problems, Professor Loeb presents not only the conclusions but the thoughts along the way. This produces a scientific notebook quality to the book which makes it both interesting to read and scientifically rewarding to those in search of information and guidance about the corona mechanism.

PHYSICS AND SOCIAL PROBLEMS

THEORIE PHYSIQUE ET RECHERCHE PREVISIONNELLE. Conf. Proc. (Paris, May 1962). J.-L. Destouches, ed. 180 pp. Gauthier-Villars, Paris, 1964. Paper 28F.

by R. Bruce Lindsay

Immediately after the conclusion of World War II there was organized in l'Ecole Centrale des Arts et Manufactures in Paris a "Centre de Recherche Scientifique" in order to bring to bear on industry the enormous development of basic research in this century. Such subjects as the physics and chemistry of metals, thermodynamics and fluid mechanics began to be intensively studied in this center. In 1961 a new section was inaugurated, dedicated to "Recherches Prévisionnelles." Its purpose was to take advantage of the new developments in cybernetics and modern planning theory to make intensive studies forecasting future progress in many fields of human activity. The project was conceived on a rather ample scale. Thus it was intended to include predictions of future developments in theoretical physics, e.g. the possible reformulation of quantum mechanics, as well as the forecasting of developments in the economic and social fields, e.g. city planning.

The volume under review is a report of the proceedings of the first international conference held under the auspices of the new center in May, 1962, organized by J.-L. Destouches under the presidency of L. de Broglie. It constitutes No. 14 in the series "Les Grands Problèmes des Sciences". M. Destouches, well known for his searching investigations into the mathematical foundations of quantum mechanics, is professor at the Sorbonne and director of the Centre de Recherches Prévisionnelles de l'Ecole Centrale.

The reader will find the book a rather singular one, since the first half is made up of six articles on quantum mechanics and elementary particle theory, whereas the second half is devoted to papers on probability and statistics with applications to linear programming, operations research, city planning and automation. In this melange there is indeed a common thread, namely that the same general philosophical principles at the basis of theorizing in an abstract science like physics are also applicable to a wide variety of problems in other domains of human intellectual activity. Whether this will lead sociologists, economists and industrial engineers to immerse themselves in the intricacies of quantum physics and its methodology is open to doubt, but the challenge is obvious.

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SYMMETRY FOR THE PASSERBY

LIE GROUPS FOR PEDESTRIANS. By Harry J. Lipkin. (North-Holland, Amsterdam) Wiley, New York, 1965. $6.00.

by John G. Taylor

One of the most important advances in our understanding of the elementary particles in the last few years has been through the use of symmetries of various sorts, both in nuclear and high-energy physics. The relevant symmetry groups are generally assumed to be Lie groups, and the appearance of energy levels grouped close together or with certain regularities is taken as an indication of which Lie group and its representations are important. In order that ideas involved and methods used be understood by more than experts, it is necessary that a suitable introduction be written describing these ideas and methods. There are two traps into which such an introduction can fall; either that of excessive simplicity, in which case the reader ends up not knowing much

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A professor at Rutgers University, John G. Taylor has published extensively on mathematical physics.

more than he did before, or that of excessive complexity, in which case the reader may not even end up before he gives up. A proper introduction must avoid these traps. In the case of symmetries the complexity is that involved with the mathematical analysis of Lie groups and their representations. In the book under review the author has attempted to present as much as possible about the physical use of symmetry groups by means of analogy with the three-dimensional rotation group and isotopic spin. He does not use the standard language of group theory nor discuss group-theoretic theorems so that he certainly doesn't fall into the second trap, that of complexity. I feel he has also mainly avoided falling into the first trap, that of simplicity. This is partly shown by the contents of the book.

He discusses angular momentum briefly in Chapter 1, and then uses analogy to consider the isospin group and its representations in Chapter 2. This is then extended in Chapter 3 to SU (3). The representation theory of SU (3) is first derived in the Sakata model, considering n, p, Λ as a basic triplet of particles, and then considered in the octet model. The use of SU (3) in the three-dimensional harmonic oscillator and its applications in the shell model are in Chapter 4. Quasispin and the symplectic groups are then described in Chapter 5. The use of Young diagrams and the permutation symmetry is briefly discussed in the final chapter (6). The final third of the book contains four appendices, one on building up higher representations of SU (3) from the triplet, one on the use of the U-spin subgroup of SU (3) to avoid using Clebsch-Gordon coefficients of SU (3) directly, one on experimental predictions on the octet model of SU (3), and one on phases.

The book is written in an easy style, with very few errors (none that this reviewer could find) and the formulas and diagrams clearly printed. There is a small bibliography which should serve as an admirable guide for further reading.

The book contains no discussion of more recent groups, such as SU (6), U (12), etc., etc., which are of present interest in high-energy physics. This is to be expected in a rapidly changing field. The reviewer feels, however, that having so successfully avoided falling into the trap of complexity by carefully severing any relation with mathematics, the author did not make the relation with physics strong enough. There is a remarkable dearth of comparison of symmetry predictions with experiment. Since the author is one of the experts on this, it is to be hoped that he may remedy this defect by either writing a companion volume or adding a further appendix.

In spite of this defect, the book makes a very satisfactory first step towards understanding the simpler Lie groups of interest.

A VERY THEORETICAL TEXT

ELEMENTARY THEORY OF ELECTRIC AND MAGNETIC FIELDS. By Warren B. Cheston, 393 pp. Wiley, New York, 1964, $9.75.

by Lawrence A. Weller

Professor Cheston of the Department of Physics at the University of Minnesota has written this textbook for an elementary electromagnetic theory course. He has intended it for use by upper-division or senior college students taking a full year's course.

The book begins with a chapter primarily on vector analysis, which is then used extensively. The next twelve chapters are devoted to three basic areas of electromagnetic theory: (1) electrostatic fields and energy in vacuum and in matter; (2) magnetic fields and magnetic materials; and, (3) Maxwell's equations and electromagnetic radiation in vacuum and in materials. Two further chapters complete the book. They present introductions to such topics as the theory of plasmas and magnetohydrodynamics, which are so limited as to be of little value.

Professor Cheston has devoted little attention to the experimental bases of the theory either in the body of the text or in the problems given at the

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