

DOES PATAGONIA REPRESENT A MISSING PIECE DETACHED FROM THE ROSS OROGEN?

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The comparison of lithology, Archeocyath fossil, stratigraphy and detrital zircon patterns shows an intimate correlation between El Jagüelito Formation (Patagonia, Argentina) and Byrd and Beardmore groups (central Transantarctic Mountains), and suggests a common Ross orogenic history in East Gondwana during the Cambro-Ordovician. The Atdabanian-Botomian Archeocyaths recovered from a fossiliferous limestone blocks of El Jagüelito Formation meta-conglomerate shows strong affinity with Antarctica-Australia paleobiogeographic province, mainly described from the Shackleton Limestone of the Transantarctic Mountains (González *et alii*, 2011 and references therein). Following the Neoproterozoic rifting of the Rodinia supercontinent, the paleo-Pacific margin of Gondwana at central Transantarctic Mountains records a passive margin deposition stage (Neoproterozoic Beardmore Group with pillowed basalts), a platform stage (Shackleton Limestone) and a syn- to late-orogenic stage (Douglas Conglomerate/Starshot Formation, late Early Cambrian to Early Ordovician). Widespread Ross arc magmatism (Granite Harbour Intrusives and their volcanic equivalents of the Queen Maud Mountains) was active during the syn- to late-orogenic stages (Goodge *et alii*, 2004 and references therein). The El Jagüelito Formation meta-conglomerate can correlate with Douglas Conglomerate, both of which contain coeval archeocyathan limestone clasts. The volcanics and ignimbrites, and the diabase-microgabbro sills-dykes of the former may have their equivalent in the volcanics of the Queen Maud Mountains and basalts of the Beardmore Group respectively. All these units underwent similar Early Ordovician low-grade regional metamorphism. The El Jagüelito Formation is intruded by Ordovician post-orogenic Punta Sierra Plutonic Complex that is a little younger than the Granite Harbour Intrusives but might correlate with them. Previous (Naipauer *et alii*, 2010) and new detrital zircon provenance patterns (U-Pb ICP-MS-LA) of the El Jagüelito Formation are also markedly similar to those of the syn-orogenic, early Ross units dominated by proximal Ross magmatic sources. The Early Cambrian peaks constrain the maximum depositional age of the El Jagüelito Formation, which is consistent with the post-Botomian deposition age indicated by the archeocyathids. Less similarity appears with the late-stage Ross units of Early Ordovician age, significantly influenced by Greenville sources. As a result, we propose Patagonia as a crustal block originated in the Ross orogen and shifted from East to West Gondwana. The geodynamic issues regarding the mechanisms and timing of detachment of Patagonia from East Antarctica, transferring, docking and final amalgamation against proto-Pacific margin of South America are still debatable.

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