BOOK REVIEWS, continued

I cannot recommend this text as the main one for a soil microbiology course. The presentations on the fundamental subject matter areas of nitification, nitrogen fixation, denitrification, and other inorganic transformations mediated by soil microorganisms is too general. The material on organic matter transformations is also too general for a soil microbiology course. It is always disturbing to read a text that promotes inaccuracies and gives incomplete information. I was particularly critical of material in Chapter 9 which concerns root nodule symbioses and the nitrogen cycle. The inaccuracies noted were (i) "An adequate supply of soil phosphorus helps to maintain the population of nodulating bacteria in the rhizosphere," and (ii) "Whereas nodules bacteria are little affected by the roots of non-legumes, they are greatly stimulated in the rhizosphere of their particular host and R/S ratio almost always exceeds 100." And (ii) the author also indicates that a certain population density in the rhizosphere is required to initiate infection and that this differs depending on whether the plant is grown in the laboratory or the field. To my knowledge none of these concepts are true. Perhaps a few publications provide some support to them but the bulk of the data do not. The nitrogen fixation discussion is also negligent in that the use of the acetylene-ethylene assay in measuring nitrogen fixation rates was not mentioned. Development of this technique was one of the most important achievements in nitrogen fixation research during the past decade.

The author states that "Because the book is not meant to be reference material, specific literature has been omitted from the text, although the contributions of individual workers are acknowledged where they are judged to be especially pertinent to the topic under discussion." I am in agreement with the author that the book would not serve as good reference material.

As a soil microbiologist involved in teaching and research I think this text may be useful as a supplementary book to be used in teaching undergraduate students soil microbiology. The text provides two good introductory chapters, a good chapter on the rhizosphere and on mycorrhiza. These topics are not covered as fully in Dr. Alexander's text, Introduction to Soil Microbiology. --- RICHARD WEAVER, Assistant Professor, Department of Soil & Crop Sciences, Texas A&M University, College Station, Texas.

Microbial Metabolism: Benchmark Paper in Microbiology

This is the 5th volume in a series of Benchmark Papers in Microbiology edited by W. W. Umbreit. As for all Benchmark Books, the purpose of this volume is to make more generally available in a single source the classic and recent papers that represent landmark developments in the field. The editor of this volume, H. W. Doelle, has made a selection of classic papers on microbial metabolism and has provided useful introductory comments and citations of other contemporary references which are helpful to the reader in reconstructing the sequence of events which led to major discoveries. All papers in other languages have been translated into English.

The majority of the 44 papers are not of interest to soil scientists. However, there are five papers which are classics for the soil scientist and microbiologist alike. These are the first report on nitrification by Schloesing and Müntz in 1877, the first isolation of nitrifiers and revelation of chemolithotrophy by Wino-gradsky in 1880, a report on sulfur oxidizing bacteria by Wino-gradsky (1887), demonstration on sulfate reduction by Beijerink (1895), and a report on denitrification in soil by Deherain (1897). One wonders why a topic of immense significance, nitrogen fixation, has been overlooked?

The book is divided into five sections with the first devoted to early stages of microbial metabolism—the Pasteur era; the second on carbohydrate metabolism; the third on inorganic metabolism; the fourth on aromatic metabolism—including Stanier's paper on simultaneous adaption and several papers on oxygenase, and the last on anaerobic fermentation.

If a soil microbiologist has not read the above mentioned classic papers, the convenience of this source makes this volume a worthwhile stop in the library.—JAMES M. TREDX, Associate Professor, Departments of Crop & Soil Sciences and of Microbiology & Public Health, Michigan State Univ., East Lansing.