

and research reports have had a persistent effect on farm practices in the Corn Belt and the research programs of other agricultural experiment stations.

In order to bring the celebrated Hopkins mnemonic up to date and to make it useful to students in my botany classes, three years ago I conceived the following version. It met with instant favorable response and provoked such interest among student-teachers that I take this opportunity to make it available to other teachers who may care to use it in their own classes: C M g - M n MoB CuZn HOPK'NS' CaFe! ("See 'em G-men mob Cuzzin Hopk'ns' Cafe!"). Admittedly inelegant and colloquial, but definitely modern American in tone, it continues to memorialize C. Hopkins. At the same time it includes all important trace elements that must be used in preparing culture solutions and in furnishing complete fertilizers to crop plants. It brings to fifteen elements instead of ten the number known to be essential more than thirty years ago. The inclusion of the element molybdenum is not too easily defended. For adequate animal nutrition, chlorine, cobalt, iodine and sodium must be added as important trace elements, so we can substitute "I" for the apostrophe in HOPK'NS. Then we can have the fun of devising another version to include "Cl," "Na" and "Co" for students of animal nutrition.

This and any other mnemonic should preferably find its place solely is an interest-arousing device. If used by the teacher in any subsequent testing program, it will tend to promote mere memorization as a poor substitute for genuine understandings.

Books

PAULI, WOLFGANG F. *The World of Life*, edited by Bentley Glass, Houghton Mifflin Co., Boston, Mass., 1949, x + 653 pp. illus. \$5.00.

Mr. Pauli's text for college general biology was written with three main objectives: 1. To stimulate interest and stress scientific method; 2. To attract and stimulate students; 3. To write a text with the principle of evolution as its guiding theme.

The book is divided into seven parts with 25 chapters: Part I, Backgrounds, the physical world with chapters on the universe and matter; Part II, The Nature of Life, including metabolism, nutrition and the cell; Part III, The Principle of Evolution, its theory, the story in the rocks, and the mechanism of evolution; Part IV, The World of Plants, primitive plants, mosses and ferns, the seed plants, and special adaptations of flowering plants; Part V, The Rise of Animal Life, Protozoa, Sponges and Coelenterates, Metazoans, Arthropods, Echinoderms and Primitive Chordates; Part VI, The Vertebrates, framework and coordination, principal organ systems, "The Great Transition", fishes and amphibians, reptiles and birds, mammals, and man; Part VII, The Bridging of Yesterday, To-day and Tomorrow, physical basis of heredity, human genetics and eugenics.

The book has a good cloth binding, 10 pages of plant and animal classification, classes and orders with some characteristics of each, 15 pages of biological terms with their definitions, and 16 pages of index. It is well illustrated, with over 500 drawings and photographic reproductions. The page size is 9 $\frac{3}{4}$ by 6 $\frac{3}{4}$.

It is a good book and should be considered by anyone who contemplates a change of text-book. Certainly it would be well to have a few copies available for teacher and student reference in both high school and college. Mr. Pauli has succeeded in writing a book which should do much to stimulate interest and students. The third objective, to write a text based on the principle of evolution, has been skillfully accomplished.

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BROWN, F. A. JR., Editor. *Selected Invertebrate Types*. John Wiley & Sons, Inc., New York. 597 pp. illus. 1950. \$6.00. Thirteen zoologists, including those con-

cerned with the invertebrate course at the Woods Hole Laboratory, Massachusetts, have produced an excellent book of descriptive directions for the study of 122 genera of animals without backbones. Included are the well known types (*Euglena*, *Volvox*, *Amoeba*, *Paramecium*, *Pennaria*, *Obelia*, *Gonionemus*, *Aurelia*, *Metridium*, *Fasciola*, *Taenia*, *Ascaris*, *Lumbricus*, *Venus*, *Busycon*, *Loligo*, *Asterias*, *Arbacia*, *Molgula*) as well as many lesser known ones. There are several supplements and separate treatments on mussels, crayfish and *Homarus*, etc. No figures accompany *Polychoerus*, *Stenostomum*, *Procotyla*, *Fasciola*, *Crisia*, *Bowerbankia*, *Electra*, *Bugula*, *Xiphosura*, *Callinectes* and the crayfishes. The rest are splendidly illustrated, half-page to full-page plates.

Thirty-four protozoan genera are described in a section beautifully done. *Sycon* and *Nereis* appear under their new designations, *Scypha* and *Neanthes* respectively. Has the generic term "*Aurelia*" been superseded by the "*Aurellia*" which T. H. Waterman of Yale uses consistently in his context? The references cited on page 572 spell it the customary way, "*Aurelia*". *Saccoglossus* is offered as though it were not a chordate and *Branchiostoma* (*Amphioxus*) of the cephalochordates is not included. Many will welcome the inclusion of notes on the larva of *Drosophila*.

It is refreshing to find a worker (Goodchild) using "cuticula" correctly in place of the misused "cuticle", (cf. p. 197) and "scolex" in place of "head" (tapeworms, p. 196 ff.). He slips into calling the proglottids "segments", however (cf. p. 200). Authorities on the subject claim that there is no one "common" earthworm, a number of types other than *Lumbricus* deserving that hackneyed description. Some teachers will prefer the many available accounts of *L. terrestris*, perhaps, rather than that of Brown, p. 295 ff. Its non-cellular, secreted external covering is a *cuticula* rather than a "cuticle." "Cuticle", p. 298, is typographically misspelled.

Chaetonotus is the type selected for the Gastrotricha. One could wish that the often-encountered *Lepidodermella* had been mentioned as well as a non-spinous form.

Phascolosoma gouldii and *Loligo pealeii* are used, therefore why not be consistent with *Actinosphaerium eichhorni* as on page 567 rather than drop the final "i" (p. 593, 25, 27)? The legend to Figure 16, page 27, spells it correctly. Some typographical errors are caught here and there in passing: read *Hoploplana*, p. 158; *Cryptocotyle*, p. 166; *S. coeruleus*, p. 58 and jacket exterior; *Metridium*, p. 121; *A. aurita*, p. 572; *Reticulitermes*, p. 15. No cytophyge (anal pore) is shown in the drawing of *Paramecium*, p. 45. Fig. 29, p. 50, of *Frontonia* shows six only of the "eight to ten canals" feeding the contractile vacuole. This ambitious and well-done work will be of much use for both high school and college classes.

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THE NEW YORK ACADEMY OF MEDICINE. *The Future in Medicine*. Columbia University Press, New York. x+160 pp. 1950. \$2.50.

This newest volume of the New York Academy of Medicine's annual Lectures to the Laity series contains five articles and lectures on important recent developments which are influencing the future in medicine.

There is the Linsley R. Williams Memorial Lecture on Law and Medicine, by Robert P. Patterson, former Secretary of War. This includes reasons why the law lags behind science, necessarily, and proposed remedies so that it will not lag too far behind. The second of the series is an article by Ephraim Shorr, M.D., Associate Professor of Medicine, Cornell University Medical College, N. Y. This article, *The Endocrines, Servants or Masters?* contains material on the evolution of the endocrine system as well as some of the most recent information in this important field.

Then there is the One Hundredth Anniversary Discourse of the New York Academy of Medicine by Leo Alexander, M.D., Director, Neurobiologic Unit Division of Psychiatric Research, Boston State Hospital. *Science Under Dictatorship* is the title and there is considerable information on the fiendish experiments by German medical men