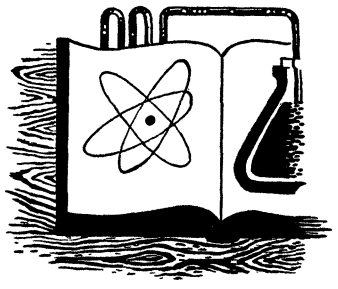
days of Linnaeus's American correspondents—Colden, Bartram, and Garden—and that he will take for his models in biographical writing such authors as Boswell, Macaulay, Fiske, and Parkman, whose scholarship never suffered from their artistry.

DONALD CULROSS PEATTIE

Santa Barbara, California



Scientific foundations of vacuum technique. Saul Dushman. New York: John Wiley; London: Chapman & Hall, 1949. Pp. xi + 882. (Illustrated.) $15.00.

This book is a monument to an era just concluded and a marker and a storage depot for the future. The era began with the invention of the condensation pump, and it ended spectacularly when vacuum went to war—high vacuum for radar and the fissioned atom, grand vacuum for magnesium and penicillin. During the intervening 30 years the gas-filled X-ray tube gave place to the Coolidge vacuum tube; the tungsten lamp and electronics came to maturity, and the molecular still was born. A regiment of subsidiary apparatus and measuring instruments sprang up and vacuum plumbing graduated from an unwelcome necessity to a hobby, then to an art, and recently to a science.

In 1922 Dr. Dushman published a little book called *High vacuum* which at once became the guide to a new territory. Shortly afterwards, many larger and more comprehensive books were written, mostly in the same pattern, but none placed the matter more succinctly. It has been evident for 10 years, however, that much new material has accumulated. It has been equally evident that the one man to make the authoritative compilation is Dr. Dushman because, as associate director of the General Electric Laboratories at Schenectady, he has witnessed or himself created nearly all that has transpired.

The *Foundations* is a reference book for scientists and advanced engineers; it does not deal with vacuum in the chemical process industries. The first four chapters—perhaps the best in a very good book—cover the theory of gases (and even the highest vacuum on earth still contains much gas). The next chapters on pumps and gauges are authoritative and comprehensive rather than selective. The later chapters dealing with adsorption, getters, solubility of gases in metals, and diffusion of gas through metals, are encyclopedic. On vapor pressure, the dry or electronic field is fully covered, but pump fluids only meagerly. The references and indexes are splendid. It is difficult to assess the merits of a book that has no rivals; suffice it to say that it stands alone. Practically every laboratory, regardless of its avowed purpose, will find a place for this book.

KENNETH C. D. HICKMAN

Rochester, New York

Quantum mechanics. Leonard I. Schiff. New York: McGraw-Hill, 1949. Pp. xii + 404. (Illustrated.) $5.50.

Schiff's new textbook *Quantum mechanics* will be a very great help to anyone who studies this fundamental subject, which by now is taught to every student of physics. There is no other field in physics which poses more and harder problems to the teacher. Explaining the fundamental concepts of quantum mechanics is the most difficult of tasks, and no really clear way of doing it has yet been found. However, every student must not only be acquainted with these fundamental concepts, but also be able to apply them in his research work. Quantum mechanics also uses a great number of very complicated mathematical formalisms to which the student must be introduced. This is the easier part of the course, and too little emphasis is usually given to the exposition of the fundamentals.

The present book is distinguished in this respect from most of the older, widely used textbooks. The first chapter contains a well-presented description of the fundamental concepts of measurement and complementarity. It introduces the reader into the problematics of the subject but does not relieve the more serious student from the study of books like the ones by Dirac or Kramers, and the classical papers of Bohr. The Schroedinger wave equation is introduced in the second chapter by using the experimental relation between frequency and wavelength. This emphasizes the connection with experimental facts, which is sometimes missing in more dogmatic representations. The following chapters are very much along conventional lines, but are written with great care and with emphasis on detailed and elegant derivations. The book differs from the usual introductions into quantum mechanics by a strong emphasis on collision theory. This is a great advantage in view of the increasing application of quantum mechanics to nuclear collision problems.

One notices a change in style beginning with Chapter 9, when the problems of many particles are treated and when radiation is taken into account. Less emphasis is placed on detailed description and the book takes on more of the character of a survey than before. These chapters include discussion of identical particles and the spin of the electron, and a semi-classical treatment of radiation and of the spectra of atoms and molecules. The last three chapters form a separate unit, on the relativistic wave equation, and the quantization of the wave fields, and a short introduction into quantum electrodynamics; they represent, therefore, what is taught in most schools in a separate course on advanced quantum mechanics.

A few details could perhaps be criticized from the point of view of the reviewer, who has probably ac-