GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES

LEGEND

SEDIMENTARY AND VOLCANIC ROCKS

CENOZOIC

QUATERNARY
- Q — *Stream, deltaic, glacial and marine beach sediments (mapped only where underlying bedrock geology cannot be inferred with reasonable certainty)*

TERTIARY
- Te — *EUREKA SOUND FORMATION: sandstone, conglomerate, siltstone; minor shale and coal*

MESOZOIC

TRIASSIC
UPPER TRIASSIC
- TRh — *HEIBERG FORMATION: sandstone, siltstone; minor shale*

LOWER, MIDDLE AND UPPER TRIASSIC
- TRba — *BLAA MOUNTAIN FORMATION: dark coloured shale and light grey calcareous siltstone; minor sandstone*

LOWER TRIASSIC
- TRbl — *BLIND FIORD FORMATION: siltstone, sandstone, shale; minor conglomerate*

PERMIAN
UPPER PERMIAN
- Pd — *DEGERBÖLS FORMATION: light coloured limestone and chert*

LOWER PERMIAN
- Pv — *VAN HAUEN FORMATION: dark coloured siltstone, limestone, chert, sandstone and shale*
- Pe — *ESAYOO FORMATION: basalt flows and pyroclastic rocks*

CARBONIFEROUS AND PERMIAN
UPPER CARBONIFEROUS AND LOWER PERMIAN
- CPn — *NANSEN FORMATION: light coloured limestone and chert; minor shale and siltstone (CPn1, CPn2; see note 1)*

UPPER CARBONIFEROUS (?)
- Cv — *Unnamed formation: basalt flows and pyroclastic rocks (see note 2)*

UPPER CARBONIFEROUS
- Ca — *AUDHILD FORMATION: basalt flows; minor pyroclastic rocks*
- Cb — *BORUP FIORD FORMATION: red sandstone and conglomerate; minor dolomite, siltstone, shale and limestone (Cbl, includes Emma Fiord Formation)*

LOWER CARBONIFEROUS
- Ce — *EMMA FIORD FORMATION: dark coloured siltstone; minor shale, sandstone and coal*

DEVONIAN
LOWER DEVONIAN AND/OR YOUNGER
- Dsvb — *SVARTEVAEG FORMATION, Member B: volcanic sandstone; minor siltstone, tuff, conglomerate, breccia, volcanic flows (including basalt), slate and shale*
- Dsva — *SVARTEVAEG FORMATION, Member A: tuff, volcanic flows (including spilite and keratophyre), volcanic sandstone; minor siltstone, shale and slate*

PALEOZOIC

DEVONIAN AND/OR SILURIAN
LOWER DEVONIAN AND (?) UPPER SILURIAN
- Dsc — *STALLWORTHY FORMATION, Member C: red siltstone, multicoloured shale; minor quartzose sandstone, conglomerate, lithic and tuffaceous sandstone*
- Dsb — *STALLWORTHY FORMATION, Member B: quartzose sandstone, conglomerate, breccia and siltstone (mostly red beds)*
- Dsa — *STALLWORTHY FORMATION, Member A: red siltstone; minor quartzose sandstone, conglomerate and shale*

SILURIAN
UPPER SILURIAN
- Slb — *LANDS LOKK FORMATION, Member B: tuff, slaty siltstone and shale; lithic and volcanic sandstone; minor volcanic flows (including keratophyre), agglomerate and/or volcanic conglomerate, limestone lenses*

MIDDLE AND UPPER SILURIAN
- Sla — *LANDS LOKK FORMATION, Member A: slaty siltstone and shale; minor lithic and tuffaceous sandstone, tuff and conglomerate*

ORDOVICIAN (?) AND SILURIAN
UPPER ORDOVICIAN (?) AND LOWER SILURIAN
- OSi — *IMINA FORMATION: calcareous greywacke, calcareous siltstone, calcareous slaty shale; minor conglomerate*

ORDOVICIAN (?)
RENS FIORD COMPLEX
- Orc — *Carbonate Unit: dolomite, limestone (stratigraphic unit; age relationship with volcanic unit uncertain)*
- Orv — *Volcanic Unit: spilitic volcanic flows and fragmental rocks (stratigraphic unit; age relationship with carbonate unit uncertain)*

ORDOVICIAN AND (?) CAMBRIAN
RENS FIORD COMPLEX
- Orp — *Pelitic and Cherty Unit: slate, phyllite, bedded chert; minor sandstone and argillaceous dolomite (lithological unit occupying different stratigraphic levels; includes green and red slates mapped as Grant Land Formation on Ellesmere Island)*

ORDOVICIAN AND/OR CAMBRIAN
LOWER ORDOVICIAN AND/OR CAMBRIAN
- €g — *GRANT LAND FORMATION (Sandstone Unit of Rens Fiord Complex): quartzose sandstone; minor siltstone, slate, phyllite, conglomerate and dolomite*

PALEOZOIC AND/OR PROTEROZOIC

LOWER PALEOZOIC AND/OR OLDER
- lPm — *Mica-schist, mica-garnet schist, quartzite, marble, amphibolite, hornfels, etc. (age relationship with Rens Fiord Complex unknown)*

INTRUSIVE ROCKS

TERTIARY
- Col — *OTTO FIORD FORMATION: anhydrite, gypsum; minor limestone and shale (see note 3)*

CRETACEOUS AND OLDER
- *Gabbro, diabase, and basalt dykes (see note 4)*

DEVONIAN (?)
MIDDLE AND/OR UPPER DEVONIAN (?)
- Dqd — *Quartz diorite, diorite, granodiorite, syenodiorite, quartz monzonite and related rocks*

LOWER PALEOZOIC OR OLDER (?)
- lPds — *Dunite and serpentinite*
- lPqm — *Quartz monzonite metamorphosed in greenschist facies*

HYBRID TERRAINS

BOURNE COMPLEX
- bc — *Slaty siltstone and shale, tuffaceous (?) green phyllite, volcanic flows, and hornfels of uncertain, probably pre-Silurian age with abundant diabase intrusions of unknown age*
- lPh1 — *Thermally metamorphosed shale, siltstone, sandstone and limestone of unknown pre-Carboniferous age with dioritic intrusions probably of Middle or Late Devonian age*
- lPh2 — *Greenstone of unknown, probably pre-Silurian age with dioritic intrusions probably of Middle or Late Devonian age*

Geological boundary (defined, approximate, assumed)
Bedding, tops known (horizontal, inclined, overturned; s, dip steep)
Bedding, tops known (from air photographs or observed from aircraft)
Bedding, tops unknown (inclined: s, dip steep; vertical; from ground observation or air photographs)
Trend of bedding (from air photographs)
Lineation (inclined)
Lineament (fault or fracture; from air photographs)
Fault (defined, approximate; solid circle indicates downthrow side)
Thrust fault (defined; teeth indicate upthrust side)
Anticline (defined)
Syncline (defined; arrow indicates plunge)
Fossil locality
Measured section showing approximate line of traverse
Boundary of Quaternary sediments
Locality where age has been determined radiometrically — 360± 25my (A)
Geological boundary, fold axis, or fault inferred beneath water, glacier, or Quaternary sediments
Type section (see note 5)

Geology of Carboniferous and younger rocks by R. Thorsteinsson 1957, 1961, 1962, 1963, and E.T. Tozer 1962, 1964

Geology of Devonian and older rocks on Axel Heiberg Island by P.E. Fricker (McGill University Expedition) 1960, 1961

Geology of Devonian and older rocks on Axel Heiberg Island and Ellesmere Island by H.P. Trettin 1961, 1962

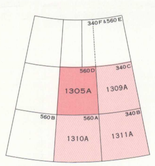
Compilation by R. Thorsteinsson and H.P. Trettin, 1970

Geological cartography by the Institute of Sedimentary and Petroleum Geology, Geological Survey of Canada, 1971

Horizontal control point
Cairn
Intermittent stream
Lake, indefinite
Dry river bed with channel
Icefield, glacier
Foreshore flats
Contours (interval 500 feet)
Sand
Height in feet above mean sea-level — 1490 ±

Topographic base-map at the same scale published by the Surveys and Mapping Branch in 1966, with revisions by the Institute of Sedimentary and Petroleum Geology, 1971

The daily change of the North Magnetic Pole causes the magnetic compass to be very erratic in this area



NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND INDEX TO ASSIGNING GEOLOGICAL SURVEY OF CANADA MAPS


INDEX MAP

NOTES

1. Extensive areas of northern Ellesmere and lesser areas of northern Axel Heiberg Island are shown as underlain by map-unit CPn1. Although commonly broken by high-angle faults, strata included in this map-unit are characterized by generally low to moderate dips. Four formations that are separated in other parts of the map-area are included in map-unit CPn1. The formations are Borup Fiord, Nansen, van Hauen and Degerböls. The van Hauen and Degerböls Formations are each, bounded below and above by disconformities, and at any given locality one or both formations may be missing. Moreover, the Van Hauen, Degerböls, and Borup Fiord Formations are relatively thin rock units with individual maximum thicknesses in the order of a few hundred feet or less. In marked contrast, the thickness of the Nansen Formation varies from about 4,000 feet in northwestern parts of the map-area to about 5,000 feet in the environs of Otto Fiord. On the basis of circumstances outlined above, an estimated ninety-five per cent of the area mapped as CPn1 exposes strata of the Nansen Formation.

   An area mapped as CPn2 near Lands Lokk on Ellesmere Island is characterized by low relief and sparse outcrops. This area includes outcrops of the Emma Fiord, Borup Fiord, Audhild and Nansen Formations.

2. An unnamed formation, composed of nearly flat-lying volcanic flows and pyroclastic rocks of undetermined thickness, is exposed over a large area of the peninsula formed by Audhild Bay and Emma Fiord. The volcanic rocks lie concordantly on limestone strata of the Nansen Formation, which on this peninsula is only a few hundred feet thick. A collection of fusulinaceans that indicate a Late Carboniferous (Moscovian) age has been collected at locality 110 in the Nansen, about 100 feet stratigraphically below the volcanic rocks. The unusually small thickness of the Nansen in this region, and the absence of younger Carboniferous and Lower Permian faunas that are generally represented in the formation, suggest that the lower part of the Nansen is all that is represented here. Unfortunately no formation is known to overlie the volcanic rocks, the age of which is therefore uncertain. Possibly the volcanic rocks were at one time intercalated in the Nansen Formation. Nevertheless, the possibility that the volcanics are in fact the Lower Permian Esayoo Formation, or represent a still younger episode of extrusion, cannot be excluded on the basis of available evidence.

3. Intrusive bodies of the Otto Fiord Formation are especially common in central and southern Axel Heiberg Island where they cut various formations including, in some instances, the Tertiary Eureka Sound Formation. The intrusions are generally related to faults and folds formed by Tertiary earth movements and are accordingly dated as Tertiary.

   The Otto Fiord Formation, throughout much of its areal extent, overlies the Borup Fiord Formation and underlies the Hare Fiord Formation. In such occurrences the Otto Fiord and the Hare Fiord Formations are facies equivalents of the Nansen Formation. However, the Otto Fiord has a somewhat greater distribution than the Hare Fiord, and in some places the Nansen Formation overlies full or partial developments of the Otto Fiord. With the exception of one locality, the Otto Fiord Formation apparently is absent in normal stratigraphic successions in the Cape Stallworthy map-area, and the Borup Fiord Formation is succeeded either by the Audhild volcanics or overlain directly by the Nansen. On the north coast of Axel Heiberg Island, at locality 113, about 50 feet of anhydrite is exposed above the Borup Fiord and below the Nansen. The anhydrites have not been mapped separately but are included in the Nansen Formation. It represents presumably a northwesterly-extending tongue of the Otto Fiord which in its normal development attains a thickness of about 1,000 feet. That the Otto Fiord Formation is present in the subsurface in the environs of Otto Fiord is indicated by the presence of an anhydrite diapir on the north side of the Fiord.

4. Basic dykes and sills intrude upper Paleozoic and Mesozoic sediments of the Sverdrup Basin throughout much of Axel Heiberg Island and western Ellesmere Island. They intrude all formations older than, and including, the Upper Cretaceous Strand Fiord Formation, a sequence of volcanic rocks that crop out in western Axel Heiberg Island. Dykes and sills have not been observed to intrude the Upper Cretaceous Kanguk Formation or the Tertiary Eureka Sound Formation. They are especially common in Mesozoic rocks that predate the Kanguk Formation, and while it is possible that more than one episode of intrusion is represented it is probable that the vast majority of dykes and sills cutting rocks of the Sverdrup Basin are Cretaceous in age.

   In the Stallworthy map-area dykes and sills are clearly more abundant in lower Paleozoic rocks than in Sverdrup Basin sediments, and although no dykes are known to be unconformably overlain by rocks of the Sverdrup Basin there is a good possibility that some dykes and sills predate the development of the Sverdrup Basin.

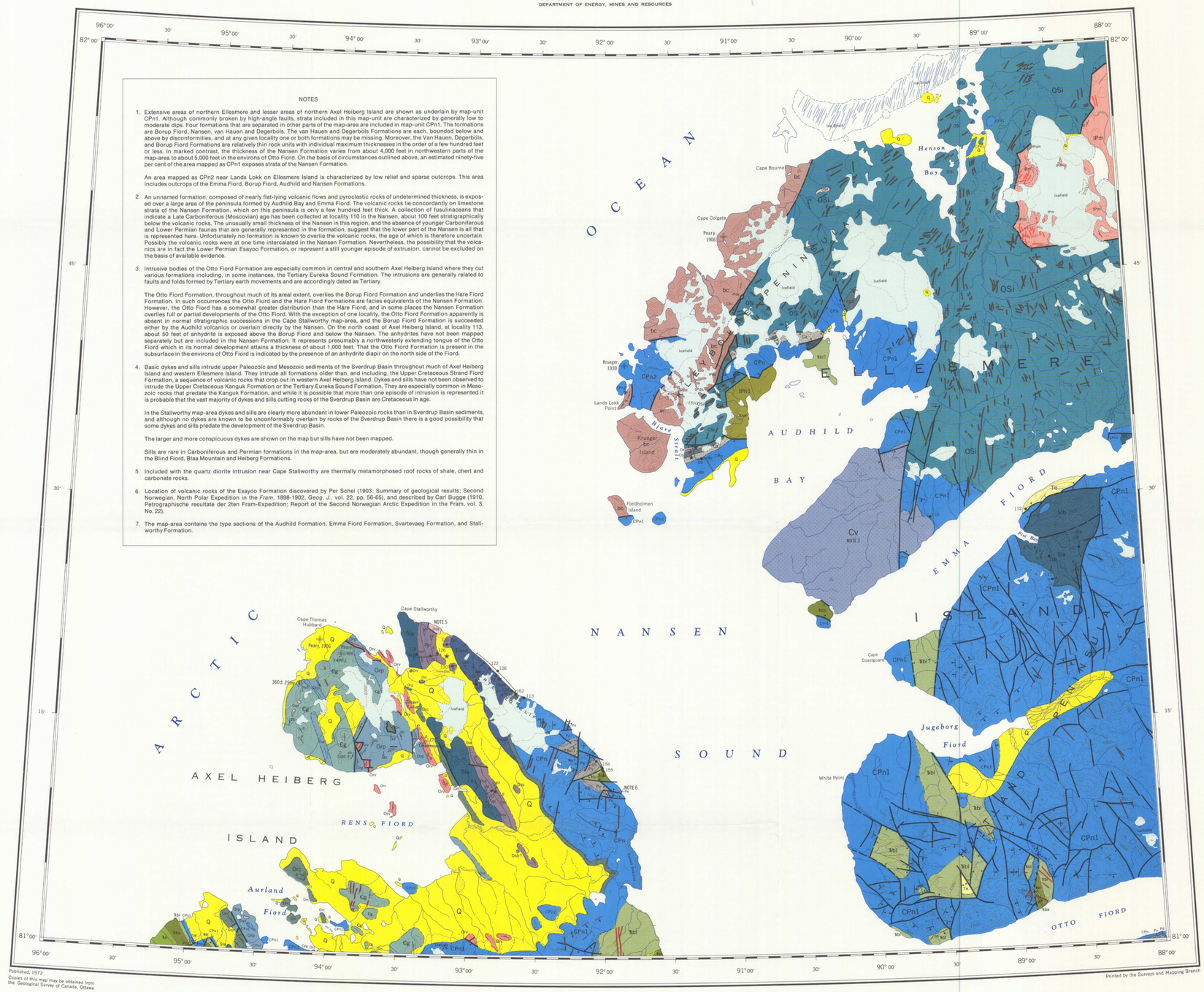
   The larger and more conspicuous dykes are shown on the map but sills have not been mapped.

   Sills are rare in Carboniferous and Permian formations in the map-area, but are moderately abundant, though generally thin in the Blind Fiord, Blaa Mountain and Heiberg Formations.

5. Included with the quartz diorite intrusion near Cape Stallworthy are thermally metamorphosed roof rocks of shale, chert and carbonate rocks.

6. Location of volcanic rocks of the Esayoo Formation discovered by Per Schei (1903: Summary of geological results; Second Norwegian, North Polar Expedition in the *Fram*, 1898-1902, *Geog. J.*, vol. 22, pp. 56-65), and described by Carl Bugge (1910, Petrographische resultate der 2ten Fram-Expedition; Report of the Second Norwegian Arctic Expedition in the Fram, vol. 3, No. 22).

7. The map-area contains the type sections of the Audhild Formation, Emma Fiord Formation, Svartevaeg Formation, and Stallworthy Formation.



Published, 1972
Copies of this map may be obtained from the Geological Survey of Canada, Ottawa

Printed by the Surveys and Mapping Branch

MAP 1305A
GEOLOGY
CAPE STALLWORTHY
DISTRICT OF FRANKLIN

Scale 1:250,000

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

1305A

MAP 1305A
CAPE STALLWORTHY
DISTRICT OF FRANKLIN

N.W.T. CAPE STALLWORTHY (District of Franklin)
1:250,000
MAP 1305A.

1972