described, respectively, in "The Novae" by C. Payne-Gaposchkin, Harvard College Observatory, and in "Supernovae" by F. Zwicky, California Institute of Technology.

This book will serve as a standard of reference for years to come. This is not to say that no further research is required in the fields discussed in the book, but rather that new data and their interpretations will more likely confirm those given to the earlier trends. In format and style it is like its predecessors in the *Encyclopedia*. However, it runs to more than 800 pages in length and weighs nearly four pounds so that it is cumbersome for one to hold with ease while reading it. Whether certain obvious abridgements in some of the articles would have produced a less bulky volume is problematical; but it seems that some repetitious material might have been omitted from the longer articles without detriment to them.

Electric Fields and Waves. Vol. 16 of Handbuch der Physik. Edited by S. Flügge. 753 pp. Springer-Verlag, Berlin, Germany, 1958. DM 158.00 (subscription price DM 126.40). *Reviewed by V. Twersky, Sylvania Electronic Defense Laboratory.*

THE first four articles of this volume deal with theory, and are ordered more or less on the basis of decreasing wavelength. Thus there are 164 pages of Static Fields and Stationary Currents (in German) by G. Wendt; 120 pages of Quasi-Stationary and Nonstationary Currents in Electric Circuits by R. W. P. King; 138 pages on Electromagnetic Waveguides and Resonators by F. E. Borgnis and C. H. Papas; and 217 pages on Propagation of Electromagnetic Waves by H. Bremmer. The final 85 pages, by L. Hartshorn and J. A. Saxton, describe measurements on the Dispersion and Absorption of Electromagnetic Waves.

The article on static fields gives detailed treatments of various boundary value problems (using conformal mapping, image methods, separations of variables, and Green's function methods) and discusses several numerical, graphical, and experimental techniques. King's article treats electric circuits, transmission lines, and thin-wire radiating and receiving antennas; in particular, the last section gives detailed consideration to coupled coplanar antennas, collinear antennas, large loops, and probes. The next article considers various cylindrical guides (including elliptic, parabolic, and triangular); sectoral horn, conical, and parabolically curved guides; dielectric rods; disk-loaded rods, corrugated surfaces, helices, and other slow wave and surface wave structures. Its final section deals with cavity resonators, and the perturbations arising from enclosed objects or deformed walls. Bremmer begins with an introductory section on wave progagation in free space (which includes such relatively new topics as a single potential representation for the electromagnetic field, and Luneberg's work on the propagation of field discontinuities and geometrical optics), and then treats various transmitting elements (including biconical antennas, apertures, arrays, and horns), and the focusing of radiation by reflectors, homogeneous and inhomogeneous dielectric lenses, and configuration lenses. The next sections consider propagation problems related to radio communication: a dipole over a lossy plane, waves in striated atmospheres and ionospheres, the effects of turbulence, the dipole and large sphere, curved atmospheres, etc. The final article reviews procedures for measuring the electrical parameters of matter (using bridges, cavity resonators, wave guides, free space reflection, interferometers, etc.), and gives data for typical dielectric materials.

Most of the material of this volume has been previously published in textbooks (including the recent ones by Borgnis, Papas, and King). The new material (drawn largely from the recent literature of applied mathematics and radio engineering) deals primarily with the analysis of propagation effects associated with special microwave structures, or with models of natural phenomena basic to various practical problems related to the transmission of information via radiation. The purpose of the book could have been furthered by concentrating on the recent literature and on the newer mathematical methods; and good coverage of the second would have increased the utility of the entire series: Green's function methods, integral equation procedures, and rigorous asymptotic developments are becoming routine in this field—and not only for the nonseparable problems for which there are no alternatives, but also to eliminate the tedium of unnecessary work with the clumsy series obtained for the somewhat pathological separable problems.

Semiconductors. Edited by N. B. Hannay. 767 pp. (ACS) Reinhold Publishing Corp., New York, 1959. $15.00. *Reviewed by Stuart A. Rice, Institute for the Study of Metals, University of Chicago.*

SEVENTEEN chapters by as many different well-known investigators, all at the Bell Laboratories, are contained in this book. In general the chapters range from the introductory to fairly full accounts of recent work. All chapters have excellent references.

It is pertinent to cite as an example of the scope of a typical contribution Chapter 7 dealing with diffusion processes in germanium and silicon. The topics considered range from the fundamental definition of the diffusion coefficient, in terms of the matter flux and the Einstein relation, to methods of measurement of diffusion in semiconductors, to specific examples of diffusion studies in germanium and silicon, to discussion of diffusion controlled reactions and precipitation. The exposition is clear and the amount of material assimilated makes the chapter an excellent review of the field.

This book will be especially useful for students, both chemists and physicists, since it provides an over-all picture at an understandable but not unsophisticated level. The references and general review character of the chapters also make it of value to investigators currently working with semiconductors.