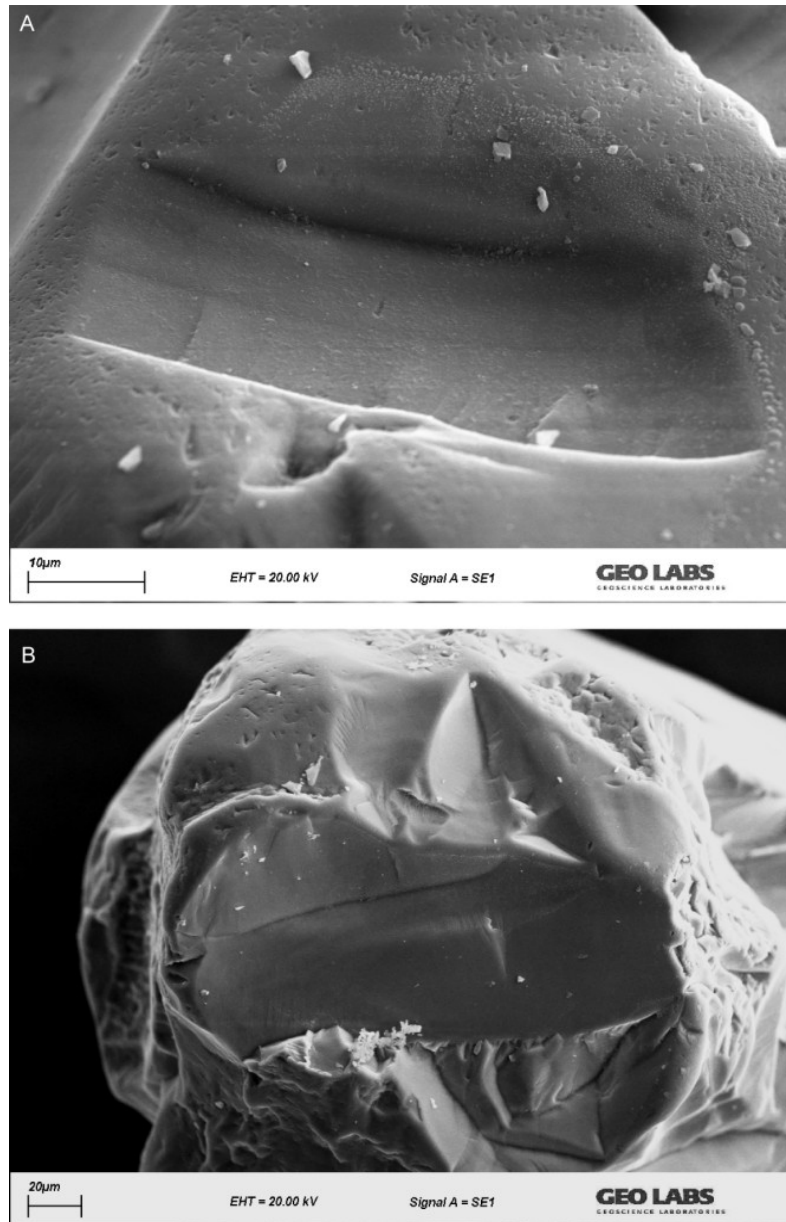
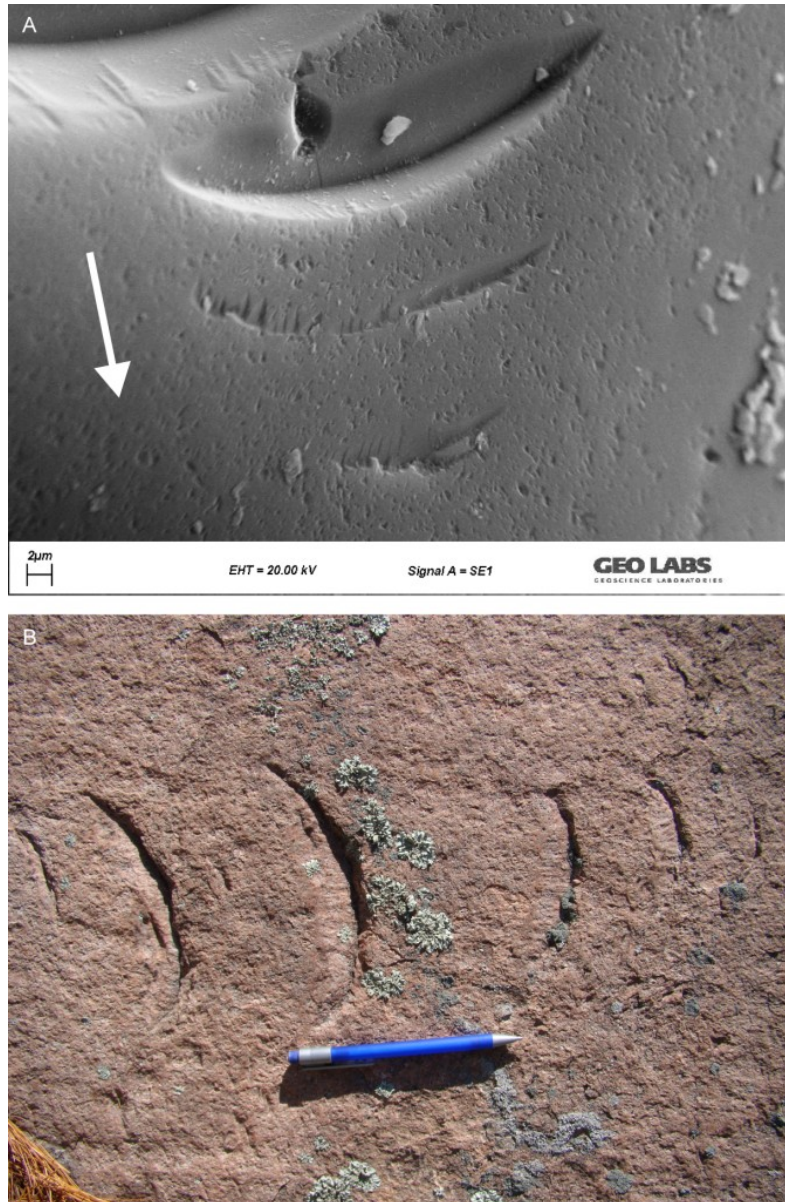


## Supplemental Figures



**Figure DR1.** Troughs with flat floor interpreted as resulting from grinding and scouring under the persistent overburden pressures from glaciers. A: In a flat surface of a quartz grain. B: Cutting through an edge of a quartz grain.



**Figure DR2.** Trails of crescentic gouges resulting from subglacial fracturing and gouging by rock fragments that were frozen to the sole of a glacier and moved in a stick-slip fashion under the persistent overburden pressures. A: Those on a quartz grain from the Pliocene till. B: Those produced by the Late-Wisconsinan Laurentide Ice Sheet on granite bedrock in northern Ontario. Arrow and pen (15 cm long) point to ice flow direction.



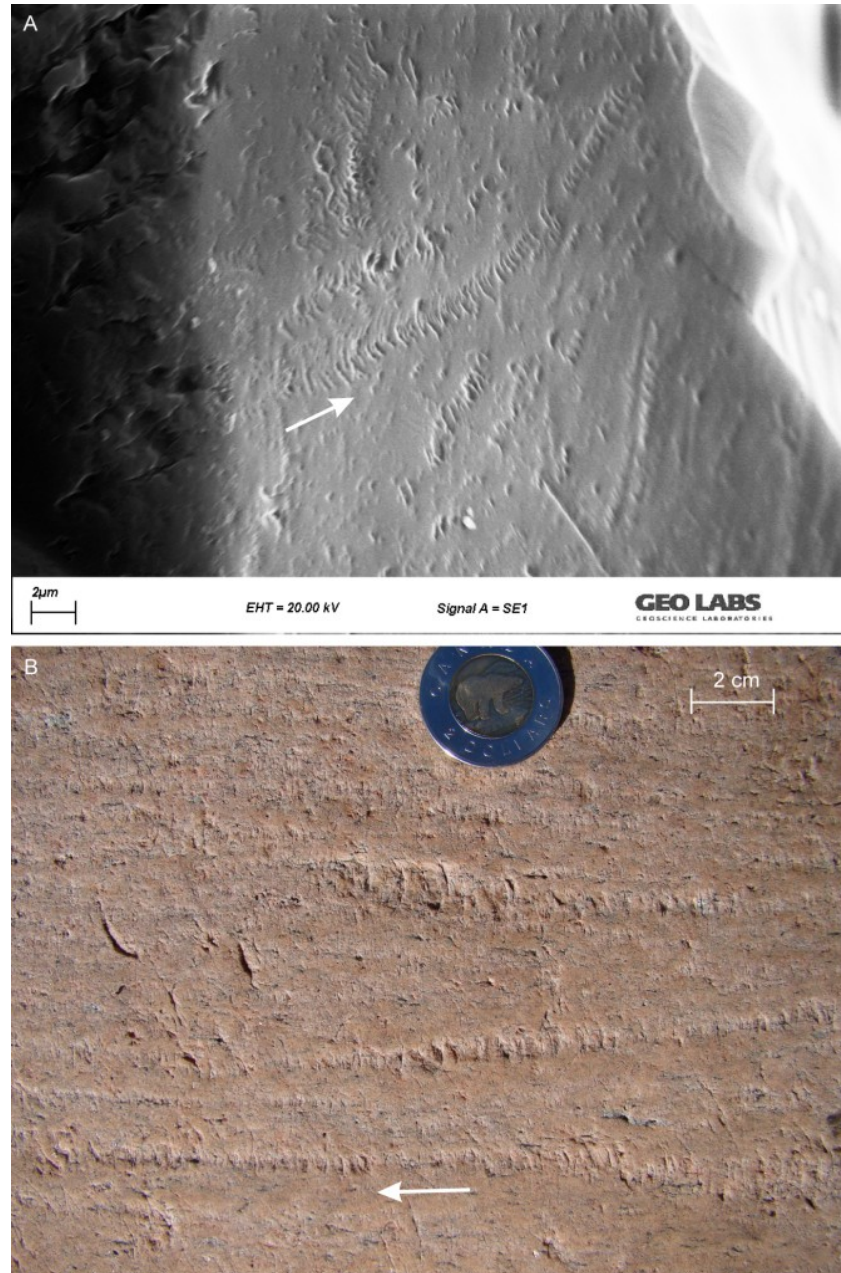


**Figure DR3.** Coaxial crescentic gouges in a groove produced by the Late-Wisconsinan Laurentide Ice Sheet on granite bedrock in northern Ontario. Ice flow direction from bottom to top. Coin 2.3 cm in diameter. Compare **Figs. 3B** and **3C** in the main text with these features.





**Figure DR4.** Transverse crescentic fractures along striae produced by the Late-Wisconsinan Laurentide Ice Sheet on granite bedrock in northern Ontario. Ice flow direction from left to right. Coin 2.7 cm in diameter. Compare **Fig. 3D** in the main text with these features.



**Figure DR5.** Transverse crescentic fractures along striae resulting from subglacial grinding and fracturing under the persistent overburden pressures from glaciers. Arrows indicate ice flow directions. A: Those on a quartz grain from the Pliocene till. B: Those produced by the Late-Wisconsinan Laurentide Ice Sheet on granite bedrock in northern Ontario. Note that (A) is the close-up view of **Fig. 3D** of the main text.