A geotraverse across the Kingston arc-Mascarene-backarc basin in southwestern New Brunswick, Canada

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New exposures along Highway 1 in southwestern New Brunswick provide an oblique cross-section through the dismembered Silurian Kingston arc - Mascarene backarc basin system. Observations made on these new exposures have better defined the relationships between volcanic and plutonic rocks in the Kingston and Mascarene groups. Much of the Kingston arc in this area is comprised of medium- to coarse- grained, and generally highly sheared mafic plutonic rocks assigned to the Andys Pond Gabbro; composite dykes of fine-grained, sheared, porphyritic granite and diabase intrude the gabbro. Highly strained, Early Silurian host rocks of the Kingston Group along the southeastern margin of the gabbro include felsic tuff and mafic tuff locally intercalated with marble. Kinematic markers indicate that shearing in the volcanic and plutonic rocks was associated with dextral strike-slip motion along the boundary with Precambrian basement granitic rocks of the Brookville terrane to the southeast. The depositional age of a thin fault sliver of highpressure, garnetiferous psammite along this boundary is uncertain.

Backarc volcanic and sedimentary rocks of the Mascarene Group are separated from the Kingston Group to the southeast by Precambrian basement rocks of the New River terrane. Late Ordovician to Early Silurian, shallow-marine limestone and tuff of the Goss Point Formation, the lowest part of the Mascarene Group, likely correlate with the highly strained marble and mafic tuffs in the Kingston Group. Steeply-dipping, Early Silurian tuff and black shale of the Letete Formation represent deeper-marine deposits within the Mascarene backarc basin. Late Silurian strata in the upper Mascarene Group are gently dipping and display wellpreserved volcanic and sedimentary structures indicative of shallow-marine to terrestrial deposition. Dyke offshoots of the Utopia Granite intrude the Mascarene volcanic sequence. Conglomerate of the Oak Bay Formation along the northwestern boundary of the backarc basin can be observed lying unconformably on polydeformed black shale of the Cambrian-Ordovician Cookson Group of the adjacent St. Croix terrane. Intercalated, brachiopod-rich, Early Silurian shallow-marine sandstone, siltstone, and felsic tuff of the Waweig Formation overlie the conglomerate. A thin unit of black shale in the middle of the Waweig section may correlate with the much thicker siltstone-shale sequence of the Jones Creek Formation, exposed in the more distal, deeper part of the backarc basin to the northeast along Highway 7.

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