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PRELIMINARY REPORT ON LA TUQUE AREA (WEST HALF), LAVIOLETTE COUNTY

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PRELIMINARY REPORT

ON

LA TUQUE AREA (WEST HALF)

LAVIOLETTE COUNTY

BY

M.-A. KLUGMAN

QUEBEC
1956

P. R. NO. 319

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PRELIMINARY REPORT

on

LA TUQUE AREA (WEST HALF)

LAVIOLETTE COUNTY

by

M. A. Klugman

INTRODUCTION

The La Tuque area (west half) was mapped by the writer during the summer of 1955. It is bounded by longitudes 72°45' and 73°00', and by latitudes NEARLY 47°15' and 47°30'. The map-area, which includes all of Turcotte and Vallières, and parts of Dumoulin, Harper, Baril, Malhiot, and Carignan townships, has an area of about 200 square miles.

The town of La Tuque, which is in the northeast corner of the map-area, is served by a line of the Canadian National Railways. It is 131 miles from Quebec City and 176 miles from Montreal, and it is reached by highway from Trois Rivières, 105 miles to the south.

Highway 19 follows the east bank of St. Maurice river in the eastern section of the map-area and crosses the map-area from its southern boundary to its northern limit. There are several gravel roads on the east side of the river but only two on the west side. One follows rivière aux Rats across the southwestern corner of the map-area and is a well maintained bush road. The other follows the west bank of St. Maurice river as far as the power-line crossing and then runs westward six miles towards Turcotte lake. A very poor road runs westward from La Tuque to Parker lake and from there northward along the power-line towards Vermillon river. An excellent portage connects St. Maurice river and La Tuque lake in the north, and another is along Deveriche creek to the head of Turcotte lake in the centre of the map-area. A portage links Turcotte lake to La Tuque lake in the northwest part of the area.

The whole area is drained by St. Maurice river either directly or through Turcotte lake, La Tuque river, and rivière aux Rats. Lakes and streams are numerous.

The map-area lies within the Laurentian uplands, and the maximum elevation is approximately 950 feet with a local relief of 500 feet. Steep slopes border St. Maurice river and the north bank of rivière aux Rats. The relief is modified by moraine, which mantles much of the map-area, particularly the northeast part.

GENERAL GEOLOGY

The consolidated rocks of the map-area are all Precambrian. Listed in order of abundance they are: paragneisses (which underlie more than three-quarters of the area), granite, gabbro, syenite, and various minor intrusives.

Most of the paragneisses have been injected to diverse extent by granitic material. The paragneisses are believed to be of an early Grenville age.

Table of Formations

Cenozoic	Pleistocene and Recent	sand, gravel, clay, till, boulder moraine
Precambrian	Intrusives	Pegmatite (not shown on map). Pink granite. Syenite and gneissic syenite. Gabbro and anorthosite.
	Grenville series?	Feldspathic hornblende paragneiss, amphibolite, quartzofeldspathic gneiss, feldspathic gneiss, quartzite, feldspathic biotite paragneiss, and migmatite.

Precambrian

Paragneisses

The paragneisses of the La Tuque area do not bear much resemblance to those of the type locality in Grenville township, Quebec. Quartzite is not abundant, but it occurs at several places throughout the map-area and one layer was traced for two and a half miles. No limestone was observed in place, but numerous boulders of it were found, particularly near the northwest corner of the map-area. These boulders showed little evidence of having travelled far.

The rock most abundantly exposed in the map-area is a feldspathic hornblende paragneiss. The essential minerals are plagioclase feldspar and hornblende, with biotite commonly in small amounts. Quartz is also found in minor amounts. The rock is medium-grained and has a marked layering. This layered appearance is produced by alternating layers rich in light and dark minerals. The rock is a light yellow-grey to a deep brown-grey, but it is usually easily identified in the field despite variation in texture and colour. Where the paragneiss is bordered by a syenite mass, the contact between the rocks is gradational and, therefore, difficult to place.

Lit-par-lit injection of granitic material has usually taken place in varying degrees. Where injection has been great, porphyroblasts of potash feldspar are common. Accessory minerals in the granite of the injections include garnet, magnetite, and graphite.

Amphibolites, which differs from the feldspathic hornblende gneiss in the greater quantity of hornblende, forms thin layers or lenses in the feldspathic hornblende paragneiss. Amphibolite is also found with metagabbro and gabbro.

Quartzofeldspathic gneiss, which is not abundant in this map-area, is believed to be the result of much lit-par-lit injection of granite into the country rock. Hornblende is the most abundant dark mineral.

Feldspathic gneiss is probably the result of intrusion and metasomatism and is always found in areas of disturbed structure.

As previously stated, little quartzite occurs in the area. Where found it is white to light grey, massive and coarsely crystalline with, in places, a little biotite or graphite.

Feldspathic biotite paragneiss is found as thin layers and lenses within the feldspathic hornblende paragneiss. It is composed of plagioclase feldspar, biotite, and hornblende, with garnet and quartz as accessories. Few occurrences of feldspathic biotite paragneiss were observed in the field.

Migmatites are widely distributed throughout the map-area. They are especially abundant in the vicinity of granitic and gabbroic intrusions and along a fault zone, which can be traced along the east bank of St. Maurice river, from the northern boundary of the map-area to a point two miles south of Carignan village. They are also found far from any exposed granite and gabbro masses. The migmatites are highly distorted and deformed and consist of the local country rock which has been intruded by granite or gabbro or both.

Gabbro and anorthosite

Anorthosite is found only at one locality. It crops out in an area of about one square mile on the west bank of St. Maurice river, on the northern boundary of the map-area, and extends northwards beyond the limit of the area. It is fine to medium-grained, white, and highly granulated in some places. It intrudes the surrounding feldspathic hornblende paragneiss and is itself intruded by pegmatite dykes and stringers.

A small body of gabbro intrudes the paragneisses in the central part of the map-area between Turcotte lake and St. Maurice river. It covers an area of approximately three square miles. The rock is medium-grained, grey to green-brown, and is composed of pyroxene and calcic plagioclase feldspar. Accessory minerals are biotite, hornblende, magnetite, and garnet. The gabbro is intruded by numerous granitic stringers and is cut, on the west, by a small granite mass.

Numerous metagabbro sills and dykes are found throughout the area. The composition of the metagabbro is similar to that of the gabbro, but it is finer grained and contains more hornblende. Most bodies show shearing, and many are deformed.

Syenite and gneissic syenite

Two small bodies of syenite were outlined in the field: one in the northwest corner of the area, north of La Tuque lake, and the other near the southern boundary of the area, west of St. Maurice river. Other small occurrences of gneissic syenite were observed but no contacts could be drawn because the syenite appears to grade into the feldspathic hornblende paragneiss. The rock is composed of hornblende, potash feldspar, and minor pyroxene and plagioclase feldspar. Accessory minerals are quartz, garnet, and biotite.

Pink granite

Medium to coarse-grained pink biotite granite is the most common intrusive rock in the map-area. It intrudes all other rocks of the area, either as irregular masses, transgressive layers, or as lit-par-lit injections in the layered rocks. Four bodies were outlined in the field. Three of them are west of St. Maurice river, in the northern, central and southern parts of the area, and the fourth is east of the river, about two and a half miles southeast of La Tuque.

The rock is composed of pink or white potash feldspar, quartz, biotite, and minor plagioclase feldspar. Hornblende is commonly present and, in some exposures, is the dominant dark mineral. Epidote is present in most exposures as fracture-filling. Garnet and chlorite (after hornblende and biotite) are common.

Pegmatite

Pegmatite dykes cut all the previously described rock types. The essential minerals are: pink potash feldspar, plagioclase, quartz, biotite and/or hornblende or augite. Garnet, magnetite, epidote, allanite, pyrite, chalcopyrite, and bornite are present in places.

Cenozoic

Pleistocene and Recent

Large stretches of the map-area are mantled by moraine, through which the underlying bedrock protrudes in many places. Drumlin-like hills are found in many parts of the area, particularly in the southeastern, northeastern and west central parts. These, together with glacial striae, indicate a south-southeasterly movement of the ice sheet.

The valleys of St. Maurice river, rivière aux Rats, and Bostonais river are pre-last glacial, and are now partially filled with gravel, sand, and clay into which the present rivers are now cutting. The depth of unconsolidated deposits in the St. Maurice river valley at La Tuque is known to be more than 230 feet. Several well defined terraces in these deposits can be traced along St. Maurice river and rivière aux Rats. The elevation of four terraces at La Tuque were measured and are as follows: the lowest, just downstream from the dam, is 425 feet above sea-level and about 40 feet above the river; the second, on which the town is situated, is 585 feet; the third is at

615 feet; and the smallest and highest is at 675 feet. The two main terraces along rivière aux Rats are 580 and 420 feet above sea-level.

STRUCTURAL GEOLOGY

The overall structure of the map-area is fairly simple. Over three-quarters of the rock-types are paragneisses, which cannot on the present scale of mapping be separated into individual lithologic units. Apart from a few exceptions, all the gneissic structures strike in a roughly uniform direction and dip east. In the southern part of the map-area the trend is northwest, changing in the central part to north-northwest, and then swinging back to northwest in the northern part. In the central part of the area the granite and gabbro intrusives disrupted the regional trend and caused much distortion of the paragneisses.

Jointing is common throughout the area, particularly in the igneous rocks. In these bodies the strike of the joints is about north-south, and the dips are steep either east or west. In the paragneisses the jointing is parallel to the layering and at right angles to it.

A fault, which strikes N. 5° E. and dips 45° E, is exposed in the cliff east of the dam at La Tuque. Its hanging-wall is highly brecciated, deformed, and mineralized, and forms a zone about 200 feet thick, which can be traced for ten miles south along the east side of St. Maurice river.

ECONOMIC GEOLOGY

Disseminated magnetite and pyrite occur in many of the rocks of the map-area. One occurrence is at the foot of the cliff on the east bank of St. Maurice river, where the river turns west nine miles south of La Tuque.

Nearly all pegmatites in the area show very slight radioactivity. Three exposures on the east bank of St. Maurice river show readings higher than normal with the Geiger counter. Upon close examination only one showed any reason for this higher radioactivity. It has scattered crystals of allanite, whose removal reduced the reading to normal for the pagmatite. In the other two exposures it is assumed that the radioactivity is a result of potassium K_4O in the feldspar. The two bodies of syenite, respectively in the northern and southern parts of the area, are very slightly radioactive.

Sand and gravel deposits are numerous along St. Maurice river and rivière aux Rats. Many of them, on the east bank of St. Maurice river, are being or have been worked.