CANADA

DEPARTMENT OF MINES AND RESOURCES

MINES AND GEOLOGY BRANCH

BUREAU OF GEOLOGY AND TOPOGRAPHY

LEGEND

Uncoloured areas are drift covered areas in which the bedrock is unknown. Coloured areas are in part drift covered.

PROTEROZOIC (LATE PRECAMBRIAN)

15 — *Quartz diabase*

POST-OPÉMISCA

14 — *Hornblende granite and allied rocks*

13 — *Feldspar-rich gabbro;* **13a**, *biotite diorite and intrusive breccia*

12 — *Interlayered pyroxenite and altered peridotite*

10 — *Gabbro*

11 — *Gabbro, pyroxenite;* **11a**, *gabbro, pyroxenite, peridotite*

9 — *Banded and foliated gabbro*

8 — *Pyroxenite, feldspar-rich pegmatite*

ARCHEAN (EARLY PRECAMBRIAN)

OPÉMISCA SERIES

7 — *Feldspar and pyroxene porphyritic lavas and tuffs*

6 — *Arkose, greywacke, pebble conglomerate; conglomerate; agglomerate*

PRE-OPÉMISCA

5 — *Quartz diorite, quartz gabbro*

4 — *Altered gabbro, amphibolite;* **4a**, *gabbro, quartz diorite;* **4b**, *gabbro interlayered with lavas;* **4c**, *gabbro interlayered with rhyolitic tuff*

3 — *Feldspar-rich tuff or sediments, felsitic agglomerate or conglomerate, grit and black slate;* **3a**, *andesitic lavas present;* **3b**, *arkose, slate*

2 / 1 — **2**: *Rhyolitic lavas, agglomerate, tuff, minor andesite;* **2a**, *rhyolitic lava, agglomerate, tuff;* **2b**, *rhyolitic and andesitic lavas and tuffs; minor gabbro*

1: *Andesitic and basaltic lavas, minor rhyolitic lavas and pyroclastics, minor basic intrusives;* **1a**, *recrystallized volcanic rocks*

Sand-covered area

Drumlinoid ridge of sand, gravel and boulders

Area of rock outcrops

*Small outcrops may be indicated by a cross, ×; by a bedding symbol; or by any of the following letters – **Gr** (granite), **G** (gabbro), **Q** (quartz porphyry), **V** (volcanic rocks), **S** (tuffs or sediments), **Py** (pyroxenite)*

Fault, shear zone

Bedding (inclined, vertical, overturned)

Bedding (direction of dip known, upper side of bed unknown)

MINERAL DEPOSITS

Chalcopyrite with iron sulphides or quartz ..... **Cu**

Gold-bearing quartz ..... **Au**

Quartz with some chalcopyrite ..... **Q**

Buildings

Road not well travelled

Bush road or trail

Township boundary and mile post

Township centre line and mile post

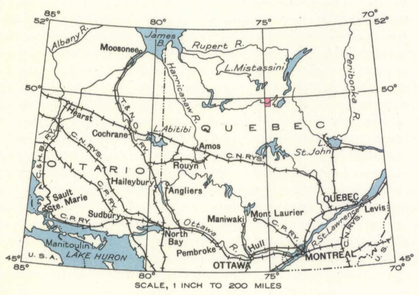
Stream (position approximate)

Muskeg

Height in feet above Mean sea-level ..... 1176'

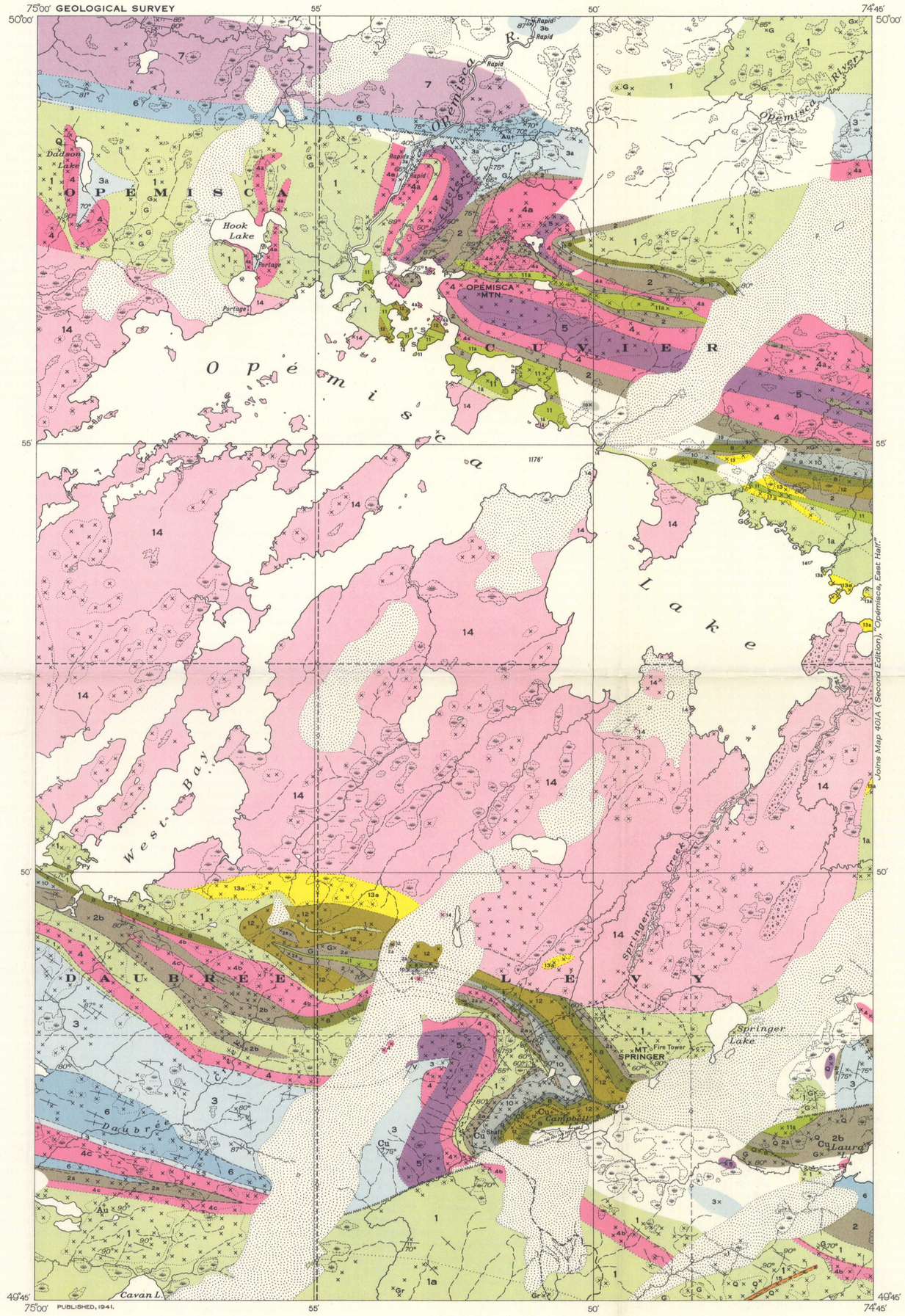
Geology by G.W.H. Norman, 1937, and 1938.

Base-map compiled by the Topographical Survey, 1938, from aerial photographs taken by the Royal Canadian Air Force, in July, August, and September, 1934; and from information supplied by the Quebec Department of Lands and Forests. Cartography by the Drafting and Reproducing Division, 1940.



SCALE, 1 INCH TO 200 MILES

75°00′ GEOLOGICAL SURVEY



75°00′ PUBLISHED, 1941. 40°45′

MAP 602A

OPÉMISCA

(WEST HALF)

ABITIBI TERRITORY

QUEBEC

Scale, 1/63,360 or 1 Inch to 1 Mile

Miles 1 0 2 3

Approximate magnetic declination, 19°30′ West.

DESCRIPTIVE NOTES

Opémisca map-area is the western part of the Opémisca-Chibougamau district where prospecting commenced in 1903, about Chibougamau lake. The district contains copper-gold and gold deposits whose development has been slow, due to the remoteness of the district. The deposits are chalcopyrite-rich replacements containing pyrite, pyrrhotite and quartz, and gold-bearing quartz veins and replacements. They occur where the rocks are much faulted and sheared. The copper-gold deposits occur in basic intrusive rocks near large faults at Doré lake 8 miles east of the map-area and at Opemiska Copper Mines claims 4 miles south of the east end of Opémisca lake. Mining operations (1934-1937) have been carried on from shafts about 500 feet deep at one of the copper-gold deposits at Doré lake and at the Opemiska copper deposits, but as yet there has been no production. Most of the gold-bearing quartz veins and shear zones in the map-area carry pyrite and they may also contain pyrrhotite, chalcopyrite, and, rarely, sphalerite. Associated non-metallic minerals include iron-rich carbonate, green mariposite (?) and tourmaline. A few veins contain arsenopyrite. Tuffaceous rocks close to basic intrusive sills are in many places heavily mineralized with pyrite or pyrrhotite accompanied by small amounts of chalcopyrite, but their copper and gold content is unpromisingly low.

The rocks of the Opémisca district are similar to those of the better known areas of Porcupine, Kirkland Lake and Rouyn-Bell river. They include, however, larger areas of granite, extensive masses of anorthosite, and a great series of folded stratiform sills ranging in composition from peridotite to quartz diorite. Thirty miles southeast of Opémisca lake is the northwestern boundary of a region of gneisses and schists. Along this boundary, which extends northeasterly, the characteristic rocks of the Opémisca district are crushed and altered.

The earlier pre-Opémisca rocks (1, 2 and 3) are like those customarily referred to as Keewatin. The oldest (1) form a thick assemblage of green andesitic lavas, in which pillow structures are common. Towards the top they include lens-like bodies of rhyolite, rhyolite agglomerate and felsitic tuffs (2) and are overlain by an upper thick group of tuffaceous sediments (3). These sediments are pale grey, green or white; are fine to coarse grained, even conglomeratic in places with felsitic pebbles; and have a high content of feldspar granules.

The pre-Opémisca intrusives (4 and 5) are cut by porphyritic dykes similar lithologically to flows and agglomerates in the Opémisca series.

The Opémisca series (6 and 7) rests unconformably on pre-Opémisca tuffaceous sediments. The lower part of the series (6) consists of arkose, with or without pebble conglomerate lenses, greywacke, and, near its base, discontinuous lenses of boulder conglomerate. The boulders are smoothly rounded and consist of granite, of underlying tuffaceous sediments (3), and of light coloured, dense to porphyritic volcanic rocks. The upper part of the Opémisca series (7) consists of volcanic rocks which occur only in the syncline north of Opémisca lake. There, a conglomerate with granitic boulders grades upward into an agglomerate composed of pale grey volcanic fragments studded with green altered pyroxene phenocrysts. The agglomerate is overlain by grey to green altered porphyritic lavas with phenocrysts of altered pyroxene or albite, the latter probably secondary after more calcic plagioclase. The porphyritic lavas are feldspar rich types. The mineralogical and textural resemblance of these lavas to fine grained phases of dykes, and of the dykes to feldspar-rich gabbro closely allied to anorthosite, suggests that these lavas and intrusive rocks have a common source. Narrow beds of agglomerate with porphyritic fragments, similar to agglomerate north of Opémisca lake, are interbedded with the conglomerate of the Opémisca series in Daubrée township in the west half of Opémisca map-area but lavas are not present there.

The pre-Opémisca intrusives (4 and 5) and the post-Opémisca intrusives (8 - 12) are, for the most part, structurally conformable with adjacent, steeply dipping to vertical volcanic and sedimentary beds. They are themselves rudely to, in places, well stratified as a result of the concentration of most of their heavy mineral constituents (olivine and pyroxene) beneath the lighter minerals (plagioclase and, if present, quartz); and they are arranged symmetrically with respect to both anticlinal and synclinal axes. These features indicate that they were injected as sills into nearly flat lying pre-Opémisca tuffs and lavas and were subsequently isoclinally folded and in places overturned. The attitude of the associated beds, as determined by grain size, crossbedding, and pillows, confirms the location of folds indicated by the arrangement of the sills.

The hornblende granite mass (14) shows an increase of microcline and quartz and a decrease of hornblende toward its centre, and has a higher potash content than the albite granite in the east half of the Opémisca map-area. Contacts with older rocks seem everywhere to dip inwards as in a funnel-shaped mass. A zone of amphibolitized volcanic rocks, widest at its northwest and southeast ends, surrounds the granite mass. Just within the borders of the mass there are, in places, irregular areas of coarse biotite diorite and other biotite-rich hybrid rocks (13a) which are altered remnants of an earlier intrusion of feldspar-rich gabbro and anorthosite. A large body of the gabbro and anorthosite outcrops immediately northwest of the hornblende granite mass and hybrid rocks (13a) have formed at the contact of the granite with the gabbro and anorthosite.

Vertical to overturned isoclinal folds trending east to east-southeast are major structural features of the map-area and are shown by the arrangement of the sills and by the synclinal belts of sedimentary rocks. The larger folds, in places, are made up of closely spaced minor folds, most of which are very incompletely exposed. The folds plunge steeply to vertically and may even be overturned. Cross folding has occurred in places close to the northeasterly faults.

The major faults in the area strike northeasterly and are part of a great system of converging faults that lies northwest of the region of gneisses 30 miles to the southeast. The fault system is not older than late Precambrian and probably developed progressively by repetition of movements at different times.

During Pleistocene time ice advanced southwestward to south-southwestward across the area, and formed drumlinoid ridges. In late Glacial time the ice receded northeastward leaving many small parallel ridges of unsorted boulders, gravel and clay, 10 to 15 feet high, at intervals of 500 to 700 feet, and also great eskers of sand and gravel 100 feet or more high. A lake hemmed in northward by ice covered the district as the ice receded. It formed conspicuous terraces at various levels along the esker ridges, left a few coarse boulder beaches in protected coves, and washed much of the drift from inundated parts of the surrounding hills.