Journal of Applied Mechanics

Book Reviews

Shock and Vibration Handbook, 3rd ed., edited by C. M. Harris. McGraw-Hill Book Co., New York, 1988. 1312 Pages. Price: $76.50.

REVIEWED BY C. W. BERT[1]

Since the appearance of the first edition, edited by C. M. Harris and C. E. Crede, in 1961, this handbook has become well established as "the" handbook of the whole field of shock and vibration. The present edition contains the same number of chapters (44) as did the second edition (1976). Of these, thirteen are completely new, seven are completely rewritten versions, six are minor revisions, and nineteen are essentially the same as in the second edition. In a sense, the appearance of whole new chapters (and vanishing of old ones) is a measure of the dynamicism of the field. New topics to which whole new chapters are devoted include modal analysis, ground motion-induced vibration, vibration induced by fluid flow and by wind, piezoelectric/piezoresistive transducers, signal analyzers, special purpose transducers, condition monitoring of machinery, and seismic qualification of equipment.

This book ranges the gamut from fundamental theory to analysis, design, application, standardization, instrumentation, and data reduction. It is intended primarily as a working reference book for engineers and scientists in the acoustic, aerospace, chemical, civil, electrical/electronic, and manufacturing fields. This reviewer believes that it fulfills this objective very well, especially for those just entering the shock and vibration field. It also may be useful as a supplemental reference for advanced courses in shock and/or vibration.

Nonlinear Water Waves, edited by K. Horikawa and H. Maruo. (Proceedings of IUTAM Symposium, Tokyo, Japan, August 25–28, 1987), Springer-Verlag, New York, 1987. 466 Pages.

REVIEWED BY A. D. D. CRAIK[2]

This volume records the proceedings of a IUTAM Symposium on *Nonlinear Water Waves*, comprising three "keynote lectures", 33 contributed papers, and 15 posters. Authors' camera-ready contributions, in the usual variety of typefaces, are acceptably reproduced; there is a brief editors' introduction and a full list of participants. The wide international representation included many leading water-wave researchers: The number of Japanese participants was naturally large, but numbers from the U.S.A. (8) and U.K. (2) were surprisingly small.

In the editors' words: "The Symposium has intended to provide a wide scope of analytical and numerical methods as well as experimental studies for the analysis of the nonlinear phenomena related to water waves . . . . . the scope of the presented papers includes the following topics: (1) Theoretical and experimental studies of nonlinear water waves, (2) Nonlinear instability and deformation of water waves, (3) Wave breaking, (4) Nonlinear wave-current interaction, (5) Nonlinear water waves around structures and ships, (6) Wave-body interaction, and (7) Nonlinear internal waves."

The keynote lectures were by C. C. Mei on nonlinear diffraction effects, D. H. Peregrine on modeling of unsteady and breaking waves, and O. M. Faltinsen on nonlinear interactions between waves and bodies. The emphasis on nonlinear effects reflects recent theoretical and computational advances. These, in turn, are mainly motivated by the need to understand and predict the complex interactions of waves with ships, moored structures, and underwater topography.

As a whole, the contributions are an interesting sample of current research, including such topics as shallow-water solutions, standing waves in closed basins, breaking and spilling waves, resonant interactions, wave propagation over bodies and varying topography, second-order wave-induced forces on bodies, nonlinear ship waves, and simulation of wave spectra. With few exceptions, each paper is restricted in length to eight pages: Inevitably, some are tantalizingly brief and others are mercifully so. Equally inevitably, many have been, or will be, published in greater detail in referred journals. One paper contains the first recorded occurrence (and hopefully the last!) of the word "serendipiditiously."

The usefulness of this collection is transient: For a few years it will provide a convenient, though incomplete and disconnected, survey of current strands of water-wave research, of use to specialists in this and related areas. It would be a worthwhile, but not indispensible, addition to research libraries. I, for one, have learned something from reading it.

Micromechanics of Defects in Solids, Second Rev. Ed., by T. Mura, Martinus Nijhoff Publishers, Boston, MA, 1987. 587 Pages.

REVIEWED BY T. C. T. TING[3]

This is a very well written book. The central theme of the book is the concept of eigenstrain, originally due to Eshelby, which has been systematically employed by Professor Mura in

[1]Benjamin H. Perkinson Chair Professor of Engineering, School of Aerospace and Mechanical Engineering, The University of Oklahoma, Norman, Okla. 73019. Fellow ASME.

[2]Professor, Department of Applied Mathematics, University of St. Andrews, Fife, Scotland, U.K.

[3]Professor of Applied Mechanics, Department of Civil Engineering, Mechanics, and Metallurgy, University of Illinois at Chicago, Box 4348, Chicago, Ill. 60680.