BOOK REVIEWS

Handbook of Heat and Mass Transfer

Volume I: Heat Transfer Operations, 1,518 pp.

Volume II: Mass Transfer and Reactor Design, 1,456 pp.

Encyclopedia of Fluid Mechanics

Volume I: Flow Phenomena and Measurement, 1,521 pp.

Volume II: Dynamics of Single-Fluid Flows and Mixing, 1,525 pp.

All edited by Nicholas P. Cheremisinoff, Gulf Publishing Co., Houston, 1986. $165 per volume.

These two volumes on heat and mass transfer and two (of an announced six) volumes on fluid mechanics are companion publications, despite the fact that one is called a "handbook" and the other an "encyclopedia." I expect encyclopedia articles to be accessible to the non-expert, and to introduce the reader to the subject; failing this expectation, the coverage should at least be complete (*encyclopedic*). I expect handbook articles to contain specific results, and to enable cursory reading until the desired material is found. These volumes are neither handbook nor encyclopedia, though some individual chapters in both sets contain features of one or the other. (The first part of the article on "Scaling in Laminar and Turbulent Heat and Mass Transfer" by *Journal* Consulting Editor Eli Ruckenstein, in Volume I of the Handbook of Heat and Mass Transfer, is a nice example of what I expect in an encyclopedia article. The Encyclopedia of Polymer Science and Engineering, the first six volumes of which have been received for review, is an excellent example of a technical encyclopedia.)

Each volume contains about 40 chapters, covering a wide range of subjects, from basic derivations of continuum equations to equipment design. The level is very uneven, and there appears to have been no attempt at serious editing in either series. Volume I of Fluid Mechanics, for example, contains two consecutive chapters on diffusion in liquids, each of which has a table of diffusivities in water at 25°C. The same volume contains chapters on flow instabilities that are clearly inaccessible to readers without a background in stability theory, together with a handbook-style chapter on industrial flow-measuring devices. The chapter entitled "Rheological Properties of Thermoplastics" hardly deals with the subject topic at all; rather, it quickly introduces the reader to an unpublished tensorial description of a fluid with microstructure, but never offers any discussion of conventional rheological measurements.

When looking at more than 160 chapters, I expected a great deal of variation, and indeed I found it. The authorship is advertised by the publisher as "international," and it is. There are many contributions from Japan, for example. The advantage of this wide distribution of authorship is that one sometimes finds references to work by non-U.S. authors that would normally not be conveniently obtained. I am struck, however, by the large number of authors who are not among the preeminent figures in the areas in which they are writing. One consequence of this fact is that far too many chapters skim over the main concepts, and emphasize instead the secondary contributions made by the authors. The chapters are mostly out of date. References past 1982 are almost nonexistent, except to publications by the authors of the chapters (frequently noted as "to be published").

The coverage in each of these volumes is so uneven that I cannot imagine that any individual would want to own a personal copy. Libraries will probably buy them, at least in part because of the descriptive brochures that are loaded with typical publisher overstatement. (The advertising appears to be the publisher's major contribution. Textual editing is disgraceful. I would expect the publisher at least to hire copy editors capable of finding incomplete sentences. The review copy of Volume II of Heat and Mass Transfer also arrived with about 20 pages that had not been printed.) Many of the chapters cover material that is readily available in standard texts and monographs, sometimes by the same authors. Most chapters are best categorized as reviews, and the average quality of the writing is not up to that in more conventional sources of reviews such as Annual Review of Fluid Mechanics (at a much lower price per page). There seems to me to be no valid reason for the production of volumes of this type, and of these volumes in particular. They represent enormous investments of time on the parts of the authors, and their purchase will make a noticeable dent in the discretionary budgets of many libraries. The packaging is such that very little of any volume is likely to be of interest to one individual, and I expect the total usage to be extremely limited. Those who can read the many advanced articles are probably familiar with the material, or can easily find it elsewhere. The introductory articles are rarely detailed enough for the beginner (and there are even occasional errors), so the beginner must still use textbooks. The handbook function is largely absent.

Several additional volumes of Encyclopedia of Fluid Mechanics have arrived for review since this text was first drafted. These volumes are more focused, and they will be reviewed individually in future issues.

Morton M. Denn
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Encylcopedia of Fluid Mechanics

Volume III: Gas-liquid flows, 1,535 pp.

This is the third of six volumes to be published in this series. The publisher's release accompanying the review copy, contained this statement: "Previously the available body of research and existing literature on this class (*sic* gas-liquid flows) was scattered and unorganized. Now, this volume pulls together state of the art design procedures and vital theory into a timely useable resource."

This 49 chapter volume comes nowhere close to meeting this claim. Several important areas of two phase flow theory and design are not addressed at all. No-