

A U-Pb date on the Mohannes pluton of southwestern New Brunswick

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A geochronological study of the syntectonic Mohannes pluton in the St. Stephen area was undertaken to better constrain the time of deformation within the Tremadocian to Caradocian Cookson Group of southwestern New Brunswick. Four generations of folds have been recognized in the Cookson Group: northeast-trending, tight to isoclinal F_1 folds vary in attitude from upright to recumbent; close to open F_2 folds are associated with a penetrative crenulation cleavage dipping gently to the northwest or southeast; open to chevron-style F_3 and F_4 folds trend, respectively, to the northeast and northwest.

The Cookson Group is intruded by the foliated Mohannes pluton and by the massive St. Stephen and Baring plutons. The rapid increase from chlorite- to garnet-grade metamorphism across the Cookson Group from the northwest to southeast appears to be associated with emplacement of these syn- to post-tectonic plutons. The steep, northeast-trending cataclastic fabric in the Mohannes pluton is defined by the preferred orientation of plagioclase and alkali feldspar augen set in a fine-grained matrix of granulated quartz. Biotite and

hornblende mosaics overprinting the cataclastic fabric may represent contact effects of the nearby post-tectonic plutons. Cordierite porphyroblasts in the vicinity of the Mohannes pluton show evidence of growth during deformation. However, the presence of randomly-oriented andalusite and staurolite porphyroblasts within large sedimentary rafts suggest that metamorphism within the interior of the Mohannes pluton outlasted deformation.

Results on three zircon fractions yield a preliminary U-Pb date of 420 ± 5 Ma for the Mohannes pluton. The time of emplacement and synchronous deformation of the pluton is, therefore, restricted to near the Wenlockian-Ludlovian boundary. Evidence for contemporaneous uplift associated with deformation is provided by the presence of Cookson Group detritus and Wenlockian limestone clasts in the Late Silurian Oak Bay conglomerate, which unconformably overlies the Cookson Group to the southeast. Indications of uplift are not evident along the northwestern margin of the Cookson Group suggesting that uplift may have been related to southward-thrusting over the Avalon Platform.