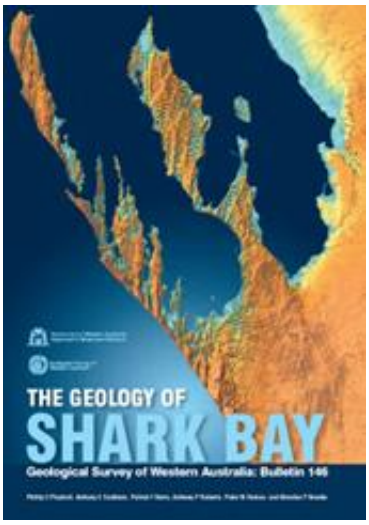

The Geology of Shark Bay, by P.E. Playford, A.E. Cockbain, P.F. Berry, P.W. Haines & B.P. Brooke, 2013. Geological Survey of Western Australia Bulletin 146 (ISSN 0508-4741; www.dmp.wa.gov.au), 281 pages. AUD 70.00. Limited edition of 300.

The mere words "Shark Bay" conjure up images of living stromatolites that are one of the few windows that we have into the long vanished world of Precambrian seascapes. Yes, this book contains a section on these iconic features but it is much more than that: it is a synthesis of the overall geology of this remarkable place. The publication is visually stunning with 436 color images and diagrams documenting the amazing geology and history, both on a personal (human) and scientific level. As most sedimentary geologists know, the stromatolites were discovered by Phil Playford and reported on in the 1950s. Later, in the 1970s, the various aspects of Shark Bay sedimentology were documented by the late Brian Logan as AAPG Memoirs 13 and 22.

This volume is organized into several parts: a relatively short Introduction followed by extensive sections on geomorphology and geology. The book concludes with short segments on structure and economic geology.

The introduction is an overview of the human history, beginning with aboriginal occupation and followed by the accidental landing of Europeans in 1616. The harsh region was subsequently populated by guano harvesters and pearl fishers in the 1850s, then pastoralists, beginning in 1868. It was declared a UNESCO World Heritage Site in 1991. Today the economy is principally tourism and fishing. Scientific research began in 1954 and the progression of discoveries is outlined up to those going on today.

The section on geomorphology (p. 56) sets the stage for the core of the book: geology. Here, after a short section describing the marine realm, the focus is on terrestrial systems, namely the islands and peninsulas covered with dune sands, eolianites, and relatively recent marine deposits. The six Pleistocene dune systems are described in detail and followed by a discussion of the islands, spectacular sea cliffs, and shoreline platforms.

The geology of Shark Bay is dominated by Pleistocene and Holocene calcareous deposits with minor outcrops of Cretaceous carbonates. Pleistocene limestones comprise the Tamala Limestone and Peron Sandstone, both of which are eolianites, and a few lesser marine units. The Tamala Limestone is thought to have been deposited ~ 250,000 BP (MIS 8). There is a spirited and scholarly discussion in the book whether this windblown shoreline carbonate was formed during glacial highstands or lowstands. The Peron Sandstone is a calcareous sandstone the origin of which is again the topic of vigorous debate: is it derived from extensive weathering of the Tamala Limestone or is it a wind-blown deposit?

The Holocene is equally as fascinating, comprising tsunami deposits, coquinas and, of course, stromatolites. For me perhaps the most fascinating deposits were the enormous blocks of calcrete that were torn from sea cliffs by interpreted mega-tsunamis and thrown up to 400m inland as much as 15m above sea level. Storm deposition is also invoked for the impressive shoreline beach-ridge coquinas and mounds. These shelly carbonates are composed almost entirely of the small bivalve *Fragum erugatum* that can exist in these hypersaline and oligotrophic environments because it is a mixotroph that harbors photosymbionts. The deposits are commonly cyclic and thought to be accumulations swept onland during intense tropical cyclones.

The iconic stromatolites (p. 70) are described in detail integrating both past and ongoing research. The history of interpretation is particularly fascinating with the intertidal versus intertidal and

subtidal schools of thought that are discussed. The structures are amazingly illustrated in no less than 126 images. Every geologist must read this section.

The geology section is completed with short descriptions of the geological structure and economic deposits, the latter mostly solar salt, gypsum, and possible mineral sands.

Upon reflection, this book is an excellent and up-to-date reference work and should be placed on the book shelf of every geologist interested in carbonate sedimentology and the interpretation of the geological record dominated by microbialites. I also recommend it as a fascinating comment on the evolution of scientific thought about these deposits. The volume is beautifully laid out, scholarly, free of serious errors, and easy to read. There are perhaps too many illustrations. Otherwise it is just what is needed to place this fascinating region in its geological context.

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