
Macrofaunal evidence for disconformities in the early Ordovician (Canadian) of Ella Ø, north-east Greenland and western Newfoundland, Canada

BOYCE, W. DOUGLAS¹, KNIGHT, IAN¹, STOUGE, SVEND², CHISTIANSSEN, JØRGEN L.³, AND HARPER, DAVID A. T.⁴
1. Geological Survey of Newfoundland and Labrador, Department of Mines and Energy, P.O. Box 8700, St. John's, NL A1B 4J6, Canada ¶ 2. Geological Survey of Denmark and Greenland, Øster Voldgade 10, DK-1350 Copenhagen K, Denmark ¶ 3. Holbæk College of Education, Seminarieparken 2, Holbæk, DK-4300 Denmark ¶ 4. Geological Museum, Øster Voldgade 5-7, DK-1350 Copenhagen K, Denmark

North-East Greenland is host to a very thick, dominantly carbonate, shelf sequence, which is time-equivalent to the Cambrian to Ordovician shelf sequence of western Newfoundland. On Ella Ø, several sections were logged through an apparently conformable succession of limestones of the Lower Ordovician Antiklinalbugt and Cape Weber formations. At least 125 macrofossil samples were collected, many from previously unreported silicified fossil horizons within the Cape Weber Formation. Comparison of the

Greenland macrofaunas with those of the St. George Group carbonates of western Newfoundland indicates the presence of a cryptic disconformity of significant duration separating the Antiklinalbugt and Cape Weber formations (as presently defined). This disconformity is correlated with the profound sub-Wandel Valley Formation unconformity of Kronprins Christian Land in eastern North Greenland.

Macrofaunas in the Antiklinalbugt Formation are dominated by trilobites and brachiopods (with some cephalopods and gastropods) indicative of an Early Canadian, Gasconadian age. The Cape Weber Formation hosts a mixed ostracode, trilobite, brachiopod, cephalopod, gastropod, rostroconch and sponge fauna of Late Canadian, late Jeffersonian and Cassinian age. The Antiklinalbugt Formation (as currently defined) broadly correlates with the Watts Bight Formation (St. George Group) of western Newfoundland; the Cape Weber Formation (as currently defined) correlates with the Barbace Cove Member of the Boat Harbour Formation and the Catoche Formation (St. George Group). No Middle Canadian, Demingian age macrofossils have been identified on Ella Ø. This indicates a faunal gap of considerable magnitude, encompassing (at least) the *Hystricurus oculilunatus*, *Leiostridium proprium* and *Randaynia saundersi* (trilobite) interval zones preserved in the lower part of the Boat Harbour Formation (St. George Group) in western Newfoundland.

This implies that the Greenland faunal gap is much greater than that recorded by the Boat Harbour “pebble bed” disconformity at the base of the Barbace Cove Member in western Newfoundland. This suggests that different depositional and possibly tectonic dynamics influenced the Greenland margin of Laurentia at this time compared to that in western Newfoundland. However, both disconformities and the sub-Wandel Valley Formation unconformity are coevally drowned by renewed marine flooding in the late Jeffersonian.