

that respiration is necessary for cells to remain alive, as distinct from actively living.

Dr. James is to be congratulated on producing a masterly and scholarly monograph on plant respiration in which the researches of more than a century are critically considered and ably presented. This work, by a recognized authority on his subject, forms a valuable addition to the literature of plant physiology.

W. STILES

TREATISE OF PALÆONTOLOGY

Traité de Paléontologie

Publié sous la direction de Prof. Jean Piveteau. Tome 3 : Les formes ultimes d'Invertébrés ; morphologie et évolution ; Onychophores. Par C. Dechaseaux. Arthropodes, Proarthropodes. Par C. Dechaseaux et G. Waterlot. Trilobites. Par P. Hupé. Crustacés. Par C. Dechaseaux, N. Grekoff, J. Roger, H. et G. Termier. Myriapodes, Insectes. Par D. Laurentiaux. Mérostomes, Arachnides. Par G. Waterlot. Échinodermes, Hétérostélés, Cystidés. Par L. Cuénot. Blastoïdes. Par F.-M. Bergounioux. Edrioastéroïdes. Par J. Piveteau. Crinoïdes, Stelleroïdes, Ophiocystoïdes. Par G. Ubaghs. Echinides. Par H. et G. Termier. Holothurides. Par M. Deflandre-Rigaud. Stomocordés, Ptérobranchés et Graptolites. Par G. Waterlot. Machaeridiens, Conulaires, Hyolithes, Tentaculites. Par H. et G. Termier. Pp. viii+1063+17 plates. (Paris : Masson et Cie., 1953.) Broché 9,600 francs. Cartonné toile 10,320 francs.

VOLUME 3 of the "Traité de Paléontologie" includes all the Invertebrata not dealt with in the first two volumes. Of editorial practices already criticized¹, authors and dates of the various taxonomic units are still too seldom given, and the type, or any species of the genera mentioned, is too often omitted. Some pre-Linnaean names of Echinoid genera are also included. The scale of magnification of the figures is usually indicated, however, and the high standard of printing and illustration is well maintained.

The Onychophora, scarcely known fossil, are treated in a brief and lucid essay which indicates the importance of this group to theories of annelid-arthropod relationship. An important chapter on the basic characters and phylogeny of the Arthropoda is useful as an introduction to this vast phylum. Of the chapters on the various classes, that on the Trilobitomorpha meets the requirements of a textbook, but the Trilobita are handled in a speculative fashion and numerous new family-group units are proposed. The author's enthusiasm and ability have nevertheless produced a well-documented account with excellent illustrations. The Crustacea are well, if conservatively, dealt with ; but more space might have been allotted to the Ostracoda in view of their economic importance, and no chapter on the Cirripedia can be adequate that ignores the work of the late T. H. Withers, especially his three catalogues published by the British Museum (Natural History). Of the remaining chapters on Arthropoda, that on the Insecta, though permitting some taxonomic novelties, far surpasses anything previously available.

The first two chapters on Echinoderms are the last of many profound contributions by the late L. Cuénot and deserve the respect due to all his work. The sections on the Crinoidea and Stelleroidea are beauti-

fully fitted to the scale of the "Traité", though the new ordinal and family-group names in the former should not have been proposed here. The chapter on the Echinoidea is scarcely worthy of the rest of the "Traité" or of the tradition of French work in this group. The morphology is inadequately illustrated, and the drawings in the systematic section are clumsy and too often taken from poorly preserved material. The concluding six chapters call for no special comment, though that on the Graptolites seems rather severely compressed.

Each of the first three volumes of the work includes more speculative matter than would a British work of the same kind, and they are not primarily useful as systematic reference books in all groups. They should not be placed in the hands of students without caution. The durability of their value, therefore, rests on a somewhat uncertain basis ; but the standard of morphological and ontogenetic information is high, and it is these introductory sections of each chapter that are likely to prove of most use. Many of the systematic sections are excellent ; but the average level is lowered by a few chapters which weaken the authority of the whole.

R. V. MELVILLE

¹ *Nature*, 172, 560 (1953).

WILLIAM HERSCHEL: HIS WORK AND PERSONALITY

William Herschel

Explorer of the Heavens. By J. B. Sidgwick. Pp. 228+4 plates. (London : Faber and Faber, Ltd., 1953.) 12s. 6d. net.

THROUGHOUT the history of astronomy, there are one or two names which stand out in sharp relief when one begins to consider the observational side of the science. Hipparchus, Tycho Brahe and Sir William Herschel are three which immediately come to mind. Each made substantial contributions, and each provided fine sets of observations which were of vital importance to those who followed. But while it is virtually for their observations alone that we remember Hipparchus and Tycho Brahe, William Herschel is noted not only for his outstanding observations but also for the great theoretical use he made of them ; Herschel was, in fact, a great theoretical astronomer as well as the observer *par excellence*.

An able and sympathetic account of this surprising genius is given by Mr. J. B. Sidgwick in this book, in which he concerns himself especially with Herschel the man. He begins, appropriately, with the Herschel family in Hanover, and follows them through their various vicissitudes which finally resulted in William and his elder brother Jacob settling in England. Mr. Sidgwick has a great feeling for his subject ; indeed, we soon find the formal "Herschel" being replaced by the more familiar "William", although a return to "Herschel" occurs when the narrative becomes concerned with his theoretical work. The book usefully brings out the success which attended Herschel's work as a professional musician and gives an admirable picture of the keen amateur astronomer who, in his diary, reported with such obvious relish that ". . . I gave up much time to astronomy and also attended many scholars. Some of them made me