whole of the Phanerozoic, but most of the contributions concentrate on particular boundaries and regions. The sorts of problems discussed in these are commonly encountered at other stratigraphic levels and localities, but in general the wider implications of the conclusions drawn are not considered. Hence, whereas most contain interesting data and observations, these papers are primarily of interest only to specialists on the fossils and/or boundaries concerned.

Given the origins of this volume, it is not surprising that six of the contributions focus on palynomorphs. However, foraminifera are important in four and three are concerned with conodonts. Ostracods, nannofossils, calcareous dinoflagellate cysts and diatoms are also discussed in some of them. On the other hand, MacLeod's interesting invited contribution on the relationship between various geological events and mass extinctions barely mentions microfossils!

Unfortunately the title of the volume gives the impression that palynomorphs, which have organic walls, are not microfossils. Palynology is no different from other specialist fields of study on small fossils such as ostracods ('ostracodology') and foraminifera ('foraminiferology') in being a subdiscipline of micropalaeontology.

Papers other than MacLeod's that are of more than specialist interest include that of the two editors, Beaudoin & Head, and Doran *et al.*, Zhang & Barnes, Nikitenko & Mickey, Hart, and Sikora *et al.* The editors discuss aspects of boundaries in the geological record and some of the conclusions drawn by the contributors to the volume. Doran *et al.* analyse planktonic foraminiferal survivorship following events linked to the Cenomanian–Turonian and Cretaceous–Tertiary (Paleogene) boundaries. Zhang & Barnes recognize 12 Cambrian–Ordovician conodont communities and assemblages based on cluster analyses of their data, and in a second contribution consider the post-Ordovician recovery and diversification of conodont faunas. Nikitenko & Mickey concentrate on the potential of foraminifera and ostracods in the development of an Arctic zonal standard for Pliensbachian–Toarcian strata. Hart discusses the implications of recognition of a non-sequence within the Cenomanian chalk succession of southern England and northern France. Sikora *et al.* consider the distribution of foraminifera, calcareous nannofossils and dinoflagellate cysts at two potential stratotypes for the Turonian–Coniacian boundary, one in Germany, the other in the USA (New Mexico). Unfortunately the microfossil data suggest that the two sections are the same age whereas the invertebrate macrofossils recovered imply that the North American section is older. This demonstrates the all-too-common problem of determining the criteria on which to identify a stratigraphic boundary.

Investigations of different candidate boundary sections by authors have commonly led to prolonged discussions in the literature and no decision, usually because suitable biostratigraphic markers are lacking or too restricted in their geographic distribution. This is despite the fact that fossil occurrences can only be guides to stratigraphic boundaries. The lack of a type locality for the Jurassic–Cretaceous boundary for example, means that, until it is eventually selected, palaeontological arguments for determining whether particular successions in different parts of the world are latest Jurassic or earliest Cretaceous in age will continue in the literature *ad nauseam.* This situation is by no means unusual. A lack of consensus has led to similar difficulties and lengthy discussions on where to place many other boundaries.

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PENTECOST, A. 2005. *Travertine*. xiv + 445 pp. Berlin, Heidelberg, New York: Springer-Verlag. Price Euros 89.95 (net price), US $119.00, £69.00 (hard covers). ISBN 1 4020 3523 3.
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This book is an excellent compilation of important ideas and key information covering much of the available literature on freshwater carbonate deposition in both ambient temperature and thermal situations. It is particularly valuable to researchers as a source book as it contains over 1200 cited references, together with 102 figures, many of them specially drawn for the book. Taken as a whole, the book is a very successful blend of published ideas and the author's own studies. Alan Pentecost is passionate about travertines and this is evident throughout his book, which meticulously deals with every facet of travertines. Divided it into 17 chapters, each contains cited examples, figures and personal overviews. Among the chapters are such aspects as precipitation mechanisms, classification, chemistry, mineralogy, stable isotopes, associated organisms, and depositional processes. There is even a chapter on extraterrestrial travertine. Despite this volume being primarily written for the specialist the written style and scope also provide ample interest for the keen amateur. Indeed, travertines are an important karstic depositional landform and one which invites and benefits from contributions by the observant amateur and expert alike. It is somewhat surprising, however, that the author has chosen to name his book 'travertine'. Of course it is logical to call all freshwater carbonates by a single name and meteogene and thermogene are well chosen terms for further defining ambient-temperature- and hot-water-derived deposits respectively. Nevertheless, it is important to note that in many parts of the World there is an historic and scientific tradition that ambient-temperature deposits are referred to as 'tufas'. This term is entrenched in the literature and its use is likely to continue.

Alan Pentecost is an acclaimed expert, particularly on the organisms associated with travertines and on the palaeobiology and biostratigraphy of these deposits. He is also well versed on the chemical composition of source waters and on depositional processes. Consequently, these chapters contain particularly full accounts with valuable fine detail of the individual processes and organisms, much based on personal research. Nevertheless, I would have liked to see a little more consideration of the relationships between micritic fringe cements and microbial processes.

The handling of Chapter 4 (morphology and facies) reveals much of the author's skill in classifying these deposits and provides excellent coverage of all aspects including their relationships to speleothems and lake deposits. There is a good coverage of specific facies, the interpretations being governed mainly by the author's experiences in Britain and NW Europe. Consequently, there is a paucity of synthesized sedimentological interpretation for the larger scale facies associations that are common in many larger meteogene travertines (tufas).

There is a splendid final chapter which deals in depth with the utilization of travertine in buildings. Here we are treated to a detailed account of the historical and artistic uses of travertines. Overall, I found this book to be varied, original in its viewpoints and presentation and a comprehensive guide to the current literature. Most importantly I found it a most enjoyable read. Certainly, I would warmly recommend it to colleagues and all those wishing better to understand freshwater limestones.

Martyn Pedley