

BOOK REVIEWS

Manning, D. A. C., Hall, P. L. and Hughes, C., Eds. *Geochemistry of Clay-Pore Fluid Interactions*. London (Chapman & Hall), 1993. xv + 427 pp. Price £75.00. ISBN 0-412-48980-5.

This book, the proceedings of a September 1990 meeting of the same title organized jointly by the Mineralogical Society (Geochemistry and Clay Minerals Groups) and the Geological Society, contains 17 papers arranged thematically in four groups. The first group of three papers covers experimental and theoretical characterization of mudrocks and clays. The use of small-angle scattering of X-rays and thermal neutrons to investigate particle size in dilute suspension and pore distribution in microporous solids is described, with emphasis placed on the importance of fractal geometry for interpreting results. The two other papers present data on the location of cations and properties of water in the smectite interlayer space obtained using Monte Carlo and molecular dynamics simulation techniques. Three following papers deal with natural diagenesis and weathering processes, covering the distribution and composition of authigenic clay minerals in recent sediments, diagenesis of North Sea Jurassic mudrocks, and pore fluid evolution in the Kimmeridge Clay. Experimental studies of diagenesis and weathering are covered in four papers. These deal with the advantages and disadvantages of solid-solution modelling for predicting stabilities of neoformed clay minerals, laboratory reproduction of morphological variation in petroleum reservoir clays, experimental diagenesis of mudrocks, and experimental weathering of montmorillonite in batch and mixed flow reactors. The final group of seven papers covers applications in civil and petroleum engineering. Apart from a review of the mechanisms of overpressuring, papers in this group all deal with the significance of clay-pore fluid interactions to toxic waste disposal. Topics include: clays as chemical and hydraulic barriers in waste disposal; mass transfer mechanisms in compacted clays; ground-water chemistry modelling beneath the Drigg low-

level radioactive waste disposal site, Cumbria, UK; porefluid extraction techniques for mudrocks; and porewater compositions of Plio-Pleistocene clay formations throughout Italy and of Jurassic shales and limestones of northern Switzerland.

This book is useful for a number of reasons. First, it demonstrates how important the application of modelling procedures is to our understanding of clay properties and genesis, and also provides an example of the use of fractal theory for enhancing interpretation of crystal structure data — an approach that will have to be used more frequently as the sophistication of structural probes increases. It also brings to the attention of a much larger audience some of the high-quality data on water-rock interaction generated in relation to radioactive waste disposal; previously, results of such investigations remained confidential or were reported in the 'grey literature' and thus difficult to access. The aim of the original meeting was to bring together scientists and engineers from a wide range of backgrounds, especially in the petroleum and radioactive waste disposal industries. From this book it is apparent that the techniques, skills and approaches for attacking geological problems in both industries are very similar. The original meeting was successful and the publication can be judged an equal success. Both contributors and authors are to be congratulated on this addition to the Mineralogical Society's special series.

D. J. MORGAN

Bickle, M. J. and Nisbet, E. G., Eds. *The Geology of the Belingwe Greenstone Belt, Zimbabwe: a study of the evolution of Archaean continental crust*. (Geological Society of Zimbabwe, Special Publication 2) Rotterdam (A. A. Balkema), 1993, viii + 239pp. Price Hfl. 165.00 (£61.00)

The Belingwe Belt of Zimbabwe is one of the world's classical Archaean greenstone belts and the Bickle-Nisbet duo have done much to justify