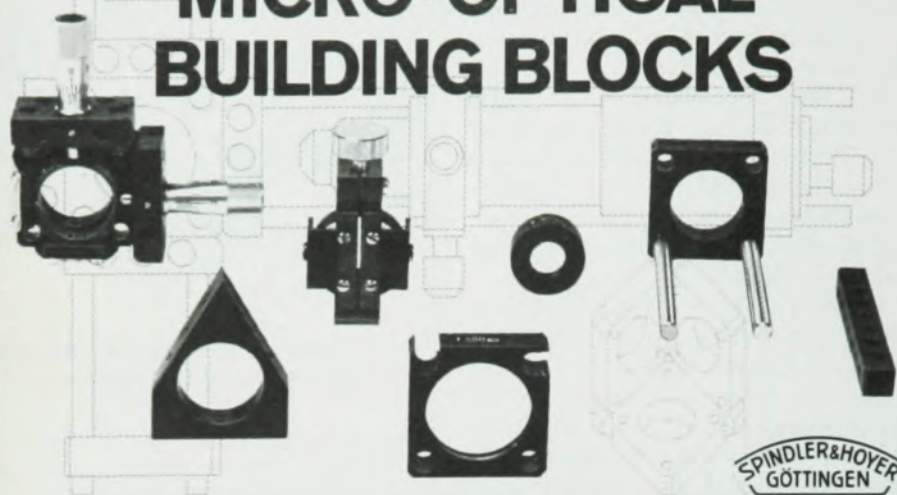


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have been represented. A most serious omission is the absence of Joseph Henry's report on "Acoustics Applied to Public Buildings," not only for its inherent merit but also because it has been buried for over a century in the forgotten annual report of the Smithsonian Institution for 1856, and is almost unknown to present-day acousticians. Henry's contributions deserve much greater credit than is usually acknowledged for his pioneer work in architectural acoustics in general, and above all for his experimental discovery and application of the "precedence effect" in early reflected and scattered sound in the design of the original Smithsonian lecture hall.

The attractiveness of this book would have been greatly enhanced by including more (and better reproduced) figures. However, in general, it is a fine production that should appeal, not only to active workers in acoustics and to those concerned with the development of mechanics, but also to scholars in the history of science. In addition to providing fascinating background for the other volumes in this series, the book stands on its own merits as a highly useful source of papers that would otherwise not be readily available to most physicists.

R. S. SHANKLAND

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The Pion-Nucleon System

B. H. Bransden, R. G. Moorhouse

538 pp. Princeton U. P., New Jersey, 1973. \$20.00 hardcover, \$8.95 paperback

Since no quantitative theory of the strong interactions of fundamental particles exists, this field involves many different principles and techniques and is changing constantly. Therefore, most books on strong interactions are either limited to some specialized topic, or are compilations of research papers or conference talks. This situation has made it extremely difficult for graduate students to familiarize themselves with the physics of strong interactions.

The Pion-Nucleon System admirably fills this gap in the literature. Almost all of the important ideas of strong-interaction physics are developed, most of them in a manner comprehensible to a young graduate student who has taken quantum mechanics. Each idea is first developed mathematically and then compared with experimental data, so the reader gets an accurate picture of the theory's relation to experiment in a given field. The experimental data is the main feature that distinguishes *The Pion-Nucleon System* from another excellent book, *In-*

roduction to Particle Physics by Roland Omnès.

The title is a little misleading because the particles considered include all members of the SU(3) multiplets of the pion and nucleon, as well as meson and baryon resonances. Presumably, the title was chosen because most of the available experimental data concerns pions and nucleons. Electromagnetic and weak interactions are included in so far as they are related to strong interactions. For example, there are chapters on photomeson production from nucleons and current algebra. The most notable omission is nucleon-nucleon scattering—the book would be more useful if a chapter on this topic were included. An advantage of this book is the inclusion of such modern concepts as duality, the Veneziano model, inclusive reactions and partons. I hope the authors keep the book up-to-date by revising it every few years. A sizable and useful bibliography is provided. No page numbers are given in most of the references to other books, but this is a minor flaw.

The Pion-Nucleon System could be used as a text for a graduate course in strong-interaction physics. The discussions of basic scattering theory, Regge-pole theory, resonance theory, SU(2) and SU(3) symmetries, and duality can be understood by graduate students with few necessary references to other works. On the other hand, the treatment is much more advanced for some topics, such as the derivation of pion-nucleon dispersion relations, the application of Regge-pole theory to pion-nucleon scattering, and the discussion of current algebra. To some extent this is unavoidable, since the authors do not wish to double the size of the book by teaching field theory. However, the chapter on current algebra is not as clear as the treatment in some other books, such as *Current Algebras*, by Stephen L. Adler and Roger F. Dashen.

Both the authors have had much experience in writing about particle physics. Moorhouse has written or collaborated on many excellent research papers in which various theoretical concepts of particle physics are applied to experimental data. Bransden has worked on similar papers, and has also written a well known review article on the K-meson-nucleon system for *High Energy Physics*, Vol. III, (E. H. S. Burhop, ed.).

If a graduate student is in search of one book to use as a basis for learning the present-day status of the physics of meson-baryon interactions, this is the best available book for him.

RICHARD H. CAPPS
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Statistical Mechanics, Kinetic Theory, and Stochastic Processes

C. V. Heer
602 pp. Academic, New York, 1972.
\$18.50

Statistical physics is a subject that has fascinated scientists for well over a century. Although some of it involves questions of considerable subtlety, much of the subject can be developed apart from foundational difficulties and advanced mathematical tech-

niques, and can be introduced early in the curriculum. The subject matter ranges widely—from the free-molecule gas to the foundations of classical thermodynamics.

Therein lies a difficulty: it is all too easy for a textbook on statistical physics to end up as a hodgepodge of apparently disconnected results, with very little suggestion of the coherence of the subject. Even ignoring such monstrosities, we find a great diversity of approaches, which can conveniently be classified according to their nearness to one of two extremes. At one extreme we find an emphasis on en-

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