CANADA

DEPARTMENT OF MINES AND RESOURCES

MINES AND GEOLOGY BRANCH

BUREAU OF GEOLOGY AND TOPOGRAPHY

GEOLOGICAL SURVEY

MORTON LAKE MANITOBA

PRELIMINARY MAP 46-26

Scale: 2 inches to 1 mile

1 ½ 0 1 2

Surveyed and compiled by the Topographical Survey. Issued 1946

LEGEND

ARCHAEAN OR PROTEROZOIC

- 12 — Medium- to coarse-grained granite, with varying amounts of included sediment (3, 4, 5, 7), greenstone (1, 2, 6), and diorite (11); 12a, pegmatite; 12b, coarse quartz-feldspar porphyry; 12c, biotite-hornblende quartz diorite; 12d, pink to red gneissic granite
- 11 — Basic intrusive complex varying irregularly from gabbro to quartz diorite; 11a, fine- to medium-grained serpentine rock; 11b, coarse anorthositic gabbro, some dark gabbro; 11c, fine- to medium-grained dark gabbro and diorite, minor quartz-bearing phases; 11d, dark biotite diorite, in part at least an alteration product of 11c
- 10 — Fine-grained, cherty quartz porphyry, in part chloritized; may be partly sedimentary
- 9 — Fine- to medium-grained biotite granitoid gneiss derived mainly from sedimentary gneisses (4, 5, 7) by action of gneissic granite (12d)
- 8 — Highly granitized sedimentary gneisses (4, 5, 6, 7) containing large amounts of granite (12, 12d)
- 7 — Sparsely garnetiferous gneisses derived from arkose
- 6 — Hornblende gneiss and schist derived from greenstone and diorite; minor greenstone
- 5 — Sillimanite and staurolite schists derived from argillaceous beds; interbeds of garnet gneiss and schist (4); minor argillite; 5a, coarse garnet schist with local staurolite and sillimanite
- 4 — Brownish grey garnet gneisses with sparse sillimanite and staurolite, derived from arenaceous beds; minor greywacke
- 3 — Interbedded argillite and greywacke, sparse quartzite; locally garnetiferous

ARCHAEAN

- 2 — Basic pyroclastic rocks, predominantly breccia
- 1 — Predominantly massive and pillowed basic flows, with some flow breccia (greenstones); minor tuff beds; minor argillite; undifferentiated related diorite; 1a, basic flows with abundant interbeds of tuff and argillite, minor greywacke

A B — A, granitized greenstones (1, 2) and sedimentary rocks (3) altered by granitic intrusions (12); B, ash grey weathering, gneissic, quartz-feldspar rock derived mainly from greenstones (1, 2) by intrusions of quartz-eye granite (not exposed in this area)

Bedding (inclined, vertical, overturned)

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

Bedding (upper side of bed faces as indicated, direction of dip unknown)

Foliation (inclined, vertical, dip unknown)

Gneissosity, schistosity (inclined, vertical, dip unknown)

Direction and amount of plunge, determined from linear elements and drag-folds — 40

Anticlinal axis

Synclinal axis

Shear zone, fault (inclined, dip unknown)

Prospect (Au - Gold, Cu - chalcopyrite Pr - pyrrhotite, S - Sulphide

Geology by J. M. Harrison, 1946

Trail

Marsh

Township boundary, surveyed, unsurveyed

DESCRIPTIVE NOTES

Map-units in the Morton Lake area are generally similar to those of the adjoining Snow Lake map-area [1], to the east. However, units 6 and 7 of the latter, comprising acid and basic wall-rocks of the Nor-Acme mine area, do not appear in the Morton Lake area, and units 8, 9, 10 of Morton Lake do not appear in the Snow Lake Area, or are present only in minor amounts. Also, rocks in the Morton Lake area are generally more highly metamorphosed than those to the east. The most remarkable unit is sillimanite-staurolite schist (5) and coarse garnet schist (5a), which has been traced along strike more than 45 miles across the two map-areas.

The group of rocks comprised essentially of greenstones (1, 2) is similar to the Amisk types occurring throughout the general region. Map-units 4, 5, 6, 7, 8, and 9 are typical Kisseynew gneisses, similar to those mapped in the Sheridon area [2]. Of these rocks, those of units 4 and 7 are very similar to certain members of the Missi series near Flin Flon. Due to faulting, age relations of volcanic and sedimentary rocks are obscure, though it appears that the predominantly sedimentary group (3 to 7) is younger than Amisk-type greenstones (1, 2).

Granitoid gneiss (9) differs from granitized sedimentary gneiss (8) in that it lacks bedding, and from gneissic granite (12d) in having a distinct compositional layering (foliation). However, boundaries between these types are gradational.

The rocks generally have been intricately folded. Sedimentary gneisses between File and Corley Lakes are folded into small isoclinal anticlines and synclines; these in turn appear to be cross-folded into another series of small anticlines and synclines just northeast of Corley Lake. The axis of an anticline trends northeastwards from File Lake in gneissic granite (12d). Between this granite body and File River, sillimanite schist (5) and hornblende gneiss (6) take the form of a large drag-fold that plunges nearly vertically. The axis of an elongated dome with gently dipping flanks runs east-west through Loonhead Lake. Other smaller folds can be distinguished throughout the area where the rocks are reasonably well exposed.

Numerous faults and shear zones are known. One of the most prominent fault zones passes through Dummy Bay of File Lake and separates sillimanite-staurolite schist (5) from greenstones (1). It extends in irregular fashion along and near the south shore of File Lake. Another large fault follows the east shore of Morton Lake north through Dummy Bay towards Corley Lake and thence westerly to Loonhead Lake. A strongly marked fault zone extends south from File Lake through the long, curving arm of Woosey Lake. Another fault, north from File Lake, separates gneissic granite (12d) from sillimanite schist (5) and hornblende gneiss (6), and File River probably follows a fault where it leaves File Lake. Other, smaller, shear zones are widespread.

Mineral deposits are known chiefly in the western third of the map-area. Many have been described by Stockwell [3], and by Wright [4]. Little work has been done on any of these properties in the last 10 or 15 years, and trenches are now caved, overgrown with shrubbery, and heavily rusted. In June 1946, three holes were drilled on a showing about three-quarters mile north of Morton Lake, but values obtained were said to be low. In 1937 Sherritt Gordon Mines, Limited, undertook a thorough exploration campaign along a shear zone just north of a small lake at the west edge of the map-area, and about 1.25 miles south of Norris Lakes. A copper deposit of good grade was outlined, but is too small to mine profitably in this locality. A small quartz vein carrying visible gold was discovered west of Corley Lake in 1946. It angles away from a shear zone mineralized with arsenopyrite, pyrrhotite, and pyrite

All mineral deposits known in the map-area occur in, or near, shear zones, except some near Loonhead Lake that show no obvious relation either to folding or faulting. Pyrrhotite is the most abundant and widespread mineral, and is said to be nickeliferous in places. A few occurrences of arsenopyrite were observed west of Morton Lake and south of Loonhead Lake. Chalcopyrite is locally conspicuous.

Prospecting is best in greenstones (1, 1a), diorite (11), and some sedimentary rocks (3), especially in the vicinity of faults that separate sedimentary from basic intrusive rocks and greenstones. However, this does not apply to the large area of greenstone between Morton and Woosey Lakes, for though it is well sheared and fractured sulphides are virtually absent.

[1] Geol. Surv., Canada, Paper 46-9, 1946.

[2] Geol. Surv., Canada, Paper 45-15, 1945.

[3] Stockwell, C. H.: Gold deposits of the Elbow-Morton Area, Geol. Surv., Canada, mem. 186, pp. 60, 61, 71 (1935).

[4] Wright, J. F.: Geology and Mineral deposits of a part of Northeast Manitoba; Geol. Surv., Canada, Sum. Rept. 1930, pt. C, pp. 66-69 (1931).