

Chapter 1 provides a short overview of the subject matter, and within chapters 2 through 6 the authors detail the production of mud and silt, its transport and deposition, the role of oxygen, the depositional systems in which muddy sediments are commonly found and the physical and chemical changes which occur in mudrocks during burial. Chapter 7 examines methods for characterizing sediment sources, using petrographic and in particular geochemical methods of analysis. Chapter 8 looks at how the geology of muddy depositional basins can be used to characterize the mudstones themselves and provide an insight into the nature of a basin, and its wider geological context. Finally, within Chapter 9 the economic importance of mudrocks and an outline of their engineering characteristics are described. The appendices are helpful as they provide short descriptions of different methodologies and useful background for readers with little knowledge of the subject.

In considering the scope of the book, it is perhaps likely that some topics will be considered in slightly less detail than others. For example, cyclical deposition within mudrocks can be certainly be recognized on lunar tidal scales through to Milankovitch frequencies, as described by the authors. In addition, there is now a sizeable literature on image-based annual- through decadal-scale records of lamina deposition, which provide a useful insight into and archive of past climate variability. The content on this subject could perhaps have been greater than it is, given the present interest in climate studies.

In summary the book is written in a style that is easy to read and provides for rapid cross-referencing of subjects/ topics of interest to the reader. The authors have attempted to provide a useful summary of the important aspects of fine-grained argillaceous rocks, and they have achieved this.

Richard B. Pearce

AVSETH, P., MUKERJI, T. & MAVKO, G. 2005. *Quantitative Seismic Interpretation. Applying Rock Physics to Reduce Interpretation Risk*. xv + 359 pp. Cambridge, New York, Melbourne: Cambridge University Press. Price £90.00, US \$140.00 (hard covers). ISBN 0 521 81601 7. doi:10.1017/S0016756806233053

This book describes one methodology for interpretation of prestack seismic reflection data amplitudes to yield a probabilistic distribution of lithology and pore fluid information in the subsurface. The authors state that one of their principal aims is to 'improve interaction between geologically and geophysically inclined seismic interpreters'. In this respect I think the book succeeds admirably. It is relatively easy to read and is complete with over 60 colour plates, 300 references and an index. The text and figures are of excellent quality and there is only a handful of typographic errors. Pitfalls and major summary points within the text are highlighted. Graduate students who work with seismic data will find that the book provides an excellent overview of rock physics and interpretation technologies that are becoming more commonly used within the oil industry. Teachers of geophysics will be able to bolster their lecture notes by summarizing this interpretation methodology in their lectures and the online data examples provided could easily be incorporated into practical sessions.

In this book the case histories and text evangelize a workflow which can help both to reduce and to quantify interpretation risk even when there is significant overlap in acoustic impedances between different rock types. While the book is well referenced the authors could perhaps have

explained alternative potential methodologies in more detail. There are some references to new and upcoming seismic analysis techniques in Chapter 4 but a case history in 4D seismic analysis and expanded discussion on attenuation and anisotropy studies would have been beneficial.

The first two chapters are a description of the field of rock physics which attempts mathematically and empirically to parameterize rocks such that the variations of lithology, porosity and saturation can be related to seismically derived P and S velocity and density. Lithology and fluid substitutions are stressed. In the third chapter statistical rock physics is used to try and quantify uncertainty. This is the hardest chapter to follow but the basic principles are well illustrated by the applications at the end of the chapter and the case histories in Chapter 5. Chapter 4 is a welcome overview of the myriad of methods for extracting quantitative information from prestack seismic amplitudes. Seismic modelling, offset dependent amplitude analysis and acoustic and elastic impedance inversion are the principal techniques covered. A section on seismic processing is outdated but an excellent overview of interpreting AVO crossplots is included. One powerful application of the probabilistic technique is to determine the value of additional data (such as elastic impedance) in classification of key facies types from seismic data. Chapter 5 is a summary of successful case histories from West Africa and the North Sea that have been used as examples throughout the book. Chapter 6 provides workflows which recommend various stages to be applied to exploration and development of oilfields.

Reading the entire book from cover to cover is a rewarding experience and gives the reader a new understanding of the breadth and scope of this field – and how it may be used to benefit the interpretation of seismic data.

Rob Hardy

WEISHAMPEL, D. B., DODSON, P. & OSMÓLSKA, H. 2004. *The Dinosauria*, 2nd ed. xviii + 861 pp. Berkeley, Los Angeles, London: University of California Press. Price £62.00 (hard covers). ISBN 0 520 24209 2. doi:10.1017/S001675680624305X

Several changes have been made since the first edition of *The Dinosauria* (Weishampel, Dodson & Osmolska, 1990). The front cover is graced by a group of indisputably bird-like creatures. This is in contrast to the particularly reptilian cover stars of the latter publication and reflects the editors' updated perception of a bird–dinosaur relationship as the 'logical sequel of phylogenetic systematics' – a methodology that is emphatically endorsed in the new book. Other changes are the addition of a numerical cladistic analysis to each of the taxonomic chapters and some changes in authorship (the number of authors has almost doubled from 23 to 43) and chapter topics, precipitated by the clarification of theropod taxonomy and the inclusion of a new chapter on biogeography.

In Section One, some 23 taxonomic chapters summarize what is known about each group of dinosaurs seriously and effectively. The level of group considered and attention to detail for each varies wildly with nine chapters spanning 183 pages of Theropoda (giving *Herrerasaurus* and *Eoraptor* the benefit of the doubt as non-theropods for this calculation) inadequately counterbalanced by two chapters sharing 90 pages of Sauropodomorpha. Ornithischia seem similarly short-changed with ten chapters over 188 pages. But then perhaps more has become known about the ever-popular carnivorous dinosaurs. The standardized format of