A reconnaissance paleomagnetic study of the Bull Arm Formation of the western Avalon Peninsula, Newfoundland

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Although much evidence supports rapid Precambrian migration of Laurentia from near the south pole to the equator, great debate still continues concerning the position of Avalonia during the late Proterozoic-early Paleozoic. In an attempt to constrain the position of Avalonia, the bimodal Bull Arm Formation of the western Avalon Peninsula was chosen for paleomagnetic study because of its suspected age (~570-550 Ma) and relatively unaltered condition.

The paleomagnetic results from the Bull Arm Formation indicate that 4 out of 7 sites displayed a stable characteristic remanence held by hematite which was isolated during stepwise alternating field demagnetization. Although a conglomerate test was inconclusive, a positive fold test indicates that this characteristic remanence predates folding and is most likely primary. The tilt-corrected site-mean characteristic remanence has a declination of 62° and an inclination of -40° ($k = 5.8$, $\alpha_{95} = 18.5$) yielding a paleopole at 3.8°S, 78°E ($dp = 13.4°$, $dm = 22.2°$) for West Avalonia. The corresponding paleolatitude for the Avalon Peninsula is 23°S ± 13°. The large error associated with the paleolatitude as well as the lack of a precise radiometric date for the Bull Arm Formation limit the extent to which these results can be applied to paleogeography. However, doubling the number of sites studied should reduce the error to an acceptable level and the presence of zircon in some felsic flows should allow precise U-Pb dating in the future.