Canada
Department of Mines
Hon. W.A. Gordon, Minister; Charles Camsell, Deputy Minister
BUREAU OF ECONOMIC GEOLOGY
GEOLOGICAL SURVEY
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LEGEND

PALÆOZOIC

ORDOVICIAN

- 9 — Sandstone, dolomite, dolomitic limestone

PRECAMBRIAN

POST-MISSI

- 8 — **8a**, massive and gneissic, granite and granodiorite; **8b**, granite-gneiss, granodiorite-gneiss, granite, pegmatite dykes; **8c**, quartz diorite, granodiorite; **8d**, granite with pseudo-stratiform structure, inclusions of gneiss and schist

- 7 — Diorite, gabbro, norite; **7a**, syenodiorite, albite, syenite

MISSI SERIES

- 6 — Conglomerate, arkose, greywacke, quartzite; **6a**, garnetiferous gneiss; **6b**, gneiss; **6c**, gneiss interleaved with granite and pegmatite

PRE-MISSI

- 5 — Granite and derived schist
- 4 — Quartz-feldspar porphyry and derived schist

WEKUSKO GROUP

- 3 — Rhyolite, dacite, lesser amounts of sediments and basic lavas, derived schist and gneiss
- 2 — Argillaceous rocks, tuff, greywacke, quartzite, etc.; **2a**, derived quartz-mica schist
- 1 — Basalt, andesite, agglomerate, tuff and derived schist; **1a**, hornblende-plagioclase gneiss and schist

Symbols

- Geological boundary
- Bedding (inclined, overturned, vertical)
- Glacial striæ
- Mineral occurrence ×
- Trail, portage, or winter road
- Rapid or fall
- Traverse survey monument K5●
- Height in feet 979'

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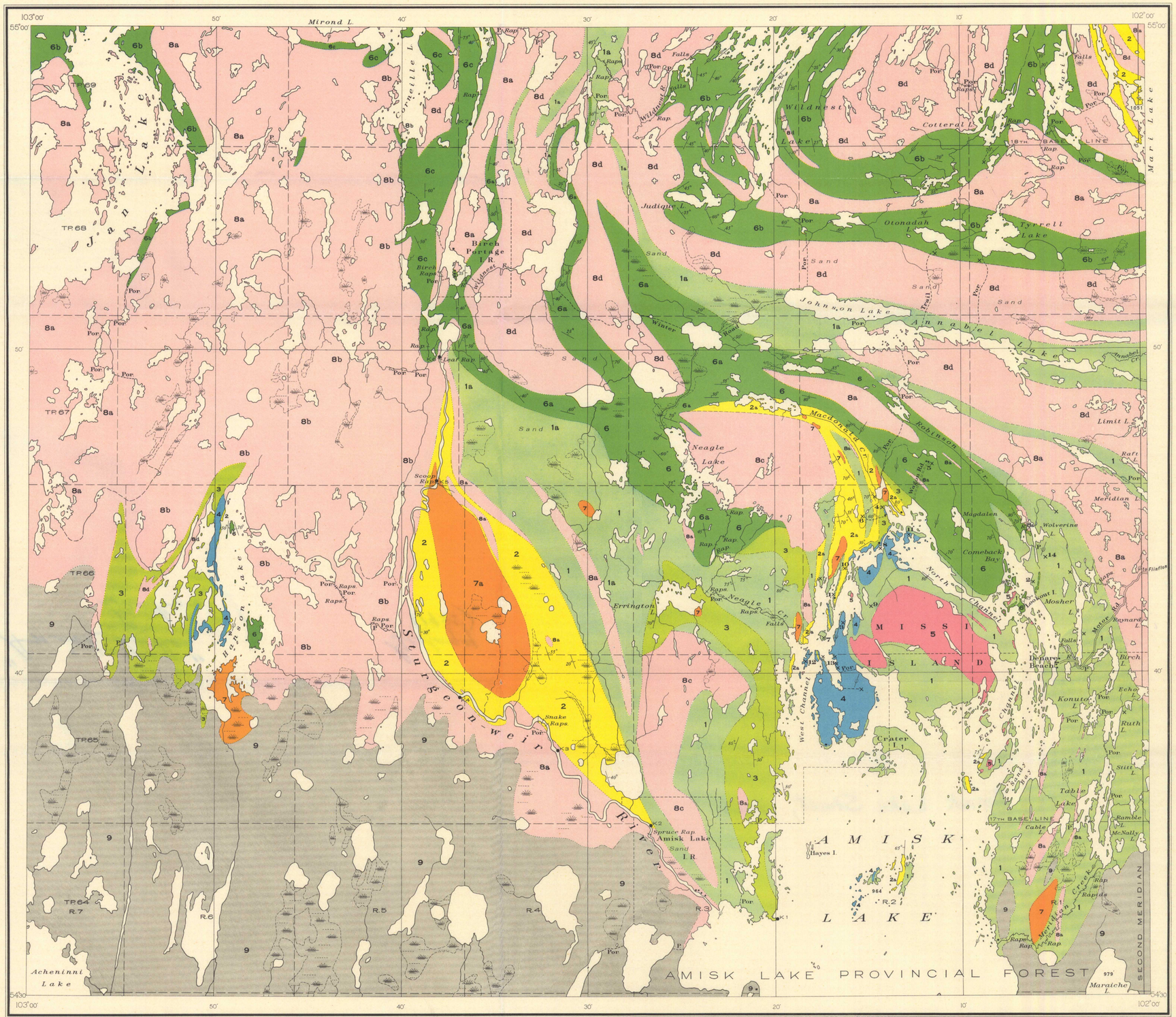
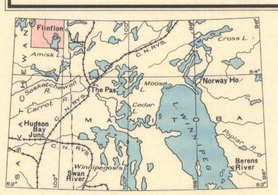
Sources of Information

Topography by **Topographical and Air Surveys Bureau, Department of the Interior.**
Geology by **J F Wright**, *1932, 1933, and* **C.H. Stockwell**, *1933.*

Approximate magnetic declination, 18° East.





MAP 314 A

AMISK LAKE SHEET

SASKATCHEWAN

Scale, $\frac{1}{126,720}$ or 1 Inch to 2 Miles

1 0 1 2 3 Miles 4 5 6 7 8

Kilometres

1 0 1 2 3 4 5 6 7 8 9 10

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ACCESS

Most points in the south and west part of the area can be reached by canoe from Loon lake from which a motor road, 9 miles long, leads to Flinflon. The northeastern part of the area is accessible by canoe from Mari lake from which a wagon road runs to Flinflon. Winter roads lead from Flinflon southwest to Amisk lake and northwest to Annabel lake.

PHYSICAL FEATURES

Amisk lake, 964 feet above sea-level, is the lowest part of the area. From it the general elevation rises to the north to 1225 feet and to the northwest to 1325 feet. About the larger lakes, the country is broken by closely-spaced, narrow, rocky ridges rising from 75 to 150 feet above the general level. Inland from the basins of the larger lakes, rocky areas 20 or more square miles in extent, are comparatively level. A belt, 2 to 5 miles wide, extending west and southwest from Annabel lake to Scoop rapids on Sturgeon-weir river is floored with sand above which project only the higher parts of the rock floor. The southern parts of the area that are underlain by Palæozoic strata are for the most part level and bedrock is exposed at only a few localities.

GENERAL GEOLOGY

The oldest strata compose the Wekusko group and are volcanic (1 and 3) and sedimentary (2) rocks possibly belonging to two or more series of different ages. The strata are closely folded but the structural features are for the most part unknown. What seems to be the older part of the Wekusko group consists of andesite, basalt, agglomerate and tuff with interbedded sediments (1). These rocks are largely altered to chloritic and other schists. Locally the volcanic rocks have been re-crystallized to hornblende-plagioclase gneiss and schist. The larger developments of the Wekusko sediments (2) for the most part consists of massive and bedded argillaceous rocks, cherty quartzites, and grey-wackes now in large part quartz-biotite schists many of which carry garnet, staurolite, chiastolite, etc. Similar sediments and also grits and conglomerates are interbedded with volcanics. What may be a younger division of the Wekusko group is largely composed of rhyolite and dacite (3). Some of these acidic lavas resemble quartzites and others have the general appearance of aplite. Locally they have been altered to mica-ceous, sericitic or chloritic schists or converted into plagioclase-mica gneiss and schist.

The quartz-feldspar porphyry (4) occurring on Missi island and nearby is a grey, fine-grained rock exhibiting rounded grains or aggregates of smoky quartz and, in some places, crystals of white feldspar. Chlorite, sericite and calcite are abundant constituents and locally the porphyry is schistose. The porphyry is cut by dykes of granite and by dykes of a porphyry that probably is a phase of the granite. The quartz-feldspar porphyry is considered to be an intrusive that perhaps formed near the end of the period of volcanic activity.

A grey to pinkish, quartzose, in part schistose granite (5) occurring on Missi and neighbouring islands cuts Wekusko lavas but is older than the Missi conglomerate.

The Missi series (6) in the vicinity of Amisk lake consists of a boulder conglomerate, in places 300 feet thick, overlain by several thousand feet of greywacke and quartzite with local developments of arkose and con-glomerate. To the northwest the basal conglomerate ceases and the series as a whole consists of fine-grained, dark quartzite and arkose. Farther northwest these rocks grade into well banded, fine-grained, garnetiferous, quartz-plagioclase-mica gneiss. Gneisses resembling these occur farther west where they are interleaved with granite and pegmatite and locally lack any evidence of clastic origin. In the north other areas of gneisses resembling these may also represent highly altered Missi sediments. The Missi strata about Amisk lake are locally closely folded but over large areas lie in open folds. As indicated by the basal conglomerate and other features, the Missi series is considerably younger than the Wekusko group. To the north and northeast where the basal conglomerate is lacking, the bedding and schistosity of the Missi and Wekusko group strata are parallel and where the two rocks assem-blages are closely folded any evidence of an unconformity disappears and in places where folds are overturned, Missi beds dip under Wekusko strata.

The comparatively small bodies of diorite and gabbro or norite (7) though only known to invade Wekusko strata are thought to be younger than the Missi series. The smaller of these bodies are fairly uniform in mineral composition and texture and are for the most part either gabbro or norite. One large body consists of rocks varying in composi-tion from syenite to varieties intermediate between syenite and diorite (syenodiorite).

The granitic rocks (8) form large and small bodies in some of which the rock is remarkably uniform whereas in others it varies from place to place. The rocks of the same body vary from massive to foliated. Some bodies display a layered structure due to well-developed, parallel joint planes. Contacts with the Missi and Wekusko strata are sharp but granite dykes may be present in the sediments or volcanics for half a mile or more from the main granite body and inclusions of the country rock, locally occur within the granite mass. The outlines of the granite bodies at most localities follow closely the structures of the older rocks. Some granite bodies cut Missi strata but all may not be of post-Missi age and those that are may be of several ages.

The Ordovician strata (9) are nearly horizontal and end in an escarp-ment facing north and varying in height up to 70 feet. The basal beds are nowhere exposed but west of Hanson lake appear to be of sandstone about 35 feet thick. The overlying strata are dolomite and dolomitic lime-stone some beds of which carry a few, poorly preserved fossils that sug-gest that the strata are of Richmond age.

ECONOMIC GEOLOGY

Gold was discovered in 1913 in quartz veins on Amisk lake but as yet the deposits have been explored only by a few shallow trenches and shafts and at two localities, by shallow diamond drilling. In addition to the gold-quartz deposits, occurrences of arsenopyrite, of pyrite or pyr-rhotite carrying some gold and copper, and asbestos are known. The gold-bearing deposits occur mainly in chloritic and sericitic schists of the Wekusko group but some occur in Missi sediments, in quartz-feldspar porphyry and in granite. Most of the known occurrences are about the head of Amisk lake where dykes are numerous.

Two main types of gold-bearing deposits are known: (1) bodies of vein-quartz; and (2) bodies of schistose rock carrying vein-quartz and sulphides. The bodies of vein-quartz lie in highly schistose zones, are irregular in shape and their outcrops are not extensive. Much of the quartz of the larger veins does not carry gold or sulphides but small areas do and some small bodies are rich in gold. The sulphides present are pyrite, arsenopyrite, galena and sphalerite. The quartz also carries iron carbonate. Schist adjoining the veins carries more sulphide than the veins but in most cases the gold content of the mineralized schist is small. The second type of deposits are wide bodies of rock parts of which are but slightly schistose, carry only scattered grains of sulphide, and little or no quartz; other parts are soft, chloritic or sericitic schists holding pyrite, arsenopyrite, and lenses and veinlets of quartz. Narrow areas of more highly schistose and mineralized rock are reported to carry enough gold to be ore. Visible free gold is present in some of the quartz but most of the gold is in the sulphides, chiefly in arsenopyrite. Many of these bodies are capped with porous, rusty schist that yields by panning much, very fine, free gold.

RELATED PUBLICATIONS

MEMOIR 105: Amisk-Athapapuskow Lake District; by E. L. Bruce, 1918.

SUMMARY REPORT, PART C, 1932: Amisk Lake Area, Saskatchewan; by J. F. Wright.

SUMMARY REPORT, PART C, 1933: West half of Amisk Lake Area, Saskatchewan; by J. F. Wright and C. H. Stockwell.