etc., through the relation between the I.C. engine and the torque converter into the design details. In the fourth chapter, the power distribution in hydraulic couplings and torque converters is discussed, beginning with the original Föttinger Turbo Mechanism (TM-System). Finally, several design examples of hydraulic couplings and torque converters used in the automotive industry are described in the last chapter. A short, comprehensive literature index is added.

Although the examples quoted are taken from the automotive practice, the flow analyses developed are applicable also to industrial-type machines. The book is intended for use by practicing engineers as well as a textbook by students. It is the reviewer's opinion that the book is a worthwhile addition to the literature on hydraulic couplings and torque converters. As usual, the meticulous and excellent edition by Springer-Verlag considerably enhances this edition.

Fluid Mechanics

Introduction Mathématique à la Mécanique des Fluides. By Caius Jacob. Gauthier-Villars, Paris, France, 1962. Cloth, 7 × 9½ in., 1286 pp.

REVIEWED BY P. D. RICHARDSON[2]

This book has been developed from courses given by the author at the universities of Cluj and Bucharest; an earlier edition, in Rumanian, was published in 1952. Although the book has nearly 1300 pages, it is not intended to be a comprehensive survey, and the lack of any index other than the four-page table of contents somewhat restricts its utility as a reference work. Instead, the author has sought to provide an extensive and largely self-contained mathematical introduction to some of the problems which have arisen in the development of aerodynamics.

The book is centered on four main topics: A review of relevant mathematical analysis, including harmonic functions of two variables and integral equations (224 pages); the equations of motion and their formal solution for problems first in incompressible flow and then in compressible flow (a total of 544 pages); finally, the author brings together approximate methods for both incompressible and compressible flow, including here a brief chapter on transonic flows (a total of 304 pages). The aerodynamic problems discussed do not include boundary-layer flows or effects to any significant extent. The style is that of a classic European treatise. The author leads his readers carefully through each problem, and includes sufficient cross references and literature references to make the book useful to readers of quite widely varied preparation. The author's pleasure and ability in describing the mathematical treatment of aerodynamic problems dominate the book.

Beam Grillages

Drehsteife Kreuzwerke. By H. Homberg and K. Trenks. Springer-Verlag, Berlin, 1962. Cloth, 8 × 11 in., vi and 318 pp. DM 87.

REVIEWED BY M. HETÉNYI[3]

This is essentially a handbook for structural designers. Theoretical expositions are kept at a minimum, only to introduce the reader to the use of the tables which comprise nearly 300 pages. Numerical solutions are given for torsion-resistant main girders, supported elastically against deflection as well as against rotation at any specific number of equidistant points, which represent connections with cross-beams whose torsional resistance is disregarded. By combination of such block-solutions, answers can be derived for a large variety of beam grillage configurations, including approximate solutions for orthotropic and cellular plates.

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Structural Analysis

Electric Circuit Analysis for Elastic Structures. By Richard H. MacNeal. John Wiley & Sons, Inc., New York and London, 1962. Cloth, 6 × 9 in., xv and 269 pp. $11.50.

REVIEWED BY T. J. HIGGINS[4]

This book is directed "primarily to practicing engineers and beginning research men who wish to acquire competence in a specialized field of structural analysis"; and in such thought the author has made an effort "to present the intricacies of analog computation in a manner understandable to the structures man who has a minimum amount of knowledge of the theory and practice of electronics."

The essential aspect is to "deal with the principles, methods, and procedures that are most important when the stress analyst wants to solve his problem with the aid of an analog computer." The corresponding content is well-evidenced in the chapter headings: 1, Introduction; 2, Electric circuit analysis; 3, Basic techniques used in deriving analogies; 4, Analogies for structures that consist of one-dimensional elements; 5, Analogies for two-dimensional structural elements; 6, Practical considerations in the construction of analogies for static structural analysis; 7, Examples of aircraft structural analysis; 8, Dynamic analysis; 9, Applications to other types of structural analysis; 10, General theorems and special synthesis procedures; Bibliography and Index.

A careful reading of the text, with close attention to detail, coupled with an exhaustive knowledge of the journal and textbook literature pertinent to the domain covered by the text (in fact, the reviewer found he had read nearly all of the cited references, and is familiar with several score more that are pertinent to citation), leads to the following epitomization: The text is well-organized; is easily read; the aims remarked in the opening paragraph above are well discharged; the content as a whole is unique in that it is not paralleled *in the large* in any other single book now in print; the content is technically accurate on the whole, except in Chapter 8, "Dynamic analysis" (in this chapter many of the equations comprise a commingling of time-domain, frequency-response-domain, and transform-domain symbols such as to evidence lack of intimate knowledge and authoritative grasp of this area); and, despite this shortcoming, the text merits the attention and reading of all concerned with structural analysis, especially in the aircraft and missile fields.

Shock and Vibration Testing

Shock and Vibration Engineering. By C. T. Morrow. John Wiley & Sons, Inc., New York, N. Y., 1963. 6 × 9 in., xix and 384 pp. $12.00

REVIEWED BY IRWIN VIGNESS[5]

This book has been directed to the practical engineer involved in shock and vibration testing and in the specifications of such tests. It has been written during a time when many changes in this field have taken place. The author, in a general and descriptive way, covers much of the state of the art at this time. The author has attempted to provide sufficient background to permit the engineer to exercise judgment in the establishment and performance of a test, it being obvious that general specifications cannot be designed to match particular environments. To permit the engineer to quickly digest the knowledge in this field the author has omitted long mathematical derivations and some mathematical precision. Principles and assumptions are given, with few intermediate steps, followed by results and conclusions. This approach will be appreciated by the busy test

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