MARTÍ, J. & ERNST, G. G. J. (eds) 2005. *Volcanoes and the Environment*. xv + 471 pp. Cambridge, New York, Melbourne: Cambridge University Press. Price £50.00, US $90.00 (hard covers). ISBN 0 521 59254 2.
doi:10.1017/S0016756808005621

That volcanism can profoundly affect the environment will hardly come as a surprise when one calls to mind the scenes of devastation accompanying large eruptions. However, the nature of these impacts can be highly complex, their extent anything from local to global, and their duration lasting long after ash has ceased discharging from the vent. Furthermore, many non-erupting volcanoes modify proximal sedimentary environments as a result of their geomorphic expression and orographic influence; the atmospheric environment through their emissions of sulphurous and halogenated gases and particles; and ecosystems through their release of heavy metals such as mercury, lead and copper. The theme of volcanoes and the environment is thus a rich one, and it is exciting and timely to see a publication devoted to this topic.

The volume is comprised of 15 chapters, each authored by specialists in their respective fields. The first four chapters serve as primers on the geological origins, eruptive styles and geomorphology of volcanoes, and cover also aspects of volcano hazards, monitoring and modelling. The remainder of the book is much more eclectic, and there isn't really an underlying progression. This makes it suitable to digest a chapter at a time at leisure, rather than a book to read through from beginning to end. There are reviews, for instance, on the links between large igneous provinces and Phanerozoic mass extinctions, and on the impacts of more recent eruptions on flora and fauna. Further chapters cover thermophilic bacteria found in volcanic environments, the impact of eruptions on global climate, and the medical effects of volcanic activity. But from this point, the content strays somewhat from the obvious implications of the book's title: remaining sections review geothermal energy, ore deposits, industrial uses of volcanic rocks, sociological aspects of volcanic hazards, and the economic impacts of eruptions. These are all authoritative and well worth reading (for instance, this is the best summary I have come across concerning the economic context) but the overall effect is to leave some significant gaps in coverage of more mainstream environmental issues associated with volcanism (such as impacts of volatile emissions on soils and aquatic ecosystems, ash fertilization effects in the ocean, tropospheric chemistry of volcanic emissions, and so on). There is also, arguably, more overlap with the 1999 publication *Encyclopedia of Volcanoes* than necessary, and only limited cross-referencing between chapters.

Nevertheless, the book represents a very worthwhile addition to the volcanologist's bookshelf, thanks to its unusual blend of topics, some from fields that are very rarely represented in volcanological periodicals. It is sure, therefore, to inform even the most seasoned volcanologists. In this regard, it compares favourably with the classic *Volcanic Activity and Human Ecology* (edited by Sheets & Grayson and published in 1979) and may accumulate similar prestige over the years. The book also makes for an excellent reader for students – from undergraduate level up – thanks to its diverse coverage and review style.

Clive Oppenheimer

References

SHEETS, P. D. & GRAYSON, D. K. (eds) 1979. *Volcanic Activity and Human Ecology*. New York: Academic Press, 644 pp.

SIGURDSSON, H., HOUGHTON, B., RYMER, H., STIX, J. & MCNUTT, S. 1999. *Encyclopedia of Volcanoes.* New York: Academic Press, 1417 pp.

YUEN, D. A., MARUYAMA, S., KARATO, S. & WINDLEY, B. F. (eds) 2007. *Superplumes: Beyond Plate Tectonics*. xiv + 569 pp. Berlin, Heidelberg, New York: Springer-Verlag. Price Euros 79.95, SFr 139.50, US $99.00, £61.50 (hard covers). ISBN 9781 4020 5749 6.
doi:10.1017/S0016756808005736

Lack of direct observation makes understanding the interior of the Earth a challenging task. Data from geology, geochemistry and geophysics must be combined to build the best picture of the inside of our planet. Since seismic tomography revealed the existence of two large, low velocity anomalies beneath the central Pacific and Africa, geoscientists have aimed to understand the origin and effects of these superplumes. This book does just that, incorporating results from recent advances in many areas to address questions related to superplumes and their role in mantle dynamics. The recently discovered phase change of the principal lower mantle mineral perovskite into post-perovskite near the core–mantle boundary has offered the opportunity for new interpretations of observations and new theories concerning the dynamics of the Earth's interior.

The book comprises 18 individual contributions covering a wide range of topics with the common goal of increasing understanding of superplumes. The papers are broken up into six sections. The first two sections summarize seismological observations of the Earth's interior and the results of high pressure and temperature mineral physics experiments. Together, these data provide knowledge of current interior Earth structure. Section 3 uses geochemical and petrological data to discern how the Earth evolved to this current structure. Both numerical modelling and mineral physics data are used in Section 4 to study the effects of the physical properties of mantle rocks on convection. The history of mantle dynamics is then discussed in Section 5, with particular focus on the development and consequences of superplumes. This section finishes with the longest paper in the book which uses results from all the previous studies to build a detailed and consistent model for the formation and evolution of superplumes. The final section addresses plumes and superplumes on the other terrestrial planets, Mars and Venus.

This book will appeal to a wide range of readers thanks to contributions covering many different geological and geophysical techniques. Most of the papers provide substantial reviews on their subject, making them accessible to the non-expert, as well as presenting recent developments to interest experts in the field. It is well presented and enjoyable to read with colour figures interspersed with the text.

Bryony Youngs

BARKER, R. D. & TELLAM, J. H. (eds) 2006. *Fluid Flow and Solute Movement in Sandstones: The Onshore UK Permo-Triassic Red Bed Sequence*. Geological Society Special Publication 263. vi + 346 pp. London, Bath: Geological Society of London. Price £85.00, US $153.00 (hardback); members' price £42.50, US $77.00. ISBN-10 1-86239-204-8, ISBN-13 978-1-86239-205-5.
doi:10.1017/S0016756808005682

The volume includes items presented at a meeting of the Geological Society's Environmental & Industrial Geophysics and Hydrogeological groups in 2003, and others submitted subsequently. In a lengthy, and comprehensive, introductory article the editors stress the importance of understanding geological factors, which they consider has been inadequate, and of the use of appropriate investigative techniques and models, including those used in the hydrocarbon industry.