Dr. Andres Folguera, Andean Tectonics Laboratory, University of Buenos Aires, Argentina

Mesozoic Tectonics in the Transition Between the Central Andes and the Patagonian Andes

Abstract. In recent years, a substantial change has occurred in the understanding of the Jurassic tectonic history in the transition zone between the Central Andeas and the Patagonian Andes. Previous hypotheses proposed a rather simple framework in which, from the Neuquén Basin southward into Patagonia, a series of extensional depocenters were formed by stages of mechanical and thermal subsidence during incipient breakup of Pangea. Recently, however, new data and ideas have contradicted these largely accepted hypotheses, following pioneering proposals of Lock (1980) and Dalziel et al. (2000). The first of these controversial premises is that Patagonia suffered a shortening stage associated with the inland migration of a volcanic arc in Late Triassic time (Navarrete et al., 2019), while crustal stretching dominated regions farther north in southwestern Gondwana. This new hypothesis considers that the Late Triassic Central Batholith constitutes a magmatic arc in central Patagonia and was affected by Late Triassic contraction, as evidenced from field and seismic data. The second premise is that Patagonia continued to experience short pulses of within-plate shortening during the Jurassic, interrupting thermal sag stages within intra- and retro-arc basins (Navarrete et al., 2016). These discrete pulses most likely relate to a strong kinematic change and southward drift registered in Gondwana at ~180 Ma, synchronous with initial spreading of the North Atlantic ocean; initial opening of the Weddell Sea at ~160 Ma pushed the Patagonian platform in the opposite direction, at the time when the Karoo hot spot was emplaced and expanded to the east (Müller et al., 2006). During these changes, the Liassic and Cañadón Asfalto basins (Chubut province, Argentina), eastern volcanogenic basins, and the North Patagonian and Deseado massifs experienced early inversion and exhumation. These pulses of Late Triassic to Jurassic contraction thickened the crust, as indicated by REE elements in Mesozoic magmas emplaced in the Patagonian Andes, and created positive topography that supplied detritus to subsiding Jurassic basins in the proto-Central Andes region to the north.