

the first time. Wasson's classification system synthesizes schemes derived from studies of chondrites, irons, carbonaceous chondrites and achondrites, and may perhaps help us better to understand the complex interrelations between the various meteorite classes. The last 150 pages of the text consist of lists of classified meteorites, allowing one quickly to identify the class of most recognized meteorites.

The most disappointing chapter is that devoted to mineralogy, hardly more than an incomplete listing of minerals found in meteorites, while the chapter on petrology of chondrites and other silicate-rich meteorites fares only slightly better. Considering the enormous advances in these fields since Mason's 1962 text, it is unfortunate that we have here only a compact outline of such a rich area of investigation. However, Wasson again presents abundant, annotated references that should permit the interested reader to pursue these topics in greater depth. Overall, this book is an essential text to anyone involved in meteoritics, and a superb reference text for the interested outsider.

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Geology and Paleontology of Southeast Asia (Volume 13)

Edited by T. Kobayashi and
R. Toriyama
University of Tokyo Press, 183 p., 1974.
\$36.00
(Distributed by International Scholarly
Book Services, Inc., Oregon).

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This volume is part of a major pioneering work on a much neglected region. The work is of great importance and interest to paleontologists in general and to geologists working in the area.

The major geological reconnaissance survey of Thailand, Vietnam, Singapore, Malaysia (Malaya), Philippines, parts of Indonesia (Borneo), and Taiwan was begun in 1962 as part of the Columbo Plan for Southeast Asia. The work has been carried out jointly by the respective national geological surveys and Japanese geologists who were sponsored by the Overseas Technical Cooperation Agency, Tokyo. The continuing series of publications to date includes 13 volumes with 135 separate contributions (total of 3047 pages, 395 plates), all in well-edited English and almost exclusively written by Japanese authors. Most of the articles (118) deal with paleontology and are found under the subheading "Contributions to the Geology and Paleontology of Southeast Asia", while 17 papers deal with structural geology, sedimentology, stratigraphy, petrology and isotope geology.

The first two volumes (1964, 1966) are, in fact, only compilations or a series of "instant reprints" of articles published no more than a year earlier in several other Japanese journals, some well-known as the Japanese Journal of Geology and Geography, others rarely available in our libraries, e.g., Memoir of the Majiro Gokuen Woman's Junior College. T. Kobayashi alone is responsible for the first volume, with R. Toriyama joining him from the second volume onward. The

papers are well introduced and illustrated, with particular attention given to the photogravure plates which are of good to excellent quality. Thus, reprinting the articles has certainly proven valuable to the non-Japanese reader because of their immediate availability.

Beginning with volume 3 (1966), all articles are original. The reproduction of the photographic plates is done by the more economic halftone screen technique; they are satisfactory in volume 3 and good to excellent in all later volumes. My only substantial criticism of the otherwise well edited series is the general lack of abstracts or brief summaries and the absence in several titles of higher-level chronostratigraphic and taxonomic names, posing difficulties to the reader not familiar with the local geology or particular taxon.

According to taxon, period and country, the number of paleontological articles (v. 1-13) mainly dealing with these subjects is as follows:

Algae: 3 Paleoz.-Mesoz. of Thailand; 1 Paleoz. and 3 Cenoz. of Philippines.

Higher Plants: 4 Paleoz., 4 Mesoz. and 3 Cenoz. of Thailand; 4 Paleoz. and 3 Mesoz. of Malaya.

Larger Foraminifera: 7 Paleoz. of Thailand; 1 Paleoz. and 3 Cenoz. of Philippines.

Other Foraminifera: Cenoz.: 1 Borneo and 1 Philippines.

Porifera: 1 Mesoz. of Malaya.

Coelenterata: 1 Paleoz. of Malaya.

Bryozoa: Paleoz.: 3 Malaya, 10 Thailand

Mollusca: Mesoz.: 6 Thailand, 4 Malaya; 3 Vietnam, 1 Philippines, 1 Singapore, 1 Borneo; Cenoz.: 2 Philippines, 2 Taiwan; Recent: 2 Thailand.

Brachiopoda: Paleoz.: 7 Thailand, 4 Malaya.

Arthropoda: Paleoz.: 6 Malaya, 1 Thailand; Mesoz.: 1 Borneo; Cenoz.: 1 Thailand.

Graptoloidea: 1 Thailand.

Conodonts: Paleoz.: 1 Thailand, 4 Malaya; Mesoz.: 2 Malaya.

Pisces: Cenoz.: 1 Thailand.

In summary, this large series still in progress is a most welcome and significant source of information for any paleontologist with interest in the subcontinent of Southeast Asia, which hitherto was so little known that much of the data presented here is new. Because of its geographical position, the area is also of special interest to paleobiogeographers with reference to the theory of plate tectonics. We ought to be particularly grateful to our Japanese colleagues for the consistently clear and comprehensible style. The series is in fact essential to any research library, but unfortunately, because of its substantial price, out of reach to most paleontologists.

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Reefs in Time and Space

Edited by Leo L. Laporte
*Society of Economic Paleontologists
 and Mineralogists, Special Publication
 18, 256 p., 1974.*
 SEPM and AAPG Members \$10.00,
 Others \$12.00.

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Some geologists might ask — What! another book on Reefs and Carbonates? But this reflects the large amount of research effort in this field, touched off by the discovery since the 1940s of petroleum deposits in carbonate buildups of Alberta and elsewhere. This publication, unfortunately delayed, results from a symposium entitled "Reef Complexes in Time and Space", organized by the Research Committee of the SEPM and held in Calgary, June 1970, at the annual meeting of the SEPM and AAPG.

So what is new? The book includes seven papers on wide ranging topics. The first three papers are concerned with Pleistocene events such as glacial sea level lowering, erosion and karst solution determining present-day reef configurations. A. L. Bloom's short paper discusses the "Geomorphology of Reef Complexes". He concludes that the concept of reefs as relict from a ten-foot stand of the sea a few thousand years ago needs to be carefully reexamined; rather reefs show every indication of being in dynamic equilibrium with the forces that now act on them.

E. G. Purdy's rather long paper on "Reef Configurations: Cause and Effect" is an examination of modern reefs, especially the extensive barrier reef and patch reefs of British Honduras. Purdy concludes that "many, if not most, of the shape attributes of modern reefs are fundamentally karst-induced rather than growth-induced". Acid solution experiments with limestone blocks indicates that meteoric water differentially lowers the central area and results in a partially or completely rimmed solution basin. A rise of sea

level permits coral colonization of the solution rim and any other topographic prominences. Atolls, barrier reefs and lagoon patch-reefs are related to a residual topography not a prior history of reef development. Can we find ancient reefs in the geologic column whose basic configurations are karst-induced?

Goreau and Land's paper on "Fore-reef Morphology and Depositional Processes, North Jamaica" is the first comprehensive paper to outline the characteristics of fore-reef and underlying fore-reef slope of a modern coral reef. A pronounced steep dropoff occurs between 55 and 65 metres below sea level. The authors conclude that these large scale geomorphic features are Pleistocene terraces mantled by recent reef growth. Rapid Holocene submarine lithification by Mg-calcite is widespread forming vertical to overhanging precipices. Abundant coarse blocks as well as fine sediment apparently creep slowly down the slope. When this work was carried out few divers and even fewer geologists had been down to depths of 100 metres. More recently geologists have used small submersibles not only in this area but also off British Honduras and Florida reefs.

P. H. Heckel provides an excellent summary of "Carbonate Buildups in the Geologic Record: a review". What in the world is a carbonate buildup? It is a general term to designate any "circumscribed body of carbonate rock which displays topographic relief above equivalent sediment and differs from typically thinner equivalent deposits and surrounding and overlying rocks". Heckel redefines reefs as a particular kind of buildup which displays evidence or potential for maintaining growth in the zone of waves. Heckel briefly summarizes possible modes of origin, and carbonate buildups in the geologic record from the Precambrian to Holocene. In addition he reviews the roles of skeletal contributors and nontaxonomic factors in these buildups. He concludes his paper with a general model for organic buildup formation and nine pages of references, including some 1973 references.

Wolfgang Krebs' paper "Devonian Carbonate Complexes of Central Europe" summarizes the data