Fluid Dynamics, Richard H. F. Pao, Chas. E. Merrill Books, Inc., Columbus, Ohio (1966). pp. xiii + 497, $11.75.

This is a sound, elementary text for engineers in which fluid mechanics is presented in the traditional manner with some reference to topics of recent importance. It should be a useful book to the teacher since it is well provided with examples.

Two introductory chapters describe the basic concepts and laws of fluid flow and are followed by three on potential flows. The first of these takes up the general properties of irrotational flow, introducing the velocity potential. The second, on incompressible potential flows, is divided between the planar and the axisymmetric, while the third is an introduction to the applications of conformal transformations. Chapters 6 to 8 are concerned with viscous flows and, as well as giving the Navier-Stokes equations and some exact solutions, deal with turbulence and boundary-layer theory. After the introduction of thermodynamic considerations, Chapter 9, on compressible flow, deals with the one-dimensional case in some detail and gives an introduction to multidimensional flows. The final chapter on magnetofluidmechanics is a refreshingly up-to-date topic for an introductory text and gets some of the basic ideas across to the student.

RUTHERFORD ARIS
UNIVERSITY OF MINNESOTA

Heat and Mass Transfer in Capillary-Porous Bodies, A. V. Luikov, Pergamon Press, New York (1966). 523 pages, $20.00.

This book, translated from the Russian edition, is intended as a graduate-level text and reference work for architectural engineers. It should be of interest to chemical engineers in connection with drying and processing of moist porous materials. The chapters are:

1. Thermodynamics of the Phenomena of Heat and Mass Transfer
2. Equations of Heat and Mass Transfer and Conditions of Single-Valuedness
3. Fundamentals of the Theory of Similarity
4. Heat and Mass Transfer of a Solid Body with the Surrounding Medium
5. Basic Properties of Capillary-Porous Bodies
6. Heat and Mass Transfer in Capillary-Porous Bodies
7. Heat and Mass Transfer in Walls
8. Heat and Mass Transfer in Some Engineering Processes
9. Experimental Methods of Investigation
10. Methods of Numerical Solution

INFORMATION RETRIEVAL

Effect of the resonance parameter on a chemical reaction subjected to ultrasonic waves, Aerstin, Franklyn G. P., Klaus D. Timmerhaus, and H. Scott Fogler, **A.I.Ch.E. Journal,** 13, No. 3, p. 453 (May, 1967).

Key Words: A. Mathematical Model-8, Ultrasonic Waves-6, Chemical Reactions-7, Yields-7, Chlorine-2, Water-1, Carbon Tetrachloride-1, Height-6, Liquid-9, Transducer-10, Resonance Parameter-6, 8.

Abstract: Experimental results are presented which indicate that the application of a fixed intensity of ultrasonic waves to a water-tetrachloride solution containing dissolved air provides yields of chlorine varying from zero to maximum simply as a function of the liquid height in the capillary above the transducer. A mathematical model to explain this phenomenon is presented.

Nonisothermal adsorption in fixed beds, Meyer, Oscar A., and Thomas W. Weber, **A.I.Ch.E. Journal, 13,** No. 3, p. 457 (May, 1967).

Key Words: A. Adsorption-8, 4, Methane-9, Fixed Bed-10, Mathematical Modeling-8, 2, 10, Charcoal-1, Helium-1, 5, Numerical Solution-2, 10, Heat Transfer-6, Mass Transfer-6, Pore Diffusion-6, Dynamic-0, Nonisothermal-0, Adiabatic-0. B. Equilibria-8, 7, Correlating-2, Methane-1, Charcoal-10, 5, Adsorption-0, Isothermal-0.

Abstract: Removal of methane from a helium stream by adsorption on Columbia SXC activated carbon was studied experimentally and theoretically. A mathematical model for the process was developed and the governing differential equations were solved numerically. The model incorporates heat and mass transfer resistances within and around the adsorption particle. Wall effects and moderate heat loss to the surroundings are also included. The required heat and mass transfer correlations were obtained from the literature. Simple expressions were developed to determine the relative resistances, for heat and mass transfer, within and around the adsorption particles.

Frequency response of gas mixing in a fluidized-bed reactor, Barnstone, Leonard A., and Peter Harriott, **A.I.Ch.E. Journal, 13,** No. 3, p. 465 (May, 1967).

Key Words: A. Frequency Response-8, Models-8, Mixing-9, Gases-9, First-Order Reactions-9, Fluidized Beds-9, Fluidization-8, 9, Mass Transfer-9.

Abstract: Frequency response methods were used to compare dynamic models for gas mixing and first-order reaction in a fluidized-bed reactor and for the experimental determination of interphase transfer characteristics. Theoretical predictions of frequency response characteristics were derived for two models based on the two-phase theory of fluidization.

A generalized model for the dynamic behavior of a distillation column, Tetlow, N. J., D. M. Groves, and C. D. Holland, **A.I.Ch.E. Journal, 13,** No. 3, p. 476 (May, 1967).

Key Words: A. Mathematical Model-8, Equations-8, Operation-9, Unsteady State-0, Distillation Column-9, Separation-10, 7, Mixture-9, Multicomponent-0, Channeling-6, Transfer Lag-6, Mixing-6, Mass Transfer-6, Digital Computer-10, Control-4.

Abstract: The generalized model accounts for the effects of channeling, transfer lag, mixing, and mass transfer that occur on each plate of a column in the process of separating a multicomponent mixture at unsteady state operation. The equations required to describe the model were tested by solving a wide variety of numerical examples. Selected numerical results are presented to demonstrate certain characteristics and uses of the generalized model.

Model-reference adaptive control system, Casciano, Robert M., and H. Kenneth Staffin, **A.I.Ch.E. Journal, 13,** No. 3, p. 485 (May, 1967).

Key Words: A. Adaptive Process Control-8, Reaction-9, Models-10, Differential Equations-10, Analog Computer-10, Stability-7, Pole-6, Lag-6, Measurement-9.

Abstract: An adaptive process control scheme, which uses a differential equation model, requires no differentiations in the adaptive circuitry, and no identification of the varying process parameter, was analyzed mathematically and studied on an analog computer. The effects on system stability with a pure delay, measurement lag, or an additional pole in the process are presented.

Free tear sheets of the information retrieval entries in this issue may be obtained by writing to the New York office.