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MEGISCANE RIVER HEADWATERS AREA, PART C

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PROVINCE OF QUEBEC, CANADA
Department of Mines and Fisheries
Honourable ONESIME GAGNON, Minister L.-A. RICHARD, Deputy-Minister

BUREAU OF MINES
A.-O. DUFRESNE, Director

ANNUAL REPORT
of the
QUEBEC BUREAU OF MINES
for the calendar year
1935

JOHN A. DRESSER, *Directing Geologist*

PART C

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Sainte-Agathe-Saint-Jovite Map-Area, by F. Fitz Osborne	53



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MÉGISCANE RIVER HEADWATERS AREA

by Carl Faessler

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MAP

Map No. 338.—Mégiscane River headwaters area (in pocket)

MÉGISCANE RIVER HEADWATERS AREA

by Carl Faessler

INTRODUCTION

GENERAL STATEMENT

During recent years, several large mining companies have undertaken work of importance in the region of lakes Chibougamau and Opemisca, which are situated some 200 miles northwest of lake Saint-Jean. Due to the efforts of prospectors, gold and copper ores have been found in several places in this district. Development of these discoveries, however, has been handicapped by difficulties of access and transport. At one time the Provincial Government was urged to build a railway into the region, either northwestward from lake Saint-Jean or northward from a point on the Quebec-Winnipeg line of the Canadian National railway; but an official investigation of the resources of the region, carried out in 1910, indicated that the construction of a railway at that time was not justified.

In 1935, certain of the interested companies began construction of a truck road from near Doucet, on the Canadian National railway, northerly to Opemisca, the site of a promising mining property in the region. Thence the road may be continued easterly or westerly to other parts of the district as required. The starting point of this road is at Rouleau Siding, which is 323 miles west of Quebec city, 69 miles west of Parent, and 33 miles east of Doucet. From Rouleau Siding, it follows the west side of the river Kekek, crosses the Mégiscane river between lakes Canusio and Wiscatis, and thence follows the Saint-Cyr and Aigle rivers to the region of Opemisca. Certain aid to this project is furnished by the government of the Province of Quebec.

For the purpose of gathering information concerning the nature and resources of the territory along and adjacent to this road, the Bureau of Mines commissioned the writer to make a geological survey of the southern part of the district. This survey, carried out in the summer of 1935, was of an exploratory nature and covered an area some 23 miles in width from east to west and extending northward from the Canadian National railways for approximately 55 miles. The shores of the numerous lakes and streams were examined, and as many inland traverses were made as the swampy surface permitted or geological considerations demanded.

LOCATION AND ACCESS

The area is conveniently reached from Quebec city over the line of the Canadian National (Transcontinental) railway. The stations within the map-sheet are, from east to west:

Coquart.	300	miles from Quebec city
Monet	309	" " " "
Bourgmont.	319	" " " "
Rouleau Siding	323	" " " "
Langlade.	326	" " " "

The railway line forms the south boundary of the area examined, which thence extends northward approximately to the 49th parallel of latitude. The west boundary coincides with that of the townships of Souart, Masères, Closse, Noiseux, Vasson, and Baudin (in order, from north to south), and the east boundary is the so-called 'third meridian', a north-south line surveyed in 1924, about one mile east of longitude 75°30'. The area within this boundary is about 1,300 square miles.

The most important waterway is the Mégiscane river, which crosses the map-area from east to west about midway between its north and south limits. From lake Tête, near the east side of the map, there are numerous rapids for a distance of six miles, after which there is no obstruction to canoe travel as far as the western boundary of the map, except one small rapid and a chute immediately below the outlet of lake Mégiscane, which necessitate a short portage.

The Mégiscane may be reached from the railway by canoe over several different routes, by way of tributary lakes and northerly-flowing rivers. These latter are, from west to east, the Serpent, Kekek, Susie, and Monet. The Kekek, which affords the shortest route, may be entered three-quarters of a mile west of Rouleau Siding, the point of departure of the truck road. From the Mégiscane, the country to the north may be reached by either of two tributaries of that river, the Macho or the Saint-Cyr. Both afford ideal canoe routes.

The region is crossed by two intersecting routes of Indian travel, which continue far beyond the limits of the map-area. One leads northerly by Father lake, Opawica river, and lake Opemisca to lakes Chibougamau and Mistassini, the other easterly by the Mégiscane river, lake Tête, and the Saint-Maurice river to the Gouin reservoir.

PHYSIOGRAPHIC FEATURES OF THE AREA

DRAINAGE:

The area is drained almost entirely by the Mégiscane river, which joins the Bell and this in turn the Nottaway, the latter reaching the sea at James bay, some 300 miles north of the railway. The height-of-land, or divide, between this and the Saint-Lawrence drainage system follows a sinuous course immediately to the south of the map-area, into which it projects for a mile or so in the vicinity of Bourgmont, and again at the extreme southeast corner, across which it cuts as the divide turns rather sharply northward and for a considerable distance lies a few miles to the east of the area. Thus all but a very minute fraction of the area drains to James bay.

In the interior of the area, local drainage is very poorly developed. Swamps and shallow lakes abound. Many of the lakes have two outlets,

draining in diametrically opposite directions. Thus lake Barry, in the northeastern corner of the area, has one outlet flowing southward into the Mégiscane and another which flows northward to join the Opawica.

Another small section in the northeastern part of the area is drained in a northerly direction by the Aigle river, a tributary of the Opawica.

TOPOGRAPHY:

Broadly viewed, the map-area is a plateau, with decreasing altitude from south to north. At the railway station of Coquart, which is in the extreme southeast corner of the map, the altitude is 1,478 feet, and from here westward the railway follows closely, but somewhat to the north of, the divide between the Ottawa-Gatineau drainage system on the south and the Mégiscane-Nottaway system on the north. Thus the tributaries entering the Mégiscane from the south have a fall of some 400 feet in a distance of 20 miles, and in places their flow is fairly rapid. Northward from the Mégiscane, the drainage slope is less pronounced, and, as already noted, the gradient in the extreme north of the area is so uncertain that some of the lakes actually have outlets both to the south and the north.

The region is outside of, and at a higher altitude than, the clay belt of western Abitibi, known as glacial lake Ojibway. Lines of hills which generally trend N.E.-S.W. give a parallel course to the streams. There are at least a dozen lakes of ten miles or more in length, and literally hundreds of lesser size. They are generally shallow and much encumbered with boulders, which make navigation hazardous for power boats.

SOIL, TIMBER, GAME

There is practically no arable land in the district. Although solid rock seldom appears at the surface, the overburden consists almost entirely of ice-borne sands, gravels, and boulders. Only a few tongues of recent soil, occurring between swamps and around the borders of lakes, could possibly be tilled. Yet there is a magnificent forest growth. The timber is principally spruce, tamarac, and cedar. Balsam is rare. White birch and jackpine are growing abundantly on some old brulés along the Saint-Cyr river.

Game is not plentiful. Moose and red fox are frequently seen, but beaver are scarce and other fur-bearing animals are apparently absent — at least none were seen by the writer. This dearth of game and fur-bearing animals is possibly to be explained by the fact that the region is easy of access for hunters and trappers.

There appear to be no trout in the rivers or lakes of the area, but pike, often of large size, and pickerel are plentiful in the lakes.

ACKNOWLEDGMENTS

The base-map used was prepared by the Topographical Survey of Canada from photographs by the Royal Canadian Air Force. The control lines of the map are the Canadian National railway on the south and

several survey lines, both north-south and east-west, that were made in 1924 or earlier by the Department of Lands and Forests of the Province of Quebec.

The writer is greatly indebted to Mr. S.-M. Rouleau, of Rouleau Siding, and to Mr. A. Lapierre, of Monet, for kind hospitality and many services rendered to members of the party; also to officials of the International Paper Company, at Clova, for help freely given and the use of their repair shop. The fire rangers of the region, both at lake Berthelot and lake Lacoursière, were especially helpful in their generous services to all the party.

In addition to the writer, the party included Heliodore Dumont, of École Polytechnique, Montreal, senior assistant; A. Altherr, J. Ganas, and C. Lapointe, of Laval University; R. Frigon, of École Polytechnique; and G. Huber, of Lac Labelle, who acted as cook.

PREVIOUS WORK

The following geological reports deal directly or indirectly with the region here discussed:

- (1) BELL, ROBERT, *Report on the Geology of the Basin of the Nottaway River*; Geol. Surv. Can., Ann. Rept., Vol. XIII, Part. K, 1900.
- (2) WILSON, W. J., *Geological Reconnaissance along the Line of the National Transcontinental Railway in Western Quebec*; Geol. Surv. Can., Memoir No. 4, 1910.
- (3) BANCROFT, J. AUSTEN, *Geological Reconnaissance along the National Transcontinental Railway between Harvey Junction and Doucet*; Min. Oper'ns in Prov. Que., 1916, pp. 128-158.
- (4) MAWDSLEY, J. B., *Eagle River Area, Abitibi Territory, Quebec*; Geol. Surv. Can., 1927, Pt. C.
- (5) RETTY, J. A., *Upper Gatineau Region and Vicinity*; Que. Bur. Mines, Ann. Rept., Part D, 1933, pp. 129-148.
- (6) MACKENZIE, G. S., *Pusticamica Lake Map-Area, Abitibi District*; Que. Bur. Mines, Ann. Rept., Part C, 1934, pp. 45-64.

As stated in the report of Robert Bell, his assistant, R. W. Brock, crossed the area from west to east in the course of a traverse on the Mégiscane river. Wilson and Bancroft examined the southern fringe of the area, along the railway line. Mawdsley gave a generalized account of the geology along the Aigle river at the northeast of the present map-sheet. Retty made a reconnaissance which extended north to the railway between Bourgmont and Clova stations. MacKenzie studied in detail an area a little northwest of the present map-sheet.

GENERAL GEOLOGY

The rocks of the region are all of Precambrian age. At the extreme north is a wedge-shaped area of volcanic rocks of Keewatin aspect, which extend southward for a maximum distance of about eight miles. Apart from this, the northern half of the map-area is underlain by granitic and related intrusive rocks, tentatively classed as Algoman. In the southern half of the area, the rocks are more varied in character. Adjacent to the railway, they consist largely of gneiss of sedimentary origin, which in places is very rich in garnet, but farther north, in the vicinity of the granitic belt, the rocks are mainly amphibolites and basic intrusives. It is thought that these paragneisses and related rocks may represent a phase of the Grenville series.

TABLE OF FORMATIONS

RECENT.	Swamp deposits; river gravels
PLEISTOCENE	Glacial deposits: sands, gravels, boulders
<i>Long period of erosion</i>	
UPPER TEMISCAMIAN (ALGOMAN?)	Biotite granite and gneiss; quartz porphyry, aplite and pegmatite; gabbro and diorite
<i>Intrusive contact</i>	
LOWER LAURENTIAN	(a) Garnetiferous paragneiss; hornblende gneiss; amphibolite (b) Keewatin: basalt, andesite, rhyolite, trachyte

Age relationship of (a) and (b) is unknown.

KEEWATIN (?)

The rocks assigned to the Keewatin series occupy some 70 square miles in the extreme north of the map-area. They extend northward beyond the limits of this area and are directly continuous with similar rocks in the Waswanipi area to the northwest that have been described by G. W. H. Norman (1).

These Keewatin rocks are all of volcanic origin and much the greater part of them are basic types, such as are commonly termed 'greenstone'. They are either massive or schistose and have a general east-northeast strike, with southerly dip. Pillow structure was observed in only one place, near the narrows of lake Rouleau. In this locality, and also near lake aux Loutres, the greenstones are highly carbonatized. The presence of tourmaline, in fine, needle-like crystals, was noted in the rock exposed on the north side of lake aux Loutres. More acidic lavas — rhyolite and trachyte — are also found in this locality.

(1) NORMAN, G. W. H., *Waswanipi Map-Area, Northern Quebec*; Geol. Surv. Can., Paper 36-3, 1936.

Intrusions of later rocks within the Keewatin lavas are rare. One, of biotite granite, was noted near the northern limit of the area, three miles northwest of lake aux Loutres. As exposed, the rock is much decomposed, the feldspar being largely altered to sericite and a little carbonate, and the biotite partly chloritized. The occurrence suggests a cupola or satellite of the main granite body which is in intrusive contact with the greenstone along its southern margin, and as such it may indicate favourable ground for prospecting.

These greenstones and related lavas are here assigned to the Keewatin on the basis of their general resemblance to the rocks of this age that occur elsewhere in this general region, as for example in the Pusticamica area, 20 miles to the northwest (1).

GRENVILLE (?)

The principal rock of the extreme southern part of the map-area is a gneiss which contains a large amount of garnet, so much so that in some places this mineral makes up more than one-half the volume of the rock. The garnet varies from wine-red to rose in colour, and is well crystallized. The other minerals present are quartz, plagioclase, and biotite, and a little orthoclase. Another interesting constituent of the gneiss seen in some localities is cyanite, easily recognized by its bladed habit and pale green colour.

The rock is highly gneissic, with alternating streaks of different composition and colour. Its ribbon-like gneissic structure, the presence of cyanite and abundant garnet, and its evident high content of lime, all support the belief that the rock is of sedimentary origin and thus a paragneiss. However, the paragneiss is so intimately associated with intrusive granite gneiss that, although the two may be distinguished in the field or in hand specimen, they cannot be shown separately on the map.

Broadly speaking, as these gneissic rocks are traced northward from the railway, the proportion of paragneiss becomes less and that of igneous gneiss increases, or, in terms of minerals, the garnet content decreases and the ferromagnesian minerals, hornblende and augite, increase in amount. Before the Algoman (?) granite area proper is reached, the dominant rock has become a gabbro-diorite of diabasic habit. In places, hornblende is the predominant mineral and the rock might be termed a hornblendite. A little biotite may be present, and in one occurrence, near the outlet of lake Tête, there is an abundance of augite in a rock composed essentially of ferromagnesian minerals.

Intrusions of Algoman (?) granite are numerous in this southern half of the map-area. They appear in places within the garnetiferous paragneiss, as at the fall on the Monet river, at the outlet of lake Chute. Such intrusions, however, are more frequent in the vicinity of the main body of granite than farther south.

To summarize the foregoing, it may be said that this southern half of the map-area is underlain by a complex of sedimentary and igneous

(1) MacKENZIE G. S., *op. cit.*

rocks which, for the present at least, cannot be mapped as separate units. It is the writer's opinion that the sedimentary portions are a part of the Grenville series that, in earlier time, may have occupied a large area in the region. This opinion can best be established or disproved by examination of the territory between the present area and the township of Suzor, near Parent, some 75 miles to the east, where crystalline limestones of the Grenville series were reported by Bancroft (1). Retty, also, described rocks of similar character south of the railway as Grenville (2).

ALGOMAN (?)

Intrusive rocks, thought to be of Algonian age, occupy the northern half of the map-area, with the exception of about 70 square miles in the extreme north, which is underlain by Keewatin greenstones. From their contact with the latter, the intrusive rocks extend southward for some 25 miles, and throughout this length they occupy the whole width of the area and continue beyond it to east and west. At their southern margin, which has a trend somewhat north of east, they are in intrusive contact with a complex series of rocks, including paragneisses, which may be of Grenville age, that underlie the whole of the southern half of the map-area.

The principal rock within this area of intrusives is biotite granite, which generally is strongly gneissic. Near the contact with the Keewatin volcanics, porphyritic types, believed to be a facies of the granite, are common. They usually show phenocrysts of quartz, in a groundmass of quartz, sodic plagioclase, and secondary hornblende. Another facies occurs on the east side of bay des-Cèdres, seven miles south of the northern limit of the granite. Here the rock is greenish around the margin of the occurrence and rose-coloured in the central part. It is very fine-grained, hard, and brittle—the last evidently a result of strong compression. This rock has features which appear to relate it to certain soda-aplites and albitites which have been described by Hawley (3) and Bell (4) in the Dubuisson-Bourlamaque-Louvicourt area, where, as they have shown, they are genetically related to bodies of granodiorite and are commonly associated with gold deposits. As rock of this type extends for some distance north of bay des-Cèdres toward lake aux Loutres and the granite-Keewatin contact, it suggests interesting possibilities for the discovery of mineral deposits in this section of the map-area.

As is shown on the accompanying map, a fault extends in a northerly direction from bay des-Cèdres to lake aux Loutres. It is along the southern part of this fault that the albitite just mentioned occurs, while the porphyritic phase of the granite is found near its northern end, on the eastern shore of the southern part of lake aux Loutres. At this latter locality, the porphyry contains flakes of molybdenite, and the greenstones along the northern part of the lake carry pyrite and tourmaline, the former

(1) *Op. cit.*

(2) *Op. cit.*

(3) HAWLEY, J. E., *Gold and Copper Deposits of Dubuisson and Bourlamaque Townships, Abitibi County*; Que. Bur. Mines, Ann. Rept., Part C, 1930, pp. 3-95.

(4) BELL, L. V., and BELL, A. M., *Bell River Headwaters Area: Detailing the Pascalis-Louvicourt Gold Deposits*; Que. Bur. Mines, Ann. Rept., Part B, 1931, pp. 59-123.

in small amount. Some mining claims in this vicinity are mentioned on a later page of this report.

The granite gneiss is intruded in places by narrow dykes of pegmatite, these being particularly in evidence along the shore of lake Masères. In the same vicinity, tongues of greenstone were observed in several places included in the granite.

The granite and gneiss definitely intrude the Keewatin greenstones to the north of them. There is, however, no conclusive evidence within this map-sheet to show whether these intrusives are Laurentian or Algonian, since no Temiscamian sediments are known in the district. The balance of evidence, especially from neighbouring fields, favours an Algonian age for this formation.

PLEISTOCENE AND RECENT

The surface within this map-area is almost everywhere covered by a thick mantle of glacial deposits. These are frequently accumulated in eskers 100 feet or more in height, which are narrow but persist to great length; their direction is uniformly N.E.-S.W. Extensive banks of gravel and sand are frequent along the shores of the lakes. On the other hand, clay is rarely found in the area, except in recent deposits along some of the rivers.

Glacial striæ are rare. Those observed indicate a movement of the ice in a direction $S.40^{\circ}W.$ This corresponds closely with the trend of the eskers and with the alignment of the lakes and many of the rivers of the area.

STRUCTURE

The alignment of lakes and rivers from northeast to southwest is a noticeable structural feature. They presumably follow lines of deep glacial erosion, with some measure of control by the parallel arrangement of eskers. How far glacial erosion has been governed by the structure and other characters of the underlying rocks is not known.

The area is apparently affected by faulting. A very pronounced fault, having a course $S.10^{\circ}W.$, can be followed for a distance of 15 miles in the townships of Deschamps and Kalm, on the east side of the map-sheet near its northern end. Chartrand creek, the upper part of the Aigle river, and a number of small lakes lie along sections of this fault zone. Another fault, trending north and south, contains bay des-Cèdres and lake aux Loutres. This has been referred to on a previous page.

Owing to the almost uninterrupted overburden of glacial deposits, very little is known of the structure of the underlying rocks. The general strike of the Keewatin lavas is $N.70^{\circ}E.$ In the township of Barry they dip toward the north, while in the vicinity of lake aux Loutres the dip is toward the south.

ECONOMIC GEOLOGY

GARNET

The earliest mention of the occurrence in this district of garnet that might be used as an abrasive was made by Bancroft, who, in 1916, wrote as follows (1) :

“Bands of gneiss containing abundant garnets are of frequent occurrence within this area. In only one locality, *viz.*, in a shallow cutting on the railway, $3\frac{1}{4}$ miles east of Langlade station, or about 60 yards east of the 70th mile-post west of Parent, were the gneisses sufficiently garnetiferous to suggest that they might be exploited as an economic source of garnet, to be used as an abrasive. Here, a band of dark gneiss, exposed for a width of several yards, is exceptionally rich in red garnets, very many of which are one-third of an inch across. The garnets comprise from one-fourth to slightly more than one-half of the volume of the rock. In thin section under the microscope, the garnets in this paragneiss are found to be lying in a matrix composed chiefly of grains of quartz, with numerous flakes of biotite and a few grains of orthoclase, sphene, black iron ore, and pyrite”.

In the *Report on Mining Operations in the Province of Quebec* for 1928, pp. 59-60, the following reference is made to the exploitation of these garnet deposits :

“The *Langlade Garnet Syndicate* was organized to develop a garnet deposit in the unsurveyed township of Baudin, on the Transcontinental line of Canadian National railways half way between the stations of Bourgmont and Langlade. . . . After some preliminary work on the ground and a series of tests on the ore, the company “*Langlade Garnet, Limited*”, was incorporated in April, 1929, to take over the properties of the syndicate. Its capital was \$500,000 in shares of \$1. . . . The ore contains about 25 per cent garnet recoverable by concentration. . . .”

The owners reported that, during 1928, a test lot of 1,940 pounds of the ore yielded 425 pounds of high-grade garnet.

No work of importance has been done on this property since 1928. The market for garnet has been much restricted in recent years, both on account of the industrial depression and because of the introduction of artificial aluminous abrasives.

Garnet is abundant in the paragneisses, and the writer is convinced that deposits even richer than that of Langlade can be found.

PEGMATITE

Dykes of pegmatite are numerous, especially in the zone between the paragneiss and the granite. The largest dyke observed is on the

(1) *Op. cit.* pp. 166-7.

shore of lake Canusio, opposite the discharge on the east side of the lake. It has a direction N.E.-S.W., dips northwest at an angle of 40°, and is six feet wide near the lake. It is composed almost entirely of quartz and shows no other useful minerals. Iron oxide, in small amount, lines numberless fractures in the quartz and may indicate pyrite in the fresh rock at greater depth.

GOLD

Three prospectors have staked claims for gold on the northwest side of lake aux Loutres. The claims bear license numbers 391, 8415, and 8416. Little stripping has been done on them, and, as a consequence, no detailed examination was possible at the time of our visit. The country rock is basalt or andesite, which in places contains much tourmaline and, in other places, magnetite. Many short, narrow veins of quartz are exposed on these claims, but the only metallic mineral seen in them was pyrite, in minor amount.

Since the close of our field work in the fall of 1935, other claims have been staked at lake Rouleau, which is north of lake Barry and beyond the limits of the map-area. The country rock here consists of bands of rhyolite or trachyte alternating with basaltic rock, which in many places contains much magnetite and carbonate.

MOLYBDENITE

Along the southern part of lake aux Loutres, molybdenite was observed in a porphyritic rock that forms a high cliff on the eastern shore of the lake. This locality is within the area of granitic rocks and the porphyritic intrusion may occupy a portion of the fault line that runs through bay des-Cèdres and lake aux Loutres, as described on an earlier page. The molybdenite is in very small quantity. It is associated with quartz in narrow veinlets.

PROSPECTING GROUND

From an economic standpoint, the greenstones of the Keewatin area offer the best possibilities, especially for deposits of metallic ores. The contact of these rocks with the intrusive granite and porphyry crosses the map-area near its northern limit in a line that curves to the south and is about 25 miles in length. The vicinity of this contact is favourable prospecting ground. From east to west, the approximate course of the contact is as follows: from the northern outlet of lake Barry along its northern shore, thence in a southwesterly direction to the vicinity of the head of lake Masères, where it turns northwesterly and so continues to the neighbourhood of lake Albert, in the northwest corner of the map-area.