

**Stratigraphic and Petrochemical Evolution of Late Proterozoic
Rocks in Southeastern Newfoundland**

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Late Proterozoic rocks, which lie to the southeast of the Dover Fault in Newfoundland, display a stratigraphic, tectonic and magmatic evolution analogous to that of many Late Proterozoic belts of Gondwana, particularly Afro-Arabia. In Newfoundland, these rocks comprise the Avalon Zone or Avalon

terrane, and are disposed in several northeast-trending fault blocks. Detailed stratigraphic and chemical data permit precise correlations across most faults; the major exception is the Paradise Sound Fault. The oldest dated rocks the Avalon Zone form a 760 Ma, ophiolitic volcanic - tholeiitic gabbro

complex; its relationship to younger rocks is uncertain. Subsequent volcanicity (630 Ma - 580 Ma) is divisible into at least three volcanologically, petrologically and geochemically distinct intervals, locally separated by episodes of sedimentation. The first is characterized by the eruption of subaqueous and locally subaerial, basaltic, rarely andesitic and rhyodacitic-rhyolitic rocks of calc-alkaline to mild tholeiitic affinity and intrusion of calc-alkaline adamellite and granodiorite. A second interval is marked by extensive epiclastic volcanism and volcanogenic sedimenta-

tion together with the extrusion of rhyolite and flood basalt of mild alkaline affinity. A final interval of latest Proterozoic age (ca. 590-580) (possibly as young as Early Cambrian) resulted in peralkaline, bimodal volcanism and rare alkaline to peralkaline plutonism. This volcanism accompanied terrestrial sedimentation locally within fault-bounded basins that formed in response to strike-slip movements. The magmatic evolution is comparable to both Proterozoic and recent Phanerozoic orogenic areas such as the Hijaz Arc and the Basin and Range Province.