

## REVIEWS

**Annual Review of Biophysics and Bioengineering**, Volume 7. Editor: L. J. Mullins, Associate Editors: William A. Hagins, Carol Newton and Gregorio Weber. (Annual Reviews, Inc., 4139 El Camino Way, Palo Alto, California 94306, U.S.A.), 1978. Pp. viii + 601. Price: \$ 17.00 in U.S.A., \$ 17.50 elsewhere.

This volume for 1978 continues to have the same high standard and variety that has been characteristic of the previous volumes of this series. There are 21 articles covering a wide range of subjects starting from pure biophysical chemistry, such as calcium-dependent potassium activation in nervous tissues, excitation and contraction processes in muscle, and structure and reactions of closed duplex DNA, and going on to problems involving physics, such as circular polarization of luminescence with biochemical and biophysical applications, chlorophyll function in the photosynthetic reaction centre, X-ray absorption spectroscopy of biological molecules, and cytoplasmic streaming in green plants, and then on to problems of a more mixed nature, such as magnetic phenomena of the central nervous system; neural circuits for generating rhythmic movements, statistical modelling and analysis in human genetics, and cytoplasmic streaming in amoeba and in green plants. Other very interesting problems are also discussed which require a knowledge of biochemistry, biophysics, and of either biology or physiology, such as countercurrent transport in the kidney, calcium buffering in squid axons, photobehavior of micro-organisms and electron microscope visualization of chromatin, etc.

The above list of topics covered, which is not complete, gives an idea of the variety of subjects in this field that are currently attracting the attention of leading workers. In fact, the approaches and the results presented in this volume will surely justify the statement that biology has been invaded and taken over by physics and chemistry. Physical and chemical methods, of both mathematical and experimental nature, have become absolutely necessary for getting a full understanding of the behaviour of biological systems in phenomena that take place in life processes. Perhaps the subject of bioengineering (in its more commonly accepted form) does not figure very much in this volume. However subjects like neurology and photology would certainly be included in this field, and, in that sense, this volume does cover aspects of research in bioengineering also.

It is obviously impossible to give any fuller account of any of the articles and the reviewer hesitates to pick out one, or the other, for detailed description. On the other hand, there is no doubt that this volume gives a true and proper picture of the modern trends in biophysics and bioengineering and the way in which physics can play a vital role in the improvement of our understanding of biological processes. Every library in the field of physics, engineering and biology, not to talk of physical chemistry and biochemistry, must have this volume for ready reference.

G. N. RAMACHANDRAN.

**Tectonic Geology of the Himalaya**. Edited by P. S. Saklani. (Today and Tomorrow's Printers and Publishers, 24B/5, Deshbandhu Gupta Road, Karol Bagh, New Delhi 110 005), 1978. Pp. vii + 340. Price: Rs. 195.00, \$ 40.00.

A vast amount of geological data has been collected on the Himalayas during the last two decades, and this volume, which contains 15 papers, is an attempt to highlight the significant advances made by the active workers in this field. The contributions cover mainly the North-western, Central, and Eastern sectors of the Himalaya, including Nepal and Bhutan.

Previously, both the high-grade kyanite-sillimanite, staurolite-garnet-biotite gneisses and schists, and the porphyroblastic garnet-biotite gneisses and schists were considered to be the same, and delineated at the base of the Main Central Thrust. According to Valdiya, the conventional MCT is actually the Chail Thrust, the real MCT being redesignated by him as the Vaikrita Thrust and situated much further north.

After making a detailed study of the minor structures in the Mukhem area (Garhwal Himalaya) Saklani has come to the conclusion that supplementary shear stresses were responsible for the different orientations of a single type of folding. He has ascribed the origin of some transverse structures to recent tectonic movements connected with Himalayan orogeny.

According to Srikantha and Bhargava, the Indus tectonic belt which lies between the Spiti-Zaskar autochthonous belt and the Ladakh Granite Complex consists of young sediments without a basaltic basement. They do not agree with the view that this belt is a plate boundary and a relic of a closed ocean.



The superposition of nappes in the Himalayan structure with reference to the stratigraphic set-up of Uttar Pradesh and Himachal Pradesh has been reviewed by Raina. On the basis of ERTS imagery he has prepared a million scale geological map showing several lineaments and cross faults.

K Ar age determinations and study of lineations and foliation in rocks of the Higher and Lower Himalaya give a complex picture of Himalayan metamorphism according to Krummenacher *et al.* The cooling ages are generally young in the high grade rocks, and older in the low-grade rocks (9 m.y. and 20.5 m.y. respectively). Ages are extremely young around the Main Central Thrust (3.7 m.y.) which indicates a high thermal gradient around this main tectonic feature, as well as its very recent activity. Some rocks show anomalously older ages which may be due to a metamorphism which has lasted since the Indian and Tibetan plates collided, and to the presence of Ar inherited from a previous (Precambrian?) metamorphic cycle.

Two stages of nappe thrusting have been recognised in the East Nepal Himalayas by Jaros and Kalvoda which took place in Oligocene and Quaternary times. The nappes were subsequently eroded and are characterised by their individual relief features.

The stratigraphy and structure of the Bhutan Himalayas are described by Jangpangi. This is a welcome addition to our knowledge of a region which has not been sufficiently explored.

Acharyya has differed from earlier views in concluding that the Main Himalayan region developed under eugeosynclinal conditions which culminated with granitic, andesitic, and basaltic activity, in a fluxoturbiditic sedimentary environment. These characters are similar to the Thai-Burmese geosyncline and unlike those of the Peninsula.

Verma and Kumar have evaluated the role of tectonics in the evaluation of the drainage system around Kud in Kashmir Himalaya. Berthelsen has drawn attention to the many analogies between Himalayan and Sveconorwegian tectonics, while Biq has described the dissimilarities between the Himalayas and the Alps.

The volume concludes with a paper by Saxena who, for over a decade, has made some significant contributions on the geology of the Himalayas. In this paper he has suggested that Himalayan orogenesis is due to island arc movements mantle diapirism, geochemical processes, and gravity gliding, as opposed to

the earlier views of compression, plate tectanics, and vertical movements.

C. S. PICHAMUTHU.

**Ecogeographical Studies in Vashisti and Terekhol Rivers.** (A case study of mangrove vegetation on river banks exposed to silting and fresh water influx). By G. V. Joshi and S. D. Shinde. (Shivaji University, Kolhapur 416 004), 1978. Pp. 2 + 56. Price: Rs. 10 00.

This booklet contains 4 chapters beginning with a brief introduction, followed by a review on mangrove ecosystems, vegetation of riverine banks, mangroves in the inlets of two rivers and ends with conclusions followed by the bibliography.

This work as outlined by the authors is a case study of mangroves on two river banks situated within a short distance of 60 km of the Ratnagiri District in Maharashtra. It is clear from their account that the environmental conditions are atypical for the establishment of extensive mangroves along the two rivers due to absence of gradients followed by limited seasonal tidal influence. In the context of the account given the broad based impressive title of this booklet is not entirely convincing.

The review on mangrove ecosystems, especially the information on Indian mangroves, suffers from inaccuracy and an apparent lack of access to some published literature and work done by the ecology unit of the Botanical Survey of India, since 1960. The classification based on habitats under atypical estuarine conditions cannot have a universal applicability despite the author's claim that these habitats have different edaphic features. Furthermore the exclusion of a few taxa of euhaline zone from the mangrove ecosystems is something like projecting a monkey without its tail. It appears that the authors are influenced by a few recent reviews on Indian mangroves which have many sweeping statements of questionable credibility. It is a pity to observe that errors and omissions are numerous and sometimes serious in the descriptions of a few mangrove taxa, perhaps for want of field knowledge along the Indian coast. There are also a few mistakes in nomenclature and bibliography. Some of the taxa have the name wrongly spelt and *Bruguiera gymnorhiza* is misspelt too. Among the photographs, some are very poor and cause doubts in the minds of readers. Finally this booklet lacks a real linking theme from beginning to end.

T. ANANDA RAO.