Matrices: Methods and Applications
STEPHEN BARNETT
Oxford University Press, Oxford, 1990. 450 + vii pp. £17.50 (paper back)
ISBN 0 198 59680 4

This text is part of the Oxford Applied Mathematics and Computing Series. The first part of the book is based on *Matrix Methods for Scientists and Engineers* published by McGraw-Hill in 1979.

This section is a first course on matrices, discussing theory and applications such as the solution of linear equations, inverses, determinants, ranks and non-unique solutions. The theory is very carefully explained from a practical viewpoint without including too much 'pure' mathematics to obscure the practical application of the mathematical methods.

Thereafter, eigenvalues and eigenvectors are introduced, and the iterative solution of linear equations is discussed. Quadratic, Hermitian and canonical forms are followed by generalized inverses, polynomials and polynomial matrices, and special patterned matrices. The Lyapunov and Riccati matrix equations arise in discussions on stability of a set of linear differential equations. The final chapter studies advanced topics including matrix equations, norms and conditioning.

The book serves very well as an introduction to matrix methods and applications, and also as a reference for the more advanced student, scientist or engineer. There are a very large number of illustrative examples to motivate the importance of matrices and their wide application in numerous subject areas. There is little coverage of computational techniques. Each chapter ends with numerous problems for solution by the reader, and solutions are given towards the end of the book. There is a long reference section which should assist those requiring specialized matrix theory for their particular subject area. The book is written in a readable style and I am sure will be warmly welcomed by lecturers and students.

ALAN ZINOBER

Parallel Learning Structures: Increasing Innovation in Bureaucracies
GERVASE R. BUSHE and A. B. (RAMI) SHANI
Addison-Wesley, Wokingham, 1991. xx + 184 pp. £18.85
ISBN 0 201 52427 9

This book is in the Addison-Wesley Series on Organization Development (OD), which is edited by Richard Beckhard and Edgar Schein. If asked why a book on OD should be reviewed in a Journal of Operational Research, we would suggest that the growing interest in 'soft' OR, with its focus on problem-solving methods for complex and 'messy' problems, requires the OR practitioner to address organizational issues as they affect the problem solving process and the management of change. 'Parallel Learning Structures' illustrates one method of dealing with these issues.

The book is based on the premise that understanding of organization design is essential for large, organizational change efforts. It advocates the use of technostructural intervention, or Parallel Learning Structures (PLSs), as a means of ensuring the success of such change efforts. These strategic interventions are viewed as a means of addressing the fundamental paradox between the organization's need for structural predictability and stability as compared with the requirement for structural adaptability, by aiming to promote system-wide change whilst retaining the advantages of bureaucracy.

A PLS aims to change the technology and/or structure of the organization, with the purpose of improving the organization's socio-technical system. This is achieved through installing a second structure (composed of a steering committee and a number of small groups), which is designed for learning, and which emphasizes creating norms and procedures that facilitate learning and innovation. Somewhat tenuous distinctions are drawn between PLSs and, say, task forces and teams; whereas the semi-autonomous work group is given as an example of a PLS in action. The book continues with a set of prescriptions for the simultaneous pursuit of efficiency and innovation; and with a explanation of why bureaucracies find 'messy' problems hard to handle (the bureaucracy is based on functional specialisms, whereas the PLS emphasizes an integrative, cross-functional