

that necessary conditions for optimality, in multivariate, non-linear, time-varying dynamic systems are either far beyond what they have read, or that they are a straightforward extension. It is hard to imagine that these readers will be very well prepared for real problems. They *will* be able to solve linear difference equations, but fourteen pounds is a high price to pay for a handbook on that.

KENNETH WICKWIRE

Introduction to Mathematical Control Theory.

STEPHEN BARNETT.

Oxford Applied Mathematics and Computing Science Series, Clarendon Press, Oxford University Press, London, 1975. 208 pp. £5.75.

This aims to be a teaching text suitable for final-year honours mathematics students, post-graduate control engineers, etc., "providing at least a small counter-balance to the deadweight of British classical applied mathematics".

After a 22 pp. introduction there are 23 pp. of specialised matrix theory which make the book self-contained. Most texts on control theory need a chapter on matrices but it is an interesting decision by Barnett to include it, since he has already authored and co-authored two books on matrices.

The bulk of the book is contained in chapters 3 and 4 on linear systems; and chapter 5 which is an exposition of stability and includes discussions of Liapunov stability, Routh-Hurwitz, Nyquist criterion etc. The treatment is very clear, there are many imaginative examples, exercises and solutions; though I thought a recurrent example about buffalo in 1830 a little forced. By referring the reader to other sources for proofs etc. the book has been kept to a reasonable size with two pages of references which are almost entirely to texts published in the last 5 years.

A chapter on optimal control ends the book and this I found less thorough. The calculus of variations is dealt with in about 10 pp. Pontryagin's principle in about 11 pp. and dynamic programming in roughly 5 pp. Nowhere in the book could I find a mention of stochastic control or of integral or differential control and for numerical solutions the reader is referred elsewhere.

However, the author of a teaching text has a lot of compromises to make and I should certainly recommend anyone teaching or learning control theory to consider this book.

D. T. BIRTWISTLE

Control of "Error" in Market Research Data.

J. U. FARLEY and J. A. HOWARD (Editors).

Lexington Books: (D. C. Heath), Farnborough. 1975. 347 pp. £7.75.

This book is a collection of eight original, commissioned papers dealing with issues related to "noise" or error in market research data. The American