Nonlinear Problems of Engineering. William F. Ames, Ed. Academic Press, New York, 1964. 266 pp. Illus. \$10.75. Fifteen papers by Richard Bellman; Hilda Geiringer; A T. Bharucha-Reid; T. M. Cherry; R. S. Rivlin; Stefan Bergman; W. G. Bickley; E. M. Sparrow and E. R. G. Eckert; J. M. Burgers; Simon Ostrach; S. I. Pai; E. V. Laitone; Preston C. Hammer; Charles H. Murphy; and David M. Young and Mary Fanett Wheeler.

Nuclear Reactor Kinetics. Milton Ash. McGraw-Hill, New York, 1965. 429 pp. Illus. \$19.50.

Optical Masers. George Birnbaum. Academic Press, New York, 1964. 318 pp. Illus. \$9.50. Supplement 2, *Advances in Electronics and Electron Physics*, edited by L. Marton.

Plasticizer Technology. vol. 1. Paul F. Bruins, Ed. Reinhold, New York; Chapman and Hall, London, 1965. 256 pp. Illus. \$12.75. Four papers: "Mechanism of plasticization" by Arthur K. Doolittle; "Plasticizers for rubber and related polymers" by S. S. Kurtz, Jr., J. S. Sweely, and W. J. Stout; "Plasticizers for the cellulosics" by W. M. Gearhart and F. M. Ball; and "Plasticizers for acrylic resins" by Joseph L. O'Brien and John O. Van Hook.

Principles of Dynamics. Donald T. Greenwood. Prentice-Hall, Englewood Cliffs, N.J., 1965. 528 pp. Illus. \$14.

Rare Earth Research II. Proceedings, Third Conference on Rare Earth Research (Clearwater, Fla.), April 1963. Karl S. Vorres, Ed. Gordon and Breach, New York, 1964. 637 pp. Illus. \$29.50. Fifty papers presented at the symposium sponsored by the Department of Chemistry, Purdue University.

Recreations in the Theory of Numbers: The Queen of Mathematics Entertains. Albert H. Beiler. Dover, New York, 1964. 367 pp. Illus. Paper, \$2.

Semiconductor Controlled Rectifiers: Principles and Applications of p-n-p-n Devices. F. E. Gentry, F. W. Gutzwiller, Nick Holonyak, Jr., and E. E. Von Zastrow. Prentice-Hall, Englewood Cliffs, N.J., 1964. 399 pp. Illus. \$15.

Theoretical Hydromechanics. N. E. Kochin, I. A. Kibel' and N. V. Roze. Translated from the fifth Russian edition (Moscow, 1955) by D. Boyanovitch. J. R. M. Radok, Translation Ed. Interscience (Wiley), New York, 1964. 583 pp. Illus. \$20.

A Treatise on Trigonometric Series. vols. 1 and 2. N. K. Bary. Translated from the Russian edition (Moscow, 1961) by Margaret F. Mullins. Pergamon, London; Macmillan, New York, 1964. vol. 1, 577 pp., \$12; vol. 2, 528 pp., \$15. Illus. Two-Dimensional Problems in Hydrodynamics and Aerodynamics. L. I. Sedov. Translated from the Russian edition (Moscow, 1950) by C. K. Chu, H. Cohen, and

 B. Seckler. Interscience (Wiley), New York, 1965. 443 pp. Illus. \$16.50.
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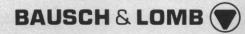
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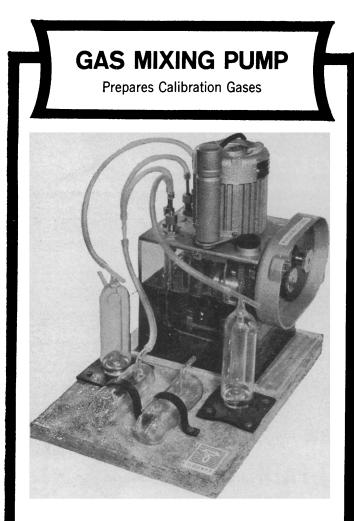


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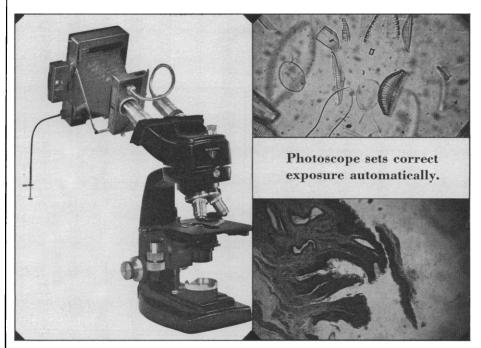
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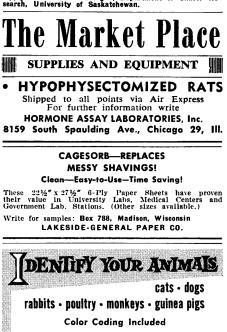
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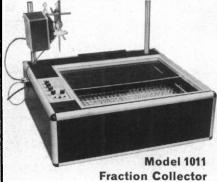




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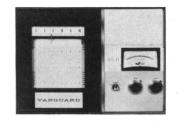
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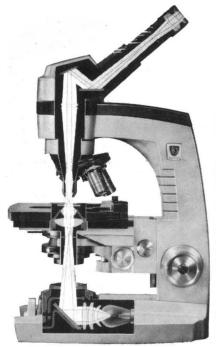
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