embrace it as a first resource, but my impression is that this book may not be used quite so much beyond introductory modules.

Sven Lukas

DAVIDSON-ARNOTT, R. 2009. *Introduction to Coastal Processes and Geomorphology*. xiv + 442pp. Cambridge University Press. £29.99, US$55.00 (paperback). ISBN 978 0 521 69671 5.
doi:10.1017/S0016756810000658

Introduction to Coastal Processes and Geomorphology has been developed out of an advanced undergraduate course taught for many years by its author at the University of Guelph. Coastal geomorphology texts have seen relatively little by way of pedagogic innovation since the appearance of Pethick's *An Introduction to Coastal Geomorphology* 25 years ago, although recent offerings have varied in the degree of rigour applied to the coverage of process mechanics and in their scholarly ambition. This new text competes most directly with Masselink & Hughes' identically titled text (published in 2003) and Haslett's *Coastal Systems* (2000, 2008). But it also approaches Woodroffe's *Coasts* (2002) in the depth of its scholarship.

The material is organised into 13 chapters, grouped under a brief Introduction that scopes coastal geomorphology in terms of its scientific heritage and contemporary relevance; a longer treatment of Coastal Processes; and a sampling of Coastal Systems in which scientific understanding of key environments is considered alongside topical management issues. From the outset, the style is authoritative yet eminently readable. Davidson-Arnott draws on personal experiences from around the globe in a way that modern undergraduates, who seem increasingly unwilling to engage with concepts presented in the abstract, will surely find appealing. This works well, and by eschewing a lengthy introduction to more general geomorphological concepts, the reader is quickly engaged with some extremely well presented material on coastal processes and their investigation in the field. Although it would be nice to see more complete mathematical treatments in a few places (e.g. in relation to tidal harmonics), the balance struck here is generally about right. The emphasis is very much on field studies rather than modelling, and although numerical models get the occasional mention, it is a pity that such a fundamental tool of modern coastal science does not yet get the coverage it deserves at undergraduate textbook level.

In contrast to Masselink & Hughes (2003), selected coastal systems are not forced into a fluvial-, tide-, and wave-dominated process framework, but receive a more balanced treatment that recognises that many important coastal environments are jointly shaped by wave and tide. The coverage of barrier island and inlets is particularly good, and all chapters are exceptionally well illustrated with much re-drafting of older material from less accessible 'classic' papers. The omission of estuaries is unfortunate, since so many of our current management problems involve estuarine shores and the interaction of estuarine with open coastal systems.

Presentation and page design suffers some of the idiocy of modern publishing; whoever thought it was a good idea to put boxes around figure captions and to further highlight the figure numbers? These irritations aside, Cambridge University Press have otherwise done a fair packaging job and figure quality is good. The author has also provided online resources, including high quality figures, rather lower quality video clips and datasets, that will be invaluable to those designing their own courses on the back of this text.

For those in search of an up-to-date undergraduate text that offers a fresh perspective on contemporary coastal geomorphology, this new offering has much to commend it. It combines an accessible yet scholarly treatment of the underlying processes with a broad range of interesting case studies.

All things considered, *Introduction to Coastal Processes and Geomorphology* would certainly be my current choice for a course text in this field.

Jon French

HASLETT, S. 2008. *Coastal Systems*, 2nd ed. Routledge. 240pp. ISBN 978 0 41544 060 8.
MASSELINK, G. & HUGHES, M. 2003. *An Introduction to Coastal Processes and Geomorphology*. Hodder Education. 368pp. ISBN 978 0 34076 411 4.
PETHICK, J. 1984. *An Introduction to Coastal Geomorphology*. Hodder Arnold. 272pp. ISBN 978 0 71316 391 9.
WOODROFFE, C. D. 2002. *Coasts: Form, Process and Evolution*. Cambridge University Press. 640pp. ISBN 978 0 52101 183 9.

GILL, R. 2010. *Igneous Rocks and Processes: A Practical Guide*. x + 428pp. Wiley-Blackwell. Price £34.95, US$80.95 (paperback). ISBN 978 1 4443 3065 6.
doi:10.1017/S001675681000066X

Second year igneous petrology is taught, in my department and many others, with a very strong emphasis on practical work. The undergraduates spend several hours every week developing their microscope skills, making observations of rocks and thin sections, and identifying minerals, describing textures and attempting to infer how the rock was formed and in what kind of setting. This should and does form the basis for teaching igneous petrology. And here is a textbook that reflects this logical order! The chapters are laid out largely in terms of rock types, including chapters headed basalts, gabbros, ultramafic rocks, andesites, dacites and rhyolites, granites, and the alkali rocks, with a couple of extra chapters on magma differentiation and physical volcanology. The petrological 'tools of the trade' are introduced when needed, inserted into boxes separate from the main text. This layout will make sense to an undergraduate, who should make observation of rocks first and foremost, then start thinking about where the rock comes from and how it was formed.

What I really like about this book is that the relatively 'dry' topics (from an undergraduate's point of view) such as phase equilibria and isotope geochemistry, are introduced when they are needed in order to interpret a rock. In this way, the student will see their practical use very easily and will understand why it is important to know, for example, the phase rule and how eutectics and resorptional points differ and how these essential tools can be used to interpret the petrological history of a magma. The book assumes a certain amount of prior knowledge of basic microscope skills and mineral identification, as is appropriate for a second year text. The book does not pretend to be a 'one-stop shop' for the second year course. There are areas that it does not cover in great detail and for these the students must be referred to other sources. Phase diagrams are introduced and used throughout the book to interpret petrological features of rocks but some of the fundamental thermodynamics must be found elsewhere. The optical indicatrix and other practical microscopy tools are covered in detail in an appendix (again, assuming a basic prior knowledge).

As an example of how this book works, the andesites, dacites and rhyolites chapter starts with a description of mineralogy and texture, then classification. It introduces the alkali feldspar solid solution series with reference to a

ternary phase diagram to aid identification and understanding of feldspars. Phase equilibria involving hydrous minerals are introduced, explaining why we often see hornblende in andesites. There follows a description of steep-sided lava flows and domes, and then a discussion of the controls on magma viscosity and the importance of volatiles and degassing for crystallisation. The origin of the calc-alkaline and low/high K trends are discussed and finally, the different tectonic settings in which silicic volcanic rocks might be found, with reference to their distinctive geochemical signatures. In other words, observations first, interpretation last. This textbook will be an invaluable guide for undergraduates in the laboratory and will allow them to develop their interpretative skills in petrology in the most intuitive way. The breadth of topics, clear layout and level of detail will no doubt lead it to become an essential, always-on-hand reference for students.

Marie Edmonds

CLARKSON, E. & UPTON, B. 2009. *Death of an Ocean. A Geological Borders Ballad.* xiii + 210 pp. Dunedin Academic Press. Price £25.00, US$39.95 (HB). ISBN 978 1 90671 602 8.
doi:10.1017/S0016756810000798

Death of an Ocean is the geological history of the Scottish Borders whose rocks were mostly laid down in the Iapetus Ocean of Palaeozoic times but also includes Upper Palaeozoic and Quaternary episodes. In telling this story the authors extend well beyond the geographical confines of the region to give an overview of the development and demise of the Iapetus Ocean and at the same time detailed evidence as found within specific Borders sites such as Dob's Linn. Additionally, they explain for the general reader the geological and palaeontological background to the processes and biota involved in this remarkable story and short vignettes of some of the historically important geologists who pioneered our understanding of this complex terrane. So there are concise introductions to a variety of topics such as plate tectonics, turbiditic sedimentation, volcanism and the Hirnantian glaciation as well as palaeontological topics such as graptolites, their palaeobiology and use in biostratigraphy.

The authors are both very experienced geologists who have spent a considerable portion of their academic careers tramping over the rocks of the Scottish Southern Uplands. Consequently, they are very well placed to recount the events and describe the sites and geological phenomena from which the story has been reconstructed.

Death of an Ocean is far more than just a geological guide. With its numerous coloured maps, diagrams, pictures of fossils and excellently reproduced colour photographs of the rocks and landscapes of the region, it provides a really useful introduction for students, the informed amateur and anyone who wants a good up to date synthesis of this important part of the geological history of the British Isles.

Douglas Palmer