

cal tabulation of transport coefficients. This includes a description of electron-electron collisions and of ionic contribution to the conductivity. Conditions for the validity of Onsager and Einstein relations are also studied.

The third part of the book contains several chapters on the calculation of rate coefficients and, more generally, of various molecular collisional phenomena. These reviews are of necessity somewhat terse but are well referenced.

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Spectropolarimetry

Optical Rotatory Dispersion of Proteins and Other Macromolecules. B. JIRGENSONS. Springer-Verlag, New York, 1969. xii + 168 pp., illus. \$12.70. *Molecular Biology, Biochemistry, and Biophysics*, vol. 5.

The author has fulfilled the promise made in the preface in offering an introduction to the use of spectropolarimetry for the analysis of the structure of biological macromolecules and in keeping the presentation as elementary as possible. The companion techniques of spectropolarimetry and circular dichroism have been widely used since 1960 to probe the conformation of biological macromolecules, and the author demonstrates his wide acquaintance with such research. Although circular dichroism is not dealt with in depth, occasional spectra are discussed. In addition to giving an account of protein conformation in general, the monograph contains brief chapters on nucleoproteins, ribosomes, viruses, lipoproteins, membranes, and other substances which will acquaint the uninitiated with the vast literature that exists on the conformation of materials of biological interest.

The first chapters, which deal with the phenomena of optical activity and with theoretical considerations, must be considered minimal in their treatment of this sophisticated subject, but the author does give references to some of the original sources. The accounts of various instruments now in use are mostly descriptive rather than critical.

The main strength of the book lies in the extensive tables the author has compiled on the vast number of proteins that have been investigated. These tables are indispensable to one wishing to begin any investigation of the optical

properties of biological materials. The author's attempt to evaluate the data often is sound but often is insufficiently critical by current standards. This, perhaps, is a consequence of the lack of a thorough discussion of the theoretical basis for interpretation, and therein may lie the main grounds for criticism of the book. One cannot fully assess the optical activity of macromolecules without taking into account circular dichroism. The explosion of research in this field would have made it difficult to contain a comprehensive account in a small book, and this criticism may be valid only in the expectation of the impossible.

The author proposes a scheme for the classification of proteins. It would appear that this new attempt is a precarious endeavor, as we have seen such attempts fail in the past. Time alone will pass judgment. Nevertheless, the thorough handling of the innumerable proteins in the various categories and the attempts to give them conformational assignments can only be viewed with admiration. The differences of opinion one may have with the author on specific problems do not diminish the magnitude of the endeavor. An addendum of references brings this part of the book up to date to some time in 1969.

Readers looking for a comprehensive theoretical and experimental review will find the work lacking, but as a source book it will find a wide and appreciative audience.

The publisher should seriously investigate the properties of the cover which make it next to impossible to lay this book flat on any surface.

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Elementary Processes

Theory of Weak Interactions in Particle Physics. ROBERT E. MARSHAK, RIAZUDDIN, and CIARAN P. RYAN. Wiley-Interscience, New York, 1969. xiv + 770 pp., illus. \$29.95. *Interscience Monographs and Texts in Physics and Astronomy*, vol. 24.

The interactions among the elementary particles are generally classified in three categories: strong, electromagnetic, and weak. Our theoretical understanding of the electromagnetic interaction is most complete, built as it is on classical electrodynamics. Over the past dozen years, following the

discovery of parity violation, a fairly complete theory of the weak interaction based on the early ideas of Fermi has been developed and verified by experiment. This is in striking contrast to the strong interactions, for which there still is no fundamental theory generally agreed upon.

Although there remain important open questions in the theory of weak interactions, it is highly appropriate at this time that a comprehensive account of its present status should be made available. Marshak and his co-authors have provided such an account. The major portion of this book provides a detailed theoretical treatment of every elementary weak process that has been experimentally studied, as well as of a number of interesting processes for which there are as yet few data. For most purposes the treatments are self-contained, although numerous up-to-date references are supplied.

The authors steer a reasonable middle course between a purely deductive approach in which the theory is assumed from the beginning and an approach which attempts to derive the theory from experimental results. Furthermore, some unresolved problems in the theory are explored in detail. In their attempt to be comprehensive the authors at some points are not sufficiently selective, and at a few points they appear overly optimistic about or uncritical of the theoretical treatments they present. An extreme example of the latter failing occurs on page 300, where it is stated that there is general agreement between theory and experiment for the neutron asymmetry from the capture of polarized muons by nuclei. In fact, the experimental result quoted is only one of several conflicting results that can be found in the references given, and the theory also is much more uncertain than the reader might realize.

Weak interactions are of importance to the study of nuclear structure and to astrophysical theory, but, with the exception of special processes (such as the conversion of electrons into neutrinos in stars) empirical information about which may help to establish the fundamental theory, the authors do not attempt to cover these applications. The book contains a fairly complete list of experimental numbers that describe elementary weak processes but does not attempt to provide any discussion or critique of the experiments on which they are based.

The first chapter presents a good