

per minute. Today, the bevatron runs for months, while experiments accumulate millions of items of information. How fortunate that c is constant.

Topics such as analyses of manpower and economic requirements of some of the larger installations are also included, which adds to the interest of the book. The editors and publishers must be congratulated on a fine production.

Nuclear Physics, Part A. Luke C. L. Yuan and Chien-Shiung Wu, eds. Vol. 5A of *Methods of Experimental Physics*, edited by L. and C. Marton. 733 pp. Academic Press Inc., New York, 1961. \$18.00. *Reviewed by H. H. Barschall, University of Wisconsin.*

THIS is the fourth volume published in the series on *Methods of Experimental Physics* (see *Physics Today*, May 1960). It is the first of two parts devoted to "the principal methods and their relative merits for the measurement of a specific quantity in nuclear physics" where the term nuclear physics "comprises both the high- and low-energy regions". This is the aim stated in the preface by the distinguished editors. To prepare such a survey the editors have obtained the help of many well-known experts. The present volume covers principles and methods of particle detection, and the determination of charge, size, momentum, and energy. The particles and radiations studied in the low-energy region are discussed far more than those studied in high-energy physics.

This book will be a useful reference work and should be in every library used by nuclear physicists. The articles differ greatly in how detailed, thorough, and up to date they are. The emphasis, as shown by the length of the treatment, does not always correspond to the importance of the method. For example, in the discussion of detectors ten times more pages are devoted to photographic emulsions than to bubble chambers, which is about in the inverse ratio of the technical difficulties as well as of the present efforts using these two techniques.

A difficulty which can arise when many authors write a book may be illustrated by the treatment of a currently widely used technique, called pulse shape discrimination, for distinguishing pulses caused by electrons and protons in organic scintillators. Pulse shape discrimination is not listed in the index, but three contributors give three mutually contradictory explanations of the basic principle involved, only the first of the three being correct. None of the three authors explain how one can actually count electrons or protons separately using this technique.

Some of the gaps in the description of methods will perhaps be filled by the second part of the book. When the first part is used by itself, these gaps are particularly serious because of a lack of references to more comprehensive treatments such as may be found in the *Encyclopedia of Physics*. For example, the section on bubble chambers does not refer to Glaser's *Encyclopedia* article, nor does the section on energy



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*c. 225 pp, 63 illus, ready Late Spring 1962—
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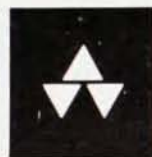
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losses of charged particles mention Whaling's article. It would be helpful if a bibliography could be appended to the second part of the book.

Modern Atomic and Nuclear Physics. By C. Sharp Cook. 296 pp. D. Van Nostrand Co., Inc., Princeton, N. J., 1961. \$7.75. *Reviewed by William F. Meggers, National Bureau of Standards.*

THIS is an introductory textbook intended for college or university students who have completed at least one year of classical physics, and mathematics through calculus. Twentieth-century physics is presented in fourteen chapters, each of which is followed by references to many modern treatises and texts, and by 8 to 24 problems (212 in all). Nine appendices and an index complete the book. The volume contains 148 line drawings and one halftone (a reproduction of a stellar spectrum showing hydrogen).

Cook's *Modern Atomic and Nuclear Physics* is confined to facts, formulas, and figures; it contains no historical or biographical material—obviously the student is supposed to find this in other books. Also, the presentation is almost entirely theoretical; many important physical experiments are mentioned, but usually with an absolute minimum of experimental details. Consequently, this textbook will be better suited to training theoretical than experimental physicists, but this introduction to atomic and nuclear theory is probably a minimum requirement for the latter.

Kinematics of Nuclear Reactions. By A. M. Baldin, V.I. Gol'danskii, I. L. Rozenthal. Transl. from Russian by William E. Jones. 303 pp. Pergamon Press Ltd, Oxford and New York, 1961. \$6.50. *Reviewed by Herman Feshbach, Massachusetts Institute of Technology.*

AS used in this volume "kinematics" may be very broadly defined as those consequences of the Schrödinger equation which can be drawn without specifying any but the most general properties of the Hamiltonian. The simplest of these are just the conservation of energy and momentum. The term "kinematics" as it is often employed is limited to the application of these two principles. However, there are many other invariances and the writer agrees with the authors that "kinematics" should also include the consequences of conservation of angular momentum, conservation of parity, and time-reversal invariance.

The first third of the book is devoted to the consequences of conservation of energy and momentum. This includes the energy-angular correlations which are involved when a particle decays into two particles, when two particles interact to form two other particles, when there are three secondary particles, and finally for multiple secondary particles. The transformations to laboratory coordinates for differential cross sections as well as the momenta and energy are given.

The second part of the volume is concerned with the properties of the *S* matrix and their corollaries for