BOOK REVIEW

GEODYNAMICS OF NORTHEASTERN INDIA AND THE ADJOINING REGION by D.R. Nandy. Published by Scientific Book Centre, Hengrabari Housing Road, Dispur, Guwahati, Assam 781006. Revised Edition, 272 pages, Price: Rs.1495.00

The first edition of this book was sold out within about a decade of its publication in the year 2001. Its demand reflects its usefulness and wide acceptance amongst students, scholars and professionals interested in understanding the processes and dynamics of crustal evolution of the northeastern part of the Indian subcontinent. A recently revised edition of the book is now available.

Geological investigations in northeastern India had a brilliant start when the pioneers from the Geological Survey of India and petroleum exploration agencies braved the adverse field conditions and laid the foundation for further geological studies. The author, working on those foundations had collected basic field data from several sectors, analysed those for stratigraphic and tectonic classifications and integrated them with the contributions from others to build a database which he nurtured, interpreted, and finally incorporated in this book.

The northeastern India presents a collage of six dissimilar tectonic provinces, some of which extend into the adjoining territories of Myanmar, or Tibet or Bangladesh, or continue beyond the shorelines into the Bay of Bengal region. Their geological evolution has followed divergent trends, covering variable time spans. First five chapters of the book elaborately deal with their diversity and complexity. The provinces are – the eastern Himalayan collision belt, the Mishmi block, the Indo-Myanmar mobile belt, the Meghalaya plateau, the Bengal basin, and the Brahmaputra valley. The introductory chapter briefly discusses the scheme of classification and geographical distribution of the provinces. Moreover, the distribution is shown on a map placed in a pouch at the inner back cover of the book. The excellent quality of production of the map sets a standard for others to emulate. Data from multiple sources have been seamlessly compiled in it. The judicious combination of alpha-numeric labels and colour symbols, side by side with a highly structured index makes it easy to navigate through the map to find the minute details.

The northeast, in spite of its comparatively small extent of about 2,55,083 sq. km, hosts a geological diversity that is phenomenal and unparalleled. About 1800 km long segment of the convergent northern and eastern boundaries of the Indian plate passes through the area is shown in the map. The northern one is collisional, whilst the eastern one is a zone of active subduction. The active plate margin, the Precambrian shield element exposed in the Meghalaya plateau, the enigmatic Garo-Rajmahal gap, the peri-cratonic Bengal basin, the wide zones of foreland molasse, the ophiolite melange – all contribute to the diversity, which is discussed with amazing clarity in the first five chapters of the book. It initially introduces the reader to the assemblage of a highly dissimilar crustal provinces, and then progressively delves deeper into their minute details, leading to a final integration of the overall dynamics of the region. It not only takes the reader on a journey through the wonders of the Dauki fault system, the Mishmi block, the 1897 Assam earthquake, the Cretaceous window

in Arunachal, the Dudhna fault, the Hinge line of the Bengal basin, the wide foreland molasse belts, the Kopili gap, the belt of schuppen, and myriads of such mega tectonic features, but also puts equal emphasis on the minute tectonic details like, say, a thin sedimentary rock horizon in the southern fringe of the Meghalaya plateau, or the imbricate slices of the Phokpur Formation within the ophiolites of Nagaland. Integration with a large volume of mid-crustal data obtained from gravity and seismic surveys, deep drill holes for hydrocarbon exploration, and instrument recorded data of seismic events and microearthquakes, adds an additional dimension to the database that is analysed. A large number of maps and illustrations of appropriate scale adds to the clarity. For the benefit of researchers who would like to view and examine the basic data in a larger perspective, the book provides detailed discussions on geology of the relevant sectors of the adjacent Myanmar, Tibet and Bangladesh.

The northeast is arguably the most dynamic sector of the present day crust. The ongoing tectonic movements here frequently trigger seismic events of high magnitude. The last three chapters of the book are focused on defining the source and manifestations of the tectonic forces that are presently active in this part of the crust. The chapters on morphotectonic lineament analysis and Bouguer gravity anomalies discuss application of these tools in critical search for the source at the mid-crustal levels. A narrative of the three past great ($M > 8$) and nine large ($M > 7$) earthquakes brings to light the severity of the seismic hazards to which this region is exposed. Chapter 8 of the book combines the results of seismotectonic analysis with paleoseismic studies and microearthquake surveys. A large number of fault plane solution data taken from various sources have been analysed to arrive at meaningful conclusions on local orientation of the stress axes. The last three chapters together present a novel approach which opens up possibilities of further studies on this line.

This book kindles an urge to know more about the fascinating geology of the northeast, and provides a platform from which several research investigations can be launched. It provides vital leads to formulate many exciting research projects. Some recently published research findings are missing in this book. However that does not present any serious impediment because most of those studies are on local issues and interested readers may track and find those in the internet. There are very few type-setting errors. Geographic coordinates of all the locations mentioned in the text are given. This book is useful for all students, scholars and research scientists interested in geology of the Indian subcontinent. It is highly beneficial, if not indispensable to those working on geology of the northeast.

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