BOOK REVIEWS

FEDONKIN, M. A., GEHLING, J. G., GREY, K., NARBONNE, G. M. & VICKERS-RICH, P. 2008. *The Rise of Animals. Evolution and Diversification of the Kingdom Animalia*. xvi + 327 pp. Baltimore: The Johns Hopkins University Press. Price £50.00 (hard covers). ISBN 9780 8018 8679 9.
doi:10.1017/S0016756808005645

Whilst there seems to be an open season on the Ediacarans at the moment, *The Rise of Animals* is a volume that many palaeontologists will, I suspect, want to own. Beautifully illustrated with innumerable photos of the fossils, plus and diagrams and maps, it is a pleasure to look at and read.

The first part gives a succinct but well illustrated geological and biological background to the Archaean and Proterozoic. It is part two that forms the bulk of the book, with a tour of the main Neoproterozoic fossiliferous localities from the classic and now well-known sites in Newfoundland, Namibia, Australia and the White Sea to Podolia, Siberia, the Urals and Canadian Cordillera to the 'also rans' such as Charnwood, Carmarthen, etc. For any student of the Ediacaran biota this part provides an invaluable introduction to the major sites, each of which has about 30 pages, summarizing and illustrating the present state of knowledge.

Parts three and four, 'Other Evidence of Animals' and 'The Cambrian "Explosion"', deal with topics such as trace fossils, body plans, etc., and finally there is an 'Atlas of Precambrian Metazoans' whose title spells out the biological stance of the authors towards the Ediacarans. However, this Atlas catalogues, describes and illustrates the holotypes of most of the presently known 200 or so Ediacaran species from around the world. This section alone is of enormous value in bringing such otherwise scattered information together.

The quality of the illustrations with full use of colour is superb and the authors have performed a great service in searching out unfamiliar material and bringing all together in this single work.

Douglas Palmer

HOWELLS, M. F. 2008. *Wales. British Regional Geology*. x + 230 pp. + map in folder. Keyworth: British Geological Survey. Price £18.00 (paperback). ISBN 978 08527 2584 9.
doi:10.1017/S0016756808005694

The long-awaited updates of the British Regional Geology guides continue to appear slowly but surely with the publication of the volume on Wales. In a sense, we get two volumes for the price of one here, because previous editions separated the principality into guides on North Wales and South Wales. The Geological Survey has wisely decided that this subdivision along a geologically arbitrary line serves no good purpose. The whole of Wales is therefore covered, but the Welsh Borderland to the east is still reserved for a separate volume. This scheme has the logic that the political boundary of Wales is at least partly influenced by geological factors.

The detailed synthesis of an area of the size and diversity of Wales would now normally be seen as a multi-author task. The new volume is therefore notable for having been written by one person, Malcolm Howells, and after his formal retirement from the Survey at that. There are few other people who could have completed this task so successfully. For sure, he will have had the advice of specialist colleagues, but Howells' writing style runs through the whole volume and gives it a pleasing coherence. Ample illustrations enliven the text. Line drawings, mostly in colour, are drafted to a high standard, and a good selection of colour photos gives an excellent taste of the field geology of Wales. A 1:625 000 geological map of Wales accompanies the book.

With the design and presentation of the guide brought up to date, it is nevertheless comforting to find the traditional chapter headings, mostly the geological periods or eons: Precambrian to Cainozoic. These core chapters are flanked by an introduction and a concluding chapter on Geology and Man. I might have added only a chapter on structure, including geophysics, as in the recent guide to the Pennines. The gravity and magnetic data on Wales add significantly to our understanding of its substructure. A structure chapter would also have avoided the anomaly of describing the Acadian deformation in the Silurian chapter, when it properly belongs in the Devonian.

The publicity for the regional guide states that it is 'aimed at geology students and advanced amateurs as well as professionals who need an overview of the geology of Wales'. The guide is well crafted for this readership, bridging the gap between the popular styles of the new 1:50 000 sheet descriptions and the weighty information in the old memoirs. We look forward to future volumes in the series.

Nigel Woodcock

MAYR, E. 2007. *What Makes Biology Unique? Considerations on the Autonomy of a Scientific Discipline*. First paperback edition; first published 2004. xiv + 232 pp. Cambridge, New York, Melbourne: Cambridge University Press. Price £12.99, US $16.99 (paperback). ISBN 9780 521 70034 4.
doi:10.1017/S001675680800558X

Ernst Mayr not only lived to a distinguished age, but his years were paralleled by his scientific distinction as one of the last century's leading evolutionary biologists. One gets the measure of his own self-assessment when we read on p. 172 'I am presumably well qualified . . . having discussed the species problem in sixty-four books and scientific papers, published from 1927 to 2000. I also had to make decisions on species status when describing 26 new species and 473 new subspecies of birds. Furthermore I had to make decisions on the rank of species level taxa in twenty-five generic revisions and faunistic reviews. Hence, there should be no doubt about my qualifications'. Quite so, and nobody would wish to deny that Mayr was one of the pivotal figures in the neo-Darwinian synthesis.

Nevertheless, the book is heavy-going, in part because it largely consists of originally separate essays and although some over-riding themes emerge there is also a degree of duplication. In essence Mayr sets out to achieve two things: first to define, defend and cherish the central fact of Darwinian evolution, and second to insist that the subject is effectively autonomous. So far as the former is concerned Mayr provides wide-ranging reviews, but the underlying tone gives me some misgivings because to a considerable extent he engages in claims for priority and authority with the result

that he is dismissive of a number of other contributors to this discipline. This recurrent whiff of the *ex cathedra* has the rather odd effect of making Mayr sound as a lonely voice, and one seldom gets the impression of biology being a buzzing, chatting, and engaging community of souls. Also, rather strangely there are very few examples of all the various wonders of biology and the marvels of evolutionary adaptation: even within the group of which Mayr was an acknowledged authority, the birds, such examples as the kiwi, hoatzin, swift and crow all have terrific stories to tell, but the woodenness of delivery leaves at least this reader feeling flat.

What of the autonomy of biology? This too is a curious gambit, and seems to this reviewer to point to incoherence. To be sure biology is a great deal more than the sum of its physical and chemical parts, and hence the recurrent lure of vitalism. That won't work, but simply for Mayr to claim autonomy is hardly sufficient if one wants to explain the evolution of such complex and integrated systems. Moreover, it is difficult to square such autonomy with the likelihood that there are deeper principles constraining what is and is not possible in biology, and however dimly somehow one senses that these must link to the other sciences.

It would be a mistake to think this book is without some value, and Mayr serves well to articulate existing pieties (such as humans being an evolutionary fluke with all the implications this has for the SETI programme) as well as providing crisp analyses as to the different types of teleology, but behind this one senses a mind that is straying into areas beyond his philosophical competence. He thus lauds the philosopher Quine in his claim that 'Darwin's greatest philosophical achievement [consisted] in having refuted Aristotle's final cause' (p. 91). Such a view is, of course, echoed by Dawkins (of whom Mayr is particularly dismissive) and Dennett, but I for one suspect that the complaint by Darwin's colleague, John Herschel, of evolution by natural selection being 'the law of the higgledy-piggledy' (p. 92), still retains a real force. Moreover, this reviewer would not be quite so ready as some to dismiss Aristotle and indeed some straws in the wind suggest that the origins of biological form, the template for its existence, may not be as nebulous as Mayr appears to think. Herschel's remarks suggest that even at the time of Darwin both he, and indeed the neglected Sedgwick, had actually put their finger on exactly why biology cannot, *contra* Mayr, be autonomous.

Simon Conway Morris

LOPES, R. 2005. *The Volcano Adventure Guide*. x + 352 pp. Cambridge, New York, Melbourne: Cambridge University Press. Price £30.00, US $50.00 (hard covers). ISBN 0 521 55453 5.
doi:10.1017/S001675680800561X

My initial impression on opening *The Volcano Adventure Guide* was that it could be *just* the gift for someone you want to 'bump off'. What could be a more original method of dispatching of an unloved one than to send them a book about planning a trip to an active volcano? However, Rosaly Lopes does clarify the risks of visiting volcanoes along with the essential measures for safe geo-tourism, so this turns out not to be a tome to file alongside the poisoner's handbook on the bookshelf. But Lopes' lively book is more than a travel guide: in her personalized Cook's Tour of the world's volcanoes, she delves into the science of volcanology and reviews some of the most famous eruptions in history and prehistory.

Actually, many millions of people *do* sightsee on volcanoes each year. The Hawaii Volcanoes National Park alone received nearly 1.5 million recreational visitors in 2007. And this is not a new phenomenon: Hawaii opened its doors as a National Park in 1916, and, long before that, Europe's well-heeled dilettante and literati crowd flocked to Naples to admire (besides the magnificent citadels and Bourbon lifestyle) smoking Vesuvius across the bay. So, actually there is real sense in publishing a guidebook dedicated to volcano travellers.

Given the numbers involved in volcano tourism, it is unsurprising that a few are killed in the process now and then. Some of the fatalities result from the stress of hiking up to the summit, thin air at high altitude, and other effects of exertion in mountainous terrain. But there are infrequent incidents in which tourists become victims of volcanic activity: through being caught in unexpected blasts of lava bombs, or poisoned by fumarolic gases, or burnt by scalding mud. There was a close call in 2001 when Masaya volcano in Nicaragua erupted, showering a couple of hundred people in the car park at the crater's edge with hot rocks ejected from the vent. Several were struck by bombs but none seriously injured. Lopes evaluates these and other risks in the first part of her book (which also introduces the global distribution of volcanoes and essential background into eruption characteristics and causes) and provides checklists for preparing for a safe volcano trip. In case the worst should happen, she lists a set of rules on the course of action to follow when caught in an eruption, though it would be best to have read these beforehand.

The second part of the book consists of a set of chapters organized by region: Hawaii, continental USA, Italy, Greece, Iceland, Costa Rica and the West Indies. In all, there are entries for 42 volcanoes, describing their histories and notable features, along with practical information for visiting them. Of course, this is by no means an exhaustive list (there is no coverage for instance of the volcanoes of Japan, some of which are extraordinarily popular with local tourists) but it does give the volcano enthusiast (or armchair traveller) plenty to consider in planning (or imagining) a sulphurous vacation. Although the book refers to itself as a 'guide', it is not one of the more portable varieties. However, with its hardback covers, it would make a good seat for the volcano traveller, protecting against the often sharp edges of scoriaceous lava, and the large format suits well the overall presentation of text and abundant colour figures and maps.

Lopes is best known in the volcanological community for her research on planetary volcanism; perhaps her next *Adventure Guide* will be an 'extraterrestrial edition' aimed at future generations of space tourists . . . or people you *really* don't like.

Clive Oppenheimer

MARTILL, D. M., BECHLY, G. & LOVERIDGE, R. F. (eds) 2007. *The Crato Fossil Beds of Brazil. Window into an Ancient World*. xvi + 625 pp. Cambridge, New York, Melbourne: Cambridge University Press. Price £80.00, US $150.00 (hard covers). ISBN 9780 521 85867 0.
doi:10.1017/S0016756808005657

The spectacular cover of *The Crato Fossil Beds of Brazil* is adorned with a photo of the magnificent fossil cicada (strictly speaking a palaeontinid cicadomorph) *Baeocossus* cf. *fortunatus*, described by F. Menon and S. W. Heads in 2005. Preservation here is so good that even the detailed colour patterning on its outstretched wings is still evident. The editors of this *Window into an Ancient World* (along with the publishers Cambridge University Press) are to be congratulated on producing such an attractive and useful work which will, no doubt, join OUP's Messel book, the Smithsonian's book on Florissant, etc., on our library shelves for decades to come.