

comparative tables, component parts, finished units, and specific applications make this book readily understandable to the layman and pilot, as well as the engineer. Quotations from papers delivered by aeronautical and turbine engineers have been freely cited to provide a broad survey of the trend of thought and progress.

The text contains chapters on Jet Propulsion, Thrust and Performance, Early Projects, Gas Turbine Components, Combustion Systems, Metallurgy, British Gas Turbines, American Gas Turbines, German Gas Turbines, Testing and Maintenance, Types of Turbine-propelled Aircraft, Jets Versus Airscrews, Turbine-Airscrew Projects, Aerodynamic Problems, Tailless Aircraft and the Flying Wing, Closed-Cycle Gas Turbines, Steam Turbines, Guided Missiles and Flying Bombs, Official Adoption of Jet Aircraft, Broadcasting the News, and Notable Views on Turbine Propulsion. The ease and simplicity, as well as the completeness, with which this book was written is indicative of the authoritative source of the information it contains.

ROBERT S. ROSS

Case Institute of Technology

Introduction to electron optics: the production, propagation, and focusing of electron beams. V. E. Cosslett. Oxford, Engl.: at the Clarendon Press, 1946. Pp. x + 272. (Illustrated.) \$6.50.

This book provides an excellent text or reference for a third- or fourth-year course in either electron optics, electronics, or physics where the subject matter is directed toward the understanding of the production, propagation, and focusing of beams of ions and electrons.

Essentially, in the reviewer's opinion, this book is divided into two parts. The first part, which includes the first 5 chapters, deals with a clear and concise theoretical exposition on the electrostatic field, electrostatic focusing, and magnetic focusing. Chapter V presents a trigonometrical approach to the subject of image aberrations. The appendix presents the Hamiltonian Method in Electron Optics.

With a background in calculus, partial differential equations, and an understanding of scalar and vector products as well as Bessel functions, the student or reader should gain a complete physical and mathematical understanding of the effect of electric or magnetic fields on the trajectory and focusing of an electron beam. As the author claims, the mathematical exposition is kept subordinate to the description of the physical principles. In many cases overlapping exists when first a phenomenon is explained physically and later the same phenomenon is presented mathematically. This method of presentation makes the subject matter more easily understood.

The approach to the subject of electron optics in this book is similar to geometric light optics. The optical analogy is made frequently, which enables the reader, who may have a knowledge of light optics, to gain a clearer picture of the electron system.

The second part of the book, the last 5 chapters, deals with devices in which the principles of electron optics are applied. First, the factors involving the production of an

electron beam are presented. The theories on thermionic emission (centered around Richardson's equation) are discussed; the structures of various electron guns are clearly illustrated and described. In this chapter, photoelectric emission and electron multipliers are described.

In the following chapters, the cathode-ray tube, television pickup tubes, both those in the iconoscope and orthicon family, with the methods and theories used to effect the deflection of the electron beams within the tubes, are clearly presented with a minimum of mathematics. The whole of Chapter VIII is devoted to the electron microscope and gives a clear and precise picture of how the principles of electron diffraction are used in electron microscopy. The remaining two chapters deal with cylindrical fields of the type that are found in a magnetron or cyclotron and velocity-modulated beams of the type that are encountered in a Klystron. The functions of the magnetron, cyclotron, and Klystron tubes are clearly analyzed and illustrated.

It is believed that the extensive bibliographies, which are found at the end of each chapter, will be extremely helpful to those readers who wish to delve more deeply into the subject matter.

JACK KLINE

Optical Research Laboratory,
Boston University

Scientific Book Register

DAUBENMIRE, R. F. *Plants and environment: a textbook of plant autecology.* New York: John Wiley; London: Chapman & Hall, 1947. Pp. xii + 424. (Illustrated.) \$4.50.

HADFIELD, GEOFFREY, and GARROD, LAWRENCE P. *Recent advances in pathology.* (5th ed.) Philadelphia-Toronto: Blakiston, 1947. Pp. viii + 363. (Illustrated.) \$6.00.

LYMAN, RUFUS A. (Ed.-in-Chief.) *American pharmacy: advanced pharmacy, medical, surgical and dental supplies, animal health pharmacy.* Philadelphia-London-Montreal: J. B. Lippincott, 1947. Pp. x + 379. (Illustrated.) \$7.00.

NORTHROP, F. S. C. *The logic of the sciences and the humanities.* New York: Macmillan, 1947. Pp. xiv + 402. \$4.50.

ROBSON, J. M. *Recent advances in sex and reproductive physiology.* (3rd ed.) Philadelphia-Toronto: Blakiston, 1947. Pp. xii + 336. (Illustrated.) \$5.75.

VAN DEN BROEK, J. A. *Theory of limit design.* New York: John Wiley; London: Chapman & Hall, 1948. Pp. viii + 144. (Illustrated.) \$3.50.

VISHER, STEPHEN SARGENT. *Scientists starred 1903-1943 in "American men of science," a study of collegiate and doctoral training, birthplace, distribution, backgrounds, and developmental influences.* Baltimore: Johns Hopkins Press, 1947. Pp. xxiii + 556. \$4.50.