

**Sanders, J. E.; and Merguerian, Charles, 1992a, Directional history of Pleistocene glaciers inferred from features eroded on bedrock, New York metropolitan area, SE NY.**

If a glacier erodes bedrock, the usual perception is that the youngest glacier will obliterate all direction-of-flow evidence that any previous glacier(s) may have sculpted. By contrast, we have found that glacially eroded bedrock can retain convincing evidence demonstrating ice flow from at least three glaciations.

Rock drumlins and/or the upglacier sides of roches moutonnées ("turtlebacks") fashioned by a glacier that flowed from N15°E to S15°W have been reshaped and grooved by one or more glaciers that flowed from NW to SE. The younger glacier(s) from the NW modified but did not destroy the diagnostic rounded shapes of the older rock drumlins and "turtlebacks." A still-younger glacier that flowed from N15°E to S15°W, from the same direction as the first glacier, eroded grooves and diagnostic crescentic marks. This youngest glacier, whose effects are much less pervasive and less widespread than those of either of the earlier two, did not obliterate the features eroded by either of the two older glaciers. This evidence of glacially eroded bedrock, which is consistent with our interpretations of multiple ice-flow directions based on provenance data, degree of weathering of stones in the till, and stratigraphic relationships, is well displayed in Inwood Park, Fort Tryon Park, Central Park, and in the New York Botanical Garden.

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