

imperfectly described, exhibit deeper and more complex invaginations, while the Muscidae form the extreme term of the series. At this moment we want above all *comparative* studies, and till they are supplied, minute descriptions of highly special cases are hardly intelligible. Few biologists seem to be aware of the interesting research which lies open to any competent student in a well-selected series of Dipterous larvæ and pupæ. It will ultimately be necessary to include other insect-orders, for imaginal folds are not peculiar to Diptera. Many Lepidoptera are instructive in this connection. Pieris, for example, as J. Dewitz (*Biol. Centralblatt*, Bd. iii. p. 582) points out, exhibits that connection between the sutures of the clypeus and the antennary folds which the author (quoting Mr. Hammond) has noticed on p. 43. The subject is not sufficiently worked out for popular treatment, and the beginner who takes up Mr. Lowne's account of the development of the fly has many a hard nut to crack.

The new work contains many interesting particulars concerning the life-history and minute structure of the blow-fly; there are not a few useful figures, and the bibliographical references are tolerably extensive. If the succeeding parts are equally full of matter, the treatise will make a really considerable addition to our knowledge.

Nevertheless there are some faults to be pointed out. The arrangement of the matter is not always convenient or luminous; see, for example, the place (p. 12) chosen for the definition of an insect and the definition of morphology. Now and then an ill-considered remark, perhaps having no close connection with the subject in hand, distracts or misleads the reader. Why should the author go out of his way to speak of mammals, birds, and reptiles as "separate and divergent genetic series" (p. 26), a proposition by no means so evident that it can be thrown in as a passing illustration! Surely Mr. Lowne, by thinking twice, would have saved his readers from puzzling over that strange remark (p. 7) that in all insects (this is apparently the sense) there is no cœlom or "distinct continuous body-cavity."

We shall await with much curiosity the promised proof of the hepatic function of the Malpighian tubules. Meanwhile we can only wonder in what sense the author uses the word *hepatic*. We shall also be glad to learn the reasons for believing in a "metenteron," as defined on p. 17.

No one interested in insect anatomy is likely to adopt all Mr. Lowne's views, but no such person can hesitate to admit that he offers us a substantial contribution to his favourite subject.

L. C. M.

OUR BOOK SHELF.

A Treatise on the Diseases of the Sheep; being a Manual of Ovine Pathology especially adapted for the use of Veterinary Practitioners and Students. By John Henry Steel. (London and New York: Longmans, Green, and Co., 1890.)

SHEEP and their diseases have had but little attention from the veterinary profession, and consequently this work, just published by Mr. J. H. Steel, one of the most astute and successful veterinary practitioners and teachers of the present day, must be looked upon as the result of

an important step in the right direction. Though we admit the author's ability and the probable usefulness of the book, yet the most conspicuous feature connected with it is the evidence which it gives of how very little of a sound, practical, and useful nature is known by scientific men in relation to sheep. No claim is made to originality in the subject-matter produced, and indebtedness to the various authorities quoted is freely acknowledged. There is, however, a distinct want of discrimination between those who are the leading authorities on certain subjects and those who are not. One who could write the three names, Walley, Williams, and Gamgee, in the order presented, shows he has no regard for precedence in virtue of merit. Gamgee in his day was perhaps the greatest genius who had ever adorned the veterinary profession, and Williams is unquestionably the most successful living author of veterinary works of a high order. Errors of an extraordinary kind appear where the writer, who is not himself familiar with the subject, attempts to enlarge upon the statements of others from whom he quotes; for example, in writing of the tick, ked, or fag (*Melophagus ovinus*), he says "the animal buries its head and proboscis in the skin, and once fixed hangs on for months. It is nimble and active, and sometimes as large as a horse-bean." Any entomologist familiar with sheep cannot fail to see that the author has mistaken the grass-tick (*Ixodes*) for the sheep-tick (*Melophagus*), which belongs to a different genus, and has confounded the habits of the two creatures in an extraordinary manner. Apart from errors of this kind the work is far from complete, but if due care were taken to correct mistakes and to consult as additional references such recent works of a superior kind as "The Animal Parasites of Sheep," by Dr. Cooper Curtice, published at Washington by the United States Government during the present year, the second edition might be made a most serviceable, interesting, and valuable volume.

Wild Beasts and their Ways. By Sir Samuel W. Baker, F.R.S. Two Vols. (London: Macmillan and Co., 1890.)

No one who has read any of Sir Samuel Baker's books of travel will need to be told that he has all the instincts and aptitudes which, under favourable conditions, make a man an eminent sportsman. He is, however, much more than a sportsman; as he himself says, he has never hunted without a keen sense of enjoyment in studying the habits of the animals pursued. In the present work he records some of the experiences he has had in various parts of the world, and students of natural history will find in his narrative much that cannot fail to interest them. The book is not, of course, in the strictest sense scientific; but it has points of contact with science, and these will make it as welcome to zoologists as it is sure to be, for other reasons, to general readers. Sir Samuel confines himself to wild animals which he himself has had opportunities of watching, so that all the incidents and scenes he brings before us have that kind of freshness and vividness which can belong only to descriptions that embody the results of direct personal observation. The work is admirably illustrated by reproductions of drawings prepared by Mr. Dixon.

Properties of Matter. By P. G. Tait. Second Edition. (London: Adam and Charles Black, 1890.)

THIS is a revised and considerably extended edition, and the author has paid special attention to points in connection with which difficulties had been found. Among the more important additions are the results of some of M. Amagat's splendid and hitherto unpublished work relating to the compression of liquids exposed to enormous pressures. This in itself, when completed, will, as the author remarks, "form a singularly interesting and practically new branch of the subject."