

## Book reviews

**Annual review of fluid mechanics, Volume 8**, edited by M. van Dyke, W. G. Vincenti and J. V. Wehausen. Annual Reviews Inc., Palo Alto, California, USA, 1976, 418 pp., price \$ 17.50.

The eighth volume of this valuable series contains the following contributions:

Hydraulic's latest golden age, by H. Rouse,  
Useful non-Newtonian models, by R. B. Bird,  
Optical effects in flow, by A. Peterlin,  
The stability of time-periodic flows, by S. H. Davis,  
Aerodynamics of buildings, by J. E. Cermak,  
Mixing and dispersion in estuaries, by H. B. Fischer,  
Homogeneous turbulent mixing with chemical reaction, by J. C. Hill,  
Instability in non-Newtonian flow, by J. R. A. Pearson,  
Computation of turbulent flows, by W. C. Reynolds,  
Hot-wire anemometry, by G. Comte-Bellot,  
Multiphase fluid flow through porous media, by R. A. Wooding and H. J. Morel-Seytoux,  
Currents in submarine canyons: an air-see-land interaction, by D. L. Inman, C. E. Nordstrom and R. E. Flick,  
Boundary-layer stability and transition, by E. Reshotko,  
Turbulent flows involving chemical reactions, by P. A. Libby and F. A. Williams,  
A blunt body in a supersonic stream, by V. V. Rusanov.

H. W. Hoogstraten

P. M. Prenter: **Splines and Variational Methods**, John Wiley and Sons, New York, 1975, 324 pp., price £ 10.75.

This book forms a bridge between the engineer's and the mathematician's point of view on finite element methods, collocation methods and approximation by splines. It lays a sound mathematical platform by aid of functional analysis for explaining the various methods but on the other hand, the author has full understanding for the need of solving practical problems. In this way she has accomplished an extremely useful and almost unique contribution to the literature in this field.

The first half of the book deals with the concept of approximation and introduces Lagrangian and Hermitian interpolation as well as interpolation by aid of splines. A chapter on approximation of functions of two and three variables, which deals with isoparametric transformations, is included.

The second half of the book begins with a chapter on variational methods, which are defined

as methods by which a solution to an equation is found from a finite-dimensional subspace. This includes a.o. least squares methods, finite element methods and collocation methods. There follows a chapter on finite element methods dealing with the general theory and giving applications to the Dirichlet, the Neumann and the Robin problem. A last section of this chapter treats the more general Galerkin method.

The last chapter is devoted to collocation methods. Special attention is given to the choice of the collocation points.

Throughout the whole book error estimates are given for the methods used.

In conclusion, the book is to be recommended to those interested in the subjects mentioned above. It may be said as a minor criticism that the book contains many printing errors, but this should stimulate careful reading.

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