

BOOK REVIEWS

WYNN JONES, R. 2011. *Applications of Palaeontology: Techniques and case studies*. xiv + 406 pp. Cambridge University Press. Price £80.00, US\$130. (HB). ISBN 9781107005235. doi:10.1017/S001675681200012X

This is a well-prepared, well-written and well-produced book with a wealth of information about palaeontology and its applications. One could have a philosophical debate about whether it should be *palaeontology* or *micropalaeontology* in the title, as the applications are mostly those that would be encountered by micropalaeontologists using the normal range of microfossil groups. The cover suggests that this is a ‘comprehensive and thematic treatment of applied palaeontology’ and, in general, it ticks many of the appropriate boxes.

In the area of sample collection there is (correctly) a mention of the UK system of Sites of Special Scientific Interest (SSSI) but no meaningful discussion of policies in other parts of the world where permits may be required in order to collect samples and, as fossils are often classified (alongside archaeological finds) as part of the national heritage, export can be a legal minefield. I found that there certainly could have been more on sampling strategies (especially for the macrofossils) and how the design of a sampling campaign has a tremendous influence on the outcome of the subsequent investigations.

The brief introduction to the main fossil groups is very readable but one wonders about the background knowledge of those entering the area of ‘applied palaeontology’. Surely, most will know much of the macrofossil (or even the microfossil) subject area as, around the world, most geoscience graduates have a basic knowledge of palaeontology. In the treatment of the microfossil groups there is much reliance on the diagrams in Lipps’ (1993) text-book. This causes some confusion as – taking an area I know reasonably well – the zonation of the planktonic foraminifera has evolved since publication of this text and later chapters illustrate more recent revisions, or even an earlier version, without comment. While I can cope with this variability, having lived through the various iterations of these zonal schemes, students could be somewhat confused. In the same way, revisions to the Cenozoic zonation using planktonic foraminifera are not incorporated in any of the charts or even mentioned in the text.

The calpionellid zonation of the Jurassic/Cretaceous boundary interval is mentioned but none of Remane’s figures of the relatively simple taxa and elegant stratigraphical usage have been reproduced. Similarly, the ichthyolith record of the deep sea is not discussed. Indeed, palaeoceanography does not really appear in the book and, while this was clearly a deliberate strategy, I do feel that the scant coverage of the use of stable isotopes (especially $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$) results in a number of serious omissions. These include the palaeobiology of planktonic (and benthonic) foraminifera including recent work on genetics, ocean stratification, palaeoceanography, Marine Isotope Stages, climate change and the Zachos and co-workers compilation of Cenozoic change (including events such as the PETM) and oceanic anoxia and the microfossil assemblages associated with oxygen minimum zones.

The important sections on real applications begin on p. 200 with sequence stratigraphy and oil exploration. These

are extremely informative and provide some real ‘meat’ for readers. There is extremely good coverage of the Middle East and the North Sea Basin although I was surprised that bio-steering was not given more space with examples from the Kuff Formation of Saudi Arabia and the chalk oilfields of the North Sea Basin.

Coalfields are covered, although there is little information on other types of mineral exploration (e.g. strata-bound Mississippian-style ore bodies). Environmental applications are clearly important today and although pollution is mentioned there are a great many interesting papers on heavy metal pollution, deformed foraminifera, etc. which are not. Pollution monitoring as part of the EU Water Framework Directive (and elsewhere in the world) is of growing importance. The study of volcanic impacts around Mt Pinatubo, Deception Island and Montserrat has led to a greater understanding of how foraminifera re-colonise hostile environments. There is an interesting discussion of the role of palaeontology in archaeology, but none of Marine Isotope Stages in the Pleistocene and how these impact on the climate control of archaeological remains, which is unfortunate.

This is clearly a well-researched book with wider readership appeal than the earlier book by the same author (Jones, 1996). I can see why the balance of the content is as it appears in the book and it is all too easy (for a reviewer) to suggest adding more sections to cover their perceived omissions. At a hardback price of £80.00 it may be more of a library purchase than affordable by undergraduate and postgraduate students. I would certainly suggest that students consult and use this book but I am not sure if I could place it in the ‘must-buy’ category for students emerging from a well-balanced geosciences degree. Biology, chemistry, physics and marine sciences graduates moving into the field of (micro)palaeontology could be a potential market but these are relatively low in number.

Malcolm Hart
University of Plymouth

References

- JONES, R. W. 1996. *Micropalaeontology in Petroleum Exploration*. Oxford: Clarendon Press, 432 pp.
- LIPPS, J. H. (ed.) 1993. *Fossil Prokaryotes and Protists*. Oxford: Blackwell, 342 pp.
- LAFLAMME, M., SCHIFFBAUER, J. D., DORBOS, S. Q. (eds) 2011. *Quantifying the Evolution of Early Life: Numerical Approaches to the Evaluation of Fossils and Ancient Ecosystems*. Topics in Geobiology 36. xx + 462 pp. Springer. £135.00, US\$209.00 (HB). ISBN 978 9 40070 679 8. doi:10.1017/S0016756812000039

In an academic world shaped, not merely measured, by impact factors and *h* indices, it is not at all clear what role there is for edited book series that are largely invisible to citation databases. This may not be a bad outcome since edited academic volumes are invariably a mixed bag, including reviews of work already published in peer-reviewed journals,