GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

MAP 56-1959

GEOLOGY

NICHICUN - KANIAPISKAU
NEW QUEBEC

Scale: One Inch to Eight Miles = 1/506,880

8 4 0 8 16 24 Miles

56-1959

LEGEND

PROTEROZOIC

12 Gabbro dykes, in part diabasic; relation to gabbro of (11) and (9b) not known

11 OTISH MOUNTAINS GROUP: red to white sandstone, arkosic sandstone, quartzite; minor pebble conglomerate, boulder conglomerate and red mudstone; intruded by gabbro sills

10 Red to white quartzite, arkosic sandstone; minor pebble conglomerate

9 KANIAPISKAU GROUP: 9a, buff, pink, and maroon arkose; jasper hematite beds; argillite; 9b, gabbro; 9c, buff and grey dolomite; 9d, argillite, slate, and phyllite with dolomite interbeds; 9e, cherty-metallic iron-formation; 9f, dark grey argillite; sandstone

ARCHAEAN

8 Ultrabasic rocks: serpentinite; pyroxenite

7 Granite to granodiorite, massive to poorly foliated, porphyritic in part; includes minor granite-gneiss

6 Pyroxene-bearing granite and granite gneiss: yellowish green granite and granite-gneiss; granulite gneiss

5 Granite-gneiss, porphyroblastic in part; includes migmatite and banded gneiss; includes minor amounts of 2, 6, and 7

4 Pink to white granite and pegmatitic granite; includes minor gneiss and schist (3)

3 Gneiss and schist derived primarily from sedimentary material, interlayered with pink to white granite and pegmatitic granite (4)

2 Gneiss and schist with minor granitic material; 2s, derived from sedimentary rocks; 2v, derived from volcanic rocks; 2f, metamorphosed iron formation

1 Greenstone, amphibolite, andesite, and dacite; includes some ultrabasic rocks (8)

Geological boundary (defined, approximate, gradational)

Boundary of areas of few or no outcrops

Bedding, tops known (inclined)

Gneissosity, schistosity (horizontal, inclined, vertical, dip unknown)

Fault (approximate, assumed)

Anticline (approximate trace of crest plane)

Syncline (approximate trace of trough plane)

Mineral occurrence (chalcopyrite, Cu; pyrite, py) py Cu

Geology by K. E. Eade, I. M. Stevenson, S. H. Kranck and O. L. Hughes, 1959

Marsh

Rapids

Height in feet above mean sea-level 2370

Cartography by the Geological Survey of Canada, 1960

Approximate magnetic declination, 28° 05' West

In response to public demand for earlier publication, Preliminary Series maps are issued in this simplified form and will be clearer to read if all or some of the map-units are hand-coloured

Air photographs covering this area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa

INDEX MAP

PUBLISHED, 1960.
COPIES OF THIS MAP MAY BE OBTAINED FROM THE DIRECTOR, GEOLOGICAL SURVEY OF CANADA, OTTAWA

PRINTED BY THE SURVEYS AND MAPPING BRANCH

DESCRIPTIVE NOTES

The mapping of the Nichicun-Kaniapiskau area is an eastward continuation of the geological reconnaissance by helicopter initiated in 1957 in the Sakami Lake area[1] and continued in 1958 in La Grande-Lac Bienville area[2]. The centre of the map-area is approximately 145 miles southwest of Schefferville, Quebec. The Department of Transport meteorological station at Nitchequon is the only settlement within the area but the Mid-Canada Defence Zone (MIDZ) crosses the area along the 55th parallel. Air transport is the only practical means of access as canoe routes are long and difficult. In general, topographic relief is moderate with a low, rolling terrain, but in the southwest corner the Otish Mountains are a prominent feature, rising as much as 1,500 feet above the adjacent country to the north. In the eastern half of the area, wherever pyroxene granite is the underlying rock, somewhat higher hills are typical. The northern section of the map-area and the highest parts of the Otish Mountains in the south are semi-barren areas with a forest cover of scattered and stunted spruce. The south and central parts of the area support dense coniferous forests with scattered deciduous groves in the more sheltered valleys.

The only published geological observations pertaining to the area are those of Low[3] along the Eastmain and Kaniapiskau Rivers and those referred to by Bergeron[4] in the Otish Mountains.

Pleistocene observations on this region will be published in a separate report.

The volcanic rocks (1) are commonly altered to greenstone and amphibolite but locally andesite and dacite are present. Most are of basic composition. These light to dark green rocks weather to various shades of green and brown and are chiefly fine grained. They may be either massive or schistose. Minor amounts of interbedded metamorphosed sedimentary rocks, impure quartzite for the most part, are included. Also included are small cross-cutting masses of ultrabasic rock, consisting essentially of serpentine.

The gneiss and schist of unit 2, in which granitic material is not abundant, comprise metamorphosed and granitized volcanic rocks (2v), sedimentary rocks (2s), and some amphibolites probably derived from basic sills, dykes, and flows. Included within the largest body of paragneiss, in the central part of the area, there may be some pyroxene-bearing types related to unit 6. Well-defined foliation is typical of the paragneiss and paraschist of this unit. Rocks composed of grunerite, ferrohypersthene, olivine, and disseminated magnetite (2f) are restricted to a single occurrence in the southeast part of the area. They are believed to be metamorphosed iron-formation, similar to that in the vicinity of Mount Read to the east.

Rock unit 3 comprises grey quartz-biotite-plagioclase schist with a typical rusty-brown-weathered surface, which grades into a grey gneiss of similar composition but with a grey-weathered surface. Both the gneiss and schist are interlayered with the granite. This sialic granite is pegmatitic to coarse grained or less commonly medium grained. Only the interlayered granite distinguishes this unit from some of the gneiss and schist of unit 2s. Minor amounts of grey granite-gneiss (5) are included.

A leucocratic, coarse-grained to pegmatitic granite (4) containing scattered inclusions of schist is similar in composition to the granite interlayered with the schist and gneiss of unit 3. It occurs as small plutons areally related to unit 3.

Granite-gneiss (5), predominantly well foliated, grades into banded gneiss and migmatite. It ranges in composition from granite to granodiorite or rarely, quartz-diorite. Feldspar porphyroblasts are abundant in many localities. Biotite and hornblende are the common mafic minerals present, but some pyroxene-bearing types, grading into unit 6, are also included. Amphibolite inclusions, of all sizes, may be present anywhere in this unit. Colours of the rocks range from pink to grey, the former containing relatively more microcline feldspar. Small areas of massive granite[7] grading into the granite-gneiss (5) have been mapped with the latter. Near the south boundary of the map-area, an occurrence of anorthositic gabbro is also included with unit 5. This gabbro body lies south of the zone of faulting along the Otish Mountains.

Pyroxene-bearing granite, granodiorite, quartz-diorite, and gneiss (6) constitute a distinctive unit in the map-area. These rocks are characterized by the presence of yellowish green plagioclase which imparts a greasy lustre to the rock as a whole. Dark grey or bluish quartz is ordinarily a distinctive constituent. In addition to hypersthene, biotite is an abundant mafic constituent and garnet is commonly present. Clino-pyroxene occurs in some specimens. The weathered surface of the rock is typically a rusty brown. Some specimens of granite included with the unit do not contain pyroxene but contain similar plagioclase and quartz. Gneisses of this unit also have greenish, greasy-lustred plagioclase, dark quartz, and hypersthene. Garnet is abundant in this foliated rock and some specimens contain sillimanite. The pyroxene-bearing granite and gneiss are similar to rocks in the adjacent Mount Wright area described by Duffell[5].

Massive granite and granodiorite (7), porphyritic in part, are locally foliated. The colour is commonly pink but may be white or grey. Normal mafic constituents are hornblende and/or biotite, with hornblende more abundant. Pyroxene is rare. Massive granites of more than one type and origin are included in this map-unit. Some of the massive granite is gradational into granite-gneiss (5) and both are, in part, derived from the sedimentary and volcanic rocks (1,2,3). Some pink to white porphyritic granite looks different. It grades into the pyroxene-bearing granite (6) to which it is spatially related, and is probably also related in origin. Small masses of pink, leucocratic, medium-grained granite, commonly with an aplitic texture, that are included with unit 7, have intruded the granite-gneiss (5) and other granites of unit 7. Similar small masses of the pink granite are included with pyroxene granite (6), which they apparently intrude.

Two small plutons of ultrabasic rocks (8) have been outlined. They are composed of remnants of pyroxene and olivine with much serpentine.

The small area of Kaniapiskau group rocks (9) was not studied in detail but a general succession of formations is apparent. The lowest exposed (9a) consists of buff to pink and maroon arkose, with some jasper hematite iron-formation and grey to green or black argillite in the upper part. The jasper hematite iron-formation is restricted to one locality. The argillite in this part of the section does not form extensive outcrops. The greyish green to black meta-gabbro (9b) is restricted to a zone in the extreme northeast corner. It has been observed only in fault contact with the sedimentary rocks, so its position in the sequence is uncertain. However, on basis of work by Roscoe[6] in the adjoining area, it is believed to be low in the sedimentary section. Overlying the argillite in the upper part of unit 9a, is buff to grey dolomite (9c). It varies from a laminated grey rock to a massive buff- or grey-brown-weathering rock. In the western part of the Kaniapiskau group in this area, the dolomite (9c) and the overlying argillite, phyllite, and slate (9d) are combined, as they are too narrow to be mapped separately. To the east, the dolomite outcrops extensively. The slate, phyllite, and argillite (9d) vary from grey to black and the unit contains some interbeds of dolomite. Some of the black phyllites contain pyrite concretions. The iron-formation (9e) is principally the 'cherty-metallic' type - massive, metallic coloured, and consisting of magnetite disseminated in chert. This is similar to iron-formation in the Knob Lake area described by Harrison[7]. A small area of interbedded dark grey argillite or slate and sandstone (9f) overlies the iron-formation in the extreme northern part of the area. Descriptions of the Kaniapiskau group rocks in the area to the north are contained in publications of Roscoe[6] and Fahrig[8].

A single area of younger sedimentary rocks (10) represents a downfaulted block of rocks that covered the granite and granite-gneiss unconformably. The only contacts observed are along faults. Pink to white quartzite containing minor layers of pebble-conglomerate, is most abundant, with a little pink or red arkose and red mudstone present in the lowest part of the exposed section. This block is similar to others occurring in the region to the west.

The Otish Mountains group (11) of younger sedimentary rocks consists of sandstone and pink to white quartzite, with minor beds of pebble-conglomerate. At the base of the exposed section, a few outcrops of coarse boulder-conglomerate were observed, and in the red arkosic sandstone overlying the conglomerate, are minor red mudstone layers. Distinctive marker beds are lacking in the sequence. Sills of green to dark grey, medium-grained gabbro, up to 350 feet thick, intrude the sandstone and quartzite at several levels in the sedimentary section. The high hills of the Otish Mountains are generally capped by gabbro sills.

Gabbro dykes (12) are present in limited numbers and segments that cannot be traced far throughout the area. They are dark green to black with a typical rusty-brown weathering and characteristic jointing normal to the trend. Metamorphism is low grade. The dykes trend predominantly in two directions, northwest and northeast. In the southwestern part of the area they appear to be related in origin to the gabbro sills intruding the Otish Mountains group (11). No gabbro dykes have been found cutting the sedimentary rocks of unit 10.

The relative ages of the younger sedimentary rocks of units 9, 10 and 11 are unknown. If the small area of metamorphosed iron-formation (2f) is the same age as similar rocks around Mount Reed which are generally correlated with the Kaniapiskau group rocks, then considering the difference in metamorphism of the iron-formation and rocks of the Otish Mountains group, the latter must be younger than the Kaniapiskau group. Lithologically, the sedimentary rocks of units 10 and 11 are similar and neither unit shows much metamorphism. The beds in both units are gently dipping, except in the vicinity of faults. The major difference in the two units is that gabbro sills are present in the Otish Mountains group but no intrusive rocks are present in unit 10 or in occurrences of similar rocks in the area to the west.

Major folds, as well as numerous minor folds, are present in the gneiss and schist (2 and 3), in the granite-gneiss (5), and the pyroxene-bearing gneiss (6), but lack of information makes them difficult to outline. In the western part of the area the general trend of the folds is about N70°E, the same as the prevailing trend in the region to the west. Eastward in the Nichicun-Kaniapiskau area, the fold pattern is more complicated, for in addition to the eastern trend, there is apparently a trend from N10°E to N10°W.

In the southwest corner of the map-area, is a major zone of northeast-trending faults that cut both the Otish Mountains group and the underlying granite-gneiss. In addition to the four parallel faults indicated, some evidence suggests faults of the same trend through the northern part of the Otish Mountains group. Vertical displacement on these faults is apparently large, with less horizontal movement indicated. This zone of faulting parallels the suggested line of the 'Grenville Front'. Faults trending northeast and northwest are the only observed contacts between the younger sedimentary rocks (10), and granite-gneiss (5) and granite (7). Large vertical displacement is suggested to account for the preservation of these remnants. The Kaniapiskau group rocks (9) are cut by strike faults trending approximately northwest, which are apparently older than cross-faults trending northeast. This pattern of faulting is similar to that found in Kaniapiskau rocks in adjoining areas. Other faults or shears, that can be traced only short distances, cut the granite-gneiss (5). Major lineaments, visible on air photographs and examined on the ground, mainly represent well-developed joints.

Rusty-weathering zones are present in some of the volcanic rocks (1), commonly along small shear zones. Pyrite mineralization is present in these zones, and in one, minor chalcopyrite is visible.

[1] Sakami Lake Area, New Quebec; Geol. Surv., Canada, Map 23-1957
[2] La Grande-Lac Bienville Area, New Quebec; Geol. Surv., Canada, Map 23-1958
[3] Low, A.P.: Report on Explorations in the Labrador Peninsula along the East Main, Koksoak, Hamilton, Manicuagan, and Portions of other Rivers; Geol. Surv., Canada, Ann. Rept. (n.s.), vol. 8, Rept. L, 1895
[4] Bergeron, Robert: Late Precambrian Rocks of the North Shore of the St. Lawrence River and of the Mistassini and Otish Mountains Areas, Quebec; in "The Proterozoic in Canada"; Roy. Soc. Canada, Spec. Pub. No. 2, pp. 124-131, 1957
[5] Mount Wright area, Quebec-Newfoundland; Geol. Surv., Canada, Map 6-1959
[6] Roscoe, S.M., Cambrian Lake (East Half), New Quebec; Geol. Surv., Canada, Paper 57-6, 1957
[7] Harrison, J.M.: The Quebec-Labrador Iron Belt, Quebec and Newfoundland; Geol. Surv., Canada, Paper 52-20, 1952
[8] Fahrig, W.F.: Cambrian Lake (West Half), New Quebec; Geol. Surv., Canada, Paper 55-42, 1956

This map has been produced from a scanned version of the original map
Reproduction par numérisation d'une carte sur papier