

NEW PLATE TECTONIC CONCEPTS IN THE TETHYAN REALM

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Recent synthetic works done in the frame of IGCP and Tethys Group projects provided the frame to reassess proposed plate tectonic models for the Tethyan realm. New plate concepts were developed to integrate new data regarding the geodynamic evolution of Variscan Europe, of the Cimmerian orogenic cycle in the western Tethys and of the Alpine cycle and its relation with the Atlantic domain and eastern Tethys. Paleomagnetic and paleobiogeographic information have also been incorporated to constrain the location of older continents and magnetic anomalies were used to constrain younger reconstructions. However the major constraint came from plate tectonic models in which plate boundaries are introduced from the start that give only little room for alternative solutions. Most paleoreconstructions consist, so far, in moving continents on a sphere; the use of plate boundaries in paleoreconstructions is absolutely necessary. These plate limits are governed by rheological laws which provide stable constraints for reconstruction when geological information is scarce. Alternative models were also tested and choices have been made. The main alternative regards the evolution of Neotethys after the Cimmerian collision (Mid to late Triassic) and our favored model is now to consider Neotethys as an Atlantic type ocean from that time until the onset of its subduction that we place in early Cretaceous time. To assess the validity of this concept, the geodynamics of Neotethys and of the Indian ocean has to be integrated in a single plate tectonic model.