Part I. However, the subject-matter is less elementary and although Part II is suitable for postgraduate study it cannot be recommended for less sophisticated students. This is not meant to imply that others will get nothing out of Part II: there is a background of historical and other details for the reader to enjoy. (The author's comments on the foundations of geometry are especially interesting.) Part III is not mathematical, but mathematicians with an interest in philosophy will certainly find it stimulating. The Appendix and Bibliography are useful sources of information and references.

R. M. DICKER

MACON, NATHANIEL, *Numerical Analysis* (Wiley, New York and London, 1963), xiv+161 pp., £2.

This book opens with the definition: " Numerical analysis, by general definition, is the branch of mathematics concerned with developing and evaluating techniques of employing computers to solve problems." One cannot accept this definition without reservation. Many problems on computers do not involve numerical analysis, while sound numerical analysis brings many others within convenient range of desk calculation. Accordingly, though much must be left out of " a textbook for a one-semester first course in numerical analysis ", this reviewer cannot accept that an account which nowhere uses or refers to finite difference methods is a suitable introduction to the subject.

Within the terms of reference of the opening definition the coverage of the subject is reasonable for a first course, though very heavily coloured by this avoidance of finite difference methods. For example, quadrature methods are confined to trapezium and Simpson rules and Gaussian methods. The latter, though excellent for automatic computation, are hopelessly impracticable for hand work on those occasions when the former rules gives insufficient precision without an absurdly large number of ordinates. Similar remarks could be made in many other places. Curiously, the opposite failing is present in the chapter on characteristic values and vectors of a matrix, where the only method discussed, iteration by repeated multiplication of an arbitrary vector by the given matrix, is one which is satisfactory on matrices within range of desk calculation, but only when used with a degree of intelligence difficult to simulate on a machine.

In short, the author's attempt to pave a royal road to high-speed automatic computation is unsuccessful, leaving a large gap between what can be done by the untrained arithmetician and what should be done on an automatic computer, and this is inevitable for there is no such road.

JOHN LEECH

COCHRAN, W. G., *Sampling Techniques* (John Wiley & Sons, 2nd edition, 1963), ix+413 pp., 72s.

The second edition of this excellent book shows a number of changes from the first edition. A glance at the table of contents shows that not only has the book been brought up to date, but many sections have been added or rewritten. In the earlier chapters one notes the introduction of estimates and comparisons between means and proportions for sub-populations or domains of study. The chapter dealing with stratified sampling has been sub-divided. The first part consists of standard theory and the second part contains not only the more specialised sections of the first edition but also new major topics such as the construction and choice of the number of strata, optimum sample sizes in strata under given precision conditions and two-way stratification for small samples. In Chapter 10, which is concerned with