

as "statistical ultramicroscopy". This cumbersome name has happily become lost.

In Pollard's review one sees that the subject has been exploited and refined until now it is a new and useful tool in the approach to the complexities of protein structure. This kind of transformation and growth of a subject is seen, too, in Blout's review of Ultraviolet Microscopy and Ultraviolet Microspectroscopy, which may be considered to be a classic subject in the repertoire of biophysics. Blout has written a refreshing summary of this field and has described the current technological improvements.

The review by Grabar of Biological Actions of Ultrasonic Waves describes the manifold effects produced by ultrasonic waves in living systems. There are stimulating speculations on the possible modes by which the effects could be produced, namely, heating, chemical action, or mechanical trauma. This discussion should be of especial interest to those studying the biological effects of ionizing radiations.

Another chapter noteworthy for its inclusion here is Pressman's review of Antibodies as Specific Chemical Reagents which is a very readable account of how antibodies behave, telling of their origin and molecular life. The intriguing questions of how antibodies are produced and their specific behavior toward antigens are presented as problems not only in chemistry and biology, but also in physics.

The editors are to be commended for their selection of topics for this volume on biological and medical physics. The expert contributors have written well and supplied ample technical references. The illustrations are excellent. There are author and subject indices along with a table of contents in which the contents of each chapter are outlined.

Joseph G. Hoffman

Roswell Park Memorial Institute

Optics

Introduction to Geometrical and Physical Optics, by Joseph Morgan (450 pp., McGraw Hill, N. Y., 1953, \$6.50), is an intermediate text designed for a one semester sophomore course. The first half includes material on reflection and refraction, mirrors, thin and thick lenses, stops, aberrations, optical instruments, and photometry. The second half deals with interference, diffraction, absorption, scattering, dispersion, polarization, and spectra; material on diffraction by crystals and liquids is included, and the book ends with a brief discussion of the wave-particle aspects of light and matter. Several appendices, and some lists of references, are included. A novel feature is the parallel noncalculus and calculus developments of the mathematical aspects of certain sections; both these developments could have been improved by using the exponential instead of trigonometric functions.

Uhf Propagation

The primary purpose of *Ultra High Frequency Propagation*, by Henry R. Reed and Carl M. Russell (assisted by W. M. Browne and J. W. Plummer; 562

pp.; John Wiley & Sons, Inc., 1953; \$9.50), is to present current information in this field and to correlate propagation data with system design. The "systems approach" (i.e. the holistic viewpoint which considers performance of the whole) is stressed throughout. The book considers the systems concept, general propagation, the standard atmosphere, elementary radiation and reflection theory, multipath propagation, antennas, and system design problems. The treatment is adequate. The experimental data included and the collection of radiation patterns will make the book a useful reference to all workers in the field.

Magnetic Field

Magnetic Fields of Cylindrical Coils and Annular Coils by Chester Snow is a very useful publication that gives the axial and radial components of the magnetic field at any point due to a current-carrying coil of wire. The cylindrical current sheet, circular current sheet, and multilayer solenoid are treated, and the results are expressed in terms of complete elliptic integrals or of Legendre functions. Since the latter have been tabulated it is possible to obtain an accurately known magnetic field from Snow's data through the use of appropriate coils. The 29-page publication is No. 38 in the National Bureau of Standards Applied Mathematics Series, and can be purchased from the Government Printing Office, Washington 25, D. C. for 25 cents.

Circuit Theory

Electric Circuit Theory and the Operational Calculus, by John R. Carson (197 pp.; Chelsea Publishing Company, New York, 1953; \$3.95), represents an extension of the original version, published in 1926. It contains a rather thorough explanation of the Heaviside operational method of solution of differential equations. This takes approximately half of the volume, the other portion being devoted to the application of the method to the solution of the classical problems in the transmission of electricity.

X-Ray Diffraction

Standard X-Ray Diffraction Powder Patterns (National Bureau of Standards Circular 539; Vol. I by Howard E. Swanson and Eleanor Tatge, 95 pp.; Vol. II by Howard E. Swanson and Ruth K. Fuyat, 65 pp.; U. S. Government Printing Office, Washington 25, D. C., 1953; \$0.45 each) is a continuation of the NBS project for improving the file of x-ray patterns published by the ASTM. Eighty-four inorganic substances are listed.

Archimedes

Archimedes (563 pp.; Dover Publications, Inc., New York, 1953; clothbound \$3.95, paperbound \$1.95) is a reissue of the original 1897 Heath Edition of *The Works of Archimedes* together with the supplement on *The Method of Archimedes* discovered by Heiberg in 1912.