

trated in "Biophysical Science." This book, which stems from a study program held under the auspices of the National Institutes of Health, is intended to serve as a "summary of some key problems in biology and provide a critical evaluation of recent advances." It serves this purpose very well. The sixty-one individual contributions can be divided into two groups. The first group, composed of twenty-three articles, provides a review of the basic methods and some of the recent results in the fields of macromolecular chemistry, spectroscopy and energy transfer. Some of the material is new and has quite properly been given full treatment. Other chapters concern background material which has already been treated elsewhere and might even have been omitted. The extensive bibliographies complement the chapters very well and the over-all effect of this section is excellent.

The remaining two-thirds of the book concerns topics of current interest in biological research such as synthesis and replication of macromolecules, fine structure of organelles, function of nerve fibers, to name a few. Some of these chapters are original contributions and the remainder are up-to-date versions of earlier studies. Since they have come from a study program, they provide excellent didactic material illustrating both the startling success in applying molecular science to some areas of biology such as collagen structure and function, and the inadequacy of our current concepts in the analysis of other areas.

Finally it should be pointed out that the book and perhaps the area may well have been misnamed. Most of the work described can very properly be classified as physical chemistry, polymer chemistry or biochemistry. Under these circumstances it seems entirely appropriate though less glamorous to give the book its proper praise as a thorough and very useful survey of molecular biology.

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**The Plasma Proteins. Volume II. Biosynthesis, Metabolism, Alterations in Disease.** Edited by FRANK W. PUTNAM, Department of Biochemistry, College of Medicine, The J. Hillis Miller Health Center, University of Florida, Gainesville, Florida. Academic Press, Inc., 111 Fifth Avenue, New York 3, N. Y. 1960. xv + 518 pp. 16 × 23.5 cm. Price, \$14.50.

This is the second of two volumes which, taken together, constitute a comprehensive and authoritative treatise on the plasma proteins. Emphasis in Volume II is centered principally on the physiological and biochemical role of the plasma proteins in the normal and disease states. The scope of this volume is broad, however, as is indicated by the table of contents: Structure and Function of the Human Serum Lipoproteins, F. T. Lindgren and A. V. Nichols; Plasma Enzymes, W. H. Fishman; Circulating Hormones, H. N. Antoniades; The Blood Coagulation System, R. G. MacFarlane; Comparative Biochemistry and Embryology, R. L. Engle, Jr., and K. R. Woods; The Biosynthesis of Plasma Proteins, H. S. Anker; Alterations in Plasma Protein Patterns in Disease, M. L. Petermann; Abnormal Serum Globulins, F. N. Putnam; Genetic Alterations in Plasma Proteins of Man, D. Gitlin and C. A. Janeway.

The chapters dealing with genetic alterations in plasma proteins, abnormal serum globulins, biosynthesis and the blood coagulation system are particularly well written. In the last instance R. G. MacFarlane has been singularly successful in effectively presenting the complex details of the clotting system and in unravelling the confused literature pertaining to this subject. H. S. Anker has written a penetrating discussion of the problem of biosynthesis of the plasma proteins. Although the plasma proteins of man receive the major emphasis, a unique chapter devoted to the comparative biochemistry and embryological development of plasma proteins has been included.

Throughout this volume there is ample evidence of thoughtful planning and design, within both individual chapters and the work as a whole. Although each chapter is the product of a different author, the work as a whole is surprisingly free of duplications. This absence of redundancy does not detract from the completeness of any one chapter since the text is liberally supplied with cross refer-

ences to related topics discussed elsewhere in the two volumes.

The printing and binding are well done. References are collected and arranged alphabetically by senior author at the end of each chapter. Author and detailed subject indices are located at the end of the volume. Together the two volumes of this treatise perform a most important function of assembling, coordinating and interpreting a highly diverse literature. The "Plasma Proteins" will be a valuable addition to the library of both biochemist and clinician.

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**Progress in Dielectrics. Volume 2.** General Editor, J. B. BIRKS, B. A., Ph.D., D.Sc., F. Inst. P., A.M.I.E.E. American Editor, J. H. SCHULMAN, Ph.D. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1960. vii + 225 pp. 16 × 25 cm. Price, \$9.50.

This second volume of an annual series contains six articles on as many aspects of dielectrics. The general subject can embrace a variety of interests in the sciences and engineering, and the particular topics taken up in the present volume reflect this, the only obvious common denominator being that the several discussions are primarily of properties in low applied electric fields.

A brief survey of theory of polarization and dielectric absorption by Wyllie reviews fundamentals and various models developed principally by physicists and physical chemists. Much is familiar ground, but this reviewer was reminded of several papers he should have read before.

The article likely to be of most general interest and value to chemists is the contribution of A. J. Curtis on dielectric properties of polymer systems. The author has done a notable job of putting the extensive literature into perspective and order with very competent critical comments. The review is highly recommended, and the author deserves thanks for having carried out an arduous assignment so well.

The article on irradiated polymers by Black and Charlesby is primarily an introductory discussion of radiation effects and processes in general, with quite brief descriptions of electrical properties and applications.

The contribution of P. M. Sutton on dielectric properties of glass is confined to combinations of inorganic oxides, and so is likely to be essential reading only for people with immediate interests in this restricted class of materials. As best this reader can judge, it is a well-balanced and quite comprehensive survey. The paper by Plessner and West on high permittivity ceramics for capacitors is equally special. Finally, the article on artificial dielectrics by J. Brown is highly unchemical and not likely to be useful to chemists except possibly for different applications of the mathematical analyses which have been developed to discuss microwave antenna arrays and the like.

Although interdisciplinary subjects are quite the fashion, and dielectrics is a subject capable of considerable common ground between disciplines, the present collection of articles reflects more the heterogeneity of the subject. Considerable numbers of people will find one or two articles of interest to them; but it seems improbable that many will want enough more of the book at hand to justify buying it for a personal library.

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**La Spectroscopie Hertzienne Appliquée à la Chimie. Absorption dipolaire. Rotation moléculaire. Résonances magnétiques.** By R. FREYMANN, Professeur à la Faculté des Sciences de Paris, and M. SOUTIF, Professeur à la Faculté des Sciences de Grenoble. Dunod, Éditeur, 92 rue Bonaparte, Paris 6, France. 1960. xi + 263 pp. 13.5 × 21.5 cm. Price, Broché, 23 NF.

This book is intended to provide a survey suitable for chemists of several newer fields of spectroscopy. The authors concentrate mainly on nuclear magnetic resonance and electron paramagnetic resonance but they also treat dipolar absorption in solids and, very briefly, rotational

microwave spectroscopy and nuclear quadrupole resonance spectroscopy. All these fields have in common the fact that they involve the absorption of electromagnetic radiation in the radio-frequency or microwave regions. Their techniques are therefore quite different from those employed in the older branches of infrared, optical and ultraviolet spectroscopy.

The level of treatment is intended to be suitable for a non-specialized but professional scientific audience and the authors have succeeded admirably in presenting the material clearly and yet concisely. They have also provided excellent coverage of the important applications of the two magnetic resonance techniques and of quadrupole spectroscopy.

Since only about three pages are devoted to the applications of gas phase rotational microwave spectroscopy, this chapter is not even an adequate summary and cannot be recommended to those who wish to acquire an idea of what can be accomplished with this technique. Thus the reader would scarcely even suspect that this field has become the most effective available tool for the determination of the molecular structure of vapors, dipole moments and their components, quadrupole coupling constants, barriers to internal rotation, molecular magnetic moments, molecular electrical quadrupole moments, etc. There are also some errors in this chapter.

Another error worth pointing out occurs at the end of Chapter 2 where it is stated that quadrupole resonance is applicable to solids and liquids whereas it is correctly stated elsewhere that it can be applied only to solids.

In general only simple mathematical results are quoted, without derivation. Typical experimental arrangements are briefly described, for each field, and a number of illustrative results are described. Each chapter ends with a short bibliography including references to books and review articles, quite adequate to permit the interested reader to proceed to a more detailed study of the subject.

In summary, this book can be recommended, except for the reservation made above, to those who wish to be introduced in a simple, clear and yet adequate manner to these newer fields of spectroscopy which have provided such revolutionary new tools for chemists. The French in which the book is written is in general quite simple and straightforward.

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E. BRIGHT WILSON, JR.

The Encyclopedia of Spectroscopy. Edited by GEORGE L. CLARK, Research Professor of Analytical Chemistry, Emeritus, University of Illinois, Urbana, Illinois. Reinhold Publishing Corporation, 430 Park Avenue, New York 22, N. Y. 1960. xvi + 787 pp. 18.5 × 26 cm. Price, \$25.00.

After some consideration, this reviewer has decided to define a spectroscopist as one who uses a spectroscope or spectrograph, or one who uses results obtained from these instruments, for scientific purposes. The breadth of this definition may be disappointing to those who restrict the purpose to the elucidation of atomic and molecular spectra. But if this definition of a spectroscopist is accepted, then the definition of spectroscopy can be made so general that an Encyclopedia of Spectroscopy may be justified.

The present encyclopedia includes thousands of minute technical details, many of which are of limited interest to specialists. Many details are of more general interest but it is very hard to find them, in the absence of any system of cross-indexing or collaboration between individual authors of the articles. This volume also contains articles which discuss problems of general interest, such as structure of atoms and molecules, description and theory of basic optical instruments and basic methods of spectrochemical analysis. While these discussions are generally good, they are (perhaps necessarily) superficial in comparison with standard textual treatments.

This brings us to the question of utility of this book. This reviewer has concluded that actually it will be of little use to the spectroscopist, who will have his own technical library and reference cards. It will be of almost no use to the general reader. It may be of some interest to the scientifically trained reader who has ample leisure for browsing.

Some of the bypaths and odd bits of information are indeed fascinating and may stimulate further reading.

A better Encyclopedia could have resulted from the fully coordinated efforts of fewer contributors. At least much of the repetition could have been avoided and the details could have been recorded in a more systematic way. Also, one does not like to see signed articles, for which the contributors are presumably responsible, mixed in with unsigned articles contributed by a Corporation and with one article taken from "an official news release."

The volume is attractively printed and bound as should be expected. It could have been reduced in size, and presumably in price, by reduction of excessive duplication.

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A. B. F. DUNCAN

Annual Review of Nuclear Science. Volume 10. EMILIO SEGRE, Editor, University of California, GERHART FRIEDLANDER, Associate Editor, Brookhaven National Laboratory, and WALTER E. MEYERHOF, Associate Editor, Stanford University. Annual Reviews, Inc., Palo Alto, California. 1960. vii + 617 pp. 16.5 × 23 cm. Price, \$7.00 (U.S.A.), \$7.50 (elsewhere).

This, the tenth volume of the "Annual Reviews of Nuclear Science," follows well in the path of its predecessors in the clarity and comprehensiveness of the various articles. There are fifteen separate articles, covering a wide spectrum of nuclear science from certain aspects of high energy particle physics down through several different areas of classical nuclear physics, cosmic radiation, chemical and geophysical applications, and certain aspects of biophysics. Almost without exception the contributions are very up to date, eminently readable, even to the uninitiated in the field, and quite authoritative in tone. In the order of their appearance they are: "Neutrino Interactions" by Frederick Reines; "Nuclear Interactions of Heavy Ions" by A. Zucker; "Cosmic Ray Showers" by Kenneth Greisen; "Bubble Chambers" by Hugh Bradner; "Optics of High Energy Beams" by Owen Chamberlain; "Nuclear Structure Effects in Internal Conversion" by E. L. Church and J. Weneser; "Recoil Techniques in Nuclear Reaction and Fission Studies" by B. G. Harvey; "Labeling of Organic Compounds by Recoil Methods" by Alfred P. Wolf; "Nucleon-Nucleon Scattering Experiments and Their Phenomenological Analysis"—'General Formalism' by H. P. Stapp, 'Experimental Data' by M. H. MacGregor and 'Phenomenological Analysis' by M. J. Moravcsik; "Theoretical Interpretation of the Energy Levels of Light Nuclei" by I. Talmi and I. Unna with an appendix by F. Ajzenberg-Selove and T. Lauritsen; "Nuclear Methods for Subsurface Prospecting" by J. G. Beckerley; "Experiments on Cosmic Rays and Related Subjects During the International Geophysical Year" by E. P. Ney; "Cellular Radiobiology" by Tikvah Alper; "Vertebrate Radiobiology: Metabolism of Internal Emitters" by Roy C. Thompson and "Vertebrate Radiobiology: Late Effects" by J. B. Storer and D. Grahm.

This reviewer was particularly impressed by Reines' article on Neutrino Interactions and Ney's article on Cosmic Radiation and the IGY. Both are extremely lucidly written, enormously informative and about as up to date in their respective fields as one could hope to attain in a finite space. Reines takes the reader quite carefully up to an understanding of the very latest ideas in the theory of weak interactions and in a short but elegant final section explores the new and fascinating field of neutrinos and cosmology. Ney's article is one of the most succinct presentations of the basic experimental facts that have emerged about our cosmic ray environment and the current thoughts that exist about their interpretation. In a more practical vein Chamberlain introduces the reader to the problems involved in beam transport with high energy machines and in wonderfully clear article gives sufficient theory and practice to enable a neophyte to do his own planning. Zucker's article on the interaction of heavy ions is an excellent introduction to this expanding field and Wolf's article on the Labeling of Organic Compounds is an excellent exposition of the wedding of nuclear techniques to chemical problems; it should be noted that the major emphasis in this article is on the use of carbon-14 and tritium.