Int. J. Heat Mass Transfer. Vol. 12, p. 981. Pergamon Press 1969. Printed in Great Britain

BOOK REVIEW

Proceedings of the 1968 Heat Transfer and Fluid Mechanics Institute: (Edited by A. F. EMERY and C. A. DEPEW), Stanford University Press, Stanford, California, 1968, 272 pp. £5 19*s*. 0*d*.

THIS book could equally well be called "Journal of Fluid Mechanics and Heat Transfer, vol. 21", and this is both praise and condemnation. It is praise because all the papers would have merited publication in one of the reputable heat transfer or fluid mechanics journals, although one or two papers might have been demoted to Brief Communications or accepted subject to more checking of the experimental results. It is condemnation because nothing remains of the flavour of a meeting: no discussions are printed, and the invited lectures are given only as summaries which add little to what one could infer from the authors and subjects (Kovasznay on Turbulent Shear Flow, Carrier on Tsunami Propagation, and Gentry on Developments in Numerical Hydrodynamics at Los Alamos). It is probably too much to ask invited lecturers to write full-blown review articles, but they could surely be asked to edit tape transcripts of what they actually said. This would be difficult if the presentation consisted largely of photographs or movies, but in general what a lecturer delivers verbally before an audience of experts ought to be of high enough standard to be *read* by lesser mortals, and it would not matter too much if the more indiscreet remarks were kept for the coffee breaks which, as everybody knows, are where all the useful business of a meeting is transacted. Exactly the same remarks apply to discussions of lectures.

Therefore the prospective buyer must regard this book simply as a collection of research papers covering a rather wider field than one would find in any one journal—which also means a wider field than any one man's current research interests. I think a student would be inspired by this demonstration of the breadth of our subject, but he would have to be a good student to understand every paper, even superficially. Seven of the 16 papers deal with "turbulent shear flow", and six with "numerical hydrodynamics". The only papers connected with the third invited lecture on tidal waves are two on sloshing in rocket fuel tanks under low gravity: since one of the latter (by Dodge and Garza of Southwest Research Institute) presents measurements done in tanks of about an inch diameter to get the right values of Bond number, $\rho g(\text{radius})^2/(\text{surface tension})$, the connection is amusing rather than instructive. There are two papers on non-turbulent heat transfer, one a theoretical model of nucleate boiling (Dzakowic of Westinghouse and Frost of University of Tennessee) and the other a numerical study of fins with convective and radiative heat transfer by Frost and Eraslan. There is a paper on measurements in a liquid sodium tunnel by Maxworthy (Southern California) which makes it all sound very easy and therefore represents a considerable achievement.

Spalding's test for a volume of proceedings is "which papers will be read in five years?" Probably more of the numerical papers than of the others: the work by Skoglund, Cole (J. K.) and Staiano, done at the University of New Mexico, on numerical solutions of laminar shock-boundary layer interaction is particularly impressive although perhaps not yet in a state for everyday use ($2\frac{1}{2}$ hr runs on a CDC 6600 to do a field solution of the Lax-Wendroff difference equations, which occupy four pages of the book). I would like to think that the Dodge–Garza paper, right at the other end of the scale, would survive as an elegant use of dimensional analysis to simplify an experiment. Nagel's deduction of a 0·4 power law for the "unit Reynolds number" effect on transition in supersonic tunnels, based on the properties of the tunnel wall boundary layers which radiate sound waves on to the model, is equally elegant and equally useful.

To sum up, this book is as good and broad a review of current research topics as one could assemble from journals at the same total purchase price. Most libraries, but few individuals, will buy it.

P. BRADSHAW

Aerodynamics Division,
National Physical Laboratory,
Teddington, Middlesex
England