

been *unsuccessful* to the extent that the distribution of achievement approximates the normal distribution."

One of the aspects directly related to mastery is what the authors term "formative evaluation"; that is, evaluation throughout the course of the learning experience rather than at the end of the quarter or semester, and the feedback to students of formative results. The data presented on the differential mastery patterns achieved through use of various feedback mechanisms in formative evaluation are rather striking in their implications for biology teaching. These chapters on mastery and formative evaluation are "must" reading.

The only disappointing chapters are 8 and 9, on evaluating higher cognitive levels. Virtually all test items included here are for above-average senior high school and college students, and they carry the implication that items measuring these skills must be complex, and at a high reading level, and difficult in format. This is most unfortunate. Granted, few existing tests for average students in the lower grades measure skills beyond memory and direct application—but this need not be the case.

Although Klopfer's chapter on evaluation in science is the most clearly pertinent part of the book for biology teachers, they would be missing a good bit of important and useful material if they skipped many of the chapters of part 1. Nonetheless, Klopfer's material is useful. It is concerned with the areas in which student science learnings might be evaluated, including manual and attitudinal as well as cognitive, and gives specific illustrations of test items measuring the subcategories of each such area. The reader may question some of these items; but in general the selection is good, and the items, whether in biology or other sciences, should provide useful models to the biology teacher preparing his own tests. They are also useful in calling to mind some of the important areas of learning not often tested for.

Unfortunately, with the exception of a few items taken from *AAA Science: a Process Approach* and the Elementary-School Science Project, the items are largely appropriate for senior high school and above-average students. Probably this choice reflects the extreme paucity of good science tests, particularly for grades lower than senior high school. A large portion of the items used comes from the national curriculum projects in high school science. Junior high school science reform is of more recent date, and tests for the new inquiry-oriented junior high school curricula may not have been available at the time the selection of items was made.

Klopfer has an interesting emphasis on the importance of testing "orientation"; that is, the student's knowledge

and comprehension of the relationships between science and other human endeavors and other modes of thought; and also on the importance of testing the student's application of principles, concepts, and methods of science to practical problems in life. Both areas are seriously neglected in most testing, yet both reflect basic goals of science-teaching.

The volume is attractive and well laid out. The editing is exemplary. The binding, however, is inadequate for a book of this size: the binding of my copy has already broken. One flaw in presentation is the consistent failure to include the keyed answer for the test items presented. The reader is left to wonder whether what he assumes is the keyed answer is, in fact, the answer intended by the author. And in some instances the reader may not be able to select a correct answer at all.

This handbook certainly belongs in the professional library of every school. The biology department might well acquire a copy, too.

Hulda Grobman  
New York University  
New York City

## Environmental Biology

*MAN'S DOMINION: A STORY OF CONSERVATION IN AMERICA*, by Frank Graham, Jr. 1971. M. Evans & Co., New York. 339 p. \$8.95.

John Pimlott's dozen or so uncaptioned pencil drawings of peaceful wilderness scenes and dominant wilderness animals send to every reader nostalgic, ominous signals that are excellently strengthened by Graham's text. Under such chapter headings as "The Age of Extermination," "The Feather Trade," "Yellowstone," "Road to the Whitehouse (TR)," "Steve Mather and the National Parks," "Hornaday," and "TVA," the author has provided a highly readable, informative, and concise historical survey of a profoundly important national enterprise, which has encountered many dark days. This book should be made available to all biology students. It should be on the shelves of public libraries. Its message should be a part of the information-bank of all our citizens. To quote from the foreword, which is by Elvis J. Stahr, president of the National Audubon Society: "*Man's Dominion* provides the colorful and occasionally violent background for the grim mission all of us have embarked on in the 'Environmental Decade.'"

A. Gilbert Wright  
Smithsonian Institution  
Washington, D. C.

*ECONOMICS AND THE ENVIRONMENT*, by Allen V. Kneese, Robert A. Ayres, and Ralph C. J. d'Arge. 1971. Resources for the Future, Inc., Washington, D.C.; distributed by Johns Hopkins University Press, Baltimore. 120 p. \$2.50.

For would-be environmentalists, as well as for those ecologists who think of economists as being ostriches, this is must reading. The authors have really addressed themselves to their economist colleagues, but the data presented and the ideas advanced have very considerable value to professional ecologists and teachers of ecology. Chapter 2, "Material Residuals from Production and Consumption," for example, is an excellent, succinct compilation of data on wastes associated with energy conversion, industrial processing, and household consumption—data that most biologists find it difficult to come by. This chapter alone would justify the book's price to a biologist.

Most significant, however, is the attempt to theorize a mathematical economic model of the residues of our biologic and cultural process. Although the authors acknowledge the deficiency of their model, it does indicate a challenge to current economic theory. What I found particularly striking is the call these economists make for a comprehensive systems economics in parallel with the comprehensive systems ecology that is currently emerging.

Although the social-sciences practice of extensive use of lengthy footnotes I find distracting and diverting, the text is relatively jargon-free and thus readable by the noneconomist. Its brevity belies its potential impact and significance.

Edward J. Kormondy  
Evergreen State College  
Olympia, Wash.

## Human Biology

*MASCULINITY AND FEMININITY*, by Benjamin F. Miller, Edward B. Rosenberg, and Benjamin L. Stackowski. 1971. Houghton Mifflin Co., Boston. 128 p. \$2.25 (softback).

At last we have a book that deals frankly with adolescent sexuality. The authors discuss such matters as clothes and hair as sexual-identity symbols, dating and sexual attraction, the male and female reproductive systems, pregnancy and birth, coping with sexual problems, and preparations for marriage.

In my opinion the frankness with

which some of the more sensitive topics are discussed will be welcomed by teachers and students alike. This book, written in a lucid style for high school students, contains numerous photographs, drawings, and cartoons. Each chapter contains one or more "Worth Doings"—activities that relate to the student, school, and community. Discussion questions follow each major part of a chapter.

*Masculinity and Femininity* should also appeal to parents of teen-agers, as well as to teachers: it contains insights into sexual attitudes of adolescents. The biology teacher will find the chapters dealing with human reproduction and genetics particularly interesting and useful; here the authors have carefully described both the anatomy and physiology of the reproductive system and have included many drawings, pictures, and charts.

I predict this book will find immediate success in high school and perhaps junior high curricula. I recommend it to any teacher involved in teaching some phase of adolescent behavior.

Jon R. Fortman  
Mississippi State College for Women  
Columbus

THE CONTEMPORARY SCENE, ed. by Paul B. Weisz. 1970. McGraw-Hill Book Co., New York. 370 p. \$3.95.

*The Contemporary Scene* is designed to aid in the search for a better perspective in this era of tremendous social change. The book consists of readings from the works of many well-known authors, and their contributions have been grouped together in five sections: man's nature; diversity; behavior; society; and environment. The material cuts across several disciplines. Editorial comment has been kept to a minimum.

The part on man's nature traces the probable evolution of man from the first small placental mammals. There are accounts of anatomic developments, including stereoscopic vision, bipedal carriage, forelimbs into hands and arms, larger brains, and the rise of manipulative skills. Ultimately, sociologic aspects, such as hunting, banding together, call systems and communications, family, competition, and hereditary and environmental influences, became a part of the evolutionary developments. In the section on man's diversity, race is defined on the basis of the frequency of some of the genes in the population rather than in terms of the sociologic, psychologic, and physical factors used by many in their attempts to validate unsound research. The section on racial differences and hatreds should be "must" reading for anyone who has not been able to arrive at a clear-cut understanding of why the terms Negro, colored, and white cannot be used to classify people.

The remaining parts of the book seem to be more in line with what is generally accepted today in various disciplines. Behavior is set forth as an outcome of the interplay of heredity and environment. Man's behavior is studied from infancy to adult groups, with attention to cultural institutions and sexuality. The part on society sets forth ideas about the social individual and his interactions. Social groups and the aggressiveness that may disrupt a society are treated next. Finally, fundamental attitudes are examined in terms of their being applied to the improvement of our lives. The last section is given over to treatment of the all-inclusive topic of the day: the environment. This is viewed both physically and sociologically.

The book is recommended to anyone who wishes to correlate and make more meaningful the relationships between the physical and sociologic aspects of current environmental problems. I consider it a valid commentary on what many have defined as a dilemma of catastrophic proportions. A secondary-school teacher could use this book for basic information and supplemental data.

Paul L. Brown  
Norfolk (Va.) State College

THE SEXES, by Donald E. Carr. 1970. Doubleday & Co., Garden City, N.Y. 252 p. \$6.95.

Written by a research chemist, this book is a popular account of sexual reproduction. It is a potpourri that keeps the reader wading through routine and well-known biologic principles to catch the numerous anthropomorphisms, gratuitous comments, hyperbolic use of adjectives and adverbs, and little parenthetical remarks about sexual trivia. The book is not scientifically acceptable. It does, however, indicate the author's diverse reading habits.

Paul Klinge  
Indiana University  
Bloomington

## Microbiology

MICROBIOLOGY: AN INTRODUCTION TO PROTISTS, by J. S. Poindexter. 1971. Macmillan Co., New York. 582 p. \$10.95.

This is a curious offering of the facts of microbial life. The relatively common descriptive aspects of microbiology—namely, the presentation of the major groups of protists—occupies about half of the book. The treatment of this material is competent, although the organization is somewhat peculiar. A section on cellular organization and one on the divisions of the microbial world seem to be naturally sequential, but Poindexter interrupts the flow with a

section on growth that neither springs from what preceded it nor leads to what follows.

Chapters on eucaryotes, procaryotes, and viruses are each followed by a block of excellent electronmicrographs. This alternation of narrative and pictures is effective, although a more sophisticated textual treatment would do better justice to the fine illustrations.

The major problem with this book is that, in the attempt to present material that is comprehensible to those who are not destined for careers in biology, many of the most interesting aspects of microbial existence have been dealt with inadequately. Features such as growth, nutrition, and regulation are so fundamental to the understanding of biology that they must be treated in a more rigorous fashion. The many details of microbial metabolism, which are only outlined or summarized in this book, are the very things that make microorganisms interesting. It is possible to present complex and sophisticated material in a way that is fascinating and of great value to the non-professional. In this book Poindexter has pulled her punches; and though there is much of value in it, it does not succeed as a convincing and engaging presentation of microbiology.

R. A. Levin  
Oberlin College  
Oberlin, Ohio

## Microtechniques

MICROTECHNIQUES: A LABORATORY GUIDE, by Ruth L. Willey. 1971. Macmillan Co., New York. 170 p. \$3.95 (softback).

This concise manual presents the basics of tissue preparation, staining, and mounting. It is intended for use as a textbook in a standard microtechnique course of 10 weeks' duration but could be adapted to a 15-week course.

A great deal of experience and thought has gone into the preparation of the book, particularly in the detailed day-by-day schedules for tissue treatment and directions for tissue processing. A section on fixation discusses the best fixatives for various tissues, giving formulas and information on their good and bad points. The pertinent aspects of tissue-embedding, employing paraffin, celloidin, and gelatin, receive excellent coverage. To help alleviate the problems encountered in microtomy, the author has included a chapter on the use of rotary, sliding, cryostat, and freezing microtomes. A discussion of sectioning problems and their solutions is an integral part of the chapter.

Most of the standard stain techniques and formulas for stain solutions are included. An entire chapter is devoted to

(Continued on p. 438)