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Palaeozoic Reefs and Bioaccumulations – Climatic and Evolutionary Controls, edited by J.J. Álvaro, M Aretz, F. Boulvain, A. Munnecke, D. Vachard and E. Vennin (eds), 2007. Geological Society Special Publication 275. The Geological Society of London, The Geological Society Publishing House, Unit 7, Brassmill Enterprise Centre, Brassmill Lane, Bath, BA1 3JN, United Kingdom. Hardback, 291 pages. Price GBP 80.00; USD 160.00 (fellow price GBP 40.00, USD 80.00; corporate affiliates price GBP 64.00; other societies' price GBP 48.00). ISBN 978-1-86239-221-2.



Facies transitions from shell accumulations to reefs in general are tackled in the introductory paper by J.J. Álvaro and his co-editors. They show problems in six examples of stabilised coquinas to (pseudo) reef frameworks, some of which are discussed in more detail further on in the book. Clausen & Álvaro discuss Early Cambrian shelly phosphorites from the Montagne Noire (France) and conclude that repeated cycles of sedimentation/reworking lead to phosphate deposits in a mainly dysaerobic substrate. Early Cambrian reef complexes from Sardinia (Gandin et al.) are unusual crust boundstones with archeocyaths, alternating with fine-grained siliciclastics or carbonates on which calcimicrobial material settles, forming an arched crust system. Álvaro & Clausen demonstrate the dependence of Early Cambrian turbid- and clear-water archaeocyathan microbial reefs in Morocco's High Atlas on synsedimentary tectonism, volcanism and sea-level fluctuations, and discuss their great morphological variety. Hunter et al. discuss the oldest evidence for a meadow aggregate of ophiuroids and stylophorans assemblages, exquisitely preserved in the Ordovician of Brittany (France). Silurian reef margins with patch reefs from Gotland and England are described by Kershaw et al.; they show internally bedded mudstone-wackestone with microbial micrite acting as reef constructor and allowing abrupt bed terminations against reef edges and steep to vertical reef margins. Hubmann & Sutter review six examples of Siluro-Devonian Alpine reefs and pavements in Austria on either side of a fundamental fault; to the east, pioneer reef communities dominate, whereas *Cardiola* pavements and Early Devonian coral/stromatoporoid patch reefs are typical to the south. Carbonate-platform formation in Middle Devonian carbonates in SW Belgium and their magnetic susceptibility are discussed by Mabilille & Boulvain. A paleodepth curve of 11 microfacies and an environmental model depicts the facies mosaic on a carbonate ramp. Correlation is reinforced by using magnetic susceptibility. Then three more contributions on the Devonian-Carboniferous of Belgium are opened by Boulvain with a discussion of the classical Frasnian carbonate mud mounds studied since 1868 and now subdivided into nine microfacies put together in mosaics characterising buildups at various stratigraphic levels and allowing reconstruction of sediment dynamics and buildup architecture in terms of paleoceanography and third-order systems tracts. Next Poty & Chevalier analyse Devonian phillipsastroid biostromes forming after the first recorded late Frasnian coral crisis, and finally Aretz & Chevalier review the Famennian-Dinantian interval and describe many not earlier described reefs that formed after the collapse of Devonian stromatoporoid/coral reefs. They conclude that these reefs were much more diverse than the well known Waulsortian mounds and those microbial communities are the backbone of such mounds. Two contributions on newly described Mexican Pennsylvanian (Moscovian) accumulations respectively deal with chaetetid boundstones on soft but firm substrates below wave base, living in symbiosis with heterotrophic bacteria (Almazán-Vázquez et al.), and on a well preserved

regional encrinite with a thanatocoenosis that characterises shallow tropical seas (Buitr6-Sanchez et al.). Vennin presents an instructive example of interaction between carbonate accumulations and regional tectonics causing neptunian dykes in the reefs. Detailed study of the dyke fill provides insights in episodes of reef and dyke growth and the changing regional tectonic regime. Weidlich aims at characterising Permian shallow-water benthic carbonate in protozoan and heterozoan carbonates of the Arabian platform in the Neo-Thetys. Existing depositional models have to be modified in various ways. Th6ry et al. review the Permian-Triassic boundary from the Caucasus and Eastern Europe with extensions into Asia with new biostratigraphic, paleobiogeographic and geochemical data. Finally, Zapalski et al. estimate paleoenvironmental changes by growth periodicity, as expressed in the tabulae of tabulates.

The above multidisciplinary studies and their facies characterisation rest on a wide range of observations successfully accomplished by the various authors. Definitions of reefs and shell accumulations give rise to various nomenclature problems, but rather than dwelling on this, the authors touch on genetic issues in the development of mounds and the role of bacterial and cryptalgal organisms versus skelets and mud. Mounds may grade into reefs depending on environmental shallowing rather than ecological maturation. Commonly this goes hand-in-hand with textural evolution and community replacement. Several coquinas generated by storms form stratigraphic discontinuities; sometimes reef soles are stabilised by (encrusting) organisms such as stromatolites. So, biomineralized metazoans in relation to microbial communities create a challenging range of benthic communities on which this book successfully focuses.

The editors organised an international meeting focused on Climatic and Evolutionary controls on Palaeozoic Reefs and Bioaccumulations (7-9 September 2005, Paris, France) and provided thus a forum to discuss reef evolution and shell accumulations. In this intent they have been successful, and the book is a useful compilation of papers touching on this divers and interesting topic.

As usual for publications of the Geological Society, the publication is well executed and could be beneficial for graduates wishing to delve deeper into facies characterization of reefs and shell accumulations and their transitional deposits. Recommended.

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