

Geomorphology and Tectonics of Himalaya-Tibet Region – B.B. Nadgir, Formerly, Geological Survey of India

The region belongs to the northern part of the Indian peninsular craton. Post-Eparchaean movements formed the Archaean-Dharwar fold belts of Aravalli, Eastern Ghats and Satpura, followed by two epochs of subsidence and sedimentation (Cuddapah-Delhi, Vindhyan and equivalents in the Himalayan geosynclines). Chails, Chandpurs, Simla Slates, Salkhalas, Trisulis (in Nepal) and Daling-Phuntsholing-Buxa were deposited in the first geosyncline, and Pre-Cambrian Bhimphedis, early Cambrian Chitlans and fossiliferous Ordovician-Silurian Chandra-giris in the succeeding geosyncline. Caledonian folding affected all sediments forming north-plunging folds, followed by Hercynian cross-folding trending WNW. The Tethys geosyncline was also formed by Hercynian upheaval. Post-Eocene upheaval strongly folded Tethyan sediments and replaced Tethys by a long, wide plateau bordered by the Main Boundary Fault (MBF) in the south and included the

northern part of the peninsula. The plateau top is a complex net-work of rings of ranges enclosing flat basins with lakes mostly without exit. Deep Crustal Fault (CF) and Mahabharat Fault (MF) triggered major physiographic changes.

The Crustal Fault truncated Kun Lun ranges and Tarim basin and clearly separated a wide belt of the Tibetan plateau in the west and south which formed the initial nascent Himalaya arch. Valleys were entrenched along the CF in two parts. Brahmaputra occupies the entire eastern part. The western Nubra-Gar Tsangpo part bisects the composite Indus basin.

A south-moving sequence of up-thrusts branching off the CF and breaking the arch, the horsts rising as Himalaya ranges and deflecting rivers impinging on them and their breach ensued. One such branch fault has dislocated the Indus Tectonic Zone. Some rings formed sources of rivers and others remained as relicts. No clear Central Himalaya Thrust is evident in Nepal where

the Great Himalaya ranges were raised along an echelon zones of up-thrusts which coincide with the thrust-imbriation zone in the north limbs of Hercynian mega-anticlines. The MBF separates the rising and eroding mountain belt from the subsiding fore-deep. The Mahabharat ranges were uplifted between MF and MBF, and formed three river basins by spectacular deflection, merger and capture of all pre-Mahabharat rivers in Nepal.

Hercynian cross-folding formed extremely large antiforms and synforms from the easily identifiable Caledonian folds, while a number of them have remained as relicts. The synforms normally contain the full Trisuli-Chitlang sequence and are thrust on the antiforms of essentially the Trisulis along the Bhimphedi thrust which slices the common limbs. The synforms bordered by the thrust led earlier workers to the nappe concept