HIMALAYAN THRUSTS AND ASSOCIATED ROCKS. P. S. Saklani (Editor) Today and Tomorrow's Printers and Publishers, New Delhi, 1986, p. 293, Price: Rs. 395.

This book is the ninth in the series on *Current Trends in Geology* and the editor has collected 15 papers for this Volume. Though all the papers are not strictly related to Himalayan Thrusts, there is emphasis on evolutionary aspects of structures within the Himalayan tectonic domain. Himalayan Thrusts and Related Structures would have been a more appropriate title.

In the Thrust Tectonics of Garhwal Himalaya, Saklani and Bahuguna discuss the evolution of the imbricate thrust units within the Crystalline Nappe of Garhwal by means of a duplex system limited by the Vaikrita roof-thrust and the Budhakedar floor-thrust. The Jutogh Thrust according to them is only branchline thrust within the duplex system. The various structural undulations are explained by horses and ramps. As the duplex system constitutes one structural slab, its regional application should also be examined as the thrusts in the neighbouring Himachal Himalaya have different connotations, particularly the Jutogh and the Panjal Thrusts. The mathematical deduction of the shortening of the individual imbricates within the duplex system is a welcome feature of the contribution.

The structural evolution of the Kumaun Lesser Himalaya by Johnson examines the application of the 'piggy-back' sequence in the Kumaun Lesser Himalaya. However, his suggestion that the Himalayan Frontal Thrust, which is still in a conceptual stage, is the sole Thrust along which the Lesser Himalaya and the Siwaliks have advanced over the foreland belie known factual information. The Krol and the Berinag Thrusts cannot be one and the same. This aspect has been examined by many workers about which Johnson does not seem to be aware. His attempt at stratigraphic revision of Kumaun to suit his tectonic model is not convincing.

Yadekar and Powar have adduced valid structural evidences in support of their conclusion that the North Almora Thrust is a high-angled reverse fault.

The strain estimation of Narendra Nagar Krol syncline by Saklani and Satendra has brought out that the flattening was variable in the folds and the Blaini Formation witnessed constrictional type of strain.

The study of metamorphites and migmatites in Uttarkashi of Garhwal Himalaya by Saklani and Nainwal, though slightly out of place in this volume, nevertheless brings out new information regarding metamorphism and the conclusion that mylonitisation took place before the thrusting movement provides a linkage to the time of emplacement of the thrust sheet.

In the Raunsal area of Tehri-Garhwal Himalaya, the Main Central Thrust represents the lower part of the Central Crystalline duplex and the subthrust zone is masked by uranium mineralisation. Bhattacharya and Saklani have presented a detailed lithologic-structural picture of both the subthrust and the overthrust tectonic units. The significance of the localisation of uranium mineralisation in the foot-wall zone of MCT could have been further elaborated.

Prasad has interpreted the existence of a plane of detachment along a mylonite of a magmatic parentage in the Dunda area of Uttarkashi based on detailed structural study of mylonites and associated rocks and also on the morphological characters of zircon.

Virdi's interpretation of a fold structure in the crystallines of the Alakananda and Dhauliganga valleys of Garhwal is based on repetition of lithostratigraphic units though cyclic repetition of similar sequence in a metasedimentary sequence cannot be ruled out. His work throws new light on the delineation of MCT as distinct from the controversial Vaikrita Thrust.

Bhola and Sharma more or less confirm the prevailing view that the NE-SW compression, the principal compressive stress of the Himalayan orogeny, is responsible for the development of F_1 and F_2 structures in the Chamba area of Himachal.

The possible linkage between the Peninsular and the Himalayan Precambrian belts has been debated for a long time. Dhaundial has very appropriately drawn the attention of geoscientists to this problem. He has tried to explain that geodynamic processes acting on the arcs and also the subduction of oceanic crust under the mobile Proto-Tethys offshore continental crust actually shaped the Precambrian evolution of the Himalayan crystallines, the relicts of which are contained in the Central Crystallines.

Nakata has introduced a new concept of active faults in the Himalayan ranges. As most of his active faults lie along either the MCT or MBT, it is likely these so-called active faults are readjustments along old thrust contacts. The Higher Himalaya is being uplifted relatively at a higher rate than the Lesser Himalayan but Nakata seems to think that Himalayan ranges are subsiding along these active faults

Jaros presents an idealized cycle of plate movements with individual stages and substages of tectogeny-taphrogeny and orogeny – the path leading towards the Himalayan type of mountain ranges.

Bogacz and Krokowski in their two related papers have discussed the geodynamic aspect of Himalayan structures. In the first paper they suggest that strike-slip shearing and normal-slip shearing have caused maximum bending of the Himalayan arc to the south in Central Nepal and dextral westward and sinistral eastward in the syntaxial bends. In their second paper, the authors suggest that the strike-slip movements parallel to the Himalayan belt contributed to the genesis of geological structures and the origin of the Himalaya. Though the importance of strike-slip movement cannot be minimised, attributing all such structures to this movement seems a little misplaced in view of the fact that underthrusting perpendicular to the Himalayan arc as attested by the directions of down-dip stretching lineations in the deeper gneisses of MCT, is more important for the origin of Himalaya.

Dubey and Bhat have brought in a new trend of experimental studies on deformed physical models in India to explain the structural evolution of the Himalaya. Though the role of basement structures in the moulding of Himalayan orogen is recognised, the factual information with regard to structure, stratigraphy and the collisional nature of Himalayan tectonics would not permit the acceptance of the Indus Suture, MCT and MBT as the manifestations of the earlier basement faults variously rejuvenated during the compressional phase of the orogeny.

The *Himalayan Thrusts and Associated rocks* is a welcome addition to the ever-growing geological literature on the Himalaya. A more regional treatment of subjects would have enhanced the value of the book. The volume is well brought out with good printing and reproduction of figures, but lacks subject and author indexes.

A. M. S. E. Wiug,
Geological Survey of India, Bangalore.

S. V. SRIKANTIA