

exist in our knowledge of the habits of these curious creatures. The Koenike-Viets classification is adopted without comment, and three families are recognised—Halacaridæ, Limnocharidæ and Hygrobatidæ. Precedence is given to the Limnocharidæ, and about eighty species are dealt with in 126 pages of text, followed by twenty useful—if not sumptuous—plates.

Messrs. Soar and Williamson have begun their task well, and the monograph will be necessary to all interested in this rather isolated group. We confess to finding occasional obscurities of language. For example, "our observations on the hatching of *P. longipalpis* extended over seventeen days" (p. 24) appears from the context to mean that seventeen days was the incubation period; and what is the precise value of observations "stated to have been made by Piersig"? These, however, are small blemishes. We are grateful to the authors and to the Ray Society, which appears to be establishing a "corner" in Acarina. May we hope in due time for a reduction of the chaos which exists in the Gamasidæ and the Trombidiidæ? C. W.

*An Introduction to Palæontology.* By Dr. A. Morley Davies. Second impression. Pp. xiii + 414. (London: Thomas Murby and Co.; New York: D. Van Nostrand Co., 1925.)

WE welcome a second impression of the useful little introduction to the study of fossils by Dr. Morley Davies. It is, indeed, a most practical handbook both for the student of geology and the amateur collector, and is admirably designed to give an insight into the methods of palæontological science. It is not a systematic treatise on the various groups, but shows clearly how each is to be studied, and it provides a series of synoptical tables of classification which will suffice for those who are chiefly concerned with fossils as indicators of the age of rocks. There are also in the appendix synopses of the divisions of geological time and the stratigraphical distribution of fossils.

The second impression of the book differs little from the first, except that certain errors have been corrected. It still retains the birds curiously as an order of reptiles intercalated between the crocodiles and pterodactyls. There is also an oversight in describing insects in amber as preserved by the "antiseptic character" of this substance: they are never preserved—they have merely left cavities where they were originally embedded. The descriptions, though always concise and clear, are sometimes overburdened with technical terms which are liable to repel rather than attract the beginner and amateur. One, however, who has plodded through the book with actual specimens of the fossils referred to, will be amply equipped to use special treatises and proceed with independent research. A. S. W.

*Department of Scientific and Industrial Research: Radio Research Board. Special Report No. 3: Variations of Apparent Bearings of Radio Transmitting Stations. Part 2: Observations on Fixed Stations, March 1922–April 1924.* By Dr. R. L. Smith-Rose. Pp. viii + 107. (London: H.M. Stationery Office, 1925.) 4s. 6d. net.

THIS report discusses the progress of the investigation into the variations of the apparent bearings of radio transmitting stations from March 1922 to June 1923,

when the observations on the longer wave-lengths ranging from 2000 to 9000 metres were discontinued. Observations, however, made at Lerwick, Shetland Islands, from July 1923 to April 1924 are included.

Experiments on the shorter wave-lengths are to be published in Part 3.

The results with the longer wave-lengths prove that when the waves travelled overland, distances ranging from 30 to 200 miles, abnormally large variations were recorded during night time. For distances less than 30 miles, the majority of the direction finder readings had an inaccuracy of about 2°. When the path between the transmitting and observing station is entirely oversea, the errors in the observed bearing were found to lie within the 2° limit for distances up to 100 miles. For most navigational purposes this accuracy suffices. It was found that, within the limits of the experiments, no appreciable effect on the results could be attributed either to the wave-length or to the use of damped or undamped waves.

*The Elements of Internal-Combustion Engineering.* By Telford Petrie. Pp. xi + 236. (London: Longmans, Green and Co., 1925.) 10s. 6d. net.

AMONG the available text-books on the theory of the internal combustion engine, there are few which present a good account of the subject within a moderate compass and can be recommended to a student in his undergraduate course. This book would appear to satisfy this requirement and is a worthy contribution to the subject. The first three chapters give a brief historical sketch and a descriptive account of the cycles employed in the various types of gas and oil engines now in use, including the Still engine and the Humphrey gas pump. The next five chapters contain a good account of the thermodynamics of the subject, including a chapter on variable specific heats so far as they affect the transformations in an actual engine, the whole of which is well arranged and clearly written.

In the remaining chapters, such matters as the formation of combustible mixtures and temperature effects are dealt with. In the former case the account contains much useful information relating to combustion which should prove of considerable interest to designers as well as to students; in the latter, however, the treatment is necessarily rather superficial, as the various subjects which are included in it could scarcely be dealt with satisfactorily in the space allotted to them. A chapter on the possibilities of development and a collection of good examples conclude the book. E. H. L.

*Primer of Arithmetic for Middle Forms.* By F. M. Marzials and N. K. Barber. Pp. xii + 262. (London: Oxford University Press, 1925.) 3s. 6d. net.

THIS book is intended to follow a preliminary course up to compound rules, practice, and unitary method. It has many excellent features which make it worthy of consideration by all teachers, but a serious defect is the neglect to train pupils in estimating for themselves the degree of accuracy which may be expected of their results; they are invariably given the number of significant figures required in the answer. It is regrettable that the absurd questions on finding the cost to the nearest penny of papering rooms have not been allowed to die a natural death.