REEF DIAGENESIS Editors: J. H. Schroeder and B. H. Purser, Springer-Verlag, Berlin, 1986, 455 pages.

The Fifth International Coral Reef Congress in Papeete, Tahiti, held in 1985 supported a special symposium on reef diagenesis which prompted J. H. Schroeder and B. H. Purser to edit a volume containing presentations by the participating scientists and articles by several specially invited workers. The volume is made up of a series of case-histories from various regions. Detailed documentation at ultra-structural levels are also included. In spite of the fact that biology, palaeontology and sedimentary facies are determinative factors in diagenesis in general, the present volume concentrates mainly on reef diagenesis because, reefs have relatively clearly defined geometries. Another reason for this special attention is the reservoir potential of these carbonate bodies.

In the introductory Chapter, the editors have clearly defined the concept, terminology and historical aspects of studies related to reefs. Setting the stage for formal presentation of case histories, which are arranged in such a mannar that diagenetic events of Cenozoic are documented in the early Chapters, followed by more and more complex and less definitive case histories of Mesozoic and Palaeozoic.

There are 7 papers on Cenozoic reefs. J. F. Marshall has described distribution of submarine cement on regional scale within an epicontinental reef system in Central Great Barrier Reef. The study is based on 15 bore-hole samples from five reefs, and the study has shown that high energy conditions are necessary to pump large volumes of water through porous reef system so as to precipitate significant quantities of calcium carbonate; hence this factor has been taken to be the prime controlling factor with respect to distribution of submarine cement. D. M. Aissaoui *et al.* present a model for reef diagenesis based on the studies on Mururoa Atoll, in French Polynesia. These authors have found that calcite diagenesis has involved both marine and meteoric processes, while dolomitization has affected the lower 2/3 of sedimentary pile. The oceanic platforms have been shown to exhibit significant increase both in calcitic and in dolomitic diagenesis towards its periphery. B. R. Constanz has discussed susceptibility of modern corals to diagenesis which is related to their primary surface area. W. C. Dullo has discussed variation in diagenetic sequences taking up examples from Pleistocene Coral Reefs of Red Sea. R. W. Buddemeier and J. A. Oberdorfer have inferred that interaction between water-flow through the sediment and the chemistry of the sediment holds the key to diagenesis in Davies reefs and Enewetak Atoll.

D. M. Aissaoui *et al.* have described diagenesis of Miocene reef-platforms in Jebel-Abu Shaar, Gulf of Suez, Egypt and conclude that there are strong contrasts in the degree of synsedimentary cementation between the talus and platform edge facies located along the eastern margin of the platform and the remainder of the Miocene platform sediments. J. H. Schroeder has discussed the complex diversity in the diagenetic patterns in the Paleocene Coral Knobs in Southern Egypt. He has shown that different portions of corals were affected at various times by neomorphism, replacement, dissolution cementation and/or fracturing.

The Mesozoic Reefs have been described by Paul Enos. Three distinctive diagenetic sequences reflect differences in the earliest diagenetic history of the rocks i.e., a) initial marine, b) initial marine vadose and c) initial meteoric phases. A comparative study of diapir-influenced reef atolls and fault-block reef platforms in the

Late Albian of Northern Spain has been made by J. Reitner. Key difference between the two types of diagenesis was the early introduction of meteoric water into the diapir reef complex. A. M. Rabat *et al.* have presented a case history of micrite diagenesis in Senonian rudist build-ups in Central Tunisia. Microsparitization has been shown to be recorders of phases of reef emergence. R. Koch and M. Schorr describe diagenetic history of Upper Jurassic sponge algal reefs. R. Henrich and H. Zankl discuss Upper Triassic Wetterstein reefs of Bavarian Alps.

The Palaeozoic section commences with an article by M. E. Tucker and N. T. Hollingworth describing the diagenetic history of Zechstein reefs complex of N. E. England. These authors have found that marine diagenesis of reefs is similar to that found in modern reefs, where extensive precipitation of aragonite and high Mg-calcite produces solid reef rocks. The calcite fan crystals are, however, unlike modern marine cements. M. Scherer has similarly described aragonite sponges from Permian of Southern Tunisia. J. Miller has presented the facies relationships and diagenetic trends in Lower Carboniferous mudmounds in Ireland and N. England and found that interbank to bank facies transitions provide evidences concerning the origin of the primary lime-mud. Comparison of early diagenetic histories from adjacent facies give important evidences bearings on the nature and timing of buildup lithification. Two case histories from Devonian have been presented by H. G. Machel and C. Kerans *et al.* Machel has discussed early lithification, dolomitization and anhydritization of Upper Devonian Nisku Buildup subsurface of Alberta, Canada and C. Kerans *et al.* discussed the marine diagenesis of Devonian Reef Complex of Canning Basin, Western Australia. They believe that diagenetic history of these Devonian reef complexes was strongly influenced by early marine cementation and had important consequences both during growth of the complex and after their burial. Two Silurian studies by K. R. Cercone and K. C. Lohmann and P. Frykman are concerned with Union 8 Pinnacle Reef of Northern Michigan, USA, and Klinteberg Formation of Sweden, respectively. In the concluding Chapter the editors have very nicely summed up the different viewpoints, points of agreement and disaggrements on the mechanism of reef diagenesis. There is, however, a bias in giving more space to similar and repetitive conclusions from similar reef types, while some reef types have not been included at all. One has to bear with editor's choice in this regard.

The standard of most of the papers is fairly high, having used most modern geological tools to arrive at specifie conclusions. An unavoidable weakness in such case history oriented publications is that similar results are repeated in paper after paper, hence, it becomes boring to read each article and find the same conclusion being repeated. The general get-up of the book, including printing, plates, figures and binding is excellent. Editors have done a commendable job in preparing the volume for publication. The book is highly recommended for use in all geological libraries and individuals interested in diagenesis of carbonate sediments in general. Price as usual is very high from Indian standards.

Department of Geology
University of Delhi, Delhi

D. M. BANERJEE