

## REVIEWS

H. H. READ & JANET WATSON: Beginning geology. London: Macmillan and Allen & Unwin 30s.

In the writing of an introductory text to our science, a number of very considerable problems have to be faced. The dimensions of the subject render difficult its compression into a small compass, so that it is difficult to attain a balanced treatment. The terminology, even at its most basic level, is unfamiliar to most readers; each term must be defined before it is employed. Illustration must be both good and full; descriptions, however accurate, never have the impact of a good photograph or drawing. Finally, the authors must have a thorough command, not just of clear expression, but also of layout and paragraphing, in order to facilitate both reading and learning.

In most of these regards, "Beginning Geology" is admirable. The presentation is attractive and the illustration excellent, consisting of well-chosen photographs, plus clear line-diagrams and maps. No term, however basic, is used unless it has been defined: examples are given wherever possible and are often imaginatively chosen. In all, this is a most attractive work and will be of considerable assistance to the beginner in geology.

A dust-jacket note suggests that the book has been designed for G.C.E. "O" and "A" level geology students and it is probable that syllabuses have been very much borne in mind in planning the work. This may well account for certain inequalities in treatment. Palaeontology is compressed into 22 pages, an unenviable task: it is hardly surprising that this section is indigestible and that the definition of major groups is often very vague. Trace-fossils earn only the sketchiest of treatments; and little mention is made of sedimentary structures. Almost nothing is said about the origins of the Earth or about meteorites, these topics perhaps being considered to lie rather in the province of the astronomer or physicist. The origins of glaciations and the phenomenon of polar wandering are not discussed; and continental drift is treated very cursorily - the authors probably decided that these topics were inappropriate to an elementary text such as this.

In general, the illustrations are adequately labelled, but in a number of cases, locality and stratal names are not given (e.g. Figure 15.1) or given so imprecisely as to be unhelpful (e.g. 6-2 "Potholes in an African river"). This reduces their interest somewhat. Still, it is refreshing, after the recent flood of American textbooks, to have one illustrated primarily by British examples!

In general, however, Professor Read and Dr. Watson merit the highest praise: there is no question that this is the most attractive and best balanced elementary text on geology currently available. It can be thoroughly recommended to anyone wishing to acquire a sound grounding in our science.

WILLIAM A. S. SARJEANT

"The Amateur Geologist" Vol. 1, Part 1. Summer 1966. Liverpool Geological Society and the Manchester Geological Association. 2s. 6d.

The many amateurs who find in geology an absorbing hobby soon become aware that, while the science is fairly well served by a number of journals, none of these publications (at least in Britain) exists specifically to serve their needs. Some journals do try to cater for the amateur, but not exclusively, and those that do are of a regional or local character rather than national.

An attempt to fill this very real gap in geological literature has recently been taken by the Liverpool Geological Society and the Manchester Geological Association, who have jointly sponsored a

new journal which has been simply titled "The Amateur Geologist." Produced by a duplicating process and without illustration, other than a handful of maps, the journal is priced at the modest sum of 2/6d.

The two editors, Ian M. Wild and Anthony Green, in their first editorial state the reason behind the journal's publication as stemming from the growing conviction on the part of the sponsoring bodies that the "interests and enthusiasm of their non-professional members should be stimulated and channelled by a journal couched in terms they can readily comprehend." "The Amateur Geologist" is thus aimed from the start at the amateur who has made geology his hobby; at the same time the new journal also, as its editors indicate, seeks to help students at colleges and universities who are not advanced enough to have graduated to professional journals, and teachers and pupils in secondary schools, where, remark the editors, "Geology is slowly gaining favour as a curriculum subject."

Few there are who would object to the sentiments quoted above: however, the editorial then introduces a somewhat jarring note by stating that it is the intention of the journal to direct attention to the "wealth of geological interest in the North-West." Such a bias can only harm a journal seeking to aid the amateur, in that this regionalism will tend to rob it of the truly national stature implied in the title. The regionalism is reflected all too clearly in the first issue, which (apart from the editorial, a feature on the activities of other societies, and a paper on the Wrens Nest National Nature Reserve) is confined to papers on the geology of the area within easy reach of Liverpool. A point coming to mind here is that, while the papers published in "The Amateur Geologist" are geared to the level of the rather raw amateur, it should also be borne in mind by the professional geologists who write some of them that it is no use writing articles at that level and then giving references to other papers which, if consulted by the amateur, are likely to confuse because their "concepts and terminology" are "beyond the comprehension of the amateur" (to quote from the Editorial).

The new journal is a worthwhile venture and worthy of support, but certainly has its limitations, the most obvious being the total lack of illustrations and its pronounced regionalism. If it can remedy the former and escape the latter, "The Amateur Geologist" could establish itself as a journal of national importance - a medium through which amateurs might not only learn but would be able to publish the results of their own research. Some of these could be of great value, but are lost because amateurs do not consider themselves as worthy of approaching established journals, mainly with professional geologists as their readership. A good start has been made; time will show whether or not the impetus can be maintained and the limitations overcome.

ROBERT W. MORRELL

D.T. DONOVAN, 1966: Stratigraphy - an introduction to principles. London: T. Murby & Co., Allen & Unwin. 30s.

It is always a pleasure to find a book which fills a long awaited need in any subject. The need filled by this book was on the general principles of stratigraphy with special reference to British rocks. In recent years a number of books have appeared on stratigraphical principles, mainly from N. America, and examples naturally have been chosen from that continent. At last a book is available which gives many examples, not only of British stratigraphy but also of the work of British stratigraphers.

In this book reference is made to the great men of British Stratigraphy who laid the foundations for the subject, including Arkell, Buckman, de la Beche, Hutton, Lapworth, Lyell, Murchison, Sedgwick, Smith, Spath, Trueman, and Vaughan. A number of these spent a lifetime's work on Mesozoic rocks; it is therefore fitting that an expert on the Jurassic should write a book about the difficulties which befell the early stratigraphers and which have been discussed ever since.

It is also appropriate that this book appears at a time when many British stratigraphers are attempting to produce an ordered code of stratigraphy which can be applied throughout this country and perhaps further afield.

Donovan's book considers the necessity to establish a sequence and shows how this is built up from a number of local sections to generalized sections covering many square-miles. The essential use of fossils for correlations is quickly established and examples are given from the Chalk, Ordovician graptolite zones, and the Carboniferous Limestone, all referring to the British Isles. Examples from elsewhere refer to trilobites in the Cambrian and to Lower Jurassic and Cretaceous ammonites. The discussion of these examples leads on to a review of zones, considered a basic unit of classification, and the special requirements for zonal fossils. In addition to the well-known attributes of short vertical range and wide geographical extent, Donovan suggests (p. 53) that such fossils should be reasonably common and easily recognisable. This last point is certainly of importance to the stratigrapher, who must become increasingly more expert in identification. The stratigrapher despairs when palaeontologists alter existing classifications for esoteric reasons. The palaeontologist, for his part, distrusts identifications made by the stratigrapher, who may not be a specialist in the group with which he is dealing.

It is shown that zones are grouped together as stages. Stages are more easily correlated over wide areas (Continents). A table showing the correlation of the Cambrian of North America (fig. 12) is given; it is unfortunate that some of the lettering on this diagram is illegible.

A chapter is included on lithological correlation. Of particular interest here is the section on cyclothems or rhythmic sequences (p. 76). Correlation is possible using these rhythms, particularly within coalfield areas. However, the author mentions three methods of correlation (using goniatites, non-marine lamellibranchs and plants) which have been used in these rocks and which render lithological correlation an academic topic. It would have been more interesting to read about correlation in the Permian and Triassic formations of this country, where fossils are rare. (For instance, are the Bunter Pebble Beds of the East and West Midlands of the same age?) The use of the term Formation is advocated by the author as the other main basic unit of classification.

Readers are next treated to a discourse on radiometric dating, which attempts to give absolute dates to rocks. Despite the difficulties, calculation errors are now reduced to a low level. Even so, these can amount to many millions of years. Subdivision of geological time by fossils demands more precise results, as is pointed out by Professor Donovan (p. 96) and, to date, the use of sophisticated equipment has yet to make significant changes to the time divisions of the Phanerozoic (Cambrian - Recent). The absence of agreed major subdivisions of the Pre-Cambrian reflects the difficulties of radiometric dating in the absence of fossil control.

These three methods of subdivision, fossils, lithology and absolute time, give the basis for stratigraphical nomenclature and classification. They result in biostratigraphical, lithostratigraphical, and time terms. There is a need for co-ordination and hence the various commissions that have been set up in various countries, all to report to an International Commission. The background of this problem and the review of the present situation make fascinating reading. The Americans on the one hand require a three-fold system of classification, the Russians on the other, a single system. Perhaps the British can arbitrate, although the scheme proposed in Donovan's book (p. 157) is unlikely to find general acceptance without a struggle.

The book is completed by a study of system boundaries. Three are chosen for consideration, firstly the question of the Tremadoc, whether Ordovician or Cambrian; secondly the Silurian - Devonian boundary - no less than eight views are illustrated in fig. 34 (in this respect it is a pity that the Marloë's Bay, Pembrokeshire, section is relatively unfossiliferous); and thirdly the Triassic - Jurassic boundary.

The absence of agreement on these points (and at most of the other system boundaries) indicates how much work is still required from British stratigraphers.

The book is extremely well written and scores high for readability. It is to be hoped that we have more books by this author.

Considering the high quality of the manuscript, the publishers have not acted fairly by this author, by using out-of-date type and inferior paper and thus making the appearance of this book unattractive. (Comment has already been made concerning the reproduction of fig. 12). In view of this, the price of this book (199 pp., 36 text-figs., without half-tone plates) is high.

In spite of the above it is to be hoped that readers will persist, for it will be an extremely useful text for University students, teachers, research workers and the like.

F.M. TAYLOR