

are presented new geochronological data ( $^{40}\text{Ar}/^{39}\text{Ar}$ , Re-Os) from mineralized areas in this region that constrains the timing of related magmatic-tectonic events. Results are summarized, progressing from east to west geographically. (1) A Re-Os age for molybdenite from the Coxheath Cu-Au-Mo porphyry deposit, Cape Breton, indicates an age of  $626 \pm 3$  Ma, which compares to 620 Ma  $^{40}\text{Ar}/^{39}\text{Ar}$  ages for the host rock. The new Re-Os age, along with the nature of mineralization, confirms this as a rare example of a Precambrian porphyry system. (2) The terrane bounding Cobequid - Chedabucto Fault System has been the locus of episodic deformation, magmatism, fluid flow, and mineralization. The age of hydrothermal activity is constrained at two localities, Copper Lake (Cu-Au) and Mt. Thom (Cu-Ni-Co). At the former, concordant ages for hydrothermal muscovite ( $^{40}\text{Ar}/^{39}\text{Ar}$ ,  $327 \pm 1.3$  Ma) and pyrite (Re-Os,  $323 \pm 8$  Ma) were obtained, which agree with  $^{40}\text{Ar}/^{39}\text{Ar}$  whole-rock ages for two hydrothermally altered granites ( $335 \pm 5$  Ma). (3) Whole-rock slates from gold districts near Halifax were dated with  $^{40}\text{Ar}/^{39}\text{Ar}$ . Samples in and distal from bedding-concordant quartz veins yielded plateau ages of ca. 375 Ma, thus younger than the age for regional deformation. That the ages overlap both vein Au formation (Re-Os arsenopyrite = 380 Ma) and 380 Ma granitic plutonism suggest that large thermal anomalies related to vein formation may reflect an underlying heat source (i.e., granites). (4) Mineralization at the East Kemptville Sn deposit is constrained at  $376 \pm 1$  Ma (Re-Os molybdenite); however, the age for reactivation of fault zones controlling ore are unconstrained. Dating of euhedral sanidine from banded zeolite-sulphide fault-fill yielded a 230 Ma  $^{40}\text{Ar}/^{39}\text{Ar}$  plateau age. This age may equate to Triassic faulting and sedimentation in the Fundy Basin. (5) Dating of both molybdenite (Re-Os) and hydrothermal muscovite ( $^{40}\text{Ar}/^{39}\text{Ar}$ ) in the Clayton Hill pluton give essentially concordant ages of  $363 \pm 1.3$  Ma and  $361 \pm 2.3$  Ma, respectively. These new data provide evidence for a previously unknown metallogenic event in the Meguma terrane, possibly associated with A-type magmatism. (6) Re-Os dating of molybdenite from richly-mineralized greisen boulders from the Plymouth area, which initiated the tin rush in SW Nova Scotia in the 1970s, gave an age of  $374 \pm 2$  Ma, similar to the age for mineralization at East Kemptville. This material is, therefore, not related to the nearby 357 Ma Wedgeport pluton.

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**Correlation of thermo-tectonic and metallogenic events in the Avalon and Meguma terranes of Nova Scotia with the use of  $^{40}\text{Ar}/^{39}\text{Ar}$  and Re-Os geochronometry**

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The geological evolution of the Avalon-Meguma composite terrane is punctuated with numerous thermo-tectonic events, including widespread magmatism and deformation (e.g., Acadian and Alleghanian orogenies). Associated with these regional events is fluid flow, localized in the case of magmatism, but more widespread for regional deformation. Herein