

the photographs, although good, would have been even better if printed on glossy paper as a group of plates. But the converse of this is that the photographs have an immediate impact as published in close association to the relevant text—I shouldn't complain.

The Origin reinforces the common and, I'm sure, accurate impression that fossil human remains and cultural artefacts occur at only a limited number of horizons, separated by large stratigraphic and geographic gaps, making interpretation of patterns difficult, at best. But modern techniques of absolute dating, coupled with other analytical techniques in, for example, computerized tomography, provide a data-rich environment from which to pursue these studies. From this modern platform, so much wider and more informed than even 30 years ago, Stringer examines the radiations of the various species of humans, and is not afraid to stress the contradictions and questions that still remain to be answered.

The 'bushiness' of human evolution is stressed and I was reminded of Gould's (1989, pp. 27 *et seq.*) discourse against the common misconception of the evolutionary ladder. I'd like to think that we're all more used to 'bushiness' in evolution today, but it is a concept that is always wise to emphasise and then emphasise again. It is significant that Stringer doesn't illustrate the 'bush' until the end of *The Origins*, in his last diagram (p. 266), building up his thesis until the case is strong enough to be interpreted in time and space. The concept that *Homo sapiens* evolved once and once only, in Africa, and only then radiated geographically, is surely the only sensible biological interpretation of the data. That there may have been some interbreeding with other species, perhaps most notably the Neanderthals, is surely a side issue, albeit a fascinating one, however meagre the supporting data.

One thing I thank the author for is the detailed examination of the morphological features that are used to define and differentiate the principal players in the story, *Homo sapiens*, *H. erectus*, *H. heidelbergensis* and *H. neanderthalensis* (pp. 28–29, figures on pp. 30, 31). This is surely an essentially starting point for any discussion on human evolution, yet it is one that I have never seen hitherto in comparable works on the subject. The anterior and lateral views of skulls of all these species both support this text, and enable the reader to form their own mental picture of the similarities and differences between species.

The Origin of our Species is stimulating, informative and entertaining. It deserves to be widely read, not just by that poorly defined creature, the 'intelligent layman', but also by Earth and life scientists of any hue. And if you haven't discovered *Homo britannicus* yet, read both!

REFERENCES

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LIVING DINOSAURS: THE EVOLUTIONARY HISTORY OF MODERN BIRDS, edited by Gareth Dyke and Gary Kaiser. Wiley, Chichester, 2011. No. of pages: xv+422. Price: UK£25-00. ISBN 978-0-4706-5666-2 (hardback).

Until John Ostrom rekindled the idea that there was a link between birds and theropod dinosaurs, the origin of birds was very much in dispute, with some researchers suggesting their origins lie within other types of archosaurian reptiles. However, most researchers now believe that the origins of birds lie within a group of theropod dinosaurs that evolved during the Mesozoic Era. More importantly, the debate is now centred on the sequence of evolutionary events that gave rise to early birds within theropods, and the widespread use of phylogenies, bio-molecular work and morphological analysis have taken this concept into new and exciting directions. This has been possible due to the discoveries of bird fossils in almost every continent, in which exquisite feather and other anatomical details have been preserved. *Living Dinosaurs* provides a review of our present understanding of bird origins, and provides a long overdue link between avian palaeontology and avian evolutionary biology. The book is divided into four sections. The first deals with the early ancestry of birds, from *Archaeopteryx* to the diverse pre-modern bird clade of enantiornithes, which now number 60 taxa and have been found in every continent except Antarctica. This section includes a thorough review of avian divergences in the Mesozoic, and explores the conditions as to why there was a major diversification in the Cretaceous. The second section provides a detailed overview of the fossil record, the contribution of palaeontology to ornithology and the diversity of modern birds. Important contributions include a review of Sphenisciformes (penguins), Phorusrhacidae (terror birds), and the Odontopterygiformes (pseudo-toothed birds). The latter were giant seabirds with huge bills adorned with bony processes (pseudo-teeth). The phylogeny and diversification of Passerines (song birds), which make up more than half of all known modern birds, are reviewed, and the use of molecular work is beginning to untangle their complex and as yet unresolved phylogenies. The late Brad Livezey, an expert and leading figure in bird phylogeny based on morphological characters, provides an overview of the progress and obstacles that can blight phylogenetics of modern birds. The third section concentrates on the features that have contributed to the success of living forms. This includes contributions on the development of flapping flight, evolution of the avian brain and diversification of neornithine birds through the K–Pg boundary. The fourth section addresses the future of avian diversity when faced with increasing anthropogenic pressure and climate change. All birds known from the fossil record and addressed in this book became extinct due to natural events, and over a comparatively long period of time. That modern birds are undergoing a human-induced mass extinction event, unprecedented in the speed in which it is taking place, cannot be denied, and the consequences of our present actions can only be guessed at.

Living Dinosaurs covers a broad spectrum, from the bio-molecular aspects of avian biology as well as the anatomy of dinosaurs. But this book is not for the layman. For example, the character matrix in the 'Pre-modern birds' chapter covers a total of 25 pages, and somewhat complex graphs and cladograms are used throughout the book. However, this book is a must for those interested in the origins of birds, either in a palaeontological or an evolutionary biological context. It not only covers present research in detail, but also lays foundations for future work and the likely direction that this will take.

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SEDIMENTOLOGY AND SEDIMENTARY BASINS: FROM
 TURBULENCE TO TECTONICS (second edition) by Mike Leeder.
 Wiley-Blackwell, Chichester, 2011. No of pages: xiii + 768.
 Price US\$ 151. ISBN 978-1-4443-4992-4 (hardback).

Mike Leeder's *Sedimentology, Process and Product*, published in 1982, was the textbook, alongside Tucker's *Sedimentary Petrology*, that I read as an impressionable undergraduate, and it really influenced my subsequent career. What attracted me to both books was their well-illustrated, precise text that did not overwhelm or result in too extensive reading assignments; after all, there were parties to attend! I still find both books, now long out-of-print, the most accessible and readable introductory textbooks on sedimentology and have long searched for equivalents for my own undergraduate classes. Leeder's successor to *Process and Product* (362 pages) was his 1999 *Sedimentology and Sedimentary Basins: from Turbulence to Tectonics*, which ran to an impressive 592 pages. This book is now also out-of-print, but recently it has been replaced by an extensively revised and further expanded second edition.

The book follows a commonly used approach, discussing first the 'Making [of] Sediment' (Part 1: Chs 1 to 3), the importance of understanding the nature of 'Moving Fluid' (Part 2: Ch. 4 and 5), and then 'Transporting Sediment' (Part 3), that includes chapters on bedforms and sedimentary structures, mass-movement deposits and soft-sediment deformation. The second edition also includes, for the first time, a generally excellent chapter on 'Major external controls on Sedimentation and Sedimentary Environments' (Part 4) that acts as an introduction to chapters on the various sedimentary environments (Parts 5 and 6, Chs 11 to 21) and a follow-on chapter dealing with the 'Architecture of Sedimentary Basins' (Part 7). If there is any criticism of these new chapters it is to be directed at the limited illustration of stratal geometries and how they form. A series of diagrams illustrating the interplay of differing rates of sediment input and accommodation generation is sorely lacking. There is also a section on 'Topics: Sediment Solutions to Interdisciplinary Problems' (Part 8) that includes sections as diverse as Banded Iron Formations, uplift of the Tibetan Plateau, Grand Canyon incision, sedimentology on Mars and speleothems. The book rounds off with fifty pages of 'cookies', providing more detailed information on essential concepts in one place rather than the now commonly used 'boxes' incorporated into relevant chapters.

In his preface, Leeder explains that, with some unease, the new chapters have replaced topics on diagenesis and lithification in his book, for reasons of space and the fact that an approach to these omitted subjects nowadays requires too much of a difference of emphasis. While I agree that the book is more focussed in this respect, it leads me to my only major complaint. Leeder expects that the people who will be reading this book are undergraduates with no or little background in sedimentology. As mentioned in my introduction, as an undergraduate I most liked the brevity yet completeness of coverage of his first book. His current offering will

not be the recommended text book for my two sedimentology courses. My students would still need to find another book in order to read up on diagenesis and lithification, and I think the book would only be a doorstop for them, being too daunting and long a read. Absolutely, our understanding of sedimentology has grown as much as the size of Leeder's (and other authors') texts, but must a 21st Century undergraduate be expected to read and understand over twice as much as my generation in order to get the same degree? I wish someone would produce a shorter synopsis. Less is more.

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BASIC GEOLOGICAL MAPPING (fifth edition) by Richard J. Lisle, Peter Brabham and John W. Barnes. Wiley-Blackwell, Chichester, 2011. No. of pages: xi + 217 pp. Price: UK£ 22.50. ISBN 978-0-470-68634-8 (paperback).

This is the latest edition of this compendium of 'best practice' in geological mapping. The commercial success of this volume in the 'Geological Field Guide Series' is demonstrated by its frequent revision (this is the fifth edition) compared to the other volumes in the series. The latest edition of *Basic Geological Mapping* includes evaluations of the newly available technological and digital mapping aids, their limitations, where to acquire them and how to use them. These sections will be of particular relevance and interest to the older generations of geological mappers, though the target readership is the 'entry level' field student on their first independent geological mapping project in the British Isles. Advice for geological mapping in the hotter, colder, wetter and drier climates also is given.

The volume commences with safety and behaviour during field work, of which the advice on safety is very relevant to the solo geological mapper. An evaluation follows of the field equipment and suitable clothing that a geologist might use. The authors emphasise the limitations and inaccuracies of Global Positioning System (GPS) 'apps' on mobile phones, apparently favoured by students, compared to GPS system handsets, which have greater accuracy. A discussion of different types of topographic maps follows and procedures on how to find where you are on a map. The benefits of air photo interpretation, before fieldwork starts, are emphasised. Different methods of geological mapping by following contacts, traversing and exposure mapping are explained, and the uses of geophysical techniques and a brief section on underground mapping are included. The authors anticipate many of the different mapping situations that the novice field mapper may encounter. A section on 'Mappable field units' discusses the recognition of the principal rock types likely to be encountered, the determination of way-up in sedimentary rocks and concludes with a brief discussion on the importance of recognising potentially economic metallic and industrial minerals; water is not neglected.

The sections on field notebooks, note taking and plotting of field maps, together with field sketching with summary acronyms to assist good practice, are followed by sections on fair-copy work, drawing of cross-sections and different types of 3-D illustrations. Geologists of