BOOK REVIEWS, continued

Soil Map of the World—General Legend and North America
Prepared and published by the Food and Agriculture Organization of the United Nations (FAO) and the United Nations Education, Scientific and Cultural Organization (Unesco). Copies of the map are available from UNIPUB, INC., P.O. Box 433, New York, NY 10016. 1973. One legend sheet $16.50; two map sheets $33.00.

This colored map consists of 18 sheets plus a legend sheet. The scale is 1:5,000,000. The information on the map is in English, Spanish, French and Russian. This review is of sheet II-1 and II-2, North America.

The base map, copyrighted by the American Geographical Society in 1942, is a bipolar oblique conformal projection. Longitudinal lines are evenly numbered on sheet II-2 and they decrease in number toward the North Pole. All latitudinal lines are evenly numbered. Other features shown include most named rivers, railroads with major towns and cities along the line, and state boundaries. These are dimly shown.

The soil classification system used by FAO consists of 106 soil units grouped at a higher category into 26 taxa. These taxa have similar but not identical taxa in the soil classification system used by the National Cooperative Soil Survey of the USA. These 26 taxa of FAO, with a similar taxon or taxon of the USA system in parentheses, are Fluvial (Udalfs, Udufults), Alluvial (Aquents, Aquents, Hapludolls). Lithic, Lithic (Lithic). Arenosols (Soils with hard rock within 25 cm), Arenosols (Oxic Quartzipsamments), Rendzinas (Rendof, Rendof), Spodosols (Spodosols). Soils (Soils with thin horizons). Yermosol (Typic Aridisols), Xerosol (Mollis Aridisols), Austrosol (Austrosol), Vertisol (Typic Aridisols). The dominant soil unit occupies > 20% of the mapping unit. If other soil units occupy > 20%, they are shown in the legend as associated soils. Other important soils occupying < 20% are shown as exclusions. The textural classes are shown only by numbers: 1 (coarse textured), 2 (medium textured) and 3 (fine textured). The slope classes are shown by small letters: a (level to gently undulating, 0-8%), b (rolling to hilly, 8-30%) and c (steep, more than 30%). Some of the phases shown by overprinting are stony, lithic, petrocalcic, frangipan, duripan, saline and sodic. The boundaries of the permafrost and the intermittent permafrost are also shown.

The Soil Map of the World will improve our international communications about soils, soil behavior, their use, management, productivity and conservation.—Andrew R. Andersen, Department of Agronomy, University of Nebraska, Lincoln, Nebraska.

Soil Properties and Behaviour

This book is a substantive revision of the authors' previous book, Introduction to Soil Behaviour published in 1966. It is designed as a textbook for courses in soils engineering and soil science. It also provides handy reference for soil researchers and a foundation for those conducting research who are not acquainted with the unique behavior of soil as a physical material. While the book can be classified as a book on soil physics it is not restricted to a consideration of soils with water. In general, the soil-water system is analyzed in terms of physical behavioral response to the application of forces or atmospheric stresses. The abundance of information on the physical behavior of soil gives a good basis for insight into geotechnical engineering problems where the soil's response to physical loads must be understood. The book therefore complements a series of books in the soil physical area which are restricted to the behavior of water in soils.

It represents an extension to establishing the current state of knowledge in this area.

The book is divided into 11 substantive chapters. The first three chapters introduce and discuss the solid framework of the soil: soil particles, clay particles, and the soil fabric and structure. Emphasis is placed on the importance of clay minerals in determining the behavior of soils. The discussion of the nature of clay minerals, the role of absorbed water and ions, and the interaction of clay particles provide the mechanisms of behavior discussed in subsequent chapters.

Chapters 4 and 5, representing 20% of the book, discuss concepts of water in the soil and methods of measuring water. Both saturated and unsaturated flow are discussed.

Chapters 6 through 10 are concerned with the physical behavior of soil under stressing. Swelling, shrinking, consolidation, yield, and shear are all discussed separately and comprehensively, applying knowledge developed in the earlier chapters. These chapters provide a good basis for a rational application of principles of the solution of practical problems.

Chapter 11 on soil freezing is the only significant discussion of this phenomenon found in advanced soils texts.

The only reference is in a single list which supports all the chapters. In addition, there is a section of suggested reading to complement selected subject matter areas. There is a healthy percentage of recent references, indicating that each topic discussed has been updated and redigested in the light of latest progress in soil behavior research. The subject matter content of the chapters themselves bears this out. It is profusely and excellently illustrated with sketches, graphs, and photographs to enhance the discussion of concepts and relationships. Its organization and rounded treatment of the various chapters make it ideal for use as a textbook or background source since selected parts can be used without a lot of cross-referencing between chapters. The book is comprehensive, of great importance and is easy reading; it should be a welcome addition to the bookshelves of individuals interested in the physical and mechanical behavior of soils. Those possessing Introduction to Soil Behaviour will assuredly want to have this most recent contribution of the authors.

This book will be important reading for advanced students studying soil physics, soil mechanics, soil science, and soil dynamics. Agricultural engineers and soil scientists conducting research on the physical aspects of soil and soil-machine systems will find the book a very helpful reference.—William R. Gill, National Tillage Machinery Laboratory, USDA-ARS, Auburn, Ala.

Characteristics, Classification and Adaptation of Soils in Selected Areas in Sierra Leone, West Africa
By R. T. Odell, J. C. Dijkerman, W. van Vuure, S. W. Melsted, A. H. Beavers, P. M. Sutton, L. T. Kortz and R. Miedema. Bull. 748, Agricultural Experiment Station, College of Agriculture, University of Illinois at Urbana-Champaign; and Bull. 4, Njala University College, University of Sierra Leone. 194 p. 1974.

This thorough report discusses soil formation factors, soil characteristics, genesis and classification, adaptation and management of soils for five representative areas of Sierra Leone.