RP 224(A)

PRELIMINARY REPORT ON ALBANEL LAKE MAP-AREA, MISTASSINI TERRITORY

Documents complémentaires

Additional Files

Licence

License

Énergie et Ressources naturelles
Québec

PROVINCE OF QUEBEC, CANADA

DEPARTMENT OF MINES

GEOLOGICAL SURVEYS BRANCH

PRELIMINARY REPORT

ON

ALBANEL LAKE MAP-AREA

MISTASSINI TERRITORY

BY

JAMES M. NEILSON

QUEBEC
1948

P. R. No. 224

ALBANEL LAKE MAP-AREA

MISTASSINI TERRITORY

QUEBEC

by

James M. Neilson

I N T R O D U C T I O N

The Albanel Lake map-area, in Mistassini territory, is bounded by latitudes 50°45' and 51°00' and longitudes 73°00' and 73°30'. The area mapped during the 1948 field-season was thus approximately 380 square miles. It includes the whole of the projected township No. 1429 and parts of projected townships Nos. 1428, 1430, 1328, 1329, and 1330.

The map-area is roughly bisected along a northeast-southwest line by the division between the Temiskaming and Grenville sub-provinces of the Canadian Precambrian Shield. The sedimentary rocks, lying to the west of this boundary, are late Precambrian in age and the gneisses, which lie to the east, resemble rocks classed as Grenville elsewhere and accordingly they are considered to be early Precambrian and of Grenville-type.

The map-area is approximately 160 miles northwest of the Lake St. John district and 80 miles northeast of Chibougamau lake. At present, the most feasible means of entry to the region is by air from bases at Chicoutimi, Roberval, St. Félicien, or Senneterre. As an alternative to flying, the area may be reached by canoe routes from Oskelaneo on the Quebec-Cochrane line of the Canadian National Railways or from St. Félicien in the Lake St. John district. Another alternative is to travel by private road to the Aluminum Company of Canada's control dam at Passe Dangereuse on Peribonca river, thence 80 miles by boat or canoe up this river to Onistagan lake and then to Albanel lake, either by air or by a difficult canoe route across the height of land.

The St. Félicien-Chibougamau allweather road, at present nearing completion, will afford relatively easy access to the area.

The map-area is inhabited during the winter by several Indian families of the Mistassini Cree tribe. The nearest settlement is the Hudson's Bay Company post near the southwestern end of lake Mistassini.

Game-fish, such as lake-trout, speckled trout and pickerel, are found in large numbers in the lakes. Northern pike and suckers are present also. Of the larger game-animals, moose and bear are fairly abundant. The smaller fur-bearing animals appear to be scarce, but some mink, muskrat, fox, otter, and a few marten are trapped each winter. Beaver are particularly scarce at the present time.

The area is heavily forested, except in the muskeg portions, by extensive stands of black spruce, balsam, jack-pine, tamarack and white birch. Some white cedar grows near the south end of Albanel lake. The predominant spruce is suitable for pulpwood.

T O P O G R A P H Y

The western portion of the map-area is underlain by gently dipping sedimentary rocks of the Mistassini series. The topography reflects the bed-rock structure, giving rise to the arcuate shore-lines of lakes Mistassini and Albanel. The strip of land between these lakes is low and contains numerous smaller lakes, which are frequently long and narrow.

The land lying to the east of Albanel lake is higher than that to the west, but the relief is nowhere more than 400 feet.

With the exception of Témiscamie river which flows into Albanel lake at the northeast corner of the map-area, the rivers of the area are not large. Chalifour river is a sluggish stream draining the southern part of the area. Richmond and Sepanakosepe rivers drain the remainder of the area east of Albanel lake; they are full of rapids and their courses are influenced both by the bed-rock structure and the glacial deposits. The whole area drains into lake Mistassini, which, in turn, is drained by Rupert river flowing westward into James bay.

Much of the land surface east of Albanel lake is mantled by glacial drift. As a consequence, many critical bed-rock areas are covered. Beach-terraces and extensive sand-plain deposits suggest that an arm of glacial lake Barlow-Ojibway may have extended into this region. A well-defined system of giant eskers trends southward along the Sepanakosepe river-valley. Other prominent glacial features are elongated ridges which have somewhat the shape of drumlins and are numerous in that part of the area underlain by sedimentary rocks. Their uniform trend indicates that, in this district, the last advance of the Pleistocene glaciers was southwestward. Abundant striae, crescentic gouges, and glacial polish show a direction of ice-movement of S.25°W. through the Mistassini basin.

GENERAL GEOLOGY

All the rocks underlying the map-area are of Precambrian age. The southeastern portion is underlain by gneisses, which resemble rocks of Grenville-type elsewhere. These rocks are considered to be of early Precambrian age. They consist of massive to banded granitic gneiss and well-banded biotite gneiss and biotite-hornblende gneiss. A few occurrences of gabbroic rocks were mapped. The rocks lying to the west of the gneiss complex form the upper portion of the Mistassini series of late Precambrian dolomitic limestone, dolomite, and iron formation.

TABLE OF FORMATIONS

Pleistocene and Recent	Glacial outwash sand, gravel, and morainic deposits
PRECAMBRIAN	
Post-Mistassini (Keweenawan?)	Diabase dykes and gabbro
Mistassini Series (Late Precambrian)	Iron formation: magnetiferous taconite, cherty iron carbonate, ferruginous slate, ferruginous quartzite
	Local disconformity (?)
	Grey dolomitic slate Grey dolomite, massive to thin-bedded; in part cryptozoon-bearing Grey to buff dolomitic sandstone
	Disconformity (?)
	Grey to buff dolomitic, massive to thin-bedded
	Disconformity (?)
	Ferruginous and argillaceous dolomite, massive to thin-bedded Argillaceous dolomitic limestone, thin-bedded.
Pre-Mistassini (Early? Precambrian)	Pink granitic gneiss, massive to well-banded; syenitic and pegmatitic facies Grey granite gneiss, massive to banded Biotite gneiss, biotite-hornblende gneiss

Pre-Mistassini

The gneissic rocks occupy the southeastern half of the map-area. They were mapped in close proximity to the sedimentary rocks of the Mistassini series, but the contact is concealed in all places by glacial drift. This contact is inferred to be a major fault. It is noteworthy that the sedimentary rocks are only slightly metamorphosed, whereas the gneisses appear to have a low-grade regional metamorphism.

Biotite gneiss has a wide distribution. It occurs in isolated exposures and in large masses parallel to exposures of pink granitic gneiss. Texture ranges from coarse to fine. It is generally well-banded. Composition varies greatly, but the percentage of biotite is usually high, whereas the percentage of white potassic feldspar is variable. In many exposures hornblende is the dominant mineral, and the rock may range from biotite-hornblende gneiss to hornblende gneiss. In some large masses adjacent to pink granitic gneiss, pink potassic feldspar and biotite are the chief constituents of the rock.

Grey granite gneiss is restricted to a small area on Sepanakosepe river, where it forms the highest hill in the map-area. This rock ranges from a light-coloured, coarse-textured rock, in which feldspar predominates, to a light-coloured gneiss composed of biotite and hornblende in bands alternating with white potassic and plagioclase feldspars, quartz, and epidote. The feldspars are comparatively fresh.

Pink granitic gneiss has a wide distribution, and it is everywhere the rock adjacent to the inferred fault-contact of the gneisses and the sedimentary rocks. The composition is granitic, but locally a syenitic facies was seen. Most exposures of this rock, however, have a high tenor of quartz (up to 50 per cent) and approximately equal amounts of pink potassic feldspar and altered plagioclase feldspar. Minor amounts of biotite, hornblende, magnetite, epidote and chlorite are present. A facies containing large grains of bluish quartz was also seen. Texture ranges from coarse-granitoid to medium-grained, with faint gneissic banding. Scattered occurrences of pegmatite appear to be related in composition to this rock.

Several exposures of hornblende schist were seen within areas of biotite gneiss; these were not large enough to be indicated separately in mapping. The strike and dip of the banding in this rock are at variance with the regional strike and dip of banding in the biotite gneiss, but the age of the schist in relation to this gneiss and the other rocks of the area is not yet known.

Mistassini Series

The oldest sedimentary rocks in the map-area are exposed along the eastern shore of lake Mistassini and on islands in the lake. These rocks are the upper portion of a thick formation of dark grey to black, fine-grained, thin-bedded, crystalline dolomitic limestone which underlies that lake. Where exposed within the map-area, jointing in these rocks is pronounced. The upper beds are characterized by slaty seams up

to one-half an inch thick. This formation passes conformably into the overlying ferruginous and argillaceous dolomite.

The ferruginous and argillaceous dolomite caps a cuesta which is a prominent topographic feature along, or close to, the eastern shore of lake Mistassini. This rock may be well-bedded or it may be massive, and it is more crystalline than that of the underlying formation. The colour on fresh fracture is medium to light grey or pink, and weathered surfaces are commonly grey or buff. At some localities this formation appears to pass into the overlying one by an interbedding of rock-types, but at others the transition is sudden and local disconformity is suggested by discordant dips in the two formations.

Above this possible disconformity a thick series of grey to buff crystalline dolomite occurs, usually massive but occasionally in thin beds. Interbedded layers of sandy dolomite are characteristic of this formation and in places the proportion of sandy material is so great that this member cannot be distinguished from the next formation. There is evidence, however, that another disconformity separates the two, at least locally. Below the disconformity thin-bedded buff dolomite is contorted into minor folds, the axes of which plunge steeply southeastward.

Above this disconformity the rock is grey to buff dolomite sandstone. Weathered surfaces are rubbly, with quartz grains standing out in relief. Well-rounded quartz grains comprise 10 to 50 per cent of the rock. Cross-bedding is common. The thickness of this formation is variable through the map-area. At the top it grades into the overlying dolomite formation by interbedding of rock-types.

Succeeding the dolomite sandstone is a light to medium grey crystalline dolomite which weathers grey. This formation underlies Albanel lake and forms the islands and reefs in the lake. The rock composing it is sometimes massive but more commonly well-bedded. The upper part of the formation is marked by well-defined horizons of cryptozoon structures. The presence of quartz stringers parallel to the bedding is another distinguishing feature which serves to identify this rock-type where it is exposed along the eastern shore of Albanel lake.

Grey dolomite slate with good cleavage occurs in isolated exposures along the lower course of Sepanakosepe river. This rock is inferred to be a metamorphosed portion of the upper, grey dolomite.

Northeast of the map-area, iron formation overlies the upper, grey dolomite with local disconformity (1). Within the map-area, however, the contact of the dolomite and iron formation is not exposed and, as exposures of the iron formation are not extensive, the various members of the iron formation were not separated in mapping. It is known that the lower member, immediately overlying the dolomite, is grey to dark grey, massive

(1) WAHL, W.G., Preliminary Report on Témiscamie River Map-area, Mistassini territory; Que. Dept. Mines, P. R. No. 211, 1947.

to bedded, ferruginous quartzite. Laminated brown to black ferruginous slate, ten to twenty feet thick, overlies the quartzite and grades upward into a bedded cherty iron carbonate. This member has a speckled appearance and is composed of grains and nodules of brown iron carbonate disseminated in a dark grey chert matrix. Masses of limonite appear on weathered surfaces. Parting is prominent parallel to the bedding in the outcrops. Magnetiferous taconite, occurring within the iron-carbonate member as a magnetite-rich zone, consists essentially of disseminated granules of magnetite in a jaspery chert matrix. Within the map-area the thickness of the iron formation is approximately 200 feet.

Post-Mistassini

Isolated occurrences of gabbro form rapids on Sepanakosepe river. Its relation to the other rocks of the area is unknown, but it and the diabase mentioned in the next paragraph are probably younger than the Mistassini series.

In the south-central part of the map-area a narrow exposure of comparatively fresh diabase, fine-grained and nearly black in colour, is in contact with biotite gneiss. Whereas banding in the gneiss dips southeastward, the dyke-like outcrop of diabase dips vertically and trends northeastward.

S T R U C T U R E

The sedimentary rocks of the Mistassini series have a regional northeast strike which, however, varies from N.10°E. to N.45°E. within the map-area as the formations follow an arcuate line from southwest to northeast. Dips are low to the east or southeast throughout the greater part of the area, increasing from about 5° in the dolomitic limestone of lake Mistassini to 30° - 45° in the dolomite west of Albanel lake. Dips in the upper, grey dolomite formation are more moderate and decrease eastward. East of Albanel lake the sedimentary rocks are much disturbed, and folding and faulting have resulted in dips ranging from 10° to vertical, and, in a few places, the beds may be overturned.

Local exceptions to the regional strike are due to flexing or gentle cross-folding. A syncline resulting from such folding was mapped in the southwestern corner of the map-area.

Regional forces which caused folding and faulting along southwest-northeast axes gave rise to broad synclinal and anticlinal structures in the iron formation and in the upper, grey dolomite immediately east of Albanel lake and near the mouth of Témiscamie river. Farther east, the grey dolomite was folded more tightly and faulted. The fault zones, or slices, are marked by their topographic expression, breccia zones, repetition of beds, and discordancy in strike and dip.

As mentioned earlier in this report, the contact of the sedimentary rocks and the gneisses is inferred to be a fault contact, but no direct evidence is to be found within the map-area.

Banding in the gneissic rocks has, in general, a regional northeast strike and a dip varying between 30° and 80° to the southeast. It is not yet known to what extent faulting may have affected these rocks.

ECONOMIC GEOLOGY

With the exception of blebs of galena and minor amounts of the manganese mineral, psilomelane, in the upper, grey dolomite and pyritization in the grey dolomitic slate along Sepanakosepe river, no mineralization was seen within the map-area.

The iron formation exposed in the area is the southwestern portion of a more extensive formation which occurs immediately northeast of the map-area between Albanel lake and the Témiscamie river (1). The exposures within the present map-area are parts of the middle members of that formation.

This iron formation received some attention during explorations in 1946 and 1947, but, to date, no deposits of hematite ore have been seen, although some outcrops show de-silication and alteration to hematite. Detailed geological mapping, however, may point the way to finding deposits of iron ore. The magnetiferous member is similar to the magnetiferous taconite of Minnesota where efforts are being made to develop new methods of mining and cheap beneficiation processes that would convert this rock into an important source of iron.

A considerable amount of magnetite, hematite, and garnet has been concentrated by natural processes on sand-beaches of Albanel lake near the mouth of Richmond river.

Extensive deposits of sand and gravel are available throughout the area for road, railway or other construction projects.

(1) WAHL, W.G., op. cit.