

# Evolution and Diagenesis of Quaternary Carbonate Sequences, Shark Bay, Western Australia

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acquiring. Several other papers, although less substantive than Rampton's are valuable because they are good reviews. This is the case with D. E. Kerfoot's "Thermokarst features produced by Man-Made Disturbances to the Tundra Terrain" a good case study which can be usefully compared to a more recent study by H. M. French published in the *Canadian Journal of Earth Sciences* v. 12, no. 2, 1975, p. 132 - 144. The paper by McCann and Cogley on fluvial activity at high latitudes is well documented and well illustrated. It should go a long way towards insuring that the importance of fluvial processes in periglacial areas is adequately evaluated. This is certainly not the case in presently available textbooks.

These papers along with others dealing with frost action, ground ice, permafrost, talus slopes, avalanches, glaciers, till and moraine formation will maintain the now well established reputation of the Guelph Symposium on Geomorphology series.

MS received April 24, 1975

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## **Evolution and Diagenesis of Quaternary Carbonate Sequences, Shark Bay, Western Australia**

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By Brian W. Logan, James F. Read, Gregory M. Hagan, Paul Hoffman, Raymond G. Brown, Peter J. Woods, and Conrad Gebelein.

*American Association of Petroleum Geologists Memoir 22, 358 p., 1974.*  
AAPG and SEPM members \$32.00;  
others \$40.00.

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This well-illustrated memoir contains seven separate papers detailing various aspects of the continuing investigation of Shark Bay, a preliminary account of which appeared as AAPG Memoir 13 (1970). Much detailed work has gone into the project, directed by Brian Logan, and each paper contains a wealth of descriptive and interpretive information useful in the analysis of modern and ancient carbonate sequences.

Shark Bay, about 13,000 Km<sup>2</sup> in area, is situated in an arid climatic zone and has a variety of carbonate depositional environments, largely controlled by bathymetry, salinity, tides and wind, restricted inlets and sedimentary sills. The climatic aridity leads to the development of hypersalinity in the bay and in the interstitial waters and results in a diagenetically active regime. All this is reflected in the diversity of topics covered, which include accounts of the formation of carbonate banks and platforms, development of supratidal flats, discussion of diagenetic alterations within the sediments and upon their subaerial surface, and a detailed account of algal mat development.

The stromatolites of Shark Bay have been discussed for over a decade but I found the account of algal mats and associated structures particularly illuminating. The development of seven basic types of mat and the distinctive sediment fabrics that they produce are clearly portrayed. These fabrics can then be used to interpret vertical sequences of sediment by relating them

to the mat position with respect to sea level, and are shown to present excellent analogies to Proterozoic stromatolites near Great Slave Lake, N.W.T. Canada.

Considerable emphasis is placed upon vertical sequences of sediment as well as lateral distribution and on the geometry of the sedimentary bodies. This three-dimensional approach greatly helps in visualizing similarities to ancient limestone units.

The memoir should be of great value to geologists concerned with problems of modern carbonate sedimentation and diagenesis, as well as to those involved in the interpretation of ancient depositional environments. I enjoyed reading this book, and it is a pity that the price is such to undoubtedly limit its sale.

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