

# Book Reviews

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## TAXONOMY

### COLORADO FLORA—WESTERN SLOPE

by William A. Weber. Colorado Associated University Press (1344 Grandview Ave. Box 480, University of Colorado, Boulder, CO 80309). 530 pp. \$19.50 cloth.

The *Colorado Flora—Western Slope* consists of a series of keys to all the vascular plants west of the continental divide in Colorado. Weber begins with a key to the families of plants. Such keys are difficult to devise and an author invariably resorts to the use of such traits as "Plants with milky juice," which is a difficult question unless the plant is fresh. One might assume the key is to be used in the field, but it requires minute observations, such as the number of locules or ovules, that may be difficult in the field. Probably the best way to use the text is with fresh specimens in a lab with access to a dissecting scope.

The beginning taxonomist will discover that the keys to the more complex families (Poaceae, Cyperaceae, Asteraceae) use special terms that apply to their flowers and fruits. Although the glossary includes brief descriptions or definitions of these terms, a novice would probably need a supplementary text for drawings diagramming the terms. This flora can be used most efficiently by the college level student or the professional taxonomist.

The photographs are of mixed quality. Some appear submerged in either red, gray or blue. The drawings, although small, seem quite useful. The combination of photographs and drawings presents a pleasant appearance to an otherwise continuous flow of keys and descriptions.

The families are divided into three parts—ferns and fern allies, gymno-

sperms and angiosperms—then arranged in alphabetical order. This arrangement is useful to the beginner. The other typical arrangement, that of placing related families together, has value. Perhaps such a grouping of families would be a method of developing evolutionary associations for the novice. Of greater concern is the dividing of some families into segregate families. For example, Weber follows the division of the Liliaceae resulting in the families Agavaceae, Alliaceae, Asparagaceae, Calochortaceae, Convallariaceae, Melanthiaceae, Trilliaceae and Uvulariaceae. Perhaps this concept of the Liliaceae will become more prevalent in the future, but at the moment it is not the more accepted treatment.

Perhaps the greatest weakness of the taxonomic treatment is also the book's greatest strength. Weber uses a more narrow concept of a genus than is common in modern floras. He defends his "splitting" of genera in the introduction, but obviously does not have the space to explain the basis for each generic division. Most of the segregate genera were originally proposed by previous taxonomists, and Weber is resurrecting their taxa. An example is the use of the genera *Viticella* and *Astragene* which are usually referred to the genus *Clematis*. I suspect most taxonomists would prefer leaving these taxa as subgenera, sections or some other grouping of species within the larger concept of a genus. The "weakness" of the narrow generic concept is that the beginning student will not be presented with closely related species as an integral taxon. The "strength" of the concept is that it will provide a fresh view to taxonomists long accustomed to the staid treatment of taxa that one finds in modern floras. In many examples, the generic concepts are reminiscent of Small's *Manual of the Southeastern Flora*, published in 1933.

From my own point of view, I found the taxonomic treatment interesting and stimulating. Last, but not least, the book's price—\$19.50—makes it a bargain.

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## ZOOLOGY

### ZOOLOGY

by L.G. Mitchell, J.A. Mutchmor & W.D. Dolphin. 1988. Benjamin/Cummings Publishing Co. (2727 Sand Hill Road, Menlo Park, CA 94025). 926 pp. \$39.95 cloth.

The authors are all experienced zoology teachers and the book's reading level and content selection reflect this background. They realize that many

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introductory courses labeled as zoology focus heavily on animal diversity, and they follow this format by titling Unit III The Animal Kingdom and the 16 chapters that follow comprise nearly half the book. The authors choose, however, to precede this material with a unit on Functional Systems of Animals (homeostasis, bioenergetics, nutrition, movement, coordination and similar topics) and a unit on Reproduction and Evolution which includes development and genetics. Unit IV, which completes the book, is titled Ecology and consists of only two chapters—one on Population Ecology and one on Communities and Ecosystems.

The five kingdoms of life are indicated in the introductory chapter and discussions of Sarcomastigophora, Apicomplexa, Microspora and Ciliophora are included in the protozoan chapter of the animal kingdom. The lower metazoa includes Myxozoa, Placozoa, Mesozoa and Porifera. Chapters on radiate animals, acoelomates, pseudocoelomates, molluscs, annelids and annelid-like protostomes, arthropods and similar phyla, non-chordate deuterostomes are followed by seven chordate chapters. One of the features which will appeal to instructors using a portion of the book is the use of open arrows in the margins to indicate sections that are pertinent in other parts of the book.

Another feature I think is distinctive is placing sections titled Trends and Strategies between chapters to tie things together. An example of one of these is The Significance of Body Cavities which is between the chapter on acoelomate and pseudocoelomate animals. Here the hydrostatic support provided by a fluid-filled cavity is discussed along with a comparison of pseudocoels, coeloms and hemocoels.

There are "boxed essays" in more than half the chapters, focusing on special topics the authors consider to be of interest to students.

Clear photographs, some of which are in color, and many distinct diagrams and drawings provide a well developed art program. A 21-page appendix provides a chart detailing the major characteristics of protozoa and animal phyla. A glossary is also included. You can never judge a textbook fully until you use it but this one should become a mainstay in the field.

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## GENETICS

### PRIMER OF GENETIC ANALYSIS

by J.N. Thompson, J.J. Hellack & G. Braver. 1987. Cambridge University Press (32 East 57th St., New York, NY 10022). 175 pp. \$32.50 cloth, \$11.95 paper.

In every general genetics class there are invariably some students who fail entirely to grasp the basics of the subject and either drop out or become permanent fixtures in the instructor's office. Usually they are not unintelligent but simply overwhelmed by their first biology course which has a strong emphasis on logic and problem solving rather than memorization and regurgitation.

This primer offers a problem solving approach to basic genetics written specifically for these students. In this emphasis, it differs from other problem manuals and from the problems usually found in genetics texts. It is meant to be used in combination with a course text and includes a convenient cross index to 13 of the more popular ones. Even if the instructor's text is not listed, the topics, which range from Mendelism to molecular genetics, can easily be adapted to any book. Each chapter contains a brief review of the topic ("Study Hints"), a list of important terms and a problem set followed by complete worked solutions to every problem. There are also practice tests for nine of the major topics, again followed by complete solutions. A glossary and reference tables for statistical analysis and the genetic code are also provided.

The authors' relaxed writing style is well suited to their goal and they have been especially successful with the major feature of the book: the problems and solutions. Some of the problems are quite imaginative and should help maintain student interest. The solutions are not only clearly written but, in most cases, emphasize logical analysis rather than simply present a series of steps. This will discourage memorization and illustrate that a problem can often be approached by different methods. The "Study Hints" provide a brief introduction to the most important aspects of the topic. Students, however, should follow the authors' instruction to read their text first. These sections are too sketchy to stand on their own. The lists of important terms also emphasize the knowledge students must gain from their texts.

Some of the book's shortcomings are probably the result of the authors' attempt to keep the manual brief. While molecular genetics is not slighted, there is no chapter on genetic engineering, a topic especially amenable to problem solving. The authors emphasize that their approach to classical genetics is primarily eukaryotic and the chapter on prokaryotic genetics lacks any discussion of selective systems, an aspect that many students find more confusing than the genetics itself. Conditional probability, an obstacle for some students, is not covered in the probability chapter but is mentioned in passing in the chapter on pedigree analysis.

These deficiencies do not detract significantly from the authors' primary goal. Students will presumably be equipped to handle other aspects of genetics once they have learned how to approach the subject. Keeping a few copies of this primer available may save both instructors and students a lot of frustration.

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