BOOK REVIEW

UPCHURCH, P., MCGOWAN, A. J. & SLATER, C. S. C. (eds). 2011. *Palaeogeography and Palaeobiogeography: Biodiversity in Space and Time*. Systematics Association Special Volume Series 77. 239pp. CRC Press. Price £76.99. ISBN 978 1 420 04551 2 (HB).
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Biogeography is a key property of life, but since the fundamental studies of Alfred Wallace and others it has been difficult to apply to the deep time distributions of fossil organisms, particularly prior to the Jurassic. The apparent mismatches in biogeographic and palaeomagnetic data in the deeper parts of the fossil record, so obvious during the 1970s and much of the 1980s, highlighted the many problems in mapping the distributions of fossils onto palaeocontinental reconstructions in the vanguard of the plate tectonic revolution. The classic green book, McKerrow & Scotese (1990), was a major advance in our understanding of the Palaeozoic disposition of the continents and their relationship to biogeographic provinces, marking the start of the reconciliation of various lines of evidence, geological and palaeontological, to sketch out the distributions of ancient continents and oceans together with their faunas and floras. More recently, Harper & Servais (in press), nearly 25 years on, demonstrated the sophisticated analyses possible of Early Palaeozoic organisms and their distributions. The hugely improved models for geography during the last 600 million years, the increasingly accurate taxonomy of many groups of fossil organisms and the more precise correlation of Phanerozoic rocks, have allowed many more exciting avenues through the ranges of fossil organisms to be explored.

Paul Upchurch, Alistair McGowan and Claire Slater have extravagantly emphasized the myriad of possibilities now available to researchers. This multidisciplinary volume, arising from a meeting of the same title in Cambridge in April 2006, pulls together many of the contemporary strands of biogeographic research while linking the movement of continents and ranges of organisms in space and time with changing biodiversity on our planet. Some 17 talks were presented, mainly targeting fossil data from the three great Phanerozoic eras, and a number have already been published elsewhere. The book comprises seven, generally succinct, didactic and well-illustrated chapters (although a number of diagrams would have benefitted from colour) covering Comparative Biogeography (Cecca *et al*.), Phylogenetic Methods in Palaeobiogeography (Brooks & Folinsbee), Uncertainties in Global Reconstructions (Smith), Boundaries and Barriers (Hafner & Riddle), Species-level Biogeographic Patterns (Stigall), Palaeobiogeography of Early Mesozoic Actinopterygians (Mutter) and Disparity in Biogeographic Studies (McGowan & Neige). There is a useful preface setting out the structure of the book and the content of the chapters that link into the main themes of the meeting, particularly numerical methodologies that can help frame and test models for biogeographic distributions, patterns and processes. The comprehensive index includes references not only in the text but in the figures and tables.

In just over 200 pages, Paul Upchurch and his colleagues have communicated much of the real excitement and opportunities in contemporary biogeographic research, new techniques available to analyse both regional and global datasets, the increasing confidence of palaeogeographic reconstructions and the strong relationship between changing biogeography and global biodiversity. This is an essential reference in a rapidly advancing field.

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References

HARPER, D. & SERVAIS, T (eds). In press. *Early Palaeozoic Palaeobiogeography and Palaeogeography*. Geological Society of London, Memoir no. 38.

MCKERROW, W. S. & SCOTESE, C. R. (eds) 1990. *Palaeozoic Palaeogeography and Biogeography*. Geological Society of London, Memoir no. 12.