The authors state that these tables have been designed for use in the numerical solution of diffraction or scattering problems involving objects with tapered distributions of density.

J. W. W.

1. A. VAN WIJNGAARDEN & W. L. SCHEEN, *Table of Fresnel Integrals*, Report R49, Computation Department of the Mathematical Centre, Amsterdam, 1949.

84[P, X].—ARTHUR G. HANSEN, *Similarity Analyses of Boundary Value Problems in Engineering*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1964, xiv + 114 pp., 24 cm. Price $6.75.

This informal monograph presents a comparative discussion of four related approaches to finding self-similar solutions to boundary-value problems in engineering. These approaches are called the "free parameter" method (Riabouchinsky's method), "separation of variables" (reference is made to D. E. Abbott and S. J. Kline), "group-theory methods" (developed by A. J. A. Morgan, following ideas of the reviewer), and (lastly!) "dimensional analysis" (following L. I. Sedov).

A modest mathematical background is assumed; for instance, the notion of a group of transformations is explained carefully. Physical, philosophical, and experimental questions are avoided; the emphasis is on working out in detail solutions to specific boundary-value problems, some of which have been published only recently in the periodical literature on fluid flow and heat transfer.

Though in no sense profound, the book should be helpful in introducing various recent extensions of Rayleigh's "method of similitude" to wider circles of mathematically-minded scientists.

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85[P, X, Z].—M. L. JAMES, G. M. SMITH & J. C. WOLFORD, *Analog and Digital Computer Methods in Engineering Analysis*, International Textbook Company, Scranton, Pennsylvania, 1964, x + 457 pp., 24 cm. Price $9.25.

This is one of the few books which presents a balanced approach to both analog and digital computing as used in engineering at the elementary level; the more imaginative and exciting uses are simply ignored. Thus, it is a good, solid, pedestrian text for a beginning computing course in engineering.

The first chapter, entitled Basic Analog-Computer Theory, covers the pertinent electronics sufficiently to make the operation clear and avoids getting mired in details. It goes on to show, by many clear examples, how to use the computer to solve practical problems.

The second chapter, Simulation of Discontinuous and Nonlinear Physical Systems, supplies all necessary details.

The third chapter, The Role of Analog Computers in Engineering Analysis, is a very good one, as it makes its points very well.

Chapter 4, The Digital Computer and the FORTRAN System, is simply an introduction to FORTRAN.

Chapter 5, Numerical Methods for Use with the Digital Computer, covers finding zeros, solution of simultaneous linear equations, eigenvalues, integration, differ-

entiation, and the solution of ordinary differential equations. The part on partial differential equations is a bit brief but does convey much information that is needed by the engineer.

All in all, it is a fine text for engineers.

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86[P, Z].—JOHN PESCHON, Editor, *Disciplines and Techniques of Systems Control*, Blaisdell Publishing Company, New York, 1965, xi + 547 pp., 24 cm. Price $12.50.

This is an excellent collection of articles by different authors devoted to an exposition of a number of recent developments in the field of control theory. The list of chapter headings gives a quick idea of the contents: L. Pun and J. Peschon, "The State of the Art of Automatic Control"; E. W. Henry, "The Basic Mathematics of Automatic Control"; J. Peschon, "Multivariable and Timeshared Systems"; L. G. Shaw, "Optimum Stochastic Control"; J. Peschon and H. B. Smets, "Nonlinear Control Systems: Selected Topics"; A. M. Letov, "Liapunov's Theory of Stability of Motion"; A. A. Feldbaum, "Optimal Systems"; C. L. McClure, "Reference Stabilization and Inertial Guidance Systems"; J. Peschon, L. Pun, and S. K. Mitter, "Computer Process Control"; and R. C. Amara, "Systems Engineering: Its Principles, Practices, and Prospects".

The inclusion of the articles by Letov and Feldbaum make the volume of particular importance. Not only are these authors outstanding in their domains, but, in addition, they are able to give the American reader an overall view of both American and Russian work in these new areas.

The book is highly recommended for students and teachers, and, in general, for all those who want to understand what some of the problems and achievements of modern control theory are.

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87[P, Z].—J. WOLFOWITZ, *Coding Theorems of Information Theory*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1962, 125 pp., 23.5 cm. Price $9.35.

In this monograph the author proves 21 coding theorems, 16 strong converses, and eight weak converses for different kinds of channels.

There are 10 chapters: one on the discrete memory-less channel, with particular treatment of the binary symmetric channel and the finite-state channel with state calculable by both sender and receiver or only by the sender; another chapter on compound channels (classes of channels) including channels with feedback; two chapters on finite- and infinite-memory channels; one on the semicontinuous memory-less channel; and one on continuous channels with additive Gaussian noise.

Since its publication the monograph has had a considerable and positive influence on mathematical work on coding theory. Many of its results are due in part to, or have been refined by, the author. The proofs are clear and elegant.