About a third of the booklet consists of useful numerical tables.

Although the book has a detailed table of contents, it does not have an index. It does not contain a single reference. It would have been particularly useful to include references to the many more extensive numerical tabulations of the kinematics of nuclear collisions, also available.

In the numerical examples for nonrelativistic collisions, integer mass numbers rather than the actual masses are used, an approximation which is rarely good enough for present-day experiments. In fact, for many experiments in low-energy nuclear physics non-relativistic calculations are not accurate enough, while the strictly relativistic calculation may be unnecessarily complicated. Unfortunately the book does not concern itself with this most frequently encountered intermediate situation in which one is interested in the first relativistic correction term to a nonrelativistic calculation.

Statistical Mechanics. By Kerson Huang. 470 pp. Wiley, New York, 1963. $10.75.
Reviewed by C. H. Holbrow, Haverford College.

Statistical mechanics is a branch of physics based upon very general considerations. Consequently, it has broad and general applications. The breadth of applicability of this theory and the logical rigor with which it has been developed make it a particularly satisfying field of study. However, because this theory has a rigorous and well-defined mathematical development, textbooks treating this subject cannot differ greatly in their presentation of the fundamentals of statistical mechanics, such as kinetic theory, the Boltzmann H theorem and its analysis, a development of the ideas of microcanonical, canonical, and grand canonical ensembles, and the application of these ideas to quantum statistical mechanics, as well as classical statistical mechanics (i.e. consideration of the classical ideal gas, the ideal Fermi gas, and the ideal Bose gas). Kerson Huang treats these aspects of statistical mechanics clearly and in sufficient depth to leave the student with a good understanding of the fundamentals. However, this task is performed equally adequately by several other textbooks on statistical mechanics.

It is the careful introduction of the statistical mechanical material by a treatment of classical thermodynamics plus an interesting selection of examples of applications of the theory that make this text especially good. The book has been divided into three parts of about the same length. The first of these is concerned with thermodynamics and kinetic theory. The treatment of transport phenomena in terms of the methods of solution of the Boltzmann transport equation is excellent. The equation is solved in the zero-order approximation and the first-order approximation, and the Chapman-Enskog method for solving the equation is also described. The relationship between transport phenomena and hydrodynamics is developed. The second part is concerned with the development of statistical mechanics, and, in addition to the "hard core" material mentioned above, there is a discussion of the application of statistical mechanics to imperfect gases. The methods of pseudopotentials and cluster expansions are discussed. The final third of the book is devoted to "special topics in statistical mechanics". This is the portion which is of particular value because it discusses some of the more recent contributions to the application of statistical mechanics. For example, the Ising model, and its applications to the descriptions of ferromagnetism, binary alloys, and a lattice gas are discussed in considerable detail. The Onsager solution to the two-dimensional Ising model is developed. Also considerable attention is given to the statistical mechanics of liquid helium. The theories of Landau and Feynman which attempt to explain the two-fluid model near absolute zero are developed. The problem of the hard-sphere Bose gas is solved in order to have a simple model of an interacting system of bosons to compare with the results of Landau and Feynman.

The interest of the teacher in the more special topics outlined in the preceding paragraph will determine whether he would wish to use this book as a text. The material covered is as up to date as possible and is presented in an excellent pedagogical style. This book should serve as an effective text and should certainly be among the supplementary readings suggested in any graduate course in statistical mechanics.

Nuclear Interactions. By Sergio DeBenedetti. 635 pp. Wiley, New York, 1964. $16.00.
Reviewed by Evans Hayward, National Bureau of Standards.

This is a book in which nuclear interactions are treated in an unusual spirit. It consists of eight chapters in each of which some topic is thoroughly developed; in each case the mathematical techniques required for the theoretical discussions are explained in detail. In this way the student need not make a research project out of the mastery of a given subject. It is all there. There is no "it is straightforward but tedious to demonstrate that . . ." nor "it is left as an exercise for the student to show that. . . ." Each step is worked through, and if the reader is already familiar with that part, he can skip it.

The first chapter begins with a discussion of conservation laws, including angular momentum, parity, time reversal, etc. These basic ideas are then used throughout the remainder of the book. A treatment of the two-body problem follows. The second chapter, on nuclear models, points out the many features of nuclei that can be associated with specific models. The transition from the harmonic oscillator picture to the Nilsson scheme is described briefly and followed by a longer treatment of the many-body problem as applied to nuclei. The third chapter is a discussion of the analysis of scattering experiments, all kinds: neutron scattering, electron scattering, nucleon scattering, and finally polarization phenomena.

The fourth and fifth chapters contrast the interactions between radiation and nucleons with other nuclear reactions, i.e., the reactions for which the basic interaction is well known, with those for which it is not. The discussion of radiation phenomena integrates its many aspects in a way that is not to be found elsewhere. And the material on nuclear reac-