# Investigations on the Quaternary deposits in the Godthåbsfjord area, southern West Greenland

**Anker Weidick**

A reconnaissance of the Quaternary deposits around Godthåbsfjord was carried out during the summer with the assistance of Flemming Damslund. The field work represented a northerly continuation of the reconnaissance of 1973 in the Fiskenæsset area (Weidick, 1974) and was made with the purpose of collecting information for the Quaternary Map Sheet 1:500 000 Frederikshåbs Isblink – Søndre Strømfjord. The area surveyed extended from Nordlandet and the islands west of the town of Godthåb to the inner branches of Godthåbsfjord at Kangersuneq (fig. 11).

The Godthåbsfjord area can be divided into two physiographic units: (1) the strandflat north and west of Godthåb, with few elevations of more than 200 m above sea level; and (2) the highland areas east of Godthåb and around the branches of Godthåbsfjord, with elevations of around 1000 m to west, culminating at 1630 m at Kînaussaq mountain in the Kapisigdlit peninsula. East of Kapisigdlit peninsula and the Kangersuneq fjord branch at 50° W, the summits decrease in altitude, reaching 1000–1200 m at the Inland Ice margin at 49°30'W, while under the Inland Ice farther east elevations of 400–900 m have been recorded (Holtzscherer & Bauer, 1954).

Local glaciers and small ice caps in the highland areas around Godthåbsfjord indicate that the present glaciation limit increases from around 800 m above sea level at the town of Godthåb to 1400 m over the Kapisigdlit peninsula. The level of pronounced

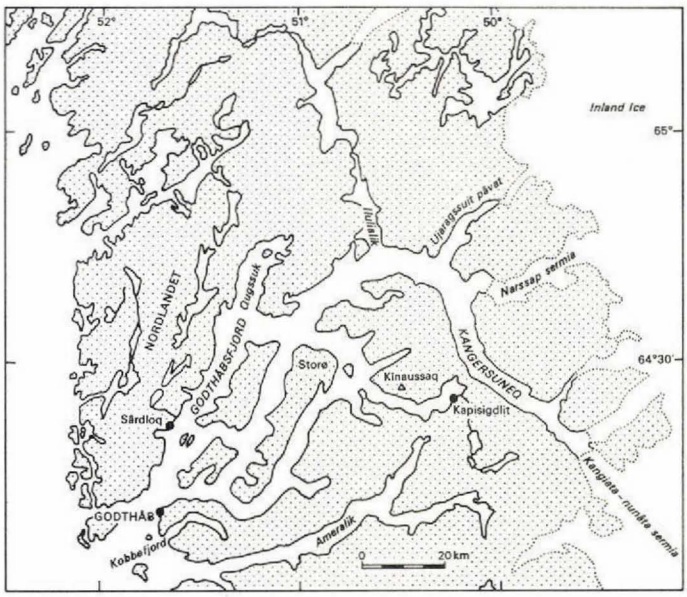


Fig. 11. Godthåbsfjord area, south-west Greenland.

corries can be seen in Godthåbsfjord and Ameralik fjord to be increasing from 200± 200 m above sea level at the entrance of the fjords, to 900±200 m in the interior of the fjords farther to the east. This indicates a former lowering of the snow line of approximately 600 m.

The gneiss terrain of the area is usually too weathered for preservation of glacial striae. Primary directions in Nordlandet, indicate an ice movement from the east. In the interior fjord region the high relief strongly influences the direction of the glacier ice.

Glacial grooves are often seen on the strandflat of Nordlandet. Their depth has previously been stated in metres (Bendixen, 1921) but the numerous examples met with during the present field work only show incision in terms of decimetres.

From the widespread occurrence of roches moutonnées, and the evidence of glacial abrasion given above, it is evident that the whole coastal area was covered by ice on at least one occasion. In this context it should be mentioned that in 1925 de Quervain & Mercanton presumed a double glaciation of the Godthåb area on the basis of the double incision ('U in U-shaped valleys') between the mountains Store Malene and Hjortetakken at the entrance of Kobbefjorden.

Evidence of glacial deposition is infrequent in the western parts of the area; kame terraces have been observed at Sardloq, Nordlandet, at elevations of 150–200 m and scattered moraine fragments occur on the south side of Kobbefjorden. In contrast, a belt of numerous ice margin deposits is met with east of the Kapisigdlit peninsula and Qugssuk bay area. Greatest frequency is attained around the fjords of Kangersuneq, Ujaragssuit and Ilulialik, and in the head of Qugssuk, and this main phase in deposition characterises the fjord stage at around 8300 B. P. (Weidick, 1968). To the east, younger stages of the ice margin deposit belt continue up to the margins of the present Inland Ice.

Marine sediments are the most widespread Quaternary deposits and are especially characteristic of the strandflat of Nordlandet, where most lowland areas and valleys between gneiss knolls are covered by marine silt. The marine silt usually occurs up to 30–50 m above sea level but isolated small terraces and beach ridges have been observed up to 70–80 m.

The marine limit west of the town of Godthåb and on the western parts of Nordlandet is about 80 m above sea level, increasing to over 100 m in the central parts of Godthåbsfjord. The determination of the marine limit is usually based on the uppermost marine terraces or beach ridges, but with an upper limit controlled by the altitude of perched boulders or undisturbed moraine. The gap between the upper beach ridges or terraces and the lowermost undisturbed moraine area seems to increase towards the west. Consequently, in this area, marine terraces can usually be met with at 70–80 m above sea level, and the lower limit of undisturbed moraine at 90 m, whereas in the eastern parts of Nordlandet the two limits nearly coincide. The explanation must be that the surf was greatest in the western areas and that sorting here was in the order of 10–15 m above the contemporaneous mean sea level.

The highest marine limit is met with in a central zone around the north end of Storeø where altitudes of 105–110 m above sea level are attained. Further east, a decrease in the elevation of the marine limit is due to the presence of subsequent young-

er moraine systems towards the present Inland Ice margin. Since the fjord stage at 8300 B. P. seems to correspond to a marine level of 70–80 m, it would appear that the older systems east of the fjord stage, attached to higher marine limits, might have been laid down at the recession before 8300 B. P. In contrast, moraine systems east of the fjord stages are related to recessional substages between 8000 and possibly 6000 B. P.

Since the glacier lobe of the Inland Ice in Ujaragssuit pâvat, Kangilínguata sermia, has its front resting on a marine terrace with minimum altitudes of 20–30 m above sea level, it would appear that the Inland Ice retreated beyond the present extent (at around 6000 B. P.?, cf. Weidick, 1972), and subsequently advanced to its present position. A narrow trim line zone around the glacier indicates a little shrinkage in this century. In addition, the Narssap sermia lobe of the Inland Ice margin south of Ujaragssuit pâvat reveals only slight shrinkage and a very stable calving front with little production of calf ice. This is in contrast to the southern calving glacier lobe of Kangersuneq, Kangiatanunâta sermia, which has receded over 20 km in the last 100–200 years (Weidick, 1968, 1972).

## *References*


Bendixen, O. 1921: Godthåb district. *In* Amdrup, G. C., Bobé, L. Jensen, A. S. & Steensby, H. P. (edit.) Grønland i Tohundredaaret for Hans Egedes landing. *Meddr Grønland* **61**, 176–269.

Holtzscherer, J.-J. & Bauer, A. 1954: Contribution à la connaissance de l'Inlandsis du Groenland. *Publs. Ass. int. Hydrol. scient.* **39**, 244–296 (also [*Publs*] *Expéd. polair. Franç.***37**).

Quervain, A. de & Mercanton, P.-L. 1925: Résultats scientifiques de l'expedition suisse au Groenland 1912–13. *Meddr Grønland* **59**, 5, 55–271.

Weidick, A. 1968: Observations on some Holocene glacier fluctuations in West Greenland. *Bull. Grønlands geol. Unders.* **73** (also *Meddr Grønland* **165**, 6) 202 pp.

Weidick, A. 1972: Notes on Holocene glacial events in Greenland. *Acta Universitatis Ouluensis*, Ser. A, Scient. Rerum Naturalium 3, Geologica No. 1, 177–204.

Weidick, A. 1974: Investigations on the Quaternary deposits in the Fiskenæsset region, southern West Greenland. *Rapp. Grønlands geol. Unders.* **65**, 65 only.


# Field work on the Precambrian basement in the Buksefjorden region, southern West Greenland


**Brian Chadwick, Kenneth Coe, John G. Stainforth, Kenneth J. Vines and Peter R. A. Wells**


Five two-man teams from the University of Exeter spent a third field season mapping in the area of Buksefjorden as part of the GGU mapping programme in the Fiskenæsset region organised by GGU in conjunction with the University of Exeter (Chadwick & Coe, 1973; Chadwick *et al.*, 1974a). Mapping at 1:20 000 was begun by J. S., K. C. and K. V. in areas north and south-east of Buksefjorden and north of Alángordlia respective-