positions, but, on the other hand, there is an increase in the number and type of examples, particularly from the field of physics, which are used to illustrate and illuminate the methods of solution.

Several new features are particularly worthy of note. There is an expanded treatment of characteristics, both from the purely mathematical point of view and in relation to propagation phenomena. This is the only place in the literature, English or German, in which such a complete and satisfying account can be found. The theory of distributions is used to generalize the solution theory of linear hyperbolic equations, and an appendix gives a concise but perspicuous introduction to and survey of distribution theory. The relation between conservation laws and differential equations is also discussed with special reference to discontinuous solutions. The treatment of transient effects in linear systems and Heaviside's calculus is given in a way that makes possible an easy transition to the generalized operational calculus recently developed by Mikusinski. Finally, there is a bibliography of 20 pages.

It is most satisfying to welcome this work as an essential and readable reference and text for anyone interested in the theory of partial differential equations and their applications.

An Introduction to the Physics of Vibrations and Waves. By Norman Feather. 330 pp. Edinburgh U. Press, Edinburgh, 1961. $6.00. *Reviewed by Walter G. Mayer, Michigan State University.*

THIS book is intended to familiarize the "beginning specialist" with the classical concepts of waves and mechanical vibrations. Starting with a chapter on stretched strings, Professor Feather introduces the reader to the fundamentals of wave propagation, damping, pulses, and spectral analysis. The next sections discuss coupled vibrations, elastic vibrations of rods, and vibrations of air columns. The book also contains chapters on plane waves in an infinite medium, water waves, and interference and diffraction. Although the book is concerned mostly with mechanical vibrations, it also contains a long chapter on the wave-particle duality in which the author discusses briefly the origins of electricity and magnetism.

The treatment of the various topics is rather extensive, possibly a little too extensive for some second-year undergraduate students. The interested student, however, will find the style and presentation very refreshing, particularly the clarity and simplicity with which the author describes the physical meaning of equations and derivations he uses—not primarily as statements of self-explanatory facts but more as illustrations of discussions in the text. There are no numerical examples, problems, and answers; instead one finds a great number of quotations by old and modern scientists, biographical details, and a good deal of historical information. Nevertheless, the author does give all the mathematical details necessary for the development of the various topics without losing sight of his ultimate goal: to make the reader understand and appreciate the unity of the subject.

Particle Accelerators. By M. Stanley Livingston and John P. Blewett. 666 pp. McGraw-Hill Book Co., Inc., New York, 1962. $17.50. *Reviewed by D. Keefe, Lawrence Radiation Laboratory.*

THE very rapid growth in the field of accelerator physics in the last decade has created an urgent need for some comprehensive textbook treatment of the subject. Both the authors of this volume have been actively concerned in machine development for many years, and have produced a valuable source book on the history, present status, and immediate future of particle accelerators.

This book and Livingood's recent *Cyclic Particle Accelerators,* reviewed in these pages (*Physics Today,* May 1962, p. 57), together should form an excellent and rather thorough introduction to this branch of physics. Actually, these two books are in a sense complementary; where Livingood has concentrated largely on the development of the basic theory of machines in a useful mathematical way, Livingston and Blewett have centered each chapter about specific accelerators and have managed to include a large amount of descriptive detail with a virtual minimum of mathematics.

The descriptions of specific types of accelerators include chapters on low-voltage and electrostatic generators, cyclotrons, betatrons, and weak- and strong-focusing synchrotrons. Other more general chapters are devoted to ion sources, particle motion, phase stability, and shielding. There is an abundance of illustrations and the references are good. The wealth of descriptive detail, albeit suffering from wordiness in many places, makes it a useful reference for anyone associated with the accelerator field. Although the level of understanding required is not high, it is probably likely to be less useful to the student than a more basic and less special text.

It is stimulating to find in the pages of a physics text an occasional heightening of the rhythm of presentation by certain personal embellishments and individualistic touches—mainly to the credit of the senior author (MSL).

Inelastic Scattering of Neutrons in Solids and Liquids. Symp. Proc. (Vienna, Oct. 1960). 651 pp. Internat'l Atomic Energy Agency, Vienna, 1961. Distr. in US by Internat'l Publications, Inc., New York. Paperbound $12.00. *Reviewed by A. A. Maradudin, Westinghouse Research Laboratories.*

ONE of the most powerful tools for the experimental study of the details of atomic motions in solids and liquids is the inelastic scattering of low-energy neutrons from solids and liquids. The suggestion that neutron-scattering experiments could be used