

REVIEWS

GEOLOGY OF INDUS SUTURE ZONE OF LADAKH, Editors: V. C. Thakur and K. K. Sharma (1983) Wadia Institute of Himalayan Geology, Dehra Dun, 248 001.

This book presents a collection of papers written largely by scientists of the Wadia Institute of Himalayan Geology and published on the centenary anniversary of D. N. Wadia's birth. These papers summarize work focussed on a specific region and carried out over the last few years by a group of scientists in the Wadia Institute. They represent an impressive accomplishment by an Institution established to carry out basic multi-disciplinary geologic research in the Himalaya, and I am sure that Wadia himself would be proud of the work done by the Institute bearing his name. Perhaps it is appropriate that the area discussed here is adjacent to the region where Wadia's Himalayan Studies were most extensive and useful.

The nineteen papers can be roughly divided into three groups; structural mapping, geochemical analyses and palaeontological constraints on the ages of various formations. Although most of the papers are quite short, the emphasis is on the reporting of factual material and not on sweeping syntheses and speculative generalisations. Thus one can be reasonably confident that the information presented will be useful for a long time.

Not surprisingly detailed studies have refined the boundaries between various units, both in space and time. For instance, the distinction between the Indus flysch and the Indus molasse has been clarified both by stratigraphic and lithologic studies and by the discovery of fossils of different ages and from different environments. Thus, one is in a position to begin seeing the transition from subduction of oceanic crust to collision of the Indian subcontinent with southern Eurasia. Geochemical and palaeontological data show that subduction and post collision convergence in Ladakh continued until more recent times, than had previously been thought from data obtained farther east. Oligocene ages for batholiths and overlying volcanic rocks imply subduction of oceanic crust at this time. Middle Eocene fossils from the Indus flysch corroborate the geological evidence indicating that the collision occurred since early Eocene, the time of collision often cited. Moreover, since these formations and the more recent molasse deposits are deformed and overthrust one another in several areas, crustal shortening continued into Miocene time, not only in the Lesser Himalaya and the sub-Himalaya, but also north of the central crystalline axis.

These and other new results help us to unravel the timing and distribution of different styles of tectonic activity in the Himalaya and they make the Indus suture zone in Ladakh one of the best laboratories for the study of continental collision. 'Geology of Indus Suture Zone of Ladakh' will be a very valuable addition to the library of anyone studying the Himalaya. It is unfortunate that most maps are reproduced at a small scale (usually less than 1 : 500,000), and in no case are topographic contours shown. Thus, it is difficult to deduce the three dimensional structure. Moreover, many photos are not reproduced sufficiently clearly to make them usable. Nevertheless, although these restrictions will limit the utility of some papers a little, the collection will serve as a basic reference on the Ladakh Himalaya and as foundation upon which future work in that area will be built.

*Department of Earth, Atmospheric and Planetary Sciences
Massachusetts Institute of Technology
Cambridge, M.A., U.S.A.*

PETER MOLNAR