Reviews

Botany

RESEARCH EXPERIENCES IN PLANT PHYSIOLOGY: A LABORATORY MANUAL, by Thomas C. Moore. 1974. Springer-Verlag, New York. 473 p. $9.50 softback.

This laboratory manual is one of the very best I have seen. Although it is specifically for use in plant physiology, it has the qualities of organization, instructions, references, and content which instructors and students look for in a laboratory manual for any subject area. Each experiment has an introduction of the topic area in general and leads the student into basic problems and exercises. In almost all cases the open-endedness of the topic is revealed, thus allowing extensive experimentation by advanced students or extensive pursuit of a topical area by students who get "turned on." This feature is one of several which make the manual useful for most levels of plant physiology from elementary to advanced.

Additional helpful features are illustrated by the author's inclusion of concepts and definitions. For example, the exercise on measuring plant-water potential reviews the concept of water potential and gives basic symbols and definitions.

Each exercise has complete methods and materials sections. Concise and precise explanations of procedures are included along with the details of how to use specific instrumentation. In most cases specific brand names and models are included. All mathematical calculations which are required have the formulas for the operations included (along with definitions).

The format for reporting results is sometimes provided, and often tables and graphs complete with labeled columns and axes are included. The author also includes an introduction to writing scientific reports, in which he outlines the use of the style for the journal *Plant Physiology*. For additional sources of information and documentation for each exercise, there is a complete reference section—complete in the sense that landmark work within a topic area is represented (that is, a first important paper, recent paper, methodology paper, and so on).

For the instructor (and I suppose it might even be useful for the student) each exercise provides recommendations for scheduling. Included are preparations which can be made in advance, those which must be made in advance, and other timing hints.

I would caution instructors to be aware that substitutions of equipment are possible and that the manual's description of specific models of specific manufacturers is meant only to be helpful, not to suggest that these are the only instruments which can be used. Also along these lines, I would point out that to undertake many of the experiments a number of sophisticated instruments are required (although substitutions for mentioned brand names can be made); in other words, careful matching of experiments and equipment is required. However, numerous experiments are included so that teachers could choose experiments to complement their courses and their facilities.

In conclusion, the manual is an excellent choice for teaching both undergraduate and graduate laboratories in plant physiology.

George J. Williams III
Washington State University
Pullman

Cell and Molecular Biology

CELL BIOLOGY: A MOLECULAR APPROACH, by Robert D. Dyson. 1974. Allyn and Bacon, Inc., Boston. 716 p. Price not given.

An excellent product of integrating the complex disciplines of cellular and molecular biology, this new book merits serious attention as a superior textbook or reference for advanced undergraduate and graduate students in this field. The flow of the text is interesting and clear, and the author has not overlooked controversial and moot topics presently at the threshold of discovery. An introductory chapter on the cellular basis of life is followed by the three major divisions of the book, each containing four chapters. "Part I: Bioenergetics" includes chemical bonding, equilibrium, sources, production, and utilization of energy. "Part II: Regulation of Cellular Activity" elaborates on the complexity of enzymes, membranes, transport systems, genes, their regulation, and cellular replication. "Part III: Cell Specialization and Examples" discusses cellular differentiation, specialized cells of blood, and lymph, neuron, and muscle cells.

Among the outstanding features of this book are particularly (i) the large number of graphs, drawings, and exceptionally fine micrographs revealing the beauty and mechanisms of ultrastructure; (ii) the organized topical arrangement of additional references, a summary, and study guide at the end of each chapter; and (iii) a detailed appendix describing the biological tools of study and research.

It is assumed that students have a background of inorganic and organic chemistry, and, hopefully, a basic knowledge of thermodynamics. In summary, here is an excellent cell biology book, highly recommended for multiple uses by students and teachers.

Jeanne d'Arc Schleicher, S. L.
Loretto Heights College
Denver

Ecology and Environmental Biology

TEXTBOOK OF ENVIRONMENTAL PHYSIOLOGY, by G. Edgar Folk, Jr. 2nd ed., 1974. Lea & Febiger, Philadelphia. 465 p. $17.50.

This book is intended for graduate students who have studied the fundamentals of mammalian physiology. It is concerned with the factors of heat, cold, light, atmospheric pressure, the water environment, daily rhythms, and other subtle environmental factors. Its coverage, in considerable detail, of the major factors of environmental adaptations makes it a valuable introduction to the relationships of healthy mammals to their physical environments. It should be noted, however, that the primary emphasis is on individuals rather than populations; thus, only one portion of the "holistic picture" is presented.

Early in the book, the author notes that there is some question about including daily (circadian) rhythms in a book on environmental physiology. To me, it would seem not only natural but necessary to include this topic. Since 1959, when Franz Haliberg named these rhythms "circadian," there has been ever increasing recognition of the evidence that the clock is endogenous. The presence of the biological clock, which appears to have its origin in evolutionary adaptations of plants and animals to conditions associated with length of day, is well established. Further, there is little doubt that what we

are observing here is the interaction between physical environment and the physiological reaction of the organism.

After the chapter on biological rhythms, the author concentrates his attention primarily on climatic factors. Edaphic and biotic components are for the most part excluded in this discussion. There are, however, some comprehensive discussions of temperature regulation and responses to hot and cold environments.

As one progresses through the book, he begins to recognize that the text is actually a compilation of research papers and other publications. Although chapters and subject headings provide some organization, the information is often spotty and jumps from one subject to another with few unifying threads. The many references to physiological adaptations in man and the final chapter, "Ape-Men, Resources and Pollution," are commendable attempts to include man as a mammal with the unique ability to drastically modify and pollute his environment while still falling prey to basic physiological and environmental principles.

The book, if used as defined, should be extremely useful. It contains a great deal of information on the physiological reactions and adaptations to the environment of mammals that cannot be found elsewhere in a single volume. As long as its shortcomings are recognized, it will make a fine textbook in the area of environmental physiology.

Richard B. Glazer
Ulster County Community College
Stone Ridge, N.Y.

SHOULD TREES HAVE STANDING? TOWARD LEGAL RIGHTS FOR NATURAL OBJECTS, by Christopher D. Stone. 1974. William Kaufman, Inc., Los Altos, Calif. 128 p. $2.95 softback, $6.95 hardback.

Stone has a rather novel approach to the problem of man's destruction of nature. He states his thesis most clearly on page 9, where he says, "The reason for this little discourse on the unthinkable the reader must know by now, if only from the title of the paper. I am quite seriously proposing that we give legal rights to forests, oceans, rivers and other so-called natural objects in the environment—indeed, to the natural environment as a whole."

The book has a foreword by Garrett Hardin and is divided into two parts. Part I has an introduction and three chapters, concerned with the author's ideas on the legal and social aspects of obtaining legal rights for the environment. Part II is a discussion of the opinions of the U.S. Supreme Court, *Sierra Club vs. Morton.* Some very interesting points are brought out in this section. The book also contains an index.

Should Trees Have Standing? will be helpful to anyone interested in the preservation of the environment. It could be a valuable tool in the hands of environmental protection groups.

William R. Thaggard
R.W. Groves High School
Garden City, Ga.

PRESERVING MAN'S ENVIRONMENT, by Joseph L. Pavoni, D. Joseph Hagerty, and John E. Heer. 1974. Data Courier Inc., Louisville, Ky. 308 p. $13.95. (hardback).

This is an outstanding book that will add new dimensions to environmental education at all grade levels. It will be a good reference for any teacher who is seeking to improve his environmental education program. Each of the ten chapters deals with some facet of the environmental crisis and provides the tools needed for the development of a comprehensive teaching unit, including authoritative background information. An outstanding section which makes this a most useful vehicle for environmental education, are the units dealing with environmental impact statements and environmental law.

Each teaching unit includes discussion of the importance of the unit and objectives. A strong point for the book is its inclusion of units for both basic and advanced classes. In addition, each teaching unit is supplied with evaluative questions that can be used at any level. Information sources for each grade level include books, periodicals, pamphlets, films, filmstrips, charts, and games.

Printed on recycled paper, *Preserving Man's Environment* will be thoroughly used by all who add it to their reference shelves.

Jimmie Pigg
Moore Public School System
Moore, Okla.

MAN'S RESPONSIBILITY FOR NATURE: ECOLOGICAL PROBLEMS AND WESTERN TRADITIONS, by John Passmore. 1974. Charles Scribner's Sons, New York. 213 p. $7.95 hardback.

"Intricate" and "intriguing" seem good words to describe the many levels of controversy and counterpoint in logic that the author pursues in this work. *Man's Responsibility for Nature* is "heavy" reading in the positive sense of the term. The depth to which the author carries his analysis of western man's attitudes toward his environment should delight the philosophers and neophilosophers among us. The ecological problems examined are pollution, conservation, preservation, and multiplication (population). Each is viewed in the light of historical and contemporary discussion in an effort to determine what access remains to solutions; whether traditional morality, in compromise with scientific and technological advance, offers promise of producing the kind of thoughtful action that western tradition permits and encourages.

Passmore offers argument that strips away "rubbish" from the viewpoints of mystics, scientists, economists, and others to show that there exist "seeds" of new patterns of human behavior which offer greater promise than a view that condemns all tradition, or all science, as immoral or irrelevant.

I recommend this book to the mature and thoughtful reader and to the analytical class, if either is motivated to move beyond the trite to a fresh engagement with "real" issues.

Thomas J. Cleaver
University of Texas at
San Antonio

AN ECOLOGICAL AND EVOLUTIONARY ETHIC, by Daniel G. Kozlovsky. 1974. Prentice-Hall, Inc., Englewood Cliffs, N.J. 127 p. $3.95 softback, $6.50 hardback.

If you are not already angry over the waste, exploitation, pollution, and human degradation occuring on our one and only earth, you need to read Daniel Kozlovsky's little volume. On the other hand, if you are incensed and are looking for the right ways to cleanse our culture of its plundering and inhumane ways, be prepared to take issue with one or more of the correctives Kozlovsky suggests. In 64 very short essays (he calls them notes), Kozlovsky develops this question: "What is meaning in . . . a social organism that is determined to change its environments to suit itself and is changing them so rapidly that no genetic correspondence can be hoped for?" It is at the author's treatment of this question that some readers will take umbrage.

Evolution, Kozlovsky maintains, is nonethical, change being indifferently wrong or right, depending on the environment. It is adaptation that has value. But genetic adaptation requires reproduction, and we have too much of that already. At our present rate of increase, we will exhaust earth's support capabilities soon. We find ourselves in a swirl of environmental, social, cultural, and political changes requiring adaptations for which our genetic tools are wholly inappropriate. Our hope lies in our capacity for behavioral adaptation. Kozlovsky contends that up to now our behavior has been directed in all the wrong ways by our widespread adoption of Christianity.

The free-spirited biologist author (he admits he has never been a certified biologist) says that human beings must learn, must be taught, to want less. He