

**Strangely preserved flutes and grooves from the fluvial Port Hood Formation,
(Carboniferous) of western Cape Breton Island, Nova Scotia**

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A widely accepted view in sedimentology is that flutes and grooves are sole marks, typically preserved on the under-sides of sandstone beds, and formed by corrosion or fluid stressing at the sediment/water interface by fluvial, tidal, or

turbiditic currents. Accordingly, such structures have come to be accepted as excellent criteria for indicating "way-up" and "palaeocurrent direction" in ancient sandstones.

Structures within some of the fluvial sandstones of the Port Hood Formation of western Cape Breton Island appear to challenge this notion. Inverted grooves and spindle-shaped flutes occur on the top of sandstone beds, whereas populations of twisted and parabolic flutes occur on vertical and inclined margins of mudstone-sandstone interbeds in highly variable orientations, and independent of current direction.

An alternative explanation is required for the origin of these and other structures within the Port Hood Formation. A physical diagenetic origin, namely the remobilization of shallow subsurface, unconsolidated muds, possibly the result of tectonism, is one such candidate. Whatever the actual cause of these structures, additional care must in future be taken when discussing the sedimentological implications of flute and groove structures. Specifically, flutes and grooves should no longer be considered as having an exclusive affinity to sole marks.