CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

LEGEND

PROTEROZOIC

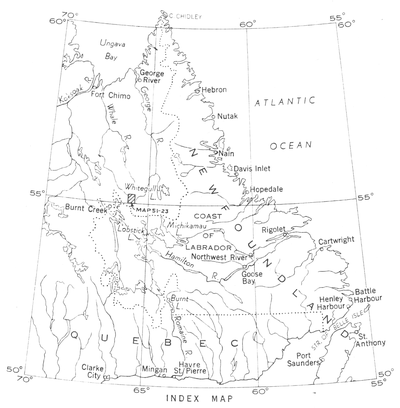
- 8 — *Serpentinized peridotite; 8A, border zone of tremolite-serpentine rock*
- 7 — *Medium- to coarse-grained meta-gabbro, intrusive equivalent of 3A. In part, coarse-grained 3A*
- 6 — *Blotchy weathering, porphyritic meta-gabbro, intrusive equivalent of 3B. In part, coarse-grained 3B*
- 5 — DOUBLET GROUP *Thin beds of finely laminated, black slates, interbedded with 3A and 3B. Generally pyrrhotitized and pyritized*
- 3A — *3A. Mainly light green, rusty weathering meta-basalts; narrow bands of breccia and tuff. In part younger than 3B*
- 3B — *3B. Mainly light green, blotchy weathering, porphyritic meta-basalts; some dark green phases*
- 4 — *Hornblende-quartz-plagioclase schist, derived from 3A and in part, from 3B*
- 2 — *Fine-grained biotite schist; possibly equivalent to 1*
- 1 — LAPORTE GROUP *Biotite-muscovite schists*

NOTE: *Map-units 1,2,3, and 5, above, do not necessarily represent a stratigraphic sequence.*

- A — *Area of carbonatized rock*
- B — *Area of carbonate-talc rock*

- *Observed rock outcrop, area of outcrops*
- *Bedding (inclined, vertical, overturned)*
- *Bedding (direction of dip known, top of bed unknown)*
- *Schistosity (inclined, vertical, dip unknown)*
- *Fault, shear zone (direction of dip indicated, width indicated)*
- *Lineation* 10
- *Anticline (position defined, approximate, assumed)*
- *Syncline (position defined, approximate, assumed)*
- *Glacial striæ*
- *Gossan and bog iron ore* G
- *Exploration pits*

Geology by W.F. Fahrig, 1950



DESCRIPTIVE NOTES

The area straddles the eastern border of the Labrador trough, and its western border lies about 40 miles east of the Burnt Creek iron range. It is easily accessible only by aircraft from Knob Lake, as the canoe route from the iron district is long and arduous.

The area is heavily drift covered along the eastern boundary and south-central parts. Most of the glacial cover, particularly that in the east, is sorted, crossbedded outwash; the remainder is boulder till. Two directions of late-Glacial movement are indicated by rock striations; the older movement is approximately parallel with the regional structure, from northwest to southeast, whereas the later movement was towards the northeast.

The rock formations of the area mapped form two structural units. These consist of a block of sedimentary schists to the east, known as the Laporte group (1)[1], and a probably younger group of folded intrusive and extrusive rocks on the west - the Doublet group (2-5). It is possible that the Laporte group is actually lower Doublet, which, in the Willbob Lake area to the west, is composed primarily of sedimentary rocks.

The Laporte group consists mainly of biotite schists, which are composed typically of biotite, muscovite, quartz, and plagioclase. They exhibit primary bedding, and dip consistently to the northeast at a moderate angle. Near the major thrust that separates them from the Doublet group they are, in places, altered to a rock consisting of layers of quartz and carbonaceous material. The metamorphic grade of the schists increases towards the east.

The Doublet group on the west comprises three main lithologic units. These are: meta-basalt flows, with very minor tuffs, and breccias (3); meta-gabbros (6, 7), some of which may be coarser phases of lavas; and carbonaceous slates (5) and a single outcrop of normal slates (2).

Map-units 3A and 3B of the Doublet group are closely related genetically to the meta-gabbro intrusive rocks (6, 7). In the field, massive flows are distinguished from intrusive equivalents primarily on a textural basis; where the meta-gabbro forms thick homogeneous bodies, these are almost invariably of intrusive origin, although well-defined contacts are seldom observed in the field.

The lavas (3A, 3B) are buff weathering, light green flows exhibiting remarkably well-formed pillows but no amygdaloidal or spherulitic structures. Inter-pillow material consists of calcite, quartz, and black chert, the last being common among the flows around McNeill Lake.

The original mineral composition of the lavas was probably similar to that of the associated intrusive rocks, but all are now representative of the greenschist facies of metamorphism, and much of their original pyroxene and plagioclase has been replaced by actinolite and clinozoisite. The meta-gabbros in some instances contain clusters of secondary, blue-green hornblende, plagioclase, and quartz, indicating a somewhat higher grade of metamorphism, bordering the amphibolite facies. The equivalence of the gabbros and pillow lavas is further indicated by a textural variation common to both, and consisting of clusters of large plagioclase crystals set in a fine- or medium-grained matrix. These clusters are usually about the size of a walnut, and have been mostly replaced by clinozoisite and chlorite. They are characteristic of the blotchy weathering lavas (3B) and meta-gabbros (6). Three continuous bands in which the above variation dominates in the extrusive rocks have been mapped. A metamorphic variety (4) of the normal lavas and diorites is outlined in the northeast corner of the mapped area, where the rocks are completely recrystallized to a schistose mass of hornblende, quartz, muscovite, and plagioclase.

Black carbonaceous slates (5) are interbedded with the pillow lavas. They are thin bands usually intruded by meta-gabbro, and are generally pyritized.

A single large outcrop of normal slate, north of Lac Girard just above a major thrust fault, suggests that the lower part of the Doublet group may contain a significant thickness of sedimentary rocks. These beds are rarely exposed in the Griffis Lake area, probably because they have been cut off by thrust faults.

The Doublet group is intruded by extensive, sill-like bodies of peridotite (8). Originally, this rock contained 50 per cent or more olivine, but 80 per cent of it is now serpentine. Remnants of olivine and pyroxene were observed in some thin sections. The latter mineral typically encloses the olivine and is less completely serpentinized. The borders of the peridotite bodies are usually tremolitized, and tremolite crystals about 5 mm. in diameter produce a warty appearance (8A) on outcrop surfaces.

The rock structures of the area trend northwest, and in the western exposures of the Doublet group the lavas form relatively open folds, the axial planes of which dip steeply northeast. The southwest limbs of some of these structures are overturned towards the southwest. The easternmost rocks of the Doublet group have reacted to stresses from the northeast by forming thrust faults of some magnitude, and marked in part by wide shear zones. The most easterly of these separates the Doublet and Laporte groups, and others lie within the Doublet and repeat what is probably the same horizon of blotchy pillow lavas. Iron carbonate has been introduced along part of one of these shear zones. For 5 miles southwest of the east margin of the Doublet group, lava flows dip steeply and face consistently northeast, further suggesting repetition by thrust faulting. A fourth zone of fracturing, and possibly shearing, lies along the axis of the McNeill Lake anticline. This zone is carbonatized (A), and where the serpentinized peridotite is encountered on the nose of the structure a zone of steatite (B) is developed. A well-defined lineation, formed by corrugations in the planes of schistosity, occurs in the Laporte schists, and has a more easterly trend than that of the fold axes in the Doublet group.

There are no known mineral occurrences of importance in the area, but four or five base-metal sulphide prospects have had a little work done on them, the last in the summer of 1949. These showings are mineralized, finely bedded, carbonaceous slates, which form thin layers between thick basalt flows.

The slates are commonly intruded by meta-gabbro, and many mineralized fragments of them are surrounded by gabbroic material. The sulphides consist mainly of pyrite and pyrrhotite, with small amounts of chalcopyrite. Their solution and redeposition have resulted in Recent deposits of bog iron ore of considerable lateral extent, which are striking in appearance, and tend to create an erroneous impression of the size of the parent sulphide bodies.

[1]Stratigraphic nomenclature is that proposed by the geological staff of the Labrador Mining and Exploration Company.

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PRELIMINARY MAP 51-23

GRIFFIS LAKE

TERRITORY OF NEW QUEBEC

QUEBEC

Scale: 1 Inch to ½ Mile = $\frac{1}{31,680}$

Miles 1 ½ ½ ½ 0 1 2

Approximate magnetic declination, 34° 30' West