

## **Reconstruction of the Cambrian-early Ordovician Carbonate Shelf Along Laurentia : Significance of the Lévis Conglomerate, Québec Appalachians**

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The Cambrian-early Ordovician carbonate shelf at the margin of Laurentia in the Québec Reentrant is best known from clasts in Cambrian-Ordovician conglomerate units of the Humber zone, Québec Appalachians. Conglomerates are divided in three main age groups: middle to upper Cambrian, upper Cambrian, and lower Ordovician. The Lévis conglomerates belong to the lower Ordovician group. The clasts are usually centimeter to meter-sized, but locally reach up tens of meters. Sedimentologic and diagenetic analyses are carried on the limestone clasts to decipher facies evolution and porosity history of the shelf.

The clasts are composed of a variety of carbonate facies and contain Cambrian and lower Ordovician faunas. The commonest facies is a massive *Girvanella-Epiphyton* boundstone into which the *Girvanella* sheets often consist in columnar stromatolites. Associated facies are pelletal bioclastic mudstone, and less frequent pelletal bioclastic grainstone. Both containing variable volume of echinoderms, trilobites, oolites, and subordinate mollusks.

Cements of the limestone clasts are of various types. *Girvanella-Epiphyton* boundstone shows a very open framework with millimeter-sized primary cavities that have been cemented, first by an isopachous finely crystalline non-luminescent calcite, followed by a dull-luminescent equant calcite spar cement. The pelletal mudstone-wackestone often shows a dissolution network filled with a zoned inclusion-rich/inclusion-poor non-luminescent calcite cement followed by a zoned dull and non-luminescent calcite spar, and a final zoned dull/bright-luminescent equant calcite spar. The less significant pelletal bioclastic grainstone facies presents same cementation episodes as boundstone shows. Late, locally pervasive dolomitization has affected all limestone types.