A.I.Ch.E. JOURNAL NOVEMBER, 1964 • VOL. 10, NO. 6

The A.I.Ch.E. Journal, an official publication of the American Institute of Chemical Engineers, is devoted in the main to theoretical developments and research in chemical engineering and allied branches of engineering and science. Manuscripts should be submitted to the New York office.

PUBLISHER

F. J. Van Antwerpen

EDITOR

Harding Bliss

MANAGING EDITOR

Sylvia Fourdrinier

ADVERTISING MANAGER

William Chenoweth

ADVISORY BOARD

C. M. Cooper R. O. E. Dwyer R.

R. H. Newton R. L. Pigford

W. C. Edmister

E. L. Piret

E. R. Gilliland

J. M. Smith

A. N. Hixson

Theodore Vermeulen

W. R. Marshall, Jr. R. R. White

R. H. Wilhelm

Publication Office, 215 Canal Street, Manchester, New Hampshire. Published in January, March, May, July, September, and November by the American Institute of Chemical Engineers, 345 East 47 Street, New York, New York, 10017. Manuscripts and other communications should be sent to the New York office. Correspondence with the editor may be addressed to him at Yale University, 225 Prospect Street, New Haven 11. Connecticut. Statements and opinions in the A.I.Ch.E. Journal are those of the contributors, and the American Institute of Chemical Engineers assumes no responsibility for them. Subscription: on year, member \$6.00; non-member \$25.00; additional yearly postage, Canada 50 cents, Pan American Union \$1.50, other foreign \$2.00 (foreign subscriptions payable in advance). Single copies: \$6.00. Second-class mail. Postage paid at Manchester, New Hampshire. Copyright 1964 by the American Institute of Chemical Engineers. National headquarters of A.I.Ch.E. is concerned about nondelivery of copies of the A.I.Ch.E. Journal and urgently requests subscribers to give prompt notification of any change of address. Sixty days must be allowed for changes to be made in the records.

Postmaster: Please send form 3579 to A.I.Ch.E. Journal, 345 East 47 Street, New York, N. Y. 10017.

Books	794
Technology and Sociology Let's Do Something About It!	795
The Study of Gas-Solid Equilibrium at High Pressures by Gas-Chromatography: Part I. Ethane, Propane, and n-Butane at Essentially Infinite Dilutions in the Methane-Silica Gel System	797
Diffusion and Flow in a Radially Moving Film R. L. Merson and J. A. Quinn	804
The Behavior of Immiscible Liquids in Concurrent Flow Through Packed Beds Robert G. Rigg and Stuart W. Churchill	810
Two-Phase, Annular, Laminar Flow of Simple Fluids Through Cylindrical Tubes John C. Slattery	817
The Mechanics of Vertical Gas-Liquid Fluidized System I: Countercurrent Flow A. G. Bridge, Leon Lapidus, and J. C. Elgin	819
Droplet Characteristics in a Countercurrent Contactor R. B. Olney	827
Aeration in Bernoulli Types of Devices	836
Mass Transfer in a Fluidized Bed Crystallizer S. H. Bransom and G. A. R. Trollope	842
Formation of Air Bubbles at Orifices Submerged Beneath Liquids S. L. Sullivan, Jr., W. B. Hardy, and C. D. Holland	848
The Movement of a Soluble Material During the Washing of a Bed of Packed Solids William R. Sherman	855
Vapor-Liquid Equilibrium in the System Bromine Pentafluoride-Uranium Hexa-fluoride Robert C. Liimatainen and Bernet S. Swanson	860
Determination of Plate Efficiencies From Operational Data D. L. Taylor, Parke Davis, and C. D. Holland	864
The Isotropic Turbulent Mixer: Part II. Arbitrary Schmidt Number Stanley Corrsin	870
Tube Flow of Non-Newtonian Polymer Solutions: Part I. Laminar Flow and Rheological Models	878
Tube Flow of Non-Newtonian Polymer Solutions: Part II. Turbulent Flow	881

(Continued on page 794)