Paired Glacial Boulder and Bedrock Cosmogenic Analyses

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We are using cosmogenic nuclides to resolve the vertical and lateral extent of ice margins in the eastern Canadian arctic during Wisconsinan glaciation. Over 100 pairs of Be-10 and Al-26 analyses from large glacial boulders and striated or ice-molded bedrock surfaces suggest that the late Wisconsinan (Stage 2) glaciation in the Pangnirtung Fjord area of Baffin Island was much more extensive than previously believed. However, weathering of boulders and till cover on bedrock surfaces could yield erroneously young exposure ages, whereas prior exposure of bedrock surfaces and/or boulders could result in isotope inheritance and erroneously old ages. To evaluate these possibilities, we sampled: 1) polished and striated tops of roches moutonnees, and 2) overlying glacial boulders. In all but one case, cosmogenic exposure ages of boulders and adjacent bedrock surfaces are concordant. These sample sites are located ·· ·g floors and sidewalls of Pangnirtung Pass and Pangnirtung Fjord ... indicate rapid deglaciation 8 to 7 Be-10 ka and suggest that sufficient material was eroded from sample surfaces to reset cosmogenic clocks. Furthermore, we conducted a direct test at Crater Lake in Pangnirtung Pass by sampling boulders and bedrock exposed by ice retreat sometime after 1976. These samples have Be-10 abundances similar to our process blanks, suggesting at least a meter of bedrock or till was eroded during Neoglaciation. All isotope data reported here use production rates of (1), but are not yet corrected for shielding, exposure geometry, or precise altitude of sample sites. A late Stage 2 deglaciation of Pangnirtung Pass and Pangnirtung Fjord is consistent with glacial ice filling nearby Cumberland Sound at 10 ka (2), but is inconsistent with a Stage 4 age for the Duval moraines (3).

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(1) K Nishiizumi *et al.*, J Geophys Res **94**, 17907 (1989); (2) A E Jennings, Geogr phys et Quat **47**, 21 (1993); (3) A S Dyke, J T Andrews, and G H Miller, Geo Soc Canada Memoir **403** (1982)

1. 1996 Fall Meeting

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4. H (Hydrology)

5. (a) n.a.
   (b) 1827 Geomorphology
   1830 Glaciology
   3344 Paleoclimatology
   (c) n.a.

6. Poster (no PV or PC)

7. n.a.

8. 5% GSA-Boston, 1993
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9. check - $60.00

10. C

11. schedule poster adjacent to similar poster by Bierman, Marsella, Davis, and Caffee, also on cosmogenic nuclide dating on Baffin Island

12. no

13. no