7 Donnelly, R. J., Herman, R., and Prigogine, I., *Nonequilibrium Thermodynamics, Variational Techniques and Stability*, 1st ed., University of Chicago Press, Chicago, 1966.
8 Silver, R. S., *An Introduction to Thermodynamics*, 1st ed., Cambridge University Press, Cambrige, 1971, pp. 47–52.
9 El-Sayed, Y. M., "On the Generalization of Thermodynamics," unpublished report, Department of Mechanical Engineering, Glasgow University, 1971.
10 Schlögl, F., "Produced Entropy in Quantum Statistics," *Zeitschrift für Physik*, Vol. 249, 1971, pp. 1–11.

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book reviews

Elastodynamic Diffraction Problems

Diffraction of Elastic Waves and Dynamic Stress Concentrations. By Y.-H. Pao and C.-C. Mow. Crane, Russak & Co. Inc., New York, 1973. 693 Pages.

REVIEWED BY J. D. ACHENBACH[1]

Elastodynamic stress concentrations near cavities and inclusions can be quite different in magnitude from the corresponding elastostatic stress concentrations. This interesting and typically dynamic effect, which is often due to the diffraction of elastic waves, has generated a good many analytical and experimental studies, including several important ones by Pao and Mow. These authors have now written a monograph in which they have collected the most useful methods of analysis for elastodynamic diffraction problems, together with extensive numerical information on the accompanying stress concentrations.

The book opens with an informative history of studies of elastic wave diffraction. The first chapter also contains sections summarizing the theory of elasticity and a brief discussion of pertinent aspects of wave propagation in elastic solids. In Chapter 2, an analysis of scattering of plane harmonic SH-waves by a cylindrical obstacle serves to introduce methods of analysis. The four remaining chapters present analytical and numerical results for both steady-state and transient diffraction by cylindrical and spherical obstacles. Chapter 3 focuses on a thorough presentation of circular cylinder problems, such as diffraction of longitudinal and transverse waves by cavities and rigid and elastic inclusions. The scattering of flexural waves by a circular inclusion in a plate is also discussed, as is the transient interaction of a circular shell with a surrounding elastic medium. Elliptic cylinder problems and parabolic cylinder problems are discussed in Chapters 4 and 5, respectively. Chapter 5 includes an analysis of the important problem of stress singularities generated by elastodynamic diffraction at the edge of a semi-infinite crack. The last chapter is concerned with the spherical inclusion problem.

This book packs a lot of information which until now was only partially available, and then dispersed in the technical literature. It will be valuable to anyone who is, or should be, interested in elastodynamic effects.

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Introduction to Materials Science

Materials Science. By A. L. Ruoff. Prentice-Hall, Englewood Cliffs, N. J., 1973. vii-928. $18.95 Cloth.

REVIEWED BY A. PHILLIPS[2]

This is an excellent introductory book on material science. It covers a large number of topics making it suitable for any engineer who wishes to be introduced to those aspects of the science of materials which are important for his work. Suitable references at the end of each chapter provide guidance for further study. The book covers material properties and behavior, electrons and atoms, micro and macrostructure, chemical equilibria, kinetics, mechanical properties, electrical properties, optical, and magnetic properties.

It is very well written and it includes a large number of examples and problems. It is a good text for teaching at the undergraduate level.

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Diffraction of antiplane shear waves and stress concentration in a cracked couple stress elastic material with micro inertia. Article. Full-text available.Â We investigate diffraction of reduced traction shear waves applied at the faces of a stationary crack in an elastic solid with microstructure, under antiplane deformation. The material behaviour is described by the indeterminate theory of couple stress elasticity and the crack is rectilinear and semi-infinite. The full-field solution of the crack problem is obtained through integral transforms and the Wienerâ€“Hopf technique. The properties of elastic waves depend on the elastic properties of the material in which they propagate. This includes the number of different modes which can propagate and their velocities. Consider, to begin with, as is usually done in this subject, an infinitesimally small cube of the material. This will provide the basis for developing the equation of motion and the wave equation as its solutions. This rather general starting point could be applied to all sorts of materials; in the following subsections, some specific solutions will be examined.Â This paper also gives a comparing form of a group of static and dynamic measurements for a high building residence district (see Table 2). Table 2. Comparing Form of the Static and Dynamic Measurements for XX Residence District. Pile No. Penetration Depth. Abstract: This monograph systematically presents methods of solution for both steady-state and transient loading on various obstacles, and also numerical results of dynamic stress concentration on obstacles of different geometries. An effort is made to collect information from the open literature as well as from government agencies, industry, and individuals. Provenance: Borg-Warner. This report has yet to be scanned by Contrails staff. Request scanning of this report. Other options for obtaining this report. Via the Defense Technical Information Center (DTIC): A record for this report, and po TITLE: Surface Effects on the Diffraction of P Wave by an Arbitrary Shaped Cavity. AUTHORS: Zhiying Ou, Hongjun Han. KEYWORDS: Conformal Mapping, Dynamic Stress Concentration Factor, Irregularly Shaped Cavity, Surface Effect. JOURNAL NAME: Open Journal of Applied Sciences, Vol.9 No.6, June 3, 2019.Â The wave function expansion method and the conformal mapping method are used in the solution of dynamic stress concentration factor around an irregularly shaped cavity at nano-scale. The stress boundary conditions on the surface are obtained by using the generalized Young-Laplace equation. The results show that the degree of stress concentration becomes more obvious with curvature increasing. case of the stationary diffraction of plane waves on a number of periodically arranged cavities, backed rings with an ideal compressible liquid inside. The solution of the problem of implementing the method of potentials. The boundary conditions have the form (8). Do not change the form and potential of the.Â 6. Pao Y.H. Mow C.C. The diffraction of elastic waves and dynamic stress concentrations. - N.Y .: Crane Russak and Co, 1973. 694 p. 7. Avliyakulov NN, Safarov II Modern problems of statics and dynamics of underground pipelines. Tashkent, Fan va texnologiya 2007,306 p. JMESTN42350848.