



***Neritic carbonate sediments in a temperate realm B southern Australia***, by Noel P. James & Yvonne Bone, 2011.

Springer Science+Business Media V.B. Hardbound, 254 pages. Price US\$ 139.00. € 106.95; £ 90.00. ISBN 978-90-481-9288-5.

In the sedimentary record, carbonate sediments are usually considered as indicators of a tropical, warm-water environment, and they have been used in numerous paleoclimatic reconstructions to reflect such conditions. It is common knowledge, however, that they accumulate also in cool- and cold-water environments, but this aspect is usually treated marginally in sedimentological textbooks. This information gap is, fortunately, filled effectively by the book under review here.

The largest area in the world of cool-water carbonate deposition is the southern shelf of Australia. This region was studied by the book's authors and their numerous colleagues during the last twenty years and the results of these investigations are summarized in this textbook which presents the contemporaneous history of the shelf against the background of the geological history of Australia. It also describes the climatic, meteorological and oceanographical conditions of cold-water carbonate sedimentation. This information, perfectly illustrated by numerous maps and schemes, is included in the first three chapters. The value of such data is highly significant, especially in the context of "palimpsest sedimentation" in the form of the large amount of older sediments that have been re-deposited in the recent sedimentary environment.

James is known as the author of numerous handbooks; all of them are characterized by clear, synthetic descriptions and perfect graphic schemes and photos. This book, too, is perfectly illustrated. The brief summaries of the major points after each chapter ("Synopsis") are an excellent idea; together with complete references and index. They make efficient and effective use of the book a simple task.

A detailed description of the biotic components of sediments is presented first. Particularly exhaustive is the characterization of calcareous algae and bryozoans, which are discussed more extensively than other invertebrates, because they are the dominating sediment component. The 10-page chapter on bryozoan morphology in particular can be treated as an exceptionally complete compendium of knowledge on this group of invertebrates. Especially useful is the simplified classification table, which enables discrimination of genera within this group during fieldwork, even by researchers who are not professional biologists. They would require long, specialized, biological studies without these schemes.

The basic subject of the book is neritic deposits, but Chapter 5 contains a description of deposition in marginal marine environments. It allows one to understand the neritic environment in the context of the entire shelf, its shallowest zones included. The most important and innovative part of the book is Chapter 6. Which provides a classification of neritic facies. In total, 23 facies are distinguished, which are grouped into five megafacies (an unfortunate term; "facies assemblages" would have been more appropriate). The primary factor enabling discrimination of these facies is the proportion of recent and relict components (grains reworked from older deposits). A secondary factor is the content of bioclastic grains. This methodology is analogous to the procedure followed for microfacies analysis of carbonate rocks. The classification of facies is presented in tables, and each definition is extended and commented on in short, more analytical

sections. Numerous photos perfectly illustrate each facies.

Chapter 6 might give the impression that the discrimination of facies is too detailed, and that some of them are very alike. This reservation will disappear, however, after reading of the next chapter, where the facies are attributed to particular sedimentation zones. These zones are distinguished on a slightly arbitrary basis (water depth), but they also have a morphological expression. Four zones are distinguished and these can be subdivided into 13 subzones. It appears that nearly all facies have an unequivocal sedimentary interpretation in the context of the shelf subdivision. It seems therefore that the discrimination of facies has an interpretative value; carbonate sedimentologists will consider this highly important.

The three chapters that follow characterize the geographical distribution of specific facies in three broadly defined regions of the Australian shelf. Numerous maps and cross-sections reveal the enormous amount of work put into the investigation of facies, and they illustrate the facies differentiation. This cartographical picture may, however, be treated only as an approximation of the real facies arrangement because of the great extent of the southern Australian shelf (thousands of kilometers).

Because bottom material was obtained usually using a pipe dredge or beam trawl, the amount of data connected with diagenetic processes is limited. The chapter devoted to this topic is relatively inconspicuous, but some remarks are very interesting, such as those concerning syn-sedimentary dissolution.

The last chapter more or less summarizes all previous chapters. This seems superfluous, considering that each chapter ends with a summary; only readers who would like to find a short description of the entire book will be satisfied. On the other hand, I totally agree with the statement, in the discussion about the relationship between shelf sedimentation and climate change, that these parameters imply sea-level changes. The authors write in the final part of the book that the application of fundamental concepts of modern cool-water carbonate deposition to the rock record is one of the current challenges of carbonate sedimentology. It is reasonable to agree with this statement, and examples of the analysis of older rock successions would have been most welcome in this context. The comparison of three lithotype examples from Oligocene, Permian and Carboniferous successions (the last figure of the book) do not really compensate for this omission, but this is one of the very few shortcomings.

In summary, I can recommend this excellent textbook to all libraries and to students and geologists who investigate carbonate successions.

Stanislaw Skompski  
Faculty of Geology  
University of Warsaw  
Poland  
e-mail: skompski@uw.edu.pl