



**LEGEND**

- CENOZOIC**
- Q Drift and unconsolidated sediments
- ORDOVICIAN AND SILURIAN**
- OSbr BALLARGE AND CAPE CHALFORD FORMATIONS UNDIVIDED: dolomitic limestone, calcareous dolomite, partly brecciated, minor shaly and silty limestones and dolomite, shale
  - OSBa BALLARGE FORMATION: dolomitic limestone, partly shaly, minor shale, calcareous and dolomitic dolomite
- CAMBRIAN (?) AND ORDOVICIAN**
- OSp,lc CAMBRIAN (?) AND LOWER (?) MIDDLE ORDOVICIAN: dolomite, in part shaly, silty, sandy, dolomitic, intrafoliated conglomerate, dolomitic quartz sandstone, minor siltstone and shale, in part dolomitic
- HELKIAN**
- Hg Gabbro sills and dykes
- PROTEROZOIC**
- Hau AURTRIDGE FORMATION: micaceous siltstone, shale, slate, ferruginous dolomite
  - Hfh FURY AND HELLA FORMATIONS: quartzitic sandstone, minor conglomerate, shale
- APHEBIAN**
- A Granite and gneissic rocks: gneiss, granite, quartz-feldspar gneiss; mica, migmatite, phibolitic gneiss; felsic, mafic gneiss; banded and bi-partite gneiss

- Geological boundary (defined, approximate, assumed) .....  
 Bedding (top known inclined) .....  
 Bedding (inclined, vertical, dip unknown) .....  
 Structural trend (in part from air photographs) .....  
 Lineament (from air photographs) .....  
 Fault (defined, approximate) .....

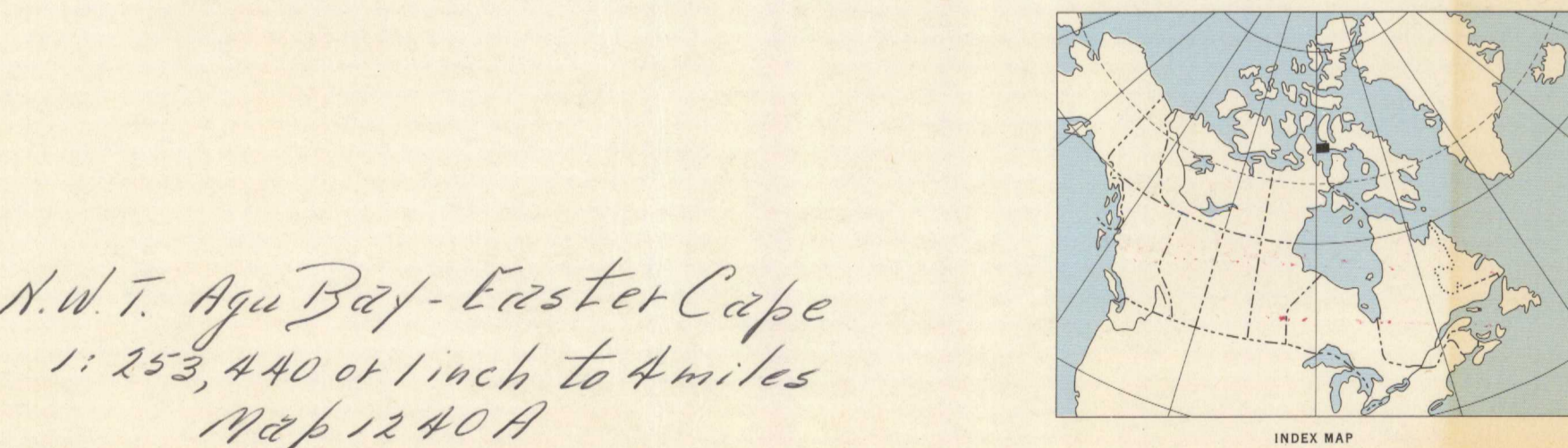
Geology of Precambrian rocks by R. G. Blackadar and W. L. Davison, 1953  
 Geology of Paleozoic rocks by H. P. Trettin, 1953

Geological cartography by the Geological Survey of Canada, 1957

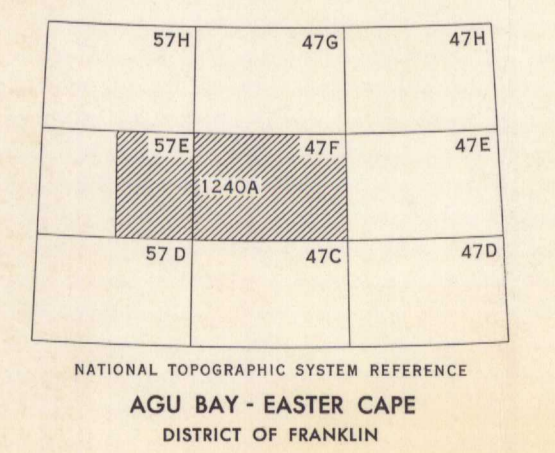
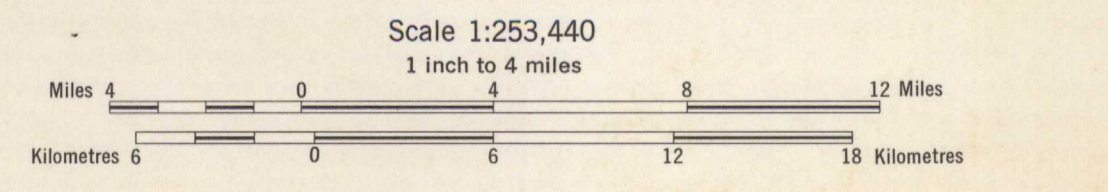
- Horizontal control point ..... Δ
- Intermittent stream ..... ~~~~~
- Dry river bed with channel ..... - - - - -
- Foreshore flats ..... [Symbol]
- Contours (interval 100 feet) ..... [Symbol]
- Rest, rock or small island ..... +
- Height in feet above mean sea-level ..... [Symbol]

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

Magnetic declination 1957 varies from 40°12' westerly at centre of west edge to 57°00' westerly at centre of east edge. Mean annual change, decreasing 4.6'.



MAP 1240A  
GEOLOGY  
AGU BAY - EASTER CAPE  
DISTRICT OF FRANKLIN



**DESCRIPTIVE NOTES**

The map-area is about 150 miles northwest of Hall Beach, which is serviced weekly by commercial aircraft from Montreal and is also the site of a principal DEW line station.

Unprepared landing sites for small aircraft equipped with low pressure, overcast tires are found in many parts of the region, but elsewhere especially in the topographically rugged areas underlain by Precambrian rocks of Apebian age, lakes or the sea provide the only certain landing spots.

Although no permanent settlements exist in the map-area, Eskimo camps are occupied from time to time throughout the year and people will generally be found either at Foss Fiord, Cape Einar Mikkelson, or Cape Hallowell.

The map-area includes parts of two physiographic divisions. The eastern half is part of the Melville Plateau division of the Northern Churchill Province whereas the western part forms part of Boothia Plateau, a division of the Arctic Lowland Province. Melville Plateau, where underlain by Precambrian sedimentary rocks, is characterized by high rounded hills, some in excess of 1,500 feet. Hills and dykes of gabbro resistant to erosion impart a serrated appearance to the skyline. Where underlain by granitic and gneissic rocks the terrain is more subdued, although rugged in detail. Many small lakes and the surface in contrast to those parts underlain by sedimentary rocks. Boothia Plateau is developed primarily on carbonate rocks. Drift deposits are widespread and outcrops are few, in contrast to many parts of the plateau region. Raised beaches are abundant, especially in the northern part of the map-area. A low, lake-filled valley extends south from Bell Bay towards Saputing Lake and Gifford River; in places water comprises more than half of the area.

The Apebian rocks (A) comprise a gneissic complex dated at 1730 m.y. (K-Ar date No. 894). Greyish or pinkish, medium-to coarse-grained, plagioclase-quartz-microcline gneiss with or without varying amounts of biotite and hornblende predominate. Massive to slightly foliated rocks are common in the northeast part of the area and porphyroblasts of pinkish potassic feldspar are prevalent. Banded and lineated gneisses outcrop along the shores of Nyckie Fiord, Ivissarak and Saputing Lakes, and north of Gifford River. These comprise alternating bands of quartz-feldspar rock and more mafic hornblende-biotite-quartz-feldspar rock.

Sedimentary rocks of Helikian age are considered equivalent to the Eglahik Group of northern Baffin Island. Two formations are present, a predominantly quartzitic unit (Hfh) and the Aurtridge Formation (Hau), a succession of siltstone, shale, and dolomite.

The quartzitic unit comprises a succession of multicoloured quartzitic sandstones with minor shale and conglomerate. Although primarily greyish orange-pink to pale red, massive to medium-bedded quartzite, strikingly different facies are present. Darkly red to dusky red-purple quartzite beds are interbedded with more fissile layers, including purple parting shales, rusty red hematite-stained shales, and black to greenish black shales.

The quartzite successions unconformably overlies gneissic rocks of Apebian age. Although conglomerate and grit layers are common in the lower part of the succession they seldom form the actual basal beds. Fragments in the conglomerate all seem derived from sedimentary rocks.

No complete section has been measured but from the outcrop pattern a thickness of between 10,000 and 15,000 feet is postulated.

The Aurtridge Formation (Hau) conformably overlies the quartzitic rocks and comprises black micaceous siltstone, black shale, slate, and ferruginous dolomite. The contact between the two units is gradational. The top of the formation has not been seen, but within the map-area the exposed thickness exceeds 800 feet and elsewhere may surpass 1,500 feet.

Dykes and sills of gabbro (Hg) cut all Precambrian units. K-Ar dates from northwestern Baffin Island indicate a Neohelikian (Upper Middle Proterozoic) age for these intrusions. Even large masses of gabbro such as the sill south of Aurtridge Bay show little evidence of differentiation, and except at the margins, the grain size is remarkably uniform.

The Palaeozoic strata rest with angular unconformity on the Precambrian, mainly Apebian crystalline rocks.

The Cambrian or early Lower Ordovician (probably Middle Cambrian) Turner Cliffs Formation\* may occur in the northeastern extremity of the map-area but the formation has not been mapped separately owing to poor exposure and lithological similarity with the overlying Ship Point Formation.

The Middle and (?) Lower Ordovician Ship Point Formation\* overlies the Turner Cliffs Formation, with the contact being interpreted as a paraconformity, which may represent a major hiatus involving the Upper Cambrian. The formation consists mainly of fine crystalline to predominantly microcrystalline dolomite. Vaguelly stratified, thin-bedded units of shaly, silty, and sandy dolomite, partly with worm burrows, ripple marks, and flat-pebble conglomerates. In the age Bay-Easter Cape map-area, as in adjacent regions south of latitude 71°, the lower part of the formation is relatively rich in sand, silt, and intraformational conglomerate, and locally contains sigmoidal stromatolites and trace amounts of glauconite.

The Ship Point is certain by the Ballarge Formation\*, although a disconformable relationship has been inferred from anomalously low thicknesses and a solution zone at the top of the formation in Navy Board Inlet map-area. The contact is interpreted as a paraconformity in the age Bay-Easter Cape map-area, the only evidence for a disconformity is the abrupt lithological change at the contact. The outcrops of the Ballarge Formation mapped in the northeastern part of the area represent mainly member A, which is probably late Middle Ordovician. This member, characterized by recessive slopes and dark grey talus, consists of thinly stratified mixtures of shale, microcrystalline limestone, and microcrystalline, noncontemporaneous dolomite.

In the central and western parts of the map-area the two formations of the Brodeur Group\*\*, the late Middle Ordovician to Middle Silurian (Niagaran) Ballarge Formation, and the conformably overlying Middle Silurian (Niagaran) Cape Crawford Formation\*, could not be mapped separately because they are very poorly exposed. Regional structural trends and a few outcrops suggest that the area adjacent to Prince Regent Inlet is underlain by member A of the Cape Crawford Formation, which consists of evaporite solution breccia, dolomitic limestone, and calcareous dolomite, and the remaining area mainly by member B of the Ballarge Formation, composed predominantly of dark reddish brown microcrystalline, partly dolomitized limestone. Member A of the Ballarge Formation is exposed in a few creek valleys cutting the escarpment that marks the eastern edge of the outcrop area of the Brodeur Group. Crown Prince Frederik Island has not been investigated on the ground. Air photographs show that the island is covered by raised beach deposits composed of carbonate debris, which is probably nearly in place. Regional structural trends suggest that the island is underlain mainly by member B of the Ballarge Formation.

In the eastern part of the map-area the Palaeozoic rocks are nearly horizontal. In the central and western region they form part of the extensive, arcuate Brodeur homocline, which there dips gently southwest. The two structural belts are separated by a curved fault zone, which extends from the head of Berlinguet Inlet to Foss Fiord and is marked by rivers and elongate lakes.

\*Blackadar, R. G.: Geological reconnaissance of the Precambrian of north-western Baffin Island; Geol. Surv. Can., Paper 64-42 (1946).  
 \*\*Lemon, R. R. H., and Blackadar, R. G.: Admiralty Inlet area, Baffin Island, District of Franklin; Geol. Surv. Can., Mem. 328 (1953).  
 †Trettin, H. P.: Lower Palaeozoic sediments of northwestern Baffin Island, District of Franklin; Geol. Surv. Can., Paper 64-47 (1955).  
 ‡Middle Ordovician to Middle Silurian carbonate cycle, Brodeur Peninsula, northwestern Baffin Island; Bull. Canadian Petrol. Geol., vol. 13, No. 1, pp. 155-180 (1965).

N.W.T. Agu Bay - Easter Cape  
1:253,440 or 1 inch to 4 miles  
Map 1240A

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