consider discrete approximations of continuous processes. In one paper the original problem is continuous in state and time, and in the other only in time.

ADRIAN C. LAVERCOMBE

Introduction to Queueing Theory
ROBERT B. COOPER
Edward Arnold, U.K., 1981. 347pp. £14.00
ISBN 0 7131 3435 6

This is a text book suitable for 3rd year mathematics graduates and perhaps graduate students of Operational Research. It starts from the basis of an intuitive analysis of a telephone system comprising two cities interconnected by a group of five telephone trunks and applying the principal formulae (which incidentally are proved more rigorously later). Many of the processes considered are those first studied by Erlang and as such are well covered in many books. The chapter reviewing probability topics, which occurs early in the book and discusses birth and death processes and some probability distributions, contains much of relevance to students of queueing theory and some important references. However, having pointed out that P.G.F.s are holomorphic functions within and on the unit circle, the book gives no examples of the use of complex variable theory in the analysis. On the other hand, the explanation of Riemann-Stieltjes integrals and Laplace-Stieltjes transforms, though modest, was informative and is followed by the standard imbedded Markov chain models. Numerous examples are given at the end of each chapter, and the publishers have available an instructor's manual containing detailed solutions. The book contains a bibliography of "almost all the English language" books on queueing theory, and this is useful. Of course, most of the topics studied in this book are contained in the others. From the Operational Research point of view there are no practical examples and little indication of how the theory may be used. Nevertheless, the book is a good introduction to queueing theory and contains worthwhile material and references brought together in one volume.

R.R.P. JACKSON

Practical Methods of Optimization. Vol. 2 - Constrained Optimization
R. FLETCHER
Wiley, New York, U.S.A., 1981. 224pp. £13.30
ISBN 0 471 27828 9

In JORS Vol. 32, No. 5 I reviewed the first of this two-volume series on numerical optimization and said that the second volume "promises to be of as much depth, scope and excellence as the first" (on unconstrained optimization); I can now report that this volume has fully lived up to these promises. Ideas, terminology and methods from Volume 1 are used, and so that volume is "essential reading" before this is tackled. Anyone with the mathematical skills necessary for Volume 1 could cope with the new material, although some knowledge of numerical analysis would be useful, as such terms as "LR and QR (Householder's) factorizations" or "condition numbers" occur occasionally.

Unlike other texts, linear programming does not play a major role in the book, one chapter dealing with both classical methods and the active set method, which Dr Fletcher clearly favours. Some theory of constrained optimization is given, and then the problem assumptions are gradually lifted as the book works through quadratic programming (again by both Lagrangean and