Book Reviews

The Vitamins: Chemistry, Physiology, Pathology. vols I and II. W. H. Sebrell, Jr., and Robert S. Harris, Eds. Academic Press, New York, 1954. vol. I, xiii + 676 pp. Illus. $16.50; vol. II, xiii + 766 pp. Illus. $16.50.

This review is concerned with the first two volumes of a three-volume reference work intended as a comprehensive coverage of the fundamental knowledge about the vitamins. In the initial volume, vitamins A, carotenes, ascorbic acid, vitamin B_{12} and biotin are dealt with, since the vitamins were selected on an alphabetical basis. The second volume is concerned with choline, vitamin D, essential fatty acids, inositols, vitamin K, niacin, and pantothenic acid.

As the editors state, they "have attempted to provide a guide service to the new and complicated areas" of what once seemed simple. In the organization of each volume, the various phases of the individual vitamins are dealt with by a contributor chosen for his competence in a given special field. Emphasis is placed on the chemistry and physiology of the vitamins, as the editors felt that the assay methods and the clinical manifestations of the deficiencies and their treatment were covered rather adequately in other publications. These phases are not entirely omitted, but are dealt with rather generally and supported by an extensive bibliography for consultation. This is particularly true for sections on determinations of the vitamins and the early history of the vitamins.

The contributors to this well-organized work have succeeded admirably in clearing up some of the confusion that has tended to exist in some phases of vitamin research. The material is presented in an exceedingly clear, simplified, and easy to read manner without loss of purpose. These volumes should prove extremely valuable to all investigators involved in vitamin research and particularly to those seeking authoritative appraisal and information of fields in which they are not directly active. The chapter on vitamin B_{12}, for instance, clears up considerably the confusion that has been associated with this vitamin. More than 125 pages are devoted to this rather recent member of the vitamin family.

The chemistry of the vitamins is treated in a very creditable manner. For example, the chemistry of biotin is divided into sections on isolation, chemical and physical properties, constitution, synthesis, analogs, complex compounds, and specificity. A similar treatment was made of the other vitamins. Of great value are the tables and structural formulas which summarize the chemical and biological aspects. This is particularly true for niacin, choline, vitamins A, and the carotenes. Similarly, the tables on the vitamin content of natural materials and information summarized on requirements should be welcomed by nutritionists.

Controversial phases of research, such as the vitamin-B_{12} relationship to choline and methionine synthesis, are considered in an excellent manner. All statements are well documented and any injection of theory or opinion by the writer is clearly indicated.

These volumes should be a stimulation for research. Sections on fields for further study are clearly indicated, with questions on present knowledge raised throughout for additional stimulation. For example, with respect to ascorbic acid, the contributor states that "regardless of a vast amount of work already completed in the field of enzyme and hormone interrelations of the vitamin, not many, if any, of the problems have been settled." Similarly, another contributor states that "the biological role of the essential fatty acids has not been elucidated, and only a few pieces of isolated information bear on the matter."

Literature references are given as footnotes at the bottom of each page for convenience, with a subject and author index at the end of each volume. References are included through 1952 and with a large number for 1953. Remarkably few literature omissions and errors were noted.

There are numerous plates, particularly with respect to the effects of a deficiency of vitamin A, choline, or ascorbic acid. Additional plates would be desirable as regards several other vitamin deficiencies. The quality of some plates did not seem to do them justice, considering the price of the books. The relatively high cost of this series will, unfortunately, limit its general use to some extent.

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Zoology. Clarence J. Goodnight and Marie L. Goodnight. Mosby, St. Louis, 1954. 730 pp. Illus. $6.50.

Clarence and Marie Goodnight, who teach introductory zoology at Purdue University, have added another volume to the shelf of zoology textbooks. A rather casual check shows that there are 23 other introductions to zoology at the college level in print, along with at least 40 introductory biology textbooks. A review of any new one, then, ought to be comparative but that would be a gigantic undertaking.

The various textbooks differ greatly in organization. There are the principles approach, the evolutionary approach, the physiologic approach, the morphologic approach—and, of course, the "dynamic approach," and a currently fashionable man-centric approach. Each book, as the publishers invariably point out, represents a "new approach."

The Goodnights have attempted a sort of blend. After an introductory section on science and the scientific method, the nature of life, and the basis of animal classifications, they have 11 chapters on the

various vertebrate organ systems. This is followed by a section on the "cell as the basis of organic activity," which includes chapters on cell structure, embryology, genetics, and evolution. Then comes a section, occupying nearly half the book, on the animal kingdom, which is reviewed phylum by phylum. Finally, there is a short chapter on ecology.

Except for details of organization, I do not see that the Goodnight book differs very greatly from its fellows. Almost all of these zoology textbooks are written in that curious dehumidified prose that the mouse tried out on the victims of Alice's tears, which seems not to be effective even as a drying agent. This book, like the others, is full of big words that the student will forget the day after the final exam and full of facts that the student will also forget.

Science, in these introductory textbooks, becomes a cut-and-dried affair—and this the students are likely to remember. The first chapter of this book, like so many others, takes up the "scientific method"—the gathering of facts, the formulation of the hypotheses, on to the discovery of "scientific law." There is a good deal about patient observation and objective evaluation.

Somehow this unreal "scientific method" symbolizes for me all that seems wrong with our college introduction to science. Can the uncertainties, the doubts, the unknown not get any mention? Can we give no feel of the historical context in which science has developed? Can we not look at scientists as men, and at science as one product of their humanity? Sometimes I suspect that these teachers of introductory science really believe in this scientific method that they foist off on their students; and the students certainly learn to regurgitate it on the exams. There is no hint of the process so neatly summed up in a saying attributed to Gauss: "I have had my results for a long time; but I do not yet know how I am to arrive at them."

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Streams, Lakes, Ponds. Robert E. Coker. Univ. North Carolina Press, Chapel Hill, 1954. xviii + 327 pp. Illus. + plates. $6.

This book is intended to be a fresh-water counterpart to the author's *This Great and Wide Sea.* That is, it is a book for that well-known abstraction the general reader and is at the same time useful as an introductory textbook. It is perhaps more suitable for the latter purposes (especially for courses in state colleges), since it is a competent, comprehensive summary of basic concepts, characteristics of various fresh waters and their biota. For such a book it is surprisingly up to date, with references up through 1953. As reading matter, however, it impresses me as somewhat static, perhaps because there is so much familiar detail in it. It is illustrated with some fine photographs (none in color, however) and line drawings. A usage unbecoming a university press is the printing of generic names in roman, while those of higher groups are more often than not in italics; the usage is inconsistent in any event. Nevertheless, the book well fills the gap between the technical presentations of Welch and Ruttner and the general ecology textbooks that skip lightly over limnology.

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Trigonometry. Elbridge P. Vance. Addison-Wesley, Cambridge, Mass., 1954. viii + 158 pp. Illus. $3.

This is a compact and carefully edited textbook on plane trigonometry, attractive in format, and adaptable to courses for varying lengths. The approach is fairly standard with a few novel features. It begins with a discussion of one- and two-dimensional rectangular coordinate systems and an intuitive treatment of arc length. The distance formula is derived and plays an important role in numerous later proofs in general settings, for example, that of the length of a chord in a unit circle, the addition formulas, and the law of sines and of cosines.

The general angle is introduced early, and the definitions of the functions in terms of the ratios of the sides of a right triangle appear later as a corollary to the law of sines. Extensive use of radian measure is made throughout the book. Revolutions, degrees, and radians are treated simultaneously with their interrelationships. Radians are defined in terms of revolutions.

Although the emphasis throughout is on the analytic aspects of trigonometry rather than the computational, the solution of triangles is handled in a brief but excellent manner, including material on significant digits. Previous exposure to logarithms is assumed; however, a brief discussion, along with interpolation and the use of tables, is given in the appendix. The basic four-place tables needed are included.

Some novel features in the book are the derivation of the functions of 36° and 3°, some approximations for functions of small angles, an interesting treatment of complex numbers as ordered pairs of real numbers, and a final section on applications of the circular functions to periodic phenomena.

I noted only one typographical error (p. 94). Some minor criticisms are these: the Greek alphabet is not mentioned but portions of it are freely used; equations of curves shown in the figures are not given directly on the graphs; the functions of 30° and 135° are given, but not those for 45° or 60°, and "function" is nowhere defined. Also the false impression appears to be given (p. 53) that the only angles constructible with ruler and compass are those that are integral multiples of 3°. Important formulas are numbered, but no distinctive type is used.

The sections on angles, exact values of the functions for $\pi/5$, the general reduction formulas, and the inverse circular functions are somewhat ponderous and