

## One hundred and eighty million years of crustal growth in the Makkovik Province, Labrador

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The Paleoproterozoic Makkovik Province of eastern Labrador and the correlative Ketilidian mobile belt of southern Greenland preserve vestiges of a ~1.9 to 1.72 Ga accretionary orogen along the southern margin of the North Atlantic craton (NAC). Both belts contain reworked Archean rocks and pre-orogenic supracrustal units in the north, and Paleoproterozoic arc-related plutons and volcano-sedimentary successions in the south. Major transcurrent shear zones at Kaipokok Bay, Labrador and Kobberminebugt, Greenland, mark the boundary between these fundamental lithotectonic domains.

U-Pb geochronology has proven an important investigative tool in unravelling Makkovikian orogenic history, particularly when sampling strategy is linked to detailed structural and geochemical studies. Oldest Paleoproterozoic rocks in the northern Makkovik Province are 2235 Ma diabase dykes, and younger platformal rocks of the Lower Aillik Group, both which are interpreted to record stretching and subsidence of Archean crust. An overlying mafic metavolcanic unit erupted at 2178 Ma, and stratigraphically higher turbiditic wackes deposited after 2013 Ma, formed in an oceanic environment that had evolved to a foredeep basin by  $\leq 2013$  Ma. Initial amphibolite-facies deformation of all these units and their Archean substrate at 1896 Ma is attributed to early interaction of juvenile terranes with the NAC margin, and (or) to continental collision in the west. Voluminous granitoid plutonism within the Archean domain between 1895 and 1860, responsible for much of the Island Harbour Bay plutonic suite, occurred in a tectonic setting marked by amphibolite-facies

thrusting but dominated by dextral transcurrent shearing. The latter part of this period coincides with earliest felsic volcanic activity in the Upper Aillik Group, an important component of the accreted juvenile terrane(s).

The U-Pb data indicate renewed granitoid plutonism and deformation between 1840 and 1785 Ma, with crustal anatexis, amphibolite- to greenschist-facies fabric development, and an evolution from calc-alkaline to A-type plutonism representing the dominant themes. Northwest- and southeast-directed thrusting within the juvenile terranes likely also played an important role. Deformation within the Archean block was increasingly localized within dextral shear zones (some which represent reactivated older thrusts), and the centre of plutonic and volcanic activity appears to have migrated southward during this period. A foliated tonalite in the Cape Harrison domain (southern Makkovik Province) yields an emplacement age of 1817 Ma, suggesting the presence of a north-dipping subduction zone beneath the accreted terranes at this time.

A-type granitoid bodies throughout the Makkovik Province are in part attributed to ca. 1720 Ma post-orogenic plutonism. A 1715 Ma megacrystic granite of the Island Harbour Bay plutonic suite is a product of this event, with a redefinition of this suite clearly indicated. Our U-Pb data and related studies demonstrate a longevity of plutonic and tectonometamorphic activity in the Makkovik Province, and invite comparisons with the Canadian Cordillera where juvenile terrane accretion and lateral tectonic displacements are hallmarks of North American crustal growth.