

## BOOK REVIEWS

### **Principles and Practice of Laser-Doppler Anemometry,**

F. DURST, A. MELLING and J. H. WHITELAW. Academic Press, London (1976). Price £12.00; \$29.73.

THE APPLICATION of laser-Doppler systems to the measurement of fluid velocity has become widespread in the last few years. Although a number of review articles on such measurements have appeared, there are few that deal in much depth with subtleties in design and application including optical components, signal processing and characteristics of the scattering media. The present volume, in striving for such coverage, provides an introduction to much of the literature in the field of laser-Doppler anemometry including many of the applications in which such techniques have been used. Though not the definitive study of laser-Doppler anemometry, the book does meet the stated goals of the authors, particularly in providing material on almost all phases of importance in such systems.

The format of the book does not particularly appeal to the taste of the present reviewer. Each subsection contains a "figure" plus written discussion and amplification of the figure. This sometimes may not be rigorous enough for the well-informed researcher in the field nor perhaps tutorial enough for the beginner. It could, no doubt, be used along with the oral presentation which an instructor might make. This type of presentation (well known by now as an Imperial College technique) may serve excellently as part of a course. It may, however, leave something to be desired in a reference work which is left to stand on its own merits.

The advantages of the text outweigh the disadvantages; it does present a very comprehensive review of laser-Doppler anemometry which should appeal to many appetites. The text provides numerous equations which are in convenient form as well as a number of references covering subjects of importance in laser-Doppler measurements. It should prove of value both to the novice and to the experienced worker seeking quick insight into some of the nuances in laser-Doppler anemometry.

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### **Alternative Energy Sources, Edited by JAMES P. HARTNETT.** Academic Press, New York (1976).

THIS book reports the proceedings of a conference sponsored by the International Centre of Heat and Mass Transfer in the autumn of 1975. The title is misleading because anyone coming to this book supposing it to contain a critical account of the various technologies generally accepted as being alternatives to conventional energy supply systems will find to their surprise two chapters devoted to coal, only a brief mention of wind power, half a page on tidal wave power, chapters on solar energy and geothermal energy but nothing on the many biochemical routes to methane, methanol and like. In other words this is not a balanced book it is a collection of conference papers. That is not to say that the papers themselves are not interesting or noteworthy.

The first three chapters deal very briefly with energy resources, future projections of energy demand and point to an impending "energy gap" which will be difficult to fill. Most of these ideas have been published before in many other places and the treatment is so condensed, fifty seven pages in all, that nothing very new or noteworthy emerges. The next two chapters on coal technology deal with fluidized beds and gasification and although out of place in a book on "Alternative Energy Sources"—alternative to what?, we have been burning coal for thousands of years and it provides much more of the world's current energy demand than nuclear—these chapters are nevertheless useful up-to-date surveys. Next come three chapters on solar energy dealing with solar-thermal collectors and their application, the rather specialised 1600 kW solar furnace at Odeillo in France and a third chapter also dealing with solar energy collection and its application to electricity generation. Finally two chapters discuss geothermal processes, the first examines heat and mass transfer in the earth in a general way and the second deals specifically with geothermal power utilisation. The chapters, or rather papers, are individually of a high standard and there are many fascinating nuggets of information to be found amongst them. For example the cost effectiveness of a variety of solar collector types is presented in considerable detail as is the solubility of quartz in water as a function of temperature together with a lengthy table of the permeability and porosity of sedimentary rocks. If this work had been presented as the collected papers given at a conference I would not have quibbled about it but it cannot by any reasonable stretch of the imagination be accurately described as a book on "Alternative Energy Sources".

IAN FELLS

### **The Flow of Heat, K. C. CORNWELL.** Van Nostrand-Rheinhold, Wokingham (1977). Price £11.50 hardbound; £5.00 paperback.

"THE FLOW of Heat", which is a small attractive volume consisting of 245 pages, has been written for the student at diploma or degree course level, and for the layman who requires a peripheral knowledge of heat transfer. In order to meet the different needs of the two classes of reader, the text is divided into two parts. Part I is of interest to both groups, while Part II is designed for the student who continues with the subject to "finals" level and also for the layman who requires further knowledge of particular topics.

Part I, entitled "The Fundamentals of Heat Flow", consists of five chapters dealing with heat flow through a vacuum, heat flow through matter, heat flow due to the movement of matter, heat flow from human beings, and finally, heat flow in exchangers. The author deals competently with the basic ideas and fundamental physical concepts. I found his account of energy transfer in matter most satisfactory and well presented, and the chapter dealing with heat flow from human beings is a well worthwhile addition to this type of text. In the second part, the author deals in more detail with radiation, conduction and forced convection analyses (Chapters 6, 7 and 8 respectively). Chapter 9 is devoted to heat flow by other mechanisms and includes brief descriptions of the heat pipe and the fluidized bed. The final chapter is headed

"Summaries, Symbols, Units and Problems, and brings together the majority of the important relationships encountered in earlier sections of the book for the purpose of reference. There is a sufficient number of typical problems (and their answers) in S.I. units. Following the final chapter, there is a list of conversion factors, a very short table of approximate material properties, a list of references, and an index.

On the whole, the publication is good: the only criticism I have to make in this connection concerns the figures, many of which I find too small, and in need of close examination. Despite this, *The Flow of Heat* is a useful book, and I am pleased to recommend it for use by students and others working in this field of study.

H. BARROW