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BOOK REVIEW

ATLAS OF EARLY PALAEOGENE INVERTEBRATE FOSSILS OF THE HIMALAYAN FOOTHILLS BELT.

N.S. Mathur and K.P. Juyal, Wadia Institute of Himalayan Geologyl, Dehra Dun – 248 001, India. WIGH Monorgrpah Series, No. 1, xxi + 257 pages including 27 illustrations, 16 tables and 45 plates, 2000. M/S Bishan Singh Mahendra Pal Singh, 23-A, New Connaught Place, Dehra Dun – 248 001, India (E-mail : bsmps@del2.vsnl.net.in : Fax : 91 135 650107). Hardbound, Rs. 1450/- ($50).

This monograph, published recently, is one among a few publications that deal mainly with early Palaeogene stratigraphy and invertebrate fossils of the Himalayan foothills belt. It reminds me of a comparable paper that came in over twenty years ago under the title "Subathu Group of India" by Dr. Pratap Singh. An excellent work by the then standards, it attempted to synthesise the available geological and palaeontological data in a manner useful in the interpretations of early Palaeogene successions of the Outer Himalayan region in the context of palaeoenvironments and palaeogeography. However, it appeared at a time when the taxonomic uncertainties of many important foraminiferal taxa had yet to be clarified and several stratigraphical and sedimentological aspects of the lower Palaeogene of the Outer Himalaya had posed problems. The result was that the synthesised information could not be put to use effectively in realising the full potential of stratigraphic correlation.

The last two decades witnessed publication of numerous papers which addressed the problems of fauna and early Palaeogene stratigraphy of the Himalaya and the Tethyan region. It had therefore become imperative to revisit the Himalayan successions and their fauna and sedimenttary frame-work, and synthesise the piled up information for use in the geological studies of the Himalaya in a wider perspective. The monograph by Dr. N.S. Mathur and Dr. P.K. Juyal is therefore a welcome addition to our knowledge. It is an attempt at such a synthesis of the new studies including their own original researches which they had been pursuing for a long time. It not only updates the early Palaeogene fauna of this belt, but also presents a comprehensive picture of the basic data on the invertebrate fossils recovered through authors' painstaking efforts in the last two decades. The main objectives of this study are (i) presentation of lower Palaeogene biostratigraphy of the Outer Himalayan region, (ii) revision and documentation of invertebrate fauna, (iii) correlation with the standared zones and (iv) discussion on palaeoecology and faunal communities during the lower Palaeogene in the Himalaya, among others.

The monograph opens with a preface followed by lengthy contents page. It is divided into four chapters : introduction, biostratigraphy, systematics and discussion. The introduction (Chapter I) gives background to the research and spells out the objectives of the study. The chapter II on biostratigraphy presents an informal zonation dividing the successions of the Jammu, Simla, Garhwal regions into eight assemblage zones based on larger foraminifera, molluscs and bryozoa, along with detailed lithologs, zonal distribution of fossils, geological maps, etc. of the studied sections. The proposed zones have been correlated with the standard zonations of the Tethyan successions based on planktic and benthic microfossils. The microfacies illustrated in three plates could be useful in correlating the studied successions with the coeval fossiliferous horizons of the neighbouring areas of the Tethyan region. In my opinion, this part could have been expanded with further addition of illustrations of microfacies from the studied sections to present a general picture of their sequence in the outer Himalayan region.

The bulk of the monograph which forms the chapter III, deals with the taxonomy of a large

number of invertebrate fossil taxa from the studied sections, most of which are common in the Tethyan realm and represent molluscs, anthozoans, bryozoans, ostracodes and foraminifera. One hundred seventy four species are described and illustrated in 40 plates. Each species includes the original citation, a brief description, biometric data and stratigraphic range followed by remarks. Remarks give geographic and stratigraphic distribution of taxa and occasionally indicate the differences existing amongst the related taxa. However, I notice that there is no reference to, or comments on, the two important taxa : *Alveolina oblonga* d'Orbigny described by Singh (1970) from the Jammu region, and *Ranikothalia nuttalli* (Davies) long suspected to be present in the Subathus and also mentioned by some workers (e.g. Singh and Andotra, 2000). Also, I find some important papers missing in the list of references (e.g. Sirel and Gündüz, 1976; Matsumaru and Sakai, 1989; Mastumaru, 1996).

The chapter IV is concerned with a discussion on palaeoecologic and faunal community interpretations (part I of the chapter IV) with reference to palaeoenvironmental reconstruction in the Outer Himalayan realm during the early Palaeogene. The distinguishing feature of this chapter is a table presenting the ecological data of all the taxa described in the monograph. Such data can be usefully integrated with the sedimentary facies data in interpreting the environment of deposition of the lower Palaeogene successions in Himalaya, and in recognising the depositional sequences within a framework of definite time lines based on the biostratigraphic information presented in the chapter II.

The monograph ends with conclusions (part II of the chapter IV) concerning the tectonic setting which is largely the consequence of the India-Asia collisional process and the depositional environment developed due to modifications in the extent of the Tethys and its withdrawal from the Outer Himalayan belt. There is also a passing refrence to the palaeogeographic reconstructions in the Himalaya during the early Palaeogene, based mainly on the works of Bhandari and Agarwal (1967), Singh (1980 a,b), Mathur (1981), Virdi (1995) and Juyal (1997). These works provide a reasonably good information about the early Palaeogene environment and palaeogeography of this part of the Himalaya. However, I feel that much work still remains to be carried out in the related disciplines of sedimentology, regional tectonics, sequence stratigraphy, etc. in the Himalaya to provide a strong database to support these conclusions. Once enough progress has been made in these disciplines, the information of this basic research in Palaeontology from the Himalaya will begin to pay dividends in terms of its wide application in the correlation of the geological events, organisation of depositional sequences and determination of palaeogeography and palaeoclimate in the region.

A major point that immediately strikes every worker of the Himalayan Geology, pertains to the use of the term "Himalayan foothills'. The term 'foothills' used by the authors in the title does not seem to be appropriate in the light of the prevalent terminology related to the geological framework of the Himalaya. The authors should have specified what they mean by 'Himalayan foothills' in the geological context.

Overall, it contains a wealth of information of useful data concerning taxonomy and distribution of the early Palaeogene invertebrate fossils of the Himalaya. Although aimed more at the specialist, it is also of interest to sedimentologist, general geologist, teachers and students working in the Himalayan successions.

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