those plants and animals smart enough to have gone in partnership with them" (p. 61).

Aside from abstract contemplations, the reader may get the benefit of a philosophy that is much closer to his home and pocketbook. The tremendous losses caused by fungi in stored grain may serve one example.

Of greatest interest to practicing foresters should be Christensen's viewpoint on the biological methods of parasite control. At regular intervals, this 120-year old idea is pushed to the foreground as a possible means of extermination of undesirable organisms, human included. In Christensen's opinion "As the problem has been gone into more thoroughly from various angles, the early hopes of easy control by this means have been greatly modified. Or, if you like it bluntly, most of such attempts have been partial or complete flops." (p. 164). After considering the meager results obtained by biological control with insects, i.e., organisms totally unprotected by public health services, sanitation corps, or quarantines, Christensen believes that "Neither, however, is there a biological basis for the type of hysteria that the idea of biological warfare or germ warfare has been greeted with in some sections" (p. 166).

The dim outlook on the possibility that some microbes will take over our job of parasite control should not diminish the interest in the struggle of living creatures for the maintenance of natural balance. The most astonishing illustration of this struggle is probably provided by the predatory fungi equipped with constricting spores for trapping nematodes, slippers, and exclusive mites which are hundreds of times the size of the molds that trap them. The Molds and Man is one of the "must" books for all agriculturists and soil specialists who are willing to avoid themselves of the rare opportunity to increase their knowledge of the life surrounding them, and, at the same time, have pleasure in so doing.

— S. A. WILDE.

THE DESIGN AND ANALYSIS OF EXPERIMENTS


The author is professor of statistics at Iowa State College. This book will be particularly useful to the researcher who needs to understand the theory and practice of statistical designs, to the consulting statistician, and to the mathematician statistician.

The techniques presented are given with a minimum of advanced mathematics, but the mathematical justification for each technique is also included. This book does much to tell the "why" of statistical methodology. — A. F. BILL.

PHOSPHORUS METABOLISM


A first symposium on phosphorus metabolism was held at Johns Hopkins University under the sponsorship of the McGolm-Pratt Institute. This publication consists of the papers and discussions presented at these meetings. It is a book for the specialist in the physiology and biochemistry of living organisms, plant, animal, and bacterial.

Phosphorus is one of the minerals essential to life. Certain of its functions have been long known, but its major role is its participation in the metabolism of a large number of intermediates, coenzymes, and enzymes. It is released from these molecules without passing through the state of inorganic phosphate, the utilization of carbohydrate by microorganisms, the interconversion of different sugars, the breakdown of sugars, fats, and organic acids as part of the respiratory process, the thermodynamics of phosphate bonds, especially of high-energy phosphate bonds such as adenosine triphosphate, a key substance in a great many biological reactions, the utilization of this energy in organic reactions, and other phases. Nearly all the evidence for these reactions comes from animal and microbiological experimentation, but enough supporting facts have been found to indicate that the green plants can carry on an essentially similar manner respiration, carbohydrate synthesis, and perhaps protein synthesis, as part of phosphorus metabolism. — J. T. SULLIVAN.

SOIL DEVELOPMENT


This book is more or less a sequel to Plowman's Folly, which was published in 1945 and first described Mr. Faulkner's ideas and philosophy of improving crop production by discarding the moldboard plow.

The author's main thesis is that any soil can be improved by merely changing from the use of the moldboard plow to some other form of tillage. This change, he says, will eliminate the plowsol layer of organic matter which the moldboard plows at a depth of about 6 inches in the soil. This "plowsol" is, according to Mr. Faulkner, the root of all soil evils, since it cuts off the capillary streams of water, which he contends would normally bring up to the surface soil adequate moisture and plant nutrients for the abundant crops. He does not, however, express any definite preference for a substitute implement. The disk is apparently satisfactory, and he suggests the use of the plow share without the moldboard.

Mr. Faulkner's primary recommendation is to incorporate all organic remains from each crop grown into the upper 2 or 3 inches of soil. This would produce a yellow, friable condition at the surface; but even more important, it develops a black color — which he says is the true earmark of a fertile virgin or "redeveloped" soil.

Whether or not a commercial fertilizer is to be used during the initial stages of this soil development program depends, he says, on whether or not the farmer can afford to wait for nature to replace the lost nutrients. However, after the soil is redeveloped, there is no need for pesticides, fungicides, and other chemicals; and all plant disease and insect problems will be reduced to a point where special treatment is unnecessary.

This reviewer has, unfortunately, not read Plowman's Folly from cover to cover, but apparently this new book is the same basic material plus the results of 7 more years of observations and "investigations." In addition, Mr. Faulkner expounds his ideas on the part his improved soils play in human nutrition, including what appear to be some excellent recipes for pancakes and whole wheat bread.

There is no question but what many of the author's ideas on soil management are sound and practical. Many agronomists also have objected to excessive tillage and plowing, especially on certain types of soil. But some of the reasons set forth by Mr. Faulkner seem to be somewhat contrary to well-established facts, an example being his statements concerning the rise of capillary water and the universally high mineral content of this water. — L. G. Moroney.

REFERENCE BOOK OF INORGANIC CHEMISTRY


Reference Book of Inorganic Chemistry is the third edition of this book, first published in 1929. According to the authors, added emphasis has been put on thermo-dynamical data, such as oxidation potentials, equilibrium constants, and free energies. Oxidation-reduction potential diagrams have been given for almost every element.

A new chapter on actinium and the heavier elements has been added. More attention is given to plutonium and the other new transuranium elements. The chapter on the atomic nucleus has been rewritten to include all general types of nuclear reactions. More information has been included in the chapters on boron, phosphorus, and silicon.

The book assumes a familiarity with the field on the part of the reader. The authors suggest that it has not been "written down" to the level of elementary students. Thus, it can be expected to have its greatest value for persons with somewhat more than an elementary knowledge of chemical terminology.

TRACTORS AND THEIR POWER UNITS


Tractors and Their Power Units is a comprehensive book about the theory and performance of tractors. It is technical in nature, but will be of value to the crops or soils worker who must utilize power machinery in his field experiments. The 26 chapters contain such titles as "Ignition Systems," "Power Take-off," "Belt Pulleys," "Power Lifts," "Hydraulic Controls," and "Traction and Traction Devices."