

our way to attaining understanding" (p. 96).

The attempt to simplify is frequently accompanied by the failure to make sharply the necessary distinctions. The result is often harder for the beginning student to understand than it would be if a more "difficult" but precise treatment had been offered.

DONALD J. LEWIS  
Northwestern University

**Electrochemistry in Biology and Medicine.** Theodore Shedlovsky, Ed. Wiley, New York; Chapman & Hall, London, 1955. xii + 369 pp. Illus. \$10.50.

The contributions to the symposium on Electrochemistry in Biology and Medicine held by the Electrochemical Society in April 1953 have been assembled in this volume. The 18 papers include both reviews and specialized presentations but fall rather naturally into four groups, depending on the relationship of the electric phenomenon under discussion to the chemical mechanism that produces it.

The first five chapters deal with situations in which the electric parameters can be discussed with some certainty in terms of specific equilibria and ionic transport systems. These are largely concerned with the properties of membranes and, as such, form an excellent, although not systematic, introduction to the following five chapters. In these the essence of the discussion is the identification of the equilibria, transport systems, and enzymatic mechanisms that underlie the transmission of the nerve impulse and other bioelectric phenomena.

There follow four chapters in which electrochemistry is chiefly discussed as a tool for the investigation of simple electrolytes, proteins, and the interaction between proteins and small ions. The final group of four chapters considers electric phenomena, the molecular basis of which is so poorly understood that it is scarcely discussed. The observations on electroencephalograms, for example, are described in terms of their reproducibility and their empirical correlation with physiological factors.

If a justification must be sought for the inclusion of so wide a variety of content in a single volume, it can be found only in the interest that chapters outside the reader's special competence may arouse. Judged in this way the book should prove useful to many. The chapters are stimulating and indicate the emphasis in current research while avoiding in most cases the restricted viewpoint of journal articles.

ROBERT C. WARNER  
College of Medicine,  
New York University

**The Roger Adams Symposium.** Wiley, New York; Chapman & Hall, London, 1955. ix + 140 pp. Illus. + plates. \$3.75.

This book contains the papers presented at a symposium in honor of Roger Adams at the University of Illinois (3-4 Sept. 1954). In addition to a biographic sketch by Ernest H. Volwiler, the following accounts are given in this historically significant book: "Steric effects in dyes," by Wallace R. Brode; "The structure of gliotoxin, a sulfur-containing antibiotic substance," by John R. Johnson; "The structure of nepetalic acid," by Samuel M. McElvain; "Chemistry of flavylum salts; reactions with amines," by Ralph L. Shriner; and "Some chemical studies on viruses," by Wendell M. Stanley.

These are a selected few of the distinguished students of Adams. The papers given by them are, as one might have expected, excellent, up-to-date presentations by masters in their respective fields. The diagrams, tables, flow sheets, and illustrations are used effectively. Chemists generally are also indebted to C. S. Marvel and his symposium committee and to the publishers for making available a splendid work of this kind.

It is an altogether fitting tribute to Adams, whose classical studies in organic chemistry have been so inspirational and whose pronounced influence on chemists and chemistry generally have endeared him to so many.

HENRY GILMAN  
Iowa State College

**Antimetabolites and Cancer.** A symposium. Cornelius P. Rhoads, Ed. American Association for the Advancement of Science, Washington, D.C., 1955. vi + 312 pp. Illus. \$5.75; AAAS memb. \$5.

This volume contains 18 contributions to a symposium presented in December 1953 at the Boston meeting of the AAAS. The variety and abundance of the findings in this area of research are impressive. C. P. Rhoads describes the development in the field of cancer research and professes some optimism in considering the probability of the discovery of specific therapeutic agents for neoplastic diseases by extension of the manufacture and screening of antimetabolites.

D. R. Ginder considers viruses as possible therapeutic aids in the treatment of neoplasms, and R. Hertz performs a similar service for hormones. Both men conclude that the lack of knowledge of the mechanisms of action and intermediary metabolism of viruses and hormones obscures any contemporary view of these agents as antimetabolites. S. Weinhouse

finds that the high rate of glycolysis in neoplasms first demonstrated by Warburg is supplementary to other, more efficient metabolic processes that are similar to those demonstrable in normal tissues. Some interesting examples of the inhibition of microbial growth by normal metabolites are given by B. D. Davis, and L. G. Nickell cites numerous compounds that affect plant growth. M. M. Nelson writes of the production of abortions and/or congenital anomalies in rats with antimetabolites of pyridoxine, riboflavin, and folic acid. D. W. Woolley presents studies on the possible oncolytic properties of certain synthetic analogs of 1,2-dimethyl-4,5-diaminobenzene, a precursor of vitamin B<sub>12</sub>.

It is revealing that 10 of the 18 papers in the book deal with antimetabolites of such precursors of nucleic acids as folic acid, leucovorin, purines, and pyrimidines. G. H. Hitchings explains the biochemistry involved and indicates probable sites of action of various antimetabolites with great clarity and precision. E. M. Lansford, Jr., and W. Shive discuss the action of aminopterin on bacteria and describe a microbiological assay method for thymidine. D. W. Visser presents some results on the action of substituted nucleosides in *Neurospora* and bacteria. J. R. Totter finds that aminopterin inhibits the uptake of C<sup>14</sup>-formate into desoxyribonucleic acid in rabbit bone marrow *in vitro*. C. A. Nichol and A. D. Welch have discovered that A-methopterin inhibits the conversion of folic acid to folinic acid in *S. faecalis*, and they discuss some possible mechanisms of drug resistance in leukemic cells (including data on cell-free extracts suggesting the importance of cell permeability). H. E. Skipper considers resistance in leukemic cells to 8-azaguanine and A-methopterin in terms of alternate metabolic pathways.

The actions and metabolism of 8-azaguanine are thoroughly reviewed in two papers, one by R. E. Parks, Jr., and the other by H. G. Mandel. G. B. Brown describes the empirical testing program of the Sloan-Kettering Institute for the detection of nucleic acid derivatives with carcinocidal or carcinostatic activity. The only clinical essay in the book, a description of the treatment of acute leukemia, is contributed by J. H. Burchenal. He presents figures on the 50 percent survival time of children with acute leukemia in months: untreated, 3.9; treated with A-methopterin and steroids, 8.9; treated with mercaptopurine, A-methopterin, and steroids, 12. Each paper has a bibliography, and the volume ends with an 11-page discussion of the papers. There is no index.

This book is a good exposition of much of the empirical work and many of the theoretical concepts formulated in the

search for an effective chemotherapy of neoplastic diseases. Relatively little about toxic reactions to antimetabolites and about the chemotherapy of neoplasms other than leukemia is included. That the volume is a bundle of researches in progress, rather than an elegant demonstration of satisfactory therapy, only reflects accurately the present state of affairs.

JOHN H. EDGCOMB

National Cancer Institute

## New Books

*Transistors and Other Crystal Valves.* T. R. Scott. MacDonald & Evans, London; Essential Books, Fairlawn, N.J., 1955. 258 pp. \$7.20.

*Drying and Dehydration of Foods.* Harry W. von Loesecke. Reinhold, New York; Chapman & Hall, London, 1955. 300 pp. \$7.50.

*Water. The Yearbook of Agriculture, 1955.* U.S. Dept. of Agriculture, Washington, 1955 (Order from Supt. of Documents, GPO, Washington 25). 751 pp. \$2.

*Guide to the Stars.* Hector MacPherson. Philosophical Library, New York, new rev. ed., 1955. 144 pp. \$2.75.

*The Wing-Venation of the Orthoptera Saltatoria with Notes on Dictyopteran Wing-Venation.* D. R. Ragge. British Museum (Natural History), London, 1955. 159 pp. £2.

*Die Überfunktion der Nebennieren.* Rudolf Chwalla. Wilhelm Maudrich, Vienna, 1955. 330 pp. \$12.

*Praktische Mikroskopie.* Ewald Schild. Wilhelm Maudrich, Vienna, 1955. 242 pp. \$6.

*Clinical Analgetics.* E. G. Gross and M. J. Schiffrin. Thomas, Springfield, 1955. 101 pp. \$3.

*The Biochemistry of Semen.* T. Mann. Methuen, London; Wiley, New York, 1954. 240 pp. \$2.90.

*Monograph of the Tenebrionidae of Southern Africa.* vol. 1, *Tentyriinae, Mollurini—Trachynotina: Somaticus Hope.* Transvaal Museum Memoir No. 7. C. Koch. Transvaal Museum, Pretoria, South Africa, 1955. 242 pp.

*Organic Syntheses.* vol. 35. An annual publication of satisfactory methods for the preparation of organic chemicals. T. L. Cairnes, Ed. Wiley, New York; Chapman & Hall, London, 1955. 122 pp.

*Crop Protection.* G. J. Rose. Philosophical Library, New York, 1955. 223 pp. \$10.

*Virginia at Mid-Century.* Jean Gottmann. Holt, New York, 1955. 584 pp. \$7.50.

*The Modern Building Encyclopaedia.* An authoritative reference to all aspects of the building and allied trades. N. W. Kay, Ed. Philosophical Library, New York, 1955. 768 pp.

*De Natura Fossilium* (Textbook of Mineralogy). Special Paper 63. Georgius Agricola. Trans. from the first Latin edition by Mark Chance Bandy and Jean A. Bandy for the Mineralogical Soc. of America. Geological Soc. of America, New York 27, 1955. 240 pp.

## Miscellaneous Publications

(Inquiries concerning these publications should be addressed, not to Science, but to the publisher or agency sponsoring the publication.)

*Variation and Genetic Relationships in the Whitlavia and Gymnobythus Phacelias.* Publ. in Botany, vol. 28, No. 2. George Willson Gillett. 60 pp. \$1. *A Review of the Nematode Genus Tylenchorhynchus.* Publs. in Zoology, vol. 61, No. 3. M. W. Allen. 37 pp. \$0.50. Univ. of California Press, Berkeley, 1955.

*Progress Reports of Investigation of Railroad Rails and Joint Bars.* Eng. Expt. Sta. Reprint Ser. No. 54. R. E. Cramer and R. S. Jensen. 30 pp. \$0.30. *The Removal of Entamoeba Histolytica Cysts from Water by Porous Filter Septums Either with or without Filter Aid.* Eng. Expt. Sta. Bull. No. 431. E. Robert Baumann and Harold E. Babbitt. 40 pp. \$0.60. *Performance of Three Types of Indirect Water Heaters.* Eng. Expt. Sta. Bull. No. 432. Warren S. Harris and Lyman L. Hill. 46 pp. \$0.75. Univ. of Illinois Press, Urbana, 1955.

*The National Building Research Institute.* Serving the building and structural engineering industries. 15 pp. *The National Physical Laboratory.* Services for science and industry. 23 pp. South African Council for Scientific and Industrial Research, Pretoria, 1955.

*Experiments with Soybeans in Australia.* Div. of Plant Industry Tech. Paper No. 4. S. G. Gray. 18 pp. *Performance of Some Sown Pasture Species at Trangie, N.S.W.* No. 5. E. C. Cuthbertson, C. A. Neal-Smith, and E. F. Biddiscombe. 11 pp. Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia, 1955.

*Empirical Equations for the 60-cycle Spark-Over Gradients in Commercial Oil.* Reprint Bull. No. 46. W. F. Gauster. 11 pp. *Beneficiation of Olivine by Means of a Humphreys Spiral.* Industrial Information Ser. Bull. No. 10. Mason K. Banks and W. Gay Wells. 19 pp. \$0.35. *X-Ray Methods of Analysis.* Industrial Information Ser. Bull. No. 11. Hans H. Stadelmaier and Elizabeth M. Whitener. 6 pp. \$0.35. Dept. of Engineering Research, North Carolina State College, Raleigh.

*Your Life Plans and the Armed Forces and Teacher's Handbook for Your Life Plans and the Armed Forces.* Prepared under the direction of the Defense Committee of the North Central Association of Colleges and Secondary Schools. 149 pp. and 23 pp., respectively. American Council on Education, Washington, 1955.

*Glosario de Terminologia Forestal.* Monogr. No. 5. Carmen García-Piquera. Department of Agriculture and Commerce, San Juan, P.R., 1955. 172 pp.

*The Exceptional Child Faces Adulthood.* Proceedings of the 1955 spring conference of the Child Research Clinic of the Woods School, held in New York City, 6-7 May. Woods School, Langhorne, Pa., 1955. 114 pp.

*Abstracts of the Literature on Semiconducting and Luminescent Materials and their Applications.* 1954 issue. Compiled by Battelle Memorial Inst., Wiley, New York; Chapman & Hall, London, 1955. 200 pp. \$5.

*Atomic Power and the H-Bomb.* C. B. O. Mohr. Melbourne Univ. Press, Melbourne, Australia; Cambridge Univ. Press, New York, 1955. 20 pp. \$0.35.

*Nuclear Energy and Its Uses in Peace.* Gerald Wendt. UNESCO, Paris, 1955. 76 pp. \$0.50.

*Rensselaer Polytechnic Institute, Annual Report, 1954-1955.* The Institute, Troy, N.Y., 1955. 52 pp.

*Bibliography of Scientific Publications of South Asia (India, Burma, Ceylon).* No. 11, January-June 1954. South Asia Science Co-operation Office, New Delhi, 2, India. 212 pp.

*National Academy of Sciences-National Research Council, Division of Medical Sciences, Annual Report, 1 July 1954 to 30 June 1955.* 53 pp. *Soil and Soil-Aggregate Stabilization.* A symposium. Highway Research Bd. Bull. 108. National Acad. of Science-National Research Council, Washington 25, 1955. 175 pp. \$3.

*The Sources of Animal Behavior.* An inaugural lecture delivered at University College, London, 5 May 1955. G. P. Wells. University College, London, 1955. 20 pp. 2s. 6d.

*Engineering Geology.* Historical development, scope, and utilization. vol. 50, No. 3. George A. Kiersch. Colorado School of Mines, Golden, 1955. 122 pp. \$1.50.

*Laboratory Study of Wind Tides in Shallow Water.* Tech. Memo. No. 61. Beach Erosion Bd., Office of the Chief of Engineers, Washington, D.C., 1955. 50 pp.

*Joseph A. Holmes Safety Association, Annual Report.* Bureau of Mines, Washington 25, 1955. 123 + 29 pp.

*Ohio Fossils.* Bull. 54. Aurele La Rocque and Mildred Fisher Marple. Ohio Div. of Geological Survey, Columbus, 1955. 192 pp. \$0.97.

*The Washo Road Test.* pt. 2, *Test Data, Analyses and Findings.* Highway Research Bd. Special Rept. 22. National Acad. of Science-National Research Council, Washington, 1955. 212 pp. \$3.60.

*The Institute of Medical and Veterinary Science, South Australia Sixteenth Annual Report of the Council, July 1953-June 1954.* The Institute, Adelaide, Australia, 1955. 106 pp.

*The Physical Anthropology of Ireland.* Papers of the Peabody Museum of Archaeology and Ethnology, Harvard Univ., vol. XXX, Nos. 1 (text) and 2 (tables and halftones). Earnest A. Hooton and C. Wesley Dupertuis; section on *The West Coast Irish Females* by Helen Dawson. The Museum, Cambridge, Mass., 1955. 304 pp. (No. 1). Paper, \$10; cloth, \$13.

*Bibliographical Bulletin of American Anthropology.* In commemoration of the Institute's 25th anniversary. vol. XVII, 1954, pt. 1. Pan American Institute of Geography and History, Tacubaya, D.F., Mexico, 1955. 335 pp. \$4. per vol.

*Growth, Population Dynamics, and Field Behavior in the Spiny Lobster, Panulirus Interruptus (Randall).* Publ. in Zoology, vol. 59, No. 6. Robert G. Lindberg. Univ. of California Press, Berkeley, 1955. 92 pp. \$1.50.

*Anales del Instituto Nacional de Antropología e Historia.* vol. VI, No. 34, pt. 1a. The Institute, Córdoba, Mexico, 1954. 150 pp.