
 BOOK REVIEWS

Theoretische Biochemie. Physikalisch-Chemische Grundlagen der Lebensvorgänge. By HANS NETTER, O. O. Professor der Physiologischen Chemie an der Universität Kiel. Springer-Verlag, Heidelberger Platz 3, Berlin-Wilmersdorf, Germany. 1959. ix + 816 pp. 18 × 25.5 cm. Price, DM. 88.—

For American readers a more revealing title of Professor Netter's book might be "biophysical chemistry," since its general structure is the development, followed by the application, of various topics in physical chemistry to problems of current interest in physiology. Complete success in writing such a book is scarcely to be expected; here and there a critic can prove that in certain instances the physical chemistry presentation is so brief as to be superficial, or that the biological context and significance is lost amongst simplifications and approximations, or that the biological topics chosen for analysis are neither the most significant nor timely. On the whole, however, Netter has achieved an *admirable* compromise between rigor, readability and length. Moreover, besides very adequate treatments of such standard topics as diffusion, thermochemistry, ionization equilibrium, etc., he has provided valuable accounts of topics rarely discussed in general books. Among these latter are distribution of materials in tissues, surface phenomena at cell membranes, thermodynamics of metabolism, and trans-membrane transport. Generally speaking, this reviewer found thermodynamics-based discussions to be excellent, and consideration of molecular models to be somewhat skimpy. If purchased soon enough (the obsolescence rate in this field is frightening), Netter's book will be especially valuable, (a) to research workers in biophysical chemistry as a reference book for subjects outside of their immediate specialty, and (b) to physics, chemistry and (well-trained) physiology majors undertaking a rigorous course in academic (non-medical) biochemistry. This reviewer would be satisfied with something less than Springer's typographical splendor if it were sensibly-priced; a cheap paper-bound English translation of Netter's book would be a significant contribution to current American biochemistry.

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Introduction to Quantum Mechanics. By CHALMERS W. SHERWIN, University of Illinois. Henry Holt and Company, 383 Madison Avenue, New York 17, N. Y. 1959. xii + 385 pp. 17 × 24.5 cm. Price, \$7.50.

Professor Sherwin's text is designed for students who have had a comprehensive basic course in physics and mathematics through the calculus; some knowledge of differential equations, orthogonal functions and complex variables is required, though these topics could be developed by the instructor or acquired in parallel mathematics courses. In short, the text could be used in the junior year of a university physics curriculum and in the senior year in most collegiate programs.

The first chapter describes the Experimental Basis of Quantum Mechanics in only seven pages of text. The second chapter is devoted to an exposition of the Basic Postulates of quantum mechanics in fifteen pages. The rest of the book is devoted to elaboration of the basic postulates and development of accessory notions through application to simple systems. The point of this exposition is to generate understanding of wave functions and the uses to which they can be put, by solution of simple problems in exact fashion rather than by the approximate solution of problems related to complex systems.

The next four chapters deal with: The Solution of the Wave Equation; The Wave Equation in Three Dimensions; The Superposition of States, and Some Calculations Using the Wave Function; and, Angular Momentum. One hundred and twelve pages of text are devoted to these chapters; in them, emphasis is placed upon numerical solutions of the

Schrödinger equation, though the analytic solutions are given.

Another four-chapter group follows: Steady-State Perturbation Theory. Nondegenerate Case; Steady-State Perturbation Theory. Degenerate Case; Identical Particles; Time-Dependent Perturbation Theory. About a hundred pages of text are devoted to this material.

The last chapter, fifty-two pages, is titled: The Relativistic Wave Equation and the Origin of Electron Spin; the necessary matrix methods are introduced as part of the exposition.

This is an excellent book. Sherwin has a nice facility for the selection of simple examples and analogies and these are scattered throughout the text. The emphasis on numerical rather than analytic methods tends constantly to bring home to the student the fact that quantum mechanics works, and he is reminded often that any but the very simplest problems may require approximations. The numerous problems appended to each chapter have a ring of originality and the collection undoubtedly will be "mined" by other authors.

Of course, since approximation methods are played-down, only the seeds of the treatment of chemical binding are sown in the text. If this book were to be used in an advanced physical chemistry course, the instructor would have to supplement it by lectures and problems on the application of quantum mechanics to systems of chemical interest; the text adheres quite closely to the author's aim of demonstrating the fundamentals, period. Perhaps this is the way texts ought to be written if the lecture system is to have a *raison d'être*.

Mechanically, the book is well produced; the type and composition are pleasing to the eye, the paper does not insult it, and the binding will stand more than ordinary use. One minor point—the use of light-face sans-serif type to number the equations is incongruous. There appear to be very few typographical errors, except in the last chapter, which is loaded with them to the extent that in some sections there just is no correspondence between text and display formulas. Otherwise, the book is both handsome and carefully constructed.

For the students he had in mind, the author achieves his purposes. The book is admirably suited for review in light of a different viewpoint by more experienced students.

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Advances in Spectroscopy. Volume I. Edited by H. W. THOMPSON, C.B.E., F.R.S., St. John's College, Oxford. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1959. ix + 363 pp. 16 × 23.5 cm. Price, \$12.50.

This volume is the first of a series in which various aspects of spectroscopy are to be reviewed. The present volume contains eight articles, written by experts who have made substantial contributions to their subject. The articles vary in length, are authoritative, and contain much instrumental, experimental and interpretative detail. Many are illustrated by photographs of apparatus and of spectra, drawings and tables of data. The individual articles are well documented, and the volume is supplied with the usual indices. No attempt is made to correlate the individual articles. A list of articles and authors follows: The Spectra of Polyatomic Free Radicals, D. A. Ramsay; Spectroscopy in the Vacuum Ultra-violet, W. C. Price; The Index of Refraction of Air, D. H. Rank; Determination of the Velocity of Light, D. H. Rank; High Resolution Raman Spectroscopy, B. P. Stoicheff; Modern Infra-red Detectors, T. S. Moss; The Infra-red Spectra of Polymers, A. Elliott; Rotational Isomerism about C-C Bonds in Saturated Molecules as Studied by Vibrational Spectroscopy, N. Sheppard.

This and subsequent volumes of the series should furnish valuable ready reference for research workers in areas allied with spectroscopy. They will obtain a clear idea of the pres-