

out of existence, the relatively small sized animals adopted themselves to a wide range of habitats in both land and sea and survived during crisis. Not only did they survive but multiplied rapidly and diversified into a variety of forms during the Tertiary. The unravelling of these dramatic events in all their grandeur is the most absorbing part of the book.

The last chapter is devoted to a consideration of the effect of humans on birds. The author states that the awesome power of flight inspired humans to conquer the air by developing the ability to fly. At the same time, their very activity has spelt disaster causing countless species to disappear. Humans seem to be the cause of another major extinction event by their acts of polluting environment and going beyond their territory and range. Mankind is tending to become a victim of its own success.

The book 'Rise of Birds' is not only fascinating reading throwing much new light on the evolution of vertebrates but its value is greater for its able analysis of the causes of mass extinction of species and the warning given at the end that if mankind does not exercise control over its ever growing lust for power, it will also be doomed, like many of his ancestors and wiped out of existence.

The book is exceedingly well produced with an attractive print style and format, written in a manner to focus the attention of every intelligent reader not necessarily a palaeontologist. We warmly commend it to our readership.

Bangalore

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THE QUATERNARY GEOLOGY OF GUJARAT ALLUVIAL PLAINS (1997) by S.S. Merh and L.S. Chamyal. Proc. Indian National Science Academy, Bahadur Shah Zafar Marg, New Delhi - 110 002; v. 63 A, No.1, 98 p., Rs. 250/-, US \$ 90.

Within Peninsular India, Gujarat is unique in the sense it has Quaternary deposits which have records in them of the effects of tectonism, palaeoclimate, sediments of different origins and structures, besides evidences of prehistoric human habitation. The Oil and Natural Gas Commission, in its quest for hydrocarbons, has made a very detailed study of the geology and structure of a major part of Gujarat, over the past three decades. Similarly a few geo-archaeologists from India, along with their foreign collaborators, had studied the history of human habitats and their environments in Gujarat and the adjoining Rajasthan. This was followed by a certain amount of dating of the Quaternary sediments and events by the scientists of the Physical Research Laboratories, Ahmadabad. The stratigraphy and sediments of the Quaternary were, however, not well studied in detail. It is this gap that has been the subject of study by a team of scholars under the able guidance of Prof. Merh at the Geology Department in the University of Baroda, confining themselves to the Gujarat Alluvial Plains, between the rivers Luni in the north and Narmada in the south.

The initial section (pp. 1-26) provides all the required basic data on climate, drainage, soils, geology, geomorphology and tectonic history as available in literature. Next follows the main contribution (pp. 26-56) in terms of lithostratigraphy and field descriptions of the unconsolidated sediments along different river sections with suggestions on the depositional environments. Basinwise lithofacies description (pp. 56-77) in specific sections is given with emphasis on the sedimentary structures therein. The variety of calcretes (pp. 77-81) seem to aid to some extent the reconstruction of the palaeoclimatic history and sea level changes (pp. 82-88), though the authors recognize the differing scenario presented by workers on sea level variations (p. 85), preventing an unequivocal correlation between palaeoclimate and sea level changes. Besides, they are also

cautious enough to admit the lack of adequate dates for the key horizons (p. 95) to give precise ages for the different formations within the Quaternary.

This monograph is a very good synopsis of the published work of this team on various journals, on the stratigraphy, sediments and structures within the Quaternary of Gujarat Alluvial Plains. The recognition of i) major changes in the drainage pattern, ii) varieties of sedimentary structures as specifically related to types of fluvial morphology, and iii) stratigraphic sequence reflecting changes in the processes and environments, have all been adequately presented with appropriate maps, figures, tables and excellent colour photographs. Perhaps maps of each of the drainage basins of Sabarmati, Mahi and Narmada, within the Gujarat Alluvial Plains, showing the *actual* locations of the studied sections, instead of their general location in terms of distance in kilometers from a locality, would have helped subsequent scholars to visit some sections to study further, the stratigraphy. So also a few sequential block diagrams, showing the provenance, the agent, nature of sediment and shifting locations of depocentres with time, if included, would have added to the better understanding of the geology and geomorphology of this region.

The text is very well presented with few flaws. However, it may be noted that 'average' is never a range (p. 34), but a specific number; it is disconformity and not non-conformity (p. 44) between Hirpura and Saroli Formations. If Valsana Member in the Sabarmati river sections is only a lensoid body (in Madhavghat Section, p.50), there is no need to describe its absence elsewhere (Mahudi Section, p. 48) as 'disappearance', which implies earlier deposition and later erosion. Perhaps it was not deposited at all, quite in keeping with such variations in fluvial deposition.

This publication with over 100 references should be of interest to sedimentologists in general and students of fluvial morphology in particular, and can be taken as a guide as to how one should go about in studying Quaternary unconsolidated sediments.

Cuddalore - 607 001

R. VAIDYANADHAN

PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON APPLIED GEOCHEMISTRY (NOV.19-21, 1991), Editors: K.Surya Prakash Rao and R.D. Schuiling; Published by the Department of Applied Geochemistry (R&T), Osmania University, Hyderabad, 1996, 472 p; Price not indicated.

The above symposium organised at the Osmania University in 1991 was to commemorate a decade of collaboration between the Dept. of Applied Geochemistry of the Osmania University (O.U.) and the University of Utrecht of the Netherlands. Prof. K. Surya Prakash Rao of the O.U. and Prof. R.D. Shuiling of the Utrecht University were, and continue to be the architects of this fruitful collaboration in the field of Applied Geochemistry, which has assumed paramount importance in several important areas of Earth Science, like in Mineral Exploration and Environmental Geology.

The symposium also co-sponsored by the Geological Survey of India (Southern Region, Hyderabad) attracted 140 scientific papers and the present publication incorporates 48 selected papers covering the gamut of:

- a. Trends in geochemical exploration for mineral deposits with special reference to Au, U and basemetals;
- b. Instrumental analytical techniques in geochemical work;
- c. Hydrogeochemistry with special reference to fluorine;