

THE EVOLUTION OF THE COLLISIONAL CONTINENT-CONTINENT PALEOZOIC OROGENIC BELT IN ARGENTINA

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The Pampean Ranges, part of the Puna, the Northpatagonian and the Deseado Massifs are interpreted as a continent-continent collisional orogenic belt which developed during the uppermost Precambrian to the Lower Carboniferous. The continental plates involved in the collision were to the East the Brazil-Africa cratonic region and to the West the Occidentalia terrane, integrated by Precambrian and reset lower Paleozoic metamorphic rocks which now trend along the Andes as minor remnants from Arequipa (Peru) to Patagonia.

The collisional event was preceded by a pre-collisional approaching subduction regime which included magmatic activity (c. 540 Ma) with tholeiitic affinities. During this episode a first deformational and metamorphic phase took place (Pampean Cycle), as well as the intrusion of several minor basic, ultrabasic and granulitic rocks from the upper mantle and the lower crust.

During the principal phase of the event (Ordovician, Famatinian Cycle, climax at 440-480 Ma), the collision progressed by thickening of the crust. Regional thrusting affected down to the lower crust and the upper mantle. The principal metamorphic episode (M2) developed mainly in a low to medium pressure/high temperature environment in which widespread migmatization and syntectonic per to metaluminous granites were emplaced, representing the melting of the continental crust during the main collisional event.

At the end of the collision, after a regional uplift, a group of posttectonic epicortical granites (some of them with the alkaline affinities) were emplaced up to the Lower Carboniferous. The intrusions were emplaced in a fragile crust, which also developed retrograde and contact metamorphism as well as late tectonic structures.

This collisional orogenic belt produce renewed crust by metamorphism and granitization as well as syntectonic and posttectonic lower to middle Paleozoic sedimentary basins, in the fore and back orogenic belt zones.

Sambagawa terrane in this area suggest extensive Late Cretaceous uplift; however, no Sambagawa erosional debris have been described from the Izumi Group.

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$^{40}\text{Ar}/^{39}\text{Ar}$ have been determined for hornblende and biotite separated from samples systematically collected along a traverse from the Ryoke terrane into the MTL (Kagun, and Chubu districts, Fig. 1). Only whole-rock samples of protomylonite within the MTL have been analyzed. Similar 68-70 Ma isotope correlation ages are recorded by hornblende within massive (Ikuta) and foliated (Minakata) granite and protomylonite within the MTL. The Median Tectonic Line (MTL) is a regional tectonic line separating metabasite-sillimanite metamorphic rocks within the Ryoke terrane from gneissic-type metamorphic rocks within the Sambagawa terrane, extending through the island arc region of Japan. These data also indicate that temperatures maintained during protomylonite formation within the MTL were less than those required to effect even partial rejuvenation of intracrystalline argon systems within hornblende. Protomylonite samples yielded well-defined whole-rock plateau ages of 62-63 Ma which are interpreted to closely date the last phase of ductile flow within the MTL. These results suggest that a significant ductile phase of movement occurred within the MTL in the early Paleocene. This may have been associated with significant sinistral strike-slip and resultant tectonic juxtaposition of previously separated portions of Sambagawa and Ryoke with unconformably overlying Izumi Group.

The MTL separates contrasting metamorphic belts (Sambagawa and Ryoke). Conditions favoring Sambagawa metamorphism reached c. 600°C and 10 kb. Maximum metamorphic pressures attained during metamorphism of the Ryoke belt have been estimated to have been c. 3-5 kb and c. 650°C.

There is no transition between high-P Sambagawa and low-P Ryoke belts, suggesting that parts of both geologic sequences have likely been tectonically extended as a result of movement within the narrowing MTL.

The late Cretaceous (Campanian to Maastrichtian, c. 66-84 Ma) Izumi Group unconformably overlies the Ryoke belt. There is no evidence of any Sambagawa erosional debris within the Izumi Group, and it appears that Sambagawa metamorphic rocks were not exhumed until after deposition of

