CANADA
DEPARTMENT OF MINES AND RESOURCES
MINES, FORESTS AND SCIENTIFIC SERVICES BRANCH
GEOLOGICAL SURVEY OF CANADA

LEGEND

PROTEROZOIC

8 — *Diabase, gabbro, diorite*

7 — *Muscovite granite; pegmatitic muscovite granite*

5, 6 — 5. *Undifferentiated granitic rocks and minor gneiss;* 5a. *granite, granodiorite, and allied rocks* 6. *Orthogneiss, paragneiss, injection gneiss; granite, granodiorite, and other intrusive rocks; inclusions of quartz-mica and amphibole schists and gneisses*

4 — *Altered diabase, gabbro, and diorite; amphibolite*

ARCHÆAN

YELLOWKNIFE GROUP (1-3)

2, 3 — 2. *Greywacke, slate, argillite, impure arkose, quartzite* 3. *Knotted quartz-mica schist and hornfels derived from and grading into 2*

1 — *Basalt, andesite, dacite, rhyolite; tuff, agglomerate; altered equivalents including amphibolite*

Bedding (inclined, vertical)
Bedding (direction of dip known, upper side of bed unknown)
Bedding (upper side of bed as indicated, direction of dip unknown)
Schistosity, gneissosity (inclined, vertical, dip unknown)
Fault (assumed)
Synclinal axis (position approximate)
Glacial striæ

Building
Portage
Survey monument
Stream (position approximate)
Fall and rapid
Marsh
Sand or gravel
Esker
Approximate height in feet above mean sea-level .... 1000′

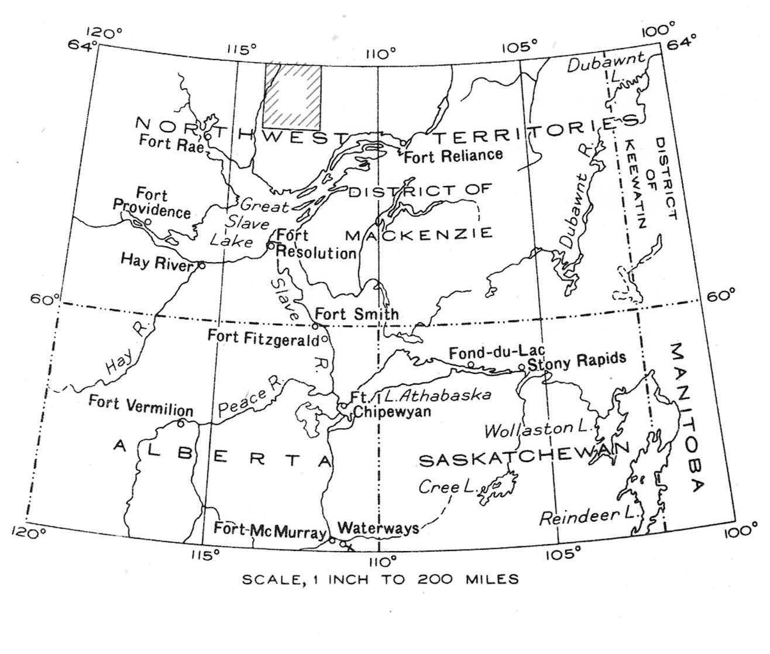
Geology by M. L. Miller, 1948, and from Map 644A, "Gordon Lake," by J. F. Henderson, 1938 and 1939. Descriptive notes by M. L. Miller.

Base-map compiled by the Topographical Survey, 1941.

Cartography by the Geological Mapping Division, 1949.

Lithographed and printed by the Army Survey Establishment, R. C. E., Department of National Defence.

Approximate magnetic declination, 37° East.



PRELIMINARY MAP 49-8

CARP LAKES

DISTRICT OF MACKENZIE

NORTHWEST TERRITORIES

Scale: 1 Inch to 4 Miles = 1: 253,440

Miles

DESCRIPTIVE NOTES

The area mapped seems relatively flat and featureless when viewed from the air or from the higher hills, but in detail is rugged, with many abrupt low hills and ridges. North and east of a line extending roughly from the point where Beaulieu River enters the area, to and beyond Garnett Lake, areas underlain by granite, particularly, and to some extent those underlain by volcanic rocks, are covered with a veneer of subangular granite boulders, gravel, and clay of glacial origin. The granite area south of Delmar Lake, in the southeastern corner of the map-area is similarly covered. Elsewhere, rock outcrops are numerous, broken only by drift-filled depressions, lakes, and streams or by local deposits of glacial drift. Areas in the vicinity of Beniah, Drybones, and McCrea Lakes are sparsely wooded, with only scattered stands of stunted spruce; the remainder of the area mapped is well wooded.

Areas underlain by granite and volcanic rocks stand at higher average elevations than those underlain by sedimentary strata, and areas of volcanic rocks are commonly slightly higher than adjoining granite areas. Areas of volcanic rocks also show greatest local relief; granite areas the least.

The volcanic and sedimentary rocks of the area have been mapped with the Yellowknife group, as represented in adjoining map-areas, and are the oldest rocks known in this region.

Volcanic rocks (1) are dark green to black, occasionally light green to grey, generally fine-grained, altered dacites, andesites, and basalts. More acidic phases are intercalated in places, but are not mappable. These volcanic flows have been recrystallized to a fresh-looking aggregate of green hornblende, sodic plagioclase, and commonly some quartz - the familiar 'greenstone'. Pillows exist in many places, but most of them are highly distorted; such pillowed lavas are well displayed in the band of volcanic rocks to the east and north of the north end of Gordon Lake. Coarse-grained basic rocks on the east side of the area of volcanic rocks east of the north end of Spencer Lake may be intrusive, but they have been mapped with the volcanic rocks; locally, these rocks contain disseminated pyrrhotite. Some sedimentary material, apparently of small but unknown extent, is interbedded with basic volcanic rocks just north of the point where Beaulieu River flows out of Beniah Lake. In many places the volcanic rocks show alternate dark green and greenish grey bands, not more than 2 or 3 inches wide, which may be the result of combined shearing and recrystallization of pillow lavas. Alteration of basic volcanic rocks near borders of granite masses results here and there in the formation of a garnet-amphibole rock.

Sedimentary rocks of the Yellowknife group are divided into relatively unaltered greywackes and associated rocks (2) and their more altered equivalents, knotted quartz-mica schists and hornfels (3), into which they grade. Commonly a less altered bed will show a gradation upward from a massive, quartzose base into an argillitic or slaty top comprising only a small fraction of the total thickness of the bed. Widths of beds vary from an inch or two up to several feet, and include minor, arkosic and quartzitic sequences. As the relatively unaltered sediments grade into the more altered phases, glistening flakes of black mica are developed in the argillitic tops of beds, and, eventually, nodular, fine-grained aggregates of quartz and mica appear. It is at this point that the boundary between unaltered and altered sediments has been drawn arbitrarily. With increasing metamorphism, the more argillitic beds become markedly schistose, but bedding is preserved except in the highly altered areas adjacent to granite masses. Coarser and more siliceous beds are commonly metamorphosed to sugary-textured hornfels. Metacrysts of garnet and andalusite are common, and staurolite is rare. Chiastolite is exceptionally abundant in the schists about a mile south of Thistlethwaite Lake. Bands of altered sedimentary rock are interposed invariably between less altered beds and contacts with granitic masses, indicating that the alteration is the result of the intrusion of the granite.

Contacts of sedimentary with volcanic rocks are commonly sharp, and many are marked by abrupt slopes, with the sedimentary material at the lower elevations. Top determinations indicate that the sedimentary strata overlie the volcanic rocks, apparently conformably. Steep dips are everywhere characteristic of the sedimentary strata, and the band extending north from the Gordon Lake area and east of Nicholson River has been folded almost isoclinally into a series of closely spaced synclines and anticlines. Elsewhere such tight folding was not well demonstrated. Evidence of the nature of the deformation of the volcanic rocks was not as readily obtainable, but it appears that they are not as closely folded as the sedimentary beds.

In the southwest corner of the map-area, to the west of McCrea River, several narrow, elongate bodies of altered diorite and gabbro (4) appear in the sedimentary rocks of the Yellowknife group. Most of them appear to be conformable intrusions. They weather dark green to brown to rusty reddish brown, and commonly exhibit a diabasic texture. They are cut by numerous quartz and feldspar veinlets and stringers of quartz and feldspar, and some of them carry considerable sulphide minerals. They probably represent basic intrusions preceding those of the main granite bodies.

The granitic bodies (5, 5a, 6) comprise a large variety of acidic rocks of variable composition and texture. Those mapped as granite, granodiorite, etc. (5a) include minor syenite, quartz diorite, and diorite. Biotite and hornblende are the most common varietal minerals. These rocks generally weather light grey to pink, but some border phases of dioritic composition weather greenish grey. They intrude all rocks of the Yellowknife group. Commonly, granitic bodies grade into areas of gneissic rocks (6) which in most places separate granite areas from areas underlain by rocks of the Yellowknife group. These gneissic bands may be several miles wide. Foliation of the gneisses closely parallels the bedding in rocks of the Yellowknife group, and contacts, such as they are, are conformable. Gneissic rocks elsewhere within the granitic masses generally occupy elongate areas parallel with nearby bands of the Yellowknife group. It would seem, consequently, that many of these areas of gneissic rocks represent granitized Yellowknife formations. Granite, rich in inclusions of amphibole schists and gneisses and quartz-mica schists and paragneiss, is mapped with the gneisses.

Near Hart and Muir Lakes, the quartz-mica schists and related paragneisses are cut by muscovite granite, locally pegmatitic (7). This appears to be a single body, possibly a sill, intruded near the contact of altered sedimentary beds with granitic rocks. Pegmatite dykes containing quartz, feldspar, muscovite, and occasionally andalusite and garnet are numerous in places.

The youngest rocks of the map-area are fresh-looking basic dykes (8) of dioritic to gabbroic composition. They weather greenish grey to reddish brown, and commonly exhibit an ophitic texture. There appears to be three main sets of these dykes, trending respectively north-northeast, north-northwest, and east-northeast, but their age relations are not known.

Faults and shear zones in the area commonly occupy linear, drift-filled depressions. Other prominent lineaments visible on the topographic map and especially on aerial photographs of the area may represent loci of fault lines. Fault or shear zones are common in the granite, and are characterized by a reddish alteration of the granite extending, in some instances, for several hundred feet on either side. Rocks within the zones are much sheared and carry abundant specular hematite.

Mineralization is in evidence throughout the area, both in quartz veins and in shear zones in rocks of the Yellowknife group. Rusty weathering shear zones are particularly prominent in the volcanic rocks, and are mineralized with pyrite, pyrrhotite, chalcopyrite, and arsenopyrite. In the sedimentary rocks, mineralization appears to be confined largely to grey and bluish grey quartz veins, which, in places, contain scattered pyrite and arsenopyrite. Such quartz veins are common in sedimentary rocks north of Gordon Lake and east of Nicholson River, and in those south of Thistlethwaite Lake. In general, the volcanic rocks are more commonly mineralized than sedimentary rocks; sulphide minerals are also common in some of the altered diorite and gabbro bodies in the southwest corner of the map-area. Cordierite (var. dichroite) was found in gneisses east of Nardin Lake and west of the bend of McCrea River northwest of Ames Lake.

Past prospecting activity is evident everywhere, except in the granite areas, but has been mainly of a cursory nature. One ore deposit, that of Discovery Yellowknife Mines, Limited, just west of Thistlethwaite Lake, has been explored by a shaft and underground workings on two levels. Much of the ground in the vicinity of Thistlethwaite Lake, and north of Gordon Lake to Van Lake, has been staked, but in most instances little or no evidence of assessment work was seen. Some trenching and diamond drilling has been done on properties just east of Nicholson River near Red Lake, and in an area just west of Mac Lake, as well as southwest of the Discovery Yellowknife property.

Within the Gordon Lake area (latitude 63° to 63°15'; longitude 113° to 113°30') "many quartz veins occur in the sedimentary and volcanic rocks. In the sedimentary rocks they have been observed along the axial parts of isoclinal folds; along dragfolded and contorted slate beds between more massive strata; and following bedding planes. Several of the veins have been found to contain gold but as yet none of commercial size and grade has been developed. The gold-bearing veins are sparsely mineralized with one or more of several sulphides including pyrite, pyrrhotite, arsenopyrite, chalcopyrite, sphalerite and galena".[1]

[1] From descriptive notes, G. S. C. Map 644 A, Gordon Lake, N. W. T., by J.F. Henderson, 1941.