

Recent Advances in Collision Tectonics of Himalaya

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The collision of India with Asia took place ~ 55 Ma in NW Himalaya and 40 Ma in Southern Tibet. Shortening of the Indian margin crust was accompanied with the development of Main Central Thrust (MCT) that brought the mid-crustal rocks to the surface overlying the Lesser Himalayan formations. The crustal thickening generated metamorphism of the mid crustal rocks of Higher Himalaya upto amphibolite facies. Two phases of metamorphism are recognised at 35 Ma and 20 Ma. The MCT initiated at 30 Ma as a major shear zone and reactivation occurred at 20 Ma, 12 Ma and 8-7 Ma. Further south the Main Boundary Thrust was initiated at 10-5 Ma at a shallow depth of ~7 km bringing Lesser Himalayan formations to override the rocks of Sub-Himalaya Zone. To the north of Higher Himalaya, the Phanerozoic sequence of the Tethys Himalaya was detached from the Proterozoic basement and was thrust northward along the low angle normal fault called the South Tibetan Detachment (STD). The detachment was formed at ~ 20 Ma simultaneous to the southward thrusting along the MCT. In the Indus-Tsangpo Suture Zone thrusting of Suture Zone rocks was initially towards south, but later the thrust propagation became northward. The collision tectonics also produced a foreland basin in front of the rising Himalayan mountain chain. The foreland basin was filled with fluvial sediments eroded from the rising mountain chain. The initiation of foreland basin started at ~20 Ma and sedimentation continued till Pleistocene. Large NS trending normal faults produced graben structures indicating an EW extension of the southern Tibet. The uplift of Himalaya and Tibet took place in three phases, viz. 21-17 Ma, 11-7 Ma and Quaternary.