

3. Marvin Marcus, "The use of multilinear algebra for proving matrix inequalities," pp. 61–80.
4. A. M. Ostrowski, "Positive matrices and functional analysis," pp. 81–101.
5. H. J. Ryser, "Matrices of zeros and ones in combinatorial mathematics," pp. 103–124.
6. Olga Taussky, "On the variation of the characteristic roots of a finite matrix under various changes of its elements," pp. 125–138.

Briefly, each author makes a penetrating study of a particular facet of matrix theory, and each author unifies and summarizes the important results in his area. This book is, without question, a very valuable collection of results and references in modern matrix theory, and the editor, Hans Schneider, is to be congratulated for his successful efforts in bringing together such distinguished researchers and for editing the final results.

R. S. V.

78[G, X].—GERHARD SCHRÖDER, *Über die Konvergenz einiger Jacobi-Verfahren zur Bestimmung der Eigenwerte symmetrischer Matrizen*, Forschungsberichte des Landes Nordrhein-Westfalen, Nr. 1291, Westdeutscher Verlag, Opladen, 1964, 59 pp., 23 cm. Price DM 58.50 (paperback).

As the title implies, this report deals with the convergence of Jacobi methods for the determination of the eigenvalues (and eigenvectors) of real symmetric matrices. Specific methods considered are the classical Jacobi method, the cyclic-Jacobi method, and the threshold-cyclic-Jacobi method.

For a number of cyclic methods a new proof of convergence is given which indicates quadratic convergence for a matrix with distinct eigenvalues. In the case of multiple and close eigenvalues, the classical Jacobi method and the cyclic-threshold-Jacobi method are examined. It is shown, for these methods, that convergence is improved for matrices with multiple eigenvalues. Close eigenvalues also improve the convergence.

Some numerical examples are discussed. For matrices of low order, high-accuracy computations were performed and the results obtained confirm the theoretical results about the rates of convergence of the methods employed.

For matrices of higher order, computations were performed with ordinary accuracy. Results obtained permit a comparison of the methods, with regard to speed and accuracy, and thus permit an evaluation of the methods for the practical determination of all eigenvalues and eigenvectors of a real symmetric matrix.

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79[K, X].—ROBERT M. FANO, *Transmission of Information, A Statistical Theory of Communications*, The Technology Press, M.I.T., and John Wiley & Sons, Inc., New York, New York, 1961, 389 pp., 24 cm. Price \$7.50.

Professor Fano's valuable textbook on modern information theory (for, certainly, it is not a research monograph) is the considered outgrowth of nearly ten