programs which, with some omissions, is up-to-date until 1975, except for one program by the author from 1977. In some cases, I have the impression that the author has not personally inspected the papers he lists, but classifies them, incorrectly, according to their titles. Thus, the programs by Gautschi and by Golub and Welsch should be listed under 'Computation of nodes and weights' rather than under 'Gaussian quadrature programs'. Boland's programs entitled 'Product-type formulae' are not cubature programs but quadrature programs while the two references to Welsch which appear in the list of tables, 'Abscissas and weights for Gregory/Romberg quadrature' belong in the list of programs.

I could report on other amusing and not-so-amusing flaws in the book, but I shall conclude with the following evaluation. For specialists and researchers in the field of numerical integration, this book contains some items of interest. However, the nonspecialist who is interested more in the practical aspects of numerical integration is advised to refer to the standard texts, *Methods of Numerical Integration* by Davis and Rabinowitz and *Approximate Calculation of Multiple Integrals* by Stroud.

PHILIP RABINOWITZ

22[2.05].—M. J. D. POWELL, *Approximation Theory and Methods*, Cambridge Univ. Press, New York, 1981, ix + 339 pp., $23\frac{1}{2}$ cm. Price \$57.50 hardcover, \$19.95 paperback.

This book grew out of the material of an undergraduate course in Approximation Theory given by Professor Powell at the University of Cambridge. There are 24 chapters, from 9 to 15 pages in length, and, quoting from the preface, ..."it is possible to speak coherently on each chapter for about an hour...".

A wide range of topics, from classical to current, are covered. The selection of topics agrees with this reviewer; some are treated in more detail like minimax approximation and various topics in spline theory. Here is a list of the chapters: 1. The approximation problem and existence of best approximations. 2. The uniqueness of best approximations. 3. Approximation operators and some approximating functions. 4. Polynomial interpolation. 5. Divided differences. 6. The uniform convergence of polynomial approximations. 7. The theory of minimax approximation. 8. The exchange algorithm. 9. The convergence of the exchange algorithm. 10. Rational approximation by the exchange algorithm. 11. Least squares approximation. 12. Properties of orthogonal polynomials. 13. Approximation to periodic functions. 14. The theory of best L_1 approximation. 15. An example of L_1 approximation and the discrete case. 16. The order of convergence of polynomial approximations. 17. The uniform boundedness theorem. 18. Interpolation by piecewise polynomials. 19. B-splines. 20. Convergence properties of spline approximations. 21. Knot positions and the calculation of spline approximations. 22. The Peano kernel theorem. 23. Natural and perfect splines. 24. Optimal interpolation.

In spite of the topical nature, notation and style are unified throughout the book. A recurrent theme is that of Lebesgue constants. It must not be inferred from the shortness of the chapters that the treatment is fast and loose: It is not. What topics are taken up are exposed in good detail and with rigor. For a lecture course, it ought to be easy to pull out parts, substitute etc. The condensed mathematical style would probably make this book unsuitable for a first self-study book of the subject.

It is remarkable what an ideal student, with previous knowledge of computer programming, could do after reading this book and working its many exercises. Faced with an approximation problem (not involving differential equations or multi-dimensional functions on general domains), he or she could:

(i) Make a rational choice of method.

(ii) Program it, or use canned programs.

(iii) Furnish meaningful error estimates and insight in the properties and expected behavior of the method.

The second point is not stressed, but there is always given just enough algorithmic detail where it matters.

With the time constraints of an (US) undergraduate curriculum, where typically not more than two courses are devoted to Numerical Analysis, it is not likely that a whole course will be given in Approximation Theory. The demand to include Numerical Linear Algebra, numerical quadrature (to a larger extent than in this book) and numerical solution of integral equations, ordinary and partial differential equations, will preclude this. Therefore, this book can be expected to find its (US) audience among graduate students.

In conclusion, I call this a perfect no-nonsense introduction to Approximation Theory for a mathematically mature audience.

LARS B. WAHLBIN

Cornell University
Ithaca, New York 14853

23[2.25].—JET WIMP, *Sequence Transformations and Their Applications*, Mathematics in Science and Engineering, Vol. 154, Academic Press, New York, 1981, xix + 257 pp., $23\frac{1}{2}$ cm. Price $38.50.

It was remarked by Benjamin Disraeli that whenever he wished to learn something of a subject, he wrote a book about it. This principle is widely practiced by writers upon mathematics and computer science; their works are offered less as statements of existing knowledge than as exercises soliciting the appraisal of the informed reader. A summary judgement upon the book under review is that its contents derive more from uncritical reading of recent papers than from profound study.

The scope of the book is very briefly indicated by the following chapter synopses. 1 gives definitions concerning comparison of rates of convergence, and miscellaneous results dealing with some special sequences. 2–4 deal with Toeplitz methods, Richardson extrapolation, special methods using known properties of orthogonal polynomials and other linear methods. 5–8 consider nonlinear algorithms—Aitken's δ^2-process, the ε- and ρ-algorithms—and their connections with the algebraic theory of continued fractions. 9 deals briefly with the acceleration of sequences of vectors and with other nonlinear algorithms. 10, 11 deal with a general theory having roughly the following import: most convergence acceleration algorithms produce numbers which may be represented as components in the solutions of sets of linear