

Book Reviews

Principles of Paleocology. D. V. AGER. McGraw-Hill, New York, N.Y., 1963, 371 pp., 86s.

“Unfortunately a dichotomy has developed in paleontology, with the morphological systematists on one branch and the ecologists on the other. The former commonly regard the latter as impractical theorizers who are unable or unwilling to read the vast mountain of relevant literature, while the latter commonly regard the systematists as hopelessly old-fashioned museum paleontologists, who only think of fossils as specimens in drawers. In my opinion a training period of purely morphological work is essential to every paleontologist, but there is no need for this to have a fossilizing effect on the student of fossils. If paleontology is to progress beyond the level of stamp collecting, we must consider fossils as living organisms. The museum and the library are excellent places to study paleontology, but so are the laboratory, the cliff, and the quarry—and so, it may be added, is the whole world of living nature.”

These words, taken from the preface of Ager’s book, are most wholeheartedly underlined by the reviewer and, therefore, appear at the beginning of this book review.

The present increase in paleoecological literature is evidence that a growing number of paleontologists and geologists thinks and works along these lines. In the field of books alone the last decade has brought us the Russian book by R. F. Gekker, *Introduction to Paleocology* (1957; now also available in French and English editions), the two-volume *Treatise on Marine Ecology and Paleocology* of the Geological Society of America (1957), W. Schäfer’s *Aktuo-Paläontologie* (1962), *Approaches to Paleocology*, edited by J. Imbrie and N. D. Newell (1964) and *Principles of Paleocology*, reviewed hereunder and written by Dr. D. V. Ager, Reader in Geology at the Imperial College of Science and Technology, University of London, and undoubtedly already known to many of the readers of this journal through his publications, especially those concerning brachiopod paleocology.

This book consists of three parts. Of these, part one is the shortest and of an introductory nature. Part two deals with the environment of life of individuals or small taxonomic units. This is the paleontological equivalent of autecology or ecology in its original, restricted sense, called by Ager paleoautecology. Part three is devoted to the ecology of life assemblages as a whole, or synecology, with paleo-synecology as the corresponding paleontological term. Many geo-scientists will consider that this is true paleocology. Chapters are devoted to a comparison of fossil assemblages with recent ones, to other geological evidence, density and

diversity, relationships between species (antagonism, symbiosis, toleration), lateral and vertical changes in assemblages (ecological and stratigraphical zones), geographical distribution of assemblages and the paleoecological syntheses. At the end of the book is a four-page glossary of the most important paleoecological terms, a practical field questionnaire, comprising 46 questions which should be answered, as far as possible, for each separate rock nodule, a bibliography listing 525 publications, and a well-compiled 25-page index.

Before anything else, it should be said that author, publisher and the whole geological world should be congratulated with the appearance of this important book. Its reading can be warmly recommended to all geologists, but especially to those who need to be informed about modern views and approaches in stratigraphy and paleontology.

Ager begins both the part on paleoautecology and that on paleosynecology with emphasis on the importance of uniformitarianism and of interpreting the past in the light of the present. He is indeed wise in doing so. But, while using data from the present-day, one should remain an independent observer of nature, always carefully investigating whether in fact data obtained through studying living organisms and communities can be applied simply to the fossil situation with which one is faced. For instance, it cannot be denied that, during the Paleozoic the stalked crinoids, now confined to deeper water, thrived abundantly in very shallow water, commonly associated with biohermal structures.

While reviewing books covering the entire field of a rapidly developing scientific discipline, it is not difficult to denote certain subjects about which one should have liked to have read more. Thus, although coral paleoecology is rather well-covered, somewhat more attention could have been given to the influence which environment exerts and, in the past, has always exerted on the growth form of both solitary corals and coral colonies.

More serious, however, but likewise inevitably connected with books giving a summarizing review of the status of knowledge in a large field, is that the author, in some respects rather the compiler, of such a book has to a greater or lesser extent to work from literature alone, rather than on the basis of his own research, observation and experience. Consequently, such an author is not always able to produce a critical attitude to each one of his sources of information. This may lead to the unannotated repetition in these books of simplifications or disputable conclusions, as were presented by the original authors.

On pp.85–87 mention is made of Crosfield and Johnston's observation that in the small Wenlock reefs in England 87.5–97.5% of the coral and stromatoporoid colonies is found upright, against only 7.5–30% in the inter-reef facies. Ager notes that the number of observations (four reef localities together with 160 colonies and four inter-reef localities together with 139 colonies) should preferably have been higher to reduce the subjectivity of such observations and, at the same time, points out that on a current-swept floor a colony will tend to come to rest in the position

of greatest stability which, in several instances, will be an upright position. Nevertheless, the fact that such a great difference in percentages is found between the reef and inter-reef facies, strengthens the opinion that the figures of Crosfield and Johnston are, in principal, useful as a distinguishing criterion. What one should have liked to have seen mentioned in this connection, is that, when such a comparison of percentages of corals and stromatoporoids in position of growth is made, it is only justified if carried out separately for each particular stratigraphic zone. Observations in Gotland have revealed that, between reefs belonging to different zones, significant differences in percentages of upright coral colonies occur, probably as a result of differences in the water depth. In reefs, comparable to those in the English Wenlock, around 81% of the coral colonies is found in position of growth, this percentage decreasing to only 46–58 for reefs formed in relatively very shallow water.

On pp.284–285 Lecompte's almost classical description of the faunal succession in the Frasnian reefs of Belgium is presented, together with Lecompte's interpretation that progressive subsidence was the controlling factor of the faunal changes, the most notable of which is the absence of stromatoporoids beneath the zone of turbulence. In his papers of 1956 and 1958, Lecompte did indeed defend the opinion that corals and stromatoporoids could co-exist in the zone of turbulence; that corals could attain great size there, but also that they greatly suffered in competition with the stromatoporoids, which organisms dominate in the reef parts formed in this zone; beneath the zone of turbulence, according to his view, corals were only capable of building reefs, not because they thrived best there but on the contrary because there they did not have to compete with the stromatoporoids.

Lecompte's opinion that the waning in importance of the stromatoporoids is caused by an increase in depth is, however, open to serious criticism. Lecompte's own publications (in the French language, with the exception of one not referred to by Ager) already indicate that another factor was of great influence over the development of the stromatoporoids, viz. mud-tolerance. LECOMPTE (1951, p.53) described how stromatoporoids are abundant in limestones, seldom in shales, and are apparently more effected by mud than the corals. The observation that stromatoporoids are intolerant of mud was repeated in 1956 (p.23). In the Niagara of Illinois, stromatoporoids also decrease in importance as reef builders in the direction of increase of the muddy impurities (LOWENSTAM, 1950, p.483), that is from the clastic-free belt, across the low-clastic belt to only a subordinate contribution at the southern border of this belt. Therefore, it is much more likely that the degree of muddiness and not the depth has been the fundamental determining factor in the occurrence of stromatoporoids. Increase in muddiness, leading to a waning in dominance of the stromatoporoids, may be correlated with increase in depth, but not necessarily. The English Wenlock presents mud but should, nevertheless, be considered a shallow-water deposit.

It is certainly not the intention of the reviewer to assail—with these remarks—the great value of Ager's well-written book. The examples show, as previously stated, that review books of this nature at present contain parts which are based only on literature studies, with the inherent risk that oversimplifications and misinterpretations find their way more easily into these books than previously and through them may obtain wide distribution and long life. Consequently, geologists should be increasingly critical in accepting statements found in literature before applying them to their own observations; and teachers of geology will do well if they thoroughly stimulate the development of a critical attitude with their students.

Another aspect which seems to go together with the rapid expansion of a particular scientific field is to restrict reading of professional literature to that which is easiest accessible rather than that which is most important. Consequently, one finds that a growing number of English-speaking scientific authors have a tendency to read, almost exclusively, publications in their own language. Although not as striking as with several other authors, this tendency can also be found with Ager. Just over 80% of the publications listed in the bibliography of the book under review were issued in the English language. This shows how the author has, to a major extent, based his book on English paleoecological literature; 11% of the publications listed are in German, one-third of which are papers by H. Richter; publications in French comprise just over 4% of the list; and all other languages make up the remainder (about 4%) of which Russian publications constitute approximately half.

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Problems in Palaeoclimatology. A. E. M. NAIRN (Editor). Interscience, New York, N.Y., 1963, 705 pp., £ 7.7.0.

This book, containing the proceedings of the NATO Palaeoclimates Institute held at the University of Newcastle upon Tyne, January 7–12, 1963, comprises no less than 54 contributions, divided over thirteen chapters. The nature of the papers varies from strictly local studies to studies of world-wide interest. It will be clear that only a—naturally subjective—selection from the contents of the volume can be mentioned here.