

Modern and Ancient Lake Sediments

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ancient rocks, and one uses data from both modern and ancient deposits. The collected papers provide a very clear picture of the differences in the methods used, and in the problems faced, by the marine geologist or oceanographer, and the land-based geologist.

None of the papers are purely review papers but the contributions by Shepard and Marshall on Currents in Submarine Canyons, by Piper on Turbidite Muds and Silts, and by Nelson *et al.* on Thin-Bedded Turbidites, provide up-to-date general accounts of our knowledge in these three fields. Most of the papers are fairly detailed and will be of interest principally to sedimentologists, marine geologists, and stratigraphers. Newcomers to the field of canyon, fan and trench sedimentation will find the book a useful up-to-date starting point and source of references.

The volume is a fairly large format, with print on substantial, matte paper that makes for easy reading; though the paper is not glossy most of the half-tones are sufficient contrast to show up well. On the other hand, several of the diagrams, particularly stratigraphic sections, have not fared well in reproduction. Some of the fault may lie with the printers because reproduction of similar cross-sections in one paper by Almgren varies from good to poor. However, more care in the selection of appropriate sizes for diagrams may have avoided some of the difficulties. In a paper by Mutti *et al.*, detailed cross-sections showing areal variations in thicknesses of turbidites occupy less than half a page each, are printed faintly, and are difficult to read, yet in the following paper (by Kepferle) a graph with only three grain-size distribution curves is accorded half a page. Proof-reading appears to have been done with care, and I found only a very few errors in the text; but the proof-reader may have been too close to the trees to see the forest because five photographs are missing from the paper by Pescatore! These problems with the figures are irritating but I found all of the papers understandable in spite of them.

The editors have provided a nice balance of studies of ancient and modern sediments; they have focussed attention on current major concerns

such as the role of bottom currents in the deep sea, the nature and origin of the very fine-grained and very coarse-grained sediments of fans, canyons and trenches, and on the role of tectonic setting and tectonic activity in the development of thick sediment wedges in the deep ocean. Their final chapter on the state-of-the-art is a stimulating and fitting conclusion to the book. Though the general geologist will find most of the papers too specialized, sedimentologists, petroleum geologists, stratigraphers and others working in deep-sea sediments will find much of interest in the volume. You can even read about one poor guy who got caught in a turbidity current!

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Edited by Albert Matter and Maurice E. Tucker
Special Publication 2 of the International Association of Sedimentologists, Blackwell Scientific Publications, 290 pages, 1978.
 \$12.00 (soft cover)

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This second special publication by the International Association of Sedimentologists takes the form of a proceedings of a symposium held at the H. C. Ørsted Institute of the University of Copenhagen in 1977, and the 14 separate papers which comprise this publication have been authored by many well-known specialists.

Hardie, Smoot and Eugster present a review of arid zone saline lake deposits, with particular reference to North American examples. Stoffers and Hecky relate the mineralogy and microfossils in the deposits of the Kivu-Tanganyika basin to implied changes in lake stratification, response to climatic variations, and the influence of Rift Valley volcanic activity during the Pleistocene-Holocene period.

In the paper by Müller and Wagner, changes from low Mg calcite to high Mg calcite are related to decreasing water levels and increased evaporation in Lake Balaton; further, recent calcite precipitation is related to algal blooms. This work is followed by a study of algal lake carbonates in which Schafer and Stapf compare ancient and modern examples from the Permian Saar-Nahe basin and Lake Constance.

A different form of carbonate deposit is described by Smoot from the Eocene Green River Formation, Wyoming. Evidence is drawn from the Wilkins Peak member to demonstrate that lacustrine dolomitic carbonates have been formed as a reworked deposit, derived by the disintegration of surface crusts, tufas and caliches which were subsequently transported as clastic materials.

Data from the Deep-Sea Drilling Program in the Black Sea has been used, selectively, by Hsü and Kelts to illustrate salinity controls on carbonate mineralogy and the formation of siderite during periods of high dissolved iron input. In addition, laminated sequences in the lower chalks are compared with the varved sequences of Lake Zurich. Cyclic interruptions in the deposition of the abyssal upper chalks are caused by the inflow of terrigenous silts, transported by turbidity currents, and derived from the drainage basin during periodic release of melt water in the early stages of the Pleistocene glaciation. The formation of turbidite and varved deposits are further described by Sturm and Matter, using Lake Brienz (Switzerland) as a typical example of deep water deposition of clastic materials where transport and deposition are strongly influenced by density flows and stratification.

Link and Osborne illustrate the variety of Lacustrine facies with particular reference to the Pliocene Ridge Basin Group, California, and papers by Truc and Tucker describe sedimentation and facies development in evaporite and carbonate sequences from the Palaeogene Mormoiron Basin of S.E. France and the S. Wales Triassic. Permo-Triassic deposits of the E. Karoo Basin of Natal, South Africa, are used by Van Dijk, Hobday and Tankard to describe cyclic sedimentary sequences which include both shore and offshore lacustrine zones.

Unusual sedimentary structures in the Horton Bluff Formation (Mississippian) in Nova Scotia are related to contemporaneous seismic activity by Hesse and Reading, and Clemney presents evidence for distinguishing between lacustrine and marine sediments, based largely on a Proterozoic interlude in the Zambian Copper Belt.

A paper by Reeves on the economic significance of Playa Lake deposits gives an unusual twist to the end of this special publication.

Without doubt, this book provides an excellent selection of case histories which describe many aspects of lacustrine sedimentation and which follow one another with at least a reasonable flow of content. However,

the work is not encyclopaedic and, as noted by Matter and Tucker in their most informative introduction, there are many topics of interest which have not been included; in particular, engineering and cultural/environmental aspects have been largely omitted.

During the past decade a rapid increase in the number of publications has given ample evidence of expanding interest in lacustrine sedimentation. In 1972 SEPM special publication 16 provided an excellent discussion of the recognition of lacustrine environments in ancient sediments, in 1973 the IAHS published an extensive series of papers on the hydrology of lakes as a proceedings of the Helsinki Symposium; by 1975 a number of reports had been published on the Lake Biwa studies and SEPM special publication 23 had provided some landmark papers on glaciofluvial and glaciolacustrine sedimentation. In 1976 the Journal of the Fisheries Research Board of Canada published a special issue entitled "Lake Erie in the Early Seventies" which also included a number of landmark papers on lacustrine sedimentation. In 1977 the proceedings of the 1976 Amsterdam Symposium on sediment/freshwater interaction became available in published form and provided a particularly useful source of information relating to environmental factors. In 1978, the release of the IAS special publication on modern and ancient sediments coincided with the release of another major text on lakes (their chemistry, geology and physics) and although some authors have prepared contributions for both publications the approaches adopted are substantially different.

In general, this special publication is informative and reasonably well illustrated; although a bias towards the descriptive interpretation of palaeo-sediments may somewhat restrict interest in it to the classical sedimentologist. While this book may lack broad scientific appeal it should be an invaluable reference on the bookshelves of most earth science libraries.

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Letter

While it is always interesting to read summaries of meetings such as the GAC Annual Meetings, where many of us have been present ourselves, it is probably even more useful to read reviews of specialist societies that most of us would not have attended. Thus I found the excellent discussion of "The Meteoritical Society at Sudbury, 1978" by Robertson and Dence in *Geoscience Canada*, v. 6 no. 2, very informative. The brief history of the Meteoritical Society's early years and later development formed a helpful introduction.

Canadians might be interested to know also that Frederick Leonard (after whom the Society's Leonard Medal was named) visited British Columbia shortly after the Society was formed in search of a meteorite that had been seen to fall in the Interior. He was assisted in his "prospecting" trip by a Provincial mining engineer who knew the country well. Although the meteorite was not found, Dr. Leonard's enthusiasm was so great that before he left Victoria he had signed up several new members for the fledgling Meteoritical Society. It is sad that, because of his untimely death, few present-day members of the Society had the opportunity of knowing Dr. Leonard personally and being inspired by his great dedication.

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