BOOK REVIEWS

The Vascular Flora of the Glaciated Allegheny Plateau Region of Ohio. Barbara K. Andreas. 1989. Bulletin of the Ohio Biological Survey Vol. 8 (1), New Series. College of Biological Sciences, The Ohio State University, Columbus, OH. 191 p. $15.00 paper.

This physiographic section of Ohio is bounded by a narrow part of the Great Lakes section to the north, the Pennsylvania–Ohio border to the east, the Unglaciated Allegheny Plateau section to the south and southeast, and by the Till Plains section in the west. The later boundary is somewhat arbitrary and often follows the Mississippian–Devonian surface bedrock juncture (Allegheny Front Escarpment) which is not always where the Wisconsin Till Plains begin, or end. It is the Illinoisan terminus that "forms the eastern and southern boundaries of three-fourths of the study area" (p. 14). These Illinoisan tills are so old, thin, or washed away that the vegetation is the same as on the Unglaciated Plateau region.

With a little imagination, the region looks like a "partly bent human leg" with the "toe" barely into Highland County to the southwest, and the end of the "thigh" covering most of Ashtabula County in the northeast and most of Columbiana County in the east. Twenty-three counties are included in this study; all of seven and parts of 16 counties.

Andreas reports that most of the distinctive elements of the flora of the region are restricted to Wisconsin Glacier deposits and weathering. Semi-ombrotrophic bogs, boggy forests, and hemlock-white pine forests in Ohio are found only in this phytogeographical region (same as Physiographic section). In Ohio, 151 taxa are for the most part confined to this area and give it its distinctiveness: 50% are confined to wetlands—peatlands in particular; 18% are found only in the hemlock-white pine hardwood forests; and 7% are on eroding slopes where postpleistocene runoff has exposed old lake deposits and shales. The remaining distinctive taxa, 25%, are found in a variety of forest communities. Of the 19 types of plant communities described, eight of them are different natural forest types. Seven are wetland communities. There are three types of disturbed areas caused by humans: waste places, old fields, and artificial impoundments. Prairie remnants and eroding slopes are two other types even though no true prairies are to be found, only indicator species in the dryest areas, which can also be eroding slopes.

The vascular flora consists of 2,002 species and 27 interspecific hybrids. There are 706 genera and 148 families represented. About 72% of the plants at the species level are native; 28% are nonindigenous. The divisions (and classes of angiosperms) are placed in phylogenetic order, but the families, genera, and species are alphabetized within each higher taxonomic group. The author uses several recent floristic works for nomenclature and circumscription, but covers any problems with synonomy with the inclusion of names used in Fernald (1950), *Gray's Manual of Botany* (8th ed.), for the same taxon.

The species and hybrids are numbered from 1 to 2,029. Two symbols are used before the binomial where appropriate, # and *. The number (#) symbol indicates that the taxon is one of the distinctive plants to the Glaciated Allegheny Plateau in Ohio. Appendix B lists these plants separately. An asterisk (*) indicates that the plant is alien to this region. It is then stated whether the taxon is considered adventive or naturalized—a good distinction to make now for future studies. The common names are consistent with the floras of other authors which Andreas cites.

A frequency rating is given for each taxon. Whether the species is common, frequent, infrequent, or rare is based on the number of counties the taxa have been collected in. It is not based on the abundance of a plant in a particular habitat. The rare taxa, those found in only 1 to 4 counties, are given "abbreviated habitat information, general location, name of collector, collection number, date, and herbarium accession number." Collections made prior to 1968, and not relocated, are said to be "presumably extirpated" (p. 32).

Each taxon has habitat information provided, and a two-letter county code list of the counties the plant has been collected in. Herbariums known to have specimens from this area were surveyed. Habitat data were taken from the labels and from Andreas's field notes.

Appendix A lists other county records of additional taxa (376), but these are outside the Glaciated Allegheny Plateau. The major usefulness in doing this is for the floras done by county. Parts of 16 counties lie outside the phytogeographical region. Fifteen of the 23 counties included in the region had been surveyed floristically by other investigators. Andreas compiled the floras of the eight remaining counties and integrated the floras of all 23 counties—one of her major goals.

Appendix C has the families arranged according to the Englerian System. The floras of Ohio and its parts that I can think of follow this basic order. There are sound arguments that this system is out of date, and until we have a more accurate phylogenetic classification, the arrangement Andreas uses is satisfactory. It is easier to use if one is not comfortable with the Englerian System.

There is an index to the Latin names and to the common names which give catalogue number(s) rather than the page. This has been well done and is useful, except if the taxon is only, or again, located in the Appendices.

By compiling the flora as that of the Glaciated Allegheny Plateau Region of Ohio, it complements in particular Cusick and Silberhorn's (1977) *The Vascular Plants of Unglaciated Ohio*, published also by the Ohio Biological Survey. The goal reached is a comprehensive flora of the entire Allegheny Plateau region in Ohio. This work was an ambitious undertaking and is a fine achievement.

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The Genetic Revolution: Scientific Prospects and Public Perceptions. Edited by Bernard D. Davis. 1991. The Johns Hopkins University Press, Baltimore, MD. 295 p. $15.95 paper, $45.00 hardcover.

Remember going to the movies on Saturday afternoon to see such adventures as *The Thing, The Fly,* and *The Time Machine*? I do. But perhaps you better remember the more recent sci-fi's such as *The Thing, The Fly,* and *The Time Machine.* America has a love for science fiction movies, a love strong enough to remake former classics. The movies have helped create stereotypes of scientists, stereotypes of what scientists do, and stereotypes of how scientists think. How accurate are these stereotypes? How have they influenced our perception of scientists in the "real world"?

However the average citizen envisions science, it is probably distorted. Science is too multifaceted to be encapsulated in the pigeonhole process of stereotyping. Nevertheless, it is of concern to scientists that scientific endeavor should not be molded by stereotypes in the formation of public policy.

In his book, *The Genetic Revolution: Scientific Prospects and Public Perception,* Bernard D. Davis, as editor, has compiled not an answer, but an investigation of the question of whether we, as humans, should pursue genetic engineering and, if so, to what extent.

Bioengineering—should we continue? The answers range from a resounding yes with no restrictions to an absolutely no for ideological reasons. Neither extreme is pursued in this book, neither the unrestricted "science" of Joseph Mengala nor the reactionary idealism of Jeremy Rifkin. All the contributors of the book agree, bioengineering will be pursued. Disagreement centers on the degree to which the pursuit is to be conducted.

It is the nature of science to deal with uncertainty and scientific investigation merely makes problems less uncertain, but uncertainty will always exist. All the contributors to *The Genetic Revolution* agree that the risks of bioengineering are very low, but are they acceptably low? While bioengineering in the laboratory may be acceptable, is the massive release of bioengineered organisms into the environment equally acceptable? Is risk assessment to be managed by a case-by-case method or are certain categories of organisms or investigations to receive blanket exemptions? Was the Asilomar Conference in 1975 a statement of concerned scientists or a premature risk assessment lacking in scientific logic? These and many other questions are addressed by the contributors. While no conclusions are reached, the bulk of opinion, including that of the editor, is that science has erred on the side of caution, valuable time being lost in solving global problems treating bioengineering as a novel process rather than assessing the product of that process.

The contributors can be divided into two main camps: the molecular biologists and microbiologists who are apt to advocate increased use of the technology pointing out that inadequate attention has been paid to the evolutionary role of competition in limiting spread, and the ecologists and environmentalists who point to the unknown effects of the transformed organisms on the environment. While the author clearly sides with the former, dissenting opinion, it seems, he nevertheless makes it clear that we have not heard the last from the latter.

The Genetic Revolution is written for the scientist, concerned citizens, and government officials. An early chapter (Chapter 2) provides the scientific background needed to adequately assess the cogency of the arguments including those dealing with the law, the role of the government, and the impact on public policy.

The Genetic Revolution should do much to dispel the myth of the scientist as bogeyman and of science as the vehicle to the development of "Killer Tomatoes." Risk assessment, a prominent feature of the book, will require more empirical data and an extrapolation of general scientific principles, including knowledge of the microbial world and an understanding of evolutionary principles. The general population may love its *Star Trek* and *Star Wars,* but any advance in solving our global problems will require clear thinking that goes beyond the stereotyping of the average sci-fi fan.

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Edible Wild Plants of Pennsylvania and Neighboring States. Richard J. Medve and Mary Lee Medve. Illustrations by Kimball S. Erdman. 1990. The Pennsylvania State University Press, University Park, PA. 242 p. $16.95 paper, $35.00 cloth.

This handy size volume is a worthy addition to the numerous books on wild edibles. The husband and wife team of Richard and Mary Lee Medve have created a very useful text. It is definitely good enough for a university level course although it was not written as such. More accurately, this book is aimed at anyone who desires to use this type of individual response to nature (edible plant gathering) to form a closer relationship with the earth. For example, foraging may bring into play a whole series of faculties or behaviors (perhaps even turn on some dormant genes) that, when brought into play in an integrated manner, make us feel much more at home on the earth. Richard Medve is a professor of biology at Slippery Rock University, which is a leader in innovative environmental education. The information he presents has been accumulated during the course of conducting field trips for thousands of individuals over a span of 38 years. Mary Lee Medve has contributed library research and expertise in food preparation and cooking, which she has done over an equivalent time span. The food aspect takes up about half of the discussion of each plant. The authors felt that they could maximize the usefulness of their book by thoroughly checking the information gathered on each plant and by being careful to use correct botanical terminology. This is emphasized by a two-page discussion of the need for precision when practicing food foraging.

The 100+ plants covered are not keyed. Instead they are arranged according to size from the smallest to the largest. The smaller herbaceous plants are therefore at the beginning of the book and the trees are at the end. This seems like it is a convenient way to locate the plant both for the expert who knows what the plants look like and for the raw beginner who has run across a plant for the first time.

For the person completely unfamiliar with the plants of the Mid-Atlantic States, using an illustrated key in conjunction with this book would probably be advisable. The drawings, which are of the useful parts of the plant, are satisfactory although not enough plants are covered to use it as a field guide. The kinds of information given for each plant which covers two pages are: drawing, description of characteristic, habitat, distribution, edible parts, food uses, precautions, preparation, recipes, and pertinent remarks. There is an index of food uses, a list of recommended books, a glossary of botanical terms, and a table is included at the end which lists the nutrient composition of selected edible plants.

Because of the combination of carefully prepared information on identification as well as on the use of the edible wild plants discussed, the fate of this volume should be a host of satisfied users.

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An Ecological History of Agriculture, 10,000 B.C.–A.D. 10,000. Daniel E. Vasey. 1992. Iowa State University Press, Ames, IA. 363 p. $34.95 hardcover.

The practice of agriculture is inseparable from ecology, for it depends on the environment for vital requirements while it simultaneously affects, and is affected by, natural communities. Indeed, much of the history of agriculture has been a struggle of man against nature, much more than with it, in his efforts to produce food ever more abundantly and efficiently.

This treatise effectively describes the influences of ecological factors, especially climate and soils, on the historical development of agriculture and on its modern practice in different regions of the globe. Arranged in twelve chapters with plentiful references, it presents "An Ecological Approach" in Chapter 1, in which Vasey states, "The systems that are of primary interest are agricultural ecosystems contained within the boundaries of human management. Of secondary interest are impinging cultural systems, notably population, economy, technology, and resource exploitation" (p. 3). He introduces such concepts as equilibrium, stability, change, niche, and trophic structure, and the requirements of the primary producers (heat, light, air, water, and nutrients).

There is a certain enticement in a title which promises to carry the reader back almost 12,000 years to view the beginnings of agriculture, and which promises as well a glimpse of what might be an almost unimaginable assortment of agricultural technologies and crops 8,000 years hence. The second chapter rapidly reviews the (apparently meager) evidence of the earliest agriculture and dwells primarily on several theories regarding the origins of agriculture, including diffusion, population pressure, environmental change, coevolution, and, as the author prefers, composite theories encompassing two or more of these.

Succeeding chapters provide an interesting overview of the kinds and distributions of preindustrial agricultural systems, drawing evidence from ethnographic, historical, and archaeological sources. Vasey is careful to point out that ". . . coverage is necessarily less complete of past possibilities than of present practices. Not all recent systems that rely on preindustrial technology were present in the more distant past, and some ancient systems may have become extinct" (p. 44). He treats pastoralism (reliance primarily on domesticated animals for one's livelihood) in a chapter separate from other forms of agriculture ("the production of food from domesticated plants and animals," p. 341) because of the distinctiveness of its environmental impact, ". . . the demands of management, and commonly associated sociopolitical forms" (p. 63). Succeeding chapters present preindustrial agriculture in the tropics, dry lands and dry summer lands, and humid temperate lands.

Two chapters chronicle the global rise, at varying times and rates, of industrial agriculture, as it was influenced by modern science, industrial technology, and "industrial inputs upon agriculture" (p. 214), through ". . . a massive escalation of human intervention in ecosystems" (p. 215). Major developments in soil science, agricultural chemistry, plant protection, animal and plant breeding, mechanization, fertilizer and energy inputs, and livestock feeding are discussed. Social, political, and economic influences on agriculture in different countries and regions are reviewed. The author notes, "Land concentration and the replacement of labor by mechanization are both variable trends, though mechanization is universal and land concentration nearly so" (p. 252). He questions whether land concentration is inevitable and notes the continuing survival in developed countries of "smallholders" via cooperation (cooperatives), off-farm employment, and subsidization.

Discussion moves to "the alternative agricultural movement," as well as biological control and integrated pest management (IPM). In reference to trends following World War II, Vasey observes, "More and more farmers are moving toward restraint and selectivity in the use of pesticides. If they go further and embrace IPM, they resume their ancient role of ecologist but may now consult with professionals" (p. 269). Surprisingly, nowhere does he address the environmental, health, and economic forces which have caused farmers to move in this direction. He does question whether alternative agriculture can feed the world, and discusses the economic and input factors which determine crop productivity in various parts of the world using forms of alternative agriculture. He points out, for example, that one ". . . obstacle to matching the yields of industrial agriculture may be the restriction on herbicides . . . [presently] the only economic substitute in highly productive industrial agricultural systems is mechanical cultivation, which is not always equally effective," (p. 273) and thick mulches are not feasible on a large scale. He recalls the optimism of others that ". . . 'integrated weed management' in a favorable social and economic climate could entail substantially reduced use of chemical herbicides" (p. 273). Unfortunately, he does not go on to describe the components or application of this management technique.

Under the title "Agriculture for Development," the

penultimate chapter addresses ways in which agriculture in the less developed countries can feed growing populations and assist economic development. He particularly considers "the green revolution" and innovative tropical systems, very briefly touching as well on the potential that genetic engineering and vegetative propagation offer to developing countries. Neither the technology nor the potential ecological consequences of either practice is mentioned.

The final chapter, "The Future," presents the demographic transition and widely disparate predictions of the world's ultimate human carrying capacity (with one prediction of 160 billion). Energy alternatives and the sustainability of agriculture are addressed, and the prospect is raised of increasing yields still further. Rather than attempting to describe specific, probably unpredictable, new agricultural technologies or crops available several thousand years from now, Vasey concludes his book by presenting alternative scenarios of agricultural production under the assumption that population will stabilize at either a high (14 billion) or a low level and that agriculture will use either high or low energy input strategies.

The book is generally well written and is almost free of typographic errors. Inclusion of more than the five tables and ten figures to illustrate concepts and examples would probably improve its readability. Many readers may need to refer frequently to a dictionary to decipher the many undefined terms. Although a glossary defines many terms, and others are explained in the text, many others are assumed to be in everyone's vocabulary, among them anthroposophy, byre, chaenopod, eco-agriculture, entomophagous, isohyet, latifundio, pot irrigation, tube well, and usufruct. Some words, such as marling, are defined at the second or a later usage. Many lesser-known crops (e.g., mangosteen, durian, teff, *Iva*) are mentioned by common or scientific name with no description; a table listing these, where each is grown (using Köppen's climate classification scheme as presented), and the kind of product, would be a very useful reference for the reader.

Several passages disclose an apparent insensitivity or naiveté of the author to the ecological consequences of modern agricultural practices. For example, in reference to claims that the world's carrying capacity has already been exceeded, Vasey states, "A tremendous acceleration of extinction is taking place, a loss of the world that we have known, but the judgment that we threaten our own survival in this way appears to me, like the mineral vitamins, another instance of confusing value with indispensability. . . We shall miss our victims, but their extinction will not lead us to our own mass grave" (p. 331). He fails to mention the broad concerns regarding the permanent loss of potentially valuable genetic material, crops, medical drugs, and other presently unknown resources through largescale extinctions.

The front jacket flap states that this book ". . . will be of special interest to agriculturalists, agricultural historians, anthropologists, geographers, and anyone concerned with agriculture and its history." Because it devotes relatively little attention to the historic, present, and future impacts of agriculture on the environment, it will probably be useful but of peripheral interest to ecologists, ecotoxicologists, agronomists, and other agricultural scientists.

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The Meaning of Evolution: The Morphological Construction and Ideological Reconstruction of Darwin's Theory. Robert J. Richards. 1992. University of Chicago Press, Chicago, IL. 205 p. $19.95 hardcover.

In this volume Richards carefully and meticulously assembles information from Darwin's notebooks and published writings to support the contention that Darwin subscribed to the Haeckelian view of recapitulation and, as such, considered evolution to be progressive. Richards directly opposes the prevailing modern interpretation, proposed variously by Bowler, Gould, and Mayr, that Darwin embraced the embryology espoused by von Baer and thus was neither a recapitulationist nor a progressivist. Furthermore, Richards contends that the prevailing view has been driven by shared scientific and philosophical interests of these authors, rather than by a shared interest "to recover the past."

The close relationship between development and phylogeny is underscored by Richards (Chapter 2) in tracing the history of the word evolution. It was initially a term used to describe embryogenesis, and later adopted to describe phylogenetic change. The progressive notion inherent in embryological development became associated with the term evolution and could easily be carried over into the phylogenetic context. Etymology aside, it is clear that biologists have long recognized some relationship between ontogeny and phylogeny. Sometimes, as in the case of Lamarck and Haeckel, the view has been seriously flawed. Properly viewed, ontogenetic data can provide valuable insights into evolutionary relationships (Kluge and Strauss 1985).

Richards traces Darwin's thought process to make a compelling case for subscription to recapitulation and, perhaps, to some view of progress in evolution. Richards suggests that Darwin's fascination with Louis Agassiz's contention "of a parallel between embryonic stages and the progressive transitions of fossilized antecedents" strengthened his acceptance of recapitulation. However, whereas Agassiz saw this progressive pattern as the unfolding of a divine plan, Darwin sought an explanation in terms of natural processes. What Richards ignores is that Agassiz's intellectual heirs, to include E. D. Cope, A. Hyatt, and A. S. Packard, among others, used recapitulationist thinking to reach very different conclusions about the evolutionary process. In developing the North American school of NeoLamarckism, these individuals proposed orthogenesis rather than adaptation as the driving force of evolution, a distinctly anti-Darwinian stance (Richardson and Kane 1988).

This book makes a good historical case for Darwin accepting some of Haeckel's recapitulationism and, thus,

Richards has provided an interesting contrast to the historical view of Gould (1977) in *Ontogeny and Phylogeny*. From the scientific perspective, however, this reader was left feeling that Darwin's subscription to recapitulation had no more effect on the value of his theory than did his acceptance of the effects of use and disuse coupled with the inheritance of acquired characters.

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SlideWrite Plus: Presentation Graphics. Version 4 for Windows. Bessie Chin and Larry Daniele. Three 5.25-inch or two 3.5-inch diskettes for PC. Advanced Graphics Software, Inc., Sunnyvale, CA. $445.
GraphPAD. Version 4. Four 5.25-inch or three 3.5-inch diskettes for PC. GraphPAD Software, San Diego, CA. $685.

This is an update of a review of SlideWrite Plus v.3 published in this journal in 1991 (91: 217-18).

Communication is essential in today's society. Whether in the form of a published paper, a poster, or an oral presentation, graphics tend to be an essential tool for communication. Computer graphics have made otherwise difficult tasks simpler. Now with SlideWrite Plus v.4 for Windows, the ease and the beauty can be extraordinary.

SlideWrite Plus v.3 is an excellent program and I too enjoyed going through it's many facets. The program had to be easy to follow for an old Apple user who was not familiar with IBMs. I was thrilled to learn that version 4 was available with Windows capabilities. I now might have the best of both worlds. Running the program was accomplished with ease and produced excellent graphs and pictures on my 9 pin Panasonic printer. I was impressed with the power of the program, allowing graphs to be drawn from data entered from a keyboard or from an existing file. The quality of the program impressed me even more when it performed statistics on a data set. Statistics were impressive, producing standard deviations, standard errors, and confidence limits for each set of data. When these statistical analyses were transferred to a graph, the results were phenomenal. Error bars gave the graph new meaning. Other statistical analyses were equally impressive. The graphics program, GraphPAD v.4, is also easy to learn and use, but of the two, SlideWrite Plus version 4 is easier to use because of Windows and the mouse. GraphPAD produces excellent graphs; SlideWrite Plus's graphs are even better. Although GraphPAD advertises its excellent statistics package, the programs are comparable for most types of statistics.

SlideWrite Plus v.4 includes a library of many figures and chemical symbols that make creating a chemical formula easy. The array of figures is extensive, the figures can be combined or altered to create even more complex drawings.

SlideWrite Plus version 4 for Windows adds the versatility of a mouse to an already excellent program. This is especially so in the creation and editing of drawings. The mouse captures any object on the screen and moves it easily. The wonderful array of figures, images, polygons, and text is available for both versions, but the flexibility of the mouse makes version 4 a better program than version 3.

Overall, I recommend SlideWrite Plus version 4 for Windows highly to anyone who wishes to communicate using graphics with ease. Version 4 is the easiest program to use that I have encountered. It cannot be beaten for versatility. The users of data in a graphic or in pictorial forms will love this program.

Comparison of SlideWrite Plus v.4 for Windows and GraphPAD v.4:

	SlideWrite Plus v.4	GraphPAD v.4
Cost	$445	$685*
Ease	++++	+++
Quality	++++	++
Statistics	+++	+++

*GraphPAD InPlot alone–$395.

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