

# Caledonian-Appalachian Orogen of the North Atlantic Region

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science and engineering context. It emphasizes the mathematical and theoretical aspects of the discipline, makes liberal use of dimensional analysis, and poses a number of unanswered questions. It tends to lack the polish, editorial finesse and perhaps the organization of a regular textbook (which it doesn't pretend to be), but it gets the message across with incisive clarity and achieves its goals admirably. It is a very worthwhile publication and no one could deny that the price is right!

MS received January 16, 1979.

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### **Coastal Sedimentary Environments**

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Edited by Richard A. Davis, Jr.  
*Springer-Verlag, New York, 420 p., 1978*  
US \$19.80

Reviewed by Robert W. Dalrymple  
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*Brock University*  
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The purpose of this book is to provide a comprehensive introduction to modern coastal environments and the processes operating within them. Because of the complexity of the coastal zone, a rather unusual, multi-authored approach has been adopted, with each chapter written by an individual (or individuals) who is a specialist in the particular field under discussion. Each chapter is intended to stand on its own, and contains a wealth of information concerning the morphology, sediment characteristics, and processes active within the various environments. Unfortunately, however, there is little cross-referencing between chapters, and the editorial pen apparently has not been wielded with consistent vigor. Consequently, the book is rather disjointed and uneven: a problem which is particularly serious in a text intended for advanced undergraduates and graduate students.

The selection of environments covered in the book is broad, but not entirely complete. Intertidal sand and mud flats, macrotidal or high-energy estuaries, rocky coasts, and back-barrier lagoons are not considered, and barrier islands as a whole receive only passing attention. Among the environments that are

considered, coverage is for the most part neither comprehensive (in terms of tectonic or climatic variability), nor uniform. The two environments which have been most thoroughly studied and documented, namely deltas and beaches, receive relatively short (but adequate) treatment in this book, in chapters by L.D. Wright and R.A. Davis, Jr., respectively. Considerable literature is also available on low-energy (muddy) estuaries, but this environment is covered in the shortest and weakest of the environmental chapters (R.B. Biggs). In contrast, the less widely documented environments, salt marshes (R.W. Frey and P.B. Basan), coastal dunes (V. Goldsmith), and tidal inlets (J.C. Boothroyd), receive more extensive discussion. Indeed, the marsh and dune chapters may well be the best available summaries in the geological literature, and the chapter on marshes is the best in the book, in this reviewer's opinion.

The two final, short chapters do not add greatly to the book. Chapter 7 (J.C. Kraft), investigates transgressive and regressive coastal sequences, particularly for barrier islands, in a rather philosophical and generalized fashion, without reference to facies or to the preceding environmental chapters. Chapter 8 (W.T. Fox) discusses several numerical modeling techniques that have been used to describe coastal zone morphology and processes. The coverage is non-mathematical and easily read, but is non-critical and seems out of place.

Throughout the book, there is a tendency for a multitude of observations from various sources to be listed without synthesis or comment. The result will undoubtedly be confusing to students without previous background. In addition, the detailed process descriptions are not linked sufficiently closely to the observed sediments. Thus, the book has limited direct applicability in the interpretation of ancient rocks.

On a more technical level, the book suffers badly from poor-quality figures. Many of the line and half-tone diagrams taken from other sources have not reproduced well, particularly in the chapter on tidal inlets, and some are almost impossible to decipher. Presumably this is the price we must pay for the low cost of the book. Typographical and other errors are also more abundant than one would wish, notably in the dune

and tidal inlet chapters.

Despite its failings, this book does provide a worthwhile summary of coastal processes, and will be of some value of those actively working in either the marine or lacustrine coastal zone. However, most geoscientists can be forgiven for passing the book up.

MS received February 23, 1979.

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### **Caledonian-Appalachian Orogen of the North Atlantic Region**

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Edited by E.T. Tozer and P.E. Schenk  
*Geological Survey of Canada,*  
*Paper 78-13, 1978, 242 p.*  
\$5.00

Reviewed by M.J. Kennedy  
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This volume is a collection of syntheses of parts of the Appalachian-Caledonian Orogen extending from the southern Appalachians of the USA to Svalbard. It includes syntheses of Morocco, West Africa, the Iberian Peninsula, France, Corsica and Sardinia as well as the main parts of the orogen that extend through eastern North America and northwestern Europe to eastern Greenland and Svalbard. The syntheses were presented in preliminary form at the Second International Working Group Meeting of IGCP Project 27 in late 1976 in Nova Scotia.

The styles of presentation are varied but the volume is intended to provide a brief overview of Caledonian geology in the Atlantic region. Whereas this aim is achieved in general, particular parts of the orogen are treated in a way that will confuse the general reader. A section comparing and interrelating the different segments would have been most useful to the non-specialist in this field of geology. Several articles lack structural cross-sections or tables of depositional and diastrophic development which would have helped the general reader.

The contributions on the Scandinavian Caledonides are particularly useful since they are preceded by a brief article by B.A. Sturt. The Caledonides of Britain are treated in a similar way but the

individual papers contain less synthesis and some concentrate discussions of current problems within this sector of the orogen rather than presenting the reader with a description of the orogen itself. The Irish Caledonides are treated by a zonal scheme which is correlated with similar zones in the Canadian Appalachians and in this sense provide a linkage between the ends of the orogen that are now separated by the Atlantic Ocean. The Canadian Appalachians are discussed in considerable detail by P.E. Schenk and although diagrams are provided that infer correlations with the British Isles, the subject is not pursued in the text, although linkages with continental Europe and North Africa are. Short summaries of the East Greenland Caledonides and Svalbard provide useful information on these geographically separated segments of the orogen. The New England Appalachians reviewed by P.H. Osberg and the southern and central Appalachians reviewed by R.D. Hatcher are both useful summaries and contain new information and interpretations.

The final part of this volume contains four syntheses on Caledonian (including Variscan) orogenic activity in France, southeast France, including Corsica and Sardinia, the Iberian Peninsula, Morocco and east Africa. All these articles are in French and they provide most helpful summaries of recent advances in these regions. It is now apparent that early Paleozoic and mid-Paleozoic orogenic activity in these areas is far more widespread than has been traditionally recognised. Definition of the southeast margin of the Caledonian belt remains difficult to define, partly because of extensive Variscan movements. It is clearly very different from the northwest margin present in Europe and North America. This publication is excellent value and will provide a useful overview for the non-specialist who already has some background knowledge of parts of the orogen. Most of the contents have been published elsewhere, but the specialist will find some new data and interpretations and the bibliographies will provide sources of more detailed information.

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