

BOOK REVIEWS

Fluid Inclusion Research, Volume 20 edited by Edwin Roedder, Andrzej Kozłowski and Harvey E. Belkin. University of Michigan Press, 1987, 559p. (ISBN 0-472-02020-X).

THIS LATEST VOLUME represents the twentieth anniversary of the annotated bibliography of fluid inclusion research started by Edwin Roedder. Each volume is larger and more comprehensive than the last, and this one has reached truly impressive proportions with "... 1409 abstracts and ... citations ... , including 90 from the Russian, 58 from the Chinese, 83 from other languages, and 46 from theses". Along with these shorter contributions, the volume contains the final part of the translation of a book on fluid inclusions by V. A. Kalyzhnyi, as well as a calendar of upcoming meetings and a very useful list of terms and abbreviations related to fluid inclusions. Roedder and Associate Editors Kozłowski and Belkin were assisted in this project by twelve geologist/translators and nine other contributors.

The result of this collaboration is overwhelming. No matter how much time you put into keeping up with the literature, this volume will humble you. For instance, two randomly chosen pages near the center of the volume cite papers dealing with melt inclusions in Central European volcanic rocks, sulfur isotopic studies of a tin deposit in

the Pamirs, brine inclusions in the Palo Duro Basin, experimental studies of melt-vapor equilibria, thermodynamic calculations for fluids in the C-O-H system, and carbon isotopic compositions of methane in fluid inclusions from the Ilimaussaq complex, which were published in Italy, the USSR, USA, and Holland. With such a broad coverage, the volume is clearly useful to anyone with an interest in the geology or geochemistry of fluids in the Earth. The volume also provides a convenient method for reviewing research developments for 1987 (and surrounding years), as well as an invaluable way to find the abstract or paper that you vaguely remember or that was filed/piled in the wrong place.

There is little that can be said in criticism of this volume. The type is a bit ragged here and there, authors' names are misspelled, and the index is still not specific enough. But these peccadillos pale into insignificance when compared to the usefulness of the volume. Even if it were not published by the University of Michigan (of recent basketball fame) Press, this reviewer would recommend that every student of fluids in the Earth subscribe to this series.

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Lacustrine Petroleum Source Rocks edited by A. J. Fleet, K. Kelts and M. R. Talbot. Blackwell Scientific Publications, Oxford, for The Geological Society, 1988, 391p. (ISBN 0-632-01803-8).

AN OUTGROWTH OF IGCP Project 219 (Comparative Lacustrine Sedimentology in Space and Time), this book contains the papers presented at a conference in London in September 1985. There are 25 chapters and 4 abstracts, authored by 65 geochemists, sedimentologists, and biologists. This useful text also includes spectacular color photographs of laminated muds and organic tissues from Big Soda Lake, Nevada.

The book is divided into three parts. Part I emphasizes tectonic, geological, geochemical, and biological framework studies (Kelts) of modern lakes, including those in tropical East Africa (Talbot, Talling) and arid Australia (De Deckker) and the Basin and Range Province in Nevada (Oremland *et al.*). Part II focuses on palaeoenvironmental indicators. This section covers such topics as the geochemical difference between organic sedimentation in clastic *versus* carbonate lakes (Katz); biomarker compounds in hot, cold, humid, and arid lacustrine environments compared to those in marine systems (ten Haven *et al.*; Vandenbroucke and Behar; Volkman); the effects of clay mineralogy on petroleum production (Yuretich); geochemical approaches to water chemistry (Bahrig; Davison); and the dating of lacustrine oils by the presence of transported pollen and spores (Jiang). Part III covers joint geochemical and sedimentological studies of lakes, many of which have not been described in detail before. Such studies include modern lakes in Central Africa (Crossley and Owen) and ancient lakes in Wyoming (Eocene), Virginia (Triassic-Jurassic) (Gore), Scotland (Devonian and Carboniferous) (Duncan and Hamilton; Hillier and Marshall; Loftus and Greensmith; Parnell), Spain (Miocene) (Anadon *et al.*), Thailand (Oligocene-Miocene) (Gibling), China (Paleozoic, Mesozoic, and Cenozoic) (Brassell *et al.*; Fu *et al.*; Luo *et al.*; Wang *et al.*), and Australia (Cretaceous and Tertiary) (Hutton; McKirdy *et al.*).

The book establishes two major landmarks in lake studies. It is the first sedimentological book on lacustrine geology that recognizes the importance of biological processes to sedimentation. Algae and

bacteria are both emphasized as important to organic productivity, petroleum source potential, and in the diagenesis of organisms. Apparently, the microbial decomposers at the end of the food chain produce the most lasting geochemical signal. The second landmark is the abundance and sophistication of geochemical data from the Chinese lacustrine sequences. Most of China's petroleum production comes from ancient lake sediments, and the remains of green algae and dinoflagellates, mixed with plant debris from onshore, characterize the geochemical signals from that petroleum. In terms of actual worldwide lacustrine petroleum potential, the saline facies of the Green River oil shale now takes its place as but an interesting sequence. The remains of cyanobacteria eaten by aquatic insect larvae in the Mahogany Ledge/Parachute Creek Member (Type I kerogen) did not provide the most productive environment in terms of worldwide lacustrine petroleum production.

The major conclusion of the book in terms of petroleum potential is best stated by M. R. Talbot: "Pyrolysis and maceral studies indicate that in most of these lakes [having source rock potential] the preserved organic matter is a mixture of phytoplankton and higher plant remains showing varying degrees of bacterial degradation. Sediments with the richest oil potential accumulate in meromictic or monomictic lakes during periods when the climate is humid and surface winds are relatively slack. The evidence from tropical Africa [and the other lacustrine petroleum producers of the world] does not support current theories that shallow saline lakes may be especially favourable sites for the accumulation of oil prone sediment".

I have no complaints at all about this book—only praise. It not only belongs on the shelf of everyone working on lacustrine sequences, but it will be a useful text for both sedimentology and geochemistry courses. For anyone too busy to read the whole book, the two magic chapters are those written by Gibling on sedimentology and Volkman on geochemistry.

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