

scope of the subject, severe restrictions have had to be made: questions of existence and uniqueness are largely ignored; several moving-boundary problems are considered, but only porous flow free-boundary problems are treated in depth; for the most part, only scalar second order elliptic or parabolic equations in two dimensions are studied. Within this self-imposed framework, the author provides an excellent exposition of the problems, their history and formulation, their solution by analytical and numerical methods.

The book alternates between the two types of problem. There are chapters on the formulation of moving-boundary problems, on their analytical solution, and on their numerical solution. Similar chapters on free-boundary problems are interspersed.

Analytical methods for moving-boundary problems are represented by similarity solutions and integral equation formulations, while the solution of free-boundary problems using the hodograph method is treated in considerable detail. All current numerical methods receive attention: front-tracking (including the method of lines due to Meyer); front-fixing (including the isotherm migration method of Crank); the enthalpy method; trial-free-boundaries; and variational inequalities.

Several misprints were noted, none of them serious, but some of which, in formulae, might cause difficulties for readers new to the field. There is an excellent subject index and, as a bonus, an author index. In the list of references, the regrettable custom of not quoting the titles of papers is followed. In parts, the text reads like a lengthy review article with each paragraph devoted to the contributions of a different author, but for the most part the text flows along very smoothly.

In summary, this is a welcome addition to the literature on free and moving boundary problems, the coverage of the latter being particularly good. If supplemented by material on existence and uniqueness theorems, it also deserves serious consideration as a textbook.

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10[65–06, 68–06].—SEYMOUR V. PARTER (Editor), *Large Scale Scientific Computation*, Proceedings of a Conference Conducted by the Mathematics Research Center, The University of Wisconsin, Madison, May 17–19, 1983, Academic Press, Orlando, Fla., 1984, ix + 326 pp., 23½ cm. Price \$26.00.

This volume contains twelve papers ranging from mathematical problems to management issues. Questions addressed include: specialized architectural considerations, efficient use of existing “state-of-the-art” computers, software developments, large-scale projects in diverse disciplines, and mathematical approaches to basic algorithmic and computational problems

L. B. W.

11[41–06].—S. P. SINGH, J. W. H. BURRY & B. WATSON (Editors), *Approximation Theory and Spline Functions*, NATO ASI Series C: Mathematical and Physical Sciences, Vol. 136, Reidel, Dordrecht, Holland, 1984, ix + 485 pp., 24½ cm. Price \$69.50.

These are the proceedings of a NATO Advanced Study Institute on Approximation Theory and Spline Functions held at Memorial University of Newfoundland August 22–September 2, 1983. The 38 papers included cover a wide range of approximation theory and are devoted about equally to univariate and multivariate theory. There are six papers dealing specifically with spline functions and their applications.

W. G.

12[65–06].—DAVID F. GRIFFITHS (Editor), *Numerical Analysis*, Lecture Notes in Math., vol. 1066, Springer-Verlag, Berlin, 1984, ix + 275 pp., 24 cm. Price \$14.00.

This volume contains the texts of 15 invited talks given at the Tenth Dundee Biennial Conference on Numerical Analysis, held June 28–July 1, 1983, at the University of Dundee, Scotland. Topics covered include high-accuracy floating-point algorithms for algebraic processes, spline approximation, numerical methods for optimization problems, bifurcation phenomena, stiff ordinary differential equations, partial differential equations and weakly singular integral equations.

W. G.

13[68–06, 68Q40].—JOHN FITCH (Editor), *EUROSAM 84*, Lecture Notes in Comput. Sci., vol. 174, Springer-Verlag, Berlin, 1984, xi + 396 pp., 24 cm. Price \$18.00.

These are the proceedings of an International Symposium on Symbolic and Algebraic Computation, held in Cambridge, England, July 9–11, 1984. The 37 papers are grouped by topic under the headings: Differential Equations, Applications, Simplification and Algorithm Implementation, Algebraic Number Computation, Languages for Symbolic Computing, Groebner Basis Algorithms, Computational Group Theory, Factorization and GCD Computations, Number Theory Algorithms, Integration, Solution of Equations. The large number of categories attests to the great diversity of current potential, and actual, uses of symbolic computation. Specific applications discussed concern nonlinear control theory, quartic equations and Riemann tensor classification, the Dirichlet problem for Laplace's equation, code generation for finite element analysis, Padé approximation, and automatic control of error accumulation.

W. G.

14[65–06, 65F10, 65F50, 65N30, 65N35, 65N50, 68N99].—GARRETT BIRKHOFF & ARTHUR SCHOENSTADT (Editors), *Elliptic Problem Solvers II*, Academic Press, Orlando, Fla., 1984, xiii + 573 pp., 23½ cm. Price \$39.00.

These are the proceedings of the Elliptic Problem Solvers Conference held at the Naval Postgraduate School in Monterey, California, January 10–12, 1983. The 38 papers are grouped here, as they were at the conference, roughly by topic under the headings: I. Software Packages, II. Vector and Parallel Processing, III. Iterative Equation Solving, IV. Finite Element and Multigrid Methods, V. Advances in