

Reefs and Related Carbonates— Ecology and Sedimentology

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Volume 5, numéro 2, june 1978

URI : https://id.erudit.org/iderudit/geocan5_2br11

[Aller au sommaire du numéro](#)

Éditeur(s)

The Geological Association of Canada

ISSN

0315-0941 (imprimé)

1911-4850 (numérique)

[Découvrir la revue](#)

Citer ce compte rendu

Davies, G. R. (1978). Compte rendu de [Reefs and Related Carbonates— Ecology and Sedimentology]. *Geoscience Canada*, 5(2), 95–95.

Reefs and Related Carbonates—Ecology and Sedimentology

Edited by Lawrence A. Hardie
Johns Hopkins University Press,
Baltimore
Studies in Geology No. 22,
202 pages, 1977.
 \$22.50

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Hardie and his co-authors have produced the new standard reference work on sedimentation of the Andros tidal flats and have done it in a well illustrated, finely constructed book that is not overpriced. This book may be placed alongside the two AAPG Memoir volumes on Shark Bay and in the Springer-Verlag volume on the Persian Gulf to provide an invaluable reference set on modern peritidal carbonate environments and processes.

This volume is the product of a long period of activity by faculty and students of The John Hopkins University. Contributors to the volume in addition to Lawrence Hardie (editor and principal contributor) are Owen Bricker, Peter Garrett, Robert Ginsburg, and Harold Wanless. The main papers or chapters in the book deal with the "Exposure Index" method of defining position within the tidal zone (all authors), an environmental summary (Hardie and Garrett), a paper on the origin and significance of lamination and bedding (Hardie and Ginsburg), a paper on biological communities and their sedimentary record (Garrett) and a paper on the morphology and significance of algal structures in cemented crusts (Hardie). A summary paper by Hardie synthesizes the principal features of the Andros rainy, low-energy tropical tidal flat in a manner that allows easier comparison with the more arid tidal flats of the Persian Gulf and Shark Bay. Finally, two short papers or notes comment on some of the implications that arise from the preceding papers.

Although the tidal flats of northwestern Andros Island have been the inspiration for a great volume of published papers dating back at least to the early 1930s, it is gratifying to have the physiographic, climatic, biological and physical sedimentary framework of the area synthesized in one book. A number of years ago, when finally I set foot on the famous Andros tidal flats with the skilled guidance of Bob Ginsburg, I was somewhat disappointed initially to find that the area was not as varied environmentally or as spectacular visually as Shark Bay or some other modern carbonate terrains. The lesson to be learnt, however, is that only by careful and prolonged observation, measurement and sampling of modern environments, particularly environments subject to physical extremes, may we begin to understand these environments and to separate real from hypothetical or imagined processes. One of the most significant contributions in the book is the result of this type of prolonged analysis – the paper by Hardie and Ginsburg on the origin and significance of lamination and thin bedding. The principal conclusion of this paper is that most of the laminae and thin beds within the tidal sediment package are the result of storms or hurricanes – that is, they are the result of abnormal events. Much of the sedimentologic and stratigraphic record may be the result of such abnormal processes.

The "Exposure Index" method of defining spatial and physical position on a tidal flat has been presented in abbreviated form earlier, but is documented more fully in this book. It provides a more quantitative basis for the analysis of the tidal flat sedimentary record, and in turn allows a more rigorous comparison between tidal deposits in different physical-climatic settings. Its practical application to the geologic record is dependent totally on the definition and recognition of sedimentary and biologic structures that may be tied back to modern analogs that in turn are diagnostic of specific ranges of exposure indices.

In summary, this is a valuable and useful book for the sedimentologist working with either modern or ancient sediments and rocks, and one that, unlike some books in related subjects by other publishers, is priced reasonably.

MS received January 23, 1978

Sedimentation on the Modern Carbonate Tidal Flats of Northwest Andros Island, Bahamas

Edited by S. H. Frost, M. P. Weiss and J. B. Saunders
Studies in Geology, No. 4,
American Association of Petroleum
Geologists, 421 p., 1977.
 AAPG and SEPM members U.S. \$19.00,
 others U.S. \$24.00

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This book, which deals with the ecology and sedimentology of reef environments, represents an excellent addition to the "Studies in Geology" series published by the AAPG. Twenty-eight papers are included, grouped into three broad categories: Modern and Ancient Reefs (9 papers); Reef Biota (13 papers); and Sediments and Diagenesis (6 papers). The majority of the papers were first presented at the symposium on "Caribbean Reef Systems: Holocene and Ancient" held as part of the 7th Caribbean Geological Conference on Guadeloupe in 1974. A few of the contributions however are from an AAPG-sponsored Research Conference held at the West Indies Laboratory on St. Croix in the same year.

The first group of papers, on modern and ancient reefs, provides an overview of the broader aspects of reef ecosystems and associated sedimentary processes. It is evident that although reefs from different areas are grossly similar, in detail they are by no means mirror images of each other. Significant variations are produced by differences in the marine environment itself, by variable response to past, rather catastrophic events such as storms, partial exposure, or man-induced stress, and by fundamental contrasts in the nature of antecedent topography and substrate type. Both broad overviews and more specific studies are presented, the latter drawn from areas such as the Netherlands Antilles, Puerto Rico, Belize, and Venezuela.