



Devonian Reef Complexes of the Canning Basin, Western Australia, by P.E. Playford, R.M. Hocking, and A.E. Cockbain, 2009, Bulletin 145, Geological Survey Of Western Australia, Bulletin 145, 444 p., ISBN 978-1-74168-233, AUD 77.00, order from www.dmp.wa.gov.au/ebookshop

Our understanding of the ancient world is predicated upon a few exceptionally preserved geological localities backed up by innumerable local examples. The Devonian Barrier Reef complex of Western Australia is an iconic example of such a critical deposit. Anyone who has studied middle Paleozoic carbonates knows of this amazing feature preserved as though the water was withdrawn just yesterday. Any earth scientist can now walk across the surface, tramp through the gorges, or fly over this astonishing feature; this book explains the amazing attributes of this exquisitely exposed structure.

The volume, accompanied by superb maps, is the result of 50 years of research by the Geological Survey of Western Australia. It is, however, really the legacy of a lifelong quest by Phillip Playford, beginning as a graduate student, to document, interpret, illustrate, explain, and place these rocks in a global context. A series of 46 publications on all aspects of these rocks have been consolidated and synthesized to reveal the essence of this ancient reef. Playford is aided in this endeavor by two of his long-time colleagues, Roger Hocking and Tony Cockbain. For readers of *PALAIOS*, this is a superb combination of sedimentology and paleobiology.

Upon opening the book and settling down to read the volume, I was immediately captivated by the many superb and detailed illustrations. Everything is in color—diagrams and images—it is stunning. Playford has long been renowned for his simple, yet conceptually clear diagrams, and this book has them all. These figures are supplemented by innumerable images, taken over the years, and here reproduced with exceptional clarity. If it were not for the high scientific level of the book, it would rank with any professional coffee-table volume.

The book is 444 pages long, has 536 figures (drawings and images), and eight maps at scales ranging from 1:500,000 to 1:25,000. It also contains three short appendices documenting the conodonts (G. Klapper), ammonoid biostratigraphy (R.T. Becker and M.R. House), and palynology (G. Playford). A short, 12 page introduction sets the stage with aspects spanning previous research, regional geology, and human habitation of this part of Western Australia. The core of the book, however, can be divided into three roughly equal sections: the reef complexes themselves, special aspects, and key localities. The text is written in Playford's characteristic lucid and succinct style, accompanied by solid scholarship. It is neither bloated nor pedantic, just clear, flowing, and concise.

The essence of the book lies within the next 107 pages, where different aspects of the reef complexes are described and interpreted. The structures are illustrated from large to small scale, aerial to outcrop to thin section. For me the most impressive images are those of polished rocks, natural and prepared, where the metazoan and microbial elements stand out starkly against the brilliant red, fine-grained rocks. Unfortunately many aerial and distance outcrop images have no scale. This part of the volume focuses on facies, lithostratigraphy, sequence stratigraphy, faulting, biostratigraphy, diagenesis, and the evolution of these biogenic structures through time. Facies attributes are clearly outlined and compared with similar deposits elsewhere. Formations are defined in the traditional way and contain much information. The authors tread carefully around aspects of sequence stratigraphy emphasizing that whereas eustasy clearly played a central role, the development of the complex, local syndepositional tectonics was perhaps just as critical. Locations are meticulously chronicled throughout this section, especially where critical events are recorded. These events are chronologically pinned down and placed in a global context via exhaustive biostratigraphic data. The eight types of different platform margins are documented in particular detail with emphasis on paleobiology and sedimentation dynamics. These are then related to the exceptionally well-preserved slope deposits. The outcrops remind the reader of similar deposits in the Permian Reef Complex of western Texas and New Mexico.

Special aspects comprise the next 125 pages, wherein topics such as conglomerates, cyclicity, importance of structure, mineralization, petroleum, and paleokarst (Late Devonian, Mississippian, and Permian) are detailed and explained. The section on cyclicity is excellent, with the subaqueous and peritidal varieties backed up by numerous stratigraphic sections. The theme of eustasy versus tectonics is again addressed here. Whereas there is not much to be said about petroleum because little has been found here, the epigenetic Pb-Zn and syngenetic stromatolite-barite exhalative mineral deposits are treated in detail. The latter appear to have formed above cool water seeps. One of the most fascinating features for me is the extensive Permian subglacial karst that is preserved today from glacially scoured surfaces to subglacial valleys and caves.

As befits a geological survey publication, the subsequent 133 pages are devoted to the description and interpretation of specific localities. This is the data section of the book where

illustrations and stratigraphic sections are used to bolster previous interpretations.

Finally, above all this book is a personal scientific statement, one that has grown out of many years of research. Readers who have followed this research will recognize many images and figures, but they are now all in one place. The work of others, often at odds with the author's conclusions, are not dealt with in detail and sometimes dismissed out of hand. It is difficult to say whether more text could have been devoted to defending interpretations without detracting from the thrust of the document. Time will tell.

In my opinion this book must be on the shelf or in the nearby library of any scholar of Devonian rocks, paleontologist, stratigrapher, and sedimentologist alike, and will certainly

be repeatedly consulted by those who are trying to understand carbonate sedimentary rocks throughout the geological record. I shall assign parts of it to my research students as required reading. The price of \$77.00 Aus. (~\$70.00 US) plus postage is cheap for this boxed set of maps, but postage may put it outside the budget of some workers. Frankly, the additional expense is worth it; this book is going to have a long life span and be a standard reference work for years to come!

Noel P. James
Queen's University
Kingston Ontario K7L 3N6
Canada
james@geol.queensu.ca