

Books—by, about, or of interest to Caltech people

MOLECULAR ELECTRONIC STRUCTURES

An Introduction

by *C. J. Ballhausen and Harry B. Gray*

The Benjamin/Cummings Publishing Company, Inc. \$14.00

An introduction to molecular electronic structural theory, this book is aimed at students who have reasonable familiarity with differential and integral calculus and are beginning a study of the physical description of chemical systems. It concentrates on the description of ground state electronic structures, that is, the principles of chemical bonding in molecules. Suggested reading and problems are included in each chapter. C. J. Ballhausen is professor of chemistry at the University of Copenhagen. Harry Gray is Beckman Professor of Chemistry and chairman of the division of chemistry and chemical engineering at Caltech. The book was largely written during the six-month period when Ballhausen was a Sherman Fairchild Scholar at the Institute.

FREUD'S UNFINISHED JOURNEY

Conventional and Critical Perspectives in Psychoanalytic Theory

by *Louis Breger*

Routledge and Kegan Paul \$15.00

A critical examination of psychoanalytic theory, this book attempts to clarify major conflicts within psychoanalysis and between various analytic and neoanalytic schools. Louis Breger, who is associate professor of psychology at Caltech, holds that Freud began with a 19th-century world view that was masculine, committed to scientific objectivity, and politically and socially conventional. The development of psychoanalysis involved the creation of a new socially critical world view that is both masculine and feminine and that values intuition and the unconscious along with objectivity. This transition from the old to the new perspective is, however, incomplete. Psychoanalytic theory is best understood as a fluctuating mixture of assumptions and values — hence the "unfinished journey." This is Breger's fourth book on psychoanalytically related subjects, written not only for members of the mental health profession, but also for the layman who is interested in therapy, human development, and psychological theory.

ADVANCES IN SWITCHED-MODE POWER CONVERSION

by *R. D. Middlebrook and Slobodan Ćuk*

TESLAcO \$45.00

This two-volume book, say the authors, constitutes an intermediate step along the way to a text. It is an assembly of papers that have been published by the Caltech Power Electronics Group, for the most part in conference proceedings. Since they were difficult to obtain in that form and since the discipline is an expanding one, the authors decided to publish the papers as a group and to add an introductory chapter, of a tutorial nature, that establishes the fundamental principles of switched-mode power conversion. Robert Middlebrook is professor and Slobodan Ćuk is assistant professor of electrical engineering at Caltech.

SIGNALS

The Telephone and Beyond

by *John R. Pierce*

W. H. Freeman and Company . . . \$15.95
\$7.95 paper

A slim volume that introduces us to the men who pioneered the telephone and traces the technological evolution of the network, this book also looks beyond technology, discussing the economics, government regulations, and legislation that will ultimately dictate the future of telephone communication. John Pierce is professor of engineering, emeritus, at Caltech and a three-degree (BS '33, MS '34, PhD '36) alumnus who had a distinguished career at Bell Laboratories before returning to his alma mater in 1971.

FOUNDATION ANALYSIS

by *Ronald F. Scott*

Prentice-Hall, Inc. \$29.95

Design may be the most complicated process an engineer is called upon to perform, but in its conventional sense, it consists of guesses made in between parts of the analysis of an engineering problem. Exact analysis is often impossible, and the designer's ingenuity lies in the choice of an analytical method that most reasonably approximates real life but still permits a solution to be obtained. This process can always be aided by careful choice of sim-

plified hand calculation at an early stage in the design operation. It is to this area that Ronald Scott, professor of civil engineering at Caltech, directs this book. He presents a number of hand or elementary computer calculation routines that have been useful to him in consulting practice and in teaching. The book is for practicing engineers and for educators and students of foundation engineering, for whom he offers problems and exercises with each chapter.

PREDICTION AND PROOF:

Theory and Observation in Astronomy

edited by *James Cornell*

and *Alan Lightman*

The MIT Press \$17.50

This book is based on a series of public lectures sponsored by the Harvard-Smithsonian Center for Astrophysics and the Boston Museum of Science. Its contributors describe for the general reader the most recent advances in man's understanding of the cosmos and attempt to clarify the nature of the mutual interaction between theory and observation, concept and experiment, prediction and proof. Alan Lightman, Caltech MS '73 and PhD '74, is on the faculty at Harvard, where his work focuses on black holes and problems of gravitational collapse.

EARTHLIKE PLANETS

Surfaces of Mercury, Venus, Earth, Moon, Mars

by *Bruce Murray, Michael C. Malin, and Ronald Greeley*

W. H. Freeman and Company . . . \$14.95

Under the impact of close-up and direct observations of actual surface phenomena, all of our traditional explanations of the nature and history of the planets of the inner solar system are crumbling. Written for college undergraduates and other serious nonspecialists, this book tries to outline the intellectual revolution concerning these planets, especially their surface features, processes, and histories. The book is suggested for use as a supplementary text in college geology and astronomy courses and also for courses covering topics in physical geology, geomorphology, planetary astronomy, volcanology,

and planetary science. General references are included at the end of each chapter for those who wish to explore further. Bruce Murray is professor of planetary science at Caltech and director of the Jet Propulsion Laboratory; Michael Malin and Ronald Greeley are both professors at Arizona State University.

GENES, CELLS, AND BEHAVIOR
A View of Biology Fifty Years Later
 edited by Norman H. Horowitz
 and Edward Hutchings Jr.

W. H. Freeman and Company . . . \$12.95

These 17 papers plus 5 introductory statements were originally presented in a symposium held at Caltech in November 1978 on the occasion of the 50th anniversary of the founding of the division of biology. All speakers at the symposium were alumni or former members of the division faculty, who had been invited to discuss their current research. In five sessions they covered Biology of Cancer; Phage; Evolution, Genes, and Molecules; Biology of Cells; and Neurons and Behavior. Norman Horowitz, professor of biology, was formerly chairman of that division. Edward Hutchings, lecturer in journalism, was for many years editor of *E&S*.

AQUATIC CHEMISTRY
An Introduction Emphasizing Chemical Equilibrium in Natural Waters
 2nd Edition
 by Werner Stumm and James J. Morgan

John Wiley and Sons . . . \$27.50

In the ten years since the first edition of *Aquatic Chemistry* was published, the field has grown and matured considerably in terms of data, unifying concepts, techniques and applications. A new edition, say the authors, is now in order, but their aim remains the same: to present a quantitative treatment of the variables that determine the composition of natural waters by drawing on basic chemical principles. Chemical equilibrium continues to be the central theme, but steady-state and dynamic models using mass-balance approaches and kinetic information have been given more attention. The book emphasizes a teaching approach and is designed to assist the reader in applying

general principles and methodologies to systems of particular interest. Werner Stumm is a professor and head of the laboratory for water resources and water pollution control at the Swiss Federal Institute of Technology in Zurich. He was a Fairchild Distinguished Scholar at Caltech in 1977-78. James Morgan is professor of environmental engineering science and vice president for student affairs at Caltech.

FRONTIERS IN IMMUNOGENETICS
 edited by William H. Hildemann

Elsevier/North Holland . . . \$45.00

An international symposium for immunogenetics was held in June of 1980 in honor of Ray D. Owen, Caltech professor of biology, on the occasion of his 65th birthday. This book contains the proceedings of that conference. The 16 articles by former students and colleagues are divided into four sections: Allogenic Polymorphism and Immunophylogeny; Genetics of Immune Responsiveness; Immunodifferentiation and Development; and Immunogenes and Disease. Hildemann is a Caltech alumnus (PhD '56) now at the UC School of Medicine, Center for Health Sciences, in Los Angeles.

THE RISE OF ROBERT MILLIKAN
Portrait of a Life in American Science
 by Robert H. Kargon

Cornell University Press . . . \$22.50

Robert Kargon, Willis K. Shepard Professor of the History of Science at The Johns Hopkins University, discusses Robert Millikan's character, achievements, and scientific style as a means of illuminating the changes that have taken place in science in this century. By describing Millikan in his roles as teacher, researcher, administrator, entrepreneur, and public figure, Kargon demonstrates how science grew in complexity and became an integral part of our culture. Millikan emerges in this account as a many-faceted and often controversial man and one with his own doubts and uncertainties. He also emerges as a major force in the development of American science. The book is slated for publication in May.

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