

space) to generate them as needed. This may cease to be true if the total number of arguments for which the quotients are needed is small, but in that case, one might just as well take the $J_n(z)$ themselves from any of the excellent tables which exist. For hand computation this will almost always be true.

Perhaps the most valuable section of the book is the introduction in which the reader will find a complete list of the relevant formulae, series expansions, and asymptotic estimates.

Nuclear Scattering. By K. B. Mather and P. Swan. 469 pp. Cambridge U. Press, New York, 1958. \$14.50. Reviewed by Kamal K. Seth, Duke University.

Nuclear properties fall into two broad categories: the "external", e.g., mass, spin, magnetic moment, quadrupole moment, etc., and the "internal", e.g., the nature of nuclear forces, nuclear excitations, etc. The former properties, though extremely useful in any over-all nuclear theory, have caught the imagination of chemists and microwave physicists. The measurement of these properties and the experimental techniques used for the purpose are essentially "non-nuclear". It is the "internal" properties, however, that have become the exclusive concern of the professional nuclear physicist. Almost all information about nuclear structures and nuclear forces originates from some scattering measurement or another. Cross sections of every conceivable type are required and a great variety of projectiles are used. With the exception of high-energy electrons and gamma rays, these projectiles are necessarily nucleons, aggregates of nucleons, or subnuclear particles like mesons. The use of heavy ions (i.e., large aggregates like triply charged nitrogen) is relatively recent; mesons and hyperons are a separate story altogether. Neutrons, protons, deuterons, tritons, and alpha particles are the most commonly used particles. The monograph by Mather and Swan essentially confines itself to proton and neutron scattering—even deuteron reactions are treated rather sketchily. Other projectiles are mentioned in passing.

The monograph is actually two well-integrated books in one. The first half of the monograph is experimental. It is devoted to the description of particle production, acceleration, targets, detection techniques, and particle analysis. The discussions are necessarily brief, but to the point and present a bulk of useful information and suggest sources for more detailed reading on specialized aspects. This part of the book should be read by everyone who is starting his experimental nuclear-physics training. The student will find himself returning to this book from time to time even after he has advanced substantially in his knowledge of the subject.

The second part of the book is devoted to a study of the theoretical aspects of nuclear scattering. n - p , p - p scatterings at low energy are discussed in detail leading up to the study of light nuclei. The theoretic-

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cal foundation is then reinforced to take the load of high-energy problems. Noncentral forces, isotopic spin formalism, etc., are explained and even a brief sketch of meson theories presented. Theory and experimental results are presented interwoven. To add to an already lofty structure, the last two chapters are devoted to the phenomenological models by means of which all that has been said before is eventually correlated and leads to a physical understanding of nuclear structure.

The scope of the monograph is grandiose. Its fulfillment in a limited number of pages is difficult but Mather and Swan have done an excellent job. The experimental part is clear, lucid, and essentially introductory. The theoretical part is somewhat more formalized. Admittedly not introductory, it assumes knowledge of quantum mechanics and sometimes more. Except for the omission of heavier particle scattering (which provides an immense wealth of mostly statistical information), which one is certain to note, but which was probably ruled out because of considerations of space, the book combines in itself all that is basic about nuclear scattering. It should prove valuable both to experimental and theoretical physicists.

Science: A Course of Selected Reading by Authorities (2nd Revised Edition). 322 pp. Internat'l University Soc., Nottingham, England, 1958. *Reviewed by James MacLachlan, Earl Haig Collegiate Institute.*

It is helpful to the success of a scientific anthology to have an evident, clear-cut purpose behind its selections. Rambling in scientific literature for its own sake is not very laudable. If the anthology is directed to the lay public, it must be decided what aspect of scientific endeavor is capable of being communicated. It is unreasonable to suppose that the intricate details of scientific law and theory can be simply expressed so as to transform laymen into scientists.

The unnamed editors of this volume have met these objectives by putting together a connected series of expositions on the nature of the universe and matter. To clothe the bare bones of scientific conclusions they have chosen works which emphasize the implications of science in modern life and thought. Readers are led to grasp the magnitude and complexity of the scientific panorama, and the power of scientific methods to unravel Nature's secrets. The keynote is well expressed by Bronowski: "It is the ideas of science that are remaking the world, not its mechanical achievements."

A sense of the personalities of scientists is created by a number of selections from addresses to the British Association for the Advancement of Science. The book is, in fact, designed as a course of lectures in physical science for laymen, in a series of volumes published by the International University Society. There are contributions from such authorities as Andrade, Rutherford, J. J. Thomson, and Spencer Jones, as well as several extracts from earlier classics of science.

Selections about the nature of the universe range from Aristotle, "On the heavens", to Eddington on