

Aeronautics

High Speed Problems of Aircraft and Experimental Methods, vol. 8. Edited by Donovan, Goddard, Lawrence, and Gilruth. Princeton University Press, 1961. Cloth, $6\frac{1}{2} \times 9\frac{1}{2}$ in., xvi and 976 pp. \$22.50.

REVIEWED BY P. P. WEGENER¹

SUBJECTS covered in this newest volume (VIII) of the Princeton series are performance calculations, stability control, aeroelasticity, and flutter of aircraft and missiles. Principles of model testing, transonic, supersonic, and hypersonic testing facilities, low density tunnels, shock tubes, ranges, and the associated instrumentation techniques are reviewed. Finally, discussions of free flight testing including the use of piloted aircraft are included. Reviewer does not lay claim to have read the monumental treatise of 967 pages from cover to cover; however, it appears that the work is unparalleled and a highly useful contribution to the current literature. Articles range in quality from outstanding contributions on the fundamentals of the problems to less useful discussion of the details of existing facilities. Only in the latter case where the basic design problems are unfortunately omitted sometimes, the text may soon be outdated by technological developments. It is surely unavoidable, in view of the vast coverage and the involvement of four editors and twenty-eight authors, that cross-referencing is often absent and repetition is occasionally present. It may be a sign of the advanced state of the art that Prandtl's name occurs just once in the index with reference to a page on which his name does not appear. Reviewer finds the volume is highly readable. Its very length often provides detailed expositions of an introductory nature to make it invaluable to the student in addition to fulfilling its unique purpose for the

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research worker. It can only be hoped that many of the sections will appear separately in the Princeton paperback form to make the content available to the student or research worker of one branch only.

Moment Distribution

Moment Distribution. By E. Lightfoot. John Wiley & Sons, Inc., New York, N. Y., 1961. Cloth, $6\frac{1}{2} \times 9\frac{1}{2}$ in., xix and 363 pp. \$11.00.

REVIEWED BY D. C. DRUCKER²

A COMPREHENSIVE treatment of moment distribution including shells, grids, and space frameworks.

As Professor Evans states in his foreword to the text, "in spite of developments on the electronic computer there will always be a place for hand computing methods in the design office."

Fatigue Testing

Fatigue Testing and Analysis of Results. Edited by W. Weibull. Pergamon Press, New York, N. Y., 1961. Cloth, $7 \times 9\frac{1}{2}$ in., xiii and 305 pp. \$12.

REVIEWED BY K. C. ROCKEY³

THE survey of this field of research, which has obviously been a tremendous task, has been carried out by the Structures and Materials Panel of the Advisory Group for Aeronautical Research and Development of the North Atlantic Treaty Organization. It is a very fine reference book and will be particularly useful to young research workers who will find the 55 pages of bibliography particularly helpful.

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BOOK REVIEWS

The book can be divided into two main sections. The first six chapters deal with fatigue testing methods, fatigue machines, instrumentation, and the manufacture of test pieces, while the remaining three chapters are devoted to the planning of an experimental investigation and the presentation and analysis of the results.

Dr. Weibull presents a vast amount of data in a most neat and concise manner.

Solid Mechanics

Curricula in Solid Mechanics. By Liebowitz and Allen. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1961. Cloth, 6 × 9½ in., vii and 147 pp. \$1.50.

REVIEWED BY D. C. DRUCKER⁴

A DISTINGUISHED group, drawn mainly from circles, presents its ideas on applied mathematics, materials, structures, and continuous media.

Automatic Control

Statistical Analysis and Optimization of Systems. By E. L. Peterson. John Wiley & Sons, Inc., New York, N. Y., 1961. Cloth, 6½ × 9½ in., xi and 190 pp. \$9.75.

REVIEWED BY WALTER FREIBERGER⁵

THIS book deals with three important areas in the theory of automatic control processes: the analysis, the synthesis, and the optimization of such systems, both when these processes are deterministic and when they are stochastic. Classical and modern techniques are presented in a clear and concise manner which will appeal to mathematically minded engineers and economists.

After a summary of the relevant probabilistic and statistical background, the response of linear systems to stochastic inputs is discussed, as well as the work of Wiener, Zadeh, Shinbrot, and others. These optimization problems are given their variational formulation in terms of linear equations and quadratic criteria. For general nonlinear control processes, the variational and the dynamic programming approaches are presented, with reference to work by Bellman, Kalaba, and Merriam. All applications are illustrated with examples. The book gives an excellent though brief introduction to the current state of the field.

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