

Book Reviews

• Readers' comments on reviews should be addressed to the Editor.

Botany

THE NATURE OF PLANTS, by Lorus and Margery Milne. 1971. J. B. Lippincott Co., Philadelphia. 224 p. \$5.95 (hardback).

The topics included in this introduction to botany are skillfully chosen. Among them are morphology, genetics, ecology, paleobotany, phytogeography, and economic botany. Highly meritorious aspects of the text include the treatment of aquatic plants, the section on plant-dispersal mechanisms, and the explanation of fossil dating. The discussion of phytogeography centers on the works of von Humboldt, Schimper, and Good. Unfortunately, the contributions of N. I. Vavilov, who added greatly to modern experimental techniques and to the modern strategies of plant exploration, are not mentioned.

There are a few errors; for example, the bacteria are referred to as "the smallest plants" and "the most minute of the fungi" (both statements are inaccurate) and lianas are called "cable-like roots" (they are shoots, in almost all cases). Under the heading "Control of Plant Pests" no mention is made of the biologic control of undesirable plants by means of insects, which is one of the most fascinating aspects of modern applied biology.

The most disappointing aspect of the book is its illustrations. Although Norman Adams' drawings are very attractive and, for the most part, accurate, they add little to the text because no reference to size (scale) is given and because of the dearth of labels and explanatory legends. Also, in several cases too many illustrations are crammed onto a single page. These fine drawings deserved better treatment by the editor or authors.

This book is for readers beyond age 12. Junior high and high school students who are serious about ecology and botany will find much to interest them. For the biology teacher, who all too frequently has little knowledge of plants, this book provides a great deal of interesting information. The book is very well written. I hope the Milnes and Adams will give us more books on botanic subjects.

Jane H. Bock
University of Colorado
Boulder

CHROMOSOMAL EVOLUTION IN HIGHER PLANTS, by G. Ledyard Stebbins. 1971. Addison-Wesley Publishing Co., Reading, Mass. 224 p. \$4.50 softback, \$9.00 hardback.

This latest of Stebbins' books on evolutionary processes focuses on evolution by chromosomal variations, which occur much more frequently in plants than in animals. Emphasis is placed on these processes in the angiosperms—the subject of most of the literature—but by "higher plants" the author means all vascular plants and bryophytes (excluding only the algae and fungi). The first two chapters, on the basic functions of chromosomes and their relation to genes, consider phenomena that apply to the chromosomes of most eucaryotic cells. Ratios presented for tetrasomic inheritance apply only if one assumes that the chromosomes segregate at random. This assumption is stated by the author, but it is well known that actual ratios correspond more closely to random chromatid assortment, though with certain restrictions based on chiasmata relationships. On page 14 it is not clear that the nucleolar organizing region is generally regarded as a type of secondary construction. Chromomeres are listed on page 29 together with chromocenters and knobs as a kind of heterochromatin, though some authors have considered that chromomeres are made up of euchromatin.

Chapter 3 deals with variations in size and organization of the chromosomes; the end of this chapter considers "B," or accessory, chromosomes. Chapter 4, on chromosomal changes, genetic recombination, and speciation, is an excellent though brief summary. Chapters 5 and 6, on polyploidy, plant geography, and evolution, provide a reasonably thorough coverage of several aspects of these topics. Especially valuable are reviews of the relationships of climate, edaphic and historical factors, and morphology to polyploidy. The book ends with a list of 253 references and a general index.

Although selective in the topics that are treated, this volume presents an excellent and modern review of the chromosomal evolution of the eucaryotic plants. It should prove most useful as a companion volume to more general textbooks or as a textbook to be used in conjunction with original references

for advanced-undergraduate and graduate courses in genetics and cytogenetics.

Adolph Hecht
Washington State University
Pullman

Cell Biology

NUCLEUS AND CYTOPLASM, by Henry Harris. 2nd ed., 1970. Oxford University Press, New York. 181 p. \$8.75.

Even in its second edition, *Nucleus and Cytoplasm* is very short; but it is also very important to those interested in recent developments in modern biology and molecular genetics. In this edition, as well as the first (1968), Henry Harris, professor of pathology at Oxford, draws attention to the many important questions that remain unanswered: How is genetic information affected by cytoplasmic regulatory mechanisms? Are genes transcribed in any particular order? Is there a definite amount of a particular protein synthesized in relation to the number of RNA copies produced by a corresponding gene? Are there variations in the amount of RNA produced by different genes, and what determines the variation? Is there any relationship between the time a particular gene is transcribed and the time at which corresponding protein is synthesized? Are there differences in the lifetimes of different RNA templates? How is the synthesis of proteins on RNA templates turned on and off, and are the rates of protein synthesis variable from template to template?

In stressing these and other questions, Harris presents some experiments of his own and the classical work of Hammerling and Hartmann (which began in 1926) on *Acetabularia*. Harris also examines in some detail the experimental findings with regard to the genetic operator model, the search for the messenger, cell regulation, cell fusion, and differentiation.

Reading Harris's book is an informative and chastening experience, giving pause against too-hasty acceptance of an oversimplified and overgeneralized picture of cellular events. Too many gaps in our knowledge may tend to be ignored for the sake of a unified picture. However, even the admittedly patchy and incomplete sets of information are forming a recognizable picture. Molecular genetics, for all its incompleteness, remains one of the most exciting intellectual achievements of the past two decades.

Edith K. MacRae
University of Illinois
Urbana