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