tion to the elementary mathematical techniques of modelling situations. It should also prove useful for lecturers in applied mathematics, particularly for individuals who find it difficult to invent suitable problem areas for classwork etc.

C. R. SERGEANT

The Art and Theory of Dynamic Programming

S. E. DREYFUS and A. M. LAW

Academic Press, London, 1977. xvi + 284 *pp.* £13.15

This book is unashamedly a straightforward textbook for a course on dynamic programming. There is no discussions of (nor references to) actual applications. The first eight chapters cover deterministic dynamic programming: path problems, equipment replacement, resource allocation, the travelling-salesman problem, problems with linear dynamics and quadratic criteria, discrete-time optimal-control problems, cargo-loading problems. The last seven chapters look at stochastic dynamic programming: path problems, equipment replacement and linear dynamics problems are looked at again, inventory models, Markovian decision processes and optimisation problems involving learning are also covered. A feature of the book is the provision of detailed solutions for every problem. The authors attach great importance to the problems, since they believe "that the art of formulating and solving problems using dynamic programming can be learned only through active participation", i.e. students must work out lots of problems.

Of course, if you are busy working out problems you have no time for distractions such as comparisons with other techniques or remarks on O.R. But even so, is it right that linear programming only gets a one-line mention? (And that is in the chapter on Markovian Decision Processes, not in the resource allocation chapter.) Is it right that O.R. only gets a one-line mention? This is the nicely turned phrase that "artful O.R. tempers realistic complexity with computational feasibility". Perhaps the authors see O.R. as a collection of mathematical techniques for solving a well-defined range of problems, with no fancy ideas of an O.R. process beginning with defining the problem and ending with implementation of a solution.

Looking at the book specifically as a textbook, it is a sound piece of work. The mathematics are not demanding, nothing further than Lagrange multipliers. Although the presentation is generally good, the lay-out of the worked solutions both in the text and at the back of the book could be improved. With so many numbers flying around, good organisation of dynamic programming calculations is essential. One way of clarifying solutions would be to draw flow-charts of the algorithms, but the authors do not use this approach.

It seems incredible that Richard Bellman is mentioned only in the dedication; Dreyfus does not even refer to the book he co-authored with Bellman on dynamic programming. The other person mentioned in the dedication is the wife of co-author Law and she is referred to again in the book. According to problem 13.4, she wants to sell her house. Ah well, it's tough living with a dynamic programmer.

ANTONY UNWIN

Markov Decision Theory

H. C. TIJMS and J. WESSELS (Editors)

Mathematisch Centrum, Amsterdam, 1977. 220 *pp.* Dfl 26.00

During the period of September 13–17, 1976, an advanced seminar on Markov decision theory was held at the University of Amsterdam. In cooperation with the Eindhoven