

Spiders and their Allies

Les arachnides (scorpions, araignées, etc.) : biologie systematique. By Lucien Berland. (Encyclopédie entomologique, Vol. 16.) Pp. 485. (Paris: Paul Lechevalier et fils, 1932.) 150 francs.

ALTHOUGH this book bears the general title of "Arachnida", 325 pages are devoted to spiders, while important orders like the mites, scorpions and Solifugæ receive less than 40 pages between them, and the Ricinulei and Palpigradi are dismissed in a few paragraphs. The doubtfully-related Pycnogonida and Tardigrada are omitted, but the Linguatulidæ are included. There is no mention of *Limulus*. Thus the book is, in effect, the third 'biology of spiders' to be published in Europe since 1928, and in view of the increasing attention which the Arachnida are attracting, it seems unfortunate that the opportunity was not taken to give other orders a fuller treatment.

Apart from this difference in proportion, each group is described in the same orderly way, with an account of structure, habits and classification, written in a style of pronounced clarity and copiously illustrated. Inevitably, much is a repetition of the work of others, and M. Berland pays a graceful compliment to his predecessors. But he surpasses the majority of them in one respect, which seems to us to be of the highest importance. "Comment interpreter ces faits?" he writes on p. 392, and elsewhere shows that he "ne se contentait pas d'une simple constatation de fait". Accordingly, he gives reasoned discussions of the facts of adaptation, mimicry, venom, courtship and other topics, which form the most valuable portions of his book. In particular, he emphasises the fact that while there are many examples of adaptation to particular environments, there exist many more cases of spiders occupying the same environment with no special adaptation to it. Therefore the structures which are usually described as adaptations can have, in fact, no survival value, since other species can survive without them.

In this connexion, it is surprising that M. Berland quotes Peckham's work on colour vision in wolf-spiders with no reference to Loeb's interpretation of this behaviour as an instance of phototropism. But he shows throughout a refreshing contempt for any theory, however famous, which fails to explain facts, and is agreeably ready to conclude a discussion with the wise admission—"We do not know." His methods are seen to the

greatest advantage in his masterly chapter on the distribution of spiders, and the same high praise is merited by his account of fossil arachnids. Both these chapters surpass anything of the kind previously available.

The anatomical part is adequate, although it is limited to external features, and the treatment of abdominal somites is not quite satisfactory. In the chapter on the classification of spiders M. Berland proposes a new system of two sub-orders with only 46 families in five groups. One of these is called the Uloboridae, and corresponds exactly with Simon's Cribellatae. Although the vexed question of bringing together all cribellate spiders is discussed, we cannot think that this arrangement is justifiable, save as a measure of practical convenience in diagnosis. Since Petrunkevitch's classification has recently been revised by its author, a further discussion of this subject here is unnecessary.

To each chapter is appended a bibliography. Many of these are rather meagre and most of them betray a relative neglect of German contributions.

Any book to the preparation of which its author devotes five years is of course bound to be overtaken by the advance of knowledge, and examples of this will be noticed by those actively engaged in arachnology. But this book is a great achievement, and the points to which we have alluded scarcely affect its value to the general zoologist, who should accord it the welcome it manifestly deserves.

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Chemical Engineering

Unit Processes and Principles of Chemical Engineering. By Prof. John C. Olsen; in collaboration with Crosby Field, Alfred L. Webre, Theodore Baker, James W. Lawrie, F. W. Sperr, Jr., Charles L. Bryden, Robert M. Keeney, P. H. Emmett, Andrew M. Fairlie, L. D. Vorce, Percy E. Landolt, George A. Prochazka, Jr., J. L. Warner. Pp. xiv + 558. (London: Macmillan and Co., Ltd., 1932.) 25s. net.

THIS is an American textbook; England still lacks one made at home which her would-be chemical engineers can read. The subject continues to make progress in Great Britain and the United States and, thanks largely to the influence which the sister Institutions of Chemical Engineers are exerting in both countries, it is being increasingly well taught at a number of centres. At one time there was some uncertainty in defining the scope