CANADA

DEPARTMENT OF MINES AND RESOURCES

MINES AND GEOLOGY BRANCH

BUREAU OF GEOLOGY AND TOPOGRAPHY

GEOLOGICAL SURVEY

LEGEND

PROTEROZOIC (LATE PRECAMBRIAN)

- 6 — Diabase, gabbro, diorite
- 5 — Granite, granodiorite, and allied rocks; **5a**, granite, granodiorite, etc., with inclusions of quartz-biotite schist and gneiss; **5b**, amphibolite
- 4 — Quartz diorite

ARCHÆAN (EARLY PRECAMBRIAN)

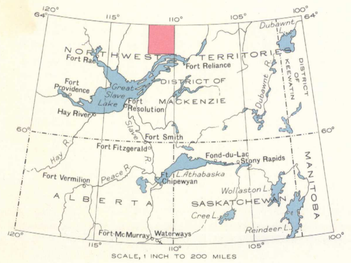
- 3 — Gabbro, anorthosite
- 2 — Greywacke and slate; **2a**, knotted quartz-mica schist derived from and grading into greywacke and slate
- 1 — Andesite, dacite, basalt, rhyolite, tuff, agglomerate; minor basic intrusive rocks

YELLOWKNIFE GROUP

- Bedding (inclined, vertical)
- Bedding (direction of dip known, upper side of bed unknown)
- Anticlinal axis
- Synclinal axis
- Fault or shear zone
- Glacial striæ
- Portage
- Cabin
- Survey monument
- Preserve boundary
- Lake and stream (position approximate)
- Fall and rapid
- Marsh
- Esker
- Height in feet above Mean sea-level (approximate) ..... 1415'

Geology by J. F. Henderson, 1940, 1941.

Base-map compiled by the Topographical Survey, 1941, from aerial photographs taken by the Royal Canadian Air Force in August 1931, July 1935, July 1936, and June 1938. Cartography by the Drafting and Reproducing Division, 1943.



PUBLISHED, 1944.

MAP 738A

MacKAY LAKE

DISTRICT OF MACKENZIE

NORTHWEST TERRITORIES

Scale, ~~253,440~~ or 1 Inch to 4 Miles

Miles 4 0 4 8 12

Approximate magnetic declination, 39° East.

DESCRIPTIVE NOTES

Most of the map-area is a rolling boulder plain with rocky ridges rising in places to 100 feet above the general level, 800 to 1,000 feet above Great Slave Lake. Towards this lake, to the south of Benjamin and MacLellan Lakes, the topography changes to include rugged rocky hills 350 to 400 feet high. Rock outcrops are plentiful throughout most of the area and are almost continuous northeast of Camsell Lake; north, west, and south of Lake of the Enemy; and in the southeastern part of the area. Around and to the south of Warburton Bay, and in the southwestern part of the area between Perlson Lake and Lac du Mort, the bedrock is heavily drift covered. Bouldery hills, 50 to 100 feet high and composed of unsorted angular granite boulders and coarse gravel, cover much of the country between Warburton Bay and Fat Lake, and to the north of Rolfe Lake. They range from irregular ridges and knobs to rounded drumlinoid hills whose long axes trend southwest, parallel to the direction of glaciation. Eskers composed of sand and coarse gravel form ridges up to 40 feet high that can be traced for miles. A line drawn from the southwest end of Warburton Bay through Fat, Wolverine, Indian Mountain, and Barnston Lakes indicates roughly the northern boundary of the wooded country. North of this line stunted spruce trees grow only in scattered groves that become more and more widely spaced to the northeast.

Volcanic rocks (1) form rather prominent ranges of hills that rise 50 to 100 feet above the general level. For the most part the flows are dark to light green, fine-grained andesites, dacites, and basalts that have been recrystallized and are now composed of fresh green hornblende, plagioclase feldspar, and quartz. Pillows and ropy flow structures are well preserved and some of the flows contain amygdules and vesicles. In places, particularly to the north and west of Rivett Lake, bodies of medium-grained dioritic rocks composed of about equal parts of hornblende and plagioclase occur within the flows. Some of these bodies cut the lavas as sills and dykes but others appear to grade into well pillowed flows. The small areas of volcanic rocks southwest of Warburton Bay, north of Athenia Lake, and at Nodinka Narrows probably represent the remnants of a once continuous belt. The rocks are dark green to black andesites and basalts now recrystallized to glistening black fine-grained amphibolite schists. The volcanic rocks in contact with overlying sedimentary schists along Beaulieu River, Old Canoe and Camsell Lakes, Nodinka Narrows, and east of Indian Mountain Lake, change from predominantly dark green andesites to light grey or white weathering rhyolites with associated tuffs and agglomerates. This assemblage of rhyolites is rarely more than 1,000 feet thick, but is a remarkably persistent feature and marks the close of the period of vulcanism. The small isolated area of volcanic rocks eight miles southeast of Indian Mountain Lake is mainly white to pink weathering rhyolite.

The sedimentary rocks of the Yellowknife Group are well bedded greywackes and slates (2) that, in most places, have been altered to quartz-mica schists (2a). The greywacke beds average from one to two feet in thickness and the slaty beds from a fraction of an inch to six inches. Many beds grade from sandy greywacke at the base to slate at the top. The greywackes are grey, sandy textured rocks with subangular grains of quartz and some feldspar, from 1/32 to 1/16 inch in diameter, in a fine-grained dark grey matrix of chlorite and mica. The slates contain more chlorite and mica. Alteration of the greywacke and slate to quartz-mica schists is marked by the development of biotite at the expense of chlorite. The mica flakes form along cleavage planes which, thereby, acquire glistening micaceous surfaces. A higher degree of metamorphism results in the development of spherical or ovoid knots or aggregates, ¼ to ½ inch in diameter, that stand out conspicuously on weathered surfaces. The knots vary from indefinite shadowy micaceous aggregates to well formed crystals of andalusite and cordierite. Despite such alteration the bedding is perfectly preserved and the metamorphosed strata are not dissimilar in appearance from the greywackes and slates from which they were derived.

Top determinations indicate that the sedimentary beds are for the most part younger than and overlie the volcanic rocks. They are interbedded to some extent along the main contacts. The structural relation of the narrow band of rhyolite eight miles southeast of Indian Mountain Lake to the surrounding sedimentary schists was not determined.

The Yellowknife Group rocks dip at steep to vertical angles. Structural determinations indicate that the sedimentary beds lie in a series of closely spaced, nearly isoclinal folds and that the volcanic rocks, though steeply inclined, are not as closely folded. The trend of the bedding varies in different parts of the map-area but in general is north-northeast. Where granitic stocks are intruded, the strata tend to conform with the borders of these intrusive bodies. A number of faults striking about north 70 degrees east were recognized and many parallel topographic features such as straight river courses and lake basins may also indicate faults. The pronounced lineament formed by the chain of lakes and rivers extending from Lac du Rocher to the south side of Munn Lake is marked, in places, by the development of fault breccia and mylonite, but there is little or no apparent displacement of the basic dykes that cross it. Numerous faults and shear zones in the granitic rocks southeast of Barnston River are probably related to the faults that occur in the basin of Great Slave Lake two miles to the south.

The gabbro and anorthosite (3) southeast of Camsell Lake is a light green to white weathering rock composed of blocky to somewhat rounded labradorite crystals up to an inch long in a dark green matrix of chlorite and hornblende. The rock ranges, in mineral composition, from gabbro composed of about 60 per cent labradorite to light grey anorthosite containing little or no chlorite or hornblende. The gabbro and anorthosite intrude the volcanic rocks, and dykes and sills of gabbro cut andesitic flows.

Two small stocks of quartz diorite (4) that intrude the sedimentary schist northeast of Lake of the Enemy are rusty, grey weathering, medium-grained rocks consisting of 50 to 60 per cent andesine, 35 to 45 per cent hornblende and biotite, and 5 to 10 per cent quartz. The feldspar occurs mainly as blocky crystals and the rock has a weathered surface that crumbles when struck with a hammer. The quartz diorite is cut by pegmatite dykes similar to those associated with the granitic rocks to the west.

The granitic intrusive rocks (5) include a wide variety of types. To the south and east of Athenia Lake the rock is a massive, pink to grey, rather coarse-grained granodiorite composed of about 50 to 60 per cent oligoclase and 10 to 20 per cent each of quartz, microcline, and hornblende-biotite. Throughout most of the area, however, potash feldspar equals or exceeds the amount of plagioclase present and the rocks may be classed as granites. Muscovite-bearing types are fairly common, particularly near and to the east of Lake of the Enemy. They grade into other types carrying biotite and, in places, hornblende. The small stock that intrudes the volcanic rocks east of the south end of Indian Mountain Lake differs in character and may be older than the granitic rocks in other parts of the area. The rock is a grey granodiorite composed of quartz, oligoclase, biotite, and some microcline. Much of it has been sheared or granulated and in even the more massive parts the quartz and feldspar grains are fractured and strained.

In places, particularly near contacts with sedimentary schist, the granitic rocks contain inclusions of partly assimilated sedimentary material (5a). The inclusions are elongated fragments of quartz-mica schist or gneiss injected by stringers of granitic material and have the same strike and dip as the bedding of nearby areas of sedimentary schist. Such zones of mixed rocks are not widely developed except in the southeast part of the map-area along and to the west of Barnston River. Here the inclusions occur as nearly flat to gently dipping layers or sheets up to 40 feet thick.

Amphibolites (5b) occur along the shores of MacKay Lake, seven miles southeast of Nodinka Narrows; at the south end of Wolverine Lake; and in other small areas. The rocks vary in texture and composition but in general are medium to coarse-grained and composed of about 50 to 60 per cent dark green hornblende and 30 to 40 per cent plagioclase, with some biotite. Contacts with the sedimentary schists are sharp and dykes of amphibolite cut the schists. The amphibolite is in turn cut by dykes of aplite and granite, but in places grades into normal granodiorite or granite suggesting that it is genetically related to the granitic intrusions.

Dykes of medium to fine-grained rusty weathering diorite and gabbro (6) are the youngest known rocks in the area. They form two well defined sets of nearly vertical dykes, one striking about north 20 degrees west and the other about north 60 degrees east. A few of the dykes are more than 200 feet wide but most of them are less than 100 feet. They are composed of about equal amounts of grey plagioclase feldspar (andesine to labradorite) and dark green pyroxene, and have sharply defined, chilled margins against the rocks that they intrude.

No mineral deposits have yet been found, but the map-area has not been thoroughly prospected. The volcanic and sedimentary rocks of the Yellowknife Group are similar to those of the neighbouring Beaulieu River and Yellowknife areas where many gold deposits and several base metal deposits have been found. The belts of volcanic and sedimentary rocks extending northeast from Rivett Lake and east of Indian Mountain Lake offer favourable prospecting ground within 40 miles of Great Slave Lake. Quartz veins are abundant in the volcanic rocks east of Indian Mountain Lake and sulphide mineralization is fairly plentiful along and near contacts of sedimentary and volcanic rocks in both belts. Areas of sedimentary rocks in the northeastern part of the area are favourable for prospecting but are less attractive because of the relative inaccessibility and lack of timber in that part of the area.

MACKAY L
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738A
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