

## BOOK REVIEWS

BALSON, P. S. & COLLINS, M. B. (eds) 2007. *Coastal and Shelf Sediment Transport*. Geological Society Special Publication no. 274. v + 162 pp. London, Bath: Geological Society of London. Price £65.00, US \$130.00; GSL members' price £32.50, US \$65.00; AAPG/SEPM/GSA/RAS/EFM/PESGB members' price £39.00, US \$78.00 (hard covers). ISBN 9781 86239 217 5. doi:10.1017/S0016756808004445

The Geological Society of London, as the oldest of such societies, is looked towards (not least by me) for leadership and excellence in Earth Sciences. *Coastal and Shelf Sediment Transport* is the 274<sup>th</sup> Special Publication of that learned society. The book continues the tradition of the Society through a compilation of selected recent studies on varying approaches used to tackle a complex and fundamentally important subject within a rapidly evolving sector of Earth Science. The book results from a stimulating conference held at the offices of the Geological Society on Piccadilly, some three years ago; a conference that I was fortunate enough to attend. Not all the papers presented at the meeting have been published, and the volume is quite slim by present standards (162 pages). Nevertheless, the 13 contributions (largely provided by researchers from the UK) have resulted in a volume that is better than the sum of its parts.

Two papers in particular have been most useful in guiding my own research interests: Vincent's paper on the uses and limitations of acoustical backscatter to measure sand in suspension is particularly timely given the expanding use (and mis-use) of ADCPs; and Aldridge's paper on the role of the interaction of the semi-diurnal overtides (M4 in particular) in controlling residual sediment transport in estuaries. Given such overtides are likely to change with rising sea level, it is quite possible that significant changes in estuarine and coastal morphology will result from this mechanism. The paper by Schmitt *et al.* on the application of swath surveying to bedform migration and sand transport is worthy of mention, as it moves beyond the production of colour imagery to the potential uses of the data behind the imagery. The paper of Cooper & McLaren on the application of Grain Trend Analysis to a Welsh embayment provides growing evidence that this highly-contentious method has perhaps come of age. It is gratifying to see that the second author has persevered in the face of heavy criticism (often from me) over a quarter of a century since the first papers on the subject were submitted for science review. The result is a valuable tool in sediment transport that appears highly effective when coupled with local experience.

In summary, this book provides examples of a variety of state-of-the-art techniques that are sophisticated within their own right but entirely complimentary. It is the combined use of such techniques that will advance our knowledge of coastal evolution in the face of climate change.

Carl L. Amos

XIAO, S. & KAUFMAN, A. J. (eds) 2006. *Neoproterozoic Geobiology and Paleobiology*. Topics in Geobiology Series Volume 27. xxi + 300 pp. Berlin, Heidelberg, Dordrecht: Springer-Verlag. Price Euros 109.95, US

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There are lots of good reasons for being interested in Neoproterozoic geobiology and palaeobiology. It was during this half-billion-year run-up to the Phanerozoic that the Earth experienced some of its greatest convulsions, including supercontinental breakup (and partial reassembly), recurrent bouts of glaciation, unparalleled fluctuations in the carbon cycle, increasing levels of atmospheric oxygen and, of course, the rise and radiation of animals. The emphasis on biology – whether geo or palaeo – is a heartening sign of the times, a recognition that palaeontologists, ecologists and evolutionary biologists have just as much to contribute to the understanding of planetary function as the commandeering geophysicists and geochemists. Biological innovation is of course what defines the end of the Neoproterozoic era, and it is this *fin de siècle* that ties together the diverse contributions of this multi-authored, multidisciplinary volume.

Body fossils offer our most direct, if imperfect, account of ancient life. In Chapter 1 Susannah Porter reviews the early fossil record of (non-metazoan) heterotrophic eukaryotes, noting that heterotrophy is both the primitive condition of this domain and, in terms of kingdom-level diversity, by far the most common means of making a living. So it's curious that their Proterozoic record is so sparse – little more than some testate amoebae and possible fungi. Porter considers the possibility that the pattern is real, perhaps the consequence of a Meso–Neoproterozoic nitrogen crisis, but then moves on to more likely explanations such as preservational bias and the facile assumption that most Proterozoic microfossils are the remains of photoautotrophs.

Most Proterozoic microfossils are taxonomically and physiologically unresolved and consequently assigned to the Acritarcha, a waste-basket group of form-taxa that is perennially misrepresented as unicellular phytoplankton. In Chapter 2, Huntley and colleagues bypass much of this systematic trainwreck by carrying out a taxon-free morphometric analysis of the early acritarch record. Significantly, they find that acritarch disparity – the different ways in which these microfossils were constructed – remains conspicuously flat through most of the Proterozoic, only rising with the onset of the Ediacaran, and again in the early Cambrian. Using a similar approach, Xiao & Dong (Chapter 3) identify a broadly similar pattern among Proterozoic 'macroalgae'. In both these studies the authors are impressed with how the patterns correspond to the Ediacaran–Cambrian radiations of animals, etc., but are unable to shake themselves clear of the current biogeochemical bandwagon that explains all evolutionary innovation in terms of 'permissive environment'.

Whether or not the appearance of eumetazoans provides sufficient explanation for the many associated phenomena, there is no question that the Ediacaran rang in a fundamentally new style of macroecology and macroevolution (Butterfield, 2007). In Chapter 4, Bottjer & Clapham present an overview of Ediacaran palaeobiology emphasizing the importance of fossil Lagerstätten in resolving this weirdly transitional world where microbial mats managed to coexist, even cooperate, with their metazoan invaders. Jensen *et al.* (Chapter 5) follow this up with a much more focused