

ters are omissions to the proper historical development of the subject, although they do not militate against the usefulness of the text and do not distort the over-all perspective and design of the subject matter treated.

J. M. DALLAVALLE
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Air Pollution Handbook. Paul L. Magill, Francis R. Holden, and Charles Ackley, Eds. McGraw-Hill, New York, 1956. 720 pp. Illus. \$15.

The growing problem of air pollution in urban environments has resulted in increased demand for information from scientists, air-pollution control officials, engineers, manufacturers, and, in some instances, the lay public. The introduction of a handbook on this subject therefore is very timely, and the present volume fills this need in a comprehensive manner.

This handbook is divided into 14 sections covering major items, such as the importance of city planning and plant location and the physical and chemical aspects of the problem. There are also three chapters covering biological aspects—namely, the epidemiology of air pollution, the effects of air pollutants on farm animals, and the effects of air pollutants on plants. From the evaluation standpoint, sections are provided on sampling procedures and analytic methods and experimental test methods; from the control standpoint, chapters are provided on equipment and processes, legislation, and meteorological aspects.

The book is well organized in spite of the fact that it has a large number of contributors. The contributors are well qualified in their phase of the problem. The material is covered in a direct manner as in technical handbooks, but each chapter is extremely well documented with references. Because of the new information rapidly being developed in this field, it is difficult for any such comprehensive handbook to be completely up to date upon release. Fundamentals and background for each problem are well covered in this book. Information on all types of pollution sources is included and discussed in detail. Of particular interest, from a fundamental standpoint, are the chapters on the physics of the atmosphere and the evaluation of weather effects.

Epidemiology of air pollution which is discussed by Phair is perhaps the only major area in which extended quantitative information is lacking. The chapter indicates this lack to be a serious problem. Essentially, the material presented in this section is a statement of the problem. Quantitative information is limited

to localized incidents, such as those at Donora and in London.

The sections on analytic methods, sampling procedures, and the experimental test methods provide enough information for new workers entering the field or those desiring further knowledge in far more detail than the customary handbook. In these areas the book approaches a textbook and should, therefore, be very useful for teaching advanced students in the field of community air pollution.

The section on abatement of air pollution is perhaps more descriptive than applied in terms of design of air and gas cleaning equipment. It provides fundamental knowledge and references, however, which enables those interested to pursue the subject in greater detail. Considerable discussion of combustion problems, as related to incinerator design and operation, is included which will be very useful.

This recent book is highly recommended for those interested in the air-pollution field in general and as a working handbook.

LESLIE SILVERMAN
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Determination of Organic Compounds.

K. G. Stone. McGraw-Hill, New York, 1956. 233 pp. Illus. \$5.

This book appears to have been designed as a textbook for courses in quantitative analysis of organic compounds. With the growing importance of organic chemical technology, some departments of chemistry have felt that training in such methods should be offered to their students. For such courses K. G. Stone's book should be popular. It is carefully and logically organized and contains much discussion of both the theoretical and practical aspects of organic quantitative analysis.

I was struck by both the breadth of the theoretical discussions and the many references to contemporary literature. Thus, the author, in discussing the use of lithium aluminum hydride in the quantitative determination of active hydrogen in organic compounds, includes a table with references describing the action of the reagent on a large number of organic functional groups as well as that of immediate interest; and, under the methods for the determination of weak acids by titration in nonaqueous media, he seizes the opportunity to introduce the reader to general acid-base theory and the "leveling effect." From these two examples chosen at random, it should be apparent that the text represents far more than a mere catalog of analytic methods with a discussion of sources of error.

Only two procedures of importance were omitted: the use of ultraviolet and infrared absorption spectroscopy in organic quantitative analysis, and the Kuhn-Roth determination of carbon-linked methyl groups, which is very useful in work with natural products.

RICHARD H. EASTMAN
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Computers. Their operation and applications. Edmund C. Berkeley and Lawrence Wainwright. Reinhold, New York; Chapman & Hall, London, 1956. 366 pp. Illus. \$8.

This book is offered as a successor to Berkeley's 1949 book *Giant Brains or Machines That Think*. It is a general description of analog and digital computers and their elementary principles. The section on applications is very general, and almost all of ten pages of comments by prospective users are 5 to 7 years old. Little information is given on the experience of the many companies who have bought or rented computers. The section describing Berkeley's miniature computer, Simon, is longer than that describing recent large-scale computers. No information is given on any of the numerous medium-sized computers now available. Apparently the book's "Checklist of characteristics," pages 65-71, has been reprinted without acknowledgement from the *Electronic Digital Computer Survey* by the Vitro Corporation of America.

WILLIAM W. YODEN
National Bureau of Standards

The Image. Kenneth E. Boulding. University of Michigan Press, Ann Arbor, 1956. 175 pp. \$3.75.

This monograph is the by-product of a year spent by the author, an economist, at the Center for Advanced Study in the Behavioral Sciences, Stanford, California. It is an exercise in abstraction, an attempt to indicate the relatedness to varied fields of study of a single conception; and it bears both the virtues and defects of being a memorandum, as Kenneth Boulding himself describes it, dictated without interruption in "a certain atmosphere of intellectual exaltation . . . which no sober editing can quite remove." It proposes, with modesty but certainly no less than half-seriousness, the creation of a new science.

Boulding's central idea is that of "the image," and its study he names *eiconics*. While he draws generously on the biological, as well as behavioral, sciences, his own intellectual habitat would seem to fall most naturally within the soci-

ology of knowledge—or, as he carefully avoids calling it until the last chapter, epistemology. Eiconics is a close neighbor of cybernetics. Where communications theory is not concerned with the semantic content of messages, however, the theory of images is concerned—in terms of the effect of information on its recipient. Those who wish Boulding's thesis in a single sentence will find it on page 7: "The meaning of a message is the change which it produces in the image."

This is, of course, to do great injustice to his book, which is witty and courageous and deserves critical study. The author is himself the first to protest its limitations. As he anticipates, specialists will undoubtedly discover that he has rifled their own storehouses somewhat more to their convenience than theirs; and generalists may well lament that he has belatedly arrived at notions of hierarchy and form which others had reached before him ("unfortunately," he cheerfully admits, "I find it easier to remember messages than their sources"). All of which is more or less necessary camouflage, a protective screen of deference to the means by which his ideas are most likely to be disparaged. Granted that his method of didactic exposition, common to so many memoranda produced for and by seminars, juxtaposes platitudes and profundities in startling contrast, the lapses may profitably be ignored, for where he is profound, he is very close indeed to his admirably extravagant objective.

ERIC LARRABEE

New York, N. Y.

New Books

CERN Symposium on High Energy Accelerators and Pion Physics, Proceedings. vol. 1, *High Energy Accelerators*; 567 pp.; F.40. Vol. 2, *Pion Physics*; 443 pp.; F. 40. European Organization for Nuclear Research, Geneva, 1956.

Education and Human Motivation. H. Harry Giles. Philosophical Library, New York, 1957. 108 pp. \$3.

Glaucoma. Transactions of the First Conference, 5-7 December 1955, Princeton, N.J. Frank W. Newell, Ed. Josiah Macy, Jr. Foundation, New York, 1956. 251 pp. \$4.50.

Studies in Differential Equations. Series in Mathematical and Physical Sciences, No. 3. Harold T. Davis, Ed. Northwestern University Press, Evanston, Ill., 1956. 114 pp. \$1.75.

An Introduction to Cybernetics. W. Ross Ashby. Wiley, New York, 1956. 295 pp. \$6.50.

Psychology. General, industrial, social. John M. Fraser, Philosophical Library, New York, 1956. 310 pp. \$7.50.

In the Last Analysis. Adam E. Armstrong. Philosophical Library, New York, 1956. 115 pp. \$3.

Wire Brush Surgery. In the treatment of certain cosmetic defects and diseases of the skin. James W. Burks, Jr. Thomas, Springfield, Ill., 1956. 154 pp. \$6.75.

Dictionary of Anthropology. Charles Winick. Philosophical Library, New York, 1956. 579 pp. \$10.

Elements of Algebra. Howard Levi. Chelsea, New York, ed. 2, 1956. 160 pp. \$3.25.

Wildlife Law Enforcement. William F. Sigler. Brown, Dubuque, Iowa, 1956. 318 pp. \$4.50.

Administrative Medicine. Transactions of the Fourth Conference, 31 October-2 November 1955, Princeton, N.J. George S. Stevenson, Ed. Josiah Macy, Jr. Foundation, New York, 1956. 251 pp. \$4.25.

Miscellaneous Publications

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

Birds of Midway and Laysan Islands. Museum Pictorial No. 12. Alfred M. Bailey. Denver Museum of Natural History, Denver, Colo., 1956. 130 pp. \$2.

A Study of Human Weight Lifting Capabilities for Loading Ammunition into the F-86H Aircraft. WADC Technical Report 56-367. ASTIA Document No. AD 97206. Irvin Emanuel, John W. Chaffee, John Wing. Wright Air Development Center, Wright-Patterson Air Force Base, Ohio, 1956 (order from ASTIA Document Service Center, Knott Building, Dayton 2, Ohio). 12 pp.

Symposium on Vitamin Metabolism. Proceedings of a symposium held under the auspices of the University of Texas and the National Vitamin Foundation, Inc., New York, 6 March 1956. Nutrition Symposium Ser., No. 13. National Vitamin Foundation, New York, 1956. 118 pp. \$2.50.

Census Atlas Maps of Latin America. Greater Antilles. Census Atlas Project. U.S. Department of Commerce, Washington 25, 1956 (order from Bureau of the Census, Washington 25). 7 maps. \$1.

Laboratory Manual to Accompany Fundamentals of Chemistry and Applications. Charlotte A. Francis, Edna C. Morse, Helen R. Chadwick. Macmillan, New York, ed. 2, 1956. 190 pp.

Statistics of Higher Education: Faculty, Students, and Degrees 1953-54. Chapter 4, Section I, Biennial Survey of Education in the United States, 1952-54. Henry G. Badger and Mabel C. Rice. 142 pp. \$0.45. *Federal Funds for Education, 1954-55 and 1955-56.* Bulletin 1956, No. 5. Clayton D. Hutchins, Albert R. Munse, Edna D. Booher. 163 pp. \$0.60. U.S. Office of Education, Washington, 1956 (order from Supt. of Documents, GPO, Washington 25).

Report of the Trustees of the Australian Museum for the Year Ended 30 June 1955. Parliament of New South Wales, Sydney, N.S.W., 1956. 7 pp. 9d.

Education of the Uncommon Man. The President's report of the Cooper Union for the Advancement of Science and Art. Cooper Union, New York, 1956. 38 pp.

Extraclass Activities in Aviation, Photography, Radio for Secondary School Pupils. Suggestions for school administrators and sponsors. Bull. 1956, No. 11. Willis C. Brown. 48 pp. \$0.25. *Statistics of City School Systems: Staff, Pupils, and Finances 1953-54.* Biennial Survey of Education in the United States, 1952-54, Chapter 3. Lester B. Herlihy. 153 pp. \$0.60. U.S. Office of Education, Washington 25, 1956 (order from Supt. of Documents, GPO, Washington 25).

Distribution of Air Within a Room for Year-Round Air Conditioning. Part 1. Engineering Expt. Station Bull. No. 435. Harold E. Straub, Stanley F. Gilman, Seichi Konzo. University of Illinois, Urbana, 1956. 48 pp.

Noise Evaluation of Air Force Ground Support Units. WADC Technical Note 56-335. John N. Cole. 24 pp. *A Statistical Comparison of the Body Typing Methods of Hooton and Sheldon.* WADC Technical Report 56-366. C. Wesley Dupertuis and Irvin Emanuel. 26 pp. Wright Air Development Center, Wright-Patterson Air Force Base, Ohio, 1956 (order from ASTIA Document Service Center, Knott Building, Dayton 2, Ohio).

Société Internationale de Photogrammétrie, Rapport de la Commission I (Photographie). VIII Congrès International de Photogrammétrie. 36 pp. *Rapport National au VIII Congrès International de Photogrammétrie Stockholm, 17-26 Juillet 1956.* 8 pp. *Société Internationale de Photogrammétrie, Rapport sur les Travaux Expérimentaux de Levés Urbains.* Exécutés en 1955-1956. VIII Congrès International de Photogrammétrie, Commission IV-Sous-Commission 2. Levés Urbains. B. L. Y. Dubuisson. 35 pp. Société Française de Photogrammétrie, Paris, 1956.

VIII Congrès International de Photogrammétrie, Stockholm, 1956. L'Appareil S.F.O.M. de l'Institut Géographique National pour la projection de photographies aériennes en Relief. 8 pp. *Compte Rendu des Travaux Effectués par l'Institut Géographique National pour l'Essai Contrôlé No. 1 (Aérottriangulation).* Application de la communication sur les méthodes de détermination des canevas de restitution des cartes aux petites échelles. 30 pp. *Essai de Levé Urbain au 1/2000 (Commune de Donzy).* 11 pp. *Méthodes de Détermination du Canevas de Restitution des Cartes à Petite Échelle.* 33 pp. *Les Laboratoires du Service des Études et Fabrications de l'Institut Géographique National et Méthode Générale d'Étalonnage des Obturateurs Photographiques.* 44 pp. Institut Géographique National, Paris, 1956.

Climatology of Summer Fogs in the San Francisco Bay Area. University of California Publ. in Geography, vol. 10, No. 3. Clyde Perry Patton. University of California Press, Berkeley, 1956. 88 pp. \$2.

Seminars in Archeology: 1955. Memoirs of the Society for American Archaeology, No. 11. American Antiquity, vol. XXII, No. 2, pt. 2. Robert Wauchope, Ed. Society for American Archaeology, Salt Lake City, Utah, 1956. 158 pp. \$1.50.