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## C<sup>14</sup> dating of Survey material carried out in 1977

General compilation by **Anker Weidick**

Forty-two radiocarbon age determinations of shell samples (27), wood (2) and gyttja (13) from North-West, North, East, and South Greenland are summarised below. All the material was collected during GGU field work in recent years.

The samples have been dated by the Geological Survey of Canada, Ottawa (marked GSC), Isotopes Inc., Westwood, New Jersey, USA (marked I) and the Carbon-14 Dating Laboratory of the Geological Survey of Denmark and the National Museum, Copenhagen (marked K).

The samples in North-West, South and East Greenland are located by the coordinates from the Danish Geodetic Institute maps; in North Greenland coordinates are from the U.S.A.F. World Aeronautical Chart 1:1000 000, 5th edition.

### *Samples collected in North-West Greenland by Peter R. Dawes*

GGU 212655: I-9802. Morris Jesup Gletscher **650±80 B.P.**

Shells of *Hiatella arctica* in moraine in front of Morris Jesup Gletscher, 3–3.5 m above sea level. South coast of Neqe Fjord, Thule district, 77°52'N, 71°10'W.

GGU 166678: I-9801. Chamberlin Gletscher **280±80 B.P.**

Shells of *Hiatella arctica* and a few fragments of *Mya truncata*. From moraine spit 14 m above sea level on eastern side of Chamberlin Gletscher. Wolstenholme Fjord, Thule district, 76°41.3'N, 68°16'W.

GGU 166679: I-9800. Chamberlin Gletscher **2650±105 B.P.**

Shells of *Mya truncata* and *Hiatella arctica*. From moraine spit 28 m above sea level at east side of Chamberlin Gletscher. Wolstenholme Fjord, Thule district, 76°41.3'N, 68°16'W.

GGU 212511: I-9799. Herbert Ø

**8345±140 B.P.**

Shells of *Hiatella arctica*. From grey sandy silt 6 m above sea level. North coast of Herbert Ø, east of prominent glacier at Kingingneq, Thule district, 77°27.1'N, 70°38'W.

GGU 212512: I-9798. Herbert Ø

**8390±140 B.P.**

Shells of *Mya truncata* and a few specimens of *Hiatella arctica*. From grey sandy silt 10–12 m above sea level at north coast of Herbert Ø, east of prominent glacier at Kingingneq, Thule district, 77°27.1'N, 70°38'W.

*Samples collected in North-West and North Greenland by Anker Weidick*

GGU 226427A: GSC-2426. Olrik Fjord

**> 33 000 B.P.**

Shells of *Chlamys islandicus*. From 2–5 cm thick shell-rich lenses of nearly horizontal extent in moraine-like silt with numerous boulders of gneiss and sandstone. Occurrence in cliff facing brook. Base of cliff 25 m above sea level, top of cliff 35 m above sea level. Sample taken at 28 m above sea level. Topmost part of the cliff 1–2 m gravel and boulders with transitional layers of sandy silt to underlying moraine-like boulder-rich silt. North coast of Olrik Fjord, 4–5 km east of western Kûgssuaq, Thule district, 77°12'N, 67°27'W.

GGU 226427B: GSC-2497. Olrik Fjord

**> 37 000 B.P.**

Shells of *Hiatella arctica*. From same sample as GGU 226427 A: GSC-2426.

GGU 226409: I-9797. Olrik Fjord

**8275±135 B.P.**

Shells of *Mya truncata*. From dark grey, boulder-rich moraine-like silt in 17 m high coastal cliff. Shells taken at 5–7 m above sea level. North coast of Olrik Fjord, 7.6 km west of eastern Kûgssuaq, Thule district, 77°11'N, 67°12'W.

GGU 226410: I-9771. Olrik Fjord

**8575±140 B.P.**

Shells of *Mya truncata* and *Hiatella arctica*. Excavated from top of delta terrace 27 m above level in dark grey sandy silt. Delta of eastern Kûgssuaq, southern and eastern part. North coast of Olrik Fjord, Thule district, 77°09.2'N, 66°53'W.

GGU 226412: I-9770. Olrik Fjord

**8300±140 B.P.**

Shells of *Mya truncata*. From laminated brownish dark silt at 17 m above sea level and close to the site of GGU 166124, 7065±110 B.P. (Weidick, 1976). Delta of eastern Kûgssuaq. North coast of Olrik Fjord, Thule district, 77°09.2'N, 66°53'W.

GGU 226421: I-9769. Olrik Fjord

**8550±140 B.P.**

Shells of *Mya truncata*. From sand bands in laminated grey silt in cliff at 18.4 m above sea level at west side of the delta. Top of cliff and surface of the delta 25 m above sea level. Delta of eastern Kûgssuaq. North coast of Olrik Fjord, Thule district, 77°09.2'N, 66°53'W.

GGU 226423: I-9768. Olrik Fjord **8480±140 B.P.**

Shells of *Mya truncata*. From brown-green fine sand covering boulder-rich moraine in cliff at 20.3 m above sea level at western flank of delta. West side of delta of eastern Kûgssuaq, north coast of Olrik Fjord, Thule district, 77°09.2'N, 66°53'W.

GGU 226424: I-9767. Olrik Fjord **8715±140 B.P.**

Shells of *Mya truncata*. From light grey sand in upper part of cliff facing the river. Top of cliff 25 m above sea level. Sample taken under the stony cover of the top of cliff at 21.5 m above sea level. Delta of eastern Kûgssuaq, north coast of Olrik Fjord, Thule district, 77°09.2'N, 66°53'W.

GGU 226431: I-9691. Olrik Fjord **8715±140 B.P.**

Shells of *Hiatella arctica*. From shell lenses in laminated grey-green fine sand-silt. Shells occur in lenses close to surface of terrace at 17 m above sea level. Surface modified by solifluction. Olrik Fjord, 3 km west of eastern Kûgssuaq, Thule district, 77°10.3'N, 67°01'W.

GGU 226440: I-9690. Hall Land **9005±145 B.P.**

Shells of *Hiatella arctica* from silt on top of marine terrace at 80 m above sea level, i.e. approximately 30 m below the marine limit of the area. Central plain of Hall Land, western North Greenland, 81°39.8'N, 60°03'W.

GGU 226441: I-9687. Hall Land **9180±150 B.P.**

Shells of *Hiatella arctica* from clayey silt under a veneer of shingles approximately 700 m east of locality for sample GGU 226440. South side of brook at 85 m above sea level. Central plain of Hall Land, western North Greenland, 81°39.7'N, 60°01'W.

GGU 226446: I-9689. Hall Land **8300±130 B.P.**

Shells of *Mya truncata* from laminated silt-clay 55 m above sea level. Shells occur in living position. Central plain of Hall Land, western North Greenland, 81°45.2'N, 59°11'W.

GGU 226449: I-9665. Børglum Elv **7710±120 B.P.**

Shells of *Mya truncata* from laminated silt under thin veneer of wave sorted boulders in depression (secondary terrace) in front of Børglum Elv delta at 40–45 m above sea level. Børglum Elv, Peary Land, 82°10'N, 31°35'W.

GGU 226448: I-9688. Børglum Elv **> 35 600 B.P.**

Wood, occurring scattered in a depression in front of the postglacial delta of Børglum Elv at surface of laminated silt covered by a veneer of rounded boulders at 40–45 m above sea level. Age of the laminated silt given by the shells dated as I-9665.

The appearance of the material is like wood shavings, mainly attached to trench of an ice wedge crossing the depression. It may have been brought to the surface from interglacial or

interstadial layers beneath the Holocene Børglum Elv delta (cf. description of locality, Weidick, 1977). An earlier date of wood from this locality ( $> 35\ 000$  B.P.) has been given by Fredskild (1969). Børglum Elv, Peary Land,  $82^{\circ}10'N$ ,  $31^{\circ}35'W$ .

GGU 226451: I-9664. J. P. Koch Fjord **5700 $\pm$ 105 B.P.**

Shells of *Hiattella arctica*. From upper silt in terrace at 30–35 m above sea level. Terrace with gravel surface at 40–45 m above sea level. Valley between Adam Gletscher and Hans Tavsens Iskappe at J. P. Koch Fjord, western Peary Land,  $82^{\circ}23.5'N$ ,  $40^{\circ}30'W$ .

GGU 226454: I-9663. Narssârssuk **9385 $\pm$ 145 B.P.**

Shells of *Mya truncata*. From transitional zone between lower laminated silt and upper grey fine sand in coastal cliff 12 m high. Sample taken at 8–10 m above sea level. Narssârssuk plain south of Thule Air Base, Thule district,  $76^{\circ}27.3'N$ ,  $69^{\circ}17'W$ .

*Samples collected in North Greenland by Hans F. Jepsen*

GGU 206054: GSC-2447. Washington Land  **$> 51\ 000$  B.P.**

Driftwood (*Picea* sp., determin. L. D. Farley-Gill, Geol. Surv. Canada). The wood is taken from the surface of a gravel river bed 260–245 m above sea level. Many pieces of wood scattered throughout the river bed. North of Humboldt Gletscher, Washington Land,  $80^{\circ}06.8'N$ ,  $61^{\circ}40'W$ .

*Samples collected in East Greenland by Svend Funder*

GGU 134016B: K-2769 **4390 $\pm$ 90 B.P.  $C^{13} = -24.9$  ‰**

GGU 134016C: K-2770 **2480 $\pm$ 60 B.P.  $C^{13} = -21.3$  ‰**

GGU 134016D: K-2771 **1890 $\pm$ 70 B.P.  $C^{13} = -21.9$  ‰**

GGU 134016E: K-2772 **1360 $\pm$ 70 B.P.  $C^{13} = -25.1$  ‰**

Silt gyttja from cores of lake sediment. The samples represent different intervals in a 150 m thick gyttja and date events in a pollen diagram from the lake (Funder, in press). Potamogetonsø, Rypefjord,  $70^{\circ}57'N$ ,  $27^{\circ}44'W$ .

GGU 134018D: K-2773 **4220 $\pm$ 85 B.P.  $C^{13} = -19.0$  ‰**

GGU 134018E: K-2774 **2470 $\pm$ 55 B.P.  $C^{13} = -16.3$  ‰**

Silt gyttja from cores of lake sediment. The samples represent different intervals in a 200 cm thick gyttja sequence and date events in a pollen diagram from the lake (Funder, in press). Bramgåssø, western Milne Land,  $70^{\circ}31'N$ ,  $28^{\circ}02'W$ .

GGU 146505B: K-2689 **8060 $\pm$ 120 B.P.  $C^{13} = -20.4$  ‰**

GGU 146505C: K-2688 **5720 $\pm$ 100 B.P.  $C^{13} = -20.4$  ‰**

GGU 146505D: K-2775 **4780 $\pm$ 90 B.P.  $C^{13} = -14.8$  ‰**

GGU 146505E: K-2776 **4060 $\pm$ 85 B.P.  $C^{13} = -16.9$  ‰**

GGU 146505F: K-2785 **2780 $\pm$ 65 B.P.  $C^{13} = -18.7$  ‰**

GGU 146505G: K-2777 **1330 $\pm$ 75 B.P.  $C^{13} = -17.7$  ‰**

Silt gyttja from cores of lake sediment. The samples represent different intervals in a 400 cm thick sequence of gyttja and date events in a pollen diagram from the lake (Funder, in press). Morten Sø, Hurry Inlet, 70°52'N, 22°27'W.

GGU 146508: I-9916 **> 40 000 B.P.**

Shells of *Tridonta borealis* from surface of stony silt 19–22 m above sea level. East of Hurry Inlet, north-west of Kap Hope, 70°28'N, 22°25'W.

GGU 146514: K-2798 **34 070+1980 B.P. C<sup>13</sup> = -0.4 ‰  
-1620**

Shells and fragments of *Mya truncata*, *Hiatella arctica*, *Tridonta borealis*, *T. elliptica*, *Clinocardium ciliatum* and *Serripes groenlandica* from surface of silt cliff 53–56 m above sea level. Near mouth of Langelandselv, Jameson Land, 70°32'N, 23°38'W.

GGU 203312: I-9659 **7795±125 B.P.**

Shells and fragments of *Mya truncata* and *Hiatella arctica* from surface of silt deposit 23–24 m above sea level. Revet, Payer Land, 74°21'N, 21°52'W.

GGU 203313: I-9803 **8505±140 B.P.**

Shells and fragments of *Mya truncata* from surface of silt deposit 13–15 m above sea level, overlain by deltaic sand and gravel up to 18 m above sea level. Zackenberg Bugt, Wollaston Forland, 74°28'N, 20°15'W.

GGU 203319: I-9660 **8480±135 B.P.**

Shells of *Mya truncata* from surface of silt deposit 19 m above sea level, overlain by deltaic sand and gravel up to 20 m. Mouth of Lille Sødal, Wollaston Forland, 74°17'N, 20°04'W.

GGU 203326: I-9661 **> 40 000 B.P.**

Shells and fragments of *Mya truncata* and *Hiatella arctica* from surface of silt cliff 10–17 m above sea level. Kap Herschell, Wollaston Forland, 74°14'N, 19°43'W.

#### *Sample collected in East Greenland by J. D. Friderichsen*

GGU 228676: I-9658 **6760±125 B.P.**

Shells of *Mya truncata* in situ in deltaic foresets 19 m above sea level. Mouth of Knækdal, Kejser Franz Josephs Fjord, 73°10'N, 27°25'W.

#### *Sample collected in South Greenland by Svend Funder*

GGU 217530: K-2748 **8260±125 B.P. C<sup>13</sup> = -14.8 ‰**

Clay gyttja representing the lowermost 3 cm of organic sediments in lake with water level 7–8 m above sea level. North side of Kangerdluarssuk, 60°52'N, 45°57'W.

### References

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## Comments on radiocarbon dates from Northern Greenland made during 1977

**Anker Weidick**

Radiocarbon dates have been made on material from nine areas in northern Greenland (fig. 40). The results are given in the compilation of C<sup>14</sup> dates (see Weidick, this report). The dates from area 5 have been given earlier (Weidick, 1977b). Comments on their significance are given below.

### *Interglacial-interstadial ages*

The dates of GGU 226427 A and GGU 226427 B from Olrik Fjord (> 33 000 B.P. and > 37 000 B.P. respectively) seem to be clear indications of a formation of interglacial age. The moraine-like appearance of the deposit might indicate a subsequent glaciation although the conservation of the shells indicates little glacial treatment.

The Holocene marine inundation in Olrik Fjord reached  $45 \pm 5$  m above sea level and modified the interglacial sediment locally; a shell sample previously dated from the eastern flank of eastern Kûgssuaq delta in Olrik Fjord (GGU 166125,  $18\,990 \pm 280$  B.P., Weidick, 1976a) is from a site approximately 14 km east of the sites of GGU 226427 A & B). This date might be based on a mixed shell assemblage of Holocene and interglacial age (cf. Weidick, 1976b). If so, the interglacial deposits must have a wide extent along the northern shores of Olrik Fjord, but in part have also been reworked in and overlain by Holocene marine deposits.

Another example of fluvio-marine redeposition of interglacial material is found at Børglum Elv delta, Peary Land. The occurrence was first described by Fredskild (1969) and has