CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

PRELIMINARY SERIES

SHEET 64 L

LEGEND

PROTEROZOIC

ATHABASCA SERIES

6 — Varicoloured quartzite and grit

ARCHAEAN

PRE-ATHABASCA SERIES

5 — Foliated biotite-granite with inclusions of 1 to 4; locally porphyritic and/or hornblendic

4 — Potash-feldspar rich biotite-granitoid gneiss derived from 1 and 3 with inclusions of 2; 4a, strongly banded pink and grey, slightly to moderately granitoid meta-sedimentary rocks; locally garnetiferous; 4b, pink, buff and light grey, moderately to highly granitoid meta-sedimentary rocks

3 — Dark grey to white plagioclase-quartz-biotite gneiss derived from 1. Includes considerable amount of white granodiorite and granodioritic pegmatite

1 | 2 — 1. Metamorphosed greywacke, argillite, quartzite, conglomerate, arkose
2. Hornblendic gneisses and schists

Heavily drift-covered area

Rock outcrop

Geological boundary (approximate)

Limit of geological mapping

Bedding, top of bed unknown (inclined, vertical, dip unknown)

Gneissosity, schistosity, foliation (inclined, vertical, dip unknown)

Fault (assumed)

Glacial striae (direction of movement known)

Esker

Geology by W. F. Fahrig, 1956

Portage

Building

Interprovincial boundary

Lake and stream (approximate)

Falls and rapids

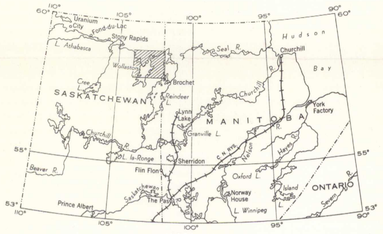
Marsh

Approximate magnetic declination, 19°46' East

Cartography by the Geological Cartography Unit, 1958

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

In response to public demand for earlier publication, Preliminary Series maps are now being issued in this simplified form, thereby effecting a substantial saving in time. There is no loss of information, but the maps will be clearer to read if all or some of the map-units are hand-coloured.



INDEX MAP

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27-1957

MAP 27-1957

WOLLASTON LAKE

SASKATCHEWAN

Scale: One Inch to Four Miles = 1/253,440

Miles

4 2 0 4 8 12

Geographical names subject to revision

DESCRIPTIVE NOTES

The least altered Archaean sedimentary rocks consist of metamorphosed greywacke, argillite, quartzite, arkose, conglomerate and calcareous strata (1). The sedimentary constituents of these rocks have been recrystallized but their primary sedimentary features, particularly their bedding, still dominate the appearance of the rocks. The originally fine- and medium-grained members now vary from dark grey biotite and garnet-rich phases to light grey or white rusty weathering quartz-rich phases. Intensely deformed conglomerate, consisting of thin lensoid granitic and darker boulders in a medium-grained pink or grey schistose matrix makes up the south side of the entrance to Hidden Bay. Thin pebbly conglomerate layers consisting of white quartzite pebbles in a biotitic matrix occur on several islands in Wollaston Lake. This conglomerate generally is interbedded with rusty weathering meta-quartzite. Light to dark green lime-silicate and carbonate-lime-silicate layers are common and typically associated with quartzite. Thin meta-calcareous sedimentary layers also are interbedded with meta-greywackes and in such cases the lime-silicate beds typically exhibit boudinage structure. The meta-sedimentary rocks of 1 are cut by numerous white biotite granodiorite pegmatites and a few pink granitic pegmatites.

Hornblendic gneisses and schists (2) are derived from basic and possibly intermediate igneous rocks, and from calcareous sedimentary strata. The bands west of Zangeza Bay (Reindeer Lake) consist of medium- to fine-grained, massive to finely laminated amphibolite and were probably derived in part from basic volcanic rock. The two belts of hornblendic gneiss along the northeast corner of Wollaston Lake consist in part of light pinkish grey and green weathering banded rocks containing layers and clots of coarse-grained epidote and hornblende. The origin of this rock is not known. The belt of hornblendic rock in the northwest part of Wollaston Lake consists in part of nodular coarse-grained garnetiferous amphibolite and in part of banded lime silicates and biotite-schist. In addition to the above, and the lime-silicate sedimentary layers included with 1, small amphibolite bodies probably derived from the metamorphism of basic dykes were observed at a few points. It is noteworthy that no post-metamorphic basic dykes were observed.

The strata of unit 1 grade by increased metamorphism into plagioclase-rich gneiss and granodiorite (3). This unit varies from dark grey plagioclase-quartz-biotite gneiss, locally containing white plagioclase porphyroblasts, through gneisses rich in white quartzo-feldspathic layers and veins, to rather massive dyke and sill-like granodioritic masses. With the above rock types are associated white weathering, tourmaline-bearing, biotite-granodioritic pegmatite which is present in much greater amounts than is the finer grained granodiorite equivalent and forms the major part of many islands in Wollaston Lake. The central zones of some of these pegmatite bodies are composed of rose quartz and in some localities rose quartz transects the pegmatite and the enclosing gneiss.

The rocks of unit 3, in particular on the border zones of the granodiorite and granodiorite pegmatite, are rich in cordierite. Fractured pale violet crystals of this mineral up to one inch in their longest dimension were observed at many points. The ubiquitous nature of cordierite in the gneisses and the grey to white colour of the gneiss indicate that the rocks of unit 3 generally are low in free potash feldspar. Flecks of graphite are common in the granodioritic gneisses and pegmatites.

Potash-feldspar-rich gneisses (4a, 4b) with associated pink pegmatite underlie about one-half the area. These gneisses have been grouped into two units, those gneisses (4a) which have a slightly to moderately granitoid appearance and those (4b) which have a moderately to highly granitoid appearance. The former are usually strongly banded, grey and pink on the weathered surface, due to alternation of biotitic and quartzo-feldspathic layers, and are characteristically garnetiferous. The latter (4b) show a less pronounced more irregular banding, typically have pink, buff or light grey weathered surfaces and consist to a considerable extent of pink pegmatite. The potash-feldspar-rich gneisses (4a, 4b) therefore grade, as do the rock types of unit 3, from clearly meta-sedimentary gneisses to more massive igneous-looking end members. All of the rock types of units 1 and 2 seem to be present as inclusions or partly digested remnants in the granitoid gneisses of 4a and 4b.

At many points the rocks of 3 grade by an increase of potash feldspar into 4a and 4b. In these intermediate zones pink granitic pegmatite crosses all the rock types of 3; on the other hand, white granodioritic pegmatite was not observed intersecting 4a and 4b. In some areas of plagioclase-quartz-biotite gneiss, pink feldspar occurs in small veinlets and as replacement borders around large white feldspar porphyroblasts. These relationships suggest that 3 represents an intermediate stage in the conversion of 1 and 2 to granitoid gneisses (4a, 4b). In some localities the more granitoid appearance of rocks mapped as 4a, 4b is due to an initially higher content of potassium-bearing sedimentary minerals.

The granitoid gneisses of 4b grade into foliated but fairly homogeneous pink weathering biotite-granite (5). Locally these granite bodies contain hornblende as well as biotite and in the southeast corner of the map-area they are porphyritic. The foliated granitic rock (5) is in part at least of meta-sedimentary origin.

Flat lying sedimentary strata of the Athabasca series (6) outcrop at a few points near the western boundary of the area. They range from sandstone to coarse grit and are cross-laminated and varicoloured with white, buff and light violet shades predominating. Boulders of quartz-pebble conglomerate form part of the drift hills west of Wollaston Lake and sandstone float was observed in the north central part of the area. A great angular unconformity separates these younger sedimentary rocks (6) from the underlying gneisses and schists (1-5).

Most of the foliation, gneissosity, schistosity, cleavage, and bedding of the Archaean rocks (1-5) trend in a northeasterly direction, parallel to the elongation of the various lithological units. A crude zonal arrangement of rock types is apparent with the granitoid meta-sedimentary rocks (4a, 4b) usually lying adjacent to the foliated granite (5). The largest area of relatively ungranitized rocks (1, 3) forms the basin of Wollaston Lake and this area may represent a major structural low. It is likely that the less granitized rocks (1, 3, 4a) are more easily eroded than the granitized rocks and this has been an important factor in the origin of Wollaston Lake and the main drainage channels of the area.

There is very little prospecting interest in the area at present, probably due to a sparsity of outcrop and the granitoid appearance of most of the rocks.

MAP 27 - 1957
WOLLASTON LAKE
SASKATCHEWAN
SHEET 64 L