of Applied Mechanics. The ensuing chapters discuss three methods to extrapolate downward wave fields, and the imaging of the cross sections (the inverse techniques). Chapter 11 compared different approaches to migration. To readers of the Journal of Applied Mechanics, it would be benefical reading Chapter 11 first before reading Chapter 1, as the latter is incomprehensible to anyone outside the field of seismic prospecting. The last chapter (Chapter 12) discusses the limits of lateral resolution.

Most of the book is confined to two-dimensional scalar wave field $P(x, z, t)$. The three-dimensional case of scalar waves, $P(x, y, z, t)$ apparently is still not within the reach of prospecting seismologists, let alone the case of vector elastic waves, including P and S-wave conversions, in inhomogeneous media. This points a direction of research of a literally very rich area for readers of Journal of Applied Mechanics who are well versed in the subject of wave propagations in solids.

Free Vibration Analysis of Rectangular Plates. By D.J. Gorman. Elsevier, North Holland, 1982. 324 Pages. Price $60.00.

REVIEWED BY A. LEISSA[3]

This work is a summarization and generalization of a number of previously published papers by Professor Gorman dealing with the free vibrations of rectangular plates. It presents the most comprehensive set of published analytical results to date for rectangular plates governed by classical plate theory; that is, the plates are limited to be homogeneous, isotropic, and thin, undergoing vibrations of amplitude less than the thickness, and free of inplane initial stresses. The book makes no comparisons with the voluminous numerical results found elsewhere in the literature, but stands upon the author's own accurate calculations.

Chapter 2 presents comprehensive eigenfrequencies for the six cases of rectangular plates having two opposite sides simply supported and the others simply supported, clamped, or free. These problems have "exact" solutions in the sense that the eigenfrequencies are obtained from frequency determinants of finite size, in this case having orders no larger than four, arising from the well-known Voigt-Levy solution of the equation of motion. For each of the six cases, 64 frequencies are presented for a/b and b/a = 1, 1.25, 1.5, ,2, 2.5, and 3 where a and b are the plate dimensions. For plates having free edges (3 cases), results are given for two values of Poisson's ratio (0.333 and 0.5).

Chapters 3–7 deal with the remaining 15 cases of plates having combinations of clamped, simply supported, and free edges. The method of superimposing infinite series of Voigt-Levy solutions previously developed by the author and others is utilized to solve these problems. Convergence studies were made to establish the accuracy of the frequencies to four significant figures. Numerical results for frequencies are given typically for the first 10 modes in each case, for values of a/b and b/a as listed in the foregoing. Where free edges are involved, Poisson's ratio is set at 0.333.

The last chapter is devoted to a series of problems involving rectangular plates having added point masses or supports, or line supports. Again the superposition procedure is used to solve the problems and results for frequencies are given.

Although the results for frequencies given throughout the book are typically quite comprehensive, considerably less information is supplied about the corresponding mode shapes.

The reviewer recommends the book highly to individuals who are interested in applying the superposition method to the analysis of eigenvalue problems for rectangular regions and/or who desire extensive, accurate numerical results for the free vibration of rectangular plates governed by classical theory.

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Shock Waves and High-Strain-Rate Phenomena in Metals. Edited by M. A. Meyers and L. E. Marr. Plenum, New York, 1981. pp. xiii-1101. Price $95.00.

REVIEWED BY U. S. LINDHOLM[4]

This large volume (1100 pages) constitutes the proceedings of an international symposium held in Albuquerque, N. Mex. in June, 1980. There are a total of 58 papers divided into topical areas titled: High Strain Rate Deformation; Dynamic Fracture; Adiabatic Shearing; three sections on Shock-Waves Experimental Techniques, Fundamentals, and Microstructural and Mechanical Effects; Dynamic Compaction of Powders; and Explosive Metal Working and Welding. The editors have done an exceptionally fine job of editing and organizing the diverse papers in such a format that the volume presents a comprehensive state-of-the-art review of the subject while fulfilling the editors objective of making it a lasting reference and potential text for graduate education. The latter objective is achieved by a number of chapters contributed by the editors themselves as well as seven appendices providing supplemental basic information required for the design of shock-loading systems. The volume also achieves a balanced perspective for each topic from the points of view of physics, metallurgy, and mechanics.

In summary, this reviewer feels that this is perhaps the best collection of papers on the subject matter seen in recent years and reflects considerable extra effort by the editors to make it a self-contained treatise. It is well worth examination by all those active or interested in dynamic deformation or fracture.

Modern Fluid Mechanics. By Shih-I. Pai. Science Press, Beijing; distributed by Van Nostrand Reinhold Company, New York, 1981. pp. xx–570. Price $37.50.

REVIEWED BY J. S. WALKER[5]

This book on theoretical fluid mechanics falls into the large gap between the teaching textbooks on classical fluid mechanics and the research-oriented monographs that summarize recent developments in specific fields. The four chapters on basic concepts assume a knowledge of the traditional treatment and provide a novel and unifying approach to fluid properties, statics, dynamics, and dimensional analysis. The kinetic theory of gases is used to link continuum and molecular models. Throughout these chapters the author prepares the reader for the specific topics that follow.

The four chapters on specific areas of research treat gas

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