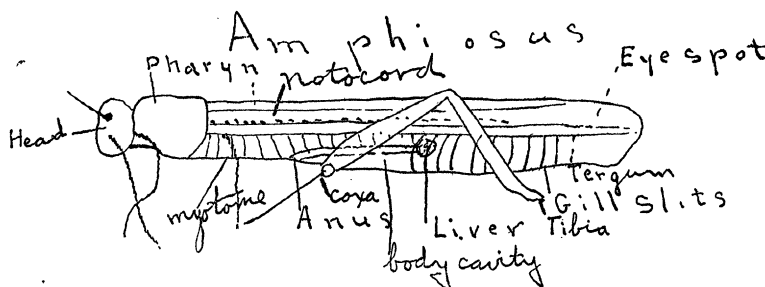


a grasshopper; but more careful examination will show that there are various parts of *Amphioxus* mixed into the grasshopper in a most remarkable way. These structures are so inconspicuous in themselves that they might have escaped notice if they had not been so plainly indexed, and if the question had been upon the anatomy of the grasshopper instead of the other animal.

the book is not dominated by the conception that, notwithstanding details, there is a clear path of advancement in biological thought.

The preface, and his estimate of some of the more prominent men, indicate that the author had this conception in mind, but it is not clearly carried out. The observations of capital importance are not separated from those of subordinate interest, nor are the chief



That the figure was not drawn as a joke seems evident from the fact that the student failed to pass the examination, and would not, of course, take the chance of having one question thrown out completely. Perhaps the joke is on the instructor, after all.

A. M. REESE

SCIENTIFIC BOOKS

The Early Naturalists: Their Lives and Work (1530-1789). By L. C. MIALl, D.Sc., F.R.S. London, Macmillan & Co. 1912.

This book, by a practical naturalist of honorable attainment in the field of research, is a useful book of reference. It has the merit of being written from a thorough examination of the original sources and is a work of great industry and patience. It covers the period from 1530 to 1789 during which the sciences of organic nature were in the process of making. Many of the contributions of the time were mixed, and, taken together, they are more in the nature of vague foreshadowings of what was to come rather than specific additions to any science that had already taken definite form. This circumstance makes it most difficult to convey to the general reader a unified picture of progress, and it is to be said that

results of investigation sufficiently emphasized to exalt them above those of secondary significance.

In its method the book is analytical rather than synthetic, and does not exhibit the selective and combining power that is necessary to convert the details into a lucid story of progress. Dr. Miall gives, with thoroughness and accuracy, summaries of the researches of the naturalists of the period and of their views on a variety of questions. His volume is a compendious reference rather than an illuminating treatment of tendencies and currents of thought, and seems, to the reviewer, to be of greater service to the naturalist than to the general reader.

His section on "The Minute Anatomists" is the most interesting and the best assimilated part of the book. Here, the author writes with an evident command of the subject, as might be presumed from his familiarity with insect anatomy, as well as his excellent account of Malpighi, Swammerdam and other devotees of minute anatomy, in Miall and Denny's "The Cockroach."

The title "The New Biology" for the first section of the book is suggestive and inviting, but it does not appear to be a happily chosen

title for the period covered—from 1530 to about 1603. The reader is likely to dissent from the inference that the work of Brunfels, Fuchs, Gesner and others constitutes the “new biology” which was more properly the product of the nineteenth century. Nevertheless, his account of the naturalists of this period is very interesting. In the works of Brunfels and Fuchs we find recognition of the practical utility of *affinities* for the systematic arrangement of plants, as well as sketches from nature published before the appearance of the “*Fabrica*” of Vesalius. This is notable, for there was little objective treatment of science at this time, and few sketches from nature before those prepared under Vesalius, the drawings of Leonardo da Vinci on anatomy being the most notable exceptions.

There are some omissions not readily accounted for. For illustration, one misses reference to the work and the great influence of Vesalius, Harvey, Spallanzani, and the Hunters. These men lived in the period under consideration and, judged in the light of their influence on the developing science of biology, they were founders in as large a sense as any others mentioned. The work of Vesalius served to open the field of morphological studies, and that of Harvey to introduce experimental observation into biological science. While Vesalius might possibly be ruled out, on the ground that his observations were not broadly morphological but applied chiefly to the human body, this is not the case of Harvey, who was not only physiologist but comparative anatomist and observer in embryology as well. Harvey is incidentally mentioned in connection with the embryological work of Malpighi, but his influence was great enough to make him worthy of separate treatment. Spallanzani and John Hunter were naturalists in a broad sense and deserving of representation. Probably Haller should also have some mention.

There are in the book many evidences of ripe scholarship and extensive learning, with an unusually limited number of mistakes. In the section on “Early Studies in Comparative Anatomy” it is probably an error to designate the Essay on Comparative Anatomy of Alex-

ander Munro primus as the earliest formal treatment on the subject. The “*Zootomia Democritæ*” of Severinus, published a century earlier (1645), is a more likely competitor for this distinction.

It is to be regretted that there are no illustrations in the volume. Portraits of the more notable observers and illustrations selected from their numerous plates would have added greatly to the interest of the book.

The reviewer has read the volume with interest, and while venturing to point out some of its limitations, he is at the same time sensible of its merits.

WM. A. LOCY

The Chemistry of Plant and Animal Life. By HARRY SNYDER, B.S. Third Revised Edition. New York, The Macmillan Company. Pp. xxii + 388. Price \$1.50.

The scope of this little volume is in some respects even wider, in others considerably narrower, than its title would lead one to expect. Of the two parts into which it is divided the first, comprising about two fifths of the text, constitutes a brief introductory course in general chemistry, presenting in elementary fashion the fundamental concepts and laws of the science, and reviewing those elements and simple compounds that from an agricultural standpoint are the most important. The second deals with certain selected phases of biochemical science, such as the characteristic organic compounds of plants and animals, the chemistry of plant growth, the composition of cereals and coarse fodders, the chemistry of digestion and nutrition, and the rational feeding of animals and men. Nearly every chapter contains, besides its expository paragraphs, a number of appropriate problems and laboratory exercises. The whole “is the outgrowth of instruction in chemistry given in the school of agriculture of the University of Minnesota.”

The book is, of course, hardly more than a primer, and from a primer much that is interesting and even important must be rigidly excluded. On the other hand, the process of elimination may be pushed too far; and the