

genetic aspects of the agammaglobulinemia and of the results of experiments in which the mentioned proteins were treated with mercaptoethanol, attests to the value of this book. Finally, mention should be made of the excellent quality of the printing and especially of the illustrations.

This impressive monograph in which a field of research on the borderline of protein chemistry, immunochemistry and medicine is discussed, is to be recommended highly to investigators and clinicians who have a major concern in these disciplines.

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Thermoelectricity. Including the Proceedings of the Conference on Thermoelectricity Sponsored by the Naval Research Laboratory, September, 1958. Edited by PAUL H. EGLI, U. S. Naval Research Laboratory, Washington, D. C. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1960. X + 407 pp. 15.5 X 23.5 cm. Price, \$10.00.

Increased financial support for scientific work has created an expanded market for scientific books and journals, so that almost any technical work can now be published at an assured profit. Thus we have had in recent years an outpouring of new journals and symposium volumes from commercial publishers. If these publications were a little bit worse, it would be easy to dismiss them as a waste of money. They often fall, however, into a no man's land of value. If four or five people see one \$12 book and learn anything at all from it, it is hard to deny that they have had their money's worth.

The merchandising of these books to scientists often lacks exactitude. The jacket of the present book, for example, states that "Section I presents an introduction and broad survey of the fundamental concepts of thermoelectricity." This statement, which is copied from the editor's preface, is simply not true. The actual content of Section I is as follows: There is a chapter by C. Zener which points out the application of Carnot's theorem to thermoelectric devices. There is a chapter by W. Teutsch (with a grandiose title) which briefly defines the thermoelectric coefficients. There is a chapter which describes several devices developed by the Whirlpool Corporation. "The development of this device grew out of the cooperation of the Whirlpool Corporation and the Franklin Institute of Philadelphia. The need for its development arose out of the desire of the liquor industry to have a reliable, accurate and unquestioned instrument to determine the density of liquor"—and so on. We also learn that a similar device can be used to cool beverages but that "such items probably would not have the market potential now enjoyed by full size refrigerators." The concluding chapter in this section on "fundamental concepts of thermoelectricity" is an analysis by two G. E. engineers of "some considerations of the problems of minimizing the weight of thermopile generators in space applications."

Once these "fundamentals" are disposed of, the book branches out into the fascinating field of "materials research." There are good informative chapters on how to measure and interpret a wide variety of properties of solid materials: thermal and electrical conductivity, mechanical properties of ceramics, thermionic emission, and even thermoelectric coefficients. There are also short chapters on the properties of mixed valence semi-conductors and porous semiconductors. Most of these chapters were originally prepared for a 1958 Naval Research Laboratory symposium. They are excellent summaries and do much to alleviate the pain caused by the earlier sections. A short chapter on liquids appears to have wandered in by mistake from another book.

The book has been given a truly beautiful production. Paper, illustrations, printing and binding are of the highest quality. In other words, the packaging is up to the highest standards of a highly competent industry.

If a book like this were presented modestly and truthfully we could welcome it as a survey of the technology of thermoelectric devices, with valuable background information for engineers working in the field. As a scientific work on "Thermoelectricity" it is poorly organized, incomplete and strongly biased toward the development work done in a

few industrial laboratories. The important Russian work in this field, for example, is only briefly mentioned, and the general thermodynamic theory is not discussed. The omission of an author index, in view of the sketchy bibliographies, may have been a defensive measure. My criticism finally comes to the point that this is a fairly useful book, but the same amount of time and effort could surely have produced a more useful one.

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Fundamental Aspects of Normal and Malignant Growth.

Edited by WIKTOR W. NOWINSKI, Associate Professor of Bio-chemistry, Director of Tissue Metabolism Research Laboratory, University of Texas, Medical Branch, Galveston, Texas. D. Van Nostrand Company, Inc., 120 Alexander Street, Princeton, New Jersey. 1960. xv + 1025 pp. 18 X 25 cm. Price, \$37.50.

This large volume consists of 13 separate monographs, each by an outstanding investigator in his field. The subject matter is concerned with the many aspects of growth, including definitions of growth (L. von Bertalanffy), the metabolism of proliferating cells (S. Kit), the role of nucleic acids in growth (J. Brachet), embryonic development and induction (A. M. Dalcq), regeneration (A. E. Needham), plant growth (K. V. Thimann) and aging (W. Andrew). Special chapters are given to wound healing (W. W. Washburn, Jr.), nitrogen metabolism and growth (H. Clark) and the protein-forming system of developing cells (H. Hermann). Neoplastic problems are reviewed in separate sections on carcinogenesis (A. Kirschbaum), the metabolism of the cancer cell (A. C. Griffin), and the effects of antimetabolites on mitosis (J. J. Bieseke). The monographs are generally broad and detailed, with an extensive list of references; several have been published separately in a more extensive form. The book, however, falls short of the goals of the editor, to publish an "introduction into various aspects of the growth problem," and to provide "an up-to-date survey of the results of basic cancer research and allied fields." While an investigator may find the book useful for information or references on a particular problem, it is not integrated or organized to provide a coherent or unified synthesis of the problems of growth. Thus, it does not wholly succeed as an introduction, a general survey, a fundamental analysis, or a current review of the status of our knowledge on normal and malignant growth. References are lavishly used, but only a few are cited after 1957. A detailed outline is provided for each chapter, and there is a 52 page subject index.

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Anleitungen für Die Chemische Laboratoriumspraxis. Band IV. **Polarographisches Praktikum.** Zweite Neuedition. By JAROSLAV HEYROVSKY. Springer-Verlag, Heidelberger Platz 3, Berlin-Wilmersdorf, Germany. 1960. vii + 116 pp. 16 X 23.5 cm. Price, DM. 19.80.

This second edition of this famous little book adheres to the purpose of the original edition, namely, to introduce the reader to the field of polarography by emphasizing basic technique and practical applications. In the author's own words "Das Werk soll als Einführung in die polarographischen Arbeitsmethoden dienen, namentlich für Analytiker, die die Polarographie als Routine-analyse benutzen sollen; diejenigen, die in der Polarographie wissenschaftlich arbeiten wollen, können sich nicht mit dieser Schrift begnügen und sollen eines der modernen Lehrbücher der Polarographie studieren."

The text comprises two main parts. The first (Mesanordnungen) reviews in 53 pages cardinal aspects of polarographic technique, with emphasis on manipulative details and the simplest instrumentation. The neophyte should appreciate the wealth of detailed practical directions un-

encumbered by theory. The second part (Polarographische Bestimmungen) outlines the scope of polarography by means of a variety of examples of the polarographic behavior of diverse inorganic and organic substances. The text is richly and very effectively illustrated by typical polarograms. The booklet concludes with some abridged tables of "depolarization potentials" and half-wave potentials of common inorganic and organic substances.

The treatment may seem to be parochial in the sense that the techniques originally developed by the author and his collaborators are described in minute detail, and scant mention is made of subsequent developments by other investigators. The fact is, however, that most of the basic principles and techniques of polarography do indeed stem from Dr. Heyrovsky's Czech school. The booklet should be appreciated for what it is, *i.e.*, a primer written by a master.

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Technique of Organic Chemistry. Volume I. Part II. Physical Methods of Organic Chemistry. Third Completely Revised and Augmented Edition. Editor, ARNOLD WEISSBERGER. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. xii + pages 895-1797. 16 × 23.5 cm. Price, \$24.50.

The title of this volume, as is also the case with others in the series, is inexact. Certainly the subject of these books is not the technique of organic chemistry in the usual sense. These volumes contain, rather, fairly detailed descriptions of the principles and practice of physical methods which have been applied to the solution of chemical problems; these techniques can be used in organic chemistry, though not in every case have they been so applied. But this shortcoming is not a serious one. The "Technique of Organic Chemistry" has become so well known during its relatively short existence that every practicing organic chemist must be familiar with its content.

These books are necessarily more mathematical than is usual in treatises on organic chemistry, but it is hoped that the organic chemist with an innate fear of mathematics is disappearing.

The present volume contains descriptions of some of the most powerful tools for structure determination available to the chemist today. Recently publicized research leaves no doubt concerning the value of neutron, electron and especially X-ray diffraction methods; the use of high speed computing techniques promises to make these methods even more widely applicable in the near future. X-Ray microscopy is a new field which, though as yet untried in organic chemistry, holds considerable promise because of the advantages it offers over ordinary light microscopy and electron microscopy. Microspectroscopy is not only important to the natural products chemist who deals with very small quantities, but it has already shown its worth in the location of chemical constituents of biological systems. The modern organic chemist usually will not have all these techniques at his disposal, but he should know that they exist and where they can be applied. He must, therefore, be familiar with the principles by which they operate.

In addition to these newer techniques, the present volume discusses older methods, some of which have ceased to be very important. Crystallochemical analysis and molar refraction are certainly not as useful in the identification of organic substances as is infrared spectroscopy. This is not to say that a knowledge of these methods is no longer valuable, but in the interest of keeping a treatise such as this to a reasonable size (Volume I in its present revision will consist of four parts containing roughly 3500 pages; at a cost of \$24.50 a part, this comes to \$98.00 for the volume), these could have been left out as newer techniques were added. This seems especially reasonable in view of the fact that the chapters discussing these older techniques appear in essentially the same form in earlier editions of the work.

This brings up the only serious fault of the present volume: it is meant to be a completely revised and augmented edition, and yet few changes have been made. Only one of the twelve chapters, that on X-ray microscopy by W. C.

Nixon is new; the rest all have counterparts in the second edition. Of these, that on X-ray crystallography by W. N. Lipscomb has been rewritten completely and bears no resemblance to the earlier chapter on X-ray diffraction by I. Fankuchen. It is perhaps the best chapter in the book. The chapter on electron diffraction was done by L. O. Brockway in both the second edition and the present volume; though the format has been kept the same, the exposition has been freshened by the choice of a new example to explain the method. The other chapters, "Determination of Diffusivity" (A. L. Geddes and R. B. Pontius), "Determinations with the Ultracentrifuge" (J. B. Nichols and E. D. Bailey), "Refractometry" (N. Bauer, K. Fajans and S. Z. Lewin), "Determination of Crystal Morphology" (the late M. A. Peacock, J. D. H. Donnay and G. Donnay), "Crystallochemical Analysis" (J. D. H. Donnay and G. Donnay), "Light Microscopy" (E. E. Jelley), "Microspectroscopy" (E. R. Blout), "Electron Microscopy" (F. A. Hamm), and "Neutron Diffraction" (J. M. Hastings and L. M. Corliss), are virtually identical with the corresponding ones in the previous edition. This similarity ranges from the addition of a few sections on diffusivity and the ultracentrifuge, through the addition of several references on microspectroscopy, to exact identity in the case of neutron diffraction. The latter is especially to be deplored when, in these authors own laboratory, neutron diffraction is yielding very useful information about hydrogen bonding in organic systems.

It seems pointless to issue a new edition which contains so little new work. A much less expensive way to modernize the treatise would have been to do what has already been done once before: to publish a supplement to the second edition. Though this book is decidedly valuable to chemists, its purchase can, unfortunately, be recommended only to those who do not have the second edition.

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Physical Chemistry of Surfaces. By ARTHUR W. ADAMSON, Department of Chemistry, University of Southern California, Los Angeles, California. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1960. xiv + 629 pp. 16.5 × 23 cm. Price, \$12.75.

Interest in the broad field of surface chemistry has increased so rapidly in recent years that conscientious efforts to assemble and clarify material in this area are most welcome. Certainly in few, if any, areas of physics and chemistry can one afford to ignore the properties of surfaces or interfaces and the films that form at interfaces. In a very readable book, Professor Adamson has organized and interpreted much of the current as well as the classical work on surfaces. The discussions clearly reflect the author's strong background in surface chemistry at the University of Chicago, where he was greatly influenced by the breadth and depth of Professor W. D. Harkins' interests and by the thoroughness and care of Dr. G. E. Boyd's counsel.

Although the "Physical Chemistry of Surfaces" was designed primarily as a textbook for college seniors and graduate students, both theory and practice are covered more fully than is customary in texts. The comprehensive nature of the book and the relative emphasis on the topics discussed can be gained from a list of the chapters with the number of pages in each: Capillarity (42); The Nature and Thermodynamics of Liquid-Gas Interfaces (46); Surface Films on Liquid Substrates (68); Electrical Aspects of Surface Chemistry (45); Surfaces of Solids (72); Long-Range Forces (11); Friction and Lubrication (27); Wetting, Flotation, and Detergency (29); Emulsions and Foams (31); The Surface Area of Solids and an Introduction to Adsorption (28); Adsorption of Gases and Vapors on Solids; the Surface Area of Solids (65); Chemisorption and Catalysis (37); Adsorption from Solution (22).

Solid surfaces and adsorption on solids are justifiably given much space. However, one of the longest chapters concerns surface films on liquids—a subject that continues to grow rapidly because it is basic to such divergent areas as molecular structure and orientation, polymer behavior, water evaporation, emulsions, foams, and biological membranes. The discussion of surface films on liquids is subdivided into forty-two sections.