Basis for Distinguishing Different Terranes Within "Avalonia" in Maine and New Brunswick

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Remnants of a non-North American continent form a composite terrane in New England and New Brunswick characterized by shelly Atlantic fauna (equivalent to the Baltic, Celtic, Acadian, or Rhenish faunas of various authors) in Paleozoic sedimentary cover sequences that were deposited upon one or more Precambrian basements. Within this composite terrane, at least two distinctive lithotectonic terranes were shuffled together before to or during accretion to the North American craton along strike-slip faults that were subsequently intruded by Acadian plutons.

Fragments of a terrane corresponding to the Avalon terrane of eastern Newfoundland occur in New Brunswick in long belts in the Caledonian Highlands and Kingston Peninsula. These belts consist of Late Proterozoic plutonic and bimodal volcanic rocks unconformably overlain by thin fossiliferous Cambrian and Ordovician rocks of shallow marine origin. No Silurian or Devonian cover rocks are present. This type of terrane is widespread in eastern Massachusetts and Rhode Island, but absent in Maine.

The second distinctive lithotectonic terrane occurs along the coast of Maine and extends northeast across southern New Brunswick. It consists of highly deformed and metamorphosed sialic Precambrian rocks overlain by poorly dated, but less deformed, Upper Proterozoic to Ordovician interbedded feldspathic and manganiferous sedimentary rocks and bimodal volcanic rocks that are metamorphosed to greenschist facies assemblages. These rocks are in turn overlain by thick sequences

of weakly metamorphosed Lower Silurian to Lower Devonian bimodal volcanic rocks and shallow marine sedimentary rocks containing shelly Atlantic fauna.

Another possible lithotectonic terrane within the composite terrane consists of thick Ordovician black sulfidic slates and thin sandstones, but the shelly fossils obtained so far may not be diagnostic of Atlantic origin. The black slate lithotectonic terrane is located between terranes with typical North American or Atlantic faunas in both Maine and New Brunswick. Meguma is still another lithotectonic terrane of early Paleozoic age that might be considered a component of the composite terrane.

The boundary between Grenville basement of cratonic North America and other younger (?) basements "outboard" of the craton need not coincide with the boundary between North American and Atlantic faunas found in the lower Paleozoic cover sequences.