BOOK REVIEWS

C. A. BREBBIA and E. ALACRON (Editors), **Applied Numerical Modelling** (2 vols). Pentech (1978).

THE 1st International Conference on the subject mentioned in the title was held at the University of Southampton from July 11th to 15th, 1977. Because of its overwhelming success the second conference followed one year later. It was held at the Madrid Polytechnical University in Spain, in September 1978. Neither one of the two conferences concentrated on a particular subject. Instead the editors of the two volume edition, C. A. Brebbia and E. Alacron, were concerned to bring together researchers applying numerical techniques in modelling a wide variety of practical problems. At the first conference the following topics were discussed: Regional Models, Hydraulic Systems, Environmental Systems, Fluid Flow Simulation, Structural Systems, Thermal Processes, and Numerical Techniques. All together 56 papers were presented. At the second conference about the same topics were covered: Global and Regional Models, Fluid Flow Simulation, Solid Mechanics and Structural Systems, Bio-

Medical Systems, and Numerical Techniques and Computational Problems. As stated in the preface of the second Volume, the number of participants was larger at the second conference. More than twenty countries sent their representatives.

At this conference an International Society for Computational Methods in Engineering was founded. It is dedicated to promoting Numerical Modelling and Computational Methods, in organizing conferences and seminars and in fostering inter-disciplinary links.

Certainly, the two conferences give an overall view of applications in the various parts of mechanics and related subjects. It is the method of approach which ties together the solutions to the problems varying in such a variety. The success of the second conference proves this philosophy right. On a broad scale, the conferences may in the future serve a good purpose if the interaction between the various branches of mechanics can be shown to be as stimulating as at the first two conferences.

E. KRAUSE

C. TAYLOR, K. MORGAN and C. A. BREBBIA (Editors), **Numerical Methods in Laminar and Turbulent Flows,** Pentech Press (1978).

CONFERENCE proceedings are always difficult to review. They are usually rather long (this set has no less than 1006 pages) and they tend to lack the unifying theme which makes it possible to assess a single-author book without reading all of it. The reviewer is usually reduced to listing the contents and to commenting on papers which have caught his eye.

The nine sections are devoted to

1. General viscous flow
2. Turbulent flow
3. Boundary layer analysis
4. Flows with heat transfer
5. Free surface flows and lubrication
6. Turbomachinery and airfoil flow
7. Two phase flow and meteorology
8. Mass transport and convection
9. Numerical and mathematical concepts

and even with this many, there seem to have been classification problems: for instance, there is a two phase paper in Section 4, and there are papers on cavity flows in Sections 2 and 9.

The papers in the first and longest section are devoted to numerical methods. Gartling and Roache compare the

efficiencies of finite element and finite difference methods for the Navier-Stokes equations, and there is an intriguing paper by Di Carlo, Piva and Gui on the computation of flows in multiply connected geometry by mapping methods.

In later sections there are a number of papers which do not really belong in a compendium on numerical methods. Birch's paper is (as its title implies) on turbulent length scales. It contains a short section on numerical results but apparently it does not allude to numerical methods. In contrast the next paper (Schamber and Larock), although mostly devoted to turbulence modelling, does have useful things to say about the solution of the resulting equations. However, the result (that algebraic modelling is rather good even in the highly asymmetric geometry of the Hanjalic–Launder experiment) is more important than the method. Gosman and Rapley's formulation of $k - \varepsilon$ equation in orthogonal curvilinear coordinates is a substantial advance, since it makes the method (fairly) readily available for ducts with awkward cross-sections.

Like all conference proceedings, this book is a mixture of the important and the unimportant. It is also a mixture of the relevant (to the stated theme) and the irrelevant, and some of the irrelevant papers are important in their own right. It is no doubt a must for libraries, but the field is too wide to appeal to most individuals.

D. C. LESLIE