er develop optimal insight into current testing practices here. The avid student, however, can discern a multitude of useful ideas and much to incite his thought.

DOROTHY ADKINS WOOD
Department of Psychology,
University of North Carolina

Overview

Systems. Research and design. Proceedings of the first systems symposium at Case Institute of Technology. Donald P. Eckman, Ed. Wiley, New York, 1961. v + 310 pp. Illus. $8.50.

It is characteristic of the emerging systems movement that, in a volume concerned with the subject, wide variations in content, viewpoint, and quality are reflected in the 14 chapters—each a symposium paper—of this book. One major worry of systems researchers and designers is that so many specialists can say something to which workers in the systems field should listen. As Simon Ramo implies in his foreword, retreat to simpler, unidisciplinary words is no solution. More inclusive and complex systems develop by default, if not by plan, so we had best face up to the whole tough task as well as we can. Fortunately, there is a new enthusiasm for the job, and there are some new tools to be used. These papers exhibit some of each.

Chapter 1, perhaps intentionally, since it was the banquet address, is more entertaining than enlightening. Chapter 2, a good charter for a broad field of systems research, places needed emphasis on a "thorough understanding of the scientific method in its most general sense." Chapter 3 puts responsibility for the choice of objectives in systems studies where it belongs and, entertainingly as well as wisely, argues against overextension of the purely mathematical viewpoint. Chapter 4 takes perhaps too ambitious a view of operations research. Chapter 5 suggests how something might be gained if computer programers and designers talked to each other more. Chapter 6 brings unfamiliar and possibly important concepts to a discussion of the binary decision process. Chapter 7 discusses man–computer systems, in a sketchy way. Chapter 8 is an informative account of the uses of human engineering. Chapter 9 makes the point that new forms of mathematics are valuable and perhaps essential in dealing with a new field, in this case group performance. Chapter 10 properly advocates, but inadequately illustrates, a broad systems view in dealing with the evolution of complex systems. Chapter 11 makes the highly questionable contention that "molectronics" is a prime solution to the reliability problem. Chapters 12 and 13 deal in an instructive way with the mature interdisciplinary field of process control. Chapter 14 gives one-sided emphasis to analytic minimization techniques.

I await with interest the published proceedings of future Case Institute symposia on systems.

W. D. LEWIS
Bell Telephone Laboratories,
Murray Hill, New Jersey

An Evaluation of Theories

Mechanisms in Radiobiology. vol. 1, *General Principles*. Maurice Errera and Arne Forssberg, Eds. Academic Press, New York, 1961. 534 pp. Illus. $16.

This volume, the first of a two-volume series, provides the basic information needed to understand the effects of radiation on embryonic and adult organisms, the topic to be presented in volume 2. Following a detailed presentation of the physical and chemical aspects of radiation effects and of biochemical lesions in vivo and in vitro, the discussion considers the principles and mechanisms underlying the effects on free-living cells and cell parts, cytological effects, and radiation genetics. Each of the seven chapters presents a well-organized, fluently written evaluation of the presently accepted theories and hypotheses in qualitative and quantitative radiation biology. One chapter even leads somewhat into practical applications—inducing mutations as a method in plant breeding, a sector sometimes classified under "beneficial effects" of radiation. In addition to perfect coverage of the different problems discussed, each chapter brings a well-selected, nevertheless voluminous, bibliography; therefore, the volume will be an important source of information for scientists who are working in radiation biology and its allied fields.

A. T. KREBS
Department of Biology,
University of Louisville

New Books

Mathematics, Physical Sciences, and Engineering

Advances in Quantum Electronics. J. R. Singer, Ed. Columbia Univ. Press, New York, 1961. 658 pp. Illus. $15.

Analytical Foundations of Physical Statistics. vol. 2. A. I. Khinchin. Hindustan Publishing Corp., Delhi, India, 1961 (order from Gordon and Breach, New York). 64 pp. Illus. $4.50.

Direct Methods in Crystallography. M. M. Woolfson. Oxford Univ. Press, London, 1961. 144 pp. Illus. $4.80.

Electric Machinery. A. E. Fitzgerald and Charles Kingsley, Jr. McGraw-Hill, New York, ed. 2, 1961. 580 pp. Illus. $10.75.

Electronics in Everyday Things. William C. Vergara. Harper, New York, 1961. 235 pp. Illus. $3.95.

Experiments in Transport Phenomena. E. J. Crosby. Wiley, New York, 1961. 200 pp. Illus. $3.95.

Fluid Mechanics. Richard H. F. Pao. Wiley, New York, 1961. 515 pp. Illus. $7.50.

Fundamentals of Scientific Mathematics. George E. Owen. Johns Hopkins Press, Baltimore, Md., 1961. 284 pp. Illus. $5.

Ground Support Systems for Missiles and Space Vehicles. Kenneth Brown and Peter Weiser, Eds. McGraw-Hill, New York, 1961. 509 pp. Illus. $15.

Industrial Dynamics. Jay W. Forrester. Massachusetts Inst. of Technology Press, Cambridge; Wiley, New York, 1961. 479 pp. Illus. $18.

Introduction to Feedback Systems. L. Dale Harris. Wiley, New York, 1961. 374 pp. Illus. $10.50.

An Introduction to Magneto-Fluid Mechanics. V. C. A. Ferraro and C. Plumpton. Oxford Univ. Press, New York, 1961. 181 pp. Illus. $4.

Kinematics of Nuclear Reactions. A. M. Baldin, V. I. Goldanskii, and I. L. Rozental. Translated by Ronald F. Peierls. Oxford Univ. Press, New York, 1961. 234 pp. Illus. $6.10.

Larousse Encyclopedia of the Earth. Leon Bertin. Prometheus Press, New York, 1961. 419 pp. Illus. $15.

Larousse Encyclopedia of Geography. Pierre Deffontaines, Ed. Prometheus Press, New York, 1961. 450 pp. + maps. Illus. $17.50.

Linear Vacuum-Tube and Transistor Circuits. A unified treatment of linear active circuits. Alfred J. Cote, Jr., and J. Barry Oakes. McGraw-Hill, New York, 1961. 437 pp. Illus. $10.75.

Lueger Lexicon der Technik. vol. 1, *Grundlagen des Maschinebaus*. Alfred Ehrhardt and Herman Franke. Deutsche Verlags-Anstalt, Stuttgart, Germany, 1961. 708 pp. Illus. DM. 135.

Notes on Molecular Orbital Calculations. John D. Roberts. Benjamin, New York, 1961. 165 pp. Illus. $4.95.

Nouveau Traité de Chimie Minérale. vol. 13, pts. 1 and 2. Paul Pascal, Ed. Masson, Paris, 1960. 2185 pp. Illus. Paper, NF. 310; cloth, NF. 330.

La Poussière Cosmique. A. Dauvillier. Masson, Paris, 1961. 212 pp. Illus. NF. 25.