CANADA

DEPARTMENT OF MINES AND RESOURCES

MINES AND GEOLOGY BRANCH

BUREAU OF GEOLOGY AND TOPOGRAPHY

GEOLOGICAL SURVEY

LEGEND

PROTEROZOIC (LATE PRECAMBRIAN)

- 11 — *Diabase and gabbro*
- 9 10 — **9**, *granite, granodiorite, and allied rocks;* **10**, *feldspar porphyry, feldspar-quartz porphyry*
- 7 8 — **7**, *andesite, dacite, tuff, breccia;* **8**, *meta-diabase, meta-gabbro, meta-diorite*
- 5 6 — **5**, *slate, shale, argillite, phyllite, cherty argillite, chert, tuff, greywacke, quartzite, arkose, conglomerate; knotted quartz-mica schist, sedimentary gneiss;* **6**, *dolomite, limestone*

SNARE GROUP

ARCHEAN (EARLY PRECAMBRIAN)

- 4 — *Granite, granodiorite, and allied rocks*
- 3a 3b — **3a**, *greywacke, slate, arkose, quartzite, phyllite;* **3b**, *knotted quartz-mica schist and sedimentary gneiss derived from, and grading into* (**3a**)
- 2 — *Rhyolite, tuff, agglomerate, breccia*
- 1 — *Andesite, dacite, basalt, rhyolite, tuff, agglomerate, breccia, amphibole and chlorite schist*

YELLOWKNIFE GROUP

PRECAMBRIAN

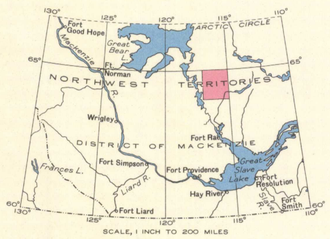
- A — *Granite, granodiorite, and allied rocks of undifferentiated Archean and Proterozoic ages*
- B — *Mixed assemblage of Proterozoic granitic rocks and of metamorphic rocks, including much gneiss and schist*
- C — *Mixed assemblage of Archean and Proterozoic granitic rocks and metamorphic rocks, including much gneiss and schist*

Quartz stockwork ("giant quartz vein") ——— — —
Fault ~~~~~
Gold prospect Aux
Glacial striæ

Portage P
Survey monument
Lake and stream (position approximate)
Fall and rapid F. R.
Marsh
Sand or gravel
Esker
Height in feet above Mean sea-level (approximate) 1050′

Geology by J.T.Wilson, 1939; C.S.Lord, 1940.

Base-map compiled by the Topographical Survey, 1941, from aerial photographs taken by the Royal Canadian Air Force, July 1934, July 1938, and July 1939. Cartography by the Drafting and Reproducing Division, 1942.



PUBLISHED, 1942.

MAP 697A

INGRAY LAKE

DISTRICT OF MACKENZIE

NORTHWEST TERRITORIES

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

Miles 4 0 4 8 12

Approximate magnetic declination, 40° East.

DESCRIPTIVE NOTES

The surface of the map-area ranges from about 700 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. Particularly prominent ranges of hills occur near Indin Lake; between Mattberry Lake and the west end of Mesa Lake; and near Rebesca Lake, Wopmay River, Little Crapeau, and Grant Lakes. Granitic rocks are well exposed but much of the sedimentary and volcanic formations are covered by drift and muskeg. Most of the area is well wooded but the trees are generally small. Barren grounds lie north of latitude 64°30′ and east of longitude 115°30′.

The oldest volcanic rocks (1) of the Yellowknife Group are mainly greenish andesite, dacite, and basalt flows. In places they are massive or contain pillows, but elsewhere they are schistose. They are commonly overlain by sedimentary rocks (3a, 3b) and are interlayered with them near their contacts. Elsewhere they pass upward into acid lavas and fragmental volcanic rocks (2) that include pink to white streaked and fragmental porphyritic rhyolite flows and schistose, rusty tuff and agglomerate. These rocks are overlain by sedimentary rocks (3a, 3b) and are interlayered with them near their contacts.

The Yellowknife sedimentary rocks are metamorphosed to a varying degree. The least altered strata (3a) are mostly greywackes, with some interbedded slates, impure arkoses and quartzites, and phyllites. 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 have been traced for several hundred feet in many places; no single bed has been observed to come to an end. Crossbedding is rare. The slate beds are black and range in thickness up to a few inches.

The less altered sedimentary rocks grade into more metamorphosed types (3b) 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.

Rocks of the Yellowknife Group commonly strike between north and northeast and dip between 65 degrees and vertical; in places they are overturned as much as 25 degrees. The sedimentary rocks lie in a series of closely spaced isoclinal folds and the volcanic rocks outcrop as bands, some of which may be the central parts of complex anticlines. In places the folds within the volcanic rocks are not as closely spaced as those within nearby sedimentary rocks.

Rocks of the Snare Group were laid down on a weathered surface of folded Yellowknife rocks and Archean intrusions (4). Sedimentary strata (5,6) are most widespread. The basal rocks near Basler and Mattberry Lakes are mainly coarse-grained, white, crossbedded quartzite and arkose with a few thin lenticular beds that contain abundant rounded pebbles of vein quartz up to two inches in diameter. Near Arseno Lake, and north-northeast of this lake, the Snare rocks rest on andesitic flows of the Yellowknife Group and the basal strata are greywacke, garnetiferous quartz-biotite schist derived from greywacke, and conglomerate. The conglomerate contains abundant rounded pebbles that range from one-half to two inches in diameter and are mainly quartz and medium-grained, equigranular, grey to pink granitic rock. Black slate, shale, argillite, and greywacke, or their altered equivalents, are the most common sedimentary strata. Most of the slate, shale, and argillite beds are less than one-half inch thick, whereas the greywacke beds are commonly one to six inches thick and are in part crossbedded. A little, white, crossbedded and ripple-marked quartzite, with a few conglomerate beds, occurs throughout these rocks but most of it outcrops near Basler, Mattberry, Norris, and Arseno Lakes. The dolomite and limestone members (6) weather grey to buff and are dense to coarsely crystalline. In places they overlie and grade into basal quartzites. Elsewhere they are interbedded with quartzite, slaty beds, greywackes, or altered equivalents of these rocks, and are commonly 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 Snare beds 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. The schists and gneisses are very much like those of the Yellowknife Group but have more gentle dips, are more thinly bedded, and in places are associated with bands of dolomite, limestone, or white quartzite.

Dykes and sills of massive coarse-grained meta-diabase, meta-gabbro, and meta-diorite (8) cut Snare sedimentary rocks and were probably in part feeders for greenish lavas (7) that overlie the sedimentary rocks. They were not observed to cut the lavas but in places appear to grade into them. The lavas are commonly massive but in places contain pillows or amygdules, or both. They are in places fresher than those of the Yellowknife Group but elsewhere lavas of the two groups are lithologically similar.

Rocks of the Snare Group commonly strike about parallel to their contacts with Yellowknife rocks or Archean or Proterozoic granitic intrusions. Their 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 it is not known whether they are of Archean or Proterozoic age (A). They can be differentiated only where their contact relations to the Snare Group have been determined.

The pre-Snare (Archean) intrusive rocks (4) 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 through Mattberry, Norris, and Arseno Lakes, and a point seven miles west of the northeast corner of the map-area are of post-Snare (Proterozoic) age. Those that were observed to cut Snare rocks (9) 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 and the Yellowknife or Snare rocks are in fairly sharp contact. Elsewhere they are separated by intimately mixed granitic material, schist, and gneiss. Where this mixed assemblage contains from 25 to 75 per cent granitic material it has been differentiated from adjacent granitic intrusions and Yellowknife or Snare rocks. In most places (C) the age of the granitic material within the assemblage is not known. In a few places (B) the granitic material in the assemblage is of Proterozoic age as it cuts Snare rocks. 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 (10) intrude Snare rocks and commonly occur near the contacts of this group with Proterozoic granitic intrusions. 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.

Many of the brown-weathering fresh black diabase and gabbro dykes (11) are vertical or nearly so and range in thickness from less than 1 foot to more than 200 feet. Others near Rebesca and Castor Lakes dip at low angles and are nearly horizontal in places; their maximum thickness is not known because in most places their dip is not known. The diabase and gabbro is fresher and more uniform in texture than the meta-diabase, etc., of the Snare Group.

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. Diabase dykes commonly follow faults near Indin Lake so some faulting is older than the diabase. A fault probably offsets a diabase dyke west of Rebesca Lake and if so some faulting is younger than the diabase.

Gold-bearing quartz veins are the only known mineral deposits of possible commercial value. Seven veins were examined and most of them are in shear zones in schistose or massive andesitic rocks of the Yellowknife Group. A few other occurrences are reported in Yellowknife rocks near Indin Lake and east of Arseno Lake. The quartz is white to grey and contains small amounts of the following minerals: pyrite, galena, sphalerite, chalcopyrite, arsenopyrite, pyrrhotite, gold, calcite, and iron-bearing carbonate. About 83 fine ounces of gold was recovered from 1,600 pounds of ore from a vein on the Ann Group on the south shore of Indin Lake. The largest known vein (1940) is on the Dingo Group east of Arseno Lake. It averages 2½ feet wide for an exposed length of 850 feet. Known and reported gold occurrences are most widespread in the strongly faulted area near Indin Lake. Some veins here are near faults but none is known to occur within a fault. Gold occurs with arsenopyrite, galena, sphalerite, pyrite, and chalcopyrite in quartz in sheared slates of the Snare Group on Norris Lake. Snare rocks are not known to contain gold elsewhere but do contain quartz veins, seams of pyrite, and small occurrences of galena, sphalerite, pyrite, and chalcopyrite, and weather rusty over wide areas. Gold deposits are not known to occur within granitic rocks. The quartz stockworks ("giant quartz veins") within the map-area are not known to contain gold; elsewhere similar stockworks contain a little specular hematite, chalcopyrite, and pitchblende.