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trigonometric and polynomial interpolations in the large, quadrature methods, and finally a very detailed and excellent account of the approximate solution of differential equations using the " τ " method. Throughout the book the techniques are illustrated by modest but illuminating examples.

This book can be highly recommended to anyone interested in this subject, and particularly to those many readers who regard numbers as a tool rather than as an end in themselves.

Electronic Computers: Principles and Applications. Edited by T. E. Ivall. 167 pp. (Iliffe, England) Philosophical Library, Inc., New York, 1956. \$10.00. *Reviewed by P. J. Davis, National Bureau of Standards.*

A collection of essays written for nonspecialists, and covering such topics as analog and digital circuits, storage systems, auxiliary equipment, general principles of computing, applications of digital computers, computers of the future. Somewhat more technical than the scientific volumes in the widely distributed British "Penguin" series, but not substantially so, and hence, in the opinion of the reviewer, vastly overpriced.

Quantum Chemistry: An Introduction. By Walter Kauzmann. 744 pp. Academic Press Inc., New York, 1957. \$12.00. *Reviewed by R. Hobart Ellis, Jr., New York City.*

How to introduce quantum-mechanical thinking to classically trained minds bothers most of the teachers and students who face the problem. This book will help. It will find its own place among the several introductions to the subject that are in use today, and it will supplement them all admirably.

The author uses a clear and simple plan of attack. Starting with the basic mathematics of his subject—operators, complex numbers, vectors—he progresses to a definition of the concepts of quantum mechanics. He states its laws simply, with a minimum of discussion, and then he proceeds to derive from these laws the properties of simple chemical systems. In the last section he treats nonstationary states.

There is a serious and, I think, a successful attempt to establish and follow a principle of separation of difficulties. "It is helpful to learn some of the mathematics in the framework of a more familiar physical problem," writes the author and he proceeds to offer the opportunity in the first 150 pages. In this mathematical introduction he makes no mention of quantum mechanics. Instead he introduces one-, two-, and three-dimensional wave equations in terms of strings, membranes, and waves on a liquid-covered sphere. Degeneracy, perturbation, symmetry, and adiabatic transformations are discussed with considerable care and detail long before the Schrödinger Equation appears.

In the author's opinion quantum mechanics is different from most other scientific disciplines in that it is the *concepts* that offer difficulty rather than the laws.

So he discusses the concepts and without ado states the laws. As a result the experimental foundations follow in orderly manner as consequences. The student is likely to lose sight of the fact that the structure was built to include these consequences, but this is probably of small concern to the man who is meeting the subject for the first time. Only the Schrödinger method is used. The student is referred elsewhere for the matrices of Heisenberg and the symbols of Dirac.

Basic to any introduction to quantum mechanics are the inarticulate major premises of the author. Some physics teachers may shudder to read that, "Particles in stationary states act as though 'guided' by a wave . . ." even though the definition of "guided" is left for the student to determine. There is a reference to "idealizations not capable of experimental verification because of the uncertainty principle". In statements of this sort the author seems to reveal a feeling for things that exist even when they cannot be observed. A particle always seems to have an existence that is more detailed than its wave function. But this book does not pretend to enter the battle of hidden variables, and as long as the journals find that subject a battleground, we cannot ask authors of the elements to define their terms with crystal clarity.

The book does not claim completeness. It sends its readers to Bohm for that writer's generous discussions of physical details, to Rojansky for his explanations of other techniques, to Eyring, Walter, and Kimball for detailed computations. But for a clear, step-by-step approach to the mysteries of the quantum theory, it will be found hard to beat.

Statistical Analysis of Stationary Time Series. By Ulf Grenander and Murray Rosenblatt. 300 pp. (Almquist & Wiksell, Sweden) John Wiley & Sons, Inc., New York, 1957. \$11.00. *Reviewed by Nelson Blachman, Sylvania Electronic Defense Laboratory.*

This monograph treats the representation of stochastic processes, the extrapolation and smoothing of time series of known spectra, spectral estimates and their distributions, and some applications. For the most part the processes depend on a time parameter which takes only integer values.

The book is written in the language of theoretical mathematical statistics, for its principal aim is to stimulate research on the many incompletely solved problems which are discussed. It is therefore likely to be unrewarding for the physicist, unless he is familiar with Cramer's *Mathematical Methods of Statistics* and Doob's *Stochastic Processes* (generally regarded as a difficult book), for it contains no review of the necessary background material. The physical reader may also wish there were more motivation for the many concise proofs, and he may be disturbed by the lack of page numbers in many of the allusions to other books which must be consulted to complete the proofs.

Nevertheless it is clear that Grenander and Rosenblatt are in a position to write a comprehensive exposi-



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