

position to give a complete course on them.

MALCOLM M. HARING

UNIVERSITY OF MARYLAND  
COLLEGE PARK, MARYLAND

**The Nature of a Gas.** LEONARD B. LOEB, University of California. John Wiley and Sons, Inc., New York City, 1931. x + 153 pp. 11 figs. 14.7 × 22.7 cm. \$2.50.

This text is Monograph No. 1 published under the auspices of the Committee on Electrical Insulation of the Division of Engineering and Industrial Research, National Research Council.

The book is divided into three parts: Introduction, The Kinetic Picture of a Gas, and Ionization Phenomena. The first deals with the electrical structure of atoms and molecules. Starting with the fundamental properties of the electron the author presents in logical sequence the necessary factors that lead to the generally accepted present-day ideas of atomic nuclei, the extranuclear structure of the atom, and molecular structure.

The second chapter explains the behavior of atoms and molecules in gases under normal conditions from the point of view of kinetics. In it are discussed Avogadro's Number, Joule's Law, Mean Free Path, Molecular Velocities, and the Law of Equipartition of Energy, concluding with a summary that provides a qualitative picture of a gas.

The third part is concerned with atoms and molecules disturbed from their normal electrical states. In this portion are discussed "the conditions causing such disturbances, the laws governing them, and the nature and extent of the disturbances produced." The author treats of the various general phenomena in excitation and ionization, together with special reference to ionization in gases.

In the appendix are tables of molecular constants, such as molecular radii, molecular velocities, mean free paths, a table of useful constants and conversion factors, and a rather comprehensive bibliog-

raphy of texts and papers. There is included also an index of names and one of subjects.

The book is well written, clear, and logical. The author has succeeded in presenting material in so-called Modern Physics in a manner that is interesting and understandable for those who are interested simply in science in general—readers who are intimidated by the usual complicated language and mathematical symbols of the specialist in this field. While written from the viewpoint of a physicist this book should be useful to the student of chemistry, furnishing him with concise, intelligible information on the work accomplished to date in a field in which both are so vitally concerned. It should be especially valuable to engineers "who are concerned with the problems of the behavior of dielectrics as insulation," in that it provides basic information on the nature and electrical properties of a gas.

CHAS. G. EICHLIN

UNIVERSITY OF MARYLAND  
COLLEGE PARK, MD.

#### **The First Course in Quantitative Analysis.**

FLOYD HAMILTON FISH, M.S., Ch.E. Professor of Analytical Chemistry, the Virginia Polytechnic Institute. P. Blakiston's Son & Co., Inc., Philadelphia, 1931. x + 120 pp. 3 figs. 19 × 13 cm. \$1.25 net.

Part I of this little book is arranged for engineering and applied science students and Part II for agricultural and home economics students; the difference being in the nature of the laboratory exercises. In Part I these consist of the preparation and standardization of the commoner volumetric solutions and their use in the titration of various mixtures of hydroxide, bicarbonate, and carbonate of sodium, and in the determination of iron, copper, and chlorine. The gravimetric exercises are the determination of iron and sulfate in a salt, and moisture loss on ignition, SiO<sub>2</sub>, R<sub>2</sub>O<sub>3</sub>, CaO, and MgO in limestone. Part II uses some of the exercises of Part I but contains mostly work in feed and fertilizer analysis.

The book is characterized by original points of view and by whatever vigor of expression comes with writing as one talks in the laboratory. Such writing, however, breeds carelessness of expression. For example, the following occurs on page 9. "A liter is the volume or space occupied by 1000 cubic centimeters of water. One cubic centimeter of water weighs one gram; 36.46 grams of pure HCl gas will, when diluted to 1 liter, make a liter of normal hydrochloric acid; . . ."

It is perhaps splitting hairs to say that a liter is not 1000 cubic centimeters, whether of water or something else. Nevertheless, the fact that it is not is recognized by the growing use of the term milliliter. The unqualified statement that a cubic centimeter of water weighs one gram is grossly inaccurate, and the expression, 36.46 grams of pure HCl gas diluted to a liter, is so far removed from the real situation handled in preparing a normal solution that no proper mental picture can be expected in the mind of the student.

The reviewer believes that the English language is the most important instrument at the disposal of an American professor of analytical chemistry, and that it should be used as an instrument of precision.

The original points of view are mostly pedagogical. Some of them are good and some of them are, at best, matters of opinion. Here is one on which opinions might vary. "The 'chemical factor' habit for the beginner, while very useful, is indeed a great hindrance to rapid readjustment in thought." A footnote is then appended (page 1) as follows. "The term, chemical factor, is not used in this course." It would now be unfair not to give at least a hint of the author's argument against the chemical factor habit. This quotation (page 2) will serve. "It would seem absurd if one had to calculate a 'factor' before he could solve the following problem:

"If 5 apples cost 25 cents, what will 75 apples cost?"

An outstanding good point in the book

is the treatment of the elementary problems in gravimetric and volumetric analysis. Students who are having difficulty in solving such problems and teachers who are having difficulty in teaching them should purchase a copy of Professor Fish's little book. It contains many typical problems with accompanying solutions clearly set down.

C. W. FOULK

THE OHIO STATE UNIVERSITY  
COLUMBUS, OHIO

**Dry-Cleaning and Redyeing Handbook, Including Laboratory Practice, Formulas, Tests, and Tables.** C. C. HUBBARD, for many years Director of Research and Education for the National Association of Dyers and Cleaners of the United States and Canada and the National Association Institute of Dyeing and Cleaning, Inc. Associate editors: Edwin R. Donaldson, graduate of Bradford-Durfee Textile School, and Mable F. Falling, for four years Assistant Research Associate, U. S. Bureau of Standards. First edition. Rock Crest, Silver Spring, Maryland, 1929. ix + 252 pp. 10 × 16 cm. \$5.00.

This handbook offers in practical style quick reference information about the general principles and methods of dry-cleaning and redyeing garments and other textile materials.

Marginal numbers divide the book into ten sections: (1) Dry-Cleaning Practice; (2) Stain Removal; (3) Wet-Cleaning Practice; (4) Bleaching and Stripping; (5) Dyestuff Application; (6) Finishes; (7) Tests; (8) Tables; (9) Definitions; and (10) Useful Information. The first six of these sections describe in sequence the steps of the dry-cleaning and redyeing processes and give specific directions for the various procedures and a critical discussion of the difficulties involved. This is by far the best part of the book. Section 7, Tests, consists of methods for the preparation and testing of laboratory reagents and an uncritical compilation of methods for the qualitative and quantitative analysis of textiles. Section 8,