RP 477(A)

PRELIMINARY REPORT ON TICHEGAMI RIVER AREA, MISTASSINI TERRITORY

Documents complémentaires

Additional Files

Licence

License

Énergie et Ressources naturelles
Québec

PROVINCE OF QUEBEC, CANADA

DEPARTMENT OF NATURAL RESOURCES

RENÉ LÉVESQUE, MINISTER — P.-E. AUGER, DEPUTY MINISTER

GEOLOGICAL SURVEYS BRANCH

H. W. McGERRIGLE, CHIEF

PRELIMINARY REPORT

ON

TICHÉGAMI RIVER AREA

MISTASSINI TERRITORY

BY

E.-H. CHOWN

QUEBEC
1962

PRELIMINARY REPORT

on

TICHEGAMI RIVER AREA

MISTASSINI TERRITORY

by

E.H. Chown

INTRODUCTION

The Tichegami River area is approximately 330 square miles in extent and is bounded by latitudes 51°45' and 52°00', and by longitudes 73°00' and 73°30'. It was mapped in the 1961 field season.

The centre of the area lies about 150 miles north of Chibougamau, or about 30 miles northwest of the north end of Mistassini lake. Heywood et al.(1958) mapped a wide region adjoining to the north at 8-mile scale, and Chown (1960) mapped the areas to the southeast and east at 1-mile scale.

The region may be reached readily by floatplane, with most of the larger lakes being suitable for landings. In addition, the area is transected by the main canoe route north from Mistassini lake. Baudeau lake may be reached from Mistassini Post, at the south end of Mistassini lake, in four to five days. From Baudeau lake the route diverges, one branch going up Tichegami river, and the other down the Tichegami for about 12 miles before cutting across to Eastmain river via a chain of lakes. Canoe travel off the main routes is relatively easy, as many of the lakes are separated only by short rapids. Foot travel is facilitated by the low relief, and by the fact that much of the area has been burnt over within the last ten years.

Much of the area is a low, rolling plain 1,200 to 1,300 feet above sea-level. Two rugged hills in the extreme southeast corner rise more than 2,000 feet above sea-level. These hills are outliers of the Tichegami range lying to the east and northeast. Elsewhere small hills up to 500 feet above the general level are present, some in the south and a few near the 52nd parallel.

The area drains into James bay via Eastmain and Rupert rivers. The east, southeast and central parts of the area drain into the Eastmain through Tichegami river, and the chain of lakes along the north border drains directly into the Eastmain.

Most of the southwest part of the region drains south through many lakes to Rupert river.

Streams in the drift-covered east and east-central parts of the area are mature and meandering, and the few rapids are caused by boulder accumulations and rare outcrops. In other parts of the region, the drainage follows series of lakes separated by short, rapid rivers. The Tichegami retains its identity as a river throughout the area, but its flow becomes faster toward the west border, and, just outside the area, above the confluence with the Eastmain, it becomes a series of lakes. Streams in the eastern part of the area drain the mountainous region farther east and are subject to great fluctuations because of the fast run-off at their headwaters. Elsewhere, the numerous lakes stabilize the river flow. Glacial structures exert a strong control on the trend of most of the streams and many of the lakes.

GENERAL GEOLOGY

All the consolidated rocks of the area are Precambrian. Massive and laminated amphibolite with minor ferruginous quartzite forms a steeply dipping series which crops out at intervals across the south part of the area from the southeast corner to the west border. Small bodies of metamorphosed ultrabasic rocks, probably associated with basic volcanic rocks, occur in the northern part of the area. A small mass of quartz diorite gneiss, common in the areas to the east, occurs in the centre of the present area. Migmatite, consisting of amphibolite and quartz-feldspar-biotite gneiss, is widespread; it occurs on the flanks of the basic volcanic series and as thin bands engulfed in granite. Gneissic and massive pink and grey granites occur in large masses in the east-central and southwest parts of the quadrangle. Contacts between granite and migmatite are gradational, but satellitic granite and pegmatite dykes cut all the older rocks. Both migmatite and granite trend east for the most part.

Dykes of gabbro and diabase cut all the other rocks. These are randomly distributed throughout the area, and conform to two trends; one nearly northeast and the other nearly southeast.

Table of Formations

Cenozoic	Recent and Pleistocene	Talus and beach deposits Till, glacio-fluvial and outwash deposits
Late Precambrian	Post Mistassini	Basic intrusions, gabbro, diabase
	Intrusive contact	
Early Precambrian		Granite, pegmatite, aplite; Migmatite Quartz diorite gneiss Metamorphosed ultrabasic rocks and amphibolite
	Metamorphosed volcanic and sedimentary rocks	Ferruginous quartzite, biotite schist, garnet biotite schist; Laminated amphibolite Massive amphibolite

EARLY PRECAMBRIAN

Metamorphosed Volcanic and Sedimentary Rocks

Massive amphibolite

Massive amphibolite occurs as mappable units only in the southeast corner of the quadrangle. It is interlayered with laminated amphibolite, the contacts between the two being sharp and conformable both to laminations and to foliation.

The rock is fine grained, dense, shiny black to dull dark green where fresh,and pale brown weathering. In some localities it grades into a medium-grained type in which the dominant minerals, plagioclase and hornblende, may be distinguished with the naked eye. Locally, alteration to chlorite and epidote gives it a greenish cast. The massive amphibolite appears to be a metamorphosed, basic, volcanic flow rock.

Laminated amphibolite

Laminated amphibolite occurs along the length of the band of volcanic and sedimentary rocks that extends across the south part of the area. It occurs as thin beds between the flows in the massive amphibolite unit, and also as a mappable unit itself. Thin beds of quartz-biotite-garnet schist and ferruginous quartzite are interbedded with the laminated amphibolite.

The rock is distinctly layered, individual layers varying from 2 mm. to 5 cm. in thickness, and differential weathering gives it a ribbed surface. It weathers light brown in general. Hornblende and plagioclase are the chief minerals, with quartz, biotite and garnet minor in amount. Epidote and chlorite, as in the massive amphibolite, occur in areas of alteration. Dark layers contain 70% or more hornblende, layers of intermediate colour, about 50%, and light-coloured ones, 10-20%. The layers rarely are as much as 15 feet long, and the contacts between them are sharp.

The laminated amphibolite, which could be a metamorphosed volcanic breccia, is more heavily altered than the massive type.

Ferruginous quartzite

Ferruginous quartzite 150-200 feet thick forms a member of the laminated amphibolite in the southern part of the area, and also occurs with the basic rocks in the northeast corner. It is rusty-weathering and is composed of alternate layers of clear, coarse-grained, glassy quartz and dark, fine-grained, biotite-quartz-magnetite schist. Garnet, hornblende and specularite are present locally in the schist, and, at some localities, the schist could be classed as a quartz-garnet-biotite variety. Outcrops of this variety have a ribbed surface as the garnet-rich layers are resistant to erosion. Layering is quite continuous in the ferruginous quartzite, but is very irregular in the garnet rich schist.

Intrusive Rocks

Ultrabasic intrusions

Metamorphosed ultrabasic and basic rocks crop out in the northern part of the area. The commonest rock in the complex has a characteristically brown and knobby weathered surface and a shiny black fresh surface. It is composed of medium-grained hornblende crystals in an even intergrowth surrounding rounded, fine-grained, magnetic clots that weather in relief. Because this rock is almost completely composed of mafic minerals, it is believed to be a metamorphosed ultrabasic intrusion.

Massive amphibolite, similar to coarse-grained varieties

in the south but containing a greater amount of hornblende, occurs in minor amount and there is a little laminated amphibolite. This rock differs from the coarsely laminated amphibolite of the south belt in that its laminae are very even, and are just the thickness of one mineral grain in the rock (1-2 mm.).

This sequence of basic and ultrabasic rocks may be a layered complex or a more highly metamorphosed series of amphibolites intruded by ultrabasic rocks. Poor exposures and the presence of numerous granite intrusions make interpretations difficult, but the presence of minor amounts of ferruginous quartzite suggests that the latter hypothesis is more likely.

Quartz-diorite Gneiss

Quartz diorite gneiss forms a small mass in the central part of the area. It is coarse-grained, slightly foliated, and composed of plagioclase (55%), quartz (30%), hornblende and biotite (15%). It is mottled on the fresh surface and weathers a chalky white.

Contacts between quartz diorite gneiss and other rocks are not exposed in the area. Its relations to surrounding rocks are assumed to be the same as those of similar bodies in the area to the east (Chown, 1960), where the gneiss is intrusive into the early volcanic series and has been metamorphosed with it.

Migmatite

Migmatite underlies much of the area, particularly in the north and west. This rock unit consists essentially of a mixture of dark (amphibolite) and light (biotite) gneiss layers varying in thickness from 1 cm. to several meters. It embraces all gradations from amphibolite and gneiss with minor pegmatite (0-15%) to granite with inclusions. Much of the amphibolite contains biotite, and is more strongly foliated than the amphibolite of the main belt. There is little or no compositional layering within the amphibolite layers.

The biotite gneiss is in very thick layers of uniform composition. It is fine to medium grained and contains about 20% biotite, 30% quartz, and 50% plagioclase. A few thin layers are composed almost entirely of biotite.

The granitic material in the migmatite ranges from grey to pink and from medium- to coarse-grained gneissic granite to coarse-grained massive granite or pegmatite. It occurs mostly in thin sills parallel to the foliation in the basic rock. Many small veins and dykes of pegmatite and aplite cut across the foliation.

Although much of the layering is even, in some areas many of the layers are bent into small folds. Thin, grey, pegmatite dykes are intricately contorted in many localities.

Granite

Granitic rocks underlie much of the area with large masses occurring in the south, southwest, east and central parts and thick, gently dipping sills intruding the migmatite in the north. The rocks are gneissic to massive, grey to pink granodiorites to true granites. They contain 20-30% quartz, 10-40% plagioclase, 20-60% microcline, and 10% or less biotite and muscovite. Small, streamlined to angular inclusions of amphibolite and gneiss occur here and there.

The pegmatite dykes cutting the early volcanic series are larger than those in the migmatite. The mineralogy is universally simple; quartz, feldspar and muscovite predominate and tourmaline is present locally.

YOUNGER BASIC INTRUSIONS

Diabase

Diabase dykes occur throught the area, ranging from a few inches to several tens of feet thick. The weathered surfaces are subspheroidal, a modification of the blocky jointing. The rock in shiny black to dark green and light yellow-brown weathering. It is too fine grained for the most part to permit identification of its mineral constituents with the naked eye. Small laths of feldspar may be distinguished in some of the coarser-grained types, and a few dykes have random phenocrysts of pale green plagioclase 3 to 5 cm. long. Dyke contacts are sharp and, locally, there is a thin, magnetic border.

The dykes dip vertically, or nearly so, and have two dominant trends: N. 50° E. and S. 30° E.

Gabbro

Gabbro forms some of the larger basic intrusions of the area. This rock and diabase are gradational near their contacts, and they have similar jointing and weathering habits. As seen in hand specimen, the gabbro contains altered plagioclase

traverse the area and roughly parallel the trend of the other deposits. Outwash deposits of fine, stratified sand occur in some places, chiefly around Tichegami river. Many of these are obscured by later muskeg deposits.

STRUCTURAL GEOLOGY

Folds

The formations, for the most part, dip steeply and trend easterly. Few major structures are apparent in the granite and migmatite units because good markers are lacking. Two west-plunging folds, an anticline and a syncline, are outlined by narrow belts of ultrabasic rocks in the northern part of the area. The extended nose of the anticline joins the two limbs of an anticline mapped in the area to the east (Chown, 1960). This anticline is upright, or nearly so, in the area to the east but is strongly overturned to the south at its nose in the present area. The syncline, on the other hand, is nearly upright. This disparity between the two folds is probably the result of granite intrusions during or after folding.

Small folds and crenulations are common in all rock units, particularly in the migmatite and laminated amphibolite. The axes of these small folds are indicated on the map as lineations.

Faults

Although no major faults were seen in the area, several small east-west shear zones occur just west of Baudeau lake.

Joints

Two prominent and nearly vertical joint sets trending about N. 60° E. and S. 30° E., respectively, are present in all the Early Precambrian rocks. A third and nearly horizontal set is not well developed. Significantly, the late Precambrian dykes have the same two trends as the nearly vertical joints.

ECONOMIC GEOLOGY

Prospecting in the area has been confined to the main water-courses. To date, no claims have been staked, although several prospectors have examined showings on Baudeau lake in recent years.

The early volcanic and sedimentary series offers the most promise from an economic standpoint. Nearly every outcrop contains some sulphides, commonly pyrite, and a few have some chalcopyrite. Most of the occurrences noted were in the southeast corner of the quadrangle. Many of the mineralized zones occur at the contacts between amphibolite and pegmatite dykes.

The thin band of ferruginous quartzite is too small, and of too low a grade, to be considered seriously as a source of iron. However, it and the interbedded volcanic rocks contain small amounts of sulphide.

The metamorphosed ultrabasic rocks in the northern sector of the area and also the gabbro and diabase dykes contain disseminated sulphides, chiefly pyrite and pyrrhotite, in several localities.

No minerals of economic importance were noted in the numerous pegmatite dykes of the region.

The abundant eskers and outwash deposits contain sufficient sand and gravel for roads and other construction.

REFERENCES

CHOWN, E.H., 1960, The Papachouésati River Area, Mistassini Territory; Quebec Department of Mines, P.R. No. 415.

CHOWN, E.H., 1960, Shigami Mountains Area, Mistassini Territory; Quebec Department of Mines, P.R. No. 440.

HEYWOOD, W.W., BRENT, S.S., CURRIE, K.L. and EADE, K.E., 1958, LaGrande Lac Bienville, New Quebec; Geol. Surv. of Canada, Map 23-1958.