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TWO RECENT VOLUMES ON ARACHNIDA.

On Two Orders of Arachnida. Opiliones, especially the Suborder Cyphophthalmi, and Ricinulei, namely, the Family Cryptostemmatoidea. By Dr. H. J. Hansen and Dr. W. Sörensen. Pp. 1-182; 9 plates. (Published by aid of a subsidy from the Royal Society of London, Cambridge, 1904.) Price 15s. net.

Palaeozoische Arachniden. By Prof. Dr. Anton Fritsch. Pp. 1-80; 5 plates and many text figures. (Prag: Selbstverlag. in comm. bei Fr. Řivnáč, 1904.)

ARACHNOLOGISTS must unite in a vote of thanks to Drs. Hansen and Sörensen for their splendid achievement in producing their treatise on Arachnida. The volume, announced many years ago as in preparation, is based upon a wealth of material borrowed from every available source such as no other taxonomists have been able to examine. It is a monument of careful research, and in every way worthy of the high reputation of its authors. Though written in a foreign tongue, the letterpress contains no passage of doubtful meaning; and Hansen's inimitable drawings have received full justice from the lithographic skill of Wilson at Cambridge. The Royal Society was well advised in contributing to the cost of publication.

The first and most valuable part of the book deals with the Opiliones, a highly specialised order the morphology of which has baffled previous workers. By the comparative and careful study of a host of forms, the Danish authors have succeeded in explaining the complicated structure of the genital area, or at all events in offering an explanation which will probably stand unless ultimately disproved by embryology. They have accepted the opinions of Simon and Thorell as to the division of the order into three suborders, and supplied diagnoses of the families of the Palpatores. In the case of the Cyphophthalmi, the least known of the suborders, a complete monograph of all the species is given, together with some new anatomical details, including the important discovery that the so-called ocular tubercles bear, not eyes, but the orifices of Krohn's glands. Incidentally, Stecker's monster, Gibbocellum, is disposed of, and, it is safe to say, will never again figure in literature.

The second part deals with an order of peculiar interest, the Ricinulei or Podogona, which has existed unchanged from Carboniferous to modern times. Amongst the anatomical discoveries made by Hansen and Sörensen, two stand out as of the greatest interest, namely, the presence of a pair of tracheal respiratory organs in the prosoma and of the elements of nine somites in the opisthosoma. The association of this order with the Pedipalpi, Araneæ, and Palpi-gradi is of interest, even if the reasons for it are unconvincing; but surely greater prominence should have been given to the fact that Börner anticipated the Danish authors in this matter!

Exact and admirable, however, as the work is, it must not be regarded as above criticism; nor must all the statements be accepted with a childlike faith. Far from it. The limitations of the authors are well known and are sufficiently in evidence in this volume, more especially in the pages dealing with the Micrura. For example, Börner's view that the "labia" in Arachnida are not homologous sclerites is worth far more than the unreasoned dismissal it receives; and it is not very obvious why the first abdominal sternal plate in the Ricinulei is homologised with the pre-genital rather than with the genital sternite of the Pedipalpi. Exception also must be taken to the application of the term "antenna" to the appendages of the first pair, and of "mandibles" to the basal segment of those of the second pair, in the Arachnida. The first change is defensible only on the grounds that the chelicerae of the Arachnida are the homologues of the antennae of insects and of the antennae of the first pair in crustaceans. Those who adopt this terminology, however, must consistently apply the term "antenna" to the buccal gnathites of Peripatus. Again, the name "mandible" is presumably given to the basal segment of the appendages of the second pair because of its supposed homological correspondence to the "mandible" of the insects or crustaceans—an opinion not generally accepted.

Points of this kind, however, would scarcely be worth mentioning were it not for the apparent inclination on the part of the authors to forget the possibility of two or more views being held on matters about which embryology is, up to the present, silent. As a last word of praise, may we, in all sincerity, congratulate the authors on the considerate tone of their criticisms and on the general absence of that air of self-satisfied arrogance for which certain Danish publications on Arthropoda have gained an unenviable notoriety? It is to be hoped that the English supervision of the letterpress is not in any way responsible for this improvement.

Dr. Fritsch's monograph of the Palaeozoic Arachnida is a volume of a quite different character. Plainly speaking, it is an anachronism reminiscent of the dark days of palaeontology when that science was held to be independent of neontology, or at all events independent in the sense that an acquaintance with the structure of the living species of a group was regarded as superfluous for the correct determination and description of its fossil forms. The comparative morphology of recent Arachnida, even with well-preserved material for examination, is difficult enough. Was it likely, then, that any great measure of success would attend the efforts to interpret the elusive structural points of Carboniferous fossils of a palaeontologist unguided by scientific familiarity with recent forms? But, although want of the requisite knowledge is plainly attested and shatters all confidence in the alleged observations and attempted restorations, yet without examination of the specimens themselves no one has the right to affirm positively that a statement is false or a drawing inaccurate in any given particular. However strongly

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one may suspect the contrary, there *may* have been a scorpion in Carboniferous times with the appendages segmented as shown in the figure of *Isobuthus kralupensis* (p. 71); or another with an additional sternal plate between the normal second and third of the opisthosoma, as in the restoration of *Microlabis sternbergi* (p. 69). Most of the specimens are in continental museums; but it so happens that there is in the British Museum a fossil scorpion which Fritsch figures and describes in the present work as *Eobuthus rakovnicensis*. To one acquainted with recent scorpions, it is obvious that this fossil resembles them in all essential points. Yet Fritsch's restoration represents an animal differing from all known forms in characters falling so wide of one's experience that it is impossible to estimate their systematic value. If this be taken as a test case, it supplies convincing proof of the untrustworthiness of the drawings and diagnoses in the book; for it shows that the author's anatomical knowledge is too superficial to enable him to distinguish between fortuitous fractures and inter-segmental joints in the fossil examples.

Haase's classification of the Carboniferous Arachnida is followed tolerably closely. To the Araneæ (spiders), however, is added the new suborder Pleuraraneæ; but its genera seem to be nothing but Anthracomarti. *Promygale*, for instance, differs from *Anthracomartus* only in the alleged presence of abdominal appendages. The evidence, however, for the existence of these seems to be of the slenderest kind. In the Opiliones figures the new genus *Dinopilio*, which presumably should be classified under the Araneæ, perhaps near the *Arthrolycosidæ*.

The volume nevertheless contains some valuable work, in addition to its usefulness as a catalogue and bibliographical record. The discovery that in the Carboniferous scorpions the lateral eyes are in advance of the medians, as in recent species, disposes of Thorell's classification of these animals into *Anthracoscorpia* and *Neoscorpia*. The author is also to be congratulated upon showing that the structure from which *Cyclophthalmus* took its name is a half-circle, not of ocelli, but of granules.

It is impossible not to regret the necessity for giving an unfavourable notice of a volume which has cost its author much time and trouble; but since his high reputation as a palæontologist and the style of the illustrations are likely to deceive the uninitiated into regarding this treatise as an epoch-making monograph, it would be unfair to do otherwise than utter a note of warning against putting reliance in its contents to those not in a position to judge of its merits for themselves.

R. I. Pocock.

THE CITIZEN AND THE STATE.

The Citizen, a Study of the Individual and the Government. By Nathaniel Southgate Shaler. Pp. viii+339. (London: A. Constable and Co., Ltd., 1905.) Price 5s. net.

PROF. SHALER, who is professor of geology at Harvard, has set before himself the practical and unambitious task of instructing the youth of the
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United States in the first principles of citizenship. In this he has succeeded; his work is interesting, suggestive, and extremely sensible. Not being written for the specialist, it is hardly to be called profound; and the theoretical considerations which are brought forward are of the simplest. But the author's sound common sense generally carries the reader with it. A favourable specimen of his mode of argument may be found in the discussion of woman's suffrage. There is no reference to the various views held by thinkers from Plato downwards; but probably Prof. Shaler's one-page argument is quite sufficient, that women, owing to their usually secluded lives, are not fitted in the same way as men to form judgments on political questions, but that, after all, if a majority of women should desire to vote, it would probably be best to give them the franchise, for the reason that it is most undesirable to have any considerable body of the people in a discontented state.

Only a few of the topics discussed in this book can be referred to here. Prof. Shaler takes the moderate view that it is more profitable to the commonwealth to engage the interest of a hundred thousand well-informed men in politics than to have a hundred able statesmen created for public affairs. He depreciates the importance of oratory for the statesman in the present condition of American society, regards a sound head for business and a faculty for clear statement as much more valuable, and contends that the most successful statesmen in America are not (as in England) gentlemen of independent means, but lawyers and business men, whose training has taught them how to enter into associations with other men, to limit themselves to practical aims, and to form the schemes necessary for their realisation.

Naturally, in a work proceeding from the United States, one looks for, and finds, the glorification of the ideals and great men of that country; the contrast drawn between Washington and Napoleon; the contention that the War of Independence broke out because the American colonists had outgrown the system of the mother country; the distinction, too, which is drawn between the soldier and the citizen spirit. Prof. Shaler sees clearly, and discusses with impartiality, some of the most pressing difficulties of American politics. Not much is said about trusts and tariffs, and the currency is dealt with briefly. But immigration, foreign possessions, and the negro question are quite adequately treated. Prof. Shaler laments, of course, that the streams of immigrants no longer come from the most healthy strata of society in Europe; and, in addition to criminals, paupers, and other defective persons, he would exclude those who are not able to read and write in the English language or their own. He gives no support to the view that the mere profession of the doctrines of Anarchism should be followed by condign punishment. He sees no necessity for any attempt to extend the possessions of the United States beyond the sea. "Lynch law" he holds in detestation, and calls upon young America, on the occasions of any outbursts, however natural, of the lawless desire for vengeance, to put itself under the orders of the sheriff