BOOK REVIEWS

FAGAN, B. (ed.) 2009. *The Complete Ice Age. How Climate Change Shaped the World*. 240 pp. London: Thames & Hudson. Price £24.95 (paperback). ISBN 9780 500 051610.
doi:10.1017/S0016756809990884

With around 200 colour illustrations, *The Complete Ice Age* is aimed at a fairly popular market but also a scientifically literate readership. The 'Ice Age' in question is, of course, the Late Cenozoic phase of climate change with warm and cold stages, commonly known as 'The Ice Age'. Brian Fagan and his coauthors cover a wide range of 'Ice Age' related topics from the history of discovery, the initiation and development of the climate cycle to the astronomical parameters and causes of ice ages in the first half of the book. The second half is devoted to the impact of these climate changes on human evolution and animal life over the last two million years, followed by a brief section on the Holocene and another on future developments. Inevitably in a book of this kind, much of the emphasis is on the northern hemisphere.

The contributors are all academics working in relevant fields: John Hoffecker is at the University of Colorado's Institute of Arctic and Alpine Research, Mark Maslin is Professor of Geography at University College London, Hannah O'Regan researches Quaternary mammals at Liverpool John Moores University and Brian Fagan is Emeritus Professor of Anthropology at the University of California, Santa Barbara.

The Complete Ice Age is a complementary volume to the same publishers' *The Complete World of Human Evolution* by Chris Stringer and Peter Andrews; indeed it reuses quite a lot of the graphics and illustrations from that book. Nevertheless, *The Complete Ice Age* is a visually pleasing and interesting introduction to the subject for the non-specialist and a useful text at the first-year student level. It has a good index and an up-to-date list of 'Further Reading', although the references are primarily to other books and so the student will have to go another step to get at the primary sources.

Douglas Palmer

BENTON, M. J. & HARPER, D. A. T. 2009. *Introduction to Paleobiology and the Fossil Record*. xii + 592 pp. Chichester: John Wiley & Sons Ltd. Price £34.50 (paperback). ISBN 978 1 4051 4157 4.
doi:10.1017/S0016756809990859

In the days before the syllabus became crammed to bursting, and topics had become finely-divided fields of specialism that needed to be fiercely protected at all costs, teaching could be a much broader, almost poetic, adventure across broad areas of intellectual interest. Great and wonderfully charismatic university teachers could enchant their audiences with tales about intangibles: the structure of the Earth, the origin of life, the history of life on Earth; they may not have had the answers to such topics, but the insights provided by a *broad scientific approach* to such subjects could act like a crucible in the minds of their students: '. . .it strikes *me* that all our knowledge about the structure of the Earth is very much like what an old hen c[d] know of the hundred-acre field in a corner of which she is scratching!' These are the reported comments of the student Charles Darwin to one of Adam Sedgwick's wildly speculative lectures on geology and time (letter of J. M. Rodwell, 1882).

The history of life on Earth is the focus of this re-branded edition (formerly known as *Basic Palaeontology*) that is intended as a primer for first- and second-year undergraduates reading either geology or biology. I feel, in many ways, that it should be required reading for all with inquiring minds (not just scientists) because it touches on so many issues, whose epicentre is 'change', that are of relevance to the Earth and the lives that we lead today. Surely it must be the case that without a proper appreciation of the depth of the history of our Earth and the constant, and occasionally dramatic, changes to the fabric of life on Earth we, as a species, will continue to fail to grasp our place, and more importantly our responsibility, with respect to life and the continuation of this planet as a viable ecosystem. Dramatic words and sentiments – perhaps; a clarion call for palaeobiology in any curriculum – undoubtedly.

This, now massive, yet fairly modestly priced, textbook has matured compared to its predecessors and offers an interesting, accessible and concise entry-point for inquisitive and aspiring students, into the branch of natural sciences called palaeontology. Now divided into 20 chapters, and supported by a resource-filled website, the book brings with it an intellectual maturity from the very outset.

The first chapter considers 'Paleontology as a science' and takes as its metaphorical call-to-arms that hoary old quotation from the cantankerous intellectual giant, Rutherford: 'All science is either physics or stamp collecting'. How many times have we (non-physicists) had to endure that put-down by – I am forced to say it – the often profoundly narrow-minded and ignorant, since Sir Ernest came up with that witty rejoinder, I wonder? Intellectualizing the philosophical basis and logical processes that are fundamental to palaeontology leads also to a short series of notes on the history of the development of this branch of science since the glimmerings of understanding provided by the early Greeks (Herodotus) through the miasmic 'dark ages' until the enlightenment of the 17th century, through to the present day, provides a useful backdrop to what palaeontology is striving toward today.

Chapters 2–7 explore the 'how to?' methods and approaches that underpin palaeontological investigation: the importance of geology to a basic understanding of time and space into which fossils fit; the nature, quality and biases within the fossil record; insights into interpreting ecology and environmental reconstruction; understanding and investigating the process of evolution as well as diversity changes in the historical past; and interpreting function from the shape of fossils.

Chapters 8–19 cover the 'nitty-gritty' concerning the major groups of organisms that are preserved as fossils and how they are represented and interpreted within the fossil record. This is the classical core of the science that constitutes the majority of the practical and demonstration work that needs to be absorbed (to varying degrees) by the student palaeontologist. While there is a boredom quotient that inevitably kicks in at this point – some groups *are* simply more interesting than others! – there is no getting away from the fact that this is solid material and made more interesting by the use of explanatory textboxes and good quality illustrations, both photographs of the original material