more difficult areas where present advanced research is concentrated: shock tube experiments involving dissociation and ionization in collisions of complex molecules and their influence on flow; flow under conditions where the gas is partially or completely ionized; and flow where turbulence plays an important role and in which encounters between clusters of molecules need to be treated.

Annual Review of Nuclear Science. Vol. 5. Edited by James G. Beckerley, Martin D. Kamen, Leonard I. Schiff. 448 pp. Annual Reviews, Inc., Stanford, California, 1955. USA $7.00; elsewhere $7.50, postpaid. *Reviewed by B. T. Feld, Massachusetts Institute of Technology.*

The editors of this series, in a preface reviewing the problems and their solutions as recognized in the half decade of experience so far accumulated with this review, allow themselves the somewhat modest conclusion that "the results to date have been well worth the effort". An outsider may, perhaps, be permitted to exhibit somewhat more enthusiasm regarding the results so far achieved by this series. Through a balanced choice of subjects and the excellence of the authors, the *Annual Review of Nuclear Science* has established itself as one of the most important means of maintaining contact and stimulating cross-fertilization among the rapidly expanding branches of this young science. Most important, as is clearly recognized by the editors, the *Annual Review* devotes an appreciable fraction of each volume to reviews of new advances in the fundamental problems of nuclear physics. It is in finding and maintaining this proper balance between the fundamental and applied that the editors have found the greatest challenge; they have achieved notable success to date.

Volume 5 contains the following reviews: (1) Electromagnetic Transitions in Nuclei, M. Goldhaber and J. Weneser: A concise summary of the theory and its use as a tool for checking the predictions of various nuclear modes. (2) The Distribution of Charge in the Nucleus, K. W. Ford and D. L. Hill: An exhaustive survey of the available evidence concerning the size and shape of nuclei. (3) Nuclear Radiation Shielding, E. P. Blizzard: The experimental and theoretical bases of the art of shielding design. (4) Nuclear Reactions of Intermediate Energy Heavy Particles, D. C. Peaslee: An excellent reassessment of reaction theory in the light of recent advances in the statistical and optical approaches. (5) Nuclear Particle Detection (Cloud Chambers and Bubble Chambers), W. B. Fretter: Recent important advances in a technique which has contributed and continues to contribute more than any other to fundamental particle research. (6) Design Comparison of Reactors for Research, L. B. Borst: Procedures and criteria for the choice and construction of a research nuclear reactor. (7) Industrial Applications (Mass Spectrometry), C. E. Berry and J. K. Walker: Analytical techniques, mainly for use in problems of the hydrocarbon indus-

try. (8) Radiation Chemistry, F. S. Dainton: A rapidly developing science brought up to date. (9) Mass Spectra and the Chemical Species Produced by the Impact of Low Energy Electrons, M. Krauss, A. L. Wahrhaftig, and H. Eyring: Application of rate theory to this complex set of phenomena. (10) Radiochemical Separation Techniques, H. L. Finston and J. Miskel: A complete collection, much of it in tabular form. (11) The Fundamentals of Radioantography, W. P. Norris and L. A. Woodruff: A general discussion of the application of nuclear emulsions to a variety of problems, mostly biological. (12) Cellular Radiology, R. K. Mortimer and C. A. Beam. (13) Removal of Radioelements from the Mammalian Body, J. Schubert: A pioneering survey of a new, highly interesting field. (14) Vertebrate Radiology, Physiology, A. Edelmann.

Special Functions of Mathematical Physics and Chemistry. By Ian N. Sneddon. 164 pp. (Oliver & Boyd, England) Interscience Publishers, Inc., New York, 1956. $1.75. *Reviewed by E. Richard Cohen, Atomics International.*

Physics and engineering today are making more and more use of the "special functions" of mathematics. In the fields of radio propagation or neutron diffusion, which now straddle the dividing line between physics and engineering, as well as in quantum mechanics, a knowledge of these functions is essential. Prof. Sneddon has written a concise survey of the field. The book (one of the *University Mathematical Texts* series) is intended for physics rather than mathematics students; it is written from the viewpoint of the mathematical physicist or the applied mathematician.

The first chapter is an introductory one on the solution of ordinary differential equations in series and the second chapter discusses the general hypergeometric equation. The final three chapters of this small book are then concerned in turn with the Legendre function, Bessel function, and the Hermite and Laguene function. In each case applications of the functions are demonstrated in the text with examples from electrostatics, astronomy, and quantum mechanics. Further examples are given in the problem set at the end of each chapter. The problems have been carefully chosen to extend the material in the text and many of the most important properties of the functions are presented here. This technique is often objected to, but with a small volume (pocket-sized, if you don't mind bulgy pockets) it becomes mandatory. The burden placed upon the instructor is greater in this case than it would be if important results were less densely packed—and the density of information in Prof. Sneddon's book is surprisingly high. The volume should also serve as a refresher course or as a handbook of properties of special functions for the physicist working in those fields where these functions arise. It does not, nor is it intended to, replace the *Bateman Project* volumes edited by Prof. Erdelyi; but for the physicist, Sneddon is the more useful.