

Timing and pattern of glacial retreat, east-central Ellesmere Island and northwestern Greenland

Weston Blake, Jr.

Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0E8, Canada

Unlike the coasts of Atlantic Canada, where numerous age determinations on both marine shells and basal organic lake sediments demonstrate deglaciation prior to 12,000, or even 13,000 radiocarbon years ago, along the high latitude coasts of southern Nares Strait (Smith Sound, at 78° to 79°N), the oldest ¹⁴C ages bearing on deglaciation are some 3,000 to 4,000 years younger, i.e., between 9,000 and 9,500 radiocarbon years.

Aspartic acid ratios on shells in till above the Holocene limit of marine submergence on both the Ellesmere Island and Greenland sides of Smith Sound are low, ranging from 0.173 (UA-3108) to 0.225 (UA-3107) for *Hiatella arctica*. Also, isoleucine epimerization ratios (*alle/Ile*) are as low as 0.052 (AAL-1499, total) for *Hiatella arctica* shells in till on top of Cape Herschel, and a single *Mya truncata* shell from this site yielded a finite ¹⁴C age of 28,680 ± 230 years (TO-1268). If this value indicates the shell's true age, the date provides a maximum limit for the latest ice advance which scooped up shells from the sea bottom.

The best explanation for: (1) the low amino acid ratios and the young ¹⁴C age, (2) the fresh-appearing glacial sculpture in Precambrian granite-family rocks, (3) the late timing of deglaciation along Nares Strait, (4) the fact that the fiord heads became free of glacier ice far later than the outer coasts, and (5) the 135 m of emergence that has occurred at Cape Herschel in the last 9,000 ¹⁴C years, is to invoke a significant cover of glacier ice in late Wisconsinan time. The field evidence strongly supports the hypothesis that the Greenland and Innuitian ice sheets coalesced over Kane Basin, a wide and shallow part of Nares Strait, and drained southward to Baffin Bay via an ice stream which filled Smith Sound (greater than 500 m deep and less than 40 km wide). This ice stream would have blocked the marine connection between the Arctic Ocean and Baffin Bay. The change should be reflected in Baffin Bay sediments.

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