



The Two-Nucleon Interaction

By MICHAEL J. MORAVCSIK. This survey of present knowledge about the two-nucleon interaction, in contrast to previous short articles and book chapters, is devoted chiefly to nucleon-nucleon scattering as related to forces between two nucleons. General knowledge of quantum mechanics and rudimentary field theory is assumed. *Oxford Library of the Physical Sciences.* \$2.90

Nuclear Energy

By L. A. REDMAN. A clear, concise, liberally illustrated explanation—for the intelligent layman and young person—of the atom, its discovery and properties, and their conversion for use in industry, medicine, archeology and other fields. Avoids quantum mechanics; uses few chemical symbols. 63 text figures; 8 half-tone plates. \$2.40

Cosmical Electrodynamics, Fundamental Principles

Second Edition

By HANNES ALFVEN, and CARL GUNNE FÄLTHAMMAR. A modernized, expanded version of the first five chapters of the first edition. Covers important recent developments in plasma physics and magneto-hydrodynamics. Assumes considerable knowledge of physics and mathematics. Other volumes to follow. 60 line-figures, 3 half-tone plates, numerous tables and equations. \$9.60

Cosmic Rays

By T. E. CRANSHAW. Makes recent research discoveries intelligible to advanced physics students who are not specialists in the field. Covers research history, the primary beam, theories of origin, energy interactions above 1,000 GeV, air showers, geomagnetic effects, time variations. Annotated author index is a useful bibliography. *Paper;* 36 illustrations. \$2.90

Oxford University Press • New York

ested in science will be delighted with this book which faithfully re-creates one of the most fruitful and dramatic periods in the development of physics. It will seem almost incredible to the post-war generation of physicists that the memorable experiments and theories presented are only about 50 years old and that not so long ago in nuclear physics it was possible to make such momentous discoveries by Rutherford's proverbially simple means.

Ergodic Theories. Proc. of the Internat'l School of Physics "Enrico Fermi" (Varenna, Italy, May 1960). 241 pp. Academic, New York, 1962. \$7.50. *Reviewed by Robert J. Rubin, University of California at San Diego.*

TO physicists, ergodic theory in statistical mechanics is inextricably linked with the notions of irreversibility and approach to equilibrium. This close connection is apparent in the book under review in which more than half of the space is devoted to ergodic theory (classical theory: Truesdell; quantum theory: Ludwig, Loinger, and Uhlhorn). The remainder of the book consists of excursions into the real world of molecular chaos, master equations, diagonal singularities, and density expansions (van Hove, Verboven, Cohen, Lebowitz, Falkoff, and Résibois), with a level-headed lead article by Rosenfeld, "Questions of Irreversibility and Ergodicity". As Course 14, *Ergodic Theories*, in the Italian Physical Society's International School of Physics "Enrico Fermi", the book is a success.

A Physical Theory of the Living State: The Association-Induction Hypothesis. By Gilbert Ning Ling. 680 pp. Blaisdell, New York, 1962. \$17.50. *Reviewed by R. B. Lindsay, Brown University.*

MODERN biophysics and biochemistry rest on the assumption that the behavior of the living cell as the unit of life can be accounted for by the use of the fundamental principles of physics and chemistry. Much success has been achieved by the hypothesis that all living systems consist predominantly of proteins, water, and salt ions, and that the behavior of such systems depends in the last analysis on the interaction of these components. For some time, a widely held theory has postulated that these interactions are essentially a long-range affair in the accepted physico-chemical meaning. The author of the present work is inclined to disagree with this view. He believes that the available experimental evidence points rather to the plausibility of the assumption that in the living cell the system of proteins, water, and ions must exist in close association, implying the interplay of short-range interactions. The author works out in detail the consequences of this point of view, supplemented also by the use of another motion which he calls the inductive effect. The latter term means essentially the influence of polar groups in the protein molecule carrying net electric charges on the distribution of free electrons.

at Sandia

At Sandia your engineering assignment could involve development and testing of weapon components and systems. The sled track symbolized here, one of many facilities in our environmental test laboratory, is capable of simulating a variety of environments that a weapon might encounter in actual operation—acceleration, deceleration and impact.

Sandia Corporation is a prime contractor of the Atomic Energy Commission engaged in nuclear weapons research, design and development. As a Bell System subsidiary, the technical and industrial know-how of Western Electric Co. and Bell Telephone Laboratories is available to assist and advise our engineers and scientists in the many complex problems they are called upon to solve.

Sandia scientists and engineers are doing related work in fields such as: Polymers and Plastics; Solid State and Plasma Physics; Materials Research and Radiation Damage; Microminiaturization; Systems and Component Design; Aerospace Nuclear Safety; Mathematical and Statistical Research.

At Sandia you would work in Albuquerque or in Livermore in the San Francisco Bay area.

Sandia Laboratories are primarily interested in recent and current graduates in the engineering and scientific disciplines at all degree levels. Sandia recruits on many major campuses. For current opportunities, contact the Sandia recruiter at your college or write Personnel Director, 3100 Ref. 559-2, Sandia Corporation, Albuquerque, New Mexico-87115.

SANDIA
CORPORATION

AN EQUAL OPPORTUNITY EMPLOYER



ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA





Helium Research Dewars



Hofman Model HLOR helium dewars for optical applications are designed for applications requiring visual observation of helium cooled detectors. The dewar pictured above has a 1-liter helium capacity and is designed to be used with a wide variety of detectors. These convenient dewar configurations are particularly applicable to research on:

Low Temperature Observation and Fluorescence Measurements
Optical Maser Research
Cooling of Infrared and Ultra-Violet Detectors
Photoconductivity Measurements
X-Ray Studies

FOR FURTHER INFORMATION
WRITE FOR BULLETIN #2003

Hofman Laboratories, Inc.
225 Parkhurst St., Newark, N.J.
telephone 824-4900

WEST COAST FACILITY
PAUL CHEMICAL CO.
6750 Caballero Blvd., Buena Pk., Cal.
LA 1-2917

These two ideas account for the expression "association-induction hypothesis" appearing in the title. The fundamental tendency of the work is to discount the ultimate utility of theories involving the pumping of all material across semipermeable membranes and to stress the importance of the interaction of fixed charges.

Though the presentation is clear and explicit, it demands for its understanding considerable background in biochemistry and the fundamentals of thermodynamics and statistical mechanics. Roughly the first quarter of the book is devoted to an exposition of the fundamental theory and the remainder to its application to numerous biological phenomena. The treatise is well illustrated by a large number of excellent figures, graphs, and charts, and there is an elaborate bibliography as well as a glossary of terms. The book will undoubtedly receive close attention from biophysicists and biochemists not only for its basic thesis, which will probably arouse much discussion, but also for its wealth of biological data.

Color in Business, Science, and Industry (2nd ed.). By Deane B. Judd and Günter Wyszecki. 500 pp. Wiley, New York, 1963. \$15.00. Reviewed by W. T. Wintringham, Bell Telephone Laboratories, Incorporated.

THIS reviewer opens a second edition with a greater sense of anticipation than a first edition. The questions in his mind are: Have the revisions of the earlier text improved the book; have the minor aggravations in the first edition been carried over to the second; and have the most recent advances in the field been incorporated in the second edition? In the case of *Color in Business, Science, and Industry*, the answers to these questions in order are: yes; yes and no; and yes.

One's first impression of the text of this edition is that it is familiar and little changed from that of the earlier edition. This impression is heightened when it is found that paragraphs and whole sections have been transferred without change to the new edition. But, it suddenly occurs to the reader that the difficult parts of the text have disappeared. Through careful rewriting of the obscure passages, and by minor changes of the order of presentation, this edition is substantially more readable than was its predecessor. Paralleling this improvement of the text, the illustrations have been redrawn and the more complicated ones simplified.

One eminent reviewer of the first edition (W. E. K. Middleton in the *Journal of the Optical Society of America*) suggested that the content of the book did not justify the inclusion of the word *Science* in the title; and he noted that the OSA terminology had been used everywhere in the text except in the discussions of the Kubelka-Munk analysis of layers of colorants. The authors appear to have considered and rejected these criticisms.

This reviewer is disturbed to find that titles have not been added for Tables A, B, and C of the Ap-