R. H. GALLAGHER, O. C. ZIENKIEWICZ, J. T. ODEN, M. MORANDI CECCHI and C. TAYLOR (Editors), **Finite Elements in Fluids,** Vol. 3 (1978) John Wiley, New York. pp. 396. £17.50.

THIS BOOK contains revised and updated versions of the invited lectures and selected papers presented at the Second International Conference on Finite Elements in Flow Problems held in 1976 at St Margherita Ligure in Italy. There are twenty-one chapters in the book; some are review articles, while others deal with special areas of application. The book is a valuable source of information about the finite element methodology and provides a comprehensive picture of the state of the art.

The convection problem is addressed in the first chapter via the 'upwind' finite elements. Chapter 6 deals with free and forced convection, where some impressive examples of application can be found. Convective dispersion is treated in Chapter 17. A general calculation method for steady and unsteady viscous flows is presented in Chapter 2, where a large variety of complex problem solutions are reported. Four chapters (9–12) deal with transonic flows. Novel techniques are presented in many chapters. For example, the penalty function method (Chapter 3), the least squares approach (Chapter 5), the mixed-hybrid elements (Chapter 7), and non-conventional elements (Chapter 8) are shown to hold promise for fluid flow calculation. The book includes chapters on individual applications such as circulation in lakes, ground water flow, flow in porous media and plasma physics. The final chapter of the book, which will perhaps be most useful to the reader, surveys finite element applications in fluid mechanics. This chapter gives 218 references to literature and summarizes recent novel developments.

The book represents an important addition to the finite element literature.

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