

Low-Temperature Physics

Helium-3 and Helium-4. WILLIAM E. KELLER. Plenum, New York, 1969. xxi + 436 pp., illus. \$18.50. International Cryogenics Monograph Series, vol. 6.

For about the last 20 years low-temperature physics has benefited much from the excellent work of the Los Alamos cryogenics researchers. This book, by a member of that group, is in keeping with the tradition.

The book presents the physics of helium-3 and -4 in a form which is understandable to people who know quantum mechanics but are not familiar with macroscopic quantum effects. The general procedure is to interweave comparison of theory with experiment and of helium-3 with helium-4. The treatment is exemplarily well ordered, logical, and clearly written. It starts with a general introduction to the experimental facts of liquid helium, beginning with the liquefaction of helium-4 in 1908 and of helium-3 in 1949, and a brief chapter on ideal quantum gases. These chapters include interesting historical asides and comparisons of the properties of ideal Bose-Einstein and Fermi-Dirac systems.

Gaseous helium and the transition from the gas to the liquid are described in the next two chapters. The gas is more tractable and better understood theoretically than the condensed phases. Keller treats the pair potential in its many forms and shows how the gas properties—virial coefficients, P - V isotherms, and transport properties—depend on the potential.

The fifth and sixth chapters are, respectively, on the properties of liquid helium-4 and liquid helium-3, subjects each of which alone could occupy a large book. Keller discusses the theories of a nonideal Bose-Einstein gas and Landau's theory of a Fermi liquid in physical terms and compares the relevant experimental properties of the liquids—that is, their thermodynamic and transport properties and susceptibility—with theoretical predictions. There is a generous supply of figures throughout the book; they are well done and a large number of them are new. They show interesting comparisons between experiment and theory, and helium-3 and -4. These figures will be a welcome aid to low-temperature physics teachers as well as researchers.

There is an elegant brief chapter on

critical phenomena which starts with a description of the general problem in thermodynamic terms. This leads naturally into a discussion of the critical-point properties of helium-3 and -4 and of the properties of liquid helium-4 near the lambda temperature. The two final chapters are on flowing helium II and critical velocities and on compressed helium. These two subjects are prime interests of the author and his colleagues, a fact which is reflected in the thoroughness with which current research on them is treated. This account will be a treat for researchers in these areas.

The presentation of the subjects within the chapters is usually historical and somewhat eclectic. Each chapter can be read as a self-consistent review article. In some cases the author makes primary reference to a recent review article and principally describes work in the field since the review. The book tends, naturally, to emphasize the interests of the author, and these interests are certainly broad. However, some subjects, among them rotating helium and ions in liquid helium, are not treated in any detail. The treatments of other subjects are fairly thorough, but it is only fair to note that descriptions of some important and interesting work are not included. Such problems are probably inevitable in a book which covers such a broad area.

In general this is a clearly written and interesting book that will be useful to all who study or use helium for fun or profit.

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Solution Chemistry

Chemical Reactions in Solvents and Melts. G. CHARLOT and B. TREMILLON. Translated from the French edition (Paris, 1963) by P. J. J. Harvey. Pergamon, New York, 1969. viii + 528 pp., illus. \$27.

This book is divided into two parts. Part 1 considers, in 142 pages, general properties according to type of reaction, such as acid-base reactions in polar and nonpolar solvents, oxidation-reduction, precipitation reactions, and complex formation. In the two chapters on acid-base reactions, only examples of

proton transfer are discussed. However, the electronic theory of acids and bases is given brief mention at the end of the chapter on complexes, followed by nearly a hundred references on "Various definitions of acids and bases."

In part 2, the following solvents are covered: hydrocarbons and halogen derivatives; acids; bases; alcohols and phenols; amides; nitroderivatives, nitriles, and ketones; anhydrides, ethers, and esters; halides; and ionized melts. A chapter is devoted to various other solvents. This section of the book contains a large number of equilibrium constants grouped in tables. Also, many possible titrations are listed.

In the preface the authors write, "The logical argument found to work so well in the case of dilute aqueous solutions can be easily applied to polar solvents analogous to water, and, with certain precautions, to all other solvents including melts. This is what we have mainly endeavoured to set out clearly in this book." They seem to have succeeded.

W. F. LUDER

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Books Received

Abstracts of Papers Presented at the Lactose Operon Meeting. Cold Spring Harbor, N.Y., September 1969. Arranged by David Zipser and Jonathan Beckwith. Cold Spring Harbor Laboratory of Quantitative Biology, Cold Spring Harbor, N.Y., 1969. 48 pp. Paper, \$2.50.

Advances in Ecological Research. Vol. 6. J. B. Cragg, Ed. Academic Press, New York, 1969. xii + 238 pp., illus. \$10.

Advances in Heterocyclic Chemistry. Vol. 10. A. R. Katritzky and A. J. Boulton, Eds. Academic Press, New York, 1969. x + 350 pp., illus. \$17.

Advances in High Pressure Research. Vol. 3. R. S. Bradley, Ed. Academic Press, New York, 1969. x + 394 pp., illus. \$17.

Advances in Organic Chemistry. Methods and Results. Vol. 6. Edward C. Taylor and Hans Wynberg, Eds. Interscience (Wiley), New York, 1969. vi + 442 pp., illus. \$22.50.

Advances in Organic Geochemistry 1968. Proceedings of the 4th international meeting, Amsterdam, September 1968. P. A. Schenck and I. Havenaar, Eds. Pergamon, New York, 1969. viii + 620 pp., illus. \$32. International Series of Monographs in Earth Sciences, vol. 31.

Advances in the Study of Behavior. Vol. 2. Daniel S. Lehrman, Robert A. Hinde, and Evelyn Shaw, Eds. Academic Press, New York, 1969. xii + 369 pp., illus. \$15.

(Continued on page 1558)



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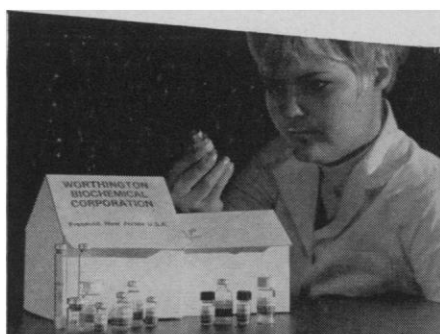
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BOOKS RECEIVED

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Biological Investigations and Observations. A Series of Laboratory Sessions for Introductory Biology. Marland L. Madson. Burgess, Minneapolis, ed. 2, 1969. vi + 278 pp., illus. Spiral bound, \$5.25.

Calculus. Vol. 2, Multi-Variable Calculus and Linear Algebra, with Applications to Differential Equations and Probability. Tom M. Apostol. Blaisdell, Waltham, Mass., ed. 2, 1969. xxiv + 680 pp., illus. \$13.50. Pure and Applied Mathematics.

Catalog of Meteorological Instruments in the Museum of History and Technology. W. E. Knowles Middleton. Smithsonian Institution Press, Washington, D.C., 1969 (available from the Superintendent of Documents, Washington, D.C.). vi + 130 pp., illus. \$3.25. Smithsonian Studies in History and Technology, No. 2.

The Chasm Ahead. Aurelio Peccei. Macmillan, New York; Collier-Macmillan, London, 1969. xviii + 302 pp. \$7.50.

Chemical Separation Methods. John A. Dean. Van Nostrand Reinhold, New York, 1969. xiv + 402 pp., illus. \$13.50.

Chemistry and Chemical Engineering: A Survey of Research and Development in Canada. Prepared by a Study Group of the Chemical Institute of Canada. A. E. R. Westman, Study Director. Science Council of Canada, Ottawa, 1969 (available from the Queen's Printer, Ottawa). xxii + 104 pp. Paper, \$2.50. Special Study No. 9.

Class and Conformity. A Study in Values. Melvin L. Kohn. Dorsey, Home-

wood, 111.; Irwin-Dorsey, Georgetown, Ontario, 1969. xxiv + 320 pp. Cloth, \$8.65; paper, \$5.65.

Classical Descriptions of Motion. The Dynamics of Particle Trajectories, Rigid Rotations, and Elastic Waves. Emil Jan Konopinski. Freeman, San Francisco, 1969. xvi + 504 pp., illus. \$15.

Clinical Analysis by Thin-Layer Chromatography Techniques. Ronald M. Scott. Ann Arbor-Humphrey Science Publishers, Ann Arbor, Mich., 1969. xii + 228 pp., illus. \$18.75.

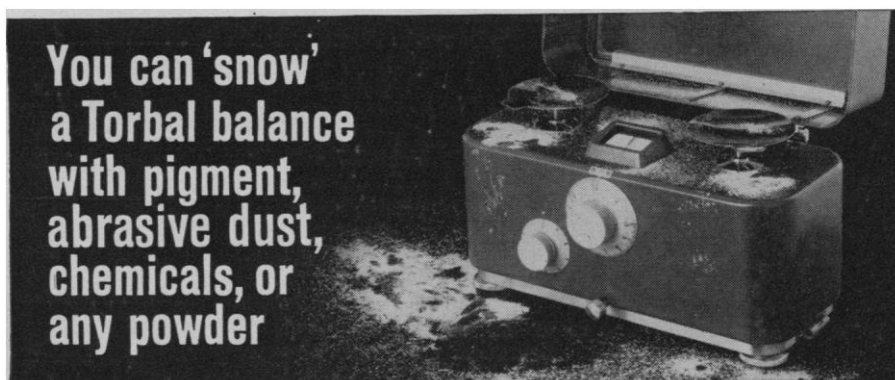
Coastal Landforms of Cat Island, Bahamas. A Study of Holocene Accretionary Topography and Sea-Level Change. Aulis O. Lind. Department of Geography, University of Chicago, Chicago, 1969. xvi + 160 pp., illus. Paper, \$4. Department of Geography Research Paper No. 122.

Comprehensive Chemical Kinetics. Vol. 2, The Theory of Kinetics. C. H. Bamford and C. F. H. Tipper, Eds. Elsevier, New York, 1969. xiv + 486 pp., illus. \$36.

Contingencies of Reinforcement. A Theoretical Analysis. B. F. Skinner. Appleton-Century-Crofts, New York, 1969. xvi + 320 pp. \$6.50. Century Psychology Series.

Critical Path Method. Introduction and Practice. A. T. Armstrong-Wright. Humanities Press, New York, 1969. xii + 116 pp., illus. Cloth, \$3.50; paper, \$2.

Cycles Biologiques et Psychiatrie. Third Bel-Air Symposium, Geneva, September 1967. Under the direction of J. de Ajuria-guerrar. Georg, Geneva; Masson, Paris, 1969. 424 pp., illus. Paper, 50 F.



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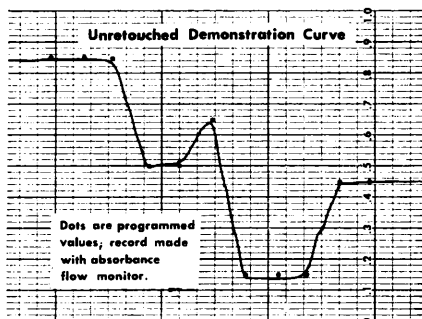


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Dream Psychology and the New Biology of Dreaming. A symposium, Cincinnati, Ohio, October 1967. Milton Kramer, Ed., in collaboration with Roy M. Whitman, Bill J. Baldrige, and Paul H. Ornstein. Thomas, Springfield, Ill., 1969. xxvi + 462 pp., illus. \$17.

The Economy of Death. Richard J. Barnet. Atheneum, New York, 1969. vi + 202 pp. \$4.95.

Education and Identity. Arthur W. Chickering. Jossey-Bass, San Francisco, 1969. xvi + 368 pp., illus. \$9.50. Jossey-Bass Series in Higher Education.

Elastic Plates. Karl Marguerre and Hans-Theo Woernle. Blaisdell, Waltham, Mass., 1969. x + 214 pp., illus. \$9.50. Solid Mechanics.

Electrophoresis—Technical Applications. A Bibliography of Abstracts. B. J. Haywood. Ann Arbor-Humphrey Science Publishers, Ann Arbor, Mich., 1969. x + 446 pp. \$18.75.

Energy Metabolism of Farm Animals. Proceedings of the 4th symposium, Warsaw, September 1967. K. L. Blaxter, J. Kielanowski, and Greta Thorbek, Eds. Oriel, Newcastle upon Tyne, England, 1969. xx + 524 pp., illus. £5.25. European Association for Animal Production, Publ. No. 12.

Epidemiology of Mongolism. Abraham M. Lilienfeld, with the assistance of Charlotte H. Benesch. Johns Hopkins Press, Baltimore, 1969. xiv + 146 pp., illus. \$7.

Experimental Approaches to the Study of Drug Dependence. Proceedings of an interdisciplinary research conference, Toronto, March 1965. Harold Kalant and Rosemary D. Hawkins, Eds. Published for the Addiction Research Foundation by University of Toronto Press, Toronto, 1969. xviii + 238 pp., illus. \$6.50.

Exploring with a Microscope. Seymour Simon. Random House, New York, 1969. vi + 82 pp., illus. \$2.95.

Extra-Terrestrial Matter. Proceedings of a conference, Argonne, Ill., March 1968. Charles A. Randall, Jr., Ed. Northern Illinois University Press, Dekalb, 1969. xx + 332 pp., illus. \$12.50.

Fifth International Symposium on Chromatography and Electrophoresis. Brussels, September 1968. P. de Moerloose, Chairman. Ann Arbor-Humphrey Science Publishers, Ann Arbor, Mich., 1969. 596 pp., illus. \$21.50.

La Fisica Concettuale. Revisione delle categorie del pensiero scientifico e visione unitaria del mondo fisico sulle basi della dialettica di Hegel. Giovanni Pietro Persona. Unione Tipografica Editrice Piacentina, Italy, 1969. 144 pp., illus. Paper. La Scienza del Pensare, vol. 1.

Frontiers of Space. The Pocket Encyclopedia of Spaceflight in Color. Philip Bono and Kenneth Gatland. Illustrated by John W. Wood, Tony Mitchell, Norman Dinage, William Hobson, Jack Pelling, and Brian Hiley. Macmillan, New York, 1969. 248 pp. \$3.95.

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Hugh F. Henry. Wiley-Interscience, New York, 1969. xx + 492 pp., illus. \$17.50.

Fundamentals of Temperature Control. William K. Roots. Academic Press, New York, 1969. xviii + 222 pp., illus. \$12.50.

Gem Hunter's Guide. The Complete Handbook for the Amateur Collector of Gem Minerals. Russell P. MacFall. Crowell, New York, ed. 4, 1969. vi + 282 pp. + plates. \$5.95.

Hair Growth. Proceedings of a symposium, Beaverton, Oregon, 1967. William Montagna and Richard L. Dobson, Eds. Pergamon, New York, 1969. xxii + 586 pp. + plates. \$21.50. Oregon Regional Primate Research Center, Publ. No. 277. Advances in Biology of Skin, vol. 9.

Heralds of Science. As Represented by Two Hundred Epochal Books and Pamphlets Selected from the Burndy Library. With notes by Bern Dibner. M.I.T. Press, Cambridge, Mass., 1969. 96 pp., illus. Paper, \$2.95. Reprint of the 1955 edition.

Histological Typing of Soft Tissue Tumours. F. M. Enzinger, in collaboration with R. Lattes and H. Torloni. World Health Organization, Geneva, 1969 (available from American Public Health Association, New York). 44 pp. + plates. Includes 152 color slides. \$50. International Histological Classification of Tumours, No. 3.

Hormonal Control Systems. Proceedings of a symposium, Rancho Santa Fe, Calif., October 1967. Edwin B. Stear, Arnold H. Kadish, George Bekey, Charles Haun, Charles Sawyer, and R. Sridhar, Eds. Elsevier, New York, 1969. xiv + 306 pp., illus. \$16. Mathematical Biosciences, Suppl. 1.

The Hudson River. A Natural and Unnatural History. Robert H. Boyle. Norton, New York, 1969. 304 pp. + plates. \$6.95.

The Human Nature of a University. Robert F. Goheen. Princeton University Press, Princeton, N.J., 1969. x + 118 pp. \$4.50.

The Human Zoo. Desmond Morris. McGraw-Hill, New York, 1969. 256 pp. \$6.95.

Industrial Chemistry and Technology of Phosphorus and Phosphorus Compounds. A Survey. John R. Van Wazer. Interscience (Wiley), New York, 1969. Illus. Paper, \$4.95. Reprint of Encyclopedia of Chemical Technology, vol. 15, ed. 2, pp. 232-330.

Intelligence and Crime. A Study of Penitentiary and Reformatory Offenders. Simon H. Tulchin. University of Chicago Press, Chicago, 1969. vi + 82 pp., illus. \$8.50. Reprint of the 1939 edition. Double-Page Reprint Series.

International Politics and Foreign Policy. A Reader in Research and Theory. James N. Rosenau, Ed. Free Press, New York; Collier-Macmillan, London, 1969. xxii + 746 pp., illus. \$9.95. Revised version of the 1961 edition.

An Introduction to Town and Country Planning. A. J. Brown and H. M. Sherard. Revised from the 1951 edition by the original authors and J. H. Shaw. Elsevier, New York, 1969. xxxii + 392 pp. + plates. \$25.

Involuntary Movement Disorders. Irving Spencer Cooper. Illustrations by Mary Lorenc. Photographs by Rosemarie Spitaleri. Harper and Row, New York, 1969. xxii + 410 pp. \$29.50.

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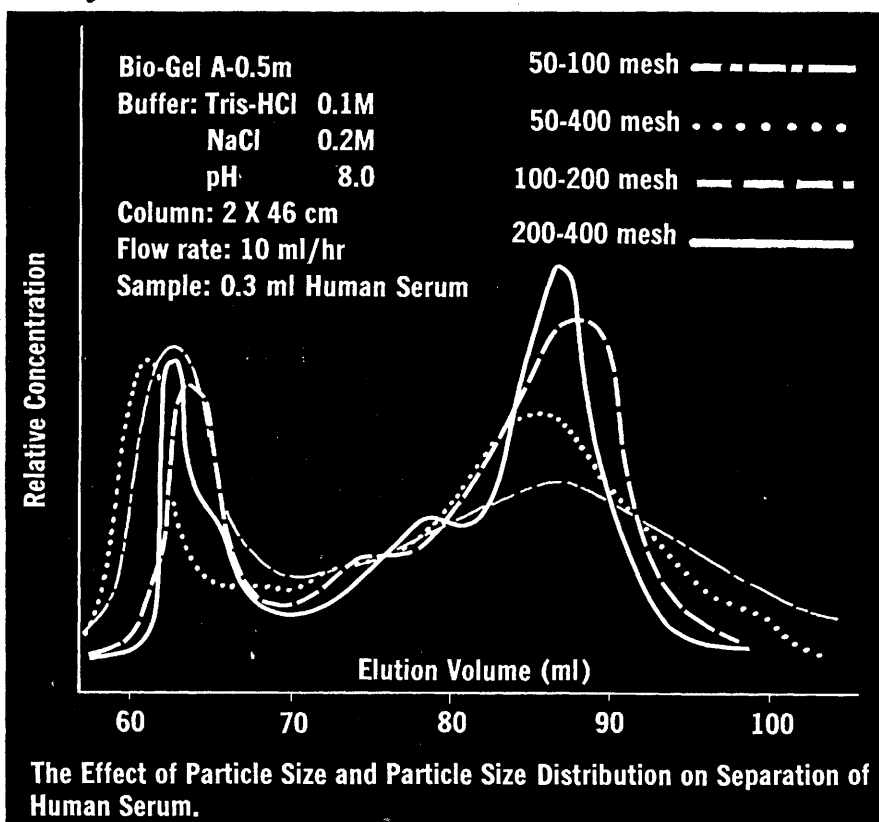
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John Wilkins 1614-1672. An Intellectual Biography. Barbara J. Shapiro. University of California Press, Berkeley, 1969. xii + 336 pp. \$9.50.

The Key. John Philip Cohane. Crown, New York, 1969. 288 pp., illus. \$7.50.

The Kodiak Island Refugium. Its Geology, Flora, Fauna and History. Thor N. V. Karlstrom and George E. Ball, Eds. Published for the Boreal Institute, University of Alberta, by Ryerson Press, Toronto, 1969. xiv + 266 pp., illus. \$10.

A Laboratory Manual of Microtechnique and Histochemistry. A. T. Sumner and B. E. H. Sumner. Blackwell Scientific Publications, Oxford, England, 1969 (U.S. distributor, Davis, Philadelphia). viii + 98 pp., illus. Spiral bound, \$3.50.

Man and Culture in the Late Pleistocene. A Case Study. Richard G. Klein. Chandler, San Francisco, 1969. xxviii + 560 pp., illus. \$6.95. Chandler Publications in Anthropology and Sociology.

The Man Who Rediscovered America. A Biography of John Wesley Powell. John Upton Terrell. Weybright and Talley, New York, 1969. vi + 282 pp., illus. \$6.95.

A Manual on Methods for Measuring Primary Production in Aquatic Environments. Including a chapter on Bacteria. Based on a working meeting, Verbania-Pallanza, Italy, May 1965. Richard A. Vollenweider, J. F. Talling, and D. F. Westlake, Eds. Published for the International Biological Programme by Davis, Philadelphia, 1969. xvi + 214 pp., illus. Paper, \$8. IBP Handbook No. 12.

Mass Loss from Stars. Proceedings of a colloquium on astrophysics, Trieste, Italy, September 1968. Margherita Hack, Ed. Springer-Verlag, New York; Reidel, Dordrecht, Holland, 1969. xii + 348 pp., illus. \$19.50. Astrophysics and Space Science Library, vol. 13.

Master Minds. Portraits of Contemporary American Artists and Intellectuals. Richard Kostelanetz. Macmillan, New York, 1969. xii + 370 pp. \$7.95.

Methods for the Numerical Solution of Partial Differential Equations. Dale U. von Rosenberg. Elsevier, New York, 1969. xii + 128 pp., illus. \$9.50. Modern Analytic and Computational Methods in Science and Mathematics, vol. 16.

Moon Flight Atlas. Patrick Moore. Rand McNally, New York, 1969. 48 pp., illus. \$5.95. A Mitchell Beazley Book.

Muscles, Molecules and Movement. An Essay in the Contraction of Muscles. J. R. Bendall. Elsevier, New York, 1969. xx + 220 pp. + plates. \$6.75.

Naked Ape or Homo Sapiens? John Lewis and Bernard Towers. Humanities Press, New York, 1969. 136 pp., illus. \$3.50. Teilhard Study Library, vol. 4.

Negative Ions and the Magnetron. F. M. Page and G. C. Goode. Wiley-Interscience, New York, 1969. xiv + 158 pp., illus. \$8.95.

Nonlinear Dynamic Elasticity. D. R. Bland. Blaisdell, Waltham, Mass., 1969. x + 102 pp., illus. \$7.50. Solid mechanics.

Occupational and Environmental Can-

cers of the Urinary System. W. C. Hueper. Yale University Press, New Haven, Conn., 1969. xx + 466 pp., illus. \$20.

The Other 23 Hours. Child-Care Work with Emotionally Disturbed Children in a Therapeutic Milieu. Albert E. Trieschman, James K. Whittaker, and Larry K. Brendtro. Aldine, Chicago, 1969. xviii + 240 pp. \$7. Modern Applications of Psychology.

The Periglacial Environment. Past and Present. Based on the Symposium of Cold Climate Environments and Processes, 7th Congress of the International Association for Quaternary Research, Fairbanks, Alaska, August 1965. Troy L. Péwé, Ed. McGill-Queen's University Press, Montreal, 1969. x + 492 pp., illus. \$25.

Phase Diagrams for Ceramists, 1969 Supplement. Ernest M. Levin, Carl R. Robbins, and Howard F. McMurdie. Margie K. Reser, Ed. American Ceramic Society, Columbus, Ohio, 1969. ii + 626 pp., illus. \$30.

Physical Chemistry. A Modern Laboratory Course. Hugh W. Salzberg, Jack I. Morrow, Stephen R. Cohen, and Michael E. Green. Academic Press, New York, 1969. xx + 532 pp., illus. \$9.50.

Physical Foundations of Technical Acoustics. I. Malecki. Translated from the Polish edition by Irena Bellert. Pergamon, New York; PWN (Polish Scientific Publishers), Warsaw, 1969. xxvi + 746 pp., illus. \$28.

Political Power. A Reader in Theory and Research. Roderick Bell, David V. Edwards, and R. Harrison Wagner. Free Press, New York; Collier-Macmillan, London, 1969. xii + 404 pp. Cloth, \$12.95; paper, \$5.95.

The Politics of Weapons Innovation. The Thor-Jupiter Controversy. Michael H. Armacost. Columbia University Press, New York, 1969. xiv + 306 pp. \$10. Institute of War and Peace Studies.

Protides of the Biological Fluids. Proceedings of the 16th colloquium, Brugge, Belgium, May 1968. H. Peeters, Ed. Pergamon, New York, 1969. xvi + 776 pp., illus. \$21.50. Proteins and Related Subjects, vol. 16.

Radiotelescopes. W. N. Christiansen and J. A. Högbom. Cambridge University Press, New York, 1969. xii + 232 pp. + plates. \$14.50.

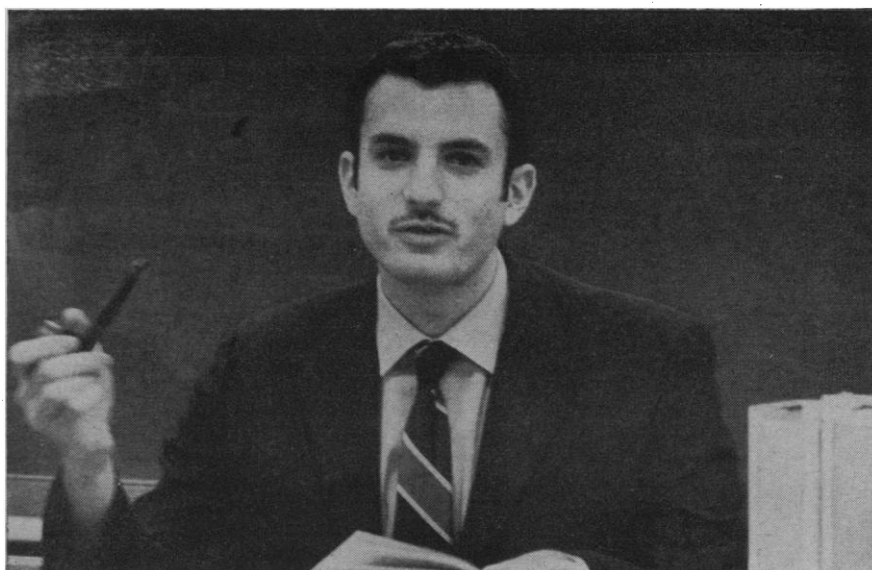
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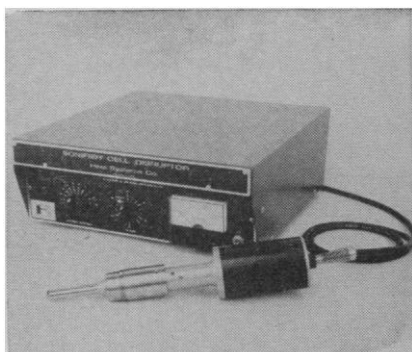
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