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BOOK REVIEWS

Prediction of Turbulent Reacting Flows in Practical Systems

T. Morel (Ed)

This slim volume contains three papers presented at the ASME's Fluid Engineering Division meeting at Boulder, Colorado, in June 1981. It follows ASME's recent trend of binding together collections of conference papers rather than issuing each manuscript as a separate preprint. This approach has a number of economic and logistic advantages for the authors, the readers and the Society itself. The papers, each in the nature of a survey article, address three overlapping aspects of the problem of calculating turbulent reacting flows of practical interest.

The contribution by Westbrook and Dryer, an entirely discursive article, considers chemical-kinetic aspects of the problem. The article by Jones and Whitelaw considers a wide range of topics at rather uneven depths: the section on numerical solution methods is fairly superficial, while the discussion on turbulence and the way it impinges on the problem of chemical reaction is much more authoritative. There would, one might suppose, be a strong interlinkage between these first two articles. One gets the impression, however, from the Jones–Whitelaw contribution that the questions of complex chemistry addressed by the Westbrook–Dryer paper are of only academic significance, while for their part, the latter authors discuss chemical reaction models in isolation from the questions of turbulence. This polarity of outlook, while reflecting the different background disciplines of the research workers concerned, is one that needs to be neutralised if many of the important problems of turbulent combustion are to be solved.

The final article by Harsha focuses on applications. His examples range from simple jets to recirculating flows and practical combustors. Through no fault of the reviewer, such surveys tend to produce a too favourable impression of the status of calculation methods, for his source material (ie the technical literature) is biased towards success: editors and authors share a disinclination to publish papers showing terrible agreement between experiments and computation. Overcoming this aversion to failure would be a further important step towards maturity in the understanding of turbulent reacting flows.

Collectively the articles give a timely, if ephemeral, snapshot of the current (or, rather, 1980) state of research in turbulent combustion. The volume is inexpensive and should be bought by anyone currently wishing to get more deeply into the subject. More than 180 papers are cited in the reviews and this alone is worth the cover price. It makes less sense as a library purchase, as the useful half life of the volume is probably not greater than two years.

B E Launder
University of Manchester
Institute of Science and Technology, UK

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An Introduction to Thermodynamics

J. P. Todd and H. B. Ellis

The authors claim their material to be aimed primarily at Engineering Technologists in training. The topics are clearly presented and aimed at a level no higher than a first year undergraduate course in Engineering. The level of ability to which the book is suited is intermediate; it is certainly not for the academic, but not strictly for the applied engineer, even if there are many helpful, practical illustrations. The questions at the end of each chapter and selected answers will be appreciated by the student reader. Judged alongside a standard undergraduate text such as Rogers and Mayhew, this work covers a wide range of topics but in considerably less depth.