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EDITORIAL

Geosciences of the Himalaya–Karakoram–Tibet orogen

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The Himalaya–Karakoram–Tibet orogen, a product of India–Eurasia collision ~55 Ma back, continues to attract global attention for its many geoscientific uniqueness. This orogen is the most exciting 'natural laboratory' to study continental dynamics and its evolution. During past few decades, phenomenal progresses have been made in uplift and extrusion models, dynamic metamorphism, magmatism, climate–tectonics interaction, etc. This thematic volume on the geosciences of the Himalaya–Karakoram–Tibet consists of eighteen papers and two Geosites.

In the first paper, Kirby and Harkins correlated variation in slip rate along the Kunlun fault with topography of the Anyemaqen Shan Mountain at the eastern Tibetan plateau. Their work indicates that fault terminations might be associated with crustal thickening of the plateau and demonstrate that the upper crustal deformation of the Tibetan plateau to be pervasive and dispersed throughout the crustal blocks rather than localized along narrow fault zones. Robinson and Pearson compiled an orogen-wide correlation of footwall and hanging wall units of the Ramgarh and Munsiari thrust sheets. They considered the Ramgarh–Munsiari thrust sheet as a single 'major orogen-scale fault' system. They hypothesized that the extensional shear within the South Tibetan Detachment was triggered possibly by 'slip transfer' from the Main Central Thrust into the Ramgarh–Munsiari Thrust during the Miocene. Thakur reviewed the tectonics of the Siwalik range of the Himalaya. He concluded in-sequence deformation and critical taper mechanism acted in this terrain. Presuming the crustal channel flow model to be correct, Mukherjee estimated a viscosity of 10^{16}–10^{23} Pa s, and a Prandtl number of 10^{21}–10^{28} for the Greater Himalayan Crystallines. Moharana et al., described the Munsiari Thrust from Kumaun Himalaya to consist of a core and a damage zone and described their structural geology in detail. Mukherjee described a 'basal detachment' of extensional ductile shear from the base of the Greater Himalayan Crystallines at Bhagirathi section of the Indian Himalaya and explained it in terms of a shifting crustal channel flow. Ubiquitous backthrusts within this terrain were another new finding and were explained by southward subduction of Eurasian plate below the Indian plate. Based on balanced cross-section studies, Khanal and Robinson estimated slip along major Himalayan faults from the Budhi-Gandhaki river section of central Nepal. Sen and Collins inferred dextral transpression and changing angle of convergence of the formation of the Ladakh magmatic arc. They also reported Late Eocene S-type granite magmatism in its central part. Mathew et al. discuss the tectonothermal evolution of the Arunachal Himalaya. They obtained isothermal decompression for the Greater Himalayan Sequence and isobaric cooling from the Main Central Thrust region. Jayangondaperumal et al. reevaluated co-seismic slip of the Himalayan Frontal Thrust. The estimated shortening around the Himalayan Frontal Thrust would lead a bigger earthquake in the western part of Indian Himalaya. Shah presented a geomorphologic study from Kashmir Basin in India, identified faults from remote sensing studies, and predicted a future earthquake of Mw 7.6. Srivastava et al.

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described three facies association from sedimentary deposits at Spiti valley and deciphered, based on luminescence dating, two intense monsoon phases at 14–8 and 50–30 ka. Fuchs et al. suggested that tectonics acted as the main trigger for the evolution of the Panj river drainage system in the Pamir. Modeling of profiles of river beds enabled them to identify three reaches of Panj. Liu et al.'s detail geomorphologic analyses for the lakes at the Qinghai–Tibetan Plateau led to conclude that the latest high stands of paleolakes formed during Holocene. Further, at that time, the lake levels were significantly high. Singh et al. deduced the development of C_3 and C_4 grasslands during Holocene period from the Siwalik at the western Indian Himalaya. Sen et al. inferred bimodal stable isotopic signature from Zildat Ophiolitic Melange. They emphasized dominance of syn-deformational hydrous fluids, which was modified through metamorphism of the adjacent Tso Morari Gneisses. Srivastava's geochemical studies on Proterozoic granitoids from Arunachal Himalaya, India revealed their peraluminous nature, derivation from lower crust, and mostly their syn-collisional genesis. Hazarika et al.'s study of seismic shear wave splitting phases from Tiding Suture (Eastern Himalaya) indicated ENE trending fast polarization direction and deformation localization in the mantle. The ENE trend might be due to India–Eurasia collision.

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