
Plant Anatomy: Experiment and Interpretation, Part 2. Organs. *Elizabeth G. Cutter.* Addison-Wesley Pub. Co., Reading, Mass. 1971. 343 p. \$16.50 (hardbound), \$7.95 (paperbound).

At last, a first-rate, comprehensive, physiological-developmental plant anatomy book has been written! Dr. Cutter's beautifully illustrated book can be read profitably by all plant scientists. Its contents, current concepts of causal developmental plant anatomy, should be incorporated into those anatomy courses which are not yet up to date. Whereas an instructor may choose not to use Cutter's book, or any other, as a text, students enrolled in a plant anatomy course will want to purchase a copy of this book and use it as an invaluable source of information, explanations of ontogenetic phenomena, and exciting concepts suggestive of research projects.

The effects of hormones, surgical manipulations, exogenously applied chemicals, other environmental factors, and genes upon the differentiation and development of tissues and organs of seed plants are elucidated and meticulously documented, with citations to the original published research papers. Histochemical and ultrastructural aspects of ontogenetic changes are discussed when data are available. Fact, inference, and speculation are clearly characterized in each instance so that the reader will not mistake one for the other.

Errors, controversial inferences drawn by the author, and failure to mention or discuss material presented in pertinent, notable, research papers are defects of most scientific books, but remarkably few of these flaws are to be found in Cutter's book. It is regrettable that Cutter failed to cite or discuss the exigent findings of Isanogle (*Ecology* 25: 404-413, 1944) on sun-vs.-shade leaf structure, of Smith (*Amer. J. Bot.* 21: 194-210, 1934) on embryonic leaf structure, and of Gawadi and Avery (*Amer. J. Bot.* 37: 172-180, 1950) on leaf abscission.

This exciting book dealing with the initiation, differentiation, maturation, and growth of the root, stem, leaf, flower, fruit, seed, and embryo could have been written only by a circumspect thinker and a fine teacher of physiological-developmental plant anatomy.

RICHARD A. POPHAM

BOOK REVIEWS

The Genera of North American Plants. *Thomas Nuttall.* Introduction by *Joseph Ewan.* Hafner Publishing Co., New York. 1971 (facsimile of the 1818 Edition). Vol. I, [i]-xxxvii + [i]-vii + 312 p. Vol. II, [i] + 254 p. + Index, 10 p. + erratum and additions. \$32.50.

This well-noted classic, entitled *The Genera of North American Plants, and A Catalogue of the Species to the Year 1817* in the original, was the first comprehensive North American flora published in the United States. Fully characterized, in the English language, are 834 genera, including 42 described as new to science, as well as many species also new to science. Those species that are well known in the flora are merely enumerated, except where new information is supplied concerning structure, habitat, or distribution. Nuttall's critical assessments were based primarily on personal observation and acquaintance with plants in the field and herbarium. From 1807-1817, his travels included trips to the Delaware River valley, New York state, the Great Lakes region, the Wisconsin, Mississippi, Missouri, and Ohio River valleys, and many parts of southeastern United States.

Nuttall's *Genera* surpassed the earlier publications of Michaux (*Flora Boreali-Americana*, 1803) and Pursh (*Flora Americae Septentrionalis*, "1814" [1813]), both published in the Latin language and both published abroad, in France and in England, respectively. For the determined, self-taught botanist, Nuttall, at 32 years of age, prepared an amazing publication that proved to be a landmark in American botany, initiating the shift of publication of studies of North American plants from the eastern to the western hemisphere. The *Genera* was described by his contemporaries as "a work abounding in accurate information respecting the plants of this country" (Stephen Elliott); "it has contributed, more than any other work, to the advance of the accurate knowledge of plants in this country" (John Torrey) (p. xx of Ewan's Introduction).

Professor Ewan's Introduction is a concise, masterly analysis of the *Genera*. He describes Nuttall's role in early American botany, gives information on the whereabouts of his collections that document the descriptions of the genera and species, lists and briefly states pertinent information for 17 names of individuals who contributed specimens or information to Nuttall, provides a Gazetteer of 76 place names—with corresponding modern equivalents and county locations—that Nuttall cited throughout the book. Under other topics, Ewan analyzes information on the botanical references cited by Nuttall, the problems encountered in the publication of the book, the response of the *Genera* by the botanical public as noted from contemporary reviews of Stephen Elliott, John Torrey, Caleb Cushing, C. S. Rafinesque, and John Locke, and the taxonomic value of the *Genera* today. A chronology from 1786 to 1818 not only gives information on Nuttall's life and work, but also on contemporary events involving other individuals. Noted are events from the lives of William Baldwin, Frederick Pursh, Benjamin Smith Barton, Bernard M'Mahon, Henry Muhlenberg, John Bradbury, and John Lyon, as they influenced and moulded Nuttall's activities toward the preparation of the *Genera*.

Professor Ewan's analysis is documented with 29 notes and 24 cited published references. One page of Nuttall's handwriting is reproduced from the original manuscript of the *Genera*. Professor Ewan's Introduction, along with Jeannette E. Graustein's full-length biography and American travels of Nuttall (reviewed in Ohio J. Sci. 68: 61, 1968) provides two major reference sources particularly useful to the critical student using Nuttall's *Genera*. This facsimile is a welcome contribution to American botany, being volume 7 in the *Classica Botanica Americana* Series under the editorship of Professor Ewan.

RONALD L. STUCKEY

Vascular Plants of Ohio. *Clara G. Weishaupt.* Kendall/Hunt Publishing Co., Dubuque, Iowa. 3rd edition (paperback). 1971. iv + 292 p. \$7.50.

We in Ohio are fortunate in having one of the few state vascular plant manuals which is complete yet constructed primarily with the beginning student in mind. The third edition of Dr. Weishaupt's book has an organization similar to the preceding editions, with a key to the families followed by keys to the genera and species within each family, keys to woody plants in summer and winter conditions, a glossary, and an index.

The new edition has been improved by the addition of diagrams and explanations of those terms which are possibly best explained by illustration or which are especially difficult for a student to comprehend. In addition, keys to species of the more common genera of deciduous woody plants in the winter condition have been added. A few species not previously known to exist in Ohio have also been incorporated, and several keys have been clarified or simplified. Undoubtedly the beginning students in Ohio will continue to complain about the wearisome and uncertain task of keying, seldom realizing how lucky they are to have available such a complete yet workable tool.

DENNIS ANDERSON

The Oxford Book of Invertebrates. Text by *David Nichols* and *John Cooke*. Illustrations by *Derek Whiteley*. Oxford University Press, Ely House, London W. 1. 1971. viii+218 p. 96 plates. \$11.00.

There is a growing need to inform the public of the nature and value of all forms of life; hence there is real cause for commendation when professionals have concern enough to take the time to meet this obligation. This volume is designed to meet the demand for information on the British invertebrates, exclusive of insects. As one of a set of four volumes on the entire British fauna, it covers the immense area of invertebrate animals better than would be imagined. A markedly successful effort has been made to present the subject using a terminology which communicates rather than bewilders. Plates in full color opposite each basic page of text teach as well as contribute to the attractiveness of the volume. Nearly all examples illustrated are identified to species. The volume is enhanced by the inclusion of a section on the classification of the invertebrates, a glossary, and thoroughly functional table of contents and index.

This book is recommended to those wishing an illustrated, annotated atlas of the common forms of invertebrate life of the world, using British species as examples. It is especially appealing, since this information has been gathered together in a single volume at a modest price. This venture in the popular presentation of a vast and complex subject sets a good example to which American zoological writers might well aspire.

DAVID H. STANSBERY

Ecological Isolation in Birds. *David Lack*. Harvard University Press, Cambridge, Mass. 1971. xi+404 p. \$12.00.

Birds are fun to observe; unordered observations are not science, but such observations still make up too much of what passes for the science of Ornithology. David Lack was among the first to plan and order observations of birds in a way that makes sense to an ecologist, and this book is Lack's attempt to interpret the great mass of zoogeographic data and observations on the more important habits of a large number of common birds. This book will be a point of departure for any ecologist and, therefore, may well be the most important bird book one can put in a college library.

It is a truly comparative study, dealing with the question of why there are so many species of birds, and is an enlightened example of the way in which the facts collected since the time of Linnaeus ought to be used. Regrettably it gives little indication that the future may well lie in the hands of the analytical ornithologists, such as MacArthur, Southern, Root, Cody, and P. Williamson.

Lack provides the basis but no direct stimulus for analytical studies, and people moving in such directions must ignore the facile postulate stated in the first two sentences and doggedly followed throughout the book: "Two species of animals can coexist in the same area only if they differ in biology. Such ecological isolation, brought about through competitive exclusion is of basic importance in the origins of new species . . ." Most of the book, however, contains significant, modern data on observations on birds that have an ecologic basis.

RODGER MITCHELL

Physical Characteristics of the Reef Area of Western Lake Erie. *Charles E. Herdendorf* and *Lawrence L. Braidech*. Ohio Division of Geological Survey, Report of Investigations No. 82, 1207 Grandview Ave., Columbus, Ohio 43212. 1972. iv+90 p.+7 pls. \$2.50, plus 10 cents tax in Ohio, and 25 cents mailing charge.

The importance of the reef area of western Lake Erie as spawning and feeding grounds for such species as walleye, white bass, and channel catfish led to a cooperative study by the Division of Geological Survey of the Ohio Department of Natural Resources and the U. S. Fish and Wildlife Service to determine the physical characteristics of that area. The results of this three-year joint project are presented in this report.

The reefs and surrounding area were mapped topographically and bathymetrically, and a subsurface sampling program was instituted to determine a chronology of ecological and geological events. In addition, the movements and the physical and chemical properties of the lake water were measured. The existing physical environment was related to the equilibrium of the ecosystem.

The area of the study is the Ohio part of Lake Erie from the Kelleys Island area westward to the longitude of Turtle Creek. The maps and charts will be useful to commercial fishermen and to dredgers, and will be of interest to many who visit the island area of Lake Erie.

OHIO DIVISION OF GEOLOGICAL SURVEY