RP 473(A)

PRELIMINARY REPORT ON VILLAGE LAKES AREA, MISTASSINI TERRITORY AND NEW QUEBEC

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PRELIMINARY REPORT

ON

VILLAGE LAKES AREA

MISTASSINI TERRITORY AND NEW QUEBEC

BY

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QUEBEC
1962

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VILLAGE LAKES AREA

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INTRODUCTION

Village Lakes area occupies some 250 square miles bounded by latitudes 52°00' and 52°15' and by longitudes 75°10' and 75°30'. It lies athwart Eastmain river, 170 miles north-northwest of the town of Chibougamau. It was mapped geologically during the summer of 1961.

The only practical means of access is by floatplane, with the nearest base being at Caché lake, near Chibougamau. The Eastmain river is navigable by canoe within the area.

Most of the area is moderately forested by coniferous trees, the common types being jack pine and black spruce. Balsam fir and tamarack are present but scarce. Minor amounts of birch and poplar are present. The area has been burnt over several times.

Pike and pickerel fishing is good in many of the lakes in the area. Lake trout and white fish were caught in the Village lakes along with pike and pickerel.

Game is scarce, although beaver, bear, otter, muskrat, mink, rabbit, partridge, and duck were seen, as well as tracks of moose and wolf.

The Village Lakes area, in general, is characterized by a rolling topography. The average relief is in the order of 150-200 feet. The highest point is at the eastern border. This hill is part of an east-trending ridge 2 miles south of Eastmain river and rises between 400 and 500 feet above it.

The area is drained by Eastmain river which flows into James bay, 135 miles to the west. The local drainage pattern is the trellis type, deranged by glaciation.

Pleistocene glaciation played an important role in fashioning the present topography and gave many of the streams and lakes a pronounced S. 60° W. trend. However, the main topographic features are closely related to bedrock structures and most of the hills and valleys reflect trends in the underlying rock.

GENERAL GEOLOGY

The bedrock exposures of the area are all of Precambrian age. Granite, granite gneiss, metavolcanics, and quartz-biotite gneiss or schist make up over 85 per cent of the rocks present. These rocks have been complexly folded and faulted.

The oldest group of rocks consists of metamorphosed and steeply inclined lavas and sedimentaries. The lavas are thought to be andesitic to basaltic in composition, while most of the sedimentary rocks are of quartz-feldspar-biotite composition. All contacts but one between lavas and sedimentaries appear to be conformable.

Lens-like bodies of gabbro occur in the lavas and are believed to be portions of the same volcanic flows. However, some of these may, in fact, be gabbro sills.

In places, masses ranging from granite to granodiorite in composition are intrusive into the preceding groups. Although some are massive, most of the granitic rocks are gneissic. The different kinds of granitic rock probably represent more than one orogenic period.

Diabase dykes, feldspar porphyry dykes and pegmatites cut the granites and are the youngest rocks in the map-area.

Table of Formations

Cenozoic	Recent Pleistocene	Peat, river deposits, beach deposits Silt, sand, gravel, boulders
		Unconformity
Precambrian		Diabase dykes Feldspar porphyry dykes
		Intrusive contact
		Pegmatite Granite, granite gneiss, granodiorite Augen gneiss-layered gneiss (migmatite)
		Intrusive contact
		Metamorphosed pebble conglomerate
		Metasedimentaries quartz-biotite gneiss or schist, biotite-staurolite gneiss or schist, some quartz-muscovite schist and minor amounts of quartzite, metamorphosed lava (andesite and/or basalt), quartz-magnetite rocks and hornblende-augen gneiss. Metavolcanics (andesite and/or basalt), gabbro and meta-gabbro with minor amounts of metasedimentaries, amphibolite and quartz-magnetite rocks.

METAVOLCANICS, GABBRO AND META-GABBRO

Metavolcanics

Lavas thought to be andesitic to basaltic in composition occur quite extensively in the Village Lakes area. They are fine to medium grained, dark green in colour, and generally chloritized and foliated.

No pillowed lavas were noted in the area, and hence the exact age relationship between the lavas and the sedimentaries is not known. The lavas are thought to be older than the sedimentary rocks. Much of the structural interpretation of the area is based on this assumption.

Gabbro and Meta-gabbro

Medium-grained, massive gabbroic rocks are interlayered with the lavas, and the origin of these rocks is obscure in most cases. In a few localities such rocks were seen to grade into basaltic or andesitic material. In these cases the gabbros are lenticular in shape and appear to be coarser-grained facies of slowly cooled basic flows. Inclusions of what is believed to be gabbroic material have been observed in some lavas. The gabbros are commonly chloritized to some extent.

METASEDIMENTARY ROCKS

The prevailing metasedimentary rocks in the area are fine- to medium-grained, light- to dark-coloured quartz-biotite gneisses or schists. They generally contain between 10 and 25 per cent biotite, with hornblende in some and, occasionally, large amounts of garnet (20-40 per cent). North of the Eastmain, these rocks are more foliated than to the south and contain little or no garnet.

In some places the mica in the metasedimentaries is muscovite and the term quartz-muscovite schist may be more appropriate. Several exposures of quartzite were also observed. These two rock types have been included with the quartz-biotite gneiss or schist on the accompanying map.

Two outcrops of banded quartz-magnetite rock were found south of Eastmain river. The rock shows alternating bands, from paper-thin to some inches in thickness, of blue-black magnetite and glassy white to grey quartz.

The biotite-staurolite gneiss or schist of the area is highly deformed and is composed of porphyroblasts of staurolite in a biotite-rich quartz schist groundmass. In many places the groundmass also includes garnets. The length of most of the

porphyroblasts is from ½ inch to 2 inches.

AUGEN GNEISS, LAYERED GNEISS

Augen Gneiss

Augen gneiss outcrops 1 ½ miles east of Clarkie lake, in the northwest corner of the area, and on both shores of the Eastmain river, in the central part of the area. This gneiss is composed of about 30 per cent hornblende and 70 per cent feldspar. The hornblende occurs in lenses in a medium- to coarse-grained groundmass, which appears to be of dioritic composition.

Layered gneiss

The layered gneisses of the area are migmatites. They are found on the north side of Lichteneger lake and east of the northern Village lakes. Numerous irregular layers of what appears to be metasedimentary rock were noted in the migmatite. A typical sample is composed of alternating layers of metasedimentary-like material and coarser-grained, feldspar-quartz layers. These beds are usually 2 to 10 inches thick and are separated by thin layers (¼ inch thick) of biotite.

The layered gneisses or migmatites east of the northern Village lakes are similar to those at Lichteneger lake except that some of the latter may have been formed by the mixture of lavas and granitic materials.

GRANITE GNEISS, GRANITE AND GRANODIORITE

Granitic rocks underlie more than half of the area and include granite, granite gneiss and granodiorite. The age relationship between these rocks is not known. In the field they were subdivided into the three broad groups on the basis of differences in mineralogical composition and colour.

The granitic rocks are generally pink to grey, medium grained and gneissic, although massive phases are common. In the south they are characterized by hornblende, with biotite present locally; elsewhere they are characterized by biotite, although hornblende is present in many places. A typical sample from near the southern border consists of 25 per cent quartz, 65 per cent alkali feldspar, and 10 per cent hornblende.

Near Lichteneger lake, in the north, leucogranites are more common than to the south and there are a few exposures of granodiorite.

PEGMATITE

Pegmatites are abundant as dykes, sills and small stocks cutting the metavolcanics, metasedimentaries and granitic rocks.

They are divided mineralogically into two groups: muscovite or tourmaline pegmatites. The muscovite pegmatite is much more common and occurs throughout the area, whereas the tourmaline pegmatite is found only at the eastern border of the area south of the Eastmain.

FELDSPAR PORPHYRY AND DIABASE DYKES

Feldspar porphyry

Two large, east-trending feldspar porphyry dykes or lensoid stocks outcrop in the southwest corner of the area. The rock contains two kinds of feldspar in rounded crystals 2 to 3 inches in diameter surrounded by a groundmass composed of hornblende. The feldspar porphyries appear to cut the surrounding granitic rocks. Many of the feldspar crystals have reaction rims. The largest dyke is 500 feet or more wide and a mile long.

Diabase

All the diabase dykes except two cut the various granitic rocks. The two exceptions cut both the metavolcanics and the metasedimentaries.

The diabase dykes are commonly 3 to 15 feet wide. They are of uniform basaltic composition and, in places, exhibit good ophitic texture. Almost all dip vertically and strike S. 20° E.

The diabase appears to be the youngest rock in the area.

STRUCTURAL GEOLOGY

Faults

In the field, two faults were recognized. One strikes N. 40° W. and can be traced for 18 miles within the area. It extends into the adjoining areas to the west and south, and is the most spectacular structural feature of the Village Lakes area. Minor fault-line scarps were noted near the fault. It appears to have a nearly vertical dip, and a strike-slip movement, with the southwest block moving northwest and up with respect to

the northeast block. Field observations supporting the presence of this fault are:

(I) continuous linear on the air photos;

(II) discontinuity of the quartz-biotite gneiss or schist and the biotite-staurolite gneiss or schist south of Eastmain river west of the fault;

(III) mylonite and slickenside at two places along the fault.

A small fault occurs between the Clarkie Lake anticline and the Lichteneger Lake syncline. This appears to be a rotational type of fault caused by the opposing plunges of the anticline and syncline. The fault is outlined by a medium- to coarse-grained hornblende-augen gneiss and by a linear on the air photographs. It has an approximate length of 4,000 feet.

Two possible faults appearing as linears on aerial photographs have also been indicated on the map. A few outcrops of hornblende-augen gneiss were found near the linear north of the Eastmain.

Although the Eastmain flows on granitic rocks, its course east of the major strike-slip fault is unusually straight. Most of the joint directions taken along the Eastmain river are not parallel to it and this east-west trend of the Eastmain may indeed represent a fault.

Along the north side of the northern Village lakes there is a discordance between the metasedimentary and metavolcanic rocks. This discordance may be due to a fault, but there is no other field evidence for such a structure.

Joints

A rough structural analysis of the joints in the region shows that the most prominent joint direction strikes S.40°E. and dips 85° N.E. This is parallel to the major strike-slip fault and appears to be a shear direction.

The second most common direction is given by vertical joints striking N. 20° W. It is thought that most of these are tension joints. Most of the diabase dykes parallel this joint direction.

The third direction is given by vertical joints striking north. This direction represents the second shear direction.

Horizontal sheeting is common in the granite rocks.

Folds

East of the strike-slip fault the metavolcanics and metasedimentaries form a refolded, east-trending, sub-isoclinally folded syncline. It appears that an east-trending, sub-isoclinal syncline with steeply dipping limbs was formed first, and was later refolded by roughly east-west compressional forces.

The quartz-biotite gneisses or schists around Clarkie lake and Lichteneger lake are less complexly folded. At Clarkie lake the rocks form an asymetrical anticline with an approximate axial trace of N. 20° E. and a plunge in the direction S. 20° W. At Lichteneger lake these rocks are folded into an overturned syncline which plunges to the northeast.

No structural patterns could be established in the granitic rocks of the region.

Foliation and Lineation

The metavolcanics and quartz-biotite gneiss or schist are well foliated, and most of the foliations appear to be the bedding plane type.

In several outcrops lineation is well developed. Parallel orientation of hornblende crystals is the most common type.

ECONOMIC GEOLOGY

Augustus Explorations Limited staked 80 claims on the west side of Village lakes during the month of February 1961. These claims were sold to Draper, Dobie and Company, Toronto. During the summer of 1961, the northeast half of the claims block was optioned to Kerr-Addison Gold Mines Limited. All 80 claims are underlain by metavolcanics, gabbros and meta-gabbros.

In the latter part of August, Kerr-Addison Gold Mines Limited did some preliminary field work on their 40 claims and other prospecting was done by Noranda Mines Limited and Corporation Administrative Service Limited.

A few small showings of chalcopyrite, pyrite and pyrrhotite were found in the lava and along small shear zones in both the lava and gabbro. On one shear 3 feet wide a silicified zone contains 10 to 15 per cent chalcopyrite over a length of 6 feet and a width of 2 feet. A few grains of bornite were mixed in with the chalcopyrite. Another silicified zone contains small amounts of nickeliferous pyrrhotite.

During the field season a fair number of rusty-weathering zones, mineralized with disseminated pyrite or pyrrhotite, were found intercalated with the lavas. The more important ones have been indicated on the map. In many parts of the area small amounts of chalcopyrite were observed in quartz veins and in lavas. Also, three obvious magnetic deviations were noted. In one case the deviation was due to quartz-magnetite iron rocks. The other two were probably due to the presence of pyrrhotite.

Reconnaissance field work indicates that the meta-volcanics, meta-gabbros and gabbros are the favourable rocks for pyrite, pyrrhotite and chalcopyrite mineralization. The writer is of the opinion that further examination of these rocks may lead to the discovery of additional copper showings. Gold discoveries are another possibility.

LIST OF REFERENCES

Eakins, P.R., 1961: Preliminary report on Natel Lake Area, Mistassini Territory and New Quebec; Quebec Department of Nat. Res., P.R. No. 454.