energy deposition method for measurement of elastic constants; ultrasonic hysteresis absorption in polymers; acoustic emission and crack propagation; photoplastic effect in alkali halides; a rapid *B*-scanner for heat examination. Another interesting and helpful feature of the book is the availability of numerous self-testing review questions, and also problems with solutions at the end of each of the eight chapters.

It is obvious that in a book of such broad scope any particular reader may find fault with the treatment of a topic of special interest to him. Such type of criticism, however, loses much of its significance in the light of the unique features of the book briefly highlighted here. We should be grateful to the author for having performed a considerable service to the profession. The book is surely a most useful volume to undergraduate seniors and graduate students, as well as to research and development engineers in a variety of disciplines.

Structural and Geotechnical Mechanics. Edited by W. J. Hall. Prentice-Hall, Inc., N. J. 1977. Pages 442. Price: $27.50

REVIEWED BY W. D. IWAN[5]

In 1975 a symposium on structural and geotechnical mechanics honoring Prof. N. M. Newmark was held at the University of Illinois. The symposium consisted of invited papers written by some of Professor Newmark's former students and colleagues. The authors were asked to review the state-of-the-art of the subject area of the symposium within the context of their own individual contributions, and to make observations regarding the directions for future research. This volume is a compilation of the papers presented at the symposium with an introductory biography and bibliography of Professor Newmark. It is a fitting tribute to a man who has made many significant contributions to the field of mechanics.

The individual papers included in the volume cover a very broad range of subjects including: educational and social issues in engineering, risk and reliability analysis, the seismic response of various types of structures, soil-structure interaction effects, soil and rock mechanics, and the development of codes and design specifications. In spite of this broad coverage, the predominant emphasis of the volume is on problems related in some way to the field of earthquake engineering.

The papers contained in the volume are generally well written and contain adequate bibliographies. Most of the papers focus on one or two specific aspects of the particular area considered rather than attempting to give a broad survey of the entire area. Each paper is written by a recognized expert in the area covered.

Professor Hall has done a fine job of editing the volume and putting the papers together in a coherent form. His was no easy task due to the diversity of the subject material covered. Because of the scope of the volume and the number of well-known authors represented, it would be useful background reading for students and others entering the field of earthquake engineering.

Dynamics of Multibody Systems. By K. Magnus, editor. Springer-Verlag, Berlin/Heidelberg/New York. 1978. Pages 376. Price $32.

REVIEWED BY T. R. KANE[6]

During the Summer of 1977, a symposium on dynamics of multibody systems was held at the Technical University in Munich, Germany. Twenty-nine papers were presented to an audience whose members came from 15 countries, these papers having been selected by a committee consisting of representatives from Australia, Germany, the Netherlands, the Soviet Union, and the USA. The papers are reproduced in the present volume.

For presentation at the symposium, the papers were grouped under the headings of modeling, formalisms, robot dynamics, solution techniques, vehicle dynamics, large systems, spacecraft dynamics, gyrodynamics, identification, and rotor dynamics. Since many of the papers deal with more than one of these topics, the editor wisely chose to arrange them in alphabetical order in this book. However, with the aid of the Table of Contents, one can easily identify papers from a particular area.

As is natural in a book of this sort, one finds here a considerable variety of writing styles, notations, levels of mathematical difficulty, and points of view. Some of the papers have the character of survey articles, whereas others deal with rather specific problems in considerable detail. A reader engaged in research in any of the areas mentioned previously will probably find material of interest to him in this book, material not readily available elsewhere.

Experimental Stress Analysis. By James W. Dally and William F. Riley. McGraw-Hill Book Company, New York. 1978. Pages xvii–571. Price $26.

REVIEWED BY A. S. KOBAYASHI[7]

This long awaited second edition of the well-known book on *Experimental Stress Analysis* incorporates the many advances made in experimental methods in the past 13 years. Although the book is divided into the same four but rearranged parts, the original Part 3 on "Photoelasticity" has been expanded to a broader field of optical methods based on elementary theory of coherent optics. Expanded coverages on moiré methods, birefringent coating, and strain gage recording instruments are in keeping with the current requirements of applied and basic research in experimental mechanics. This second edition has the making of exceeding the popularity of the popular original edition.

The Finite Element Method for Elliptic Problems. By Philippe G. Ciarlet. 1978. North-Holland Publishing Co., Amsterdam and New York. Pages xvii-530. Price $56.95.

REVIEWED BY J. T. ODEN[8]

This book represents a monumental work on the mathematical foundations of finite-element methods as they apply to elliptic boundary-value problems. While some results on nonlinear problems are provided, the thrust of the work is definitely toward linear elliptic problems. The book is written in a descriptive tutorial style, is easy to read, and is complete with carefully designed exercises for the student. It is assumed that the reader has some knowledge of functional analysis.

The book has eight chapters. The first chapter summarizes the properties of linear elliptic boundary-value problems and Sobolev spaces. The second chapter, an introduction to the finite-element method, gives an excellent summary of interpolation properties of finite elements. Many of the results in this chapter were originally developed by Ciarlet himself. It is perhaps the most carefully written and complete account of the subject available. Chapter 3 is devoted to the use of conforming elements for second-order elliptic problems. It includes a detailed analysis of L_∞-error estimates following the work

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[8] Professor, Department of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin, Austin, Texas 78712.

Dynamics of Multibody Systems Second Edition. 123. Professor Dr.-Ing. Jens Wittenburg University of Karlsruhe (TH) Institute of Engineering Mechanics Kaiserstrasse ï™„ï™… ï™Šï™‰ï™„ï™…ï™‹ Karlsruhe, Germany Email: . Originally published under: Dynamics of Systems of Rigid Bodies, in the LAMM series, Teubner ï™„ï™Œï™Šï™Š. Library of Congress Control NumberÂ Also, the order of topics has changed. Multibody systems with spherical joints and with equations of motion allowing purely analytical investigations are no longer treated first but last. The emphasis is placed on a general formalism for multibody systems with arbitrary joints and with arbitrary system structure. This formalism has found important engineering applications in many branches of industry.