4. Mathematical Linguistics and Machine Translation. Papers by: S. Abraham & G. Salapina, M. Bierwisch, L. Deshoe, Gy. Hell, F. Kiefer, R. B. Lees, S. Marcus, P. Sgall, Gy. Sipoeczy.

5. Digital Computers and Programming. Papers by: B. Doemoelki, I. Friš & P. Liebl, M. A. Kartsev & E. B. Glivenko, Z. Pawlak, Gy. Révész.

6. Application of Computers in Economics. Papers by: C. A. Aleskerov, J. L. Destouches, S. Ganczer, I. Kiss, B. Krekó, B. Martos, J. Piehler.

7. Artificial Intelligence, Machine Learning. Papers by: H. L. Gelernter, V. M. Glushkov & A. A. Ctogniĭ.

E. I.

42[P, X].—S. O. Asplund, *Structural Mechanics: Classical and Matrix Methods*, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1966, xiii + 474 pp., 24 cm. Price $14.00.

The purpose of this book is to serve as a text for advanced undergraduates and graduate students in structural mechanics. It treats both determinant and indeterminant structures in great detail. However, the emphasis in this book is somewhat different from the one normally found in a structural mechanics text. The author is very cognizant of the impact of modern high-speed computers on this field and has written his text accordingly. Thus, while classical methods are discussed, matrix methods are emphasized as being the more useful to the practicing engineer.

In many ways this is a remarkable book. It is contemporary and every page reflects the author's familiarity with his subject. Each topic is given a consistently polished development and logic is never sacrificed to intuition. The style of the book may tend to be overly succinct and the notation may cause some difficulty to those familiar with more common notations. However, with these reservations, this is a highly recommended book.

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43[P, X].—A. Halanay, *Differential Equations: Stability, Oscillations, Time Lags*, Academic Press, New York, 1966, xii + 528 pp., 24 cm. Price $19.50.

This monograph is essentially a translation of the original Rumanian edition of 1963. It presents a unified treatment, for ordinary differential equations and functional-differential equations, of those topics in stability theory and the theory of oscillations which have been at the center of interest during the past decade.

Chapter I concerns the various types of stability, including total and integral stability, that may be defined for the solutions of ordinary differential equations. The setting is that of Lyapunov's Second Method, and the stability criteria given, except for Perron's condition, are either deduced from, or stated directly in terms of appropriate Lyapunov functions. In Chapter II sufficient conditions for the absolute stability of regulator systems are derived, using both Lurie's approach and the method of Popov. Chapter III deals with the existence of periodic and al-

most-periodic solutions of ordinary differential equations. It contains concise expositions of the method of averaging, the method of successive approximations, and a treatment of singular perturbations. Chapter IV, by far the longest, takes up the questions of the previous chapters in the setting of functional-differential equations. Stability theory is developed in terms of Lyapunov functionals, the stability of a regulator system with time lag is discussed by the method of Popov, criteria for the existence of periodic solutions are given, and an extension of the method of averaging is introduced in detail.

Each chapter is provided at the end with some brief notes containing references to the origin of some of the theorems and to further work. The book closes with a fairly complete bibliography up to 1964.

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44[P, X, Z].—B. A. Volynskiĭ & V. Ye. Bukhman, *Analogues for the Solution of Boundary-Value Problems*, International Tracts in Computer Science and Technology, and their Application, Volume 13, Pergamon Press, New York, 1965, xi + 460 pp., 24 cm. Price $15.00.

The primary aim of the authors is to describe the development of network analyzers in the Soviet Union for the approximate solution of boundary-value problems in partial differential equations. To this end, the book is divided essentially into two parts.

First, representative scientific and engineering problems which lead to boundary-value problems are introduced, and finite-difference, integral and Monte Carlo methods for their solution are investigated. The construction of electrical circuits corresponding to the approximate expressions for the solutions of the mathematical equations are presented for numerous cases. The Dirichlet, Neumann and mixed-boundary value problems are covered. The treatment is well-organized and lucid, with particular emphasis placed on the nature of errors in the solutions and on methods for improving accuracy. This should prove of great value to the engineer who seeks a practical, clearly written approach to the subject.

The second portion of the book is concerned with general-purpose and special-purpose network analyzers. The former are applied to equations of the Laplace, Poisson and Fourier type; the latter are invoked when there are more stringent requirements, e.g., greater number of nodes, improved accuracy, greater speed of solution. There is a detailed discussion of the construction of these analyzers and of techniques for measuring the physical quantities which yield the solutions.

One subject which receives special attention is the use of a "star" configuration of resistors to represent the integral form of solution of boundary-value problems for unbounded domains. This English edition contains a supplementary chapter which reviews the research, carried out after the book appeared in the Soviet Union in 1960, on the simulation of integral methods and of more complicated boundary conditions. A few hybrid applications are also included.

The material in this second part of the book is highly specialized; much of it