

RP 290(A)

PRELIMINARY REPORT ON WACOUNO RIVER AREA, SAGUENAY COUNTY

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PRELIMINARY REPORT

ON

WACOUNO RIVER AREA

SAGUENAY COUNTY

BY

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QUEBEC
1953

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on

WACOUNG RIVER AREA

Saguenay County

by

Roger A. Elais

INTRODUCTION

The Wacoung River area was mapped (Map No. 1029) by the writer during the summer of 1953. It comprises an area of 250 square miles, bounded by longitudes 65°40' and 66°00' and by latitudes 51°00' and 51°15'. The southwest corner is approximately 57 miles north-northeast of Sept-Îles, a village on the north shore of the St. Lawrence.

The easiest way to reach the area is by means of the Quebec North Shore and Labrador railway, which will join the iron ore deposits of Burnt Creek to the port of Sept-Îles. It is expected this railroad will be completed in 1954. That part of the railroad located within the area extends from Mile 67 to Mile 86 (distance from Sept-Îles, measured along the railroad route) and follows closely the course of Wacoung river. Daily trains along the railroad were used to reach the area adjacent to Wacoung river.

The area may also be reached by plane. An excellent airstrip lies along the railroad, at Mile 80. Seaplanes may also be used to reach the larger lakes, namely, Kachipitonkas, Favre, Mamikam, and Premic-Réal lakes.

Three main canoe routes permit access to different parts of the map-area. The first one is by way of Nipisso river, which may be ascended by canoe from the St. Lawrence, via Moisie and Nipissis rivers. It leads to the southeast corner of the area. Favre lake, in the northwest corner, may be reached by following the Nipissis river from Moisie river. The third canoe route, up Wacoung river from its junction with the Nipissis, gives access to the central part. The latter route is not used now, however, because of its proximity to the railroad and the nearly uninterrupted series of falls and rapids in the river.

TOPOGRAPHY

The area is part of a deeply dissected Laurentian plateau. Its rugged relief is due to sub-parallel valleys trending in a south-southwest direction. Such valleys are those of Nipisso, Wacoung,

Kachipitonkas, and Nipissis rivers, which are part of the drainage system of Moisie river which flows into the gulf of St.-Lawrence.

The region is very well drained, as evidenced by the scarcity of swamps and by rapid water run-off. Most rivers have a steep gradient, marked by numerous falls and rapids. For instance, Wacouno river drops about 800 feet in less than seven miles. Approximate elevations of Wacouno river, at the north and south boundaries of the area respectively, are 1,450 and 575 feet above sea-level. On the other hand, the surface of the upland is between 2,100 and 3,000 feet elevation.

The local relief of the upland is largely dependent on the nature and the structure of the bedrock. Relatively low ground in the southeast corner of the map-area is underlain by metasedimentary rocks. Higher ground two miles north of Premio-Réal lake is underlain by granulated granite. The gneissic granite of the northern part of the area underlies still higher upland. Here, bands of paragneisses included in the gneissic granite tend to form linear depressions. The highest ground is within the area of a granite batholith, which underlies the central and southwest parts of the map-area.

Locally, the topography is much influenced by the structure of the bedrock. Several valleys and ridges are parallel to the general strike of the gneissic structure. However, joints seem to have played a major part in the development of some of the topographic features.

The effects of glaciation are dominant along the main river valleys. Here, the valleys have a rough U-shape, and are partly filled with unconsolidated sediments. Glacial grooves were found along the walls of the valleys, which are marked occasionally by minor hanging valleys. Many of the rock exposures of the upland are well polished, and they locally display glacial striae and crescentic gouges which indicate a southward movement of ice. Glacial erratics were found in abundance even on the highest plateaus, and drumlins and esker-like ridges occur on lower ground.

GENERAL GEOLOGY

General Statement

All the rocks of the area are of Precambrian age. About half of the map-area is underlain by granite. The rest is comprised of: metasedimentary rocks, migmatites and injection gneisses, augen gneiss, gabbro, granulated granite, granodiorite, and various minor dykes.

The following table of formations is based on field relationships. Where contact features were not seen, or where comparative degrees of deformation and/or recrystallization were not indicative, inferences on age relationships were drawn from geological work in surrounding areas (1, 2).

- (1) HOGAN, Howard W., Preliminary Report on Nipisso Lake Area, Saguenay County; Quebec Dept. Mines, P.R. No. 280, 1952.
- (2) GRENIER, P.-E., Preliminary Report on Nipissis River Area, Saguenay County; Quebec Dept. Mines, P.R. No. 272, 1952.

Table of Formations

Cenozoic	Recent and Pleistocene	Clay, sand, gravel, erratic boulders
Great Unconformity		
Precambrian	Post-Grenville (?)	<p>Lamprophyre dykes (not shown on map) Aplite and pegmatite dykes (not shown on map)</p> <p>Pink porphyritic granite, pink biotite granite Pink hornblende-biotite granite, grano-diorite</p> <p>Gneissic granite Granulated granite Gabbro Augen gneiss</p>
		<p>Injection gneiss Migmatite</p>
	Grenville (?) metasedimentary rocks and associated igneous rocks	<p>Metadiorite</p> <p>Amphibolite and associated rocks</p> <p>Quartz-biotite gneiss, biotite-hornblende gneiss, feldspar-biotite gneiss, garnetiferous gneiss, biotite schist, white quartzite, grey micaceous quartzite</p>

Grenville (?) Metasedimentary Rocks and
Associated Igneous Rocks

Metasedimentary Rocks

Sedimentary rocks, possibly of Grenville age, are predominant in the southeast corner of the map-area. They also crop out as narrow bands in the northern part, and form roof-pendants in the main granite massif. These metamorphosed sediments include: quartz-biotite gneiss, biotite-hornblende gneiss, feldspar-biotite gneiss, garnetiferous gneiss, biotite schist, grey micaceous quartzite and white quartzite.

A distinct layering is characteristic of most of these paragneisses. The thickness of the layers varies from a fraction of an inch to one foot, and is regular over lengths of tens of feet. The gneissic structure in these rocks is generally well developed. Although bands of paragneisses were traced for several miles, the diversity of rock types in separate exposures prevents the sub-division of the rocks of such bands into smaller lithologic units. The similarity, in both structure and mineralogical variations, in the rocks of the different bands suggests that they belong, in all probability, to one series, possibly the Grenville.

By far the most common type of paragneiss is the quartz-biotite gneiss. This rock consists essentially of biotite, quartz, and feldspar. It is fine- to medium-grained, and has thin layering caused by the alternation of biotite-rich and quartz-feldspar-rich layers. Depending on the biotite content, the colour is from light to dark grey. The rock is usually highly schistose, crumbling easily on the weathered surface. In places, the gneissic structure is poorly developed, and the rock is massive for widths of several feet.

The biotite-hornblende gneiss is closely associated with the quartz-biotite gneiss. In addition to biotite and hornblende, it contains minor amounts of quartz and feldspar. This rock is medium-grained, strongly gneissic, and dark greenish-grey.

Layers of feldspar-biotite gneiss were found in several exposures of paragneisses, but it was impossible to trace such layers for any considerable distance. The structure of this rock is similar to that of the quartz-biotite gneiss.

The garnetiferous gneiss, unlike the preceding types of paragneiss, has a restricted distribution. It crops out in the band of paragneisses half a mile north of Canatiche lake. The garnetiferous gneiss is composed of biotite, feldspar, quartz, a little hornblende, and garnet. The latter mineral occurs as small disseminated grains and as large augen.

The biotite schist is dense, medium- to coarse-grained, and black. It is highly biotitic, with minor amounts of quartz and feldspar. This rock occurs as thin layers within the previously described rocks.

Lenses of white quartzite occur within the paragneiss bands, in the northern part of the area. The rock is medium- to coarse-grained and recrystallized. Of far broader distribution is grey mica-ceous quartzite, which is interstratified with quartz-biotite-feldspar paragneisses. This impure quartzite is medium- to fine-grained and has a gritty feel.

Associated Igneous Rocks

Small, concordant bodies of altered basic igneous rocks are closely associated with the paragneisses. They include small sills of amphibolite and plagioclase-hornblende gneiss, and slightly discordant masses of metadiorite. These rocks do not have the layering seen in the paragneisses. They are generally coarse-grained and dark grey. Their vague gneissosity is parallel to that of surrounding paragneisses.

In that part of the southeast corner lying west of Vatshishilet lake, migmatites predominate over paragneisses. The migmatites result where pink granite has intimately injected paragneiss in lit-par-lit fashion. The contacts between the introduced granitic material and the host-rock are characteristically diffuse. Biotite and hornblende are common minerals of the granite stringers. Field relationships suggest that the hornblende is, in part, a relic mineral.

Injection gneisses form a large part of the bands of paragneisses of the northern part of the area. They consist of gneissic granite intruding paragneisses, and are characterized by numerous, long, thin inclusions of quartz-biotite gneiss and biotite schist. The gneissic granite is biotitic and has sharp contacts with the enclosed paragneisses.

Post-Grenville (?) Intrusives

Augen Gneiss

A wide band of augen gneiss occurs in the southern part of the area, east of Wacoune river. The band trends northeast and is parallel to a band of paragneisses to the east of it. The augen gneiss is pink, coarse-grained, and is characterized by large, sub-parallel crystals of pink potassic feldspar. The groundmass is medium-grained and consists of pink and white feldspars, quartz, biotite, and a little hornblende.

Gabbro

A few outcrops of altered gabbro were found near the centre and in the northwest corner of the map-area. The rock is massive, hard, black, and coarse-grained, and consists essentially of pyroxene, plagioclase, and biotite. It is characterized by pronounced granulation and by criss-cross fractures plated with large biotite flakes.

Granulated Granite

A band of granulated granite outcrops east of Wacoune river, north of Zara lake. The rock is medium- to coarse-grained and pink. The principal visible minerals are pink and white feldspars, quartz, and a little biotite. The rock has a typical granulated appearance and is characterized by long blebs of quartz which impart a strong lineation to it.

Gneissic Granite

Pink gneissic granite is the predominant rock in the northern third of the area. It consists of feldspars, quartz, biotite, and rare hornblende. This medium- to coarse-grained rock shows all degrees of development of gneissosity and, in places, the rock is a true granite gneiss. In contrast with the injection gneiss, it is remarkably free from inclusions of paragneiss.

Hornblende-Biotite Granite

A narrow band of hornblende-biotite granite trends northeast across the area, not far west of Vatshishilet and Dimpf lakes, in the southeast corner. The granite is pink and medium-grained. It contains pink and white feldspars, quartz, biotite, and some hornblende. The biotite is arranged in sub-parallel planes. This granite forms a sill-like intrusion in paragneisses. It is considered to be older than the main body of biotite granite.

Granodiorite

A few small masses of granodiorite, not shown separately on the accompanying map, occur within the main granite body. The rock is grey, medium-grained, and schistose. It is composed of feldspars, biotite, hornblende, chlorite, and some quartz. The granodiorite is older than both the pink porphyritic granite and the pink biotite granite.

Pink Porphyritic Granite

The largest intrusive mass in the area is the batholith of pink porphyritic granite that occupies the central and southwest parts of the map-area. The rock is coarse-grained and massive. Essential minerals are pink and white feldspars, quartz, and biotite. Magnetite is a common accessory. In many places, this granite shows syenitic facies.

Pink Biotite Granite

An equigranular, pink, biotite granite is closely related to the main massif of porphyritic granite. The rock is massive,

medium-grained, light-coloured, and consists essentially of feldspars, quartz, and biotite. This biotite granite is mostly found along the eastern margin of the granite batholith.

Pegmatite and Aplite Dykes

Pegmatite dykes have been found cutting all the previously described rocks. They are very coarse-grained and most of them are pink. Essential minerals are pink and white feldspars, quartz, and biotite. Hornblende is present in the dykes that cut the hornblende-bearing paragneisses. Magnetite occurs in nodules, up to one inch in diameter, and in thinner dykes it makes up as much as ten per cent of the rock. Scapolite is a common accessory and occurs in emerald-green crystals some of which are as much as one foot long.

Aplite dykes cut some of the pegmatites. The aplite is pink, medium- to fine-grained, and has a sugary texture. Its mineral constituents are those of the pegmatites.

Lamprophyre Dykes

A few basic dykes, tentatively classified as lamprophyre, cut biotite granite. The rock is dark green, very fine-grained, massive, and highly altered. It contains amphibole, biotite, feldspar, and a little quartz.

STRUCTURAL GEOLOGY

The main massif of granite occupies an area of nearly 100 square miles and is remarkably uniform throughout. Within this massif, steeply-dipping, epidote-coated joints strike northeast and northwest. Most of the other joints are also steep and strike within twenty degrees east or west of north. A nearly horizontal jointing is also present.

Original structures within the paragneisses have been largely obliterated and have been replaced by a layering, which is nearly parallel to geological contacts. This layering was found to be parallel to the relic bedding planes in the white and grey quartzite and, on this basis, gneissosity of the sedimentary rocks may be used to interpret the regional structure. The structural interpretation outlined is consistent with the distribution of the various types of gneisses in this area.

The paragneisses of the southeast corner of the area have been folded into a syncline, the axis of which follows a northeasterly trending depression about a mile east of Vatshishilet lake.

Near the northeast corner of the map-area, the axis of a south-plunging anticline follows the valley of Wacoune river. Unlike the syncline just mentioned, this fold is broad and is marked by a gentle northward bend in the general east-southeast trend of the gneisses.

The structure of the gneisses in the northwest corner of the area is that of a broad, southeast-plunging anticline, the axis of which was traced from the north end of Favre lake to Mimi lake. The formations on the south limb of the anticline dip south at intermediate angles, that is, towards the granite batholith. On the north limb, the structure is interrupted by a minor south-plunging anticline, three miles northwest of Mimi lake.

Small shear zones were found in the vicinity of the small gabbro masses. Minor shears are also common in the layered rocks of the area.

ECONOMIC GEOLOGY

Several small "showings" of metallic minerals were found in different parts of the map-area. The type and amount of mineralization should be of some interest to prospectors.

Sulphides

Sulphide mineralization is found about 500 feet west of the outlet of Dimpf lake, in the southeast corner of the area (locality 1 on the map). The mineralized zone has a maximum width of 14 inches and is exposed for a length of 8 feet. Disseminated pyrite, some chalcopyrite and molybdenite occur in a concordant dyke, three feet thick, of sheared hornblende granite cutting paragneisses. A grab sample assayed: copper, 0.34%; nickel, 0.01%; molybdenum, 0.04%; and silver, 0.046 oz./ton.

Veinlets of pyrite and chalcopyrite were found erratically distributed in gabbro in a railroad cut, 150 feet long, at Mile 79.2 (locality 2). A grab sample of this mineralized gabbro assayed: copper, 0.24%; nickel, 0.20%; and silver, 0.010 oz./ton.

Finely disseminated pyrite is found here and there in the granites, especially along the borders of the main batholith. A grab sample of granite showing a local concentration of disseminated pyrite, from a railroad cut at Mile 76.4 (locality 3), has 0.19% copper.

Iron and Titanium

An angular piece of massive titaniferous magnetite, eight inches in diameter, was found on a sandy beach of Kachipitonkas lake (locality 4). Attempts to find the source of this float in the region have so far been unsuccessful.

In a railroad cut at Mile 82.1 (locality 5), magnetite has extensively replaced granite over a width of ten feet. A grab sample of this material assayed: iron, 36.47%; titanium dioxide, 1.22%; and chromium, 0.01%.

Magnetite is a frequent accessory mineral in the pegmatites. It accounts for more than 10 per cent of some of the thinner pegmatite dykes.