

which so-called bacteriological research opens up to those who, incapable of doing real pathological or physiological work, have leisure to practise bacteriology as a "fireside" game.

In conclusion, a word in praise of the translator and editor: he has done his work excellently, so well, in fact, that one cannot help regretting that he used his gifts and expended his labours on a book hardly worthy of so much conscientious energy and patience. The translation is better than the original in arrangement, type and general "get up." Since it is pleasing to most to possess a nice book, and one which is at the same time instructive, in spite of some remarks which may appear severer than they are meant to be, we may recommend it safely as an addition to the student's library.

A. A. KANTHACK.

### THE NATURAL HISTORY OF AQUATIC INSECTS.

*The Natural History of Aquatic Insects.* By Prof. L. C. Miall, F.R.S. (London: Macmillan and Co., 1895.)

PERHAPS no country possesses so many amateur naturalists as England, at least in proportion to its population, and it is not without significance in this direction that many of our best professional men of science have not thought it undignified to furnish sound information on their special subjects in a popular and yet accurate manner. The present work is a good example of this, and Prof. Miall deserves praise for the admirable account he has put together of the insect inhabitants of our lakes, ponds, and watercourses.

Of course it has not been without forerunners. One of the last works of that well-known writer on popular science, the late Rev. J. G. Wood, was entitled "The Brook and its Banks," and covered much the same ground; but one may say, without any disparagement, that his book was more picturesque or anecdotal natural history than strictly scientific.

Again, Prof. Miall, like every subsequent writer on entomological subjects, is greatly indebted to the laborious researches of Swammerdam, Réaumur, Lyonnet, and others of the early naturalists, but in every case this is freely acknowledged, and he adduces their works as models of patient investigation on the living animal, particularly worthy of emulation at the present time, when attention is almost exclusively paid to phylogeny and classification, to the neglect of the actual life history, where so much still remains to be discovered. Some essential matters are briefly treated in an introductory chapter, such as the equilibrium of aquatic insects, the tension of the surface film of water and its effect on small objects, and also the question of the original habitat of insects, whether terrestrial or aquatic, which Prof. Miall confidently decides as the former, mainly from the universal presence of tracheæ and functionally active spiracles even in purely aquatic insects, showing that such as are fitted for breathing only dissolved air are those that deviate from the general and primitive rule. The chief aquatic Coleoptera are taken first, and certain curious structures in the larva and imago of several families somewhat fully described. Among these we may mention the mouth organs of the larva of *Dytiscus*,

which have been a subject of controversy from the time of Swammerdam and De Geer up to Meinert, Schiötte and Burgess, whose description has been verified by Prof. Miall, and also the well-known tarsal clasping suckers of the adult male, the real structure and action of which was first pointed out by Lowne. The method of respiration in the adult *Hydrophilus* is well explained, and the extraordinary arrangement for obtaining air from cavities in submerged roots adopted by the larva of *Donacia*, as discovered by Siebold. Flies with aquatic larva receive considerable attention, no less than 122 pages being devoted to these extremely interesting creatures, which from their transparency, in many cases, have long been favourite objects with microscopists. The development of the Gnat, *Chironomus*, *Simulium*, *Eristalis*, and numerous others is fully gone into, and the amateur naturalist will find plenty of occupation, and derive no little benefit, by following out their structure with this book as his guide. There is a short account of that very beautiful aquatic hymenopterous insect *Polynema*, which, according to Ganin, deposits its eggs in the eggs of a Dragon-fly; and another form, *Agriotypus*, said to be parasitic on a Caddis-worm. Caddis-flies (*Trichoptera*), *Sialis*, the alder-fly of anglers, the stone-flies, may-flies, dragon-flies, pond-skaters, water-boatmen, and all the rest of the host of insects which pass a large part of their existence in the water, are dealt with in due order, and the descriptions are frequently supplemented with bibliographies, which will be useful to those who require further information on special points. A word must be said for the illustrations, which in large part have been drawn by Mr. A. R. Hammond for this work; they are extremely clear and well executed—quite a relief, indeed, from the old clichés usually considered good enough by publishers to adorn a work of this kind. Altogether, the "Natural History of Aquatic Insects" is a very good and useful specimen of its class.

### OUR BOOK SHELF.

*The Royal Natural History.* Edited by Richard Lydekker, F.R.S., &c. Volume iii. (London: Warne, 1895.)

THE third volume of this excellent "Natural History" finishes the mammals, and commences the birds.

Among the former the Cetaceans, the Rodents, the Edentates with the pouched mammals, and the Monotremes are described at appropriate length. The information is generally up to date, and the illustrations are good. To the notices of the occurrence of Sowerby's whale on the coasts of England and Scotland, may be added that of its being captured some years ago in Brandon Bay, Kerry, the head of the specimen being in the Dublin Museum. The immense group of the Rodents is judiciously treated, most of the more important facts of their history being given. Only six pages are devoted to the egg-laying mammals, and there is no figure of the duckbill's egg.

The chapters on the perching birds and *Picariæ* are contributed by Mr. H. A. Macpherson and Dr. Bowdler Sharpe. "The number of the existing species of birds being in all probability considerably over ten thousand," the authors are obliged to treat of them even in a more condensed form than were the mammals; still the order of Passeres, which includes by far the majority of known birds, is fairly treated, and most of the well-known or interesting birds are alluded to. Dr. Sharpe confesses