

Post-Taconian history of the Newfoundland Humber Zone

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The Humber Zone of western Newfoundland is characterized by the presence of Grenville basement overlain by Cambro-Ordovician shelf sediments that represent the pre-Taconian passive margin of North America; this succession is frequently described as an 'autochthon', on the basis of its relationship to the overlying Taconian Humber Arm Allochthon. Several lines of evidence suggest that the 'autochthon' was in fact significantly transported during post-Taconian deformation related to the accretion of exotic terranes to the east.

Offshore seismic profiles to the west of Newfoundland indicate the presence of a thrust front in which the upper Silurian Clam Bank Formation is deformed. To the south, the thrust front can be traced to Port au Port Peninsula where balanced section construction suggests duplication of the carbonate platform succession, and reactivation of Taconian normal faults as Acadian thrusts.

Inland, Lithoprobe East Vibroseis line 12 shows subhorizontal and gently dipping reflectors beneath the 'inlier' of Grenville basement at Indian Head. This suggests that the considerable shortening represented at the surface in this area

by folding and faulting is accommodated by a major detachment at depth. To the north, between the Bay of Islands and Deer Lake, platform carbonates are similarly intensely shortened and show several generations of fabric development. Subhorizontal, parallel reflectors displayed on Lithoprobe lines 2 and 3 can be traced continuously beneath Deer Lake. These are interpreted as autochthonous shelf sediments beneath allochthonous units that outcrop at the surface.

Farther north, the southern edge of Grenville basement of the Long Range massif is a NW-trending monocline which we interpret to reflect a hangingwall ramp on a major detachment surface. Outcrop of Grenville rocks is bounded to the west by a thrust fault (the Long Range thrust) which dies out southward and which probably accommodates only a minor amount of displacement. Just west, the Parson's Pond Thrust is interpreted to be a major detachment, transporting platform and basement rocks above the Cow Head portion of the Humber Arm Allochthon. We infer that the trace of this detachment passes offshore close to Green Point, and links with the seismically imaged thrust front offshore.