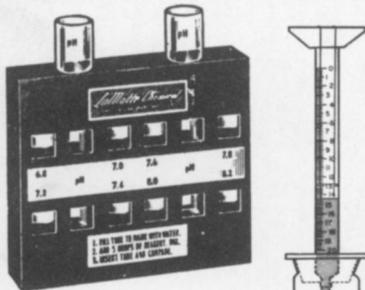


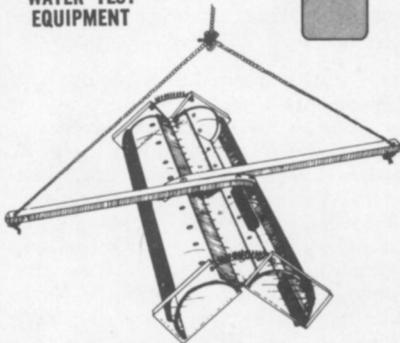
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succession of neurological correlates" (p. 111): they are two different aspects of a single event.

This book is a welcome addition to the growing number of works on philosophy of science written by biologists. The author gives a prominent place to experimental data from studies of brain function that support his philosophic postulates—a choice of emphasis that will please many biologists. However, he introduces several philosophic viewpoints that require more elaboration. For example, he attributes theory formation in the sciences to the method of retroduction, extends consciousness to many animal species, and asserts that purpose has been accepted in science in the same way in which cause has been accepted. Each of these ideas is introduced into the discussion but is not clarified to the point where this reviewer can evaluate its relationship to the author's philosophy.

Those teachers and text writers who require a real world, "out there," will find little comfort in Rosenblueth's interpretations of neural events and the highly deterministic framework within which he finds nervous systems must work.

James T. Robinson
University of Colorado
Boulder

Microbiology

BIOLOGY OF MICROORGANISMS, by Thomas D. Brock. 1970. Prentice-Hall, Inc., Englewood Cliffs, N.J. 749 pp. \$12.95.

This book is designed primarily for an introductory undergraduate course in microbiology. The general organization is excellent. The text is subdivided into five parts: structure and function; growth and its control; genetics and virology; ecology; and evolution, taxonomy, and diversity. All of the important topics normally included in an introductory course are discussed at an elementary level, but the emphasis is on fundamental principles and on organisms. The distinction between eucaryotic and procaryotic cells is a theme that permeates the text. Brock does not, however, cover the field of immunology in depth.

The text is well illustrated and easy to read. The definition of terms is precise, and the explanation of concepts is always clear. When Brock considers difficult concepts, the reader is assisted by exceptionally graphic figures succinctly illustrating them. He provides the reader with up-to-date information, thorough analysis of concepts, modern approaches to solving problems, and current philosophies in a field that is rapidly changing. Altogether, this textbook offers exceptionally wide coverage of the field of microbiology.

Frank H. Gleason
Colorado College
Colorado Springs

Zoology

PRIMARY ANATOMY, by John V. Basmajian. 6th ed., 1970. Williams & Wilkins Co., Baltimore. 420 pp. \$8.75.

Intended as a text book for students of nursing, physiotherapy, and physical education, *Primary Anatomy* relates structure to function without attempting to treat physiology. Both the text and the well-executed line drawings emphasize the relationships among the parts as they work together. Four good halftone plates from photographs show surface anatomy in light and shadow.

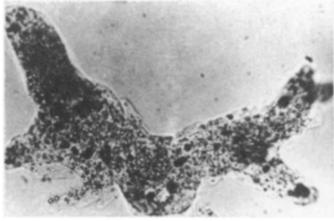
An introductory chapter dealing with cells, tissues, organ systems, and embryology, and a chapter on postnatal growth and development give a brief but adequate treatment of these subjects. The chapter on the articular system is outstanding. Not only are the different kinds of joints covered, but specific joints (shoulder, wrist, knee, ankle) are described and illustrated in considerable detail, showing how the movements are effected. This chapter will be very useful to students of physical education and physiotherapy. The final chapter discusses recent changes in anatomic nomenclature. It will be helpful to teachers who find that the terms they learned as students are no longer used.

John M. Hamilton
Park College
Kansas City, Mo.

FIRST AND LAST EXPERIMENTS IN MUSCLE MECHANICS, by A. V. Hill. 1970. Cambridge University Press, New York and London. 156 pp. \$9.50.

This delightful volume is an autobiographical documentary on that part of a scientific career devoted to muscle physiology by one of this century's leading scientists. Hill describes his 1924 work with H. S. Gasser on the dynamics of muscle contraction in which the investigators used isolated frog sartorius muscle to verify relationships of the speed of shortening and work done. Diagrams of the apparatus and kymograph tracings are included in the abbreviated form of the work as it appeared in the *Proceedings of the Royal Society*. Of special interest are the footnotes, which Hill uses to put the work in historical perspective. Some of the chapters that follow are about the force-velocity relationship, intrinsic speeds in fibre populations, duration of active states, elastic state, internal redistribution of length during isometric contraction, and effects of stretch on collapsing structure. These frequently refer back to the early work with Gasser and also include recent references.

The final chapter departs from the technical material of the earlier portions to the inaugural address given by Hill to the 11th International Congress of Physiologists, at Tokyo in 1965. His reminiscence of earlier congresses and



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earlier physiologists such as Foster, Pavlov, and Dale are priceless.

This book—particularly the introduction and the first and last chapters—will be of interest to all biologists; the remainder will be of particular interest to students of muscle physiology. The only unfortunate thing is the price, which may put it out of range of many who might enjoy and benefit by it.

Paul M. Daniel
 Miami University
 Oxford, Ohio

PICTORIAL GUIDE TO THE BIRDS OF NORTH AMERICA, by Leonard Lee Rue III. 1970. Thomas Y. Crowell Co., New York. 384 pp. \$12.50.

Rue, a wildlife photographer, has eked out a collection of his pictures—140 pleasing black-and-whites—with a text based partly on personal experience but mostly on other people's bird books. Many small errors and awkwardnesses show he is not quite at home in ornithology. The title is ludicrous: the accounts of 16 orders, 41 families, and a mere 82 species are but fractionally representative of the birds occurring north of Mexico. An unusual but nearly useless feature is a foldout color "key" to species: the swatch of red sends you to the cardinal, all right, but a brown is supposedly a clue to anything from

Canada goose to roadrunner, and some hues—light brown for turkey vulture, dark gray for red-eyed vireo—are simply wrong. An appended list of birding localities is inadequate by comparison with Pettingill's *Guide to Bird-Finding*.

This product of the bird-book industry is not recommended.

Sam Gadd
 Colorado Springs, Colo.

METHODS IN EXPERIMENTAL EMBRYOLOGY OF THE MOUSE, by Keen A. Rafferty, Jr. 1970. Johns Hopkins Press, Baltimore. 105 pp. \$8.50.

This little book should open to students and teachers of mammalian development the kind of experimental work in early stages that, until now, has generally been considered too difficult for ordinary laboratory work. By accumulating in one handy volume the many "tricks" scattered throughout the literature, ordering them into a coherent sequence, and adding the result of the direct experience accumulated by himself and his colleagues, Rafferty makes it possible for anyone trained in sterile techniques to learn the manipulations needed for the experimental exploration of early development in the mouse.

After a careful and thorough section

in which equipment, general techniques of animal handling, and the pertinent media are described, the book presents a series of laboratory exercises that are, in effect, introductions to particular techniques. Each is described in sufficient detail so that it can be followed readily by the novice. They range from elementary exercises, such as the obtaining of viable gametes and implanting them into a pseudopregnant female, to the more advanced, such as the formation of mosaic embryos by the fusion of ova. Appendices provide further information on media, charts of the stages of mouse development, and sketches for the construction of an operating hood.

The book is well illustrated and plainly written. It suffers somewhat from poor editing (typographical errors, slight discrepancies). I recommend it for inclusion in the libraries of developmental biologists as well as of teachers of biology who wish to demonstrate early mammalian development, from the appearance of the unfertilized gametes to the later stages of cleavage. Not only is it the first book of its kind; it is quite good by any measure.

Werner G. Heim
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