

Evolution of the Gondwana Margin in Southern Chile, as Revealed by U-Pb SHRIMP Zircon Dating.

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Along the Patagonian Andes, low-grade metamorphic rocks crop out in two belts, to the east and west of the 100 km wide Mesozoic-Cenozoic Patagonian batholith. They have usually been considered to be parts of a single Late Paleozoic accretionary complex developed on the SW margin of Gondwana. New petrological and paleontological data, and U-Pb SHRIMP dating of detrital zircons, indicate that they differ significantly in age and geological development. The eastern belt has a Devonian to Carboniferous sedimentary protolith of passive margin provenance, which was metamorphosed in a low P/T environment during the Late Paleozoic. It contains scarce metabasites of intraplate alkaline affinity and, in its northwestern part, extensive marble bodies. The diachronous western belt has units deposited during the Permian (the allochthonous Denaro Complex and Tarlton Limestone, and the Duque de York Complex), the Late Triassic (the Chonos Metamorphic Complex), and the Late Jurassic (the Diego de Almagro Metamorphic Complex). Metabasites of oceanic provenance are widely distributed. The two younger units underwent high P/T metamorphism in Jurassic to Early Cretaceous times.

This portion of the Gondwana margin does not record the products of a Late Paleozoic active continental margin as is the case in the Chilean coast to the north. Subduction was initiated in the Late Jurassic and is still active. It is possible that Late Paleozoic arc and forearc units were originally located outboard of the present margin and were tectonically displaced during the Jurassic break-up of the Gondwana margin.