

Oxford University Press

Strange Particles and Strong Interactions

By RICHARD HENRY DALITZ. This detailed discussion of the reactions involving the strongly interacting particles, and the resonant states presently known, develops and illustrates a formal reaction theory and explains its relationship to more elaborate dispersion theory. Most recent experimental evidence on resonance states is included, and also proposals for experimental determination of strange particle parities. *Tata Institute of Fundamental Research Studies in Physics.* Paper. \$5.05

Angular Momentum

By D. M. BRINK and G. R. SATCHLER. The quantum theory of angular momentum is here introduced to students unfamiliar with it, and developed to a stage useful for research. Part one contains the basic theory of rotation. Part two emphasizes its application to phenomena, states theorems without proof, and presents a collection of results which will be helpful in solving problems. *Oxford Library of the Physical Sciences.* \$2.40

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solids or free radicals in biological systems, to studies of electron and isotopic exchange reactions, as well as to nuclear astrophysics.

Without meaning to be disrespectful, this reviewer sees this volume as a veritable potpourri, the ingredients of which are related only through their sometimes rather tenuous connection with nuclear science. Contemplate the unlikely juxtaposition of "Dispersion Relation Methods in Strong Interactions" sandwiched between "Isotopic Exchange Reactions in Nonaqueous Systems" and "High Sensitivity Mass Spectroscopy in Nuclear Studies". There is something in it for everyone, which is equivalent to the statement that nobody will read the whole thing, not even the conscientious reviewer who feels some responsibility in this direction.

Angular Momentum. By D. M. Brink and G. R. Satchler. 134 pp. Oxford Univ. Press, Oxford, 1962. Paperbound \$2.40. *Reviewed by Michael Danos, National Bureau of Standards.*

THE theory of angular momentum is very simple in principle. It is, however, very involved in detail. This is illustrated by the history of the topic: the concepts which form the skeleton of the theory had all been fully developed about twenty years ago whereas the detailed conventions and the notation have not been stabilized even today. Consequently, it is inevitable that any new presentation of angular-momentum theory appearing on the scene will be scrutinized not only for the clarity and completeness of the presentation but also for its contribution to the systematization and simplification of the details. For the first of these aspects the booklet by Brink and Satchler deserves high praise. It is written in a precise and compact style, and the authors have succeeded not only in describing all the concepts one would expect in such a book but also in giving an almost complete treatment, thus enabling a beginner to use the book to learn the subject. The contents are in short: symmetries in physical laws, rotation matrices, coupling and recoupling of angular momentum, tensors and tensor operators and their matrix elements, and as applications, electromagnetic transitions, interaction between two systems, interaction between two particles in a central field, and multipole expansion of the density matrix. The book also contains an adequate collection of formulae.

With respect to the second aspect, the treatment of the details of notation and standardization, I have the following reservations. In defining the rotation matrices, the authors use the convention in which the "body" is rotated. I would, however, definitely prefer the convention in which the coordinate axes are rotated. This corresponds intuitively much more closely to the kinematical nature of the rotation operation: it takes no effort to reproject the state in a rotated coordinate system, but just think of rotating an object, say, a grand piano or a nitrogen molecule! Somewhat more unfortunate is the use of the old Racah W instead of the symmetric six- j -coefficient whose advantages are par-

ticularly apparent in algebraic manipulations. There is no rational reason in retaining the old W ; even Racah has completely switched over to the six- j -coefficient.

Notwithstanding the flaws, this booklet should prove convenient and useful both as a tool in computations and as a compact introduction to angular-momentum theory.

An Introduction to Transport Theory. By G. Milton Wing. 169 pp. John Wiley & Sons, Inc., New York, 1962. \$7.95. *Reviewed by George Weiss, University of Maryland.*

MOST physicists are familiar with one form or another of transport theory as a physical theory. In this book, transport theory is presented as a purely mathematical theory along the lines of recent work of Bellman and collaborators on the invariant-imbedding method. Unfortunately, it does not appear that this method leads to the solution of any fundamental problems although it does, however, lead to a unified and elegant derivation of transport equations.

Wing analyzes few physical problems. Instead, he first concentrates on some one-dimensional rod examples, which can be solved exactly and then proceeds to set up equations for more complicated systems. The concept of criticality remains, throughout the book, a fairly mysterious one since the author deals with mathematical systems rather than physical ones. The only fairly realistic problems for which solutions are actually found are those of reflection from a semi-infinite slab first treated by Chandrasekhar, and the Milne problem solved by the Wiener-Hopf technique. The solutions to these problems are given in somewhat abbreviated form possibly because the author does not consider it part of his main contribution.

It may indeed be of some value to try to understand the mathematical problems of transport theory independently of physical interpretation, and for those whose interests are mainly mathematical this book provides a good interpretation. Those whose interests are directed towards the solution of actual physical problems will find this to be a disappointing book.

Progress in Microscopy. By M. Françon. 295 pp. Row, Peterson & Co., Elmsford, N. Y., 1961. \$9.00. *Reviewed by W. T. Wintringham, Bell Telephone Laboratories.*

THERE is a tendency today to look across the Atlantic and to comment that European facilities for training in the field of optics are far superior to those in the United States. One proper measure of such a difference is the content of publications on the two sides of the ocean.

Such comparison does little to refute the belief that the Europeans are ahead of us in the formal preparation of source material. The pages of the journals and transactions of the scientific societies in England and on the Continent contain a substantial fraction of re-

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