BOOK REVIEWS

Thesaurus of scientific, technical, and engineering terms
Hemisphere Publishing Corp. 1988, 1216 pp.

A first rule of bibliography should require all books to be signed. We are told that the *Thesaurus of Scientific, Technical, and Engineering Terms* was written by NASA and DOD. But NASA and DOD are not people, and they cannot write books. Those employees of NASA and DOD who assembled this work have hidden their names from view. Responsibility had been quite completely abjured by all involved. Yet respectable compendia of this sort, always list editors, assistants, and the authors of specific articles.

No book of words is ever complete, but I really puzzle over what I find in this one. *Indiana* and *Tunisia* are included, but *caloric* and *phlogiston* are not. One would think that recently obsolete terms of such major importance would rank high in the list. *Calves* is given in the sense of being Elsie's offspring, but not as the manifestation of *gastrocnemius* muscles in the leg.

We are told that *enthalpy* is a word related to *entropy* (How?), but nothing is said of *disorder* or *time's arrow*. Under *equilibrium* we read that *stability* is a related idea. I find that scary. Without explanation it encourages the kind of error that substitutes *nonequilibrium* for *unstable*. The popular misuse that makes a noun out of the adjective, *schematic*, is perpetuated without comment, although the *only* synonym offered is *circuit diagram*.

One might pick any thesaurus apart this way. But in this case, I run into some such problem almost every time I look up a word. This work would be more useful if – like *Samuel Johnson's Dictionary* – it flagrantly presented one man's prejudice. Then, at least, you could use it within a pattern of disagreement. Then the book would be *something* rather than a cipher.

The Foreword suggests that the work is intended for computer manipulation of keywords. Perhaps that would explain the lack of any of the value judgments that are so gracefully expressed in my copy of *Roget's Thesaurus* (Jay Luzzatto and Loy Moreheads, eds.) That lack does not give me great confidence in computer searches.

What we have here is the fruit of an enormous labor, not of love, but of salaried employees. I look at it and see taxpayer's dollars – lots of 'em. In the end I cannot imagine ever reaching to take this book from the shelf. In the end, the weaknesses are all traceable to the lack of personal responsibility.

J. H. Lienhard

Innovation in process energy utilization
edited by A. Ross
Hemisphere Publishing, $9.50 (U.S. and Canada), 445 pp.

This book is the proceedings of a three-day symposium organized by The Institution of Chemical Engineers (South Western Branch) and The Institute of Energy (South Wales and West of England Section) held at the University of Bath in September 1987. With the common thread of "process energy saving" being what ties these papers together, one can imagine that there might be papers on a diverse set of topics. Such is clearly the case. The Chairman of the Organizing Committee for the conference states in the Foreword of the book the hope that successful developments in one industry may be applied to other industries. Whether or not this will be accomplished with this text is difficult to estimate. However, the number of industries represented in the papers is very large (breweries to palm oil mills), as is the breadth of topics (fuel cells to fluidized beds).

Many papers are related to the chemical process industry. Most deal with actual equipment (e.g., "Performance of a 600kw Pump-Around Heat Recovery System on Humid Pneumatic Conveyor Exhausts"), but a few are devoted to new theoretical and/or more generally applicable developments (e.g., "A New Approach to Distillation Sequence Synthesis"). A very small number of papers may be of value only to workers in a geographical region in, or around, the UK (e.g., "Funding of Innovative Projects—Tapping Resources in the UK and Europe"). Many of the papers not not long nor are they too much into theoretical development.

The book should be examined by those engineers concerned with industrial energy conservation, with particular emphasis in the chemical process industries. Academics in fields related to this will also find some areas of interest. Relationships between consecutive papers in the book are usually not very clear, hence a reader will need to go through the book quite carefully to see what might apply to his or her needs. Because of the breadth and practicality of this book, however, those interested in industrial energy conservation will find one or more concepts of value here.

R. F. Boehm

Heat transfer in gas-cooled annular channels
J. Vilemas, B. Cesna, and V. Survila
Washington, D.C., Hemisphere Publishing Corporation, 1987, $73.95, U.S. and Canada, 226 pp.

This book is of likely interest to mechanical, chemical, and nuclear engineers interested in fluid flow and heat transfer in the case of gas flows in annuli. Much material useful in the design of high-performance equipment is presented.

The book can be described as a lengthy and carefully detailed report of a series of experiments performed at the Institute of Physical and Technical Problems of Energetics of the Academy of Sciences of the Lithuania SSR. These experiments were performed on carefully constructed equipment, arranged to provide for a wide variation of several parameters. The experiments provide detailed information on drag coefficients and Nusselt numbers for gas flows in annuli. The variations that have been considered include entrance effects and developing flow, effects of radius ratio, physical properties of the gas dependent on temperature, ratio of wall to freestream temperature, one-sided and two-sided heating, the attachment of a turbulence generating mechanism, and the use of a helical-shaped inner pipe. In all cases, the outer pipe was circular.

Data have been reduced to nondimensional form and expressed in dimensionless equations, which have been presented in forms compatible with standard dimensionless equations. Efforts have also been made to relate the results to standard theory. Numerous graphs have been presented, mostly in dimensionless form. A chapter summarizing the nondimensional equations, as well as a very lengthy appendix of selected original data are included.

The order of presentation of the material appears logical and desired

topics are easily located. The information provided is in readily usable form, though for specific needs some digging may be required, as would be expected. While not suitable for pleasure reading, the book reads well and is not unduly difficult to follow. The quality of printing and reproduction of figures is superb. No obvious errors were detected in reading through the book.

M. Crawford

Turbulence and random processes in fluid mechanics
M. T. Landahl and E. Mollo-Christensen
Cambridge University Press, $17.95, 154 pp.

This slim paperback volume covers a vast territory, inevitably not very deeply. The book has evolved over a period of twenty years from lecture notes developed for a graduate course of the same title taught by the authors at the Massachusetts Institute of Technology. It is written in a pleasant, accessible style that makes it as suitable for private study as it is for a companion to a course of lectures.

The first three brief chapters provide an introduction, a discusson of scales and the basic equations. Chapter 4, Statistical Tools for Description of Turbulence, contains a surprising albeit welcome amount of material for a monograph of its size and range. Chapter 5, Examples of Homogeneous Turbulent Flows, by contrast is narrow in scope, while Chapter 6 (Waves) and 7 (Instability and Transition to Turbulence) provide fresh treatments of complex subjects. The section on universality in transition to chaos in Chapter 7 provides a well-handled introduction to a rapidly developing field, not to be found in most other texts. The subsequent chapters on Shear Flow Turbulence Structure (8), Turbulence Modeling and Closure Schemes (9), Aerodynamic Noise (10), and Convective Transport (11) are so brief as to provide only a flavor.

Workers with an interest in the fundamentals of turbulence or, more widely, statistical mechanics will find this inexpensive book a welcome addition to their bookshelves.

B. E. Launder

Engineering principles and concepts for active solar systems
Solar Energy Research Institute
Hemisphere Publishing, 1988, $49.50 (U.S. and Canada), 295 pp.

This practical handbook of information for those working with active solar heating and solar hot water systems contains a wealth of detailed practical knowledge garnered from Solar Energy Research Institute research and programs. It is an update of the work previously published in 1987 as the *Solar Design Workbook*. Its purpose is to "... distill in these pages the wealth of solar energy design information accumulated over the years by the U.S. Department of Energy." The book succeeds very well in carrying out this goal.

The book's thirteen chapters are gathered into three parts: Fundamental, Active Solar System Design and Sizing; and Active Solar System Installation, Construction and Operation.

Within these sections, individual chapters provide designers and installers of active systems with descriptions of load calculations; descriptions of the components of active systems and necessary subsystems; fundamentals of solar energy, climate, and details of human comfort and how it is affected by temperature, humidity, ambient air velocity, and mean radiant temperature; details of design, sizing, installation, and construction; costing; collector specification and pre-bidding; startup and acceptance testing; development of operations and maintenance manuals; instrumentation and performance monitoring; and system construction-cost estimation.

The book contains information that is gathered from a variety of sources. Little of it has not been previously published, but to have it in one volume makes it a very valuable resource for anyone active in practical solar heating or DHW applications.

The book is nicely bound in hardcover; however, the review copy had about 20 percent of the pages uncut and a few pasted together with binding glue, which made for minor irritation in seaching for particular information.

Jack Howell

Books Received But Not Reviewed

Heat Conduction (Second Edition), by S. Kakac and Y. Yener

Soviet Technology Reviews, Section B, Thermal Physics Reviews, volume 1, edited by A. E. Scheindlin and V. E. Fortov

Current Research in Heat and Mass Transfer, Festschrift for Professor Ramachandran, edited by M. V. Krishna Murthy, V.M. Krishna Sastri, P. K. Sarma and S. P. Sukhatme

Heat Exchanger Design Handbook, supplement 4, edited by E. Y. Schlunder

Particulate Phenomena and Multiphase Transport, volumes 1–5, edited by T. N. Veziroglu

Coal Liquid Mixtures, Proceedings of the Third European Conference, edited by T. J. Pierce

Fluid Mixing III, edited by N. Harnby

Distillation and Absorption, two volume set, edited by G. G. Haselden