CANADA
DEPARTMENT OF MINES AND RESOURCES
MINES AND GEOLOGY BRANCH
BUREAU OF GEOLOGY AND TOPOGRAPHY

GEOLOGICAL SURVEY

SNARE RIVER
DISTRICT OF MACKENZIE
NORTHWEST TERRITORIES

MAP 690A

Scale, 1/253440 or 1 Inch to 4 Miles

Approximate magnetic declination, 39° East.

Joins Map 697A, "Ingray Lake."

LEGEND

PALAEOZOIC

ORDOVICIAN

8 — Dolomite, sandstone, conglomerate, arkose

PROTEROZOIC (LATE PRECAMBRIAN)

6 7 — **6**, granite, granodiorite, and allied rocks; **7**, feldspar porphyry; feldspar-quartz porphyry

4 5 — **4**, slate, shale, argillite, phyllite, cherty argillite, chert, tuff, agglomerate, greywacke, quartzite, arkose, conglomerate, andesite, dacite; knotted quartz-mica schist, sedimentary gneiss; **5**, dolomite, limestone — SNARE GROUP

ARCHEAN (EARLY PRECAMBRIAN)

3 — Granite, granodiorite, and allied rocks

2 — Greywacke, slate, arkose, quartzite, phyllite; knotted quartz-mica schist, sedimentary gneiss

1 — Andesite, dacite, basalt, rhyolite, tuff, agglomerate, breccia, amphibole and chlorite schist — YELLOWKNIFE GROUP

PRECAMBRIAN

A — Syenite, nepheline syenite, nepheline-sodalite syenite, and related rocks

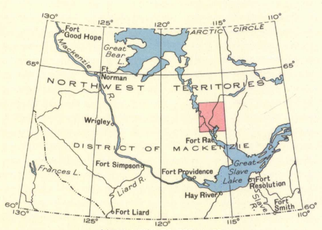
B — Granite, granodiorite, and allied rocks of undifferentiated Archean and Proterozoic ages

Quartz stockwork ("giant quartz vein")
Fault
Gold prospect and area of post-Snare (Proterozoic) age — Au
Fossil locality — F

Portage
Building
Boundary of Yellowknife Preserve
Survey monument
Lake and stream (position approximate)
Fall and rapid
Marsh
Height in feet above Mean sea-level — 495'

Geology by C.S. Lord, 1938, and 1939.

Base-map compiled by the Topographical Survey, 1941, from aerial photographs taken by the Royal Canadian Air Force, during the summer months of 1930, 1931, 1933, 1934, 1937, and 1938. Cartography by the Drafting and Reproducing Division, 1942.



PUBLISHED, 1942.

DESCRIPTIVE NOTES

The surface of the map-area ranges from 495 feet to about 1,350 feet above sea-level. Hills commonly rise abruptly to 150 feet, and less commonly to over 400 feet, above adjacent lakes and muskegs. Prominent ranges of hills occur in the extreme northwest corner of the area; southeast of Mazenod Lake for 20 miles; 8 miles south of Tumi Lake; around the shores and for 10 miles southwest of Basler Lake; near Kwejinne Lake; and for 10 miles north of Siemon Lake. Bedrock is well exposed except in and near areas underlain by Palaeozoic rocks and along lower Marian River. The area is well wooded but the trees are generally small.

The volcanic rocks (1) of the Yellowknife Group are mainly light to dark greenish, andesite, dacite, and basalt flows. In places they are massive or contain pillows, but elsewhere are schistose. They are interlayered, especially near their contacts with sedimentary rocks, with a little white-weathering porphyritic rhyolite and schistose tuff, agglomerate, and breccia. In places the volcanic rocks pass into sedimentary rocks (2) through a little interbedded lava, tuff, and sedimentary material.

The Yellowknife sedimentary rocks (2) are metamorphosed to a varying degree. The least altered strata are mostly greywackes, with some interbedded slates, impure arkoses and quartzites, and phyllites. They are most common near Mosher, Russell, and Siemon Lakes, and near Émile River east of Mazenod Lake. The greywackes are well-bedded dark grey sandy-textured rocks that weather dark grey, greenish grey, or buff. They consist mainly of quartz and biotite and contain a little plagioclase feldspar, white mica, and chlorite. Many beds grade from coarse greywacke at the bottom to slate at the top. The impure arkoses contain more feldspar and less quartz than the greywackes whereas the impure quartzites consist of quartz and a little biotite. The greywacke, quartzite, and arkose beds range in thickness from 6 inches to 12 feet or more and in many places have been traced for several hundred feet; no single bed has been observed to come to an end. Crossbedding is rare. The slate beds are black and up to a few inches thick.

The less altered sedimentary rocks grade into more metamorphosed types consisting of buff or rusty-weathering knotted quartz-mica schist and sedimentary gneiss. The schists are well-bedded rocks consisting, mainly, of quartz, biotite, white mica, and feldspar and contain knots, nodules, or crystals that commonly project above the weathered surface and range from small rounded forms to rectangular crystals several inches long. Some of the knots are aggregates of quartz, mica, and other minerals; others are mainly andalusite, staurolite, or cordierite. Many beds grade from coarse at the bottom to fine at the top and knots are most common near the tops. The gneisses are more highly altered, more coarsely granular, and less well bedded rocks than the schists and grade into them. They rarely contain knots and commonly lie between the schists and the granitic rocks.

The sedimentary rocks of the Yellowknife Group lie in a series of closely spaced isoclinal folds. Commonly they dip between 65 degrees and vertical and in places are overturned as much as 25 degrees. The volcanic rocks of the group dip at similar high angles but individual folds appear to be broader. In many places the Yellowknife beds strike about parallel to the border of enclosing bodies of granitic rocks.

The rocks of the Snare Group (4,5) were laid down on a weathered surface of folded Yellowknife rocks and Archean intrusions (3). Near Basler and Kwejinne Lakes and north of Siemon Lake they are but slightly metamorphosed as they are in contact in only a few places with younger granitic rocks. The basal strata are chiefly white to pink quartzites and arkoses. The beds range in thickness from a few inches to 10 feet and are commonly ripple-marked and crossbedded. They vary from fine-grained quartzites and arkoses to conglomerates made up of rounded quartz pebbles about two inches in diameter. Arkose is most common where the beds rest on granitic rocks. Conglomerate forms bands that are commonly from six inches to two feet thick and are probably lenticular. In places about 30 feet of light to dark green massive andesite and dacite, with pillows or amygdules or both, lies near the base of the Snare Group. The basal rocks also contain some shaly beds and grade upward into interbedded slate, shale, argillite, phyllite, greywacke, crossbedded and ripple-marked white quartzite, and dolomite and limestone. Slaty beds are commonly less than one-half inch thick whereas the greywacke beds are from one to six inches thick. The dolomite and limestone members (5) weather grey to buff and are dense to finely crystalline. In places they overlie and grade into basal quartzites. Elsewhere they are interbedded with quartzite, slaty beds, or greywacke, and many of these bands are only a few feet thick. In many places the dolomite and limestone contains numerous veinlets of quartz and carbonate that project above the weathered surface. Algal structures were observed at a few horizons. Where the Snare strata are in contact with Proterozoic granitic rocks they have been altered to thin-bedded grey, green, and pink cherty argillite; thin-bedded, light grey, quartz-mica schist and knotted quartz-mica schist, and gneiss, and contain a few beds of dolomite, limestone, or white quartzite.

Rocks of the Snare Group commonly strike about parallel to their contacts with Yellowknife rocks or with Archean or Proterozoic granitic intrusions. The dips range from vertical to nearly horizontal but are commonly less than 45 degrees.

The granitic intrusions include a wide variety of massive and gneissic rocks and in most places their age is uncertain (B). They can be differentiated only where their contact relations to the Snare Group have been determined.

The pre-Snare (Archean) intrusive rocks (3) are pink to grey, medium-grained, equigranular to porphyritic and contain a little muscovite and biotite.

As far as known all granitic intrusions west of a line from the head of Marian Lake to the south end of Saddle Lake are of post-Snare (Proterozoic) age. Those that were observed to cut Snare rocks (6) range from very coarse-grained pink porphyritic quartz monzonite or granite to medium-grained equigranular dark grey to red quartz diorite or granodiorite.

In places the granitic intrusions are in fairly sharp contact with Yellowknife or Snare rocks. Elsewhere, especially along and between Bousso and Wecho Rivers, they are separated by a mile or more of intimately mixed granitic material, schist, and gneiss. Where this mixed assemblage contains more than half granitic material it is mapped as granitic rock; elsewhere it is mapped as sedimentary or as volcanic rock. In general the character of the contacts between Archean intrusions and Yellowknife rocks appears to be similar to that of contacts between Proterozoic intrusions and Yellowknife or Snare rocks.

Bodies of grey to reddish brown feldspar porphyry and feldspar-quartz porphyry (7) intrude Snare rocks and commonly occur near the contact of this group with Proterozoic granitic rocks. They contain phenocrysts of altered feldspar, and, less commonly, of clear quartz, in a very fine-grained to flinty groundmass. In places they grade into Proterozoic granitic rocks and in other places are cut by them. In a few instances lithologically similar porphyries were observed to cut granitic rocks that lithologically resemble Proterozoic granitic intrusions.

A complex body of syenite, nepheline syenite, nepheline-sodalite syenite and related rocks (A) near Bigspruce Lake may be of post-Snare age as it is intrusive into a small body of white, banded, crystalline limestone that is probably a member of the Snare Group.

Beds of nearly flat-lying dolomite, sandstone, conglomerate and arkose (8) rest on a hilly erosion surface of unweathered Precambrian rocks. Ripple marks, crossbedding, and salt casts are common, and beds are from a few inches to several feet thick. Medium-grained grey and buff crumbly sandstone and a little arkose lie in the hollows of the old surface. Buff-weathering sandy dolomite and dolomite probably overlie the sandstone where it is present, but sandstone was not seen on the higher parts of the erosion surface, and in such places sandy dolomite or nearly pure dolomite rests directly on Precambrian rocks or is separated from them, locally, by thin conglomerate. In places the dolomite contains abundant Upper Ordovician (Richmond) fossils. The contact between the sandstone and dolomite was not seen, and the sandstone may be of earlier Palaeozoic, or, possibly, even late Precambrian age.

Many faults have been recognized and probably all of them are nearly vertical. They commonly follow nearly straight topographic features such as rivers, lakes, valleys, or scarps and in most places are covered by drift or water. Straight topographic features elsewhere in the map-area may mark the positions of other faults. The Ordovician rocks are not known to be faulted and, in one place, rest undisturbed on a quartz stockwork that probably follows a strong northeast fault.

Gold-bearing quartz veins are the only known mineral deposits of possible commercial value. Three veins were examined. They are in Yellowknife greywackes, slates, and schists and contain small amounts of the following minerals: pyrite, arsenopyrite, pyrrhotite, chalcopyrite, sphalerite, gold, carbonate, and feldspar. Abundant visible gold occurs in parts of a quartz vein two miles north of Siemon Lake. The vein is two feet wide, contains no wall rock, and is (1939) exposed for 240 feet. A gold-bearing quartz stockwork on an island in Mosher Lake probably lies close to a northwest fault that crosses the lake. The stockwork lies in drag-folded and crumpled slate and greywacke and a stripped area 120 feet long with a maximum width of 90 feet contains about 10 per cent quartz. A few other occurrences of gold-bearing quartz are reported to be in Yellowknife rocks near Russell and Siemon Lakes and some of these lie in or close to faults. The quartz stockworks ("giant quartz veins") shown on the map are not known to contain gold; some of them contain a little specular hematite and elsewhere, beyond the map-area, similar stockworks contain a little chalcopyrite and pitchblende. They are commonly 100 feet or more wide and range up to a mile or more in length. They contain many veinlets of rhythmically banded comb quartz in reddened and silicified rock and form ridges. No gold deposits are known within granitic rocks or rocks of the Snare Group, but the latter contain quartz veins, seams of pyrite, and a few small occurrences of galena, sphalerite, pyrite, and chalcopyrite. Blue, translucent to transparent cordierite, some of which may be of gem quality, occurs with graphite in garnetiferous gneiss and pegmatitic lenses on the east boundary of the area seven miles south of Ghost Lake, and elsewhere in that vicinity. The cordierite crystals are fractured and the largest noted are four inches long and two inches in diameter.