entry which won him the Grand Prix of Mathematics at the Academy in 1906. The work of Stieltjes, typically analytical, could not be interpreted by purely algebraic theory. Did Hermite, friend and admirer of Stieltjes, brutally point this out to Padé? Padé either chose, or was forced, to live in the country, and this cost him the loss of information from, and contacts with, Paris. He certainly carried out continuous correspondence with several mathematicians, and surely with Hermite. The reading of this correspondence could have explained a lot of things, but unfortunately Brezinski could not find it. Finally, Padé, solitary researcher, ended up in a cul de sac. Did he suffer some problem which left him without motivation for research, or did he simply find satisfaction in academic administration? Brezinski does not reply to these questions. As for the scientific work of Padé, it has a magnificent flair of combat, partially lost at first, and won 70 years later. From reading his papers, one can also profit from an interesting lesson on how to avoid scientific dead ends.

JACEK GILEWICZ

Centre National de la Recherche Scientifique
Centre de Physique Théorique
Luminy, Case 907
F-13288 Marseille Cedex 9, France

Université de Toulon
F-83130 La Garde, France

2[65–02, 65F05, 65F10, 65L05, 65N10, 65N30, 65N50].—JOHN NOYE (Editor), *Computational Techniques for Differential Equations*, North-Holland, Amsterdam, 1984, vii + 679 pp., 24 cm. Price $74.50, Dfl. 175.00.

These are expanded versions of tutorial papers presented at the 1981 Conference on Numerical Solutions of Partial Differential Equations held at the University of Melbourne, Australia. The authors and their titles are: JOHN NOYE, "Finite Difference Techniques for Partial Differential Equations" (260 pages), CLIVE FLETCHER, "The Galerkin Method and Burgers' Equation" (121 pages), JOSEF TOMAS, "The Finite Element Method in Engineering Application" (47 pages), LEIGH WARDLE, "An Introduction to the Boundary Element Method" (27 pages), KEN MANN, "Direct Solution and Storage of Large Sparse Linear Systems" (69 pages), LEONARD COLGAN, "Iterative Methods for Solving Large Sparse Systems of Linear Algebraic Equations" (57 pages). In addition, a survey paper by ROBERT MAY on "The Numerical Solution of Ordinary Differential Equations: Initial Value Problems" (94 pages) has been included. The treatment is on a thoroughly practical level, but includes ample reference to theoretical results and to current activities in the field.

W. G.

3[65F15, 65F25, 82–02].—D. G. PETTIFOR & D. L. WEAIRE (Editors), *The Recursion Method and its Applications*, Springer Series in Solid-State Sciences 58, Springer-Verlag, Berlin, 1985, viii + 179 pp., 23½ cm. Price $29.00.

By "Recursion Method" physicists refer to Lanczos-type methods for tridiagonalizing the Hamiltonian operator in some matrix form and for computing its spectrum,

or part of it, and the corresponding eigenstates. This is closely tied up with continued fraction theory, orthogonal polynomials and the moment problem. The book under review contains the invited papers of a conference on the subject, held at Imperial College, London, September 13–14, 1984. Although written largely by physicists, in their own terminology, this collection of essays should be of interest to those who want to learn about current applications of Lanczos-type algorithms in solid-state theory, nuclear theory and lattice gauge theories.

W. G.