

BOOK REVIEWS

FRIEND, P. F. 2009. *Southern England*. 414 pp. London: HarperCollins. Price £30.00 (paperback). ISBN 9780 00 724743 1.
doi:10.1017/S001675680999029X

One of the many joys of geology is gaining sufficient insight into a landscape to enable four-dimensional vision. Instead of seeing just a hill, the insightful geologist sees gently dipping clays and sandstone strata, deposited during a marine highstand, overlain by a series of much more recent conglomeratic terraces, deposited by a river cutting and sculpting a modern valley. Unfortunately, even the most astute and experienced geological observer often cannot interpret a landscape alone without additional information and evidence, for example relating to absolute ages and rates and the way in which geology connects together regionally. This is especially true when the relevant features of the landscape are subtle or partly hidden by modern human activity.

Southern England by Peter Friend will be useful in this context to any amateur or professional geological observer curious about the landscape around her. The book starts with three introductory chapters setting out some current theories of landscape evolution and explaining key tectonic and climatic landscape-shaping processes before moving on through a series of chapters focussing on different areas providing complete coverage of southern England from East Anglia all the way to Devon, and Cornwall in the southwest. Each chapter explains the bedrock geology in terms of age, basic process of formation, and history of tectonic deformation using a combination of stratigraphic column, cross-section and photographs. Having established this foundation, bedrock geology is skilfully linked to landscape morphology via explanations of glacial ice-sheet history, sea-level changes, and the Holocene to modern history of drainage development. This is illustrated with a series of aerial photographs, topographic profiles and maps, some of which make use of geographic information system technology to delineate hill slope and drainage basin geomorphology. The result is an effective, clear and detailed explanation of landscape development that, with only a little bit of effort on behalf of the reader, provides much insight into the geological evolution of southern England.

As an example, the reviewer has been living in west London for the last year and wondering about various aspects of Thames Valley geology as alluded to in the opening paragraph. This book very nicely explains the history of the area, outlining development of the London Basin from Mesozoic to Palaeogene deposition in greenhouse climatic conditions, through Cretaceous and Neogene faulting and down-warping, to ice sheet advance and retreat and the final Pleistocene and Holocene episodes of fluvial terrace formation and down-cutting. All this explanation is achieved with a minimum of technical jargon, while maintaining a balance in the level of detail that is likely to be useful to amateur and professional alike.

In summary this is an excellent book providing much useful geological insight. It will be an invaluable part of a book collection for anybody living in or visiting southern England who has any interest in understanding the four-dimensional landscape around them more fully.

Peter Burgess

WALTHAM, T. 2008. *The Yorkshire Dales. Landscape and Geology*. 224 pp. Marlborough: The Crowood Press. Price £16.99 (paperback). ISBN 9781 86126 972 0.
doi:10.1017/S0016756809006219

The Yorkshire Dales are a dissected upland terrain in the northern Pennines of England. One of the most accessible of National Parks, the Dales serve as a recreational area for visitors ranging from climbers to shoppers. Most will not realise that the park boundaries are essentially geological. The area is delimited by the Permian unconformity to the east, the Stainmore Trough to the north, and by steep faults on the other two sides: the Dent Fault to the west and the Craven Faults to the south. The 'Askrigg Block', so defined, has a northward tilt and therefore progressively younger Carboniferous outcrop from south to north, giving three distinct scenic areas within the Dales region itself. What better region then to explain landscape and geology in a book aimed at the general reader.

Tony Waltham's book is divided into three parts. First he describes the bedrock geology, then the geological influence on Dales landscape, and finally the human use of the geology and terrain. Geological information is presented clearly but without over-simplification. The text and well-chosen illustrations should be understandable to our 'general reader', but the geologist will learn much too. Here we benefit from the author being both geologist and caver. His enthusiasm for 'landscape' therefore extends well below the ground level that most of us see. He explains karstic features and processes in an authoritative and entertaining way, and the maps, sections and photographs of cave systems are highlights of the book. The subsurface emphasis also permeates the applied geology section, with a particularly informative section on the former mining activity in the Dales, as well as sections on quarrying, farming and tourism. The excellent content of the book is enhanced by the well-crafted text style and the excellent illustrations: purpose-drawn colour diagrams and the author's striking colour photographs.

With geology still declining as a taught subject in schools, the subject needs the advertisement provided by excellent popular books like Tony Waltham's. He has justifiably made the reader understand that both landscape and activities in an area such as the Yorkshire Dales are rooted in the geology. Our climber will understand this better than our shopper, but all visitors to the Dales should enjoy this book.

Nigel Woodcock

CUNNINGHAM, W. D. & MANN, P. (eds) 2007. *Tectonics of Strike-Slip Restraining and Releasing Bends*. Geological Society Special Publication no. 290. vi + 482 pp. London, Bath: Geological Society of London. Price £100.00, US \$200.00; GSL members' price £50.00, US \$100.00; AAPG/SEPM/GSA/RAS/EFG/PESGB members' price £60.00, US \$120.00 (hard covers). ISBN 9781 86239 238 0.
doi:10.1017/S0016756809006025

This special publication of the Geological Society draws together a collection of 17 papers stemming from an international conference hosted by the Geological Society in September 2005. The volume focuses on the complexities which arise when non-planar strike-slip faults develop

local areas of contraction or extension to create so-called restraining and releasing bends respectively. The editors once again provide a useful summary to the contents and main issues tackled by the collection of papers, and have divided the volume up into three main sections covering bends and sedimentary basins, restraining bends and releasing bends. Following the introduction, the book actually commences with a major review paper by Mann (extending to some 130 pages) which provides an excellent catalogue and classification of restraining and releasing bends on ancient and currently active strike-slip faults. The volume also covers the geometry and reactivation of strike-slip faults, the magnitude and distribution of strain together with stress fields, and feedbacks between climate, topography and thermal histories. The editors also provide some pointers concerning the future direction of this research topic highlighting the unravelling of deformation histories in regions affected by coalescing strike-slip faults, together with the linkages and interactions of fault bends with the lower crust and lithospheric mantle as potential themes.

In summary, this is a very useful, well illustrated and timely contribution to what is an extremely important topic in terms of Earth tectonics and seismicity. As with the theme of many special publications of the Geological Society, the topic will appeal more to the specialist audience, although this volume does provide an excellent benchmark and ready-to-use source of up-to-date information for those who wish to delve further into the subject. It deserves to find a place on the shelves of many university libraries.

Ian Alsop

LEWIS, G. B. & DE LAJARTRE, P.-E. B. 2007. *The Red Volcanoes. Face to Face with the Mountains of Fire*. Introduction by Alain Gerente and John P. Lockwood. 144 pp. London: Thames & Hudson. Price £18.95 (hard covers). ISBN 0 500 54340 5. doi:10.1017/S0016756809006062

The Red Volcanoes is a simply stunning collection of photographs of lava and eruptions on Hawaii and Réunion. The photographers, G. Brad Lewis and Paul-Edouard Bernard de Lajarte, have superbly captured the inherent beauty and excitement of nature at her rawest and most exhilarating. The collated images document the immense, rich variety of phenomena displayed by the two active volcanoes and are testament to the artistic skill, bravery and patience of the two contributing photographers. Introductions by scientists John P. Lockwood and Alain Gerente poetically set the scene for the 115 photographs in this collection, outlining in lay terms the history of the volcanoes, their impact on the inhabitants of the islands and their connections with the volcanic giants.

The featured images in this book are exceptional documents of the beauty of flowing lava and glowing fountains and include everything from sweeping aerial panoramas of the volcanoes, through to bursting bubbles of lava, flowing rivers of red hot rock cutting through lush rainforests and towering white columns of steam generated as lava streams into the ocean. Each image is a marvel, drawing the eye in and around time and again. Each is magnificently composed, and some almost appear abstract or impressionist in their other-worldly beauty, with sprays of molten rock looking more like petulant flicks from a heavily loaded paintbrush rather than hot, dense disrupted magma (p. 36). Several images stand out, including a striking close-up photograph of a giant bubble bursting through lava (pp. 52–3), a heart-shaped ring of spatter from Pu'u O'o (p. 59) and aerial photos of backlit steam columns billowing above lavas along Réunion's growing coastline (pp. 116–19). The print quality of the images is high and

the book is beautifully laid out with a thumbnail section at the back giving a brief background to each featured image and a short glossary of terms. This book is sure to make a much-read addition to the coffee table and will provide endless conversation and inspiration. It is an ideal gift for Earth scientists, nature lovers and anyone seeking the spectacle of the Earth's most impressive displays of power.

Richard Brown

STACEY, F. D. & DAVIS, P. M. 2008. *Physics of the Earth*, 4th ed. xiii + 532 pp. Cambridge, New York, Melbourne: Cambridge University Press. Price £40.00, US \$80.00 (hard covers). ISBN 9780 521 87362 8. doi:10.1017/S0016756809006104

I must confess that before taking on this review I had not really looked carefully at previous editions of this book. Now in its fourth edition, *Physics of the Earth* has been completely revised and expanded in comparison with its earlier incarnations. Paul Davis has also joined Frank Stacey as an author. The preface outlines the major changes. The number of chapters has been increased by subdividing the chapters of the previous edition and new chapters have been included covering elastic and inelastic properties of rocks and rock mechanics which provide a framework for additional chapters on earthquake processes and dynamics.

These changes have resulted in a book consisting of 26 chapters covering an extensive range of topics which include most aspects of Solid Earth Geophysics and a host of other subjects which might best be described as underpinning knowledge, such as 'Origin and history of the Solar System' and 'Composition of the Earth'. While being largely self-contained, the topics are organized in a logical fashion so that any knowledge required for an understanding of subsequent chapters is introduced at an appropriate point. For example chapters on 'Rotation and the figure of the Earth and gravity', and 'Precession, wobble and rotational irregularities' precede the chapter on the satellite geoid. The shorter chapters, each averaging around 15 pages, provide a well-written, concise and easily readable introduction aimed at final-year undergraduate or first-year postgraduate level. Each chapter is prefaced with an excellent section outlining critical aspects of the topic and putting it into an appropriate context. In my mind this is one of the best parts of this textbook since the reader can quickly make a decision whether to pursue each chapter further or move on.

On reflection, while the coverage of topics is comprehensive there is one area that the book might cover but does not. I expected the chapters on 'Tectonics' and 'Convective and tectonic stresses' to consider the possible links between mantle convection and surface elevation through viscous coupling. While in some respects this topic is emerging and controversial, and the authors could be forgiven for steering clear of it as a result, there is a need for a textbook-level introduction and this volume would seem to be the appropriate place.

To complement each chapter there is a comprehensive set of problems in a separate section at the back of the book. The problems are related to chapters by their numbers and a set of solutions for course convenors is available online. There is also a set of appendices covering mathematical topics in more detail than would be appropriate for the chapters together with listings of fundamental data. The book is rounded off with a comprehensive and up-to-date reading list and an extensive index.

In conclusion, this is an excellent text that I can strongly recommend to anyone requiring an introduction to Solid Earth Geophysics and planetary science.

R. W. England