

density and carbon-isotopic composition (Xie *et al.*) of plant material, these in turn enabling detailed inferences concerning taxonomic affinities and physiology, palaeoclimate, atmospheric composition and the source material for hydrocarbon accumulations. There are also examples of exceptionally preserved mid-Jurassic, non-marine animals, notably the abundant fossils of the Daohugou fauna (Inner Mongolia, China), which rivals the early Cretaceous Jehol fauna of the same area in its diversity and exquisiteness of soft-part preservation (Huang *et al.*; Tan & Ren).

The standard of English in all papers is very high, thanks in significant measure to the editorial efforts of Dr Susan Turner (Queensland Museum). The illustrations, a fair number of which are in colour, are also generally of very good quality; in just a few cases (e.g. Meesook *et al.*) reproduction of some fossil photographs and mid- to long-range field shots has been at too small a size for details to be discernible. Hopefully, the high standard of science and presentation will stimulate Jurassic researchers from outside Asia (very few of whom are represented in this issue) to become involved in future IGCP 506 meetings (events are planned in North America and Britain) and to contribute to similar collections of up-to-date regional information and global syntheses.

A. L. A. Johnson

SAMBROOK SMITH, G. H., BEST, J. L., BRISTOW, C. S. & PETTS, G. E. (eds) 2006. *Braided Rivers. Process, Deposits, Ecology and Management*. Special Publication no. 36 of the International Association of Sedimentologists. vi + 390 pp. Oxford: Blackwell Publishing for the International Association of Sedimentologists. Price £75.00 (paperback). ISBN 1 4051 5121 8. doi:10.1017/S0016756807003688

Over the last 30 years, the study of fluvial sedimentology has benefited from a series of special publications – collections of papers which have become essential reference volumes for the subject area. This new collection of 18 papers on a variety of aspects of braided rivers is a welcome and valuable addition to these volumes which will be used by fluvial geomorphologists and sedimentologists for years to come. In particular, the paper by Bridge & Lunt, 'Depositional models of braided rivers', is destined to become one of those papers that is quoted every time the sedimentary record of braided rivers is mentioned. The authors present a clear synthesis of the depositional models for braided rivers, incorporating plan views, cross-sections and sedimentary logs that other authors can use to benchmark their own interpretations of fluvial deposits.

This is the second special publication on the subject, the first being *Braided Rivers*, edited by Best & Bristow and published in 1993, and this new compilation reveals some important changes in the nature of the research in the subject. For example, case studies of fluvial successions from the stratigraphic record formed an important part of the literature a decade or more ago, but do not feature at all in this new volume. Instead, there is a somewhat greater focus on understanding and quantifying processes. Several of the papers in this volume take a computational approach to the analysis of braided river form and hydrology, including the development of numerical models for the formation of channel patterns and depositional features. Other papers are based on experimental work carried out in flume tanks and provide insight into processes of bedload transport at different scales.

The economic applications to the study of braided river form and sedimentology are considered by Kelly, who reviews issues of scaling and hierarchy and their implications for oil and gas reservoir modelling. Other authors tackle the environmental impact of fluvial hydrology, both as a consequence of natural events such as earthquakes and the human effects of channel and water management. An interesting and informative departure from the scope of most collections of sedimentology papers is the inclusion of two papers on the ecology of braided rivers. One of these by Tockner *et al.* is an account of the relationship between river hydrology, geomorphology and the ecosystems in and around them. To the sedimentary geologist, this provides an insight into the ichnofauna associated with braided river deposits and hence a further tool for the reconstruction of ancient fluvial environments.

This is the first in the excellent series of volumes published by the International Association of Sedimentologists to adopt a larger format and the inclusion of colour photographs and diagrams throughout the text. The new format and colour have not been exploited to their full potential by many of the papers, but the production values are of a very high standard, making this an attractive and accessible volume.

Gary Nichols

GRIMALDI, D. & ENGEL, M. S. 2005. *Evolution of the Insects*. xv + 755 pp. Cambridge, New York, Melbourne: Cambridge University Press. Price £45.00, US \$75.00 (hard covers). ISBN 0 521 82149 5. doi:10.1017/S001675680700372X

Like any subject biology has its worn-out metaphors. Scarcely less of a cliché than Dobzhansky's dictum that nothing in biology makes sense except in the light of evolution, so Haldane's quip that the Creator's fructifying genius might seem odd given his inordinate fondness for beetles is long past its sell-by date (to compound the clichés). But if there was ever a case to be made that even within the beetles, let alone the insects, the variety of forms verges on the marvellous then this book will provide the gold-standard for years to come.

Its most obvious advantage is the superb range of illustrations, from the golden tombs of amber to vivid examples of living insects and striking reconstructions of extinct forms. In essence the book is a superb review of the insect groups, along with such matters as the geological history of insects, the ways in which the principal modes of fossilization act and a succinct review of evolutionary principles. The real thrills in reading this book, however, are the endlessly fascinating examples of evolution and ecology in action. Hardly surprising are the many examples of mimicry, not least the amazing katydids that effortlessly blend into moss and leaves and equally astonishing mantises that can look deceptively like a white orchid or plant tendril. Such are quite familiar, but did you know (keeping with the mantises) that the hymenopodid nymphs have a shape, movement and colour that closely mimic the fearsome army ants, or of a South American sphingid that not only looks uncannily like a snake but can even mimic the striking action. Indeed, apart from being a marvellous survey of insects this book is a treasure-trove of biological insights, be they remarkable instances of mimicry and many other convergences, sound production, defence, predation, and fascinating instances of gigantism.

Clearly the authors are gripped with their enthusiasm for insects, and even when reviewing the fossil record remind us that not only do many questions remain to be solved, but

also the past was indeed a different country. Were we, for instance, to visit a Triassic tropical forest then in comparison with today's cacophony dominated by frogs and birds then apart from 'the occasional groans and squeaks of tetrapods, most song probably derived from the resonant clacking of titanopterans, backed by the trills of haglids and the chirping of early gryllids' (p. 206). So Grimaldi & Engel throw open a window onto an unexpected world, and one that in principle is recoverable from study of the fossilized stridulatory organs and ears.

It is this reviewer's opinion that science urgently needs to recapture a sense of imagination, and whilst the stern realities of analytical judgement cannot be neglected, the fact of the matter is that whether by teaching or research it is the telling example, remarkable fact or intriguing instance that must readily serve to reawaken the deep springs of our curiosity and so the source of scientific enthusiasm. So too one is not surprised to find interspersed poetic contributions by such as Frost, Keats and Nash. *Evolution of the Insects* serves to do exactly what is most important, and that is to remind us of our extraordinary world and how we can understand it more deeply. At an astonishingly reasonable price every biologist and palaeontologist should regard this book as an essential acquisition.

Simon Conway Morris

WYNN JONES, R. 2006. *Applied Palaeontology*. xiii + 434 pp. Cambridge, New York, Melbourne: Cambridge University Press. Price £45.00, US \$85.00 (hard covers). ISBN 0 521 84199 2. doi:10.1017/S0016756807003718

This textbook, as the title indicates, concerns the use of fossils in the study of biological evolution, environmental processes and industrial applications. There are many texts on fossils, and aspects of their palaeobiology, but this book fills a large gap because it discusses the 'classic' palaeontology, together with the practical application of fossils. The author, Bob Jones, is a well-known micropalaeontologist who has worked for BP for over 20 years.

The first chapter is a brief introduction which summarizes the remaining six sections, and is a very useful abstract. Chapter 2 is on 'Fossils and Fossilisation', and is a relatively short account of a multiplicity of aspects of palaeontology. These include the fossilization process, preservation and cladistics, in addition to (arguably) more prosaic topics such as fieldwork, collecting, preparation and curation. I must make special mention of Jones's hilarious account of the naming of new fossil taxa on pages 14 and 15. No revelations are repeated here; but honestly, this short section is well worth the cover price alone! Chapter 3 is on the major fossil groups. It is the principal section of the book and gives, in some 200 pages, succinct descriptions of the major groups of fossils including microfossils, plants, invertebrates, fungi, vertebrates and trace fossils. Jones describes the different groups in a pragmatic, and often quirky style. For example, I was surprised (and delighted in equal measure!) to see forensic palynology described on the first page of this extensive chapter. The descriptions of the different palaeontological groups are up to date, well illustrated, and biostratigraphy is always prominent. Unsurprisingly, foraminifera (Jones's specialism) are given an authoritative and comprehensive treatment. This chapter is an excellent introduction to the many fossil groups for students and professionals alike. Chapter 4 is a relatively short section on palaeobiology, and encompasses aspects such as palaeoecology, biogeography and palaeoclimatology.

The fifth chapter is devoted to 'key biological events in earth history'. This is a very skillfully crafted synthesis of our knowledge of evolution and extinction. After a brief introduction, Jones describes major palaeobiological events in stratigraphical order. This begins with the origin of life during the Proterozoic, and ends with a concise and accessible discourse on palaeogeography, palaeoclimate and land mammal evolution/dispersal during the Quaternary. Chapter 6 is on biostratigraphy and sequence stratigraphy. As would be expected, given that the professional background of the author is the oil industry, Jones skillfully guides the reader through the rudiments of the use of fossils as indices of relative age. He then seamlessly explains sequence stratigraphy, with the emphasis on how biostratigraphy is an integral part of this unifying theory of sedimentary geology. Sequence stratigraphy is a somewhat complex concept, rich in jargon. However Jones's concise explanation is as good an introduction to sequence stratigraphy as you will find anywhere in the literature. The final section, Chapter 7, is on case histories of the applications of palaeontology. Although relatively short, in my view, this is the strongest and most interesting chapter of the entire book. Some of the modern, integrated applications of micropalaeontology and palynology in the oil industry are as equally ingenious as they are fascinating. Many, of course, receive little or no publicity, due to the fact they are industrial operations. The insight, skill and level of expertise required for many of these is just as scientifically worthy as aspects of the subject that are generally perceived to be more high profile. Jones does not confine himself to describing oil industry operations; examples pertaining to engineering geology, archaeology and vertebrate palaeontology are all described.

Some general points are pertinent. I very much like the way the author has used numbered headings and subheadings. These make the book much more user-friendly, easy to use and to cross-reference. The book is well-illustrated with high-quality diagrams. However there are no photomicrographs of fossils which seems rather a shame.

I must give special mention to the acknowledgements on p. xiii. Following a long list of the author's teachers and colleagues, there is a listing of Bob's favourite musicians who have inspired him over the years. It is an unprecedentedly eclectic selection including Bach, Johnny Cash, Maria Callas, Jimi Hendrix, Joy Division, Mozart and Gillian Welch. I found myself immediately warming to an author who has the courage and honesty to reveal his (in my view excellent) musical tastes, and to acknowledge the inspiration of music and musicians to a scientific career.

In conclusion, *Applied Palaeontology* is an absorbing and highly readable book on all aspects of palaeontology. The book is eminently suitable for advanced undergraduates, postgraduates and professionals alike. Bob Jones is to be congratulated for producing a book which is unique in this very crowded marketplace. It is highly recommended to those interested in palaeontology at any level.

J. B. Riding

KONHAUSER, K. 2006. *Introduction to Geomicrobiology*. x + 425 pp. Maldon, Oxford, Carlton: Blackwell Publishing. Price £34.99 (paperback). ISBN 9780 632 05454 1. doi:10.1017/S001675680700369X

This work was designed as a text for final year earth sciences, geology and biology students following a course in geomicrobiology. It will also provide a valuable text for post-graduates and other researchers in the field. Micro-organisms