

LAURENTIA-SOUTH AMERICA RELATIONS DURING ORDOVICIAN TIMES

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The Laurentian benthic faunal and stratigraphic affinities of the Precordillera terrane of NW Argentina (PC) during Cambrian and Early Ordovician times constitutes the nearest thing to a 'smoking gun' for the hypothesis that the proto-Appalachian and proto-Andean margins were in proximity during Early Paleozoic times. Paleomagnetism supports the hypothesis that the PC was derived from Laurentia in the vicinity of the southern Appalachians and Ouachita embayment. Derivation of the PC as a microcontinent requires a substantial (1000 km) ridge crest jump into the cratonic interior of the Laurentian craton after isolation from Gondwanaland. In the absence of evidence of plume impingement in the interior Ouachita embayment or present western flank of the PC, this appears to be a non-actualistic scenario. Moreover, the presence of numerous K-bentonite layers in the San Juan Formation of the PC which still has Laurentian benthic faunal affinities, at a stratigraphic level (Arenigian) where ash layers are very rare along the proto-Appalachian margin of Laurentia, points to an offshore plateau environment at the time. This would have been similar to that of the present Maurice Ewing Bank at the eastern extremity of the Falkland/Malvinas Plateau in the South Atlantic Ocean, which is situated close to the South Sandwich Islands arc. It leads to a model for the Famatinian-Taconic-Grampian orogeny that is analogous to the orogenesis resulting from Australia southeast Asian convergence today, and several tens of millions of years into the future.