

vided a detailed account of the nutrition and metabolism of pure cultures of ciliates. The complexities in the nutrition of these "simple" animals, and the few species that have been pure-cultured, constitute a challenge to biologists and biochemists.

The entire volume, with its repeated emphasis on comparative biochemistry and physiology, should prove stimulating not only to protozoologists but to biologists and biochemists generally. It is quite clear that the "little animals" present many intriguing problems.

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The Vitamin B Complex. F. A. Robinson. New York: Wiley, 1951. 688 pp. \$9.00.

Knowledge of the individual compounds that comprise the vitamin B complex, and of their significance in nutrition and metabolism, has grown tremendously in recent years. Despite this fact, and the difficulties in orientation that it entails for the newcomer to the field, no up-to-date monographic treatment has been available until recently. This book was written to fill the gap; in the meantime, another monographic treatment of the same field has appeared (Williams *et al.* *The Biochemistry of B Vitamins*, Reinhold [1950]).

The present book treats each of the B vitamins (thiamin, riboflavin, niacin, vitamin B₆, pantothenic acid, biotin, folic acid, vitamin B₁₂, *p*-aminobenzoic acid, inositol) in a separate chapter, each organized under 6-22 subheadings. These include topics such as history, isolation, synthesis, properties, stability, methods for determination (chemical, biological, and microbiological), distribution in foodstuffs, effect of deficiencies in man and animals, effects on microorganisms, metabolism, analogs, etc. Bibliographic references are given at the end of each of the subsections, a practice that increases the ease of referring to them. This tends to create a discontinuity in the text, however, and frequently necessitates several printings of the same reference at different places in a single chapter. Good author and subject indexes are provided.

The diversity of the topics covered, and the large number of original papers surveyed, preclude an intimate knowledge of each topic by a single author; consequently, it is not surprising to find a considerable number of factual and interpretative errors in the text. Some of these, but by no means all, result from an uncritical acceptance of claims made in the original literature, but later corrected. For example:

N. sitophila can utilize pyridoxal, pyridoxamine, or pyridoxine with equal facility in satisfying its vitamin B₆ requirement, despite the statement (p. 313) that it utilizes only pyridoxine. Similarly, *Streptococcus faecalis* R and *Leuconostoc mesenteroides* P-60 grow without added riboflavin, despite the statement (p. 204) to the contrary. The reported growth and antianemic properties of α - and β -pyracin, emphasized at several points in the text (pp. 320, 336, 344, 459), have never been confirmed,

despite repeated attempts. Few nutritionists now believe that pernicious anemia is due to inability to utilize folic acid conjugates, or that vitamin B₁₂ is specifically required for the cleavage of such conjugates (p. 526). An inconsistency in nomenclature, which has the sanction of common usage but is nonetheless confusing and misleading, is continued in this book—namely, frequent use of the term *pyridoxine* as a name both for the specific compound, 2-methyl-3-hydroxy-4,5-bis(hydroxymethyl) pyridine, and as a term synonymous with vitamin B₆, and hence including the forms pyridoxal and pyridoxamine. One must judge from the context whether the specific or general sense is meant. Considerable space is devoted to chemistry of α -biotin. Most investigators in the field will feel that the existence of this substance as a distinct entity from synthetic biotin (β -biotin) remains to be proved.

Quantitative relationships are occasionally overlooked. Thus, the claim that *p*-aminobenzoic acid is required in the diet of trout is reported without comment (p. 552), despite the fact that the amounts reported as necessary (10-20 mg/100 g of diet) could scarcely be obtained by ingestion of any assortment of natural foodstuffs, if the data for distribution of this compound, reported elsewhere in the text, are correct. In general, the coverage of individual topics is quite complete to the date of printing. A notable exception is the treatment of distribution of the vitamins, where only illustrative values appear to be given, and little attempt is made to arrive at the most reliable estimates of potency in terms of present-day knowledge of assay techniques, extraction procedures, etc.

Individually, errors or drawbacks such as those illustrated above are perhaps of little importance; collectively they seriously lessen the usefulness of the monograph as a source of authoritative information. Nonetheless, the book contains a large amount of well-organized and generally reliable information that has not been summarized elsewhere. It is well printed and extensively documented. It thus provides a useful addition to the literature on vitamins, and one that merits extensive use.

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Scientific Book Register

Textbook of Electrochemistry, Vol. I. Rev. ed. of *Lehrbuch der Elektrochemie*. G. Kortüm and J. O'M. Bockris. Houston-Amsterdam: Elsevier Press, 1951. 351 pp. \$7.00.

The Anthropology of Iraq: The Northern Jazira, Part II, No. 1. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol. XLVI, No. 1. Henry Field. Cambridge, Mass.: Peabody Museum, Harvard University, 1951. 116 pp., tables and plates. \$6.50.

Antibiotic Therapy. Henry Welch and Charles N. Lewis. Washington, D. C.: Arundel Press, 1951. 562 pp. \$10.00.

Stages in the Evolution of Plant Species. Jens Clausen. Ithaca, N. Y.: Cornell Univ. Press, 1951. 206 pp. \$3.75.

Internal Constitution of the Earth. Rev. 2nd ed. Beno Gutenberg, Ed. New York: Dover, 1951. 439 pp. \$5.50.