BOOK REVIEWS

MONOGRAPH ON NITROGEN FIXATION IN SOILS

Agriculture, Volume IV, Agricultural Society, Sheila Dhar Institute of Soil Science, University of Allahabad, India, 1954.

At the outset of this monograph, S. P. Mitra, one of several contributors, states that the only practical solution to the problem of world hunger is to increase the productivity of land already under cultivation. In eastern countries, such as India, the price of commercial nitrogenous fertilizers puts them far beyond the means of the average farmer, and thus nitrogen fixation by natural means, in the field, assumes utmost importance. Contrary to the usual approach in the United States, these workers place relatively minor emphasis on symbiotic and non-symbiotic biological nitrogen fixation. Workers in America will be interested in the rather lengthy sections devoted to photochemical nitrogen fixation, a facet of the overall nitrogen problem which receives scant attention in this country.

According to theories first developed by N. R. Dhar, neither soil nor bacteria are absolutely necessary for nitrogen fixation. Any surface where oxygen, hydrogen, nitrogen and energy material can come in contact in the presence of light suffices for the fixation reaction to occur. Results of investigations utilizing sawdust, straw, coal, and other organic energy sources are discussed. A final paper proposes a photochemical theory to account for the formation of nitrate beds in nature.

It is regrettable, especially since the existence of the photochemical reaction is still subject to considerable controversy, that the authors have not detailed experimental procedures. One would like to know, for example, the techniques employed to insure the sterility so essential in many of these studies. Since it is often difficult to trace small changes in the nitrogen status of soils, a knowledge of sampling and analytical methods used would also be helpful in evaluating the significance of the various papers in this monograph.—Howard Loewenstein

HEAT CONDUCTION—WITH ENGINEERING, GEOLOGICAL AND OTHER APPLICATIONS

By Leonard R. Ingersoll, Otto J. Zoeebl and Alfred C. Ingersoll.

Madison, Wis., University of Wisconsin Press, 340 pp. 1954. $5.00.

This is a very useful book for students, engineers, and research workers, covering in a clear, concise manner the conventional mathematical methods for calculating heat flow and temperature distribution for numerous practical cases. Various short cut auxiliary methods are also given, along with illustrations.

Applications of the extensive mathematical literature dealing with heat problems are made to other fields, including agricultural soils and soil mechanics. The similarity of Fourier's law for heat flow to the Darcy law for saturated flow of water in soil is pointed out so that methods and solutions for heat problems apply directly for some water flow problems in soils. The same applies to water vapor transfer in relatively dry soils where a linear diffusion equation holds. The driving force for unsaturated flow, however, is hyperbolically related to water concentration and the heat methods do not apply to this important case.

Heat and temperature problems related to soils are dealt with in several chapters and soil physicists will find this book to be of interest and use. Conversion factors for various units, and methods for measuring various thermal properties of solids and liquids are pointed out. The authors are to be congratulated for using metric units mostly in their problems and illustrations.—L. A. R.

METHODS OF SURVEYING AND MEASURING VEGETATION

Published October, 1954

MARKETING (THE YEARBOOK OF AGRICULTURE)


This volume is the 55th in the series of the Yearbooks issued by the U. S. Department of Agriculture. This year the volume includes marketing, and the book covers the complete range of marketing, and the book covers the complete range from the time it leaves the farm to its ultimate destination.

Subjects discussed in the volume include salesmen in the field, cooperatives and cooperatives, fair dealing, ownership, prices and pricing, and the like. As in other recent yearbooks, this year's volume includes a record of the number of farmers, the number of farmers who are USDA employees. Others are producing the report. The editors have given the report to the USDA staff.

Included in the volume is a statement that large-scale production of livestock and livestock products from the time it leaves the farm to its ultimate destination.

Each chapter of Congress receives a certain number of copies of this yearbook. Over the past 40 years the Royal Agricultural University has collected a vast amount of information on the tropics based on data from workers in economics, sociology, and related fields. The review should be particularly useful to economists, animal husbandmen and range managers, as providing background information.

FARM BUILDINGS, 4TH EDITION


This book is designed as a textbook for a one-semester college course. Special consideration is given to such factors as labor efficiency, functional utility and flexibility of use and modern-day principles of farm buildings. This year the book is up-to-date to include structures for dairy cow milking parlor, large-scale poultry housing, and utility-type buildings. There are sections on barns, cattle, beef cattle, sheep, grain, poultry, general residential housing. These chapters are developed to guide the reader in making a wise choice of plans.