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.

K. M. WATSON
*Department of Physics,*
*University of California, Berkeley*

## 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.

GERALD D. FASMAN
*Graduate Department of Biochemistry,*
*Brandeis University,*
*Waltham, Massachusetts*

## 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 coauthors 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

introduction to the theory of weak interactions, including a very clear account of the experimental status of the relevant symmetry principles. The second chapter, entitled "Mathematical preliminaries," provides elegant summaries of all the basic theoretical methods employed in the book, but its 120 pages may prove somewhat forbidding even to advanced graduate students. Although the volume therefore may prove somewhat difficult as a textbook, it is likely to remain the standard reference book on weak interaction theory for some time to come.

LINCOLN WOLFENSTEIN
*Department of Physics,*
*Carnegie-Mellon University,*
*Pittsburgh, Pennsylvania*

## Many-Body Problems

**Mathematical Methods in Solid State and Superfluid Theory.** Scottish Universities Summer School in Physics, St. Andrews, 1967. R. C. CLARK and G. H. DERRICK, Eds. Plenum, New York, 1968. xvi + 400 pp., illus. $26.50.

The organizers of the summer school of which this book is the proceedings were able to bring together some very erudite physicists, who in addition write with clarity. There are lectures by Lanczos on variational methods and by Gross on transformation theory which discuss well-developed subjects from a unified and a refreshing point of view. The presentation emphasizes the esthetics of the subject matter, an aspect the reviewer especially enjoyed. The other lectures deal with matters of varying degree of current activity, but again always emphasize the generalities of their subjects. There are lectures also on recent developments in many-body physics such as spin fluctuations, uses of the Bogolyubov inequality, and solution of the ice model which are of considerable interest to theoretical physicists and chemists.

The lectures are almost all written up with a great deal of sophistication and assume some prior knowledge of the subject matter. The strongest sentiment the book excites is the wish that one had attended the summer school. For those of us who did not, and have a smattering of knowledge in many-body theory, it is an excellent book to have available at the institutional library.

C. M. VARMA
*Bell Telephone Laboratories,*
*Murray Hill, New Jersey*

## Books Received

**The Acquisition of Syntax in Children from 5 to 10.** Carol Chomsky. M.I.T. Press, Cambridge, Mass., 1969. xiv + 130 pp., illus. $5.95. Research Monograph No. 57.

**Advances in Catalysis and Related Subjects.** Vol. 20. D. D. Eley, Herman Pines, and Paul B. Weisz, Eds. Academic Press, New York, 1969. xviii + 438 pp., illus. $19.50.

**Advances in Clinical Chemistry.** Vol. 12. Oscar Bodansky and C. P. Stewart, Eds. Academic Press, New York, 1969. xvi + 464 pp., illus. $19.50.

**Advances in Virus Research.** Vol. 15. Kenneth M. Smith, Max A. Lauffer, and Frederick B. Bang, Eds. Academic Press, New York, 1969. viii + 464 pp., illus. $19.50.

**Ancillary Techniques of Gas Chromatography.** Leslie S. Ettre and William H. McFadden, Eds. Wiley-Interscience, New York, 1969. xii + 404 pp., illus. $17.50.

**Approaches to Animal Communication.** Thomas A. Sebeok and Alexandra Ramsay, Eds. Mouton, The Hague, 1969. 262 pp., illus. F. 52. Approaches to Semiotics, vol. 1.

**The Archeology of the New Testament.** The Life of Jesus and the Beginning of the Early Church. Jack Finegan. Princeton University Press, Princeton, N.J., 1969. xxvi + 278 pp., illus. $20.

**Aspects of Palynology.** Robert H. Tschudy and Richard A. Scott, Eds. Wiley-Interscience, New York, 1969. x + 518 pp., illus. $24.95.

**Basic Color Terms.** Their Universality and Evolution. Brent Berlin and Paul Kay. University of California Press, Berkeley, 1969. xiv + 178 pp., illus., + chart. $8.50.

**Behavior Therapy.** Aubrey J. Yates. Wiley, New York, 1970. xiv + 450 pp., illus. $13.95. Series in Psychology.

**Bloodsucking Flies and Other Outdoor Nuisance Arthropods of New York State.** Hugo Jamnback. New York State Museum and Science Service, Albany, 1969. x + 90 pp., illus. Paper, $2. Memoir 19.

**The Burrowing Barnacles (Cirripedia: Order Acrothoracica).** Jack T. Tomlinson. Smithsonian Institution Press, Washington, D.C., 1969 (available from the Superintendent of Documents, Washington, D.C.). vi + 162 pp., illus. Paper, $1.25. U.S. National Museum Bulletin 296.

**Catalog of Recent Ophiuroid Type Specimens in Major Collections in the United States.** Maureen E. Downey. Smithsonian Institution Press, Washington, D.C., 1969 (available from the Superintendent of Documents, Washington, D.C.). vi + 240 pp. Paper, $1.50. U.S. National Museum Bulletin 293.

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**Computational Methods in Partial Differential Equations.** A. R. Mitchell. Wiley, New York, 1969. xvi + 256 pp., illus. $11. Introductory Mathematics for Scientists and Engineers.

**A Concept of Corporate Planning.** Russell L. Ackoff. Wiley-Interscience, New York, 1970. xiv + 162 pp., illus. $7.95.

**Concepts of Zoology.** Hubert Frings and Mable Frings. Macmillan, New York; Collier-Macmillan, London, 1970. x + 454 pp., illus. $9.95.

**Contemporary Technical Mathematics with Calculus.** Richard S. Paul and M. Leonard Shaevel. Prentice-Hall, Englewood Cliffs, N.J., 1970. xiv + 642 pp., illus. $11.95.

**The Cornea.** Macromolecular Organization of a Connective Tissue. A symposium, Kyoto, Japan, 1967. Maurice E. Langham, Ed. Johns Hopkins Press, Baltimore, 1969. xii + 244 pp., illus. $9.

**Cosmic Electrodynamics.** J. H. Piddington. Wiley-Interscience, New York, 1969. xii + 308 pp., illus. $18.50. Interscience Monographs and Texts in Physics and Astronomy, vol. 23.

**The Cost of Accidents.** A Legal and Economic Analysis. Guido Calabresi. Yale University Press, New Haven, Conn., 1970. xii + 340 pp. $10.

**Current Topics in Developmental Biology.** Vol. 4. A. A. Moscona and Alberto Monroy, Eds. Academic Press, New York, 1969. xx + 236 pp., illus. $12.50.

**A Directory of University Urban Research Centers.** Urban Institute, Washington, D.C., 1970. 144 pp. Paper, $3.50.

**Down's Syndrome (Mongolism).** A Reference Bibliography. Rudolf F. Vollman. National Institutes of Health, Bethesda, Md., 1969 (available from the Superintendent of Documents, Washington, D.C.). iv + 92 pp. Paper, 45¢.

**Economic Analysis and Operations Research: Optimization Techniques in Quantitative Economic Models.** Jati K. Sengupta and Karl A. Fox. North-Holland, Amsterdam; Elsevier, New York, 1969. xvi + 480 pp. $22.50. Studies in Mathematical and Managerial Economics, vol. 10.

**The Ecosystem Concept in Natural Resource Management.** Based on a symposium, Albuquerque, February 1968. George M. Van Dyne, Ed. Academic Press, New York, 1969. xiv + 386 pp., illus. $16.50.

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**Electron Probe Microanalysis.** A. J. Tousimis and L. Marton, Eds. Academic Press, New York, 1969. xii + 452 pp., illus. $22.50. Advances in Electronics and Electron Physics, Suppl. 6.

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**Energy and the Mitochondrion.** David E. Green and Harold Baum. Academic Press, New York, 1970. xiv + 210 pp., illus. $8.50.

**Energy Transfer and Organic Photochemistry.** A. A. Lamola and N. J. Turro. With chapters by P. A. Leermakers and T. R. Evans. Interscience (Wiley), New York, 1969. xii + 388 pp., illus. $18.50. Technique of Organic Chemistry, vol. 14.

**Evolution.** Jay M. Savage. Holt, Rinehart and Winston, New York, ed. 2, 1969. viii + 152 pp., illus. Paper, $2.95. Modern Biology Series.

**Exposed Precambrian Rocks in South-**

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