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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end of most chapters. For example, Hertz's experimental verification of the existence of electromagnetic waves previously theoretically predicted by Maxwell is not mentioned. In addition, this book contains few experimentally measured values of the electric and magnetic properties of real materials.

In the first thirteen chapters of this book Professor Cheston has presented in a straightforward manner the basic elements of nonrelativistic electromagnetic theory. By doing so he has written a good textbook for a conventionally theoretically oriented course in elementary electromagnetic theory.

EMPHASIS ON THE PRACTICAL

ATOMIC THEORY OF GAS DYNAMICS. By J. W. Bond, K. M. Watson and J. A. Welch. 518 pp. Addison-Wesley, Reading, Mass., 1965. $16.75.

by Kurt E. Shuler

The subject matter of the book and its interdisciplinary aspect can best be exhibited by listing the chapter headings: Thermodynamic Properties of a Gas, Shock Hydrodynamics, Continuum Hydrodynamics, Atomic and Molecular Physics, Equation of State, Kinetic Theory of Gases, General Theory of Transport Processes and Hydrodynamics, Dissociation and Ionization in a Gas, Kinetic Theory of Transport Processes in Multicomponent Gases, Radiation Transport Theory, Opacity, Radiation Transport Applications, and Shock-Front Structure.

Word of mouth comments concerning this book which have come to the attention of the reviewer have in general been negative. This is particularly true of the academically oriented component of the scientific community. If one considers, however, the audience to which this book is specifically addressed and the difficult and complex interdisciplinary problems with which this audience is faced, such a negative attitude is not justified. This reviewer, who is somewhat familiar with these problems through his own involvement with defense-oriented science, considers it to be a very useful contribution—provided that certain caveats are kept in mind.

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The preface clearly states that the book was written for students and workers in the fields of supersonic aerodynamics, rockets and nuclear weapons, and allied defense-oriented interdisciplinary subjects. As also pointed out in the preface, much of this material has not so far been available in book form—and certainly, the reviewer would add, collected for ready reference in one book. Additional features emphasized by the authors are the stress on applications to real problems and the inclusion of extensive data on atomic physics. Bearing in mind the announced intentions and contents the reviewer feels that the authors have produced a useful survey of atomic physics and gas dynamics and a useful primer on the application of some of the more elementary aspects of atomic and molecular physics and gas dynamics to "practical" problems.

Two caveats, however, should be noted. The reviewer finds it difficult to believe that this book is "suitable as a textbook for graduate students. . . ." For that, the book by its announced primary purpose does not have sufficient depth of coverage and critical evaluation in any of the specific topics treated. This comment leads to a second, which is that thoroughness, critical discussion, and rigor have often been subordinated to the objective of obtaining an answer. There is nothing wrong with that if the primary objective is to obtain some reasonable solution to a practical problem—*provided* that the student or practitioner is constantly aware of the limitations, approximations, subtleties, and pitfalls that may be involved in applying some particular result to his problem. If reader John Doe does not already have the background for such critical evaluations he may be misled into thinking that he knows *the answer* instead of an approximation whose validity needs further investigation. The user would be well advised to do extensive collateral reading in the stand-