

theories of gravitation. As for the conceptual simplicity of source theory in the form offered here, the reviewer was not impressed; the theory is too plastic.

A. S. WIGHTMAN

*Joseph Henry Laboratory of Physics,
Princeton University,
Princeton, New Jersey*

Physics and Ontology

Atomic Order. An Introduction to the Philosophy of Microphysics. ENRICO CANTORE. M.I.T. Press, Cambridge, Mass., 1969. xiv, 338 pp., illus. \$12.50.

The development of the modern theories of microphysics (kinetic theory, atomic and molecular physics) is viewed by the author of this book as a continuous fulfillment of the program of imposing an order upon observations. The subject is approached by the so-called inductive-genetic method: inductive because it starts from the detailed study of individual theories, genetic in the sense that it follows the development of individual theories as they "gradually unfold and develop in time."

This methodology does not imply, however, according to the author, any strict adherence to the historical development of science—a subject of research which is considered as encompassing also priorities, mutual influences between discoverers, and controversies—because, "when occasion arises, the scholar goes beyond history in his investigation of origins," having recourse for instance "to psychogenetic studies of the kind that have made famous Piaget's school at Geneva."

In the laying out of the development of theories, however, extensive use is made of secondary historical sources; since these sources, as is well known today, are not always reliable, this description is sometimes flattened, "linearized," if not distorted. This is the case, for instance, with the reported reconstruction of the discovery of Pauli's principle, which can be confronted with the more complex, if not essentially different, pattern described by Pauli himself in his "Exclusion Principle and Quantum Mechanics."

The role of philosophy relative to science consists, according to Cantore, in making the philosophically relevant aspects of science come to the surface, because "science has an immanent philosophical structure." The ontological implications of atomic physics are,

among others, that "the recognition of universal intelligibility in the specificity and intrinsic order of matter is now a peaceful acquisition." The almost complete lack of reference to professional philosophers of science is justified by the consideration that discussion of their ideas would have made the book "insufferably long," owing to the "painstaking examinations and comparisons" that such a discussion would require.

The more physically oriented sections of the book, the description of the outlines of the atomic structure and periodicity of the elements, molecular structures, and macroscopic aggregates, reveal a remarkable effort toward clearness and conciseness. No use is made of mathematical formulas, but many graphs, diagrams, tables, and pictures illustrate the description. The principal conceptual features of modern theories are illuminated with penetration and acuteness. In this respect the book might be useful to those students of physics or scholars in general science whose aim is to grasp the main features of physical theories, which sometimes are hidden, in more specialized texts, under the burden of mathematical developments.

S. D'AGOSTINO

*Istituto di Fisica,
University of Rome, Rome, Italy*

Biophysics from Japan

Advances in Biophysics. Vol. 1, 1970. MASAO KOTANI, Ed. University of Tokyo Press, Tokyo, and University Park Press, Baltimore, Md. 1970. xii, 184 pp., illus. \$11.50.

This volume is the first in a yearly series to be published under the auspices of the Biophysical Society of Japan. The editor considers biophysics to be the study on the basis of the physical sciences of the various biological processes essential to life. This definition is probably as good as any other and allows a free choice of topics. The purpose of the series is not to present comprehensive reviews but to give "complete accounts of the authors' works on specified subjects that will be understandable to interested readers without the necessity of their referring to other papers."

In the first volume the subjects discussed are the lateral line organ of sharks, the structure and function of ribonuclease T_1 , polymerization of

flagellin, and spin changes in hemo-proteins. In general an effort has been made to make the papers understandable to an interested reader. As an example, the article on the lateral line organ is introduced by a section on the structure and distribution of the various types of specialized receptors which is very helpful in understanding the physiology to follow. In all cases the papers are amply illustrated and clearly presented, although there are a few instances in which the text might have benefited from scrutiny by an English-speaking editor.

Since each article is primarily a review of its author's work, rather than of the whole field, the result may seem somewhat unbalanced, but it has the advantage of being reasonably short. As many of the authors chosen for this and forthcoming volumes are important contributors to their respective fields, the series promises to be an interesting addition to the biophysics literature.

EDWIN TAYLOR

*Department of Biophysics,
University of Chicago,
Chicago, Illinois*

Books Received

Advanced Calculus. Problems and Applications to Science and Engineering. Hugo Rossi. Benjamin, New York, 1970. xii, 732 pp., illus. \$17.50.

Advances in Applied Microbiology. Vol. 13. D. Perlman, Ed. Academic Press, New York, 1970. xx, 488 pp., illus. \$24.

Advances in Computers. Vol. 10. Franz L. Alt, Morris Rubino, and Walter Freiburger, Eds. Academic Press, New York, 1970, xviii, 314 pp., illus. \$14.50.

Agenda for Survival. The Environmental Crisis—2. Harold W. Helfrich, Jr., Ed. Yale University Press, New Haven, Conn., 1970. xii, 234 pp., illus. Cloth, \$10; paper, \$2.95.

Algebraic Topology. C. R. F. Maunder. Van Nostrand Reinhold, New York, 1970. x, 376 pp., illus. \$25. New University Mathematics Series.

American Images of Soviet Foreign Policy. An Inquiry into Recent Appraisals from the Academic Community. William Welch. Yale University Press, New Haven, Conn., 1970. xvi, 316 pp. \$10.

Among Animals of Africa. Gernhard Grzimek. Translated from the German edition (Frankfurt, 1969) by J. Maxwell Brownjohn. Stein and Day, New York, 1970. 368 pp., illus. \$12.50.

Analyse tridimensionnelle des éléments cranio-faciaux d'une population de mélaniésiens en orientation vestibulaire. Comparaison avec le crâne européen. Thèse pour le doctorat en chirurgie dentaire. Pellerin Claude. Faculté de Médecine, Paris, 1970. xxii, 70 pp. + plates. Paper.

Animal Physiology. Knut Schmidt-Nielsen. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1970. xii, 146 pp., illus. Cloth, \$6.95; paper, \$2.95. Foundations of Modern Biology Series.

Approximate Methods in Optimization Problems. Vladimir F. Demyanov and Aleksandr M. Rubinov. Translated from the Russian edition (Leningrad, 1968) by Scripta Technica. George M. Kranc, Transl. Ed. Elsevier, New York, 1970. xii, 256 pp. \$18.50. Modern Analytic and Computational Methods in Science and Mathematics.

The Archaeology of Michigan. A Guide to the Prehistory of the Great Lakes Region. James E. Fitting. Published for the American Museum of Natural History by the Natural History Press, Garden City, N.Y., 1970. xiv, 274 pp., illus. \$18.95.

The Armadillo Papers. Beatrice R. Vogel. Published by the author, 2505 Ashdale Dr., Austin, Texas, 1970. No. 2, Bibliography of Texas Spiders, 38 pp., illus. Paper, 75¢; No. 3, Taxonomy and Morphology of the *Sternalis* and *falcifera*, Species Groups of *Pardosa* (Araneida: Lycosidae), 32 pp. + plates. Paper, \$3.50.

An Atlas of Speciation in African Passerine Birds. B. P. Hall and R. E. Moreau. Trustees of the British Museum, London, 1970. xviii, 424 pp., illus. £15.

A Bibliography for the Continuing Dialogue. Convocation Honoring Dr. Ernst Weber. Polytechnic Institute of Brooklyn and Society of Sigma Xi, Polytechnic Chapter, Brooklyn, N.Y., 1970. ii, 154 pp. Paper, \$3. Polytechnic Institute of Brooklyn Libraries Publication No. 28.

Biological Basis of Chemotherapy of Infections and Infestations. Harry Seneca. Davis, Philadelphia, 1971. xii, 1180 pp., illus. \$37.50.

Carl Rogers on Encounter Groups. Carl R. Rogers. Harper and Row, New York, 1970. xii, 172 pp., Cloth, \$5.95; paper, \$1.95.

The Chemistry of Nonaqueous Solvents. Vol. 3, Inert, Aprotic, and Acidic Solvents. J. J. Lagowski, Ed. Academic Press, New York, 1970. xiv, 408 pp., illus. \$21.

Cluster Analysis. Robert C. Tyron and Daniel E. Bailey. McGraw-Hill, New York, 1970. xx, 348 pp., illus. \$13.50.

Comparative Biochemistry of Nitrogen Metabolism. Vol. 1, The Invertebrates. J. W. Campbell, Ed. Academic Press, New York, 1970. xiv, 494 pp., illus. + index. \$21.50.

Complex Variables Applied in Science and Engineering. Harold Wayland. Van Nostrand Reinhold, New York, 1970. xii, 350 pp., illus. Paper, \$9.50.

Computer Architecture. Caxton C. Foster. Van Nostrand Reinhold, New York, 1970. xiv, 226 pp., illus. \$12.50. Computer Science Series.

Computer Techniques in Image Processing. Harry C. Andrews. With contributions by William K. Pratt and Kenneth Caspari. Academic Press, New York, 1970. xii, 188 pp., illus. \$10.50.

Determination of Organic Compounds. Methods and Procedures. Frederick T. Weiss. Wiley-Interscience, New York, 1970. xii, 476 pp., illus. \$17.50. Chemical Analysis, vol. 32.

Differentiable Manifolds. An Introduction. F. Brickel and R. S. Clark. Van

Nostrand Reinhold, New York, 1970. xii, 290 pp. \$19.95. New University Mathematics Series.

The Emotional Rehabilitation of the Geriatric Patient. Kurt Wolff. Thomas, Springfield, Ill., 1970. xiv, 232 pp. \$11.50.

Encyclopedia of Polymer Science and Technology. Plastics, Resins, Rubbers, Fibers. Vol. 12, Reinforced Plastics to Starch. Herman F. Mark, Norman G. Gaylord, and Norbert M. Bikales, Eds., Interscience (Wiley), New York, 1970. xiv, 862 pp., illus. \$50.

Experimental Meson Spectroscopy. Charles Baltay and Arthur H. Rosenfeld, Eds. Columbia University Press, New York, 1970. xiv, 664 pp., illus. \$15.

Facies and Genesis of a Hurricane-Washover Fan, St. Joseph Island, Central Texas Coast. Peter B. Andrews. Bureau of Economic Geology, University of Texas, Austin, 1970. 148 pp., illus. + plates. Paper, \$3. Report of Investigations No. 67.

Formation and Destruction of Blood Cells. A symposium, Washington, D.C., April 1970. Tibor J. Greenwalt and G. A. Jamieson, Eds. Lippincott, Philadelphia, 1970. 312 pp., illus. \$18.

New Technology and Marine Resources Development. A Study in Government-Business Cooperation. Miller B. Spangler. Praeger, New York, 1970. xxxvi, 610 pp., illus. \$22.50. Special Studies in U.S. Economic and Social Development.

Optimal Control Theory. An Introduction. Donald E. Kirk. Prentice-Hall, Englewood Cliffs, N.J., 1970. x, 452 pp., illus. \$13.50. Network Series.

Principles and Techniques of Cardiac Pacing. Seymour Furman and Doris J. W. Escher. Harper and Row, New York, 1970. xii, 270 pp., illus. \$12.50.

Principles of Biosystematics. Judy Longley Lines and Thomas R. Mertens. Educational Methods, Chicago, 1970. vi, 138 pp., illus. Paper, \$2.95. EMI Programed Biology Series.

Problem Drinkers. Don Cahalan. Jossey-Bass, San Francisco, 1970. xx, 202 pp., illus. \$8.75. Behavioral Science Series.

Proceedings of the First U.S.-Japan Conference on Toxic Micro-Organisms. Mycotoxins, Botulism. Honolulu, Hawaii, October 1968. Mendel Herzberg, Ed. U.S.-Japan Cooperative Program in Natural Resources (UJNR) Joint Panels on Toxic Micro-organisms; U.S. Department of the Interior, Washington, D.C., 1970 (available from the Superintendent of Documents, Washington, D.C.). xxii, 490 pp., illus. \$5.75.

Progress in Biophysics and Molecular Biology. Vol. 20. J. A. V. Butler and D. Nobel, Eds. Pergamon, New York, 1970. x, 342 pp., illus. \$17.50.

The Reconstruction of a Riot. A Case Study of Community Tensions and Civil Disorder. Robert Kapsis, Bruce Saunders, Jim Smith, Paul Takagi, and Oscar Williams. Brandeis University, Lemberg Center for the Study of Violence, Waltham, Mass., 1970. vi, 70 pp. Paper, \$2. Approaches to the Study of Violence.

Relativity Reexamined. Léon Brillouin. Academic Press, New York, 1970. xiv, 112 pp., illus. \$6.75.

Science and Secularity. The Ethics of Technology. Ian G. Barbour. Harper and Row, New York, 1970. viii, 152 pp. \$4.95.

Science in Russian Culture, 1861-1917. Alexander Vucinich. Stanford University Press, Stanford, Calif., 1970. xvi, 576 pp. \$18.50.

Scientific Publications from Eastman Kodak Laboratories, 1969. Eastman Kodak Laboratories, Rochester, N.Y., 1970. Section 1, Organic Chemistry, Polymer Chemistry, Biological Chemistry (xxiv, 104 pp., illus.); section 2, Analytical Chemistry, Physical Chemistry, Chemical Engineering (xxiv, 132 pp., illus.); section 3, Physics, Mathematics, Engineering (xxiv, 120 pp., illus.); section 4, Photographic Science and Technology (xxiv, 114 pp., illus.). Paper.

Semiconductors and Semimetals. Vol. 6, Injection Phenomena. R. K. Willardson and Albert C. Beer, Eds. Academic Press, New York, 1970. xiv, 362 pp., illus. \$19.50.

Solvent Extraction of Metals. Anil K. De, Shripad M. Khopkar, and Robert A. Chalmers. Van Nostrand Reinhold, New York, 1970. x, 260 pp., illus. \$18.50. Series in Analytical Chemistry.

Spectral Data of Natural Products. Vol. 1. K. Yamaguchi. Elsevier, New York, 1970. xiv, 766 pp., illus. \$56.

Spectroscopy in Inorganic Chemistry. Vol. 1. C. N. R. Rao and John R. Ferraro, Eds. Academic Press, New York, 1970. xiv, 410 pp., illus. \$19.50.

Statistical Methods of Econometrics. E. Malinvaud. Translated from the French edition (Paris, 1964) by A. Silvey. North-Holland, Amsterdam; Elsevier, New York, ed. 2. 1970. xvi, 744 pp., illus. \$17.25. Studies in Mathematical and Managerial Economics, vol. 6.

Systems Analysis for Business Data Processing. H. D. Clifton. Auerbach, Princeton, N.J., 1970. xii, 242 pp., illus. \$8.95.

Things. Four Metaphysical Reflections. J. H. van den Berg. Duquesne University Press, Pittsburgh, 1970. viii, 130 pp. \$4.95.

Transferable Drug Resistance Factor R. Susumu Mitsuhashi, Ed. University Park Press, Baltimore, Md., 1970. x, 204 pp., illus. \$14.50.

Understanding Everyday Life. Toward the Reconstruction of Sociological Knowledge. Jack D. Douglas, Ed. Aldine, Chicago, 1970. xvi, 358 pp. \$9.50.

Unused Power. The Work of the Senate Committee on Appropriations. Stephen Horn. Brookings, Washington, D.C., 1970. xiv, 286 pp., illus. \$7.50.

Urbanisme électronique. Structures parallèles. T. Ch. Zenetos. Architecture in Greece, Athens, 1969. 62 pp., illus. Paper.

The Urbanization of the Earth. Jorge Arango. Beacon, Boston, 1971. xvi, 176 pp., illus. \$6.95.

Vitamin C and the Common Cold. Linus Pauling. Freeman, San Francisco, 1970. x, 122 pp., illus. Cloth, \$3.95; paper, \$1.95.

Welsh Wildlife in Trust. William S. Lacey, Ed. North Wales Naturalists' Trust, Bangor, 1970. xvi, 186 pp. + plates. \$4.

When the Tide Goes Far Out. Lorus Milne and Margery Milne. Illustrated by Kenneth Gosner. Atheneum, New York, 1970. viii, 88 pp. \$4.25.

Zeno's Paradoxes. Wesley C. Salmon, Ed. Bobbs-Merrill, Indianapolis, Ind., 1970. x, 310 pp. Paper, \$3.85. Library of Liberal Arts.