

Implications of $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende ages from late Proterozoic-Cambrian plutons in the Avalon Composite Terrane of Nova Scotia

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The Avalon Composite Terrane in Nova Scotia mainly represents a late Proterozoic, rifted, cratonic, magmatic arc complex. The geochemistry of the volcanic rocks indicates that

most of southeastern Cape Breton Island is underlain by a volcanic arc, whereas the Antigonish and Cobequid Highlands expose intra-arc rift sequences. These units are unconformably

overlain by subaerial to shallow marine Cambrian-Ordovician sedimentary sequences containing an Atlantic fauna that are interbedded with Early to Middle Cambrian, within-plate, continental rift volcanic rocks. $^{40}\text{Ar}/^{39}\text{Ar}$ plateau ages recorded by hornblende from plutons spatially associated with these volcanic rocks correspond to three groupings: (1) ca. 600-635 Ma in Cape Breton Island south of the Macintosh Brook Fault (traversing the Boisdale Hills); (2) ca. 525-555 Ma in Cape Breton Island north of the Macintosh Brook Fault (Boisdale Hills, North Mountain and Creignish Hills); (3) ca. 600-625 Ma in the Antigonish and

Cobequid highlands. Based upon the low metamorphic grade of the late Proterozoic and Early Paleozoic rocks, and the low pressures recorded in contact aureoles and plutons, it is inferred that these plutons were emplaced at relatively shallow crustal levels, and therefore the $^{40}\text{Ar}/^{39}\text{Ar}$ plateau ages probably closely date their emplacement. Interpretation of the age data suggests that plutonism in Nova Scotia associated with the rifted magmatic arc lasted from ca. 635-600 Ma. Igneous activity continued between ca. 555-525 Ma and may have been related to the Cambrian, within-plate, rift volcanism.