simple in starting with pulses and then proceeding to traveling waves. No explicit mention is made of dispersion, and the qualifying remarks on p. 578 could easily be overlooked. Group velocity does not enter, but could surely have been included, with its important consequences.

There are many more places at which one can pick upon more or less minor points. What, then, is the over-all impression? As an attempt to break away from the traditional fragmentary treatment of freshman physics, this approach is refreshingly original and is to be commended. While there is considerably more than enough text for a two-semester course, one might also query whether there is enough. There are many sections one might be tempted to omit, were it not for their use in introducing new ideas. In a general introductory course, though, a different balance might be desired, and many sections one might wish to cover are not included here. For instance, wave motion does not get as far as light waves and interference and diffraction; the dynamics and the generally good treatment of frames of reference does not get extended into special relativity—this would be an algebraically simple step, yet of major importance conceptually, and there is no reason why this great upheaval in our thinking should not be discussed in a first course.

This might be a hard book to use as the sole text for a one-year course, unless extensive additional notes were produced; as the basis of the first year of a two-year course it seems more reasonable but even then with qualifications; as a source-book for teachers it is stimulating. Altogether, it is hard to foresee it gaining an adoption as widespread as the more staid best-sellers, although it is superior in its approach and treatment of most topics.

Quantum Mechanics. By John L. Powell and Bernd Crasemann. 495 pp. Addison-Wesley Publishing Co., Inc., Reading, Mass., 1961. $9.75. *Reviewed by Eugene Guth, Oak Ridge National Laboratory.*

AFTER a period of dearth, quite a number of new books, for the most part introductions at the senior-graduate level, have appeared on quantum mechanics. None of these books discuss the fundamentals as profoundly as the classic expositions of Dirac, Pauli, and Kramers. Nor do they describe applications as extensively as, for instance, Bethe's well-known *Handbuch* article (and its up-to-date successor: Bethe-Salpeter). Some of them are curiously alike in content; others reflect the preference of the authors in their contents.

This book is among the better ones in the new crop. The first five chapters follow somewhat the historical development of quantum theory, and contain a good introduction to wave mechanics, including the uncertainty relation and one-dimensional problems. Unfortunately, no applications of the correspondence principle are given, nor is matrix mechanics mentioned in these early chapters. In this book (as in some of the other newer texts) the idea prevails that matrix me-

chanics presupposes a discussion of linear spaces. The simple physical idea of replacing the classical Fourier coefficients by matrices, foreshadowed by Einstein's derivation of Planck's law, is thereby lost. Chapters six through twelve, constituting over two-thirds of the book, develop the formal apparatus of quantum mechanics. Linear operators, eigenfunctions, commutation relations, and spherically symmetric one-body systems are discussed. A good introduction is given to the theory of elastic scattering. The algebra of linear vector spaces receives a careful treatment and is then applied to matrix mechanics, which in turn is used for a discussion of angular momentum and spin. The book closes with chapters on perturbation theory and identical particles. The helium atom is discussed briefly, but the hydrogen molecule and chemical bond are not treated at all. Every chapter ends with annotated references to books and good sets of problems. The book is well-balanced and can be recommended as a good text for an introductory course in quantum mechanics at a senior-graduate level.

Lehrbuch der theoretischen Physik. Vol. 1, Einfuhrung, elementare Mechanik und Kontinuumsphysik. By Siegfried Flügge. 256 pp. Springer-Verlag, Berlin, 1961. DM 25.80. *Reviewed by Jacques E. Romain, General Dynamics/Fort Worth.*

ALTHOUGH it is difficult to appraise a five-volume textbook from the first volume, Prof. Flügge's new undertaking seems promising. According to the author, the publication of still another "Lehrbuch" of theoretical physics is warranted by the need to stress quantum theory in an over-all exposition of contemporary physics. The earlier major German handbooks of theoretical physics were written before quantum mechanics had reached a satisfactory state of development, and therefore quantum theory appeared in them as an addition to a classically conceived structure. In this book, a sound understanding of quantum physics is the final purpose.

This first volume deals with general mechanics of the point particle and of a pair of point particles, the dynamics of deformable continuous media, equalizing phenomena (diffusion, heat propagation), and classical gravitational potential theory. The latter topics appear to have been chosen in order to introduce the main mathematical tools (above ordinary calculus level) that will be required later on, e.g., differential and partial differential equations, special functions, and vector analysis. Many worked examples are included, from celestial mechanics and astrophysics as well as from mechanics. Additional problems, with fully detailed solutions, are proposed at the end of the book. The subject index has been carefully compiled, but there is no bibliography.

The other four volumes (to be released at six-month intervals) are entitled: II, Mechanics and Heat; III, Electrodynamics and Optics; IV and V, Quantum Theory.