

Results of recent mapping in the Newfoundland Appalachians

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Some of the major results of a five year program of geological mapping carried out by the staff of the Department of Mines and Energy and funded under a joint Federal/Provincial Program are summarized.

Cambro-Ordovician carbonate sedimentation in the Humber Zone in Western Newfoundland occurred in three megacycles, each containing a major marine transgression and regression. Disconformities formed during the regressive stages. Local dolomitization of limestones occurred during the regressions and these dolomites are the locus of Mississippi Valley-type mineralization. The regressions on the platform can be related, on the basis of conodont biostratigraphy, to deposition of limestone reefs in the volcanic arcs of the adjacent Dunnage Zone.

Mapping has confirmed the major subdivisions of the Dunnage Zone in the centre of the island into ophiolitic basement, lower Ordovician island arc, Upper Ordovician shale and flysch, and Upper Ordovician to Silurian shallow water and subaerial volcanics and sediments. Rocks in southwest Newfoundland, previously considered to be Grenville

basement are now interpreted as remnants of Lower Ordovician oceanic crust intruded by syntectonic tonalite plutons. The Cape Ray Fault, once interpreted as a cryptic suture, is explained as a strike-slip fault that separates an ophiolite-plutonic subduction related complex to the northwest from an ophiolite-island arc complex to the southeast.

Extensive dismembered ophiolites (previously interpreted as mantle diapirs) have been discovered in the eastern part of the Dunnage Zone. A ring of ophiolites east of Great Burnt Lake may be the remnants of a large thrust sheet, raising the possibility that much of the Dunnage and Gander Zones is allochthonous.

Dating of phyllites in the Dover Fault indicates that the Gander and Avalon Zones were juxtaposed in Devonian times. The post-tectonic Ackley granite (356 ± 5) cuts the fault and is unaffected by it. A litho-geochemical study of this pluton indicates that high level, ore differentiated phases in the south are anomalous in F, U and Sn. Mineralized Greisen zones were recently discovered by ground follow-up.