GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES

PROVISIONAL EDITION

47 E

LEGEND

CENOZOIC

QUATERNARY

Q — *Drift and unconsolidated sediments*

PALAEOZOIC

ORDOVICIAN AND SILURIAN
LATE MIDDLE ORDOVICIAN TO MIDDLE SILURIAN

OSba — *BAILLARGE FORMATION: dolomitic limestone, shaly limestone, calcareous and dolomitic shale, dolomite*

ORDOVICIAN
MIDDLE AND (?) LOWER ORDOVICIAN

Osp — *SHIP POINT FORMATION: dolomite, in part shaly, silty, and sandy; dolomitic intraformational conglomerate; quartz sandstone, in part dolomitic; minor siltstone, shale*

CAMBRIAN AND/OR ORDOVICIAN
CAMBRIAN AND/OR EARLY LOWER ORDOVICIAN

€Oad — *ADMIRALTY GROUP: GALLERY AND TURNER CLIFFS FORMATIONS UNDIVIDED: quartz sandstone, in part dolomitic; dolomite, in part shaly, silty, sandy; dolomitic intraformational conglomerate; minor siltstone, shale, conglomerate*

€Oad,sp — *Undivided*

PROTEROZOIC

HELIKIAN

Hg — *Gabbro, diabase*

Hfh — *FURY AND HECLA FORMATION: sandstone, quartzitic sandstone; minor conglomerate, grit, shale*

APHEBIAN

A\ — *Granitic and gneissic rocks; Agr, granite; Amg, migmatite, Amt, mafic rich gneiss; Abd, banded gneisses*

Geological boundary (approximate, assumed)
Bedding, tops known (inclined)
Gneissosity (inclined, vertical, dip unknown)
Trend lines (in part from air photographs)
Fault (approximate)

Geology of Precambrian rocks by R.G. Blackadar and W. L. Davison, 1963
Geology of Palaeozoic rocks by H. P. Trettin, 1963

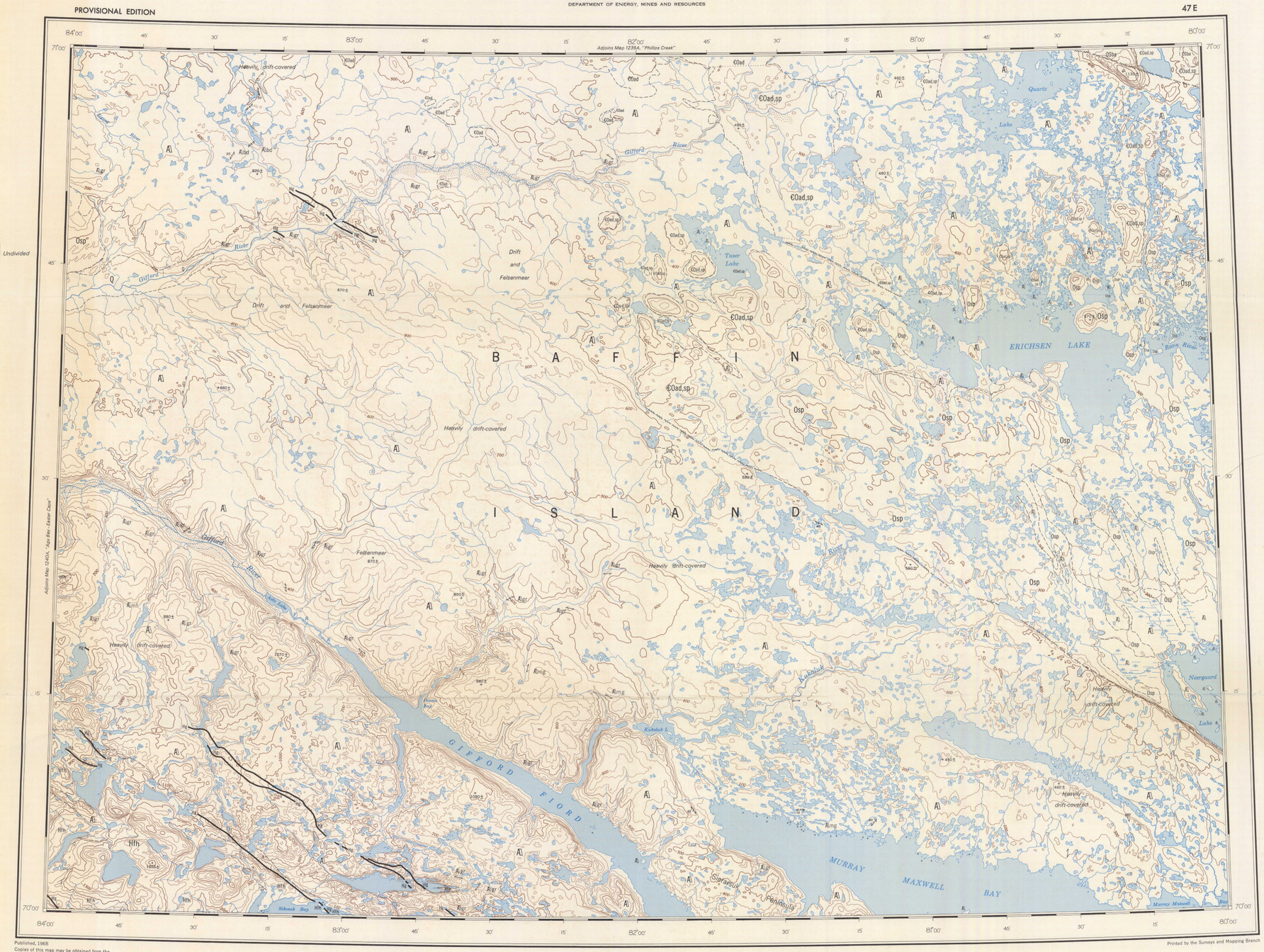
Geological cartography by the Geological Survey of Canada, 1967

Horizontal control point
Intermittent stream
Rapids, falls
Dry river bed with channel
Foreshore flats
Reef, rock or small island
Marsh
Contours (interval 100 feet)
Height in feet above mean sea-level +1090±

Base-map compiled and drawn by the Surveys and Mapping Branch, 1965-66

Magnetic declination 1967 varies from 57° 10' westerly at centre of west edge to 60° 53' westerly at centre of east edge. Mean annual change, decreasing 29.0'

INDEX MAP



Published, 1968
Copies of this map may be obtained from the Director, Geological Survey of Canada, Ottawa

Printed by the Surveys and Mapping Branch

MAP 1242A
GEOLOGY
ERICHSEN LAKE
DISTRICT OF FRANKLIN

Scale 1:253,440
1 inch to 4 miles

Miles 4 0 4 8 12 Miles
Kilometres 6 0 6 12 18 Kilometres

DESCRIPTIVE NOTES

The centre of this map-area is about 125 miles north of Hall Beach, a settlement served by commercial air service from Montreal. The Baffinland Iron Mines property at Mary River is 30 miles northeast of the northeast corner of the map-sheet. There are no settlements within the region but from time to time Eskimo hunters from Igloolik visit parts of it.

The eastern half of the area is part of the Foxe Basin Lowlands and the western half forms the northernmost extension of the Southampton–Melville Upland. Gifford River dominates the drainage but in Foxe Basin Lowland drainage is less well developed and there are low swampy areas, innumerable small lakes, and some larger but relatively shallow lakes such as Quartz and Erichsen Lakes.

Drift cover is widespread except south of Murray Maxwell Bay, Gifford Fiord and the lower reaches of Gifford River. West of Neergaard Lake and extending north from Murray Maxwell Bay almost to Erichsen Lake is drumlin field[1] but throughout much of the region the drift is featureless. Felsenmeer, relatively abundant for about 10 miles north of Gifford Fiord, reflects the proximity of bedrock to the surface, but farther north such deposits are absent.

The oldest rocks are those of the Aphebian crystalline complex and are mainly massive to poorly gneissose, pink to grey, quartz, feldspar granite and granitic gneisses. Mafic minerals, usually biotite or hornblende, make up less than 15 per cent of the mineral content. Here and there migmatites and banded gneisses can be distinguished but these are gradational into the predominant massive granitic rocks.

The Fury and Hecla Formation unconformably overlies the Aphebian rocks, and is composed of greyish orange-pink to pale red, massive to medium-bedded quartzite and quartzitic sandstone. Minor conglomerate, shale, and grit layers are present. The former are found only in the lowermost strata but do not form the basal beds. Pebbles in the conglomerate beds studied are derived from sedimentary rocks.

The Fury and Hecla Formation and the Aphebian rocks are cut by diabase dykes similar to dykes found elsewhere in northwestern Baffin Island. Age determinations from several specimens indicate a Neohelikian age for dykes near Arctic Bay (northwest of the map-area) and this age is tentatively assigned to the intrusions in Erichsen Lake map-area.

The Palaeozoic strata rest unconformably on the Aphebian basement. They are relatively thin and poorly exposed, and were examined only briefly.

The Admiralty Group[2,3] comprising the predominantly fluviatile Gallery Formation, and the predominantly intertidal Turner Cliffs Formation is Cambrian and/or Lower Ordovician in age. Although diagnostic fossils have not been found, the Gallery Formation is probably correlative with the late Lower Cambrian Rabbit Point Formation, and the Turner Cliffs Formation with the Middle Cambrian Bear Point and Ooyagh Formations of Dundas Harbour, Devon Island[4], and with Middle Cambrian strata on Boothia Peninsula and Somerset Island[5]. The Gallery Formation consists mainly of quartzose sandstone showing trough- and high-angle planar crossbedding, with less siltstone, conglomerate, and shale. The Turner Cliffs Formation is composed of two alternating assemblages: 1) finely microcrystalline dolomite, which is mostly shaly, silty, or sandy, and commonly forms ripple marks and flat-pebble conglomerates; 2) pure and dolomitic quartz sandstones commonly showing cross-lamination, as in the Gallery Formation. The only fossils known, besides abundant worm markings, and relatively few stromatolites, are linguloid brachiopods, mainly Linguiella s.s. The Admiralty Group was deposited in a basin whose axis plunges across central Borden Peninsula in an easterly or southeasterly direction. Erichsen Lake map-area lies on the southern margin of the central part of that basin. Stratigraphic sections of the Admiralty Group have not been measured in the present area, but extrapolation of regional isopach maps[2], and observations from the air suggest that the thickness of both formations decreases in a southerly or southeasterly direction, with the zero isopachs passing somewhere through the northern half of the map-area. Observations from adjacent areas suggest that sediment transport was in northerly directions.

In most of northwestern Baffin Island, the Ship Point Formation consists mainly of finely crystalline to predominantly microcrystalline dolomite. Vaguely stratified, thick-bedded units of nearly pure dolomite alternate with well stratified, thin-bedded to laminated, shaly, silty, and sandy dolomite, commonly with worm borings, ripple marks, and flat-pebble conglomerates. In Erichsen Lake area, the entire formation, and particularly the lower part, is rich in sand, silt and intraformational conglomerate. Here and there algal stromatolites and suthigenic pyrite are present. All these features indicate deposition in a shallow, near-shore marine environment.

Complete, though poorly exposed sections of the Ship Point Formation in the northeastern part of the map-area are between 200 and 300 feet thick. An incomplete section at 70° 30' N latitude, and 81° 25' W longitude comprises about 175 feet of strata. At the type section, on Baillarge Bay, the formation has yielded an early Middle Ordovician fauna[2]. Fossils of Whiterockian (early Middle Ordovician) or late Canadian age were found in the lower one hundred feet of the formation, east of Jungersen Bay. Arenigian (late Lower Ordovician) graptolites found by Blackadar[6] on Jens Munk Island, Foxe Basin, just southeast of the Erichsen Lake map-area, are believed to have come from the basal part of the formation.

Although the basal part of the Ship Point Formation and the upper part of the Turner Cliffs Formation are so similar that they can hardly be distinguished, the probable ages of these two units suggest that they are separated by a major disconformity involving the Upper Cambrian.

Mapping of the Baillarge Formation has been extended south by photo-interpretation, from Phillips Creek area into the northeastern part of Erichsen Lake area. The contact between Ship Point and Baillarge is probably a minor disconformity involving parts of the Middle Ordovician. Member A of the Baillarge Formation, which is probably late Middle Ordovician, is characterized by dark grey talus, and by recessive slopes which are underlain by argillaceous carbonates. The overlying Member B, which ranges from late Middle or early Upper Ordovician to Middle Silurian, is composed mainly of cliff-forming crypto-crystalline limestone with a few recessive, shaly intervals. Only the lower, Ordovician part of that member appears to be preserved in the present area, as the entire outcrop of the Baillarge Formation is only about 200 feet in stratigraphic thickness.

The Palaeozoic strata are generally horizontal, and disturbed only by northwesterly trending faults and fractures. The most extensive fault, which marks the southeastern limit of the Palaeozoic outcrop area, appears to have had not more than a few hundred feet of vertical displacement, with relative downward movement of the northeastern block.

[1] Blackadar, R. G.: Patterns resulting from Glacier Movements, north of Foxe Basin, N.W.T. Arctic, vol. 11, No. 3 (1958)

[2] Lemon, R. R. H., and Blackadar, R. G.: Admiralty Inlet area, Baffin Island, District of Franklin; Geol. Surv. Can., Mem. 328 (1963).

[3] Trettin, H. P.: Lower Palaeozoic sediments of northwestern Baffin Island, District of Franklin; Geol. Surv. Can., Paper 64-47 (1965).

[4] Kurtz, V. E., McNair, A. H., and Wales, D. B.: Stratigraphy of the Dundas Harbour area, Devon Island, Arctic Archipelago; Amer. Jour. Sci., vol. 250, pp. 636-655 (1952).

[5] Christie, R. L.: The lower Palaeozoic rocks; in Geological reconnaissance, Boothia Peninsula, and Somerset, King William, and Prince of Wales Islands, District of Franklin (by R. G. Blackadar and R. L. Christie); Geol. Surv. Can., Paper 63-19, pt. 2 (1963).

[6] Blackadar, R. G.: Foxe Basin North; Geol. Surv. Can., Map 4-1958 (1958)
: Additional notes to accompany Map 3-1958 (Fury and Hecla Strait map-area) and Map 4-1958 (Foxe Basin North map-area); Geol. Surv. Can., Paper 62-35 (1963).