

BOOK REVIEWS

GEODYNAMICS OF THE INDIAN PENINSULA AND THE INDIAN PLATE MARGIN. By R. K. Verma, 1991. Oxford & IBH Publishers Pvt. Ltd., New Delhi-110 001. 357 pp.

Prof. Verma has made a good effort in bringing under one cover a variety of geophysical fields encompassing different tectonic scenarios of the Indian subcontinent, Himalaya and the northern Indian ocean. Emphasis is more on sedimentary basins and mobile environs, probably because the geophysical characteristics of the stable cratons were covered in his earlier book. There is a strong tendency to integrate field with either deep seismic sounding crustal features or seismotectonics.

Out of the 13 Chapters in the book, 5 Chapters deal with the gravity field analysis and 3 Chapters on combined gravity and seismotectonics while the remaining deal with paleomagnetism, heat flow and thermal regime and radioactivity of the Indian peninsula and Himalaya. There are two separate Chapters on the evolution of the Indian ocean and the Geodynamics of the Himalaya and the nature of the continent-continent collision.

Introduction to the geology and history of evolution of the Indian subcontinent (Chapter 1) is adequate. This chapter deals with the geology and tectonics of old cratons, Proterozoic mobile belts and sedimentary basins and areas of younger sedimentation and volcanism. The nature of gravity field over the intracratonic and coastal sedimentary basins is presented in Chapters 2 and 3. Surprisingly, treatment of the sedimentary basins in the western offshore is missing. The east coast sedimentary basins are well-covered providing both geophysical and drill-hole data. Chapter 4 is an exhaustive presentation of deep seismic sounding results vis-a-vis the gravity field, encompassing diverse tectonic environs like, stable cratons, rift valleys and continental flood basalt provinces. Some interesting correlations like Moho depth vs. average elevation or gravity field are presented. The absence of DSS results over Godavari basin is conspicuous. Heat flow, thermal regime and radioactivity of the Indian Peninsula and the Himalaya find their place in Chapters 5, 6 and 7. Chapter 7 is exclusively devoted to the occurrences of hot springs and their relationship to the tectonic features.

The book deals with the geodynamics of the Indian subcontinent and it is but natural that paleomagnetism should find its place here. Chapter 9 presents various aspects of paleomagnetism, starting with the rudiments and progressing to the major applications of this field in geodynamics. It provides considerable paleomagnetic data from the Indian subcontinent in detail elucidating its implications in the drift history of the Indian landmass and its subsequent collision with Eurasia.

Chapter 8, 10, 11 and 12 deal with seismotectonics of different parts of the Indian plate, viz., the Peninsular India, Indian ocean, Northwest Himalaya including Pakistan and adjoining regions, as well as the Burmese arc in the east. Every effort has been made to compile all the available information on seismicity in terms of earthquake locations, fault plane solutions and their relation to different tectonic units. The effort made in compiling gravity information from the scattered data over the Burmese arc and the Himalaya is commendable. The concluding Chapter presents the geodynamics of the Himalaya. It consists of the various

models presented by different workers including the author's and those of his co-workers.

This praiseworthy compilation of rich research material is regrettably not free from a few blemishes. Some are mentioned below :

While describing the seismicity of Peninsular India in Chapter 8 no mention is made of the school of thought which relates the seismic activity around Koyna with the reservoir. Such a mention would have contributed to the completeness of the topic.

On page 168 of Chapter 8, while describing the seismicity of Shillong plateau and Bengal basin, the author mentions "A notable seismic hazard presently threatens the Bengal basin in general and Tripura fold belt in particular (*see* Chapter 12)". No confirmation can be found in that Chapter. Similarly, his statement on page 173 reads "There has been 50 years quiet period along the major thrust (MBF). We may therefore expect a large magnitude earthquake anywhere along the MBF...". The author obviously considers this quiet period as premonitory to the occurrence of a large earthquake. That some premonitory phenomena precede a large earthquake does not find a mention earlier.

The implications of the seismicity of Indian ocean, particularly with respect to the intense deformation zone in the Central Indian ocean basin, have not been high-lighted. The book deals with the geodynamics of the Indian plate margins. A brief presentation on the possible plate boundary reorganization, implied by the intraplate seismicity, would have been in order.

The book on the whole presents rich material for any serious worker. The Chapters were so dealt with that each of them is complete in itself. An added advantage is the objective manner in which the compilation is presented devoid of undue biases. We find the bibliography quite exhaustive. This book will be a valuable possession of serious workers in the field of geodynamics and should find its place in the libraries of national organisations and universities dealing with geoscientific research activities.

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GEOTECHNICAL APPLICATION IN CIVIL ENGINEERING. by R. N. P. Arogyaswamy, Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi-110 001. Rs. 395/- 301 pages 1991.

This book is very interesting and useful to practising engineering geologists and civil engineers. It will also be a good reference book to B.E. (Civil), M.E. (Geotechnical Engineering) and M.Tech. (Engineering Geology) students. The appendix 'A' on case histories of India is a valuable feature of this book. The size of the book is just adequate and text is readable. There are large number of figures to illustrate basic concepts of Soil and Rock Mechanics. The author is, therefore, to be congratulated wholeheartedly for this contribution of benefit to both geologists and civil engineers. To serve the needs of students, it is suggested that the publishers should bring out a student's edition at low price.

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