Richard Askey has long contended that applying the term "classical" to the "Classical" orthogonal polynomials of Jacobi, Hermite and Laguerre (and sometimes Bessel) results in too much attention (read "characterization theorems") being placed on too small a class of orthogonal polynomials. G. E. Andrews and R. Askey describe the various orthogonal polynomials which they contend should be included in any family called "classical." Their thesis is that the term "classical orthogonal polynomials" should apply to the special and limiting cases of certain ${}_4\varphi_3$ basic hypergeometric polynomials: the Askey-Wilson polynomials (née q-Racah polynomials) and their absolutely continuous analogues. The limiting cases which have ordinary hypergeometric representations are the basis for the classification which Labelle has summarized in his "Tableau d'Askey." Andrews and Askey contend that this is the largest class of orthogonal polynomials that have such nice properties as a Rodrigues type formula of the right form, and they challenge their readers to prove wrong their claim that they now have the "ultimate" extension of the classical orthogonal polynomials. A characterization theorem seems to be called for here.

The final invited address is by W. Gautschi, who discusses some new applications of orthogonal polynomials in Gauss-Christoffel quadrature, spline approximation theory, and summation of series. He also discusses the critical role played by the Askey-Gasper inequality in de Branges' proof of the Bieberbach conjecture. The author's own numerical calculations played an important role in convincing de Branges of the correctness of his approach and led Gautschi to contact Askey (with the resulting spectacular consequences).

The contributed papers are far too numerous to describe individually, but a listing of the topics by which they are grouped will indicate the wide range of subjects discussed: orthogonality concepts, combinatorics and graphs, function spaces, the complex plane, measures, zeros, approximations, special families, numerical analysis, applications, problems. It is perhaps worth mentioning, however, that one paper deals with a special case of the Freud conjecture, but D. S. Lubinsky, H. N. Mhaskar and E. B. Saff have recently announced settling the general case. All of this activity attests to the healthy state of a subject that seemed moribund a scant thirty years ago.

B. C. C.

24[35J60, 65N05, 65N10, 35B25].—PETER A. MARKOWICH, *The Stationary Semiconductor Device Equations*, Computational Microelectronics (S. Selberherr, Editor), Springer-Verlag, Wien and New York, 1986, ix + 193 pp., 25 cm. Price $45.00.

This book is a well-written, eminently readable introduction to the mathematical analysis of the stationary semiconductor device problem.

There are four serious chapters: Chapter 2 describes the source of the problem, various parameter models, geometric assumptions, and boundary conditions currently in use, and the possible scaling of the dependent variables.

Chapter 3 discusses existence, uniqueness, and regularity of the solutions, and has some interesting comments on the continuous dependence of the solution on the problem. The analysis proceeds primarily via maximum principle estimates and compactness arguments. The uniqueness result is confined to conditions very close to thermal equilibrium and is obtained via the implicit function theorem.

Chapter 4 describes the approach to this problem via singular perturbation theory. This is the best chapter in the book, hardly surprising in view of the research interests of the author. There is a very nice theorem showing how the singular perturbation construction approximates the electrostatic potential function associated with a thermal equilibrium solution. Unfortunately, such results have not been obtained for the full system corresponding to nonzero applied voltages. Indeed, the treatment of the current continuity equations is limited essentially to one dimension.

Chapter 5 discusses approximation methods. Unfortunately, the discussion is primarily a derivation of the commonly used methods, not containing convincing convergence proofs. There is a very good discussion, however, of the difficulties occurring when the simplest centered averages are used for the carrier densities in the continuity equations.

This book is a good complement to that of S. Selberherr [1], providing much of the needed detail of the mathematical methods, particularly the discretization methods. I expect that it will be helpful indeed to a considerable number of readers.

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1. S. SELBERHERR, *Analysis and Simulation of Semiconductor Devices*, Springer-Verlag, Vienna and New York, 1984.

25[65-06].— D. F. GRIFFITHS & G. A. WATSON (Editors), *Numerical Analysis*, Pitman Research Notes in Mathematics Series, Vol. 140, Longman Scientific & Technical, copublished in the U.S. by John Wiley, New York, 1986, vi + 262 pp., 24 cm. Price $24.95.

These are the proceedings of the 11th Dundee Biennial Conference on Numerical Analysis held at the University of Dundee June 25–28, 1985. They contain the complete versions of 16 invited lectures, as well as the titles of 80 contributed talks. The range of topics covered is quite broad.

W. G.

26[53-01, 68U05].—J. A. GREGORY (Editor), *The Mathematics of Surfaces*, The Institute of Mathematics and its Applications Conference Series, Vol. 6, Clarendon Press, Oxford, 1986, xi + 282 pp., 24 cm. Price $49.00.

From the Preface: "This book contains the proceedings of the conference 'The Mathematics of Surfaces' organized by the Institute of Mathematics and its Applications and held at the University of Manchester from 17th–19th September, 1984.

The main aim of the conference was to consider mathematical techniques suitable for the description and analysis of surfaces in three dimensions, and to consider the application of such techniques in areas such as 'computer-aided geometric design'.