Recent and Ancient Nonmarine Depositional Environments: Models for Exploration. F.G. Ethridge & R. Flores (eds.), Society of Economic Paleontologists and Mineralogists, Special Publication 31 (1981). U.S. $20 to members, $25 to nonmembers.

This book contains nineteen papers, twelve of which were presented in a symposium at the Annual Meeting of the Rocky Mountain Section, Society of Economic Paleontologists and Mineralogists, Casper, Wyoming, June 1979. The theme of the book is a discussion of fluvial, lacustrine and eolian sedimentation and the use of sedimentological information in the development of petroleum, coal, uranium, water and other resources. The subject is a vast one, and only random bits of it can possibly be tackled in a book of this size. There is some excellent material here, but the overall impression is of a rather patchy collection.

The first part of the book is entitled "Review of recent and ancient nonmarine depositional models" but is, in fact, nothing of the kind. It contains three papers. Flores and Ethridge open with a literature survey of fuel, mineral and water resources in nonmarine deposits, with brief comments on the use of sedimentological methods in exploration or exploitation. Most of their examples are American, particularly from Texas and the Colorado Plateau. There is an excellent reference list, except that a lot of valuable material appears to be buried in internal, unpublished or Open File reports or local journals, all of which are difficult to obtain.

Schumm then presents a review of some of the sedimentologically important aspects of fluvial geomorphology, with a useful summary of ideas on variations in channel patterns, geomorphic thresholds and the various time scales of cyclic processes.

The last paper in the section is a description of modern volcaniclastic sedimentation in Guatemala, by Vessell and Davies. The episodic supply of vast quantities of coarse debris generates catastrophic debris-flows that are interbedded with airfall ash and glowing avalanche beds. Very rapid diagenesis of the immature detritus is a distinctive characteristic of these sediments.

Part 2 of the book is the longest, containing nine papers on alluvial fan and fluvial deposits. These comprise a variety of surface and subsurface case studies, most carried out for some economic purpose, including coal, petroleum or uranium exploration, water supply or groundwater-quality evaluation. All are excellent examples of the application of modern sedimentological basin-analysis methods to particular rock units of interest. They range from a synthesis of the vast Cenozoic fluvial complexes of the Gulf Coast by Galloway to an examination of a local water-supply problem by Shepherd and Owens. One paper by Keighin and Fouch focuses on petrology and diagenesis of a fluvial unit. Most of these papers adopt a sophisticated approach to facies analysis, and it is gratifying to see interpretations carried beyond the simplistic "braided" or "meandering" alternatives that were common only three or four years ago.

Part 3 of the book contains three papers on lacustrine deposits. The first, by Dean, is a useful review of the physical, chemical and biological factors that control sedimentation in temperate lakes, with emphasis on hard-water lakes. Ancient deposits are not dealt with here, but are reviewed by Picard and High in an update of their 1972 paper on criteria for recognizing lacustrine rocks. Their emphasis, as indicated by their title, is on the "physical stratigraphy of ancient lacustrine deposits"; the paper is packed with useful facts, figures, maps and sections. Many sedimentologists will be mining this paper for information and ideas, although they may be surprised at the inclusion of many references to papers that are sedimentologically ancient (pre-war). However, I was grateful for the omission of Twenhofel's bullseye model for clastic facies belts, which persists in appearing in practically every undergraduate's term paper on facies models submitted in my advanced course. The last paper in this section discusses sulfur isotope variations in the Green River Formation. Isotopic concentrations of sulfur are a useful supplementary indicator of nonmarine depositional environments, and this paper provides much useful data on an important oil-shale bearing unit.

The fourth part of the book contains four papers dealing with facies analysis of modern and ancient eolian deposits. By far the most interesting of these is the article by Hunter, one of a series published by this author over the last four years in which he has examined the nature of sediment transport and the resultant small-scale sedimentary structures produced in modern dunes, and attempted to recognize the same features in selected ancient eolian deposits. Hunter has almost single-handedly solved the problem of identifying ancient eolian cross-bedding by paying close attention to the details of sand-grain movement. Surprisingly, this has eluded previous workers, who have tended to bog down in the minutiae of cross-bed orientation. Hunter has indentified three types of eolian stratification, sandflow, grainfall and

climbing translatent (ripple) lamination and, in his paper in this book, illustrates their occurrence in many of the classic eolian deposits of the American southwest. Another useful paper in the eolian part of the book is that by Ahlbrandt and Fryberger on interdune deposits, liberally illustrated with excellent photographs.

The editors have done an excellent job with overall scientific standards, and the book is beautifully produced in the tradition of SEPM. Errors are few, and the price is right; I have no qualms in recommending that anyone involved with nonmarine rocks should purchase this book, if only for the papers by Flores and Ethridge, Schumm, Galloway, Picard and High, and Hunter (my personal favorites).

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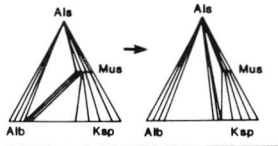
MINERALOGICAL SOCIETY OF AMERICA
1982 SHORT COURSE

Characterization of Metamorphism Through Mineral Assemblages and Mineral Chemistry
October 15-17, 1982
Hyatt Hotel, New Orleans, Lousiana



The Mineralogical Society of America will sponsor a Short Coures entitled "Characterization of Metamorphism through Mineral Assemblages and Mineral Chemistry" before the 1982 annual MSA/GSA meeting in New Orleans, Louisiana. The Short Course will be held from Friday morning October 15 through Sunday noon October 17. An introductory party will be held on the evening October 14. The Short Course will be held in the Hyatt Hotel.

Authors/speakers are: E.J. Essene (University of Michigan), J.M. Ferry (Arizona State University), D.M. Kerrick (Pennsylvania State University), J.M. Rice (University of Oregon), D. Rumble (Geophysical Laboratory), F.S. Spear (Massachusetts Institute of Technology), J.B. Thompson, Jr. (Harvard University), and R.J. Tracy (Yale University). The following topics will be covered: (a) strategies of algebraic and graphical analysis of mineral equilibria, (b) determination of equilibrium pressure, temperature and fluid composition, (c) mineral inclusions and compositional zoning in minerals, (d) stable light isotope composition of metamorphic rocks and minerals, (e) buffering phenomena, and (f) applications of the reaction progress variable.

The Short Course will consist of three morning and two afternoon lecture sessions and one evening workshop. Short Course lectures will form the basis of Volume 10 of the MSA series "Reviews in Mineralogy".

For further information, write:

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