

New radiometric data from basement rocks offshore Nova Scotia

L.F. Jansa

*Atlantic Geoscience Centre, Geological Survey of Canada, Bedford Institute of Oceanography,
P.O. Box 1006, Dartmouth, Nova Scotia B2Y 4A2*

and

Georgia Pe-Piper

Department of Geology, St. Mary's University, Halifax, Nova Scotia B3H 3C3

About 20 hydrocarbon exploration wells on the Scotian Shelf have encountered basement rocks beneath the Mesozoic sedimentary basins. Most basement lithologies are either granite or low grade metamorphic rocks. We have made new radiometric determinations on granites from two wells on the La Have Platform and on Meguma Group rocks from the Montagnais I-94 impact structure and compare these data with radiometric data from on land.

K-Ar dating of biotite from Ojibwa *-* gave an age of 359 ± 12 Ma; from Mohawk *-* 329 ± 14 Ma. $^{40}\text{Ar}/^{39}\text{Ar}$ dating of Meguma metapelites at Montagnais I-94 gave an age of 359.3 ± 1.1 Ma. We have also dated pseudotachylite from Sandy Point, Shelburne Company by whole rock K/Ar at 281 ± 10 Ma.

The similarity of the metamorphic age from Meguma rocks at Montagnais and the biotite from Ojibwa suggests that this records a phase of plutonism, approximately coeval with the South Mountain Batholith. Although simple K/Ar dates are difficult to interpret with confidence, the date from Mohawk is

similar to the mid-Carboniferous "Hercynian-Alleghanian" reheating event recognised by several workers in the satellite plutons of southern Nova Scotia. There is no evidence for igneous activity corresponding to the mid-Permian plutonism off southwestern Nova Scotia. Since the pseudotachylite sample was somewhat altered, it is unclear whether the relatively young age results from some argon loss or whether it records a mid-Carboniferous thermal or shearing event.

New Sm/Nd isotopic data have been recently obtained from the Montagnais I-94 as part of a study into the relationship of the Montagnais impact to known tectite fields. This Sm/Nd chronology yield T_{CHUR} of 1127, 1190 and 1390 Ma for Meguma Group metasediments and 1330 Ma for the overlying Tertiary sediments. This T_{CHUR} estimate compares favourably with 1358 ± 104 determined by previous workers for Meguma metasediments. Rb/Sr data suggest a significant enrichment in Rb at about 400 Ma, which may correspond to either metamorphism of the Meguma Group or intrusion of the major batholiths.