

## **Tethyan Orogens in Eurasia: Where Do They Fit in the Structure of the Continent and in the World of Metallic Ores?**

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Eurasia is the youngest continent, having been assembled only during the Phanerozoic. It has four major and two smaller cratons: Russia, Siberia, Arabia, and India are the big ones; North China and Yangtze are the smaller ones. Smaller, similar entities such as Annamia are best considered parts of orogenic collages. The Tarim basement is an enigma and the possibility of at least a part of it being a Precambrian oceanic plateau has not yet been ruled out. All these cratonic entities have been stitched together by orogens of various sizes and ages, constituting a wonderful analog for the internal structures of the Precambrian cratons. In Asia, the Paleo-Tethyan suture separates two realms in which the orogenic architectures are very different. In the north, between the Siberian craton and the “intermediate units” (from west to east: Scythides, the Tarim basement, and the Manchurides) is the vast realm of the Altaids, a Turkic-type orogen that evolved between the Ediacaran and the Early Cretaceous. Its rock types are dominated by turbidites, deep sea cherts, basalts, and serpentinites and magmatic arcs. It consists of arc massifs of Precambrian age and larger subduction-accretion complexes of Phanerozoic age with coeval magmatic arcs, and records the simultaneous history of three major arc complexes that have long been known to house major ore resources. Major discoveries continue to our own day.

The Hercynides are a very different orogenic belt, dominated by major dextral strike-slip systems, and their paleogeography is still poorly understood. What seems increasingly more likely is that there was a single major Hercynian ocean, the Rheic. To its south, the Pan-African (= Brioverian = Cadomian) accretionary complexes are intimately mixed with younger ones, and sorting them out is still in progress.

The Tethysides, south of the main Paleo-Tethyan suture, are different. Except in the Songpan-Ganzi system in China and on a smaller scale in the Katawaz Basin, Makran, and eastern Turkey, they have no major subduction-accretion complexes and their tectonics were dominated mainly by asymmetric override- and nonoverride-type collisional orogenic belts. No major magmatic arcs exist in their structure west of the southern Carpathians and, to the west, the historical ore richness is mainly of sedimentary origin. Magmatic ores make their appearance mainly in Turkey and continue eastward, in parallel with the ever increasing importance of magmatic arcs. A major episode of black shale deposition during the late Permian may have been caused by a pervasive poisoning of the Paleo-Tethys, leading to a global extinction, and created a number of important massive copper sulfide deposits. Their tectonic distribution indicates that further hopeful prospects may lie in the high mountains of the Kuen-Lun in China.

Neo-Tethyan orogens are poorer in ores than any of the preceding, although their eastern part is more promising than the western part. This results from the diminishing size of the Neo-Tethyan oceans westward.