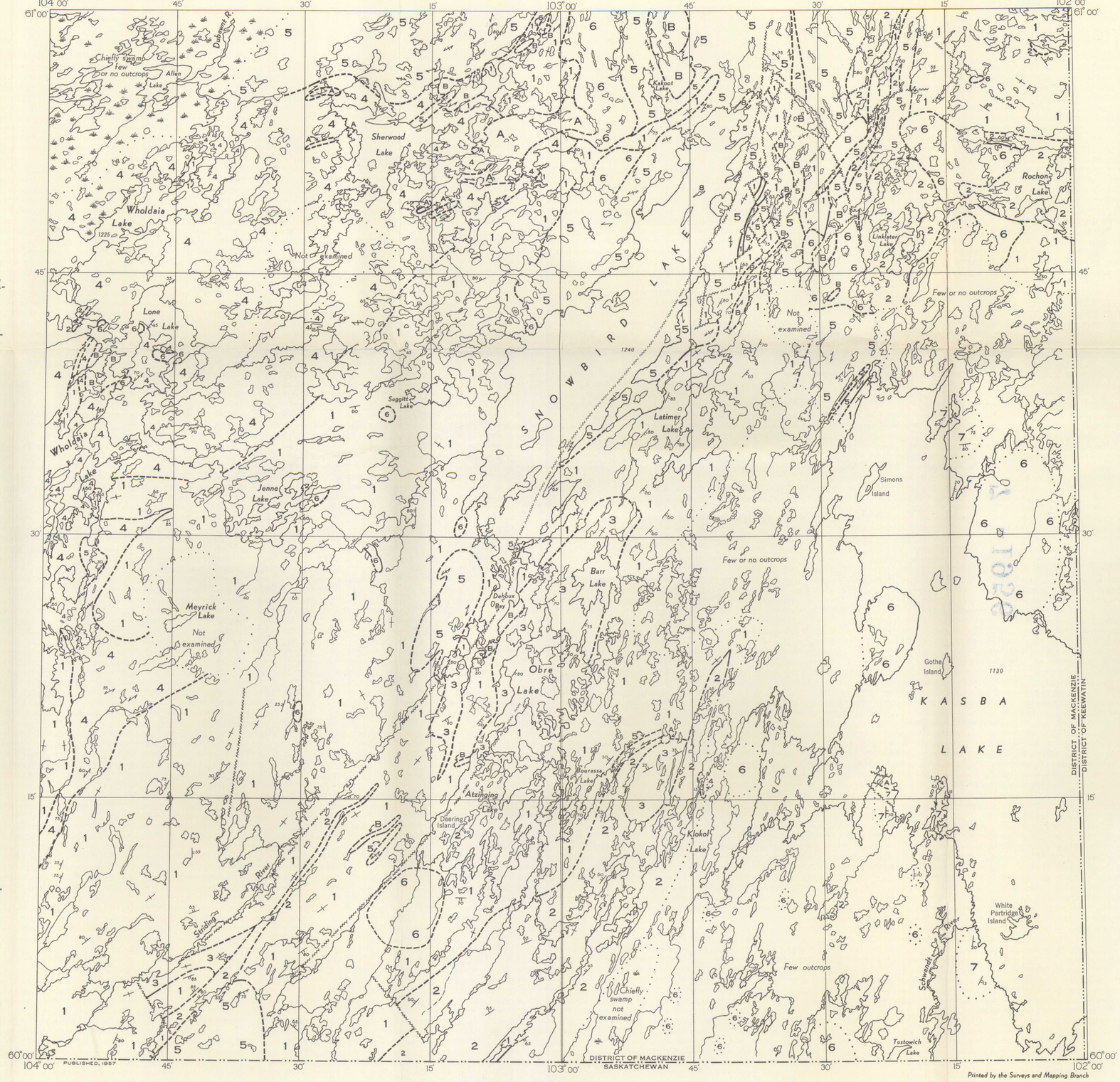
CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

PRELIMINARY SERIES

SHEET 65D



LEGEND

PRECAMBRIAN

8 Arkosic conglomerate, arkose

7 Sandstone, quartzite, argillite, calcareous argillite; L, limestone; D, dolomite; minor andesite and tuff; age relative to other units unknown

6 Granite, granodiorite, and allied rocks; probably of more than one age

5 Granite-gneiss and allied rocks; includes minor amounts of 1, 2, 3, and 4 and partly granitized sedimentary rocks

3 Intercalated volcanic and sedimentary rocks 1 and 2

2 Volcanic rocks: chiefly basalt; some andesite and tuff; basalt in part intrusive

1 Sedimentary rocks: chiefly quartzite; some greywacke; minor iron-formation

4 Paragneiss; garnet-mica-quartz gneiss and allied rocks; derived from 1

PRECAMBRIAN

A Amphibolite

B Gabbro, gabbro-diabase

Geological boundary (defined, approximate)

Bedding (inclined, vertical, overturned)

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

Schistosity, gneissosity (inclined, vertical, dip unknown)

Fault

Glacial striæ (showing direction of ice movement)

Geology by F. C. Taylor, 1954

Provincial boundary

District boundary

Marsh

Height in feet above mean sea-level 1225

Cartography by the Geological Cartography Unit, 1957

Approximate magnetic declination, 20°43' East

Air photographs covering this map-area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario

INDEX MAP

PUBLISHED, 1957

Printed by the Surveys and Mapping Branch

MAP 7-1956

SNOWBIRD LAKE

DISTRICT OF MACKENZIE

NORTHWEST TERRITORIES

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

Miles

4 2 0 4 8 12

DESCRIPTIVE NOTES

The map-area is 200 miles east-northeast of Uranium City, Saskatchewan, and 300 miles northwest of Churchill, Manitoba. Aircraft are available at both centres. A canoe route from Stony Rapids, Saskatchewan, 60 miles to the southwest, passes through the northwest part of the area. Numerous closely spaced small lakes and a few streams provide water routes inland from Kasba, Snowbird, and Wholdaia Lakes.

Outcrop is common in only three areas: 12 miles west of Atzinging Lake and along the north and east sides of Snowbird Lake. Approximately 40 per cent of the area supports only a stunted vegetation, the remainder is forested with black spruce, jack pine, tamarack and scattered white birch.

The area is featureless with only a few hill tops over 200 feet above the valley floors. Hills are few in the west part of the area and there large tracts are covered by swamp and peat. Polygonal patterns, up to 150 feet in diameter, are common in the swamps. In the area bordering Kasba Lake, the hillsides are characterized by remnants of several narrow abandoned lake beaches. The highest of these is approximately 160 feet above the present level of Kasba Lake.

The entire area has been glaciated by a southwest flowing ice-sheet. Glacial striæ, ice polish, friction cracks, eskers, and drumlin-like boulder ridges are common.

The oldest rocks are a group of sedimentary and volcanic rocks (1 and 2) which underlie most of the southwest quarter of the map-area and smaller areas elsewhere. The quartzites are massive to poorly bedded, light to dark grey, fine- to medium-grained rocks, locally crossbedded. The greywackes are grey to dark grey, medium-grained rocks in which graded bedding is rare. A few thin bands of magnetite iron-formation, rarely more than 10 feet thick, are interbedded with the quartzites. Locally these rocks are gneissic and grade into paragneisses (4) and granite gneisses (5). Many of the quartzites are feldspathized particularly in those areas close to granite masses and along the east side of Snowbird Lake.

Basalt and andesite are green to dark green and commonly massive. Primary structures, which are rare, include vesicules and flow top breccias. Some of the basalts are intrusive into the sedimentary rocks (1) as sills and slightly discordant dykes and locally these intrusive rocks form the largest part of individual outcrops. Indeed much of the rock mapped as basalt may be intrusive.

Tuffs are well-bedded rocks with distinct but discontinuous bands of pale green feldspar, quartz, and dark green hornblende. Locally, they contain volcanic bombs and have graded bedding. Some tuffs that outcrop northeast of Bourassa Lake may be younger than 2. Where volcanic and sedimentary rocks are intercalated they have been grouped together (3).

Most of the sedimentary rocks in the northwest part of the map-area have been so metamorphosed that few or no sedimentary characteristics remain. These are mapped as paragneiss (4). This paragneiss is chiefly medium to coarse grained, medium grey to dark grey and, commonly, highly contorted. Porphyroblasts and streaks of introduced pink potash feldspar are common.

The granite gneiss (5) is a pink to grey, fine- to medium-grained, well-foliated rock, locally of the "augen" type. It consists chiefly of quartz, pink potash feldspar, and accessory biotite or hornblende. Most of the granite gneiss has formed by granitization of the sedimentary rocks (1). Contact relationships between the two are commonly gradational, although locally contacts are well defined. Most of the boundaries of the granite gneiss are arbitrarily drawn.

Several stocks and one batholith of granite and granodiorite (6) are present in the east part of the area. Small, widely spaced stocks are present in the west part. The granite is chiefly pink to red, rarely grey, medium to coarse grained, commonly equigranular but locally porphyritic. It either intrudes the sedimentary and volcanic rocks (1 and 2) or is derived from them by granitization. Dykes and sills of granite that cut the granite gneiss are probably late phases of the granitization. The granite commonly grades into the granite gneiss (5).

The granitic rocks may be of more than one age.[1] The porphyritic granite for instance, may be younger than the equigranular rock. The stock north of Snowbird Lake is a poorly zoned body with a porphyritic centre and a medium-grained equigranular margin suggesting that the entire mass is the same age but that the centre cooled more slowly than the margin.

A group of sedimentary rocks (7), occurs near Kasba Lake whose relationship to the other lithological units of the area is not known. The sandstone and quartzite are fine- to medium-grained, grey to pale red, rocks, commonly well bedded. The limestone and dolomite occur as lens-shaped bodies and irregular masses within the quartzite. The limestone is light to dark grey, fine to medium grained and poorly bedded to massive. The dolomite is a fine-grained, grey to white massive rock characterized by reddish brown weathered surfaces. Both the limestone and dolomite are cut by irregular quartz veins which commonly project above weathered surfaces. The argillite is a light to dark grey, thin-bedded rock which is locally intercalated with small amounts of limestone. Hematite is locally present in the argillite. On the northeast side of Kasba Lake these sedimentary rocks conformably overlie andesite and tuff. The volcanic rocks are light green, and show flow breccias and amygdules. The tuffs are commonly magnetic.

Arkosic conglomerate (8) outcrops on an island in Snowbird Lake and in a single exposure north of the lake. The conglomerate consists of well-rounded pebbles and cobbles of granite gneiss, granite, quartzite, and quartz set in a matrix of arkosic sandstone. The clastic fragments average 1 inch in diameter but range up to 6 inches. The islands in the north half of Snowbird Lake are commonly covered with boulders of pale brown to red arkose which probably belongs to the same group as the conglomerate. The arkose is medium grained, crossbedded and characterized by ripple marks and mud cracks.

Amphibolites (A) are dark green to black, medium-grained, massive to gneissic rocks composed chiefly of hornblende and calcic feldspar. They commonly contain garnet grains up to 1/4 inch in diameter. These rocks are derived from volcanic rocks (2) and from dykes and sills of gabbro and gabbro-diabase (B). The larger masses occur mainly within the areas of gneissic rocks but smaller masses are present within all but the youngest rock groups (7 and 8).

Dykes, sills, and small stocks of gabbro and gabbro-diabase (B) are common in the west part of the area, but only the larger plutons are shown. There are at least two ages of these rocks, one older than the granitic rocks (5 and 6) the other younger, although none is known to cut rocks of unit 7 or 8. The older of the two is commonly altered to garnetiferous gabbro-diabase and occurs as lenticular masses within the sedimentary rocks (1) and the gneisses (4 and 5). Most of the younger dykes trend southeast.

The most prominent structural feature in the Snowbird Lake area is a longitudinal fault zone that cuts diagonally across the map-area. A mylonitized zone, ranging in width from a few tens of feet to 1 mile, extends from the southern border of the area northward to Snowbird Lake. The preservation of the conglomerate and arkose (8) in and near Snowbird Lake suggests that the west side of the fault moved downward relative to the east side. The main fault zone probably lies off-shore in Snowbird Lake and faults to the east of the lake are subsidiary fractures.

A second longitudinal fault, parallel to the first and 4 to 6 miles to the southeast, is suggested by aeromagnetic data. Outcrops are however too scarce for its presence to be confirmed.

In the area north and east of Snowbird Lake numerous longitudinal and cross faults have preserved small areas of sedimentary and volcanic rocks within the granitic gneisses and gabbroic rocks. There are probably many more faults than shown but the scarcity of outcrop prevents their delineation.

Folding is probably complex but the dearth of primary structures in the bedded rocks and the scarcity of outcrop prevent the recognition of more than the general structural trends. The large area of sedimentary rocks (1) in the southwest part of the area probably includes many folds not recognized by reconnaissance mapping. In several places where tops were determined beds are overturned. The sedimentary rocks (7) surrounding Kasba Lake are complexly folded but no continuity was established.

The area has not been prospected thoroughly. A few claims have been staked in the area near Bourassa Lake where an airborne magnetometer survey disclosed a magnetic high.[2] This area is largely covered by drift but few boulders of magnetite iron-formation in it suggests that the high may be due to a band of those rocks. Several narrow bands of iron-formation occur elsewhere within the sedimentary rocks (1) but none is considered to have any economic importance.

Several rust zones are present, particularly in the west half of the area, in the sedimentary rocks (1), paragneiss (4), and amphibolites (A). Those examined contained disseminated pyrite and, rarely, arsenopyrite. Numerous faults and small folds in the sedimentary and volcanic rocks (1 and 2) may have provided channelways for ore-bearing solutions and are worthy of examination.

[1] Lord, C. S.: Geological Notes on Southern District of Keewatin, Geol. Sur., Can., Paper 53-22, pp. 6-7.

[2] Geological Survey of Canada, Aeromagnetic Map, Magnetic Anomaly East of Atzinging Lake, District of Mackenzie, N.W.T., Geophysics Paper 218.

MAP 7-1956
SNOWBIRD LAKE
NORTHWEST TERRITORIES
SHEET 65 D