by determination of the excess barium. His discussion progresses through a well-rounded, thorough treatment of the subject.

The author divides his subject into four parts: introduction, general principles, practical aspects, and applications. Consideration of fundamental principles includes properties of ion exchange resins, ion exchange equilibria, ion exchange kinetics, and ion exchange column operation. The practical part includes the technique for ion exchange separations for analytical purposes and the technique for ion exchange chromatography.

Over two-thirds of the book is devoted to the 19 chapters on applications, which include determination of total salt concentration, removal of interfering ions, and inorganic analysis, inorganic colloids and high polymer electrolytes, isolation of trace constituents, inorganic qualitative analysis, chromatographic separation in inorganic chemistry, isolation of low molecular weight organic acids, high molecular weight organic electrolytes, alydehydes and ketones, sugars and polyhydric alcohols, sulfate waste liquor, algaloids, amino acids, nucleotides etc., vitamins, antibiotics, other biochemical and biological applications, investigations of complex salt solutions, and clarification and recovery of analytical reagents. An appendix gives characteristics of commercially available ion exchangers and the characterization of mesh sizes of screens. The documentation to the literature is extensive. This book will make a substantial contribution to the work of soil chemists.—M. L. Jackson.

**Sampling Techniques**

*By William G. Cochran, New York, John Wiley & Sons, Inc.* 1953. $5.00.

Prof. William G. Cochran is eminently qualified to present the particular subject. He is well known, by reputation at least, to Agronomists through his joint authorship of a previous publication, "Experimental Designs." At various times, Prof. Cochran has served as Statistician at the Rothamsted Experiment Station, Professor of Mathematical Statistics at Iowa State College, Associate Director of the Institute of Statistics, University of North Carolina and currently Professor of Biostatistics at the School of Hygiene and Public Health, The Johns Hopkins University. During World War II, he conducted sampling studies for the United States Strategic Bombing Survey.

The book "Sampling Techniques" is an outgrowth of a series of lectures on sample survey techniques given at North Carolina State College. The level of presentation assumes that the reader has had some preparation in both Statistics and Mathematics. The book presents a reasonably detailed development of sampling theory with illustrations of how the theory may be applied in practice. In the early portions of the book detailed proof are provided for each of the theorems presented. In later portions of the book, the proofs are presented in much more condensed form.

The presentation is quite logical, with an excellent balance between theory and practice. The book should prove very useful to anyone interested in sampling techniques. Sample surveys have demonstrated their usefulness in many fields. The use of sample surveys has been somewhat limited in the field of Biology and even more limited in Agronomy. The failure to use this technique should not be construed as an indication of limited value; rather it indicates that those problems have been almost completely ignored for which survey sampling would provide an adequate tool. A greater realization of the usefulness of surveys under a wide variety of conditions will certainly lead to their eventual use by Agronomists.—G. F. Sprague.

**General Chemistry**


"An Introduction to Descriptive Chemistry and Modern Chemical Theory" is the subtitle which the author, professor of chemistry at the California Institute of Technology, gives to this second edition of his college chemistry text. In revising his first edition, the author has had to face the prevalent problem of introducing a subject which itself is in a state of uninterrupted progress. In meeting the problem, he has introduced two new chapters dealing with atomic physics which give quite thorough discussion to the discovery of the electron, the nucleus, the quantum theory, the photoelectric effect and the photon, the Bohr theory of the atom and other related aspects of atomic science. The discussion on elementary physical chemistry is broadened beyond the scope of the first edition, and a chapter on biochemistry has been added. These introductions of new material, the author concedes, expand the contents beyond that which can be adequately covered in a one-year course. However, this feature would enable an instructor to exercise some selection in adapting the text to the special needs of a class. Prof. Pauling's book should well serve the first year needs of students who intend to pursue the subject in advanced and specialized fields.

**The Practice of Arable Crop Experimentation**

*By P. N. Harvey, Sprowston, Norwich, England, Norfolk Agricultural Station, Paper bound, 1933.*

This little booklet presents a detailed account of the field plot techniques which have been developed at the Norfolk Agricultural Station, England, over the past 25 years. A small amount of space is devoted to principles of modern field experiments and the problem of reducing experimental error. The major portion of the pamphlet, however, is devoted to suggestions for locating and marking out trial areas and the procedures used with cereal, root, flax and grass crops. The presentation would be useful to someone having had no previous experience in this field. Its interest to the experienced investigator would lie in the presentation of methods and procedures which have been found valuable under environmental and agronomic conditions which are quite different from those commonly encountered in the United States.—G. F. Sprague.

**The Ustilaginales of the World**

*By the late George L. Zundel, State College, Pa. The Pennsylvania Agricultural Experiment Station, XII + 410 pp. 8 1/2 x 11 inches, multilithed, bound, $4.00 ($3.50 plus 50c handling charge). Only 550 copies printed.*

This is an important monograph representing the life work of one of the leading Ustilaginologists of the world, and published below cost by the Pennsylvania Agricultural Experiment Station. It contains 140 plates, 188 illustrations of the fungi, host symptoms, synonyms, type hosts and distribution of all the known grain species of the world, together with a host index and an index of synonyms. The manuscript was completed in 1945 but publication was delayed because of World War II and other difficulties.—H. W. Popp.

**Soil Science Simplified**

*By Helmut Kohake, West Lafayette, Ind., Published by the author.* 66 pages, illus. 1935. $1.00.

Prof. Helmut Kohake, soil scientist at Purdue University, has written this little booklet to "give an understanding of the nature and behavior of soils to all those who want to become better acquainted with the soil and who have not the time to devote to an extensive study." Material was originally presented as a lecture series for young people attending conservation camps in Indiana. Well illustrated, the book is well suited as a reference book for vocational agriculture students. For the most part it presents the technical aspects of soil science in manner suitable for "popular" consumption.

**Crop Production: Principles and Practices**


The basic principles of farm crop production are presented in this excellent volume which is well arranged and written in a clear, concise style. These features should render it extremely useful for a beginning college course in crop production as well as for high school vocational agriculture use.

The book starts out with two general chapters on the nature and function of crop plants. Following are 18 chapters devoted to individual treatment of the major crops grown in the central and northern U. S. Six other chapters deal with pastures, haymaking, grass silage, weeds, rotations and green manuring, and plant breeding. Helpful features include a glossary, tables of weights and measures, and lists of major crop diseases and insect pests. Careful indexing, effective illustrations, and judiciously chosen tables enhance the usefulness of this book.