BOOKS

Energy: From Surplus to Scarcity?, K. A. D. Inglis, (Ed.), Halsted Press, New York (1974). 224 pages. $21.95.

This book comprises the proceedings of the Institute of Petroleum summer meeting held in June, 1973, at Harrowgate, Yorkshire, United Kingdom.

Broad consideration is given to the future roles of coal, petroleum, natural and synthetic gases, nuclear energy, and electricity in the changing world situation. New technologies are discussed in relation to their utility and their potential contributions, but process features and fundamentals are not elucidated.

The focus is on global and regional resources, projected growth in energy use, efficient fuels utilization, allocation and supply problems, alternate energy sources, and the possible effects of political and economic determinants. Unhappily, though no doubt correctly, the United States is credited with leading "the age of profligate use of energy" which may well be coming to an end.

The fifteen chapters, each representing an original paper, are reasonably compatible with little overlapping and, taken as a whole, provide a useful and well balanced statement of the energy problem. In view of developments since the conference, the treatment seems low key in places but is generally perceptive and realistic.

However, the chapter entitled "Towards the All Electric Economy" has somewhat the tone of an utility company television commercial. It would, one feels, have been distinctly improved if the author (1) showed greater recognition of the long-range need for avoiding energy waste, (2) contemplated a more balanced allocation of fuel resources to end uses, and (3) used conventional overall efficiency criteria. He treats electricity as a fuel and compares its use efficiency with that for the overall use of fossil fuels. This ignores the generation efficiency which in the United States is typically something less than 33%.

Some of the papers appear to regard the world as a highly flexible and adaptable unit in which any important need will be met with a prompt and adequate production and delivery response. The meeting, it will be remembered, took place before the oil embargo. However, Professor Penrose gives an excellent and pertinent analysis of political considerations in relation to the economic self interests of fossil fuel rich countries. She points out, for example, that oil production and exportation by an oil-rich, but industrially underdeveloped, country will almost certainly be managed not, primarily, to benefit the importing countries, but to optimize its own position and foster its current and future interests.

On the whole, the book is recommended as a useful and well-presented overview of the energy situation.

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Momentum, Heat and Mass Transfer, 2nd Edition, C. O. Bennett and J. E. Myers, McGraw-Hill, New York (1974). 810 pages. $17.85.

This text is a clearly written introduction to the transport phenomena which presents the basics of momentum, heat, and mass transfer without vector notation. The material is arranged into three sections in the now classic order of the title. The unique feature of this book is the attempt to show the student that transport phenomena and unit operations are a continuum, with the former providing the theoretical basis for the latter. To this end, design equations have been given in each section while a chapter on filtration closes the momentum transfer section, a chapter on heat exchangers completes the heat transfer section, and five unit operations chapters (continuous contacting of immiscible phases, equilibrium stage operations on immiscible phases, on miscible phases, binary distillation and multicomponent separations) wrap up the mass transfer section. The most successful marriage of transport theory and unit operations is the description of filtration, while the heat transfer unit operations chapter is less successful. Of the mass transfer unit operations chapters, only that on continuous contacting of immiscible phases (gas absorption) uses transport theory to any extent. Since extraction and distillation are conventionally treated through the equilibrium stage model and are so treated here, the authors should have deleted these applications, settled for one illustration of each type of transport, and shortened the book by 100 pages. Although Bennett and Myers have not convincingly shown how the unit operations may be analyzed through transport phenomena, perhaps the fault lies, in part, elsewhere. After working through this text a bright student could reasonably ask, "Why haven't the transport phenomena had greater impact on bread-and-butter chemical engineering?"

Those familiar with the first edition will see that the second is over 100 pages longer. Nearly 40% of this inflation is due to the addition of three appendices; the longest contains physical property and other data useful in solving the many new problems added at the end of each chapter. The chapter on high speed flow and the chapter on mass transfer with chemical reaction have been deleted. The remaining material and its treatment are essentially identical to that of the first edition with minor additions and some rationalization of material between chapters. SI units are not used; They are dismissed in five lines in Chapter 1.

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Handbook of Process Stream Analysis, Kenneth J. Clevett, Halsted Press, New York (1973). 470 pages. $39.00.

This is the best book now available on the increasingly important subject of techniques for the continuous monitoring of process streams in the chemical and related industries. The subject matter is well organized, well illustrated, and easy to read.

There are 17 chapters, each devoted to a physical property or an analytical technique currently utilized in process stream control. These items range from viscosity of *p*H to octane number to water analysis. Each chapter contains (1) introductory comments on the general nature of the property or analysis, (2) a summary of basic principles, (3) a brief discussion of laboratory techniques, (4) descriptions of available commercial on-line analyzers, and (5) examples of specific industrial applications.

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