

Late Precambrian basement - Silurian cover relationships and tectonostratigraphic affiliations in southern Newfoundland

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In the Hermitage Flexure segment of the Newfoundland Appalachians, a Silurian cover sequence, disposed in elongate fault-bounded basins, rests unconformably on a late Precambrian basement. The cover basins, which consist of 430–420 Ma fluvial clastic and subaerial felsic volcanic rocks (La Poile Group), exhibit strong, coincident, thermal and strain gradients increasing from depocenter to margins. An upright to recumbent structural transition in the La Poile Group reflects inhomogeneous, thrust sense, simple shear deformation. Regional high-T, low-P dynamothermal metamorphism produced hornfelsic schists near synkinematic granites that are preferentially intruded near basin margin faults. Where younger granites intrude the cover, static hornfels are typical. The sub-La Poile Group basement includes a variety of late Precambrian, Cambrian and Ordovician rocks that record evidence of at least two pre-Taconian orogenic events. The oldest component of this basement is the Grey River-Cinq Cerf gneiss (post-686 \pm 33/-15 Ma; pre-580 \pm 10 Ma), a complex of amphibolitic gneiss, migmatite, hornblendite and

metagabbro. During Silurian remobilization, these rocks were thrust imbricated with the La Poile cover, variably re-metamorphosed, and intruded by synkinematic granites. These events essentially completed fragmentation of a once-contiguous late Precambrian basement block.

Earliest metamorphism of the Grey River-Cinq Cerf gneissic basement post-dates Grenvillian metamorphism of Humber Zone basement inliers and is broadly synchronous with tectono-magmatic events in the Avalon Zone. The Dunnage Zone, which does not contain strata older than Cambrian, occurs in the western Hermitage Flexure, overthrust by late Precambrian basement. Field relationships indicate that Dunnage (and Gander) Zone rocks were never deposited on this crystalline basement, where Ordovician rocks do not intervene between basement and Silurian cover. However, the presence of detritus of possible late Precambrian basement affinity in the Ordovician rocks suggests their original proximity.