

cists, and petrologists. The result, not surprisingly, is a voluminous literature of extraordinary diversity. This literature includes far-ranging new discoveries, some of dramatic significance, others important only insofar as they provide a data base for new hypotheses. It lays some old superstitions, but replaces some of these with new ones. It represents, withal, a vast extension of our insights into and understanding of the complexities of the natural occurrences of this seemingly simple group of minerals. Milliman has attacked this literary morass with courage and vigor and produced an exceptional book that goes far beyond his stated objective, "to synthesize our present-day knowledge about calcium carbonate in the marine environment."

The book does provide such a synthesis, one that is concise, readable, accurate, and unusually complete. It is also an illustrated manual for the sedimentary petrographer and a critical, annotated bibliography of approximately 1300 primary references. It serves as an index to the carbonate literature, affording multiple access paths, abundant internal cross-references, and a highly flexible organization.

Milliman has maintained commendable objectivity throughout the book. Although his treatment of certain controversial matters clearly reflects his own interpretations, the discussions and choice of references are evenhanded and balanced. Indeed, Milliman might be criticized (mildly) for being unduly tolerant of some hypotheses that seem best consigned to the dustbin of geological mythology. Beneath the scholarly and impartial narrative, a careful reader will detect the whisper of scientific controversy, the shadow of unfulfilled investigative promise, and occasional bits of whimsy. But these are sidelights in what is first and foremost an encyclopedic synthesis of recent advances in the field.

Milliman does not deal with one major subject of recent study, the physiology of organic calcification, but he treats virtually every other aspect of carbonate deposition and diagenesis in the marine ambient. Some readers may find the opening chapter on carbonate chemistry and mineralogy disappointingly brief, but much of the material that has been omitted here will be found in later sections of the book dealing with the particular subjects to which it is most relevant (diagenesis, cementation, dolomitization).

Carbonate mineralogy is also specifically developed in a book that must stand as a companion volume, F. Lippmann's *Sedimentary Carbonates* (Springer-Verlag, 1973), which is too recent to appear in the bibliography.

It is regrettable that numerous typographical errors have escaped the proofreader's eye, many of them in the bibliographic entries; none of these, however, appears to be of more than irritational significance. The book will prove invaluable to students and investigators in a wide range of fields. It will be, I believe, the definitive source book on marine carbonates in the late 20th century, complementing and extending earlier definitive works by Schmidt and Cayeux.

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