GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES

PROVISIONAL EDITION

48 D

LEGEND

CENOZOIC

QUATERNARY

Q — *Drift and unconsolidated sediments*

PALAEOZOIC

ORDOVICIAN AND SILURIAN
LATE MIDDLE ORDOVICIAN TO MIDDLE SILURIAN

OSba — *BAILLARGE FORMATION: dolomitic limestone, in part shaly; minor dolomite*

ORDOVICIAN
MIDDLE AND (?) LOWER ORDOVICIAN

Osp — *SHIP POINT FORMATION: dolomite; in part silty, sandy, shaly; dolomitic intraformational conglomerate*

MIDDLE AND LOWER ORDOVICIAN AND (?) CAMBRIAN

€Oad,sp — *Admiralty Group and Ship Point Formations undivided*

(?) CAMBRIAN TO MIDDLE SILURIAN

€OS ad,sp,ba — *Admiralty Group, Ship Point and Baillarge Formations undivided*

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

€Otc — *TURNER CLIFFS FORMATION: dolomite; shaly, silty, sandy, pure; quartzose sandstone, in part dolomitic; dolomitic intraformational conglomerate; minor siltstone, shale, mostly dolomitic*

€Oga — *GALLERY FORMATION: quartzose sandstone; minor siltstone, conglomerate, shale; a little breccia*

ADMIRALTY GROUP

€Oad — *Gallery and Turner Cliffs Formations undivided*

PROTEROZOIC

HELIKIAN

Hg — *Gabbro dykes*

ULUKSAN GROUP (Hab to Hel)

Hel — *ELWIN FORMATION: sandstone, siltstone, shale*

Hssu — *STRATHCONA SOUND FORMATION (upper part): siltstone, sandstone*

Hssl — *STRATHCONA SOUND FORMATION (lower part): reddish mudstone and siltstone; minor dolomite and intraformational conglomerate*

Hvb — *VICTOR BAY FORMATION: dark to pale grey dolomite; minor dark grey limestone and black mudstone and edgewise conglomerate*

Hvb,sc — *Victor Bay and Society Cliffs Formations undivided*

Hsc — *SOCIETY CLIFFS FORMATION: grey dolomite*

Hab — *ARCTIC BAY FORMATION: black argillaceous limestone; calcareous dolomite*

EQALULIK GROUP (Hna to Has)

Has — *ADAMS SOUND FORMATION: silica-cemented quartzite*

Hna — *NAUYAT FORMATION: andesite and basalt, in part amygdaloidal*

APHEBIAN

Ai — *Granitic and gneissic rocks; $R_{1\,mg}$, migmatite*

Rock outcrop
Geological boundary (defined, approximate, assumed)
Geological boundary (gradational)
Bedding, tops known (horizontal, inclined)
Foliation (inclined)
Fault (defined, assumed)
Fossil locality (F)

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

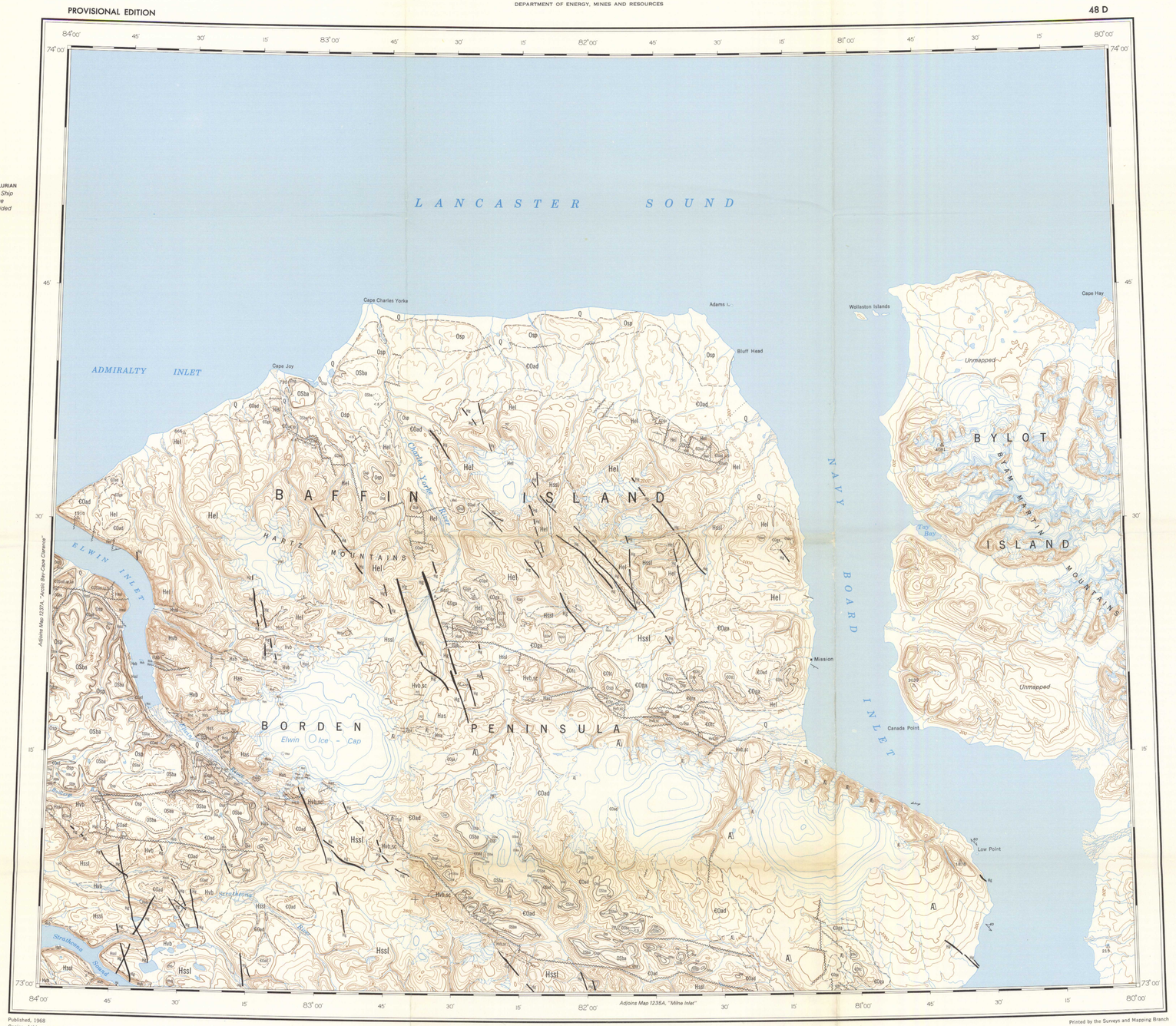
Geological cartography by the Geological Survey of Canada, 1967

Horizontal control point
Intermittent stream
Dry river bed with channel
Contours (interval 200 feet)
Icefield, glacier
Height in feet above mean sea-level 1878

Base-map compiled and drawn by the Surveys and Mapping Branch, 1964

Magnetic declination 1967 varies from 76°30' westerly at centre of west edge to 75°30' westerly at centre of east edge. Mean annual change, decreasing 28.3'

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 1236A

GEOLOGY

NAVY BOARD INLET

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

C. FALCONER

1236A

DESCRIPTIVE NOTES

The centre of the map-area is about 250 miles east-southeast of Resolute, N.W.T. and 320 miles north of Hall Beach, N.W.T. A commercial air route from Montreal serves both places. Pond Inlet is about 45 miles east of the eastern limits of the map-area and Arctic Bay 24 miles west of the southwestern corner. These latter settlements are centres for trade and government services. Although there are no settlements within the map-area, a small Roman Catholic Mission on the west coast of Navy Board Inlet is occupied from time to time. Small Eskimo groups have temporary camps along the shores of Navy Board Inlet.

The region is part of Lancaster Plateau. Steep sea cliffs, some more than 2,500 feet high, margin the plateau along Elwin Inlet, but a narrow, and in part drift-covered, coastal plain extends from a few miles northeast of the mouth of Elwin Inlet to the mid-point of Navy Board Inlet. Elevations in excess of 1,000 feet are found within 6 miles of the north coast except along the valleys of the larger rivers. The highest point in the area, 4,200 feet, is the summit of the ice-cap east of Elwin Inlet.

Drainage is well developed, resulting in the formation of many small flat-topped plateau blocks. The largest streams, such as Charles Yorke River or Strathcona River, flow in broad, flat-floored valleys, but the upper reaches of these and the smaller streams may be turbulent and steep-floored.

Crystalline rocks (Ai) that extend east from 'Elwin Ice-cap' to Navy Board Inlet comprise greyish or pinkish medium- to coarse-grained plagioclase-quartz-microcline gneiss with variable mafic content. These rocks are rather massive and foliation is poorly developed. Garnetiferous biotite-quartz-feldspar migmatite is exposed in the small, high, steep-sided fault block 2 miles southeast of 'Elwin Ice-cap'. Boulders and cobbles of gneiss are common near the ice tongue at the head of 'Elwin River', indicating that part of the ice-cap is underlain by Aphebian rocks. Narrow, discontinuous quartz or quartz-feldspar pegmatite veinlets and dykes intrude many gneissic exposures.

Geological and formational names applicable to northwestern Baffin Island were proposed by Lemon and Blackadar[4] following reconnaissance studies made in 1954 in Admiralty Inlet district.

Outcrops of sedimentary strata of presumed Helikian age are widespread on northern Baffin Island. Two groups, Eqalulik and Uluksan have been recognized. Exposures of Eqalulik and lower Uluksan Group rocks are restricted mainly to a zone up to 10 miles wide and about 30 miles long extending east from Elwin Inlet.

Nauyat Formation (Hna) comprises dense, dark greenish grey to dark red-brown basalt and amygdaloidal flows. Exposed thicknesses approach 1,000 feet.

Adams Sound Formation (Has) comprises pale orange, medium- to thick-bedded, silica-cemented quartzitic sandstone. Crossbedded structures are common, but conglomerate beds were not observed although present in adjacent map-areas. A gradational contact separates this formation from the overlying Arctic Bay Formation. Faulting has caused repetition, but the total thickness appears to exceed several thousands of feet.

The upper few tens of feet of the Adams Sound Formation are micaceous and transitional into a black micaceous shale and calcareous siltstone unit. On the basis of stratigraphic relationships this unit is correlated with the Arctic Bay Formation of Admiralty Inlet district. No sections have been measured in this map-area, but structural measurements indicate a thickness in excess of 1,000 feet.

A massive light grey to buff cherty dolomite overlies the Arctic Bay Formation on the north side of 'Elwin River' valley a few miles east of the river's mouth. Similar rocks outcrop on the south side of the valley and north of 'Elwin Ice-cap'. This unit is conformably underlain by beds correlated with the Arctic Bay Formation and on this basis it is correlated with the Society Cliffs Formation.

The Society Cliffs Formation is overlain by a succession of massive to well-bedded, dark to pale grey, dolomite and argillaceous dolomite commonly containing edgewise conglomerate, cherty blebs and vermiform cherty masses. Outcrops of this unit about Strathcona Sound are correlated (by physical proximity and lithology) with Victor Bay Formation, which at the type section near Victor Bay is 520 feet thick. Eight miles east of Baillarge Bay at least 1,025 feet of relatively argillaceous strata are exposed. East of Elwin Inlet rocks, which from their position in the stratigraphic column are presumed to be Victor Bay, show a greatly increased thickness (up to 2,500) and a less varied lithology. There intraformational conglomerate and argillaceous beds are uncommon.

East of 'Elwin Ice-cap' Society Cliff and Victor Bay Formations have not been separated and are mapped as one (Hvb,sc).

A monotonous succession of dark red mudstones, shales, grey siltstones, and sandstones, which comprise the Strathcona Sound Formation (Hss), conformably overlies the Victor Bay Formation. Silty sandstone and conglomerate are common in the uppermost Victor Bay beds, and these transitional beds indicate instability in both source and depositional areas. A remarkable intraformational conglomerate 2 miles long, and up to 100 feet thick, outcrops on both sides of 'Baillarge River' valley. Fragments of medium grey dolomite up to 1 foot long are set in a matrix of dark red mudstone. Similar but thinner conglomerates are present throughout the formation. Two principal lithologies characterize the formation, firstly dark red mudstones and shales (Hssl) and secondly grey sandstones and siltstones (Hssu). The former are commonly lower in the succession, but here and there the two interfinger. The Strathcona Sound Formation is gradational into the overlying Elwin Formation and the contact is placed where the relatively monotoned siltstones and sandstones of the lower formation are replaced by a more colourful clastic succession.

The Elwin Formation (Hel) is a varied coloured assemblage of reddish or bright orange-weathering quartzitic sandstone, reddish silty sandstone and micaceous shales. No complete section has been measured, but thicknesses in excess of 5,000 feet are probable. An erosional disconformity separates the Elwin Formation from overlying Palaeozoic strata.

Eqalulik and Uluksan Group rocks are intruded by north-northwest trending gabbro dykes (Hg). These range in width from a few tens of feet to more than 400 feet. Contact effects are limited to chilled margins or slightly coarser grained textures at the centres of the largest dykes. K-Ar dates of 915 and 1140 m.y. indicate a Neohelikian age of intrusion.

The Palaeozoic strata rest with slight angular unconformity on several Helikian formations, and with pronounced unconformity on a block of crystalline Aphebian rocks in the southeastern part of the map-area. This block, which must have been elevated in Cambrian or late Proterozoic time, and was intermittently positive in subsequent periods, is referred to as the Navy Board High[1].

The Admiralty Group[2,3] comprising the predominantly fluviatile Gallery Formation[3], and the predominantly intertidal Turner Cliffs Formation[3], is Cambrian and/or early Lower Ordovician. The Gallery Formation is possibly correlative with the late Lower Cambrian Rabbit Point Formation, and the Turner Cliffs Formation with the Middle Cambrian Bear Point and Ooyagah Formations of Dundas Harbour, Devon Island[2] and with Middle Cambrian strata on Boothia Peninsula and Somerset Island[2], but diagnostic fossils are lacking. The Gallery Formation consists mainly of quartzose sandstone showing trough- and high-angle planar cross-lamination with lesser siltstone, conglomerate, shale, etc. The lower part of the formation is predominantly red, and the upper part predominantly light grey. The Turner Cliffs Formation is composed of two alternating assemblages of rock types: 1) finely microcrystalline dolomite, which is mostly shaly, silty, or sandy, and commonly forms ripple marks and flat-pebble conglomerates, and associated dolomitic siltstone and shale; 2) pure and dolomitic quartz sandstones commonly showing cross-laminations, as in the Gallery Formation. The formation weathers generally in light hues of grey, green, and orange, but some sandstones in the lower part are bright red. The only fossils known - besides abundant worm markings and some stromatolites - are linguloid brachiopods, mainly Linguiella n. s. The Admiralty Group was deposited in an embayment known as the Admiralty Basin[3], the axis of which plunges across central Borden Peninsula in an easterly or southeasterly direction. Navy Board Inlet map-area lies on the northeast side of this basin, and the thickness of both formations decreases to the north and northwest, but the thickness of the Gallery Formation decreases also towards the south-eastern extremity of the map-area, which lies on the Navy Board High. Measured thicknesses of the Gallery Formation range between 575 feet (west of the southeasterly bend of Navy Board Inlet) and 20 feet (southeast of Cape Joy), and those of the Turner Cliffs Formation between about 1,000 feet (southeastern extremity of map-area) and about 285 feet (southeast of Cape Joy). Crossbedding attitudes indicate that in Navy Board Inlet map-area the currents that deposited the Gallery sands came from northwesterly to westerly directions.

The Middle and (?) Lower Ordovician Ship Point Formation[4] overlies the Turner Cliffs Formation, the contact being a paraconformity that may represent a major hiatus involving the Upper Cambrian. The formation consists mainly of fine 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, partly with worm borings, ripple marks, and flat-pebble conglomerates. The formation weathers in hues of light grey. At the type section on Baillarge Bay the formation has yielded early Middle Ordovician fossils[4]. Late Lower Ordovician (Arenigian) graptolites found by Blackadar[1] on Jens Munk Island, Foxe Basin, are believed to have come from the lower part of the formation. At the type section just east of the map-area[4], the formation is about 900 feet thick. Its thickness decreases in an eastward direction to between 150 and 200 feet in the southeastern parts of the present area. A brecciated, partly red-weathering solution zone at the top of the formation indicates that erosion has taken place prior to the deposition of the Baillarge Formation, which was probably caused by positive movements of the Navy Board High.

In Navy Board Inlet map-area only the Ordovician part of the Baillarge Formation[4,5] is preserved, represented mainly by member A and the lower part of member B. Member A, probably late Middle Ordovician in age, is characterized by recessive slopes and dark grey talus. In the present area, only thin-bedded shaly, partly dolomitized limestone has been observed in this unit, but thinly stratified shale and penecontemporaneous dolomite recognized on Brodeur Peninsula may be present. Member B is composed of cryptocrystalline, partly dolomitized limestone, which is mostly dark reddish brown and cliff-forming, but partly argillaceous, recessive, and greenish. The lower part of this member contains the Arctic Ordovician fauna.

On the north coast of Borden Peninsula a belt of lower Palaeozoic strata dip gently north, probably forming an extension of the arcuate, southwesterly to northwesterly dipping Brodeur homocline. In the remaining parts of the map-area the Palaeozoic strata rest nearly horizontally but are locally disturbed by several groups of faults. These include: 1) extensive, southeasterly trending normal faults, some of which bound the Navy Board High; 2) complicated fault zones composed of numerous minor faults that mark the transition zone between the northern Borden Peninsula homocline and the remaining parts of the area; 3) complicated minor faults displayed mainly in the area northeast of the Navy Board High.

[1] Blackadar, R.G.: 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).

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

[3] 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).

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

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