APPLICATION OF GENETICS TO COTTON IMPROVEMENT. By Joseph Hutchinson. New York: Cambridge University Press, American Branch, 32 East 57th Street, New York 22, N. Y. 87 pp. 1959. $3.00.

A cursory reading of this book leaves the impression that the title is misleading and that the author is re-stating theses presented in an earlier publication (Evolution of Gossypium, by Hutchinson et al., 1947, Oxford University Press). But the book warrants more than a cursory reading.

The author first gives attention to the relatives of cotton as an indication of the limits of genetic diversity available for cotton improvement. The origin and spread of old world cottons (13 chromosomes) and new world cottons (26 chromosomes) are depicted within these limits of diversity. Changes within old and new world cottons represent separate pools of diversity which have been exploited to fit the needs of man.

The apparent association between genetic variability and natural population size has given distinct evolutionary patterns in cotton. These patterns are of interest to the cotton breeder in that the greatest diversity appears near the periphery rather than near the center of origin, which is contrary to the generally accepted thesis of Vavilov. The author emphasizes this in approaching the practical problems faced by cotton breeders.

Breeding may be regarded as an exercise in the management of variability, the author states. He proposes that a selection index be established upon an estimate of the current genetic variance for each trait subjected to selection pressure maximizes genetic progress. The improvement of African cottons is cited as evidence that the genetic diversity of evolutionary significance has equal significance in cotton improvement. Further, although much could be said about breeding systems, the success of any system is a function of the measurable genetic diversity.

The book is well written and the author's views are clearly stated. These views should excite the interest of plant breeders in general and cotton breeders specifically.—B. A. WADDELL, Department of Agronomy, University of Arkansas, Fayetteville.


This is the first volume published in a proposed six volume series, designed (in the words of the editor) to "say what Plant Physiology is about and to do this in sufficient detail and with sufficient analysis of, and even extracts from, the ever expanding literature, so that each volume will be in large measure self-contained." Volume I, when published, will supplement Volume II on the topic of Cell Physiology and Problems Relating to Water and Solutes. Volumes III and IV will deal with the subject of Nutrition and Metabolism. Volumes V and VI will be concerned with Growth and Development. The treatise aims, then, not simply at bringing research workers up to date on the latest advances in various specialties, but rather at synthesizing the current body of knowledge of plant physiology, much like the treatise of Pfeffer some fifty years ago.

Volume II is divided into seven chapters, each written by a different author(s). Runar Collander, in Cell Membranes: Their Resistance to Penetration and Their Capacity for Transport, discusses the ability of cells to control the passage of substances across boundary surfaces, particularly from the standpoints of permeability and active transport. Water Relations of Cells by T. A. Bennet-Clark and The Water Relations to Stomatal Cells and the Mechanisms of Stomatal Movement by O. V. S. Heath are written from the standpoints of osmotic behaviors and the water relations of specialized cells such as the guard cells of the stomata. The volume has 124 illustrations, including 46 tables and 73 diagrams, and an excellent bibliography which in itself merits the price of the book. The book is well written and should serve as an authoritative reference in plant physiology.

This treatise should occupy a unique position in the literature of plant physiology. The general plan of organization is well conceived and it is hoped that succeeding volumes will meet the same standards set by Volume II. The book should serve as an invaluable reference for workers in the biological sciences.—R. E. FRANS, University of Arkansas.


This book contains a description of electrophoretic techniques currently used for the identification, separation, and analysis of electrically-charged particles. Among the topics covered are the moving boundary method of Tiselius, electrolytic and electrophoretic migration medium, and paper electrophoresis. The various techniques are described, and the equipment required is shown.

Three chapters in the book are devoted to the discussion of electrolytes and colloidal behavior; another three to the discussion of particle mobilities. The concluding chapter discusses applications of electrophoresis, including the use of electrophoresis as a tool for soil research.

This book should prove to be a useful reference for the scientist with interests in soil organic matter chemistry, soil biology, and clay mineralogy. The importance of electrophoresis as a tool for soil research is apparent from the interest shown by the book. Many of the authors stressed basic principles of electrophoresis, and they have adequately the application of these principles to colloidal suspensions and solutions of electrolytes. The book should serve as an invaluable reference for workers in the plant sciences and for those concerned with soil research.


This book contains the papers presented at the Congress with discussion from the floor, on the general subject of fertilization in relation to soil moisture. Of the papers presented, 4 are in English. Summaries are given in English, French, Spanish, and German.

The President of the Congress summarized the various papers in his closing address. An adequate complete subject index is included.

The papers were presented by authorities from Germany, Great Britain, Israel, Japan, France, and the United States. Many of the authors stressed basic principles of potassium nutrition as influenced by soil moisture levels. The utilization of potassium on the water economy and dryland crops was presented.

The Congress was organized into four sessions: (1) Fertilization problems in Spanish agriculture; (2) Fertilization and plant; (3) Water, potassium, and soil; and (4) Water and plant regions showing water deficit or water excess. These are: Potassium fertilization in irrigated areas of the United States; potassium present in the various mechanisms of the plant; The morphological and physiological conditions of potassium uptake in relation to soil moisture. The book is well written and should be an invaluable reference for workers in the plant sciences and in soil research.