

remove the epidermis from a snail-shell and observe the result.

The lip or aperture of a snail's shell is not generally called the *peritreme* but the *peristome*. The lines of growth in a snail's shell are not "arranged concentrically with the nucleus," although this is the case with the growth-lines in bivalves.

We fail to understand how the *operculum* of a snail "differs from the true shell in having more *conchiolin* entering into its composition." Surely the author meant to say *less conchiolin* and *more chitine*?

The *epiphragm*, or layer of hardened mucus, sometimes strengthened with carbonate of lime, closing the aperture of the shell of land-snails during hibernation is called here also the *clausilium*! (p. 5). The description of the odontophore with its radula and jaws (pp. 6 and 7) is very inaccurately rendered, and in copying Prof. Lankester the author has carefully also quoted a mis-statement as to the formula of the teeth.

The eggs of snails are said by the author to be "laid in a string, which is called the *nidamental ribbon*, or inclosed in *horny capsules*." This is true of sea-snails, such as the whelks (*Fusus*, *Buccinum*, &c.), but it is not the case in land-snails, of which Dr. Williams is discoursing. In these the eggs are separate and protected by a shell, which is sometimes membranous and flexible, at others calcareous and brittle, while those of the fresh-water species are deposited in small glairy masses of soft transparent jelly-like consistence.

Turning from the snail to the fresh-water mussel (Chapter II.), the author, in describing the animal of the latter, appears to have made a mistake similar to that which he has made with regard to the garden snail: not knowing his subject well, he has in fact described a *siphonated Mya*, when he fondly imagined he was writing about a *non-siphonated Unio* or *Anodon*.

Turning to the species enumerated by the author, we regret to observe that here the discrimination of the expert is alike wanting. For example, *Anodonta anatina*, Linn., figures as a good species, whereas it is merely a variety of *A. cygnea*, Linn. It seems rather absurd to give in a shell-collector's hand-book such shells as *Physa acuta*, Drap., "Hab. In one of the lily-tanks in Kew Gardens, imported" (p. 72); *Bulimus Goodallii*, Miller (introduced into a green-house with exotic plants); *Vertigo tumida*, Westerlund, another "casual"; *P. dilatatus*, Gould, in the canals around Manchester, "introduced from America in cotton bales." If these are admitted, why omit *Clausilia parvula* and *C. solida*, also "casuals," which appear both in Sowerby's last edition, and in Gwyn Jeffreys, v. 161-62?

Far too much prominence is given to worthless varieties of the common snail *Helix aspersa*, such as *minor*, *maxima*, *albida*, and *sinistrorsum*, &c.; but, having put them in, why should the author omit such a one as *Unio timidus* var. *ponderosa*? Many of the genera, too, need revision to be brought up to date. Thus, *Achatina acicula* should be *Cæcilianella acicula*; *Bulimus acutus* should be *Helix (Cochlicella) acuta*; *Zonites* should be *Hyalinia*. By the way, *Zonites draparnaldi* is omitted altogether, although known for years.

The habitats of many of the species are badly given. Thus, *Testacella Mauget* is said to be found in gardens

and fields, whereas it has been met with in the neighbourhood of Bristol, whence it has spread to a few limited localities.

Why are the three known localities for *Vertigo moulinsiana* (p. 129) omitted?—Itchen Valley, near Otterbourne; near Hitchin; and near Rye-House, Herts. Other quite local species are recorded as if they occurred everywhere, as *Helix pisana* and *H. obvolvata*, &c.

A few woodcuts are inserted, but they are very poor and not accurately drawn. *Testacella haliotidea* is reversed.

The minute characters of the shells, so useful in many instances in the field, are omitted. The book is interleaved, which doubles its thickness for field-work, and we at first wondered why so much plain paper was added. It has since occurred to us that the author had the convenience of the reviewer in his mind's eye, and we must say we found the blank pages most useful in correcting the text as we turned over the leaves.

Is it too much to hope that the author may be able to give some attention to the living land and fresh-water Mollusca before he brings out a new edition of his handy shell-collector's manual, and so avoid those pitfalls into which he who compiles unskilfully and without practical acquaintance with his subject is sure to slip?

OUR BOOK SHELF.

A Text-book of Biology. By J. R. Ainsworth Davis, B.A., Lecturer on Biology in the University of Wales, Aberystwith. (London: Griffin and Co, 1888.)

THIS is one of a class of books which the system of examining the whole world on a limited schedule, drawn up by a Board of disinterested philanthropists, is bound to produce. It will delight the misguided student whose sole desire is "to get through" with the least knowledge possible, and will disgust every competent teacher. Mr. Davis is in error in stating that his book supplies a gap in literature. The little text-book by Prof. Lloyd Morgan is on the same lines, and appears to us to be far less objectionable, inasmuch as it is, though of smaller dimensions, a more genuine exposition of the principles of the subject, less of a cram-book than the present work, and written with maturer judgment and literary power. The only way to prevent the study of biology, as directed by the University of London, from sinking into a worthless exercise of memory applied to the contents of such little books as this by Mr. Davis, is to change the animals and plants enumerated in the schedule every three years. This, however, would hardly suit the ubiquitous aspirants to a degree for whom alone the Imperial University arranges its curriculum. Nor would it suit Mr. Davis and other more distinguished authors of regulation cram-books. The fact is that genuine education in biology as a science, and the influence of personal contact and association with an active investigator and discoverer as teacher and friend, are destroyed by the Imperial system of schedule and examination; and their place is taken by weary grinding at little books written by teachers of no authority, and too often ignorant as well as unintelligent.

Mr. Davis has borrowed a number of excellent figures to illustrate his book, which is nothing more nor less than a strictly limited, and in minor points an inaccurate, description of the types named in the schedule of the University of London. The new figures are bad, and the short general introduction is not merely shallow but erroneous, e.g. the account of protoplasm and the tabular statement of differences between plants and animals.