

The values of the successive powers of ι of course recur in sets of four; consequently the author boldly affirms that there are only four classes of sensation, and that sensations of temperature are identical in kind with sensations of pressure, and smells with tastes. Pain and pleasure (*Wollust*) appear as opposite special qualities of touch, and are equated with the taste pair bitter-sweet, and the sound pair $e - b$. So again the antithesis red-green is said to correspond to cold-hot and $c - g$.

It is hard to believe that a mathematical theory which involves these and numerous other equally unmeaning assertions can be turned to any serious account by psychologists.

A. E. TAYLOR.

OUR BOOK SHELF.

Elementary Practical Zoology. By Frank E. Beddard, M.A. (Oxon.), F.R.S. Pp. vi + 210; with 93 illustrations. (London: Longmans, Green and Co., 1898.)

THIS little book is written as a guide to the elementary zoology required by the Science and Art Department. There already exists at least one work designed for this special purpose, and several others more or less adapted for these examinations. Most of these have been written by men who though teaching zoology can hardly claim to be specialists in this subject; consequently, on coming across a book written by such a well-known zoologist as Mr. Beddard, one naturally expects that the work will be something out of the common. We are afraid that any one taking up this book with such expectations will be disappointed; for although this book may be better than those already in existence, we do not consider that Mr. Beddard has done either himself or the subject justice in it, the book having the appearance of being turned out in a hurry and without due care.

In spite of Mr. Beddard's remark we still believe in Huxley's method of working from the known to the unknown, and should rather have seen the book commence with the frog than with the *amœba*.

One of the most disappointing portions of this book is the chapter dealing with the earthworm. Mr. Beddard, as is well known, is perhaps our greatest authority on the Oligochaeta, and one consequently expects that this chapter would be very superior; but even here we find evidence of want of care, the very illustrations being bad. The first one (Fig. 9), stated to be a side view of the worm, is really a latero-ventral view, and what the row of setæ on the left margin of the figure are is difficult to imagine; they do not tally with the description, nor do they exist in any of our common earthworms. Figs. 12 and 13, too, are curious combinations of the anatomical characters seen in *Lumbricus* and *Allolobophora*, two worms that have been so long confused in the practical text-books; but the author does not state that they are combined figures, and the student will look in vain for the origin of the lateral œsophageal vessel on the twelfth segment, or for six "hearts" in a worm with three pairs of calciferous glands.

So throughout the book we find this lack of care in the preparations of the illustrations, which latter should be of the greatest importance in a practical text-book, and especially in one in which the author frequently states that a description of a given set of organs is unnecessary as the illustration will explain the facts.

Some of the figures are combinations from several published by well-known teachers, and during the process of combination they have suffered considerably; so much so, that the originators will hardly care to see their names attached to them. In the diagram of the vascular

system of the frog, after Howes, the *anterior abdominal* is represented as entering the liver quite independent of the *hepatic portal system*, and the latter is indicated in part as joining *directly* with the inferior *vena cava*.

We have yet to learn that the teeth on the radula of the snail are calcified, and that the rabbit has only one deciduous premolar on either side of the lower jaw.

We have only drawn attention to a few of the errors which occur in this work, and we cannot congratulate Mr. Beddard on its production. In our opinion the more elementary a book is the more correct should be its facts, and the greater should be the care expended on it.

M. F. W.

Elementary Conics. By W. H. Besant, Sc.D., F.R.S. Pp. 176. (London: George Bell and Sons, 1898.)

Examples in Analytical Conics for Beginners. By W. M. Baker, M.A. Pp. 87. (London: George Bell and Sons, 1898.)

OF these two volumes of the "Cambridge Mathematical Series," Dr. Besant's book is practically a reprint of the first eight chapters of his "Conic Sections treated Geometrically," which has for so many years held its ground as a favourite text-book among teachers. "Geometrical Conics" seems to be rather less "the fashion" now than it was formerly, and we hope that the present issue, containing all the more important propositions in a small compass, will encourage students in looking up geometrical proofs instead of trusting too exclusively to the often cumbrous and ill-understood methods of coordinate geometry.

Mr. Baker's collection of examples, though intended primarily for the use of Sandhurst and Woolwich candidates, will be welcomed by University students as well. Most beginners in coordinate geometry find the want of a thorough drilling in simple examples which are straightforward applications of book-work, before they can fully grasp the significance of the principles involved. Such exercises this book is intended to supply; but perhaps the most useful feature is the set of questions on "book-work," as these cannot usually be found in any text-book.

G. H. B.

Dobbie's Horticultural Handbooks. Edited by William Cuthbertson. *Pansies, Violas, and Violets.* By Charles Jordan, John Ballantyne, Jessie M. Burnie, William Cuthbertson. Pp. 102. (London: Macmillan and Co., Ltd., 1898.)

TO all who grow for pleasure or profit the delightful flowers treated of in the book under review, the present work is to be recommended. In the space of about a hundred pages as much information regarding the evolution of the various varieties of the flowers, their botany, the methods of growing for the garden or for exhibition is given as is likely to be necessary for most readers. And the sentimental side is not overlooked, for some thirteen pages are devoted to the poetry of the subject, short extracts from the writings of various poets being gathered together in praise of the flowers under consideration. The work is illustrated by several very clear wood-engravings.

The Mechanical Engineer's Handy Office Companion. By Robert Edwards. Pp. viii + 70. (London: Crosby Lockwood and Son, 1898.)

THIS small book is what it professes to be, viz. a "handy office companion," giving, as it does, in a succinct form a variety of information likely to be required by mechanical engineers in their every-day office work. At the end of the volume appears a somewhat invidious list of books on mechanical engineering, and allied subjects, which the author recommends to his readers. We miss from the list the titles of very many books which we should have thought merited inclusion as much as several to which attention is called.