone beds 6 inches. Cross-beds and graded beds are typical of the sandstones.

The unit has a maximum thickness of 5,000 feet, if not repeated by faulting. Fossils include abundant crinoid columnals, some large brachiopods and, in the limestone fragments of the conglomerate, corals and stromatoporoids. Large brachiopods were seen at a few localities. Pending a detailed study of the fossils collected, the formation is considered to be upper or post-Saint-Léon and pre-Cape Bon Ami.

DEVONIAN

Cape Bon Ami formation

The Cape Bon Ami crops out in the northeastern corner of the area. It is composed of dark grey, argillaceous, silty limestone and calcareous siltstone, weathering buff-brown. Beds are faintly indicated but, in general, appear to be ½ inch to 3 inches thick.

The formation is about 1,500 feet thick. Fossils found to the northeast (Péland, 1960) indicate a Lower Devonian age.

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* " lithic sandstone" as used by Gilbert in "Petrography", 1955 p. 292

STRUCTURE

This area has been involved in two orogenies, the Taconic and the Acadian.

The Ordovician sequence was intensely folded during the Taconic orogeny. This is indicated by generally vertical dips, common drag folds that are inconsistant in plunge, and, particularly in the finer-grained clastic facies, a well-developed cleavage. The overlying Siluro-Devonian sequence rests unconformably on the Ordovician, as can be seen on the range road 2 miles north of Saint-Guy, and was deformed to a lesser extent during the Acadian orogeny. Dips range from flat to vertical, and average about 45 degrees. Cleavage is well developed in the fine clastics beds, and joints occur in some of the major outcrops of the coarser clastics. The joints generally strike perpendicular to the bedding.

Folds

Folds in the Ordovician assemblage are difficult to trace because of the lack of markers and the scarcity of indications of tops.

In the Siluro-Devonian sequence, two major synclines that trend and plunge northeasterly have been outlined. The Rimouski River section of the Saint-Guy, or northwestern, syncline displays strong drag folds with wave lengths of from 20 to 100 feet. The apparent great thickness of the Lac des Baies unit may result from such drags.

Faults

The two above-mentioned synclines apparently are separated by a fault, judging from the distribution of formations and the interruption of the northwestern fold. The nature of this fault can only be conjectural but it is presumed to be a thrust and, actually, a southeasterly dipping thrust fault is exposed in section on Rimouski river in line with the presumed major fault. A longitudinally transcurrent (strike slip) fault is a possibility but is unlikely in view of the different rock assemblages in the two synclines.

The other faults, both of them normal and with the southeastern side downthrown, are postulated in the northwestern corner of the area.

ECONOMIC GEOLOGY

Metallic Minerals

Five miles northeast of Saint-Guy and $\frac{1}{2}$ mile southeast of the road leading to Cossette lake in the western part of the area (Bédard township, Range VIII, Lot 10) a few grains of galena were found in Sayabec limestone. Also, a film of chalcopyrite was seen on a cleavage face in Ordovician slates, on the range road 2 miles southeast of Esprit-Saint (Laroche township, Range III, Lot 3).

Petroleum

The Sayabec formation has been considered as a potential petroleum reservoir to the east of the present area (Béland 1960). In the present area,

the thickest exposed section of the Sayabec is south of Touladi lake, on the northwest limb of the L'Islet Lake syncline. Here, the limestone is interbedded with calcareous siltstone similar to that of the Saint-Léon formation. Surface porosity in the limestone is usually high, but no organic structures such as bioherms or biostromes were seen.

The thrust fault, which presumably truncates the northwest limb of the L'Islet Lake syncline may constitute a structure favorable to petroleum accumulation.

Saint-Guy building stone

The pink orthoquartzite of the Robitaille formation has been used as a building stone for a few houses and one hotel in the village of Lac-des-Aigles. The rock was quarried near Saint-Guy village where the formation is well developed; however, the orthoquartzite zone is only about 30 feet thick and not well enough jointed to permit easy quarrying.

Gravel

South of Esprit-Saint and east of Lac-des-Aigles are several sand and gravel deposits, some of which are at least 100 feet thick. The material is well sorted, and individual beds vary from coarse sand to coarse gravel.

REFERENCES

Béland, J. (1960) Preliminary Report on Rimouski-Matapedia Area; Electoral Districts of Rimouski, Matapedia, Bonaventure and Matane. Quebec Dep't Mines, P.R. No. 430.

Lajoie, J. (1961) Preliminary Report in Prime Lake Area (West Half), Rimouski County: Quebec Dep't Nat. Res. P.R. No. 448.