



GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 64 N

DESCRIPTIVE NOTES

Much of the topography is characterized by broad, drift-covered ridges and by shallow, muskeg-filled valleys. Bedrock in the southeastern quarter of the map-area is well exposed but outcrops elsewhere are, in general, small and few; shoreline exposures are rare. Movement of glacial ice in a southwesterly direction is inferred from striae, roches moutonnées, boulder distribution, and drift ridges. Eskers, as much as 60 feet high, are similarly aligned. The drift also comprises numerous fields and extensive outwash deposits of coarse sand. Abandoned beaches occur west of Egenolf Lake at a maximum elevation above sea-level of 1,300 feet. The area supports an open growth of spruce; jack pine, white birch, and tamarack are locally abundant.

Sediments (1-3) in the Hasbala Lake region have many features in common with presumably Proterozoic strata in the southern District of Keewatin described by Lord¹, and subsequently termed "Hurwitz" by Wright². Rocks of unit 4 have probably been derived from similar sediments, which in many places have been further transformed, by the addition of granitic material, into foliated granite (6) and granite-gneiss (5). The potassium-argon age of biotite from intrusive fluorite-bearing granite (7b) south of Hasbala Lake is Proterozoic³ (1,735 m.y.) and represents a minimum for the sediments (1-3) in this area⁴. The arkose (1a) is fine grained and light grey or brownish red. Interlocking grains of partly sericitized microcline and plagioclase constitute one-third or more of the rock and are complemented by quartz, with minor chlorite, carbonate, and actinolite. The arkose is indistinctly but regularly bedded or massive.

The finely foliated augen-gneiss (1b) is composed of variable proportions of very fine-grained, crushed quartz and felspar, separated by regular laminae of chlorite or biotite, and commonly carries 1/4-inch augen of potassic feldspar. Associated with the augen-gneiss are augen-free, banded, grey and pink feldspathic quartzites. The gneiss grades into grey, layered gneiss (5) containing biotite and hornblende.

Dark grey or black argillite (2a) grades downward into siltstone and argillaceous quartzite. With the development of feldspar augen and feldspathic layers, these rocks pass into augen-gneiss (1b). The argillite breaks readily along bedding-plane foliation into thin slabs and is nearly everywhere deformed into small folds a few inches in amplitude. In these, laminae of grey or pink feldspathic material alternate with dark grey laminae. In much of the argillite, lenses of clear quartz up to several inches long follow the foliation planes. The siltstone generally lacks minor folds. It consists mainly of quartz, with up to 30% biotite and some alkali feldspar; near granite (7b) it may contain hypersthene and plagioclase. The upper part of the argillite (2a) contains layers and lenses of carbonate and calc-silicate (skarn) rock which increase in abundance towards the overlying dolomite (3). The distribution of biotite quartzite (2b) has been inferred from a few widely separated outcrops. The quartzite is dark grey, fine grained, massive to poorly bedded, and similar to the quartzite phase of unit 2a.

The dolomite (3) is white, grey, or buff, rarely reddish, and weathers dull brown or grey. It is fine to medium grained and massive or poorly bedded; the bedding planes are commonly marked by white to pale green layers or lenses of tremolite, feldspar, oligoclase, and quartz. Layers of massive, dense, actinolite skarn a few feet thick and fine-grained, white, crystalline limestone are found locally.

Biotite-rich metasediments (4) include dark grey, fine- to medium-grained, metamorphosed greywacke which is gradational into biotite schist. These rocks typically contain about 50% quartz, 30% andesine, 15% biotite, minor hornblende and potassic feldspar. Schist low in potassic feldspar (4b) is a variety more characteristic of the metasediments in the vicinity of Nahili and Nueltin Lakes—may carry small red garnets and pale blue, glassy grains of cordierite up to 1/4-inch in diameter. This schist is commonly coarser grained and more strongly foliated than unit 4a. Potassic feldspar in these rocks may, in part, replace plagioclase or cordierite. Schist (4) may contain layers and lenses of dense, fine-grained, greenish skarn material, gradational into the schist. This consists chiefly of diopside and plagioclase, and includes, in some cases, hornblende and phlogopite. Locally, schist or greywacke (4) grades into arkosic quartzite like that of unit 1a.

Skarn rocks (4c) are massive to foliated, fine to medium grained, buff, white, or greenish, and weather buff to brown or grey. They comprise albite, diopside, and sphene, and, less commonly, actinolite, calcite, and apatite. White to pale green, fine-grained, crystalline limestone containing minor diopside and phlogopite is associated with the skarn rocks in some places.

The transition from schist to gneiss (5) is marked by an increase in potassic feldspar and a decrease in biotite. The mica is arranged in regular laminae or in discontinuous, tabular segregations. Strongly banded rocks may grade into gneissic or massive varieties and the colour may change from grey to pink over a short distance. The gneisses are typically medium to coarse grained, but may be fine grained. Hornblende is a common mafic constituent west of Kasmere Lake where biotite schist and amphibolite have been cut by masses of coarse-grained to very coarse-grained, massive, white, perthitic pegmatite and pegmatitic granite, and altered to migmatite (5a) and biotite-hornblende gneiss. Similar white pegmatite is widely exposed across the map-area intruding metasediments (2a,4) and migmatite (5a). The pegmatite may contain large grains of biotite, garnet, cordierite, or black tourmaline. These same minerals may be found in the intruded rock. Rusty graphitic schist associated with the pegmatite in several places. Black, medium-grained amphibolite (5b) occurs sparsely in the migmatite (5a) as tabular bodies a few tens of feet wide, and also in granite-gneiss (5a) and foliated brown granite (6a) in layers a few inches thick. The amphibolite is possibly of intrusive origin.

Foliated or massive granite (6) may include granites ranging widely in composition and appearance. In general, however, two types predominate; both contain scattered remnants similar to unit 4a. One is a brownish, medium-grained granite (6a) that weathers dull grey or white and contains small grains of dark grey, opaque quartz, found to be full of microscopic inclusions. The grains are distributed in planar aggregates that impart to the granite an indistinct but regular foliation. Other constituents include microperthite, and minor biotite, or more rarely, hornblende, with accessory magnetite. Brownish granite northwest of Erickson Lake has more biotite and carries translucent quartz. The second type of granite (6b) is fine grained, light pink, massive to faintly foliated, and contains a few per cent biotite in fine, evenly distributed flakes.

Both the porphyritic granite (7a) and the fluorite-bearing granite (7b) appear to be intrusive and are possibly of comparable age. In the pink porphyritic granite are microperthite phenocrysts, rectangular in outline and composed of Carlsbad twins an inch or so in length. These comprise about two-thirds of the rock and are set in a matrix of coarse-grained, dark grey, opaque quartz, and minor oligoclase, biotite, and magnetite. In several exposures the long axes of the phenocrysts lie in a horizontal plane and are oriented northeasterly. Marginal parts of the granite body may be light grey and contain inclusions of biotite schist or gneiss and impure quartzite. Around these the granite is commonly slightly foliated. Small, regular felsic dykes, and rarely, irregular dykes of pink quartz-feldspar pegmatite, cut the porphyritic granite. Dykes of pink pegmatite also cut the older metasediments (1a,4) and granitic rocks (5,6a).

The outer parts of the massive granite (7b) south of Hasbala Lake, are light grey and consist mainly of quartz, microcline microperthite in 1/2-inch Carlsbad twins, lesser amounts of oligoclase, biotite, and hornblende, and minor sphene, apatite, zircon, and magnetite; purple grains of fluorite up to 1/4-inch across are sparsely distributed throughout. Central parts of the granite body are largely drift-covered but boulders found in this area are mostly pink and pegmatitic. The granite contains a few small rounded inclusions of fine-grained biotitic rock and is cut locally by narrow red felsic dykes.

Sediments and metasediments (1-4) lie in apparently synclinal fold-belts that trend northeasterly and plunge at low angles to the northeast and southwest. Fold structures in granite-gneiss (5) and foliated granite (6a) are similarly oriented; southwest of Whitmore Lake the plunge in foliated granite (6a) is N30° E at 20°. Structural trends in the vicinity of massive granite bodies, however, are more closely aligned with the general outline of the bodies.

West of Kasmere Lake a gossan carrying pyrrhotite follows an easterly trending ridge of amphibolite for 600 feet and is cut by numerous pegmatite stringers. Elsewhere, except for a few small rust zones in graphitic schist, there is little direct evidence of mineralization.

¹Lord, C. S.: Geological Notes on Southern District of Keewatin; Geol. Surv., Canada, Paper 53-22 (1953).

²Wright, G. M.: Geological Notes on Central District of Keewatin; Geol. Surv., Canada, Paper 55-17 (1955).

³Stoekwell, C. H.: Structural Provinces, Orogenies, and Time Classification of Rocks of the Canadian Precambrian Shield; in Age Determinations by the Geological Survey of Canada, Report 3-Isotopic Ages (Paper 62-17, in preparation).

⁴Lowdon, J. A., compiler: Age Determinations by the Geological Survey of Canada, Report 3-Isotopic Ages (Paper 62-17, in preparation).

MAP 31-1962
KASMERE LAKE
MANITOBA
64 N

MAP 31-1962
GEOLOGY
KASMERE LAKE
MANITOBA

Scale: One Inch to Four Miles = $\frac{1}{253,440}$

4 2 0 4 8 12

- LEGEND
- 7a, porphyritic granite; 7b, fluorite-bearing granite
 - Foliated to massive granite; 6a, brownish, medium-grained, foliated granite; 6b, fine- to medium-grained pink granite
 - Granite-gneiss, migmatite; minor amphibolite; may include some foliated or massive granite; 5a, migmatite; 5b, amphibolite
 - Biotite-quartz-feldspar schist, metamorphosed greywacke, impure quartzite, skarn rocks; all probably derived from rocks similar to units 1-3; 4a, mainly biotite-feldspar-quartz schist and metamorphosed greywacke; 4b, biotite-quartz-plagioclase schist containing garnet and/or cordierite; 4c, skarn rocks
 - Dolomite; minor crystalline limestone and skarn rocks
 - 2a, metamorphosed argillite and siltstone; 2b, biotite quartzite, metamorphosed greywacke
 - 1a, grey to reddish, metamorphosed arkose; 1b, fine-grained, pink, augen-gneiss and feldspathic quartzite

Drift boundary

Geological boundary (approximate or assumed)

Limit of geological mapping

Bedding, tops unknown (inclined, vertical, dip unknown)

Foliation, gneissosity, schistosity (inclined, vertical, dip unknown)

Lineation (horizontal, inclined)

Structural trend (from air photographs)

Lineament (from air photographs)

Glacial striae

Drumlins, drift ridges (from air photographs)

Esker

Occurrence of white pegmatite

Gossan

Specimen taken for K-A age determination

Geology by J. A. Fraser, 1961

Intermittent stream

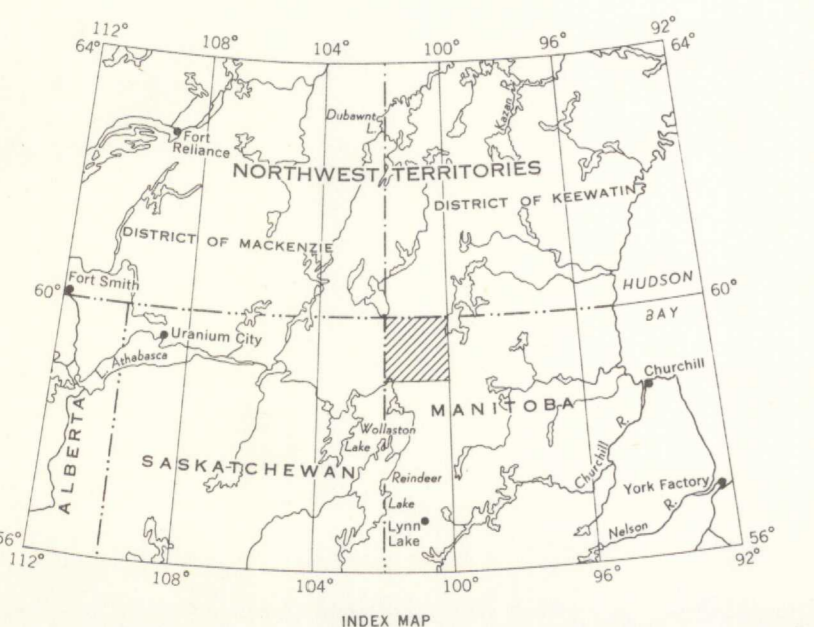
Rapid

Marsh

Height in feet above mean sea-level

Cartography by the Geological Survey of Canada, 1962

Mean magnetic declination, 16°26' East, decreasing 1.1' annually. Readings vary from 14°37' E in the NE corner to 18°23' E in the SW corner of the map area.



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5.1.3 Man. Kasmere Lake Map 31-1962
A, Geol. Scale - 4 mi. to 1"