

THE TETAGOUCHE GROUP: RECORD OF A CAMBRIAN-EARLY ORDOVICIAN  
PASSIVE MARGIN AND MIDDLE ORDOVICIAN BACK-ARC BASIN

*C.R. van Staal*  
*Geological Survey of Canada*  
*Ottawa, Ontario, K1A 0E8*

The central part of the New Brunswick Appalachians is underlain by Cambro-Ordovician volcanic-sedimentary rocks of the Tetagouche Group and correlatives. Cambrian marine quartzose sediments and Tremadocian-Arenigian black shales extend from Bathurst to the Cookson Inlier in southern New Brunswick. The quartzose sediments are interpreted as a clastic wedge deposited on a westward dipping continental slope and rise of the Iapetus Ocean. They are overlain by Early Ordovician black shales and quartzose sediments which appear to onlap on to the Avalon Platform.

Initiation of S-type igneous activity in Late Arenig times is marked by a locally preserved disconformity, produced by the "Penobscot disturbance." Rocks below and above the disconformity record an identical structural history, and pebbles in the conglomerate overlying the black shales do not contain a predepositional cleavage. This disconformity is explained by thermal bulging related to earliest rifting associated with eruption of

extensive S-type silicic volcanism. Mafic igneous activity followed silicic volcanism in late Middle Ordovician time. Basalts, which are abundant in the northern part of the Miramichi Zone and along its western margin, have compositions typical of ocean floor and oceanic island. Although they can be correlated with the Pointe Verte Formation of the ophiolitic Fournier Group, these MORB and WPB basalts erupted locally on sialic crust.

Structural and metamorphic data suggest that the main body of the basalts was thrust southeastwards over the quartzose sediments that underlies most of the Miramichi Zone. These relationships suggest that the Tetagouche volcanics formed in a back-arc basin that evolved into a marginal sea floored by oceanic crust. Southeast obduction of the ophiolitic Fournier Group and associated accretionary wedge suggest northwest-directed subduction during closure of the marginal sea in Late Ordovician and/or Early Silurian times.