BOOKS

THE GROWTH OF PHYSICAL SCIENCE. By Sir James Jeans. 364 pp. The Macmillan Company, New York, 1948. $4.00.

Sir James Jeans, one of the most successful popularizers of modern physics and astronomy, revised the proofs of this last book of his shortly before his death in September 1946. Having exhausted the topics of modern science, he apparently believed that a popular book on the history of physics—including astronomy and mathematics—would serve the same purpose for early science as his other books did for more recent science. And, just as his other popular books were intended for the general reader rather than the trained scientist, this one is likewise offered to the "general educated reader," to "those who are beginning the study of physics, and possibly to students of other subjects."

The first hundred and twenty pages are devoted to the beginnings of science in Babylonia, the early and later Greeks, Alexandria, and the Middle Ages. A hundred pages suffice for the account of late sixteenth- and seventeenth-century achievements, followed by some sixty pages on "The two centuries after Newton," and a concluding seventy-page account of "The era of modern physics." From the point of sheer readability and intelligibility, the first half of the book is obviously better than the second: more space is available, and less happened. Toward the end of the book, we are presented with almost a dry cataloguing of facts, and with the introduction of a large number of names and technical terms which will surely lessen the reader's interest if he is not previously acquainted with the subject matter.

Like all of Sir James' books, this one makes entertaining reading. But it suffers by comparison to his other works in that he really knew something about the subjects of modern physics and astronomy, to which he had contributed notably. His approach to the history of science is, by contrast, that of the dilettante. The greater part of the book derives from secondary sources, whose contents are summarized without any saving, illuminating comment. Mediaeval figures—both European and Islamic—are frequently spelled in a fantastic way. The naivete of writing about Aristotle's "entirely homocentric view of the world, seeing man as the center of all creation," as if "homocentric" were a philosophical word, rather than the Greek for "having the same center" as applied to homocentric or concentric spheres, makes the occasional quotation in Greek seem to be misplaced pedantry. Neither science nor its historical interpretation is well served in such a fashion.

It is difficult indeed to conceive of anyone who is not already familiar with the subject of physics approaching this book and getting from it any true understanding of physical science. Since its value is limited to students who know some physics to begin with, it can hardly stand up in competition with such excellent, if limited, books as Crew's "Rise of Modern Physics" or Cajori's "History of Physics." The latter two books are as well written as Jeans' and they both have the additional merit of being written by men who knew both the subject of physics and the discipline of the history of science. Though they may be a little more difficult to read, they are that much more rewarding.

Although Jeans was a man of strong and frequently unorthodox opinions, as may be seen throughout the book, he ends with no conclusions about science in general, physics in particular, or the world in which we live. The final paragraph is devoted to the last work of Eddington, whose views Jeans neither accepts nor rejects.

I. Bernard Cohen
Harvard University

NUCLEAR PHYSICS IN PHOTOGRAPHS. By C. F. Powell and G. P. S. Occhialini. 124 pp. Oxford University Press, London, 1947. $6.00.

It is, perhaps, no exaggeration to say that the most striking work in physics in the last decade is the discovery of the heavy meson and its decay into a lighter meson, by C. M. G. Lattes, C. F. Powell, and G. P. S. Occhialini, at the University of Bristol.

Now Messrs. Powell and Occhialini have presented us with a book showing how varied are the phenomena that can be detected and studied by means of tracks of particles in photographic emulsions, the same method used for their discoveries. A worker in the same field may as well express his disappointment at the beginning that the book does not go into details of the many refinements in technique introduced by the Bristol workers, but the book was written with a different purpose, and the disappointment is only a disappointment, not a criticism.

The subtitle, "Tracks of Charged Particles in Photographic Emulsions," shows clearly the nature of the book. A collection of microphotographs is presented, consisting of examples of the principal nuclear phenomena recorded in photographic emulsions. Radioactive emission of heavy particles, interaction with atoms of the emulsion and disintegration of those atoms by primary particles, fission, disintegration "stars" produced by cosmic rays, mesons and the meson interactions, are some of the events shown in a series of photographs with an explanatory text both vivid and clear.

Tables of the dependence of range in the emulsion on the energies of protons and alpha particles and the procedure for processing the emulsions should help any one interested, and with good microscopic equipment and technique, to undertake studies of nuclear and cosmic-ray phenomena with this technique. Even with quite ordinary equipment, many of the phenomena can be easily repeated with the proper emulsions.

The book should be an invaluable supplement to any introductory course in nuclear physics, and the authors will have the gratitude of a public much larger than the specialists in nuclear and cosmic ray physics for their extraordinarily simple and readable work. Indeed, it ex-

Continued on page 37

ABROAD *Continued from page 35*

tutes, with funds set up by the Italian government (theoretically 200,000,000 lire, but actually 100,000,000 lire for 1947). Although this sum is small and cannot compare with those supplied to American institutions, it is enough to keep research from stopping entirely. In addition, the Rome physics institute and some others have been aided by business firms and private enterprises.

It follows from all this that for the next several years most of the Italian research will be addressed, necessarily, to those fields which do not require a large outlay of money, such as cosmic-ray studies. In any event it is hard to say whether normal physical progress can persist in this situation. The greatest and most unavoidable danger is the continuing departure of physicists to other countries, especially to the United States, where they may have better research equipment and living conditions.

E. AMALDI

BOOKS *Continued from page 25*

emplifies its own quotation from a characteristically exquisite piece by Maxwell, ending: "scientific truth should be presented in different forms, and should be regarded as equally scientific, whether it appears in the robust form and the vivid colouring of a scientific illustration, or in the tenuity and paleness of a symbolical expression."

E. O. Salant
Brookhaven National Laboratory

TECHNIQUES OF OBSERVING THE WEATHER. By B. C. Haynes. 272 pp. John Wiley & Sons, Inc., New York, 1947. $4.00.

Excellently illustrated. In simple language it describes cloud forms, meteorological instruments, and a homemade observing station. Tables are included.

Gordon A. Atwater
American Museum of Natural History

ENERGY UNLIMITED. By Harry M. Davis. 273 pp. Murray Hill Books, New York, 1947. $4.00.

Physics in the best style of the news magazines, clearly written and beautifully illustrated. It shares with that medium an over-excited view of headlines and gadgets. It makes no demand on the reader and is just a little shallow.

Philip Morrison
Cornell University

PHYSICAL SCIENCE AND HUMAN VALUES. 181 pp. Princeton University Press, Princeton, New Jersey, 1947. $3.00.

The papers and discussions of the Nuclear Science Session of the Princeton Bicentennial Conference are here presented with a foreword by E. P. Wigner. This material, dealing with society's influence on science and science's influence on society, was edited and coordinated by K. K. Darrow. The sections of the Conference devoted to scientific problems of a technical nature are not recorded in this book.

Books Received

THE NAMING OF THE TELESCOPE. By Edward Rosen. 110 pp. Henry Schuman, Inc., New York, 1947. $2.50.

TECHNIQUES GENERALES DU LABORATOIRE DE PHYSIQUE. Vol. I. Edited by J. Surugue. 433 pp. Centre de Documentation du Centre National de la Recherche Scientifique, Paris, 1947.

STUDIES AND ESSAYS: Presented to R. Courant on his 60th Birthday January 8, 1948. 470 pp. Interscience Publishers, Inc., New York, 1948. $5.50.

YALE SCIENCE: The First Hundred Years 1701–1801. By Louis W. McKeehan. 82 pp. Henry Schuman, Inc., New York, 1947. $2.50.

THE EARLY WORK OF WILLARD GIBBS IN APPLIED MECHANICS. Assembled by L. P. Wheeler, E. O. Waters and S. W. Dudley. 78 pp. Henry Schuman, Inc., New York, 1947. $3.00.

KERNPHYSIK UND MEDIZIN. By Gerhard Schubert. 344 pp. Muster-Schmidt, Goettingen, 1947.

ELECTRONIC TRANSFORMERS AND CIRCUITS. By Reuben Lee. 282 pp. John Wiley & Sons, Inc., New York, 1947. $4.50.

DISSOCIATION ENERGIES AND SPECTRA OF DIATOMIC MOLECULES. By A. G. Gaydon. 239 pp. John Wiley & Sons, Inc., New York, 1947. $5.00.

RADIOACTIVE TRACERS IN BIOLOGY. By Martin D. Kamen. Second printing. 281 pp. Academic Press Inc., New York, 1948. $5.00.

SURFACE CHEMISTRY FOR INDUSTRIAL RESEARCH. By J. J. Bikerman. 464 pp. Academic Press Inc., New York, 1948. $8.00.

JOURNAL *Continued from page 14*

Counters

During and since the war great improvements have been made in the theory and application of particle and quantum counters. For the benefit of those interested in counting techniques but who have not had firsthand experience with all the various counters and who wish to acquaint themselves with the factors which make different counters adaptable to different problems, a review has been written of the operating mechanisms and special properties of the commonly-used counters. Details of calibration and measurement techniques have not been treated, nor has auxiliary electronic equipment, such as scalers or discriminators, been discussed.

The following subjects are covered: Ionization counters—the theory of pulse shape, the effect of the counting gases, characteristics of amplifiers, slow and fast counting, signal-to-noise ratios, and counter geometry. Proportional counters—gas multiplication, pulse shape, counting gases, time resolution, and details of construction. Geiger counters—the gas discharge mechanism, counting gases, pulse shape, dead times, recovery times, random time lags, efficiency, life time, and counter construction.

Similar discussions are given about electron multipliers, photo-multiplier-phosphor counters, and crystal counters.

R. R. W.

Particle and Quantum Counters
D. R. CORSON, R. R. WILSON
Review of Scientific Instruments, 19: 207, April 1948