

The Development and Fragmentation of the Permo-Triassic Gondwanian Fold Belt.

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The Gondwanian fold belt represents one of the most extensive geological lineaments in the Southern Hemisphere. Segments are found in southern South America (Sierras Australes and Falkland/Malvinas Islands), South Africa (Cape fold belt), and Antarctica (Ellsworth and Pensacola mountains). The fold belt is composed of low grade, folded and thrustsed Palaeozoic sedimentary rocks, deformed during the Permo-Triassic Gondwanian orogeny.

Geodynamic models for the Gondwanian orogeny vary from collisional to Andean margin in style. The current consensus of opinion suggests that the Gondwanian fold belt represents the foreland expression to an Andean type magmatic arc developed along the southern margin of Gondwana. However, such models must take into account the intracontinental position of the fold belt (up to 1000km from the margin), and the presence and significance of dextral transpressive deformation in the Ellsworth Mountains and Sierras Australes. Another feature of the fold belt that is poorly understood is the dramatic deflections in structural grain that are present in many of the dispersed fold belt fragments. Available data suggest that they are kinematically unrelated features, although they may betray the presence of orogen-scale basement control on fold belt development and its later reactivation.

Gondwanian deformation was closely followed by the initiation of Gondwana break-up in the Early Jurassic. Initial fragmentation was centred on the Gondwanian orogen in the proto-South Atlantic region, and lead to the generation, rotation and displacement of allochthonous crustal blocks by a yet to be establish mechanism. It is unclear at this time if the formation of the Gondwanian fold belt and its ultimate dispersal are related in some way.