P. R. No. 357

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PRELIMINARY REPORT

ON

PONTEFRACT-GILLIES AREA

PONTIAC ELECTORAL DISTRICT

BY

RALPH KRETZ

QUEBEC
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INTRODUCTION

The geology of the Pontefract-Gillies area was studied by the writer in the summer of 1957. The area, which is about 100 miles northwest of Hull, is bounded by latitudes 46°00' and 46°15' and by longitudes 76°30' and 76°45'. It includes the major parts of Pontefract, Gillies, Bourgogne, and Normandie townships, and a narrow strip along the northern border of Huddersfield township, or some 205 square miles in all.

The area has few permanent inhabitants. It has one farm owned by J. Burke, a logging camp on Usborne lake owned by Gillies Brothers, and a logging camp in the northeast corner on the shore of Owen lake. A fishing lodge on Squaw lake is owned by L. Kearns, and other private fish and game clubs have camps at Gaudry, Bell, Stubbs, Laforest, Burnt Dam, McKay, and Dumont lakes.

The gravelled Picanoc road extends from Otter Lake village, off the southeastern corner of the area, to Usborne lake in the north. From Usborne lake, the John Bull road extends several miles farther north. Stubbs lake, in the south-central part of the area, may be reached from Fort Coulonge and Davidson Depot by a road which, within the area, is essentially a winter road; during summer months it is, for the most part, passable only by truck or jeep. The west-central part of the area is accessible from the west by a branch of the Black River Jim's Lake road. A road also enters the northeast corner of the area from the Gatineau River valley to the east. These roads and the several logging roads and trails make most of the area moderately accessible.

The topography is hilly although local relief is rarely more than 300 feet. Most of the area is well wooded. Small lakes are numerous. Three-quarters of the drainage is to Coulonge river, which passes through the area, and the remainder to Picanoc river.

The western part of the area, mainly along Coulonge river, was examined by Retty (1932), and the area immediately to the south was mapped by Kretz (1956).

GENERAL GEOLOGY

All consolidated rocks in the area are Precambrian. Gneisses of Grenville aspect, chiefly hornblende and hornblende-biotite types, are most abundant. These nearly everywhere have some intermixed granite, syenite, or pegmatite. Limestone and tactite are rare and occur chiefly as small, tabular or irregularly shaped masses. Gabbro is present locally, apparently as lens-shaped concordant bodies; this rock is more basic and more homogeneous than the gneisses. A basic amphibolite and pyroxenite are in places closely associated with the gabbro. Rocks rich is potassium feldspar are common within the gneisses. The potassium feldspar is in grains, prophyroblasts, or in numerous small parallel veins. Structurally and texturally these rocks resemble the Grenville-type gneisses, and it may well be that the potassium feldspar was introduced into such rocks. In the western part of the area, two irregularly shaped masses are composed principally of granite or syenite, with gneisses occurring as tabular inclusions and schlieren. East-trending, unmetamorphosed, diabase dykes cut all other rocks of the area. The many varieties of rock types noted in this map-area are listed in the Table of Formations.

Limestone and tactite

Limestone and tactite are relatively rare. They occur mainly as tabular or lens-shaped masses a few inches to a few tens of feet thick in gneisses and granitic rocks. Commonly tactite is found near limestone.

Limestones of the area are white or pink and are composed chiefly of medium-to coarse-grained calcite, Locally dolomite is present; limestones composed chiefly or entirely of dolomite are rare. Nearly all limestone contains some (commonly 10 per cent) silicate minerals, such as phlogopite, diopside, actinolite, chondrodite, and serpentine; rare constituents are graphite, quartz, potassium feldspar, apatite, and spinel. Inclusions are common in the limestone. One type of inclusion is a coarse-grained aggregate of silicate minerals such as are dispersed in the limestone. Another type is of fine-grained, quartz-feldspar-rich rock and hornblende-biotite gneiss, occurring as pods or irregularly folded layers. There is evidence locally that calcite has partly replaced these silicate rocks.

Limestone is not abundant in the area. It appears mainly as tabular or lens-shaped masses a few inches to a few tens of feet thick in gneisses and granitic rocks.

The term "tactite" here refers to a rock rich in green diopside. The grain-size is predominantly coarse but characteristically variable. The mineral distribution is heterogeneous and mineral orientation is random. Some types are composed almost entirely of pyroxene; some contain abundant scapolite. Other constituents, locally present, are biotite, actinolite, sphene, quartz, feldspar, and allanite.

Gneisses (Grenville-type)

The most abundant gneisses are grey, leucocratic to melanocratic rocks, commonly foliated and laminated, with grain size predominantly 1 to 2 mm., and classifiable in general as biotite-plagioclase-quartz and hornblende-biotite-plagioclase types. However, they are composed of various combinations and proportions of plagioclase, quartz, sillimanite, biotite, garnet, hornblende, and calcium pyroxene, with such common minor constituents as sphene and magnetite. Neither sillimanite and hornblende nor sillimanite and pyroxene are found together in a rock, and pyroxene and garnet are rare together.

Nearly all genisses have a laminated or layered structure, shown by: 1. an interlayering of various types of gneisses; 2. variations in the proportions of mineral constituents of one type of gneiss; or 3. layers, lamellae, and lenses of potassium feldspar-rich, or plagioclase-rich rock (various granitic and syenitic rocks and their equivalent pegmatites).

In the northeast corner of the area leucocratic to mesocratic gneisses, containing very little granitic material, crop out. However, small lenses and layers of quartz-plagioclase, with or without hornblende are common. These are considered to be mineral segragations.

Gneisses with Intermixed Granitic and Syenitic Rocks

Most of the area is underlain by a mixture of gneisses and granitic or syenitic rocks. The granitic and syenitic rocks occur as concordant or discordant layers and irregularly shaped masses. The most abundant types are pink, potassium feldspar-rich, leuco-granite and leuco-granite pegmatite.

Gneisses Rich in Potassium Feldspar

Some gneisses in the area contain potassium feldspar. They are pale pink, fine- to medium-grained rocks which, in addition to potassium feldspar, have the mineral assemblages of Grenville-type gneisses. These may have been Grenville-type rocks, into which potassium feldspar was introduced.

Some potassium feldspar gneisses are veined. These are Grenville-type gneisses or potassium feldspar gneisses as described above, which contain numerous lamellae, lenses, or porphyroblasts of medium- to coarse-grained pink potassium feldspar or potassium feldspar-quartz assemblages.

Potassium feldspar-rich gneisses are commonly interlayered and intermixed with Grenville-type gneisses and granitic rocks.

Amphibolite, gabbro, altered pyroxenite

These are grey to black, mesocratic to melanocratic rocks. Gabbro is the most common and is composed of basic plagioclase and hornblende with common pyroxene and biotite and rare garnet. The rock is more homogeneous than the Grenville-type gneisses, and it is also distinguished from the gneisses by the presence of small aggregates of plagioclase grains that produce a spotty weathered surface. Amphibolite, biotite amphibolite, altered pyroxenite, and biotite pyroxenite occur locally close to gabbro.

TABLE OF FORMATIONS

Recent and Pleistocene		Sand, gravel, till, glacial erratics.
Precambrian	Diabase dykes	Pyroxene-hornblende-calcic plagioclase diabase
	Granitic and syenitic rocks	Light-coloured granite and syenite and pegmatitic equivalents. Biotite granite and syenite and pegmatitic equivalents. Hornblende, pyroxene, and hornblende-pyroxene granite and syenite and pegmatitic equivalents.
	Amphibolite-gabbro; altered pyroxenite	Amphibolite and biotite amphibolite-associated with gabbro. Pyroxene-hornblende gabbro and pyroxene-hornblende-biotite gabbro. Altered (pyroxene to uralite) pyroxenite and biotite pyroxenite.
	Grenville-type gneisses rich in potassium feldspar	Biotite, hornblende, and pyroxene gneisses, containing grains of potassium feldspar. Veined gneiss-biotite and hornblende gneisses containing veins of quartz with potassium feldspar, or porphyroblasts of potassium feldspar.
	Intermixed gneisses (Grenville-type) and granitic or syenitic rocks	
	Gneisses (Grenville-type)	Quartz-biotite-plagioclase gneiss, locally with garnet, sillimanite, graphite. Plagioclase-hornblende gneiss; plagioclase-pyroxene gneiss; plagioclase-hornblende-pyroxene gneiss; locally with biotite, garnet, pyroxene-scapolite.
	Limestone and tactite (Grenville-type)	Calcite and dolomite limestone, commonly containing phlogopite, diopside, rarely actinolite, serpentine, chondrodite, apatite. Tactite-chiefly pyroxene tactite and pyroxene-scapolite tactite, locally containing actinolite, biotite, quartz, feldspar.

These rocks are not abundant in the area. They occur as layers and lenses, which appear to be mainly concordant with the enclosing gneisses.

Granitic and Syenitic Rocks

The granitic and syenitic rocks are predominantly pink with some grey, medium- to coarse-grained, and possess a characteristic heterogeneous mineral distribution. They are composed of various proportions and combinations of the minerals quartz, potassium feldspar, plagioclase, calcium pyroxene, hornblende, and biotite. Plagioclase is subordinate to potassium feldspar. Minor constitutents are sphene, magnetite, and allanite. The various combinations of minerals that were found in the field are listed in the Table of Formations.

These rocks are mixed with Grenville-type gneisses and with potassium feldspar-rich gneisses. Locally granitic and syenitic rocks exceed 70 per cent of the total rock exposed; such areas are outlined on the accompanying geological map.

Although the granitic and syenitic rocks make up 30 per cent or more of the total rock of the area, homogeneous masses underlying more than a few hundred square feet apparently do not exist.

Diabase Dykes

Several post-metamorphic diabase dykes, commonly about 200 feet thick, were found in the southern part of the area. They trend east or slightly south of east. The rock is black, fine- to medium-grained, homogeneous, hornblende-pyroxene-plagioclase diabase. The dykes cut all rocks described above.

Unconsolidated Deposits

Much of the area is underlain by a thin covering of unconsolidated Glacial to Recent deposits. Sand is predominant and is most abundant in the valleys of Coulonge and Picanoc rivers. It is locally cross-bedded, and is probably alluvial. In places, pebbles, cobbles, and boulders are intermixed with sand. The origins of many of these deposits are uncertain. Deposits of till, as well as large glacial erratics, are present locally.

STRUCTURAL GEOLOGY

Planar features in the rocks of the area (excepting diabase) are shown by laminated and layered structure, and by the orientation of inequant mineral grains, such as biotite and quartz. Linear features are marked by linear aggregates of minerals, orientation of inequant mineral grains, such as hornblende and quartz, by fold axes, and by linear grooves on inclusions in limestone.

The layered structure and mineral foliation, which are everywhere parallel, trend northwest; dips are variable and mostly less than 45 degrees. The trend of lineation is southeast, with a plunge of about 15 degrees.

Joints are well developed locally, but the orientation varies from place to place. One persistent joint set strikes easterly, parallel to the diabase dykes; another strikes northeast, perpendicular to the lineation.

The gneisses are locally displaced by small faults, most of which now contain pegmatite.

MINERAL DEPOSITS

Squaw Lake Molybdenite

The property is at the southeast end of Squaw lake, mainly in lot 24, range VIII, Huddersfield township. It was examined by Ingham (1942), Eardley-Wilmot (1925), Wilson (1924), and Bancroft (1918).

The workings consist of a few open pits and 3 diamond-drill holes. The pits are not now accessible. No work has been done since 1918.

Klock Radioactive Property

The property includes lots 20-27, range VIII, Huddersfield township; the main radioactive areas are immediately west of Black lake. The property was examined by Shaw (1955).

The radioactive minerals are small red grains of thorite, and small black grains of thorianite which contains some uranium. These occur in pale pink to white calcite limestone. The limestone contains phlogopite, actinolite, diopside, and, locally chondrodite. Inclusions of tactite are common. Three northwest-trending layers or lenses of radioactive limestone have been explored by 8 trenches and 12 diamond-drill holes. The average thickness of the limestones at the surface is about 20 feet.

Tactite is closely associated with the limestone and is composed of pyroxene, scapolite, actinolite, and biotite. Other rock types that crop out nearby are hornblende-biotite-plagioclase gneiss, hornblende-potassium feldspar gneiss, leuco-granite, and pyroxene syenite pegmatite.

A more detailed description of the property is given by Shaw (1955). Very little work was done at the property in 1956 and 1957.

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