Int. J. Heat Mass Transfer. Vol. 15, p. 567. Pergamon Press 1972. Printed in Great Britain

BOOK REVIEW

G. F. HEWITT and N. S. HALL TAYLOR, **Annular Two-Phase Flow.** Pergamon Press, $20, 310 pp.

THE AUTHORS' purpose is "to provide an authoritative source of information on annular two-phase gas liquid flow". They have succeeded. The book is by far the most thorough and comprehensive treatment of this particular topic which has yet appeared and it is likely to retain this distinction for some time. I am impressed by the authors' temerity in writing an entire book devoted to a sub-division of a branch of fluid mechanics which is itself just emerging as a mature science. Their justification lies in the importance of the numerous practical applications.

The book is aimed mostly at the researcher or graduate student who is active in this field, though there are sections which will appeal to undergraduates, designers, or even curious laymen. The authors often make painstaking efforts to mention all significant work which has been performed and to trace the historical development of methods of analysis and experimentation. Almost every chapter contains several paragraphs of "literature survey". This makes it difficult for a designer to extract a useful answer quickly. The long qualitative discussions of experimental observations and tentative physical explanations give a fair appraisal of the present state-of-the-art and will provide a mine of ideas for researchers. For teaching purposes, however, more distillation of the information and worked examples showing its utility would be welcome.

The book opens with a description of the qualitative aspects of gas–liquid flow. The various flow regimes and simple criteria for their occurrence are presented. The basic one-dimensional hydrodynamic theory is clearly developed and most current methods of analysis are reported. At this stage the neophyte reader might be glad of more advice on the practical use of the results and how to choose between alternative methods when he is faced with a practical problem. He may also be rather disconcerted to find that the presentation of many of the theories is concluded by discussions of their limitations and the need for future work.

An interesting discussion of the mathematical approaches to the problem of interfacial waves is given, though the connection with the experimental results presented later in the chapter is tenuous.

The chapters on stability against de-wetting and droplet entrainment include some rather tentative theories. In some cases the predictions are shown to disagree with the data by a large factor or to be incompatible with alternative equations. The authors are aware of this and provide qualitative judgements to guide the reader in achieving a sense of proportion.

The chapters on heat transfer provide a lucid and uncluttered introduction to the subject. The authors have been selective, mostly quoting established theories and correlations. Calculation steps for problem solving are clearly indicated and results are given as straightforward equations or graphs.

The chapter on Burnout reverts to the discursive style, listing evidence in support of the various postulates. It is valuable as a very up-to-date record of the authors' present view of the field, reading in places like a progress report of the latest work at Harwell. Empirical correlations are presented for the case of boiling water.

An excellent survey and critical discussion of experimental techniques is included.

The book is recommended for academic and industrial libraries serving the fields of chemical, civil, heat transfer and power engineering. Active researchers and interested graduate students would do well to acquire a copy for its enduring encyclopaedic qualities.

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