Courses in U. S. universities on international agriculture, tropical crops, tropical soils, world ecology, or applied botany in the tropics could use this book and learn much useful information. It would probably be a better text for botany or crops than for soils. Most soil scientists would probably expect more information on soil suitability for the 13 crops discussed. Soils, drainage, and fertilizers are discussed as if each subject were discrete.

A confusing technique used throughout the book is the use of an admixture of British and metric units with only an occasional conversion following in parenthesis. This practice is explained by a note on Page XIX: "Since the book reviews diverse material both metric and other units are used." Compounding the confusion is the use of "cwt" standing for British hundredweight. This is one-twentieth of a British ton (long ton of 2240 pounds) and is 112 pounds and not 100 pounds as in the United States.

The strongest features of the book are the excellent discussions on botany of crops and the 19 pages of bibliography. A comprehensive introductory chapter and a detailed index are the beginning and end of a highly recommended book.—ROY L. DONAHUE, Professor Emeritus of Soil Science, Michigan State University, and Consultant on Soils, Agriculture, and Environmental Sciences, Midwest Research Institute, Kansas City, Missouri.

Some Methods for Microbiological Assay

This is the eighth volume in a technical series and includes the contribution from the autumn demonstration meetings of the Society for Applied Bacteriology, held in the United Kingdom.

There are 17 parts to the book. Most of the contributors are from the United Kingdom and each part deals with a separate methodology used in the field of microbiology. The first part deals with semiautomated methods for microbiological assay and the antibiotic susceptibility testing has been used for routine microbiological turbidimetric assays. This method gave mean values with low coefficient of variation that can provide a high degree of precision and accuracy and is described to be a reliable system for use. Authors have used it for a period of five years.

Other parts deal with the description and use of: an automatic dilution apparatus; automated identification of bacteria; automatic plating out machine for microbiological assays employing an 8 x 8 design; virus concentration by means of soluble ultratiters; inhibition from nitrite, assay of nisin in foods; assay of staphylococcal enterotoxins; assay of myo-inositol using the yeast Kloeckera apiculata: vitamin assay bacteria, a simple, rapid assay for the measurement of antibiotic concentrations in human serum; bioassay of agricultural and horticultural fungicides; testing bacillary plates; microbiological assay of chemicals for the protection of wood; techniques for the assay of effects of herbicide on the soil microflora; and microlaue for the assay of herbicides.

Each chapter is written clearly and methodology is described in a way that can be used in most bacteriology labs. In a research lab, of course, one has to try out these methods and later may or may not feel the need to modify the procedure.

These assay methods cover a wide variety of fields and can be useful to workers in industry, government, and university research labs. Some methods can be used in graduate level courses in applied bacteriology, soil microbiology, or systematic bacteriology.

The automatic identification of bacteria using ammonia-releasing enzyme (L-asperinase) is fascinating and will save a lot of tedious, back-breaking jobs of the identification of an unknown. Authors of this section have concluded by making a statement that their automated system reduces overall testing time by 3-12 days and reduces considerably the labor involved in identification.

In my judgment the assay methods described in this book look time-saving; the book provides reliable, bench-tested methods for a variety of workers, and also presents some new ideas in the area of uivating for microorganisms.

This book will be a valuable addition for research workers who want to try new time-saving methods and are willing to modify and methods according to their needs, equipment, etc. I found other volumes in this series also useful for microbiologists.—P. CHANDRA, Professor of Microbiology, Lake Superior State College, Sault Ste. Marie, Michigan 49783.

Die Bodenkunde
Die Bodenkunde und ihre geologischen, geomorphologischen, mineralogischen und petrologischen Grundlagen (Soil Science and its geological, geomorphological, mineralogical and petrological Fundamentals.) By Prof. Eduard Muckenhausen, DLG-Verlag-GmbH, D-6000 Frankfurt am Main, Rasterstrasse 13, West Germany. 580 p. plus 24 color plates. 1975. DM 190/US $76.00.

Written by the founder of the present soil classification system used in Germany, this book serves as a textbook and reference work for the area of soil science.

The first 186 pages are the geological basis of soil science with an explanation of: rock formation and characteristics; minerals; landscape features and their formation, especially with development of European systems; plus geological processes, which affect soil formation. It is very rich in illustrations, thus providing good associations with the nomenclature, and an extensive, current bibliography of general and selective works from numerous countries is included, bringing in a broad range of ideas.

The second part of the book represents soil science in the narrower sense, with chapters on: soil characteristics (CEC, pH, structure, etc.), organic matter, soil water, soil biology, soil genesis, and a large section on soil classification. Not only the present German system is discussed in full, but the systems from the USA, USSR, France and the Netherlands are also reviewed. It is not written with an emphasis on pedochemistry, but with a geological-geomorphological point of view. Areas such as clay minerals are intentionally not extensive because of research that is special and works in these areas. It also contains no chapters on soil fertility and soil management as is common in American texts, but does have short chapters devoted to soil conservation, mapping, and soil evaluation. Many new methods of soil research are indicated and generally, good advantages are pointed out well. The entire book is strongly outlined, and the index is divided into two parts. Both parts also include numerous graphs and tables. The style is concise and also avoids cumbersome grammar forms, making it easy to understand; the terms are well defined and often include alternate or foreign terms. The color plates at the back are of the major minerals and rocks connected with soil formation and 24 aquarell paintings of soil profiles with descriptions follow.

Die Bodenkunde is of particular interest to the people dealing with soil classification and genesis, geomorphology, geology, mineralogy, petrology, geography and soil science in general, but also has value to those in neighboring areas of soil science and agriculture, who require knowledge of these basics and can come into contact with foreign literature. Although the price is considerable, it should be available to major public, university, and private libraries as a reference work.—ALAN C. PLANTZ, Undergraduate Student in Soil Science Presently on Junior Year Abroad Program through University of Wisconsin-Madison, Bonn, Germany.

Field Engineering for Agriculture Development

Developing, managing, and improving soil and water resources to increase food production is of major importance for all developing countries. It is only by improving the management of the soil and water presently utilized in food production and the development of additional soil and water resources will the food and fiber requirements in the developing countries be met. This soil and water development, management, and improving aspect of agricultural engineering is called Field Engineering in Britain and Soil and Water Engineering in the United States.

The developing countries and even the developed countries do not have sufficient trained manpower to implement improved field engineering practices or to develop the additional soil and water resources necessary to meet the anticipated food and fiber needs of the world. It will therefore be necessary to utilize untrained technicians and laymen in field engineering. To utilize untrained people will require manuals, state-of-the-art papers, and training programs to teach the best practices of field engineering. Only in this way can the available manpower resources be strengthened to meet the need. The purpose of this book is "to help bridge the gap between the unskilled layman and the professional agriculture engineer." The book purports to provide simple practical how-to-do-it information for laypersons with a minimum of theory and mathematics. In many instances the book achieves its objectives, but often it falls short of its goal. Many explanations or simple calculations are implied rather than being explicit. For example, in the chapter on irrigation the question is asked, "How much (water) to apply?" But no simple calculations or explicit directions are