

BOOK REVIEWS

JOHNSON, D. 2009. *The Geology of Australia*, 2nd ed. Cambridge University Press. 348pp. Price £40.00, US \$70 (paperback). ISBN 978 0 521 76741 5. doi:10.1017/S0016756810000439

Fortunately, demand for David Johnson's *Geology of Australia* must have been sufficient for Cambridge University Press to publish this second edition just five years after the first edition appeared. This well illustrated introduction to the geology of one of the great Gondwanan continents is particularly useful for students in that it not only deals with the geological development of the continent but also discusses the basic principles and processes of geology from a southern hemisphere perspective.

Following that 'geology primer', Johnson follows a chronological account from the Precambrian through to Cenozoic and modern times. Then there are substantial chapters on specific topics from an Australasian perspective, such as the evolution of life, building the continental shelf and Great Barrier Reef to climate change. Each chapter ends with a short list of appropriate websites, as is expected these days.

For a single author to cover such a huge range of information is a considerable undertaking. Johnson has taken the opportunity of this new edition to update information and improve the balance of topics by upgrading the sections on palaeontology and climate change.

The abundant illustrations are invariably of high quality and range from colour photos of sites, rocks and fossils to maps, cross-sections and diagrams plus plenty of other black and white illustrations from numerous sources, all carefully listed at the back, along with a very full and useful bibliography and index. The production quality is high and although already 348 pages long, the book is not unwieldy and could reasonably be expanded somewhat in future editions. For students and other geologists who are not familiar with the geology of Australia this is an ideal starting place.

Douglas Palmer

AMBRASEYS, N. 2009. *Earthquakes in the Mediterranean and Middle East: a multidisciplinary study of seismicity up to 1900*. Cambridge University Press. xx + 947pp. Price £120.00, US \$210.00 (hard covers). ISBN 978 0 521 87292 8. doi:10.1017/S0016756810000452

It is a great relief to see this monumental work finally printed. Professor Ambraseys has towered over research into historical earthquakes for 50 years. He didn't invent the subject, but he certainly demonstrated how it should be done to standards that make it effective, with a level of scholarship that very few people can match. That it is important is beyond doubt: earthquakes repeat on particular faults only every few hundred or thousand years, even in places that are moving quickly, like California. The modern, high-quality, instrumental record of earthquakes provided by seismology is only about one hundred years long, and is clearly inadequate to see longer-term patterns.

Ambraseys has been pointing this out for years: thus, for instance, the Dead Sea fault system, from Aqaba to

Antioch, has been very quiet in the 20th century, but was the site of several enormous earthquakes over the previous thousand years, some of which are well-documented by historical sources in crusader times. The last 100 years are simply not representative of the longer period, and give a completely misleading and unrealistic view of the true earthquake hazard.

In 1982 Cambridge University Press published Ambraseys & Melville's book *A History of Persian Earthquakes* (re-published 2005), which was widely admired and used by seismologists, engineers and tectonic geologists. It is an extraordinary work of scholarship and absolutely iconic, setting a standard in this area of research that has not, in my opinion, been equaled since. It is so good because they returned to original literary sources and assessed them with a modern, well-informed eye. This requires a prodigious range of skills: an exceptional linguistic ability, able to take on ancient Aramaic as well as mediaeval Persian and Arabic; a profound historical knowledge of the region, able to tell whether documentary silence from a place was really because there were no earthquakes, or because trade-routes had switched, places had declined in importance through disease, invasion etc.; the knowledge of a well-informed modern seismologist, able to interpret the historical accounts in a realistic way, allowing for the inevitable hyperbole in a way that is physically realistic and possible; and finally the eye of an engineer who is familiar with indigenous building styles and building performance in earthquakes, and can interpret the historical accounts accordingly. To cap it all, Ambraseys has spent a huge amount of time in the field, visiting and assessing the sites of these earthquakes, and in many cases identifying the faults responsible for the earthquakes themselves. Ambraseys has all these skills, and no-one else does.

This new book is a distillation of Ambraseys's research in the area 28–44°N, 18–44°E, roughly from Romania to Egypt and from Albania to Iraq, drawing on and acknowledging his collaborations with others, especially with Charles Melville, Caroline Finkel and Dominic White, who supplied specialist knowledge in arcane languages. The bulk of the work is 750 pages containing evaluations of earthquakes prior to 1900, most of them over the last 2000 years. The accounts summarize key primary documentary sources (in English), correcting errors in previous compilations and discussing different modern interpretations of some of the more important large events. This is an invaluable core of knowledge and scholarship, and it is a great achievement to render it accessible in a single volume.

Shorter chapters discuss the nature and evaluation of the historical and macroseismic data sources, the evaluation of 20th century instrumental seismic data (important in providing the calibration between instrumental and macroseismic measurements necessary for a realistic estimation of pre-instrumental magnitudes), patterns of long-term seismicity, and the tectonic setting. All of these are balanced, sensible and useful in the high-quality and reliable tradition of all Ambraseys's immense published output. The preface of the book is particularly interesting, containing the author's quite freely-expressed, almost philosophical conclusions and perspectives on seismic hazard in developing countries, after a long, distinguished and widely admired career. They are also rather gloomy

and pessimistic, concluding that people quickly forget lessons in how earthquake effects might be mitigated, and become resigned or fatalistic to their consequences. Many places in the region that have been destroyed by historical earthquakes, with (by modern standards) relatively little loss of life because of their small populations at the time, are now occupied by megacities with no significant improvement in the building stock. The outlook for such cities is bleak. The contrast between places like California and Japan, where earthquakes of moderate size are mostly stories about money, and much of the developing world, where earthquakes of the same size kill large numbers of people, is one of the most chilling realities of the modern world.

Cambridge should be congratulated for publishing this book; such should be the purpose of an academic publisher. This book will never go out of demand, though that demand will be slow, steady, and professional: for libraries, researchers, consulting engineers and the insurance industry. It will not be a student textbook, and its substantial price is probably inevitable. Ambraseys and Melville's 1982 book was out of print for a number of years, but was in constant demand, with second-hand copies much sought-after and coveted: it is pleasing to know it is now re-issued in paperback.

James Jackson

Reference

AMBRASEYS, N. & MELVILLE, C. P. 2005. *A History of Persian Earthquakes*. 240pp. Cambridge University Press. Price £40.00, US \$70.00 (paperback). ISBN 978 0 521 02187 6.

SCARTH, A. 2009. *Vesuvius: A Biography*. 342 pp. Harpenden, England: Terra Publishing. Price £24.95, US\$29.95 (hard covers). ISBN 978 1 903 54425 9; 978 0 691 14390 3 (US). doi:10.1017/S0016756810000622

For both historic and contemporary reasons, Vesuvius is one of the most famous volcanoes in the western world. The eruption of AD 79 (of Vesuvius' precursor Monte Somma), which buried Pompeii, Herculaneum and other surrounding towns and villages and killed Pliny the Elder, the Roman admiral, natural historian and man of all parts, has ensured this volcano's place in history. Today, Vesuvius is one of the world's most dangerous volcanoes since it has not had a major eruption for some 200 years and is situated within 10 km of suburban Naples and a population of a million and more.

Alwyn Scarth's biography of Monte Somma, Vesuvius and the whole Campanian volcanic field in southwest Italy takes an historical approach to the development of volcanism in the region. He starts 35,000 years ago with the impressive eruption of the Campi Flegrei volcano, which lies to the west of modern Naples. At that time it expelled some 500 km³ 'of glowing dust, ash and pumice in an enormous cloud, which formed great ashflows of phonolite. . . over an area of 30,000 km². . . and reached thickness of 60 m in many places'. Then some 25,000 years ago the Somma region to the east of modern Naples joined in and has since produced a dozen or so major eruptions and another couple of dozen and more significant eruptions up to 1944. The last major eruptions were in 1631 and 1794, so over 200 years ago, and there are fears that another big one is due. Inevitably, the eruptions of AD 79 and 1631 and the subsequent discovery and excavations of Pompeii and Herculaneum are covered in considerable detail along with the history of the scientific observation and discovery of the geology of the volcano in

which Sir William Hamilton played a pioneering role whilst his wife Emma was latterly entertaining Nelson in 1799.

Finally, Scarth discusses the current problems of prediction associated with future eruptions in the region such as the recent 'bradyseismic' movements of the ground around Pozzuoli in the Campi Flegrei region, which may herald changes in the magma level associated with future eruptions. As he says, 'forecasting when Vesuvius will erupt again is perhaps the most important question in volcanic Europe. . . but it is still impossible to make an accurate long-term forecast of even the year when the next eruption will occur'.

Vesuvius' biographical details provide a salutary tale of human need, adaptation, short-term memory and wishful thinking over the centuries. How many times do people have to be reminded of the dangers of 'playing with fire'? But the pressures of survival, the temptations provided by fertile volcanic soils and the seemingly lengthy pauses between eruptions on the human lifetime scale have led millions of needy people around the world to live within the shadows of potentially lethal volcanoes. Scarth tells a gripping historical tale for the general reader and whilst the geology will be familiar to those in the profession, it provides an excellent well illustrated introduction for the student and plenty of fascinating detail that will be unfamiliar to all but specialist volcanologists.

Douglas Palmer

TAUXE, L. 2010. *Essentials of Paleomagnetism*. xvi + 489 pp. Berkeley: University of California Press. Price £34.95, US \$49.95 (paperback). ISBN 978 0 520 26031 3. doi:10.1017/S0016756810000555

As is made clear at the start, the book is a collaborative effort with contributions from R. F. Butler, S. K. Banerjee and R. van der Voo and indeed this book replaces and surpasses Butler's as the new 'standard' text for anyone requiring an introduction to palaeomagnetism. In many ways it follows the original format of the Butler text but integrates this with Tauxe's previous volume which was much more focussed on the physics and statistics behind the subject. It starts by introducing the reader to a series of essential background information: the essential physics of magnetism (chapter 1), the nature of the geomagnetic field (chapter 2) and rock magnetism (chapters 3–8). The practical, laboratory-based need to know material, forms the second half of the book and is divided into two broad areas: palaeomagnetic and statistical analysis (chapters 9–13) and then on into aspects of the application of palaeomagnetism (chapters 14–16). It is, however, a much more successful and fulsome text than anything previously available, both because of the way it is written and due to the presence of three additional elements. The first is the use of colour both in diagrams and photographs throughout, which greatly clarifies things for the budding palaeomagnetist and simply adds to the high quality of the illustrations throughout. The second is the use of supportive software using the Python scripting language with many ready to use examples that relate directly to the examples in the book and can be downloaded from the companion website. While it is openly stated that getting 'Python' to work is tricky, and this it proves, it does mean that students will be able to make the calculations and analyses for themselves. The third support mechanism is the website itself with useful supportive material including errata, problem set solutions and updates and, indeed, the whole book is available online! The physical and statistical background to the subject is particularly well handled throughout, reflecting Lisa Tauxe's