

with Pipalkoti and Badolisera-calc zone of Pithoragarh and Gangolihat etc, the Pratapgarh quartzite Group with Berinag Quartzite and Dharmandal with Askot-Bajnath crystallines.

The crystalline Nappes are described in Bhilangna valley, Bhagirathi valley and Yamuna valley. Some classification is attempted in the Bhagirathi and Yamuna valleys. In the former the sequence starts with Joti Formation, considered equivalent of Vaikrita, Bhatwari as equivalent of the Jutogh and the Budhakedar comprising mainly granite gneiss. In Yumuna valley a separate set of names are used.

The Chapter on Structure and Tectonics refers to the variopous nappes cited before. The author writes (Page 36) that the Chandpur and Nagthat Formations should not be included in the Krol Nappe as they show tectonic contacts with the Krol formations and in the next page (Page 37) he presents a succession of Blaini-Infra Krol-Tal overlying unconformably over the Chandpur-Nagthat and the base of these is depicted as Krol Thrust overriding the Subathu Formation unconformably overlying the Simla group. The Chail/Jaunsar Nappes are described with a lithotectonic sequence. The Chail nappes are shown as 1, 2 and 3 and there are other names like Pratapnagar/Berinag Nappe. Structures are presented with complex range of tables of fold classification, strain ratio in various dimensions. The crystalline nappes are also subjected to similar descriptions and structural analysis.

The author has concentrated only on metamorphic petrology and there is no chapter on sedimentation. The study covers the Chail and Crystalline Nappes. The principal metamorphic minerals are sericite, chlorite and biotite. The Crystalline Nappes show distinct metamorphic characteristics with increasing grade from Budhakedar, with sericite-chlorite-biotite, to Jutogh with chloritoid-biotite-garnet and to Vaikrita containing garnet, staurolite, kyanite and sillimanite. Saklani proposes two phases of metamorphism, one pre-Tertiary and the second Tertiary.

The chapter on concluding remarks contains a summary. The book contains 24 plates of structural and thin section photographs, a bibliography, author and subject indices.

The book appears to have been written in a great hurry. Many repetitions have cropped up in chapters of stratigraphy and geology and also geology and structure-tectonics. There are also many contradictions. Also introduction of new names in an area which has already been covered under Geology of Kumaun Lesser Himalaya by K.S. Valdiya confuses the readers. The author hardly deals with sedimentation aspect. Many of the structural details which are good for publication in a Journal do not fit in a book.

I am not sure whether this book really fulfills the *fond expectation* of the author to *enthuse* and *invigorate* the interest of earth scientists engaged in Himalayan Geology studies. At least the book brings out one aspect that the road to understanding the geology of the Himalaya is long and arduous. It needs much closer coverage of the ground and also the realization that unlike the Alps where the segments are not continuous, the Himalaya being a linear mountain belt the geology cannot be too different from one sector to another particularly in the Lesser Himalayan zone where they are closely linked. Nevertheless the efforts of the auhtor deserve appreciation.

Flat-201, A Block, Ushas Apts.,  
26, 16th Main, IV Block,  
Jayanagar, Bangalore-560 011

S.V. SRIKANTIA

### GEOMORPHOLOGY OF THE DESERT ENVIORNMENTS (1994)

(Eds.) Athol D. Abrahams and Anthony J. Parsons. Chapman & Hall, 2-6, Boundary Row, London SE1 8HN. 674p. £ 85.00

During ther past two to three decades there have been a few publications dealing with some aspects and features of deserts of the world, which occupy about one third of the earth's

surface supporting 15% of its population. The present volume under review covers most aspects and wider area and is an up-to-date treatise on the subject. The 26 chapters in the volume are divided into 8 parts: Introduction, Weathering, Hill slopes, Rivers, Piedmonts, Lake Basins, Aeolian Surfaces and Climatic Change. All hot, warm and temperate, arid and semiarid areas of the world are considered as deserts (Ch.1). No two desert regions are entirely identical. They have different past climatic histories (Ch.2). The need for detailed study and research in this field is timely since monitoring of these areas show that some of deserts are infact enlarging rather than contracting, mostly due to grazing intensity of stock animals and hastening of human occupancy.

There is a popular misconception of extremes of temperature variability and absence of moisture as the norm for all desert regions. It is clearly shown that even in the desert, chemical weathering does take place almost similar to what is observed in other climatic zones, though not of the same intensity. Table 3.6 (p.56) listing tests and procedures of possible relevance to the study of the weathering in deserts should be of particular interst to the researchers embarking in this field (Ch.3). Desert environment also shows up soils, though they may be thin, gravelly, salt-dominated and organic-poor(Ch.4). Morphology, chemistry, mineralogy and origin of major types of crusts (calcrete, silcrete, gypcretes) are adequately covered, some are pedogenic and some are nonpedogenic (Ch.5). The major determinants of rock varnish physical characteristics are the relative contents of clay minerals (commonly 60 to 80 %) and hydrous non-crystallines of Mn, Fe and Si, each of which attains values of 50 % or more. Research on this has led to considering it as a possible tool (p.117) for both absolute age determination and paleoenvironmental analysis (Ch.6).

Principles of rock mechanics have been applied judiciously in the development of models of scarp profile evolution (Ch.7). Hydraulic processes have been evoked in understanding the formation and distribution of rock-mantled slopes (Ch.8). Perhaps badlands offer a unique opportunity, as exemplified in the text, for development and testing of quantitative landform models because the processes are rapid enough to enable measurements of rates of landform changes (Ch.9). The study of the impact of plants on geomorphic processes, often ignored or considered insignificant, is a welcome addition (Ch.10).

It is the spatio-temporal diversity of rainfall (hydrological processes with river as a major agent) that lead to significant differences in the corresponding geomorphic processes (Ch.11). Undeniably leading contributions to our knowledge of channel processes, evolution and history of desert regions have come mainly from southwest United States (Ch.12). As a transitional landform, the pediments with variable characteristics have not been easily susceptible to quantitative measurements and analysis. However, concepts and factors dealing with these have been discussed in considerable detail (Ch.13). Alluvial fans are generally encountered along the mountainous regions under all climatic domains, though they are best seen and studied in arid environment. Their morphology is largely dependent on dynamic and static processes and nature of materials involved in transportation and deposition (Ch.14). Hydrographic (Ch.15) and geomorphic (Ch.16) pattern of hemiarid lake basins are mentioned briefly, perhaps because these are not ubiquitous in all desert regions.

The three chapters that follow (17, 18 and 19) exhaustively deal with the fundamentals of aeolian sediment entrainment, transport, wind erosion processes and landforms, dune morphology and dynamics and paleoclimatic interpretation of aeolian sediments and landforms. In the final part, some of the earlier described features like rock varnish (Ch.20), hillslopes (Ch.21), river landforms and sediments (Ch.22), alluvial fans (Ch.23), paleolakes (Ch.24), desert dunes and sediments (Ch,25) showing evidences for climatic changes are brought to focus. The last chapter (26) deals with climatic changes in the Cenozoic. A very large extent of what is seen today in the deserts is a result of changes during this era.

As the editors have regretfully confessed there is a geographical bias with 14 of the 22 authors based in North America. Naturally studies in that part of the world find a prominent place followed by those in Australia, North Africa and Middle East; Thar desert is barely mentioned in spite of some studies on this region having been published in international journals. The illustrations are excellent, references under each chapter and subject index at the end, are adequate, though the photographs could have been much better.

This can be considered as a reference volume to all those interested in the study of desert landforms and wish to do research in this fascinating field.

R.V.

## NOTES

### PROFESSOR ROSS TAYLOR HONOURED

Professor Ross Taylor Honorary Fellow of our Society, has been elected as Foreign Associate of the U.S. National Academy of Sciences. The Academy has about 2000 members, of which about 260 are Foreign Associates.

Dr. Taylor is a well known geochemist and was elected to the Honorary Fellowship of our Society in the year 1978 in appreciation of his valuable contributions to the advancement of our knowledge of the continental crust. He is the author of several popular books and a number of original contributions which are frequently quoted in geological literature. He is now retired from the research School of Earth sciences and is presently working in the Department of Nuclear Physics, Australian National University, Canberra. He is presently engaged in revising his earlier book 'Solar System Evolution: a New Perspective' first published in 1992. The new book is expected to be published by the Cambridge University Press in 1996 and will highlight the uniqueness of the solar system.

### Nkosi Sikelele Africa (God Bless Africa)

Out of the experiences of an extraordinary human disaster that lasted too long must be born a society of which humanity will be proud..... The time for healing of the wounds has begun.

NELSON MANDELA