

point. These chapters display a nice balance in the discussion of experimental techniques, data, and theoretical analysis. Transition probabilities are calculated for all the decay processes. A uniform point of view is maintained throughout. A discussion of the neutrino's properties is included.

The tandem Van de Graaff, sector-focused cyclotron, and electron linac, together with the more classical accelerators are explained with operating specifications.

The chapter on nuclear reactions has examples and cross-section calculations (and a discussion of their regions of validity) for the compound nucleus, optical model, stripping reactions, coulomb excitation, and photonuclear reactions. The spectroscopy of elementary particles is treated, but unfortunately without the help of the quark model.

Each of the fifteen chapters has a problem set of varying degree of difficulty. Some of these are "term problems" that require a considerable amount of work on the part of the student.

This is an up-to-date and thoughtfully put together text. Relatively simple concepts with a minimum of mathematical complexities do allow the student to gain a feeling of understanding of the data. Perhaps the job has been done too well and the student might get the impression that there are no open problems in nuclear physics. An instructor should have little trouble setting him straight on this point, however.

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James O'Connell is a nuclear physicist at the National Bureau of Standards specializing in photonuclear reactions.

A reference text

PROBABILITY, RANDOM VARIABLES, AND STOCHASTIC PROCESSES. By Athanasios Papoulis. 583 pp. McGraw-Hill, New York, 1965. \$19.50

by Joseph G. Hoffman

The stated purpose of explaining the theory of random processes to students of engineering and physics is admirably achieved. A careful pedagogic method of discussing concrete examples, and even paradoxes, is displayed,

especially in the first 5 of the 16 chapters. For instance, chapter 4 on the concept of a random variable has 17 examples interspersed among basic materials. This same chapter has in one section a comparison of the normal, Poisson, binomial, gamma, beta, Laplace, Cauchy, Rayleigh and Maxwell distributions in a useful compilation for students of other texts on statistics. The special meaning of the binomial distribution is made clear in the comparison. The orderly presentation makes for teaching at its best, but it also provides a handy reference text.

Since it is aimed at engineers and physicists, there are numerous applications as indicated by some chapter titles: Harmonic Analysis of Stochastic Processes, Brownian Movement and Markoff Processes, Poisson Process and Shot Noise, and Correlation and Power Spectra. The major effort, however, is to develop basic concepts. Chapter 9, entitled "Basic Concepts of Stochastic Processes," is a concise presentation of random walk, Wiener-Levy process, binary transmission, correlation, stationary processes and ergodicity, among other concepts. The interrelationships between the concepts are carefully worked out for the student.

There are numerous figures; the physical format is attractive; and a table of contents and subject index make the materials readily accessible. Essential bibliographic references are given as footnotes at relevant points in the text. I recommend this work not only for its excellent presentation of stochastic processes, but as a basic intermediate reference.

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The reviewer is professor of physics at the State University of New York at Buffalo.

Interdisciplinary and mature

ADVANCES IN RADIATION BIOLOGY. Volume 2. L. G. Augenstein, R. Mason, M. R. Zelle, eds. 371 pp. Academic Press, New York, 1966. \$15.00

by Joseph G. Hoffman

The six papers comprising this volume illustrate the subject of radiation biology in its broadest possible sense. B. Rosenberg's article on a "Physical Approach to the Visual Receptor Process" presents a model of a transducer

for making vision possible. In an entirely different direction, L. I. Grossweiner reviews "The Study of Labile States of Biological Molecules with Flash Photolysis" and describes work on proteins, amino acids, visual pigments, chlorophyll and sensitizing dyes.

Three articles deal with the genetic aspects of radiation effects. They are: "Repair of Premutational Damage," by R. F. Kimball; "The Genetic Control of Radiation Sensitivity of Micro-Organisms," by H. I. Adler; and "The Role of Genetic Damage in Radiation Induced Cell Lethality," by D. R. Davies and H. J. Evans. The last named is representative in its scholarly analysis of a difficult subject. The reader is made aware of the possibilities of ionizing radiation as a tool for probing the information content of living matter.

Photoreactivation is reviewed by C. S. Rupert and W. Harm in "Reactivation after Photobiological Damage." A textbook clarity is achieved to describe target theory, reactivation mechanisms, and even the terminology used in the technical literature.

An impressive feature of the reviews is in their approach: the tools of radiation are made ancillary to the job of solving the biological problems. This gives a remarkable scientific maturity to the interdisciplinary subjects presented in a highly commendable volume. The physical format is excellent; there is a table of contents, an author index, a topical index, and each article is well documented.

BRIEFLY NOTED

DIRECTORY OF BRITISH SCIENTISTS, 1966-67. In two volumes. 2318 pp. Bowker, New York, 1966. \$44.10

Containing 54 000 entries, this directory includes with each scientist's brief biography the titles of his most important publications and his present affiliation. An index is provided, classifying the scientists according to field of interest. Additional features include listings of British scientific societies and their journals, other scientific periodicals, and British research establishments.