calculated for the Klondike gravel. This result assumes a depositional $^{26}Al/^{10}Be$ ratio equal to 6.75 (spallogenic production ratio). Depositional ratios can differ substantially from this value due to: (1) temporary burial of sediment during transport (sediment storage or ice cover); (2) deep-seated mass wasting of material whose production ratio is controlled by muons; and (3) long-term (>1 Ma) stability followed by rapid erosion of surfaces contributing sediment to the deposit. However, reconciling these results and the paleomagnetic record with a Pleistocene age requires unrealistic exposure and erosion scenarios for the catchments sourcing the UWC. Furthermore, the $^{26}Al/^{10}Be$ ratios measured in the UWC and Klondike gravels are identical, suggesting an insensitivity of their depositional ratios to the widely different sediment sources, glacial histories, and transport mechanisms responsible for the two deposits. These results confirm a Pliocene age for the earliest advance of the CIS, and imply that large ice volumes in the northern Cordillera predate extensive Laurentide glaciation.

Burial dating of Klondike and Upper White Channel gravels confirms a Pliocene age for the earliest advance of the Cordilleran Ice Sheet

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The most extensive Cordilleran Ice Sheet (CIS) in northwestern Canada is also thought to be the earliest. Outwash gravel associated with this advance is magnetically normal, and predates the Mosquito Gulch tephra (ca. 1.4 Ma) in the Klondike area, suggesting either a Pleistocene (1.77–1.95 Ma; Olduvai) or Pliocene (2.58–3.58 Ma; Gauss) age. In the lower Klondike valley, this outwash (Klondike gravel) is interbedded with Upper White Channel (UWC) gravel, which is elsewhere associated with tephra beds dating to ca. 3 Ma on the basis of glass fission-track ages.

Here, in situ-produced cosmogenic ^{26}Al and ^{10}Be, is used to test the age model for earliest CIS advancement by burial dating sediment at the top of the UWC, and at the base of the Klondike gravel at Australia Hill near Dawson City, Yukon Territory. Based on recent estimates for post-depositional deep muon production, a mean burial age of 2.8 ± 0.3 Ma is

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