test, that he anticipates it (in example 7.7) and has to refer forward to it. In example 7.6 (in which the least value of a variable G is being found) we are told that if G assumes a minimum value for some value of x, then for that value $D_x G = 0$, even though it is specifically pointed out earlier (p. 98) that a function can have an extremum where it is not differentiable. So practice becomes separated from theory! And in all examples the author, though looking for greatest and least values, is content to find relative maxima and minima.

The author puts the reader very properly on his guard against certain ambiguities of notation and there are several places where he explains that a symbol has a double meaning; in particular he remarks that there is a tendency (a word which the reviewer feels could be replaced by a stronger one) to use ϕ and $\phi(x)$ interchangeably. On the integral notation he writes "It is not easy to avoid confusion over the double use of $\int$ and dx. It would be far better if an entirely different symbol were used for the definite integral. But the use of these symbols for the two different purposes has become so entrenched in the literature that it takes more courage than the present author has to make a change". The reviewer suggests an alternative solution: leave the notation for definite integrals, and avoid (rather than replace the notation for) indefinite integrals. The author has gone some way towards this already in replacing systematic integration by systematic solution of separable first-order equations. The book is now in its third edition: if the author would like, in the fourth, to take one more step towards clearing up the confused notation of the elementary calculus, he will have this reviewer at least on his side.

H. A. Thurston, University of British Columbia

Mathematical Methods for Digital Computers, edited by Anthony Ralston and Herbert S. Wilf. Wiley, New York, 1960. 293 + xi pages. $9.00.

This book should be in the hands of every person concerned with the choice or development of numerical methods for the digital computer solution of general scientific, including statistical, problems. Indeed, although it is not formally a textbook on numerical analysis, it is certain to give the mathematically literate reader, with the most rudimentary knowledge of the organization and operation of computing machinery, a clear grasp of the way in which computers are set up to solve mathematical problems, and some idea of the scope and limitations of existing techniques of numerical analysis.

The book contains 26 articles, by different authors, written, with a single exception, in an uniform format; each dealing with a different numerical technique. The articles include paragraphs on the formulation of the particular problem in hand, on the mathematical context of the problem, including, wherever possible, a discussion of error analysis and control, and on the numerical procedure in step-by-step or "recipe" form. A macroscopic flow chart, adaptable to any computer, is included, together with a written description of it, estimates of memory requirements and running time, test cases; and a bibliography.

Needless to say, the editors of a book of this type leave themselves open to criticism on their choice of the numerical techniques which are included, or, more important, which are excluded from it. Thus the single article on matrix eigenvalue problems, devoted to Jacobi's method, could profitably be supplemented by articles on the power method, which is applicable to general matrices, and on the application of eigenvalue techniques to the solution of linear determinantal equations in the form $\det(A - \lambda B) = 0$. Similarly, the section entitled "Miscellaneous Methods" could well have included an article on the ubiquitous curve-fitting problems that occupy so much of the time of scientific computing facilities.

Despite these, and other controversial shortcomings, the book is well worth while, and the first book of its kind to appear. Its appearance makes one wonder why someone has not undertaken something of the sort long ago.

James L. Howland, University of Ottawa

<u>Digital Computers and Nuclear Reactor Calculations</u>, by Ward C. Sangren. Wiley, New York, 1960. 208 + xi pages. $ 8.50.

The author's objectives are to present an introduction to high-speed nuclear-reactor calculations for the nuclear engineer or scientist, and to provide an introduction to high-speed computation for practitioners in any field of engineering or physical science. The attempt to present so much material in so few pages leads to a rather terse style of writing, and results in a rather sketchy treatment of some topics, especially numerical analysis.

The book is divided into two parts. The first part, concerned with digital computers, programming and numerical analysis is intended as a general introduction to these topics. The chapters on computers and programming are adequate to this purpose, but the chapter on numerical analysis is very sketchy, devoting but five pages to matrix calculations and six pages to the numerical solution of partial differential equations. Each of these topics is of fundamental importance in the second part of the book. Readers interested in the topics of this part of the book would be better advised to consult the longer, but better written and more readable treatment by Alt; "Electronic Digital Computers.