The number of brief monographs intended to serve as introductions to complicated topics appears to be on the increase. Professor Spitzer's little book on ionized gases might well serve as a model for such publications, for few, in this reviewer's opinion, succeed so well in cutting through a mass of detail to present the basic physical ideas clearly and simply. An introductory exposition must necessarily omit or dismiss with a phrase many topics that demand pages for adequate explanation, and the author commits many such items to the physical intuition of the reader or to the bibliography.

The interests of simplicity and brevity are further served by the fact that a fully ionized gas in many ways is less complicated than one that is weakly ionized, for the many quantum phenomena characteristic of the latter are missing. Attention can be focussed on the basic problems of particle motion in electric and magnetic fields, particle interactions, and the way in which the combination contributes to macroscopic motion. With these basic concepts in hand, the reader is prepared to look further into astrophysical problems that are the principal interest of the author, or to proceed with the additional complications of the gaseous electronics field.

The book begins with a discussion of motion of charged particles in various combinations of fields of electromagnetic and gravitational origin, and gives as an illustration the Fermi and Alfvén theories of cosmic-ray production. Then follows a discussion of macroscopic motion, with emphasis on the effects of external magnetic fields. The various types of plasma waves, including hydromagnetic (magnetohydrodynamic) are treated briefly. The last chapter concerns the effects of collisions between charged particles, and here most of the results must be taken on faith, as they depend upon calculations that are beyond the scope of the book. In the Appendix the basic equations of motion are derived from the Boltzmann equation. One might wish for some mention of the basic difficulties involved, first in conceptual problems involved in applying the Boltzmann equation, and second in the actual calculations using it.

In summary, this little book is a very readable introduction to the behavior of charged particles at low pressures and high temperatures, and should prove useful as a simple introduction to those unacquainted with the field.

DEPARTMENT OF PHYSICS
THE JOHNS HOPKINS UNIVERSITY DONALD E. KERR
BALTIMORE, MARYLAND

---

**High Polymers. Volume V. Part III. Cellulose and Cellulose Derivatives.** Second Completely Revised and Augmented Edition. Edited by EMIL OTT, HAROLD M. SPURLIN and MILDRED W. GRAFFLIN, Research Department, Hercules Powder Company, Wilmington, Delaware. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1955. viii + 1057–1601 pp. 16 × 23 cm. Price, $12.00.

Rapid growth of the knowledge of chemistry of high polymers has rendered many excellent texts obsolete. Appearance of this revision of Ott's 1943 compendium alleviates this difficulty for cellulose chemistry for perhaps another dozen years. The editors have done a commendable job in compiling the bulk of industrially significant information in the three books. So complex is the subject matter that reviews will rival the books in length if any adequate description were offered.

Like Gaul, the books divide, rather illogically, into three parts. These are the revision of the 1943 edition of Volume 5 on High Polymers. This review covers Part III corresponding to Chapter IX of the original volume on the physical and mechanical properties of cellulose and its derivatives. The book begins with a clear and authoritative discussion of the physical properties of cellulose and its derivatives. It includes solubility information, the thermodynamic properties of those solutions, problems arising in determination of molecular weight and molecular weight distribution. In addition, there are theories of viscosity of dilute solutions of macromolecular compounds, and a discussion of flow properties. Next there is a chapter on the mechanical properties of cellulose and its derivatives, including creep, stress relaxation, deformation, elastic recovery, and that elusive concept, ultimate strength.

The collation of these usually widely scattered data will endear the book to researchers in the field of cellulosics. It is to be recommended to all engaged in technical activities on the numerous end products of cellulose.

As a final bonus there are two indices at the end of Part III. These include an author index and a subject index to the three volumes.

The book is excellently done, and commendably accurate in typography and detail.

PLASTICS DIVISION RESEARCH DEPT.
CELANESE CORPORATION OF AMERICA O. V. LUKE, JR.
SUMMIT, NEW JERSEY

---

**Essays in Biochemistry.** EDITED BY SAMUEL GRAFF. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N.Y. 1956. x + 345 pp. 15 × 23.5 cm. Price, $6.50.

The twenty-five essays compiled in this book and written in honor of Hans Thacher Clarke present a unique coverage of biochemical material which should be of general interest to a variety of disciplines. The essays, written in large part by former students of Hans Thacher Clarke, encompass limited aspects of carbohydrates, proteins, lipids, nucleic acids, enzymes, viruses, porphyrins, hormones, stereochemistry of enzymatic reactions and other special topics. The freedom allowed the writers for speculation and thought projection has added a desirable and not too common personal tint to this remarkable collection of essays. The ideas presented by the writers may serve to stimulate further discussion on controversial and unexplored fields and may also provide fruitful avenues for future research. Much of the subject material included in this group of essays is not covered adequately in textbooks on general biochemistry. Consequently this book should serve a useful function as a supplement to the usual textbooks on biochemistry. Above all, the unrestricted style and freedom of thought depicted in this book may prove to be a rewarding stimulus to others.

THE UNIVERSITY OF ROCHESTER
SCHOOL OF MEDICINE AND DENTISTRY
DEPARTMENT OF BIOCHEMISTRY
ROCHESTER 20, NEW YORK GUIDO V. MARINETTI

---

**The Mathematics of Physics and Chemistry.** Second Edition. BY HENRY MARGENAU, Eugene Higgins Professor of Physics and Natural Philosophy, Yale University, and GEORGE MOSELY MURPHY, Chairman, Department of Chemistry, Washington Square College, New York University. D. Van Nostrand Company, Inc., 120 Alexander Street, Princeton, New Jersey. 1956. xii + 604 pp. 16 × 23 cm. Price, $6.85.

The first edition of this book, which appeared during the war years, has found a secure place in the libraries of graduate students in physics and chemistry. The second edition, although containing numerous minor changes and corrections, has been only slightly expanded (~20 pages) through the introduction of new material, mainly on Laplace and Fourier transforms. Thus this review would not differ materially if it concerned, instead, the first edition.

The authors' aim "to present between the covers of a single book, those parts of mathematics which form the tools of the modern worker in theoretical physics and chemistry," has been largely achieved. The digestibility of the condensation "on the senior and first year graduate level" may be somewhat more in doubt. In any event, the airing of the reviewer's prejudices which follows cannot detract from the main fact that this book is the most comprehensive single volume of its kind in English.

For the most part the treatment is conventional, being designed to fit onto the usual courses in differential and integral calculus. While this may aid the understanding of the mathematical (as distinct from the physical) aspects at the senior level, adherence to this conventional approach postpones the introduction of those tools—such as matrix algebra and group theory—whose use could have greatly simplified the presentation of many earlier topics. For example, angular momentum and spherical harmonics can be seen in their full splendor only in terms of the rotation groups—which, alas, conclude the last chapter. In fact, the connection between conservation laws and invariance