1. *Developments in Boundary Element Methods*, Vol. 1, Edited by P. K. Banerjee and R. Butterfield, Elsevier, London, 1979.
2. *Developments in Boundary Element Methods*, Vol. 2, Edited by P. K. Banerjee and R. P. Shaw, Elsevier, London, 1982.
3. *Developments in Boundary Element Methods*, Vol. 3, Edited by P. K. Banerjee and S. Mukherjee, Elsevier, London, 1984.
4. *Developments in Boundary Element Methods*, Vol. 4, Edited by P. K. Banerjee and J. O. Watson, Elsevier, London, 1986.
5. P. K. BANERJEE & R. BUTTERFIELD, *Boundary Element Methods in Engineering Science*, McGraw-Hill, London, 1981.
6. A. HARTEN & S. EFRONY, "A partition technique for the solution of potential flow problems by integral equation methods," *J. Comput. Phys.*, v. 27, 1978, pp. 71–87.

13[76–02, 76–08].—EARLL M. MURMAN & SAUL S. ABARBANEL (Editors), *Progress and Supercomputing in Computational Fluid Dynamics*, Progress in Scientific Computing, Vol. 6, Birkhäuser, Boston, 1985, ix + 403 pp., 23 cm. Price $44.95.

This volume constitutes the proceedings of the U.S.–Israel Workshop entitled "The Impact of Supercomputers on the Next Decade of Computational Fluid Dynamics" held in Jerusalem, Israel, during the week of December 16, 1984. From the editors' preface the intent was to "... present to the community a sort of 'State of the CFD-Nation' report consisting of two elements: technical papers by leading researchers and an attempt to assess where the field is going".

Taken as a whole, the papers provide an excellent overview of the present status of computational fluid dynamics with particular emphasis on problems relevant to aerodynamics. The Euler and compressible and incompressible Navier-Stokes equations are considered. A variety of numerical algorithms and their vectorization properties are discussed, including explicit and implicit methods, multigrid and spectral methods. Finally, the important topics of prediction of transition and turbulence are presented. Reflecting the present emphasis in the community, most of the papers utilize finite difference approximations rather than finite elements.

One paper surveys the present status of supercomputer hardware and projects capabilities into the immediate future. Unfortunately, there is not a companion paper to speculate on the kind of software systems that the new supercomputers will require in order to be effective for computational fluid dynamics, but many authors did comment from their own perspective on what they considered necessary and desirable. In addition, these issues were discussed during panel sessions, and a summary of those discussions is given in the introductory paper by the editors.

With the expected explosive growth in raw computational power, the participants look forward to an exciting decade of discovery in computational fluid dynamics. However, the following statement from the editors' introduction indicates there is a clear understanding that such power alone is not sufficient: "It is important to understand that the powerful new supercomputers will only yield useful results if the mathematical and numerical analysis formulation is carefully done."

There follows a list of papers and authors included in the volume:

Current Status of Supercomputers and What is Yet to Come
Sidney Fernbach

Experience with a Personal Size Supercomputer—Implications for Algorithm Development
W. T. Thompkins

Remarks on the Development of a Multiblock Three-Dimensional Euler Code for Out of Core and Multiprocessor Calculations
Antony Jameson, Stefan Leicher and Jef Dawson

Developments in the Simulation of Compressible Inviscid and Viscous Flow on Supercomputers
Joseph L. Steger and Peter G. Buning

High Resolution Solutions of the Euler Equations for Vortex Flows
Earll M. Murman, Arthur Rizzi and Kenneth G. Powell

An Efficient Iteration Strategy for the Solution of the Euler Equations
Robert W. Walters and Douglas L. Dwoyer

Numerical Methods for the Navier-Stokes Equations
Robert W. McCormack

Algorithms for the Euler and Navier-Stokes Equations for Supercomputing
Eli Turkel

Viscous Flow Simulation by Finite Element Methods and Related Numerical Techniques
R. Glowinski

Marching Iterative Methods for the Parabolized and Thin Layer Navier-Stokes Equations
Moshe Israeli

Multigrid Solutions to Quasi-Elliptic Schemes
Achi Brandt and Shlomo Ta'asan

Secondary Instability of Free Shear Flows
Marc E. Brachet, Ralph W. Metcalfe, Steven A. Orszag and James J. Riley

Turbulent Flow Simulation—Future Needs
Joel H. Ferziger

Numerical Calculation of the Reynolds Stress and Turbulent Heat Fluxes
Micha Wolfshtein

Numerical Investigation of Analyticity Properties of Hydrodynamic Equations using Spectral Methods
P. L. Sulem

Order and Disorder in the Kupamoto-Sivashinsky Equation
Daniel Michelson

Information Content in Spectral Calculations
Saul Abarbanel and David Gottlieb

Recovering Pointwise Values of Discontinuous Data within Spectral Accuracy
David Gottlieb and Eitan Tadmor

Numerical Problems Connected with Weather Prediction
C. Browning and Heinz-Otto Kreiss

Order of Dissipation Near Rarefaction Centers
Michael Sever

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