BULLETIN

SPRING 2005 VOLUME 51 NUMBER 1

PLANT SCIENCE

The Botanical Society of America: The Society for ALL Plant Biologists

ISSN 0032-0919

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BOTANICAL SOCIETY OF AMERICA

A new year! A new volume! A new issue!

There are some new things associated with the *Plant Science Bulletin* (PSB) this year so let me point out just a few. Following the policy established last year for the *American Journal of Botany* (AJB), contributors to PSB are now asked to submit a copyright release form. When articles or reviews are accepted, the editor will send the form to the author who should complete it and forward it to the BSA office. Related to this, contributed articles will be reviewed by one or more members of the editorial board as well as the editor before they are accepted for publication. Finally, the mailing date for AJB has been moved forward so that members will receive their copy at the beginning of the month, rather than the middle or later in the month. Because *Plant Science Bulletin* is bundled with the Journal to members who receive hard copy of the latter, our deadlines for submission of material to PSB must also be moved forward. Effective with the next issue, deadlines for receipt of materials for the spring, summer, fall, and winter issues will be 15 January, 15 April, 15 July, and 15 October respectively.

The changes noted above are minor and soon will become part of the accepted norm. A part of that norm is to solicit articles of importance to the mission of the Society and/or of general interest to the membership. This issue is no exception. We started last year with an article addressing the direction botany is heading [PSB 50(1):2-7]. As mentioned in that article federal agencies and others are having difficulty finding applicants well trained in basic taxonomy to fill some of their positions. We are not the only group aware of this problem. The first article describes the Native Plant Conservation Campaign, a growing network of societies, gardens, and arboreta that among other things shares our concern with declining botany research and education. The second article highlights what will be "just around the corner" from our annual meeting later this summer in Austin. With many of us looking out the window at snow these days, the images in this article may be just the incentive you need to submit that abstract for **BOTANY 2005** in the Lone Star State.

-editor

The Native Plant Conservation Campaign – The National Advocacy Network For Native Plant Science and Conservation

Native plants are not as firmly established in the public eye as their animal counterparts — but they are the foundations of ecosystems. The Center for Biological Diversity, the California Native Plant Society and 30 other plant science and conservation advocacy groups have joined forces to step up the oft-forgotten fight to protect our native flora.

The U.S. is home to more than 15,000 native plant taxa. But as many as one-third of these (more than 5,000 taxa) may be at risk of extinction. Most of these imperiled plants receive little or no protection from environmental laws. Every day, roads and houses are being built on wildflower fields; off road vehicles are driven over imperiled plants, and livestock trample delicate mountain meadows. Forests are logged after wildfires, and herbicides applied to kill post-fire natives which might slow timber species regrowth.

In 2002, the Center for Biological Diversity and California Native Plant Society formed the Native Plant Conservation Campaign (NPCC)— the first U.S. national organization dedicated to advocacy for native plant science and conservation. Imperiled

PLANT SCIENCE BULLETIN

ISSN 0032-0919

Published quarterly by Botanical Society of America, Inc., 4475 Castleman Avenue, St. Louis, MO 63166-0299. The yearly subscription rate of $15 is included in the membership dues of the Botanical Society of America, Inc. Periodical postage paid at Columbus, OH and additional mailing office.

POSTMASTER: Send address changes to:
Botanical Society of America
Business Office
P.O. Box 299
St. Louis, MO 63166-0299
email: bsa-manager@botany.org

Address Editorial Matters (only) to:
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animals, even some single species, have national organizations working on their behalf. Remarkably, however, before the NPCC the entire plant kingdom had no organized national constituency for its protection. As a result, native plants have become "second class conservation citizens". Conservation laws such as the federal Endangered Species Act provide weaker protection for plants than for other species. In fact, under some circumstances, plants listed under the federal Endangered Species Act, among the rarest and most imperiled in the world, can be deliberately driven to extinction without violating the law.

The lower priority given to plant protection is also reflected in grossly inadequate staffing and funding for botanical training and research, and for plant conservation and management programs nationwide. Opportunities to study and practice plant taxonomy, biology, and ecology are declining. Botany professorships, departments, herbaria and arboreta have quietly disappeared at many universities. Further, conservation agencies such as the U.S. Fish and Wildlife Service and Bureau of Land Management employ far fewer botanists than other specialists—despite the central role of plants in ecosystem function, and despite the fact that there are generally more imperiled plants than other taxa in need of conservation experts. The U.S. Forest Service, for example, has only 175 full time botanists to manage botanical resources on its 191 million acres. Recovery is the primary goal of the Endangered Species Act, and sixty-one percent of the organisms on the federal endangered species list are plants. However, the Department of Interior reports that less than four percent of funding for recovery programs goes to plants. Thus, many plant recovery plans are not implemented.

In short, imperiled plants face even longer odds for survival and recovery than the rest of our gravely

Astragalus brauntonii. Braunton's milkvetch is an edaphic endemic in small areas of Southern California. It is among the most imperiled species in the world, and was listed as an endangered species under the federal Endangered Species Act in 1997. Nonetheless, it has been bulldozed, sprayed with herbicides, and dug up for years by developers who want to build on its habitat. Unbelievably, none of this is illegal. Although the federal Endangered Species Act protects federally listed animals wherever they occur, it does not prohibit destruction of federally listed plants unless the destruction occurs during a project on federal lands or is permitted or funded by a federal agency. Because of this loophole, the California Native Plant Society is seeking state protection for this plant. The Native Plant Conservation Campaign initiated the Equal Protection for Plants project in 1999 to raise awareness of this problem with the law and of inadequate protection for imperiled plants in general.

endangered species. Meanwhile, irreplaceable plants and their habitat continue to be destroyed by development and mismanaged logging, road building, grazing, and recreation. We created the Native Plant Conservation Campaign to find solutions to these problems.

BUILDING THE FOUNDATION

In the three years since we launched the NPCC, we have already built a thriving campaign. Our accomplishments include:

The NPCC Affiliates. We have a growing network of 32 affiliate native plant societies, botanic gardens, and arboreta in 30 states—representing almost 60,000 individual members.

Cooperators. We have recruited of 13 cooperating scientific and conservation groups that share our biodiversity conservation goals but do not focus primarily on plants. These groups allow us to reach hundreds of thousands of scientists and activists with information on the plight of plants and tools to fight for them.

Tools for Local Advocacy. One of NPCC's top priorities is to make plant conservation easier, more effective - and more fun. Effective advocacy requires understanding of complex agency procedures and legal and scientific issues. Because agencies, laws and policies often treat plants differently than animals, and because basic principles of conservation biology differ for plants and animals, it is crucial to provide plant-specific information to our advocates. We develop plain language "how to" guides and summaries of key legal, political, and scientific information that can be shared with agencies, elected officials, and the press and help local advocates take action.

Federal Advocacy. We give Congressional testimony and meet regularly with legislators and agency leaders to educate them about the value and imperilment of native plants and the inadequate funding and staffing for plant programs.

International Initiatives. NPCC worked with PlantaEuropa, a European native plant conservation organization, to secure the 2002 adoption of a Global Strategy for Plant Conservation by the Global Convention on Biological Diversity.

Public Outreach. We bring native plant issues into the public eye through outreach materials, an educational website, and media coverage.

A SUCCESS STORY! Robbins' cinquefoil (***Potentilla robbinsiana***) is an alpine rose endemic to two sites in New Hampshire's White Mountains. It was listed as federally endangered and critical habitat was designated in 1980 after decades of trampling by recreationists and commercial collectors.

An NPCC affiliate, the New England Wildflower Society, joined with the Appalachian Mountain Club and federal agencies to reroute recreation away from the plant's protected habitat and propagate the species for replanting in the wild.

Thanks to these efforts, the Robbins' cinquefoil rebounded from about 1,800 plants in 1973 to more than 14,000 by 2002. It was removed from the endangered species list in August 2002 but continues to be monitored and protected by agencies and volunteers.

THE PATH AHEAD

We are expanding our existing advocacy and grassroots technical support programs and also developing new programs using a variety of methods and resources to address the wide range of challenges facing native plants and their advocates:

Research and Public Education

"Second Class Conservation Citizens" We analyze data from federal agencies and peer reviewed studies to quantify the underfunding and understaffing of botany programs in federal land and endangered species management. We use these data to inform decisionmakers and the public about the urgent need for increased support for plant conservation.

Declining Botany Research And Education We are in the early stages of a project to quantify the reduction in botany course offerings, departments, herbaria and graduate programs. This is an urgent issue. If the U.S. stops producing botanists and studying native plant biology and ecology, there will be no one to manage and conserve our flora.

Important Plant Areas The Important Plant Areas model is already being implemented in Europe. It is based on Birdlife International's Important Bird Areas Program. Important Plant Areas are sites where native plant protection is a priority—due to the presence of high diversity, rare species, or simply intact and healthy native plant communities. We work with botanists and agencies to identify these areas and advocate for their protection.

· Conservation Economics We seek to counter the widely held belief that protection of the environment must come at the expense of the economy. We give presentations, develop literature reviews and fact sheets to publicize the growing body of evidence that ecosystem health and conservation of biological diversity are essential for economic health.

ADVOCACY

Advocacy and Technical Support. We are building on the local and federal advocacy work described above. We have recently begun to provide one on one "tech support" to help advocates put imperiled plants on the endangered species list, or challenge projects that threaten native plants. We also are initiating annual trips to Washington DC for plant scientists and advocates to meet with policymakers. Congress needs to be educated on plant issues and reminded that plants have a large and diverse constituency across the U.S.

The Equal Protection For Plants Initiative seeks to broaden awareness of the second-class status of plant conservation in staffing, funding and law, and to increase support to remedy the situation. Our Equal Protection statement has been signed by 62 groups representing hundreds of thousands of individuals, including the Society for Conservation Biology, the Botanical Society of America, the American Society of Plant Taxonomists, and Defenders of Wildlife.

Environmental Group Outreach. Many large wilderness and wildlife conservation organizations have traditionally placed relatively little emphasis on plant issues. These groups have unparalleled public access through their newsletters, magazines, and websites, as well as influential lobbying programs. We work to educate the leaders and members of these groups about native plants, and to supply information so that they can incorporate botanical issues in their policy advocacy, publications and outreach.

WE ARE MAKING PROGRESS

Through these programs, we are making significant progress. The large environmental groups are hearing our message, and plant conservation is increasingly becoming a central issue in the mainstream environmental discussion. Plants are now routinely included in environmental lobbying and outreach programs. The agencies are hearing our message as well. In the past 3 years, there has been a 30 percent increase in the number of botanists employed by the U.S. Forest Service—still far from what is needed, but a strong first step. We have also worked with federal agencies to advocate for use of local native plants in restoration projects such as roadside stabilization and stream restoration. With NPCC support, the federal government has spent more than $10 million to grow seed from local native plants, construct greenhouses, establish contracts with local nurseries, and these plant materials are used more widely every year.

WHAT'S NEXT?

We have created the first national native plant conservation organization in our nation's history. Now we must use that organization to change policy. We will continue to document plant problems and produce up-to-date outreach tools for policymakers and grassroots advocates—and citizens who want to become native plant advocates but do not know where to begin. We will continue to make sure our message is heard in the halls of Congress, in university classrooms, in academic societies, in the media and in environmental group headquarters. Finally, we will expand our roster of affiliate and cooperating groups to build an ever-stronger and more effective voice for native plants.

-Emily Roberson

To learn more about how you can help preserve native plant diversity and support the Native Plant Conservation Campaign, please contact NPPC Director, Emily Roberson, at:

eroberson@biologicaldiversity.org
web*: www.plantsocieties.org*

Lady Bird Johnson Wildflower Center

Decades ago, Lady Bird Johnson recognized the country's mounting loss of natural landscapes, native wildflowers, and natural beauty. –In 1982 she founded the Lady Bird Johnson Wildflower Center to help preserve and restore the natural beauty and biological richness of North America.

"My special cause…is to preserve the wildflowers and native plants that define the regions of our land – to encourage and promote their use. Native plants are as much a part of our national heritage as Old Faithful or the Capitol Building in Washington, and they speak the regional accents of the land, saying this is Virginia, or New Mexico, or the California desert after rain." Lady Bird Johnson, 1990.

Entry arches. Photo by Ron Sprouse

The mission of Lady Bird Wildflower Center is to educate people about the environmental necessity, economic value, and natural beauty of native plants. The Wildflower Center works nationally and regionally to raise awareness about native plants and native landscapes, and provides people with the knowledge they need to protect and restore their own native places.

The Center's award-winning headquarters in Austin, Texas reflect the natural and architectural heritage of the Texas Hill Country, and provides unique educational opportunities for professionals, individuals, and families. From this inspiring location, the Wildflower Center also conducts research and promotes native plant conservation to a national and international audience. The Center's facilities display regional architecture, green building principles, and exemplary site planning– the hallmarks of environmentally sensitive design. The buildings also reflect local history, culture, and the use of regionally available materials.

The gardens showcase the beauty and benefits of the wildflowers and native plants of Texas, particularly of the Texas Hill Country. They introduce people to native plants and demonstrate how they

Display gardens, McDermott Learning Center and butterfly habitat gardens. Photo by Bob Daemmrich.

can be used in formal as well as informal landscapes. For home gardeners and landscape professionals who may be uncertain about growing natives, the Center's gardens provide useful horticultural information and diverse examples of landscape design using native species. As one of only three public gardens in the United States that exclusively uses regionally native wildflowers, trees, grasses and shrubs, the Center demonstrates that interesting design and compellingly beautiful gardens can be achieved with ecologically sound plantings.

Land restoration techniques, a centerpiece of the Center's conservation mission, are tested and demonstrated across the entire site. Public trails lead visitors through a living laboratory for restoration research where they can view both disturbed and healthy landscape areas, and learn first-hand how to restore native vegetation on degraded landscapes. The Center works directly with landowners, commercial developers, cities and counties to apply land restoration techniques and bring back healthy native vegetative communities on a landscape level.

Critical to the Wildflower Center's mission is protecting native plants in danger of extinction. As part of a national and international community of scientists, the Wildflower Center is working to understand rare plants and to develop conservation strategies to keep these species where they belong:

in the wild. The Center participates in The Center for Plant Conservation, a national coalition of gardens and arboreta committed to preserving the rare plants of North America. By working with U.S. Fish and Wildlife Service, Texas Parks and Wildlife Department, and other agencies, species of concern are identified and seeds of these rare and endangered species are collected and banked. As a partner in the Millennium Seed Bank Project, a global plant conservation effort led by the Royal Botanic Garden, Kew, seeds are collected from two

Tower and library with Texas Mountain Laurel (***Sophora secundiflora***) in the foreground. Photos by Bob Daemmrich.

priority ecoregions, the Edwards Plateau and the Blackland Prairie.

The lack of information about native plants has made it more difficult for people to appreciate, use, and conserve them. In many areas, it can be hard to find a commercial source of native plants, or landscapers experienced in designing with them.

To address this problem, the Wildflower Center established an information clearinghouse. The Internet-based Native Plant Information Network (NPIN**)** is the largest clearinghouse of native plant information in North America. Since its inception in September 2003, more than 73,000 individuals have used the network to find plant images, information about plant species of North America, and regional information about landscapers and plant suppliers, and a calendar of events related to native plants. NPIN is a free service that is useful to home gardeners as well as professional land managers and plant scientists. An “Ask the Expert” feature allows anyone to get answers and advice from Center staff.

Native Plants magazine is published quarterly and enjoyed by more than 13,000 Wildflower Center members nationwide and other supporters and enthusiasts. Complemented with beautiful photographs, the magazine features stories from across the North America on native plant species, landscaping with natives, horticultural advice, wildlife habitat, and organizations and individuals having an impact on native plant conservation.

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For more information about the Lady Bird Johnson Wildflower Center, to access the NPIN databases, or to become a member, visit www.wildflower.org or call 512-292-4200.

-Mischelle Amador
Lady Bird Johnson Wildflower Center

East view of tower, part of the rainwater collection system. Photo by Ron Sprouse.

News from the Society

Conference Overview

The annual Botany Conference brings together a broad spectrum of researchers, professors, educators and motivated students, all focused on what's new and vibrant in the diverse field of plant biology. Botany 2005 promises to be the most successful in the series. This is the annual conference of four leading professional societies, including the Botanical Society of America, the American Bryological and Lichenological Society, the American Society of Plant Taxonomists, and the American Fern Society.

An anticipated 600 participants will present an anticipated over 500 scientific contributions including 7 symposia, papers, posters, and special lectures. A full slate of field trips and scientific workshops and social events will round out the program.

Botany 2005 is being held at the Austin Hilton, a new hotel that has a enough meeting space for our entire program. An Exhibit Hall will be located in a plush ballroom, and will be the center of social activities including conference-wide breaks and poster session for the meeting.

Saturday, August 13, will feature the 4th Educational and Outreach Forum. This successful component of the Botany conference is designed to draw an audience of educators and researchers involved in the teaching of biology and plant science on many levels, from kindergarten through college. The day will include a range of interesting discussion-type sessions, a keynote lecture and will conclude with a reception, which will give attendees the opportunity to discuss and network in a social setting. For the first time, attendees will be able to apply for Texas Continuing Professional Education Credits for attending Forum sessions and activities.

Sunday, August 14, will be an active day of scientific workshops, and fieldtrips. Sunday evening will open the scientific meeting with the conference-wide Plenary Lecture, followed by an All Society Mixer. Monday morning, August 15, kicks off the scientific sessions and symposia. Tuesday afternoon, August 16, will feature a conference-wide Poster Session, with an expected 200 posters featuring current research and recent topics. Scientific Sessions will conclude on Wednesday August 17. Participating Societies will also hold social events and meetings through out the week.

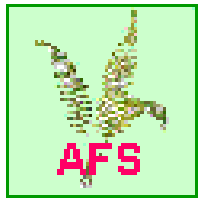
Participating Societies

American Bryological and Lichenological Society (ABLS)

American Fern Society (AFS)

American Society of Plant Taxonomists (ASPT)

Botanical Society of America (BSA)



Increasing Undergraduate Diversity in Botany

The Botanical Society of America (BSA) is pleased to announce the third year of a program entitled "Increasing diversity at the annual Botanical Society of America meeting," This program is supported by the National Science Foundation (Undergraduate Mentoring in Environmental Biology (UMEB) Program) and will provide financial and professional assistance for 10 minority (African-Americans, Hispanic-Americans, Native Americans/Alaskan Natives and persons with disabilities) undergraduate research students to attend the Botany2005 conference. Through a supportive mentoring network and orientation activities, the students will be integrated into professional and social activities of the Botany 2005 conference (http://www.botanyconference.org/). If you know of

an eligible and deserving undergraduates who would benefit from this experience, or if you would like to serve as a mentor, please contact Karen Renzaglia (renzaglia@plant.siu.edu) or Jeffrey Osborn (josborn@truman.edu). A call for applications and application guidelines are available on the BSA (http://www.botany.org) and Botany 2005 (http://www.botanyconference.org) web sites. The deadline for applications is May 1, 2005. This program is an important step towards strengthening the science workforce by utilizing the full range of intellectual talent from diverse ethnic and minority populations. We encourage and welcome your participation.

CENTENNIAL CELEBRATION: WE NEED A THEME

As you know, BSA will be celebrating its centennial when we meet at Chico State University, California, in 2006. In the last issue of the PSB, you read about the various plans underway to help make this a very special event. However, a decision has not yet been made on a theme for the meeting, and the Centennial Committee would like to present one or more ideas to the Executive Committee at its spring meeting on April 8th. The possible themes identified thus far are:

1. Looking to the Future - Conserving the Past
2. Green Earth - Blue Planet
3. Plant a Seed - Sow the Future
4. Plants are Us
5. Growing Our Future, Conserving Our Past
6. Planting Our Future, Conserving Our Past

Thus, please think about the theme and send Bill Dahl (wdahl@botany.org) your choice, ideas and thoughts. Also, any ideas for making the centennial meeting extra special would be greatly appreciated. Dr. William Dahl, BSA Business Office, Botanical Society of America, 4475 Castleman Avenue, P.O. Box 299, St. Louis, MO 634166—299 (phone = 314-577-9566)

Stay tuned. In the next issue of the PSB, the design for the Centennial Medallion will be revealed.

Sincerely,
Jack Horner
Chair – BSA Centennial Committee

Announcements

In Memoriam:

Theodore M. Barkley, 1934–2004

Dr. Theodore M. (Ted) Barkley, Botanical Research Institute of Texas (BRIT), died on 24 July 2004 in Fort Worth, Texas. He was 70.

Ted was born on 14 May 1934 in Modesto, California. He received his B.S. from Kansas State University in 1955, his M.S. from Oregon State University in 1957, and his Ph.D. from Columbia University in 1960. Ted joined the faculty of Kansas State University in 1961 where he enjoyed a 37-year career as a professor and curator of the herbarium. He retired from K-State in 1998 and moved to Fort Worth, where he was a Research Associate at BRIT until his death.

Ted was well-known for his research on the systematics of the North American Senecioneae (Asteraceae), especially *Senecio*, *Packera*, and allied genera. He published more than 30 research papers on the nomenclature, systematics, and phytogeography of these challenging plants. Ted trained nearly a dozen Masters and Ph.D. students, and influenced the careers of countless other undergraduate and graduate students during his tenure at K-State.

Ted firmly believed that the results of systematic research must be made accessible to the broader scientific community and to the general public through the writing of floras. “How does this allow a person to put a name on a plant in hand?” he often asked. He devoted much of his career to floristic research. Based partly on the published and unpublished manuscripts of Frank C. Gates, botany professor at K-State from 1919–1955, Ted wrote A Manual of the Flowering Plants of Kansas in 1968, which he used in his plant taxonomy class. Ted was a central figure in the Great Plains Flora Association, an alliance of 15 botanists from 13 institutions that produced two seminal floristic works about the vascular plants of the central North American grasslands: Atlas of the Flora of the Great Plains (1977) and Flora of the Great Plains (1986, 1991). Ted was an editor and contributor for these books, the latter of which received the Henry Allan Gleason Award in 1987 for outstanding publication in the fields of plant taxonomy, plant ecology, and plant geography.

Ted carried his passion for floristics to another major initiative in the 1980s – the Flora of North America (FNA) project. He played a central role in the project during its formative year and remained

active in FNA until his death. He served as North Central U.S. Regional Coordinator from 1991–1998, Taxon Editor for Asteraceae from 1991–2004, Lead Editor for Asteraceae for 1998–2004, member of the Editoral Committee from 1984–2004, and member of the Management Committee from 1996–2004. He moved to BRIT in 1998 in large part to devote his full attention to the establishment of an editorial center there to coordinate production of three volumes covering the Asteraceae. That center carries on, and Ted's work, and that of many colleagues, will be published in 2005 – a remarkable achievement in North American botany.

Ted was a life-long student of the history and philosophy of taxonomy. He often concluded his plant taxonomy lecture on the history of botany by recounting his own academic lineage: Barkley was a student of Cronquist, who was student of Rosendahl, who was a student of Engler, who was a student of Göppert, who was a student of Beckmann, who was a student of Linnaeus. The impact on students was tangible and indelible. While respecting botany's history, Ted foresaw many of the challenges and opportunities that the revolution in information technology would bring to the discipline and to science in general. He pushed for a new generation of biologists to be trained to mine the voluminous data accumulated from experimentation and observation, to place them in a broader context, and to extend their utility.

A gifted communicator, Ted had a clear and unencumbered manner of expressing himself. His love of puns – magnified when he was a doctoral student with Art Cronquist – was renowned. Ted's finely honed lectures were replete with puns, wordplay, and the occasional double entendre, many of which were lost on students feverishly transcribing lecture notes. For me, one of his most memorable lectures was delivered when I was a teaching assistant in his plant taxonomy class. Ted's mother, Faye, was visiting from California, and Ted invited her to sit in on the class. Faye and I planted ourselves in the back of the lab as Ted launched into his lecture with characteristic enthusiasm. Soon into it, we decided to evaluate Ted's performance. With each pun, Faye and I hastily scrawled scores from 1 to 10 on notebook paper and flashed them at Ted. Nonplussed at first, Ted quickly grasped the significance of the numbers and seized the challenge to rack up maximum points for delivery and impact. The students were oblivious; the performance was the stuff of legends.

Ted cherished the opera and tea time. At K-State, he spent most Saturdays in his office in the herbarium perfecting manuscripts, listening to the Metropolitan Opera on the radio, and breaking for a pot of Lapsang Souchong or Oolong in the mid-afternoon. Ever the teacher, light conversation over tea inevitably would give way to science, and Ted would regale participants with a homily about some botanical luminary, generic concepts in the Senecioneae, or the floristic heritage of North America.

Memorial services were held in Texas on 26 and 27 November 2004. Another service is planned for 2 April 2005 at the College Avenue United Methodist Church in Manhattan, Kansas. The Botanical Research Institute of Texas has renamed its academic seminar series, now the T.M. Barkley Plant Science and Ecology Seminar, to honor Ted's dedication to research in botany and ecology.

Craig C. Freeman, R.L. McGregor Herbarium, University of Kansas, Lawrence, Kansas 66047

Symposia, Conferences, Meetings

The International Society for Phylogenetic Nomenclature

The International Society for Phylogenetic Nomenclature (ISPN) is a newly formed organization the purpose of which is to encourage and facilitate the development, codification, and utilization of phylogenetic nomenclature. Phylogenetic nomenclature is, in short, the theory and practice of naming groups of organisms and applying existing names to such groups in the context of newly proposed phylogenetic hypotheses using principles and methods derived from the fundamental principle of common descent. The ISPN (in particular, its Committee on Phylogenetic Nomenclature) will be responsible for ratifying and overseeing future changes in the PhyloCode, a codified set of principles and rules of phylogenetic nomenclature. The ISPN was inaugurated and met for the first time in July 2004 in Paris, France. The Society is open to all persons interested in phylogenetic nomenclature and is now accepting members. A membership form can be downloaded from the PhyloCode/ISPN website at http://www.ohiou.edu/phylocode/ or http://www.phylocode.org/ (see the link at the bottom of the gray bar on the left-hand side of the home page). The Council of the ISPN would like to encourage all interested persons to join the Society.

Kevin de Queiroz
President, ISPN

2005 *In Vitro* Biology Meeting

June 5 - 8, 2005
Baltimore, Maryland

The 2005 In Vitro Biology Meeting will be held from June 5 - 8, 2005 in Baltimore, Maryland. The meeting, which will attract scientific participation from many countries, will focus on issues pertinent to Plant, Vertebrate, Invertebrate, and Cellular Toxicology research to give participants a unique learning experience on plant and animal cell culture and biotechnology. Scientists, sponsors, and exhibitors interested in participating in the 2005 Meeting are asked to contact Gordana Vunjak-Novakovic, 2005 Program Chair, or the specific Section Program Chairs: Gordana Vunjak-Novakovic, Cellular Toxicology Program Chair; William J. Smith, Vertebrate Program Chair; Guy Smagghe, Invertebrate Program Chair; or Allan Wenck, Plant Program Chair.

For additional information see <http://www.sivb.org/meetings.asp>

International Carnivorous Plants Society

The 2006 Meeting of the ICPS will be held at Frostburg State University in Frostburg, Maryland, from Friday June 2, 2006, to Sunday June 4, 2006 (participants can arrive Thursday June 1), with field trips on Monday June 5. Frostburg is several hours west of the Washington/Baltimore/Philadelphia area, and Frostburg University has a conference center experience d in hosting international conferences. Transportation to and from major international airports will be available, and there are several relevant for this meeting.

Housing and meals will be available on the University campus as well as in hotels near the University, and space for vendors will be available very close to the sites for talks and posters.

In addition to all of the usual activities, the committee is planning a workshop on botanical art and one on using cp's to teach children about science. Several fieldtrips to the Middle Atlantic region of the USA are being planned for immediately after the conference.

For updates on the web, please watch the ICPS homepage

www.carnivorousplants.org

for links to the conference website, which should be available during February 2005 for information, mid-2005 for registration and abstract submission.

The organizing committee is co-chaired by Doug Darnowski of Indiana University Southeast and Hong-qi Li of Frostburg State University and also includes Terre Golembiewski of the University of Wisconsin-Whitewater and Steve Williams of Lebanon Valley College.

Positions Available

Department of Horticulture, Oregon State University

Applications are invited for a faculty position at the rank of Assistant Professor in research and Extension on environmental issues related to nursery production as well as biotic or abiotic factors limiting plant production or quality, with emphasis on integrated container production systems. Appointment to the position will become effective as early as July 1, 2005. For a complete announcement, visit the website of the Department of Horticulture, http://oregonstate.edu/dept/hort/. *Oregon State University is an AA/EOE.*

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Award Opportunities

GRANTS FOR BOTANICAL GARDENS AND ARBORETA

The Stanley Smith Horticultural Trust invites applications for grants up to $20,000 for education and research in ornamental horticulture. Not-for-profit botanical gardens, arboreta, and similar institutions are eligible. The deadline for applications is August 15, 2005. For current guidelines, contact Thomas F. Daniel, Grants Director, SSHT, Dept. of Botany, California Academy of Sciences, 875 Howard St., San Francisco, CA 94103, USA (email: tdaniel@calacademy.org).

Thomas F. Daniel, Grants Director, Stanley Smith Horticultural Trust, Dept. of Botany, California Academy of Sciences, 875 Howard Street, San Francisco, CA 94103 U.S.A.
tel: 415/321-8358

M.Sc. Opportunity at Acadia University.

Helianthemum canadense is an endangered plant species in Nova Scotia that uses two very distinct modes of reproduction to produce seed in the same season. This project, beginning in April 2005, will involve the use of specialized microscopy techniques (paraffin and resin embedding and sectioning; scanning electron microscopy) to study comparative floral development, and associated changes in reproductive biology, in chasmogamous and cleistogamous flowers of *Helianthemum canadense*. The successful candidate must be willing and able to carry out some independent field research at a site approximately 60 km from Acadia University. The candidate should also be willing to travel and obtain specimens from other remote sites (e.g., northeast USA). A stipend of $15000 CDN per year will be made available for two years. Please send a cover letter, CV and two letters of reference (preferably from undergraduate supervisors) to:

Rodger Evans
Biology Department
Acadia University
24 University Ave.
Wolfville, NS
B4P 2R6

phone: 902-585-1710
fax: 902-585-1059
e-mail: rodger.evans@acadiau.ca

SUMMER INTERNSHIPS AT CHICAGO BOTANIC GARDEN

NATIONAL SCIENCE FOUNDATION RESEARCH EXPERIENCES FOR UNDERGRADUATES
2005 Summer Undergraduate Research Fellowships
PLANT BIOLOGY AND CONSERVATION

Application deadline: March 15, 2005

The Chicago Botanic Garden and Northwestern University are accepting applications for a Summer esearch Program in Plant Biology and Conservation Science (June 15 - August 30, 2005) supported by a National Science Foundation-REU site grant. This year we will offer up to 8 awards to qualified undergraduates interested in conducting plant research. Stipends of $3,000 plus accommodation costs will be awarded to successful applicants. Funds are also available to support research and travel. We offer students hands-on experience and training in a wide variety of field studies, including: plant demography, quantitative genetics, molecular ecology, plant breeding, invasive plant dynamics, paleoethnobotany, economic botany, soil ecology, and remote sensing. Responsibilities may include field sampling, laboratory studies, and data analysis. Core program activities include the design and execution of independent, mentored research projects, and participation in weekly seminars. Through these activities, students will learn the fundamentals of experimental design, the use of the scientific literature, data collection and analysis, and oral presentation. At the end of the summer, students will analyze their data, prepare an abstract, and present their findings at a student research symposium. Applications and further information can be obtained from Dr. David Lentz (dlentz@chicagobotanic.org). Completed applications (see form attached) for the summer of 2005 must be received by March 15 and notification of acceptance into the program will be provided by April 20. Acceptance into the program will be based on academic performance, your professional goals and research interests.

Courses/Workshops

VALUE OF A GARDEN

This new lesson makes a total of 37 lessons available for classroom use. It engages students in critical thinking about the value of botanical, community, and other gardens in preserving biodiversity and in contributing to sustainable communities. The lesson is accompanied by a PowerPoint presentation, FEEDBACK LOOPS FOR FLOWER GARDENING. Access the lesson and PP presentation from the lesson directory at: http://www.actionbioscience.org/lessondirectory.html

Other News

NORTHWESTERN AND CHICAGO BOTANIC GARDEN JOIN FORCES TO TRAIN BOTANISTS

EVANSTON, Ill. — Chocolate, coffee, rice, wheat, corn, eucalyptus, aloe vera, wood, cotton and oxygen. Where would we be without plants? At a time when native plant species are increasingly endangered around the world so, it seems, is the plant scientist. Not enough botanists or plant conservationists are being trained to address the growing national and international threats to biodiversity and impending global mass extinctions.

In response to this critical shortage, Northwestern University and the Chicago Botanic Garden are joining forces to offer the nation's first master of science degree in plant biology and conservation — a unique interdisciplinary program designed to educate the next generation of plant scientists. This is the first major collaboration between the two institutions.

"This is a wonderful new marriage of intellectual interests, culminating in an important new graduate program that neither institution could offer alone," said Jon E. Levine, professor of neurobiology and physiology at Northwestern and director of the program in biological sciences. "We are experiencing major environmental changes — loss of habitat and biodiversity, extinction of species, global climactic change — and these shifts are having a major impact on human life and the science of our globe. By teaching new scientists to apply human reason and science to these large and complex problems we are looking to the future."

From the Eastern prairie white fringed orchid of the Midwest to the *Aloe rauhii* of Madagascar, the Earth's plants are in peril. According to a 1997 World Conservation Union report, 34,000 species, or 12.5 percent, of the world's flora are facing extinction. In the United States, 4,669 species, or 29 percent of the country's plants, are in danger of becoming extinct. The United States' flora is the fourth most endangered in the world. Here in Illinois, more than 300 species of native plants are listed as threatened or endangered.

The primary causes of species extinction or endangerment are habitat destruction, commercial exploitation (such as plant collecting), damage caused by nonnative plants and animals introduced into an area, and pollution. Of all of these causes, direct habitat destruction is the most problematic for plant species.

To stem the loss of biodiversity and its harm to ecosystems, threatened and endangered plants must be located and safeguarded; their reproductive biology must be understood; and they must be propagated and reintroduced to native habitats that will sustain them into the future. This requires qualified and committed botanists and plant conservationists.

"In light of the colossal environmental changes taking place across the globe, this dynamic partnership between the Chicago Botanic Garden and Northwestern University seeks to create an educational springboard for tomorrow's leaders in plant conservation and biodiversity research," said David Lentz, vice president of scientific affairs at the Chicago Botanic Garden. "This new program is urgently needed to produce conservation biologists who will help anticipate and prevent the potential loss of plant species and the valuable genetic and chemical information they contain."

Students in the Northwestern/Chicago Botanic Garden program will study populations of endangered plants — their genetics, the environmental changes to their habitats and their potential for reintroduction. They will learn how to use the Code of Botanical Nomenclature and define plant populations; acquire an understanding of the complexity and interactions of the many organisms that comprise plant communities and ecosystems; learn the diverse ways that plants are valuable to people; develop a working knowledge of nucleic acid and chromosome structure; and master DNA sequencing and gene cloning.

Upon graduation, the plant scientists will go on to work in the nation's botanical gardens, for the

federal government, as teachers in high schools or junior colleges, or continue their studies in doctoral programs, leading efforts to save plant species from extinction and increase public awareness.

Applications are being accepted for the first class, entering in fall 2005. The master's degree — five core courses, four electives, independent research and a thesis — can be finished in four or five quarters. Molecular biology, biostatistics and plant science will be at the curriculum's core; the independent research component will provide students with opportunities to work on "real world" conservation and botanical problems. Classes will meet at Northwestern and the Chicago Botanic Garden and be taught by faculty from biology, environmental studies, anthropology, engineering and economics.

"The master's program is part of a bigger effort to build synergy between Northwestern and the Chicago Botanic Garden," said Levine. "Our undergraduate science students also will benefit from access to new classes and independent research projects conducted under faculty at the Garden. This is an exciting opportunity for them as well."

Applications are being accepted for the first class, entering in fall 2005.

The master's degree —five core courses, four electives, independent research, and a thesis — can be finished in four or five quarters.

Classes will meet at the Chicago Botanic Garden and Northwestern University.

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Brooklyn Botanic Garden Awarded Prestigious $150,000 Grant Second Year in a Row From Institute of Museum and Library Services

BBG Receives Maximum Grant Amount to Promote Message That Plants Are Essential To Life

BROOKLYN, NY—November 10, 2004— Brooklyn Botanic Garden (BBG) was awarded a major grant from the Institute of Museum and Library Services (IMLS) for the second year in a row. The three-year $150,000 grant, **Where Plants Come to Life: Interpreting the Garden for the 21st Century,** will fund BBG in its mission to promote lifelong learning through an innovative interpretation program that will convey essential information about the environment, while demonstrating to visitors that plants are both fascinating and essential to life. The goal of this program is to give BBG the institutional capacity to provide visitors with a better understanding of the vital role plants play in their lives, and consequently, to become better stewards of the environment.

The IMLS Museums for America grant will enable BBG to develop a formal, institution-wide interpretation program dedicated to conveying the vital conservation message, "Plants are essential to life." This important message will target the Garden's more than 750,000 annual visitors. Specifically, the grant will fund the development of the Garden's first interpretive master plan, the creation and testing of a variety of interpretive devices to be used onsite at BBG, and staff development to facilitate this program. The Garden will pilot new signage and install new interpretive signs in order to create a long-lasting awareness of the importance of plant conservation.

"Receiving a prestigious IMLS grant for the second time is an enormous honor for BBG," said Judith Zuk, president Brooklyn Botanic Garden. "This year's award goes right to the heart of our mission which is to educate the public about the importance of conserving plants—our most vital and threatened resource. Our new interpretation will communicate our plant conservation message and encourage visitors to see their trip to the Garden not as a one-time experience, but as a starting point to lifelong learning about the environment," Zuk explained. "This vital funding from IMLS will help us capture visitors' imaginations — perhaps the most powerful way of engaging and exciting people — with the hope of encouraging visitors to develop a more

active and responsible relationship to the world around them," Zuk added.

According to Dr. Robert S. Martin, Director of the Institute of Museum and Library Services, "We are pleased that Brooklyn Botanic Garden will use this grant to enrich the visitor's learning experience and communicate an important message that plants are essential to life. BBG's new signage efforts are impressive; they will be comprehensive, interpretive communication vehicles," Dr. Martin added. "The purpose of Museums for America grants is to help museums advance their roles as trusted resources that serve communities by creating and sustaining a nation of learners. Receiving this competitive award is a great accomplishment and demonstrates the ability of BBG staff to provide highly valued museum services," said Dr. Martin.

IMLS is an independent federal grant-making agency dedicated to creating and sustaining a nation of learners by helping libraries and museums serve their communities. IMLS Museum of America grants reinforce the ability of museums to serve the public more effectively by supporting high-priority activities that advance the institution's goals. The grant application process is highly competitive; this year IMLS received 829 applications for the Museum of America grants, and distributed 190 awards totaling in $16 million.

Julie Warsowe, Director of Continuing Education at BBG will direct this three-year program. "I am honored to have been selected to head up this groundbreaking project. The grant allows us to provide a useful and easy-to-understand interpretation of the plants in the Garden with the twin goals of inspiring curiosity about plants in our lives and facilitating a deeper understanding of the importance of plant conservation," said Warsowe. "BBG's new signage efforts will make it one of the only gardens in the country with this kind of comprehensive, interpretive communication vehicle. We will develop an interactive, creative interpretative program to encourage visitors to physically interact with the Garden in a new way. Traditional signs and brochures will be re-designed, and non-traditional mechanisms, such as storytelling or new ways of using the website, will be introduced to help our visitors better understand and enjoy BBG's collections," she explained.

In 2003 IMLS awarded BBG a Learning Opportunities Grant to support the Garden's role in creating Brooklyn's first environmental high school in partnership with the NYC Department of Education and the Prospect Park Alliance. Brooklyn Academy of Science and the Environment (BASE) opened its doors in September 2003 to a starting freshman class of 125 students. Last year's grant enabled Brooklyn Botanic Garden to develop curriculum for BASE and to fully utilize the Garden's staff to evaluate the curriculum's success. In addition, the grant gives BASE students access to BBG's world-class botanical resources, including its plant collections, Library, and Herbarium as part of the high school campus. BASE students ended their first year with an impressive average attendance rate of 90%, and over 75% of the students passed the Living Environment regents exam at a level to qualify for a Regents diploma.

GA Herbarium Closed During Infrastructure Upgrades

The University of Georgia Herbarium [GA] collection will be unavailable from 4 Jan. through 1 April 2005 due to NSF/BRC-funded infrastructural upgrades to the compactor system [NSF DBI-0450818; W. B. Zomlefer, PI & D. E. Giannasi, coPI] and associated specimen reorganization. During this time, we will likely be unable to fulfill loan requests; we can, however, accept loan returns and exchange (but would prefer to receive them after 1 April). We apologize for any inconvenience.

Wendy B. Zomlefer, Curator; Kelly A. Bettinger, Collections Manager

Opportunities to Comment on NEON

Planning for the NSF-funded National Ecological Observatory Network (NEON) is on a fast track. A distinguished body of scientists, engineers, and educators has been selected to serve on the committees that will shape the blueprint for NEON's implementation. Members of the biological community will have a number of opportunities to review and comment on draft materials as the NEON Design Consortium produces documents early in 2005.

In September 2004, AIBS finalized a cooperative agreement with the National Science Foundation to develop a detailed NEON planning document by June 2006. The NEON Design Consortium — with more than 150 committee and subcommittee members — formally begins its work with meetings in January, March, and June of 2005. The committee reports will identify which continental-scale science

questions NEON will address, what kinds of sensor technology and cyberinfrastructure will be required, and how to realize NEON's potential for educating new generations of scientists.

The eight Subcommittees of the Science and Human Dimensions Committee will focus on invasive species, land use, biodiversity, biogeochemical cycles, climate change, infectious disease, hydrology, and emerging issues. Additional subcommittees will develop NEON's approaches to research infrastructure, IT and communication, and sensors and sensor networks. Education subcommittees will address NEON opportunities for K-12, the graduate and postdoctoral level, and informal education.

Members of the bioscience community can find the latest news about NEON at www.neoninc.org, including a full roster of NEON's Design Consortium members. Draft documents will be posted online for peer review shortly after each of the three meetings scheduled in 2005: January 4-6, March 15-17, and June 7-9.

Third Annual Orchid Show at the New York Botanical Garden

February 26-March 27, 2005

Just when the winter blues are most likely to have set in, The Orchid Show at the New York Botanical Garden offers a warm getaway to exotic locales that proffer countless varieties of orchids - by way of the landmark Enid A. Haupt Conservatory in the Bronx. More than 5000 orchid specimens will be on dramatic display in naturalistic habitats and artistic settings.

The 2005 show, which carries the distinction of being the only curated and designed museum-quality orchid exhibition, is themed "Orchid Adventures." The focus is on orchid exploration, particularly of orchids that have become scarce in the wild, and conservation in the Old World - primarily Asia - and the new World.

Orchid-filled canoes afloat in a pool surrounded by towering palm trees in the Conservatory's Palms of the Americas gallery mark the beginning of the exciting journey.

In the Lowland Rain Forest gallery, the sight and scents of *Oncidiums, Epidendrum, Cattleyas*, and other New World orchid species amid dense, lush greenery brings the illusion that one is exploring the jungles of the Americas.

Enter the Seasonal Exhibition galleries and you are suddenly traveling through the farthest reaches of Asia. Among the thousands of Old World *Vandas, Dendrobium, Cymbidium, Phalaenopsis*, and more is set a reed hut, illustrative of a site where orchid explorers (and smugglers) would make camp.

Orchid adventures don't end in the Conservatory. Just a short walk on the Garden grounds from America's preeminent glasshouse, varieties of Old and New World slipper orchids will be on view in the terrarium of the Mertz Librarty's Orchid Rotunda for additional study and enjoyment. These captivating beauties come in a wide range of colors, sizes, and forms, all sporting the pouch lip reminiscent of fine ballroom slippers. The intriguing beauty of slipper orchids has made them targets for unscrupulous plant collectors for well over a century. Today, international laws restrict their removal from the wild.

Thousands of top-quality, exotic, and hard-to-find orchid specimens are available for purchase in the Shop in the Garden, along with orchid products for the home grower and dozens upon dozens of orchid book titles.

Exhibition tours home gardening demonstrations, expert Q & A sessions, Continuing Education classes, and children's programming round out the month-long orchid adventures at the New York Botanical Garden.

Botany in Introductory-level Courses

As a follow-up to the botany in US universities survey we did a year or so ago and published in the *Plant Science Bulletin*, I'd like to take a closer look at the botany students are getting in our introductory-level courses. If you are teaching an introductory-level botany course **or an introductory-level biology course** (for either majors or non-majors), I would appreciate it if you would send me a copy of your syllabus(i) (electronic is preferred, but hard copy will do). I'd also appreciate any anecdotal comments you'd like to share about teaching botany to your students.

Thank you in advance

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Books Reviewed In this issue:

Evolutionary Theory - Mathematical and Conceptional Foundations. Sean H. Rice. 1997. Sinauer Associates, Inc. 370 pp. ISBN 0-87893-702-1. Mathematical modeling of biological systems is a powerful technique that can result in a synthesis of details and provides a basis for testing of new hypotheses. In recent decades, a synthetic mathematical approach has been applied to such diverse problems as population biology, community ecology, and evolutionary theory.

Much of the mathematical work in evolutionary biology has centered on population genetics. Rice has taken a more comprehensive approach, combining a discussion of mathematical population genetics with modeling of phenotypic evolution. The first chapters of the book cover selection on one and two loci, drift at neutral loci, effective population size and diffusion theory. In the sixth chapter, Rice builds on classical population genetics by introducing Price's Theorem, which describes the mean phenotype of descendents as a function of phenotypes and numbers of ancestors. Development of chapter 6 continues, showing how Price's Theorem unites material covered in previous chapters. The remaining chapters include discussion of developmental evolution and evolutionary game theory, but the first 6 chapters are the core of "Evolutionary Theory".

Rice states that "Evolutionary Theory" forms the basis for a graduate course that he teaches. Furthermore, he claims that only a basic knowledge of calculus is required. Though I am not an evolutionary biologist, I have considerable experience in mathematical biology and come from a physics background. Reading through Rice's book, I found that some sophistication in understanding mathematical notation might be required. The basic mathematics isn't very difficult, but the use of notation might sometimes be a bit much for graduate students of biology. I'm happier with the more straightforward notation and directness of authors like Roughgarden.

The mathematical treatment starts abruptly and moves into a not too elegant description of chaos, in the first dozen or so pages of the text. A student with only a basic calculus background will likely find the description of the diffusion equation a bit difficult. Mercifully, Rice doesn't use gradient and Laplacian operators. On page 78, the discussion of random walk seems to imply that the mean of the absolute value of distance from the origin is somehow the same as the standard deviation of distance from the origin. One reason we use standard deviations, the root mean square deviation, is that absolute values are notoriously difficult to calculate and express in a simple way. Lack of care in the use of notation seems to confuse this discussion of random walk. I suspect that my problems with other parts of this book may lie more with lack of clarity in notation than with inherent conceptual difficulty.

In short, the selection of topics in "Evolutionary Theory" is excellent. I'm sure that the author understands the subject well. However, I'm not sure that students of biology, even with some experience in mathematical modeling of evolutionary and ecological problems, will fully benefit from using this book. A student of mathematics or a biologist guided by a skilled instructor will be able to glide over the rough spots and benefit from the detailed and comprehensive structure of the book. - Thomas J. Herbert, Department of Biology, University of Miami, Coral Gables, FL 33124-0421

Seed Conservation: Turning Science Into Practice. Roger D. Smith, J.B. Dickie, S.H. Linington, H.W. Pritchard, and R.J. Probert (eds). 2003. ISBN 1842460528. (Cloth US$116.90) 1023 p. The Cromwell Press Ltd. Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB. Multicellular organisms are obviously very complex phenomena. Their structure, behavior, interactions with both the biological and the non-biological are involved and often counterintuitive (to us). Seeds, now, there's a simpler matter. Probably we tend to assume this

attitude, rather than consciously express it. No doubt there is some truth in, but only a relative truth. Seeds are surprisingly complex.

Seed Conservation is the proceedings of a 2001 conference. There are 56 chapters and close to 1000 pages of text. It does not pretend to cover all seed plants, nor all aspects of its topic. This is too heavy a book for bedtime reading and hardly the style for it anyway. Basically, it is a reference manual. In a forward that provides a good overview, Peter R. Crane, of Kew, says the book is not recipes, but a road map. Recipes are useful (and there are some in the book), but road maps are also useful. Much of the text does strive to provide us with guidance on some interstates, various US and a few state and local routes. There is a lot about planning and how to do things.

A goal of conserving, as seed, 10% of the world's flora by 2009 was set. This is a good enough objective (in 2 senses) so, let us wait and see how it turns out. Since dry country plants are easiest to store, with present techniques, they will be emphasized. Every bit helps, but 24,000 species, mostly xeric grasses, shrubs, and pharmaceutical plants may not be at the top of everyone's conservation priorities. If we could save *Ginkgo* or *Franklinia*, or else a lot of savanna grasses, how many hundreds of these last would seem like a fair trade? There are many invaluable facts and figures in the book, but I was most taken by page 49. The cost of conservation of ONE species is **£**1000 to **£**33000 per year. Reread this, pause, and think about the implications.

There are aspects of this book that I must criticize. The color cover illustration is representative of the contents. But there are 56 chapters plus three sections and a couple of other subdivisions. The same photo, full page, in a blurry gray greets us in front of each. The reverse of the page is blank. That makes about 120 totally wasted pages. Save a tree? It would have been nice to have good illustrations of some of the plants discussed, especially ones we do not otherwise see. *Millettia leucantha* and *Warburgia salutaris* may be boringly common to East Africans but are completely unfamiliar to Floridians!
Most angiosperms are mycorrhizal. This topic is discussed in several places. But I had a feeling the problems of identifying, preserving ex situ, and sometime in the future reassembling the symbiosis may need far more attention.

Near the end, p.986, lack of discussion of restoration to the wild is excused by saying that seed bank managers can't be expected to do everything. But there are many authors and couldn't someone else have been added, to at least provide a road map to restoration? What about 1 or 2 case histories? If funding agencies, taxpayers, and conservation people see 24,000 species freeze dried at enormous cost, but no evidence of any impact on the environment, how soon will the funds dry up? And then what becomes of the seed?

I don't know about the rest of the world, but here in Florida if you give a talk and even mention ex situ seeds or live plants, you will be criticized or attacked by native plant enthusiasts and even a few academic biologists for messing with Mother Nature. You can plead that nature is being heavily messed with by others and ex situ is essential to counter some of this. Thank God that *Ginkgo*, *Franklinia*, and *Delonix regia* survive! To this, they become agitated, because you are saving nonnative species. Some readers may think this paragraph is an exaggerated joke. It is not. I have come to the point of often avoiding giving talks because of these unpleasant encounters. But if we could show actual strong restoration results, I think matters would go smoother.

The country of Jordan does not extend from longitude 33° to 22° East and latitude 29° to 11° "East" as stated on p. 913. The editors should have caught this strange confusion.

There is a much more serious error on p.258. We are told that pollen tube growth and fertilization takes, "just a few minutes or hours" in angiosperms, versus weeks in gymnosperms (except *Ephedra*). The Orchidaceae have 25,000 plus species, more than 10% of angiosperms (by the count implied in *Seed Conservation*). So, this one family is larger than their goal of 24,000 species saved. Fertilization is fast in *Listera*, but most orchids take weeks, months, in many cases the better part of a year. There are several published summaries of this, including long lists of taxa and their timing, in various books and journals.

But overall, this is a very worthwhile road map. Those who will not be doing ex situ seed conservation can still find much of value. There are numerous facts and ideas worth incorporating in freshman botany and biology courses, for example. On p. 655, it is said that models should sharpen the questions. All of us need that attitude every day. I wish the conferences had paid a lot more attention to plants of wetter habitats, particularly on tropical mountains. That would have sharpened some of their questions. I find myself sharpening my questions about dry habitat plants, such as in our white sand scrub. If the road map leads us to new things it is a useful tool to keep at hand. John Beckner –Marie Selby Botanical Garden.

Timber Press Pocket Guide to Ornamental Grasses. Rick Darke. 2004. ISBN 0-88192-653-1 (Flexbind US$19.95) 224 pp. Timber Press. 133 S.W. Second Avenue, Suite 450, Portland, OR 97204-3527. The *Pocket Guide to Ornamental Grasses* is another attempt by Timber Press to provide the general public, gardeners, and horticulturists with authoritative and comprehensive references to plant groups of horticultural interest. This particular volume is a condensed, pocket version of Rick Darke's more comprehensive book *The Color Encyclopedia of Ornamental Grasses* (Timber Press, 1999) and its revised and expanded companion version *The Color Encyclopedia of Ornamental Grasses on CD-ROM* (Timber Press, 2004). Together these books and the cd provide back-yard gardeners and professionals alike with an impressive array of color photographs, many in natural settings, and readable and informative text on how to grow grasses and which species and cultivars are available for cultivation.

The first 20 pages of this pocket book provide basic, general information about ornamental grass habits, growing seasons, sun and soil preferences, fertilization, diseases and pests, planting and mulching techniques, weeding, cutting back and burning, and dividing and transplanting techniques, as well as a helpful list of grasses for specific purposes and locations, i.e., cool-season ornamental grasses, ornamental grasses for movement in breezes, ornamental grasses for fall color, etc. The remaining c. 180 pages describe 430 species and cultivars, illustrating 320 with beautiful color photographs (there are 721 high-resolution, full-screen photos in the cd-rom version). Most of the entries are ornamental grasses, but grass-like plants such as sedges, rushes, restios (Restionaceae), and cat-tails are also included. The entries are arranged in alphabetical order by scientific (genus) and cultivar names. Common names and some synonyms are also provided (check the Index for additional "missing" names, i.e., nomenclatural synonyms). Each entry provides information as to the plant's potential size and shape, light and moisture requirements, USDA cold-hardiness zones, important seasonal color variations of foliage and inflorescences, and ideas on display and propagation methods. Rick Darke's personal insight into each plants outstanding horticultural features and his excellent photographs demonstrate both a professional and hands-on love of ornamental grasses.

This is a great book for weekend gardeners (and would-bes like me) to carry to their neighborhood nursery, garden-supply store, or botanical garden to develop ideas about which available plants might fit into an overall scheme for the home garden or local landscape! - Dr. James L. Luteyn, The New York Botanical Garden, Bronx, NY 10458-5126

Medicinal Plants in Folk Tradition: An Ethnobotany of Britain & Ireland, Allen, David E. and Gabrielle Hatfield. 2004. ISBN 0-88192-638-8 (hardcover US$29.95) 431 pp. Timber Press, Inc., 133 S.W. Second Avenue, Suite 450, Portland, OR 97204-3527.

In recent years Gabrielle Hatfield has published prolifically on the folk traditions of medicinal plants in the old and new world. This fourth book, co-authored with David E. Allen, appears to be a compendium of some of her previous work. The focus of this book is on the oft neglected history of plants in human health. Documentation of medical tradition is provided for more than 400 entries representing three major kingdoms still found in the wilds of Ireland and Britain: Plantae, Protista, and Fungi. An extensive collection of "herbal use" to treat humans, as well as animals, has been gleaned through over 16 years of research and anecdotal survey.

The book's chapters are broken down and loosely based on the Cronquist system of classification of scientific order and family, which is not entirely intuitive. Without the three indices in the back of the book — folk uses, scientific names, and vernacular names — it would be difficult to find a particular plant of interest. Each chapter begins with a list of family names. Beneath family names are specific entries listed by Latin name. Each Latin name is followed by the most common

vernacular names (and in some cases Celtic names), and records of herbal use. The records are broken down by geographical area; herbal uses in the counties of Britain are listed before the counties of Ireland. The records of herbal use are historical in nature, enumerating the county and/or country in which the use occurred, the ailment, and the ways in which the plant was used. Depending upon the text and oral records that the information was gleaned from, these historical accounts of herbal use can be as short as a sentence or extend as long as a few pages. Sometimes the absence or acceptance of herbal use in a particular area bears comment, especially if it seems notable due to a geographic location. Citations within the herbal use records are numbered. Each chapter ends with a numbered list of authors/ titles corresponding to the citations. However, the full citation is only listed at the end of the book, which makes for cumbersome cross-referencing. The illustrations within the text are reproduced from various sources and lack consistency. Some illustrations may be helpful for taxonomic identification while others are only vaguely representative of the plant. There is only a small section of color plates.

This was an ambitious scholarly work and, in light of the resurging interest in traditional and folk medicine, it is worthwhile to examine this book. The documentation and preservation of medicinal plant traditions in any region is a worthwhile goal. However, in sampling entries, the reviewer found the deliberate exclusion of the science behind ethnobotany to be disappointing. Given the litigious nature of today's society, it is not surprising that the authors distance themselves from endorsing any of the herbals but there was a surprisingly brief acknowledgement of any modern application. Many of the recent tomes regarding medicinal plants and ethnobotany have raised interest in the genesis of herbal lore to modern Western medicine. Creating interest in the symbiotic relationship between plants and human health provides the opportunity to convey a profound respect for indigenous cultures, people, and environment. The authors missed the opportunity to add value to their book and reduced the readability by restricting its scope. This is not a book for those seeking a story of the history of a plant for specific medical use, but it would fit into an academic library's collection of traditional medicine. — Lynette Y. Wong, Department of Plant Biology, University of Minnesota, St. Paul, MN 55108

Multimedia Toolkit for Educators in the Plant Sciences. Vol. 1: Basic Biological Principles and Plant Structure, Vol. II: Botanical Diversity. 2003. 2 CD's. Michael Clayton, UW-Department of Botany. University of Wisconsin Board of Regents.

This 2 CD volume contains a great diversity of material including 18 lecture outlines (HTML format), lab manual covering 23 topics, and a large number of images and movies. Volume I covers basic principles, including cell structure, cell division, and anatomy and morphology while Vol. II includes the broad reach of Botany including Bacteria, Protists, Fungi, and the Plant Kingdom. As such, nearly all the material that would be covered in an introductory botany course at the undergraduate level is available. To me, the best aspect of the CD's are the great variety of images, which are in JPEG format (2365 image files) and the 35 digital movies. The images can be searched using an enclosed Portfolio catalog that can searched by topic, genus, or part. Also included are 3 Macromedia Authorware interactive activities and an interactive pictorial key to the common trees of the Midwest.

For those using MACS, do not fear. The CD's are cross-platform compatible. I ran the CD's on a Compaq PC using Windows XP and everything worked as intended. The material is accessed through a somewhat unwieldy use of Abode acrobat (Adobe reader is included). I had some difficulty maneuvering through the material without getting lost. However, as the author notes, this CD is really meant to be incorporated, as needed, into your own lecture and lab materials and this requires copying files and folders to your computer. These are NOT disks that will be handed out to students or purchased as a supplemental learning aid, they are meant for the educator to utilize to develop or enhance an existing botany course. All of the material is available, under fair use, to be incorporated into courses elsewhere.

Will this set of CD's be useful to you? That will depend on how far along you are in developing your course. If you have not yet made the transition to the electronic age of information dissemination, yes they will. However, those of us who have spent much time developing our own electronic format courses might not find much to use here as I suspect most of this material, in one form or another, already is included in our electronic lecture notes and web-accessible material. Most of the Botany textbooks come with an extensive image collection on CD. Even so, the image collection can still enhance one's lecture, if nothing else by providing different images than the ones from the book. I find that students will pay more attention to an image that is NOT from their textbook, even though it covers the

same material (I guess they either already know the image from deep study (we hope) or figure they can cram it in later). Although I enjoyed using the pictorial key to try to identify trees from my ancestral home in the Midwest, it is of lesser heuristic value here in the outer coastal plain of the Southeast. However, it did provide me with a great idea for a similar pictorial key for the next botany class project. That is the true value of the CD-to provide ideas and inspiration for educators to develop similar materials for their courses and regions. Please note that all proceeds from the CD's will go to support undergraduate activities in Botany at UW-Madison. - John Pascarella, Department of Biology, Valdosta State University, Valdosta, GA 31698

BPH-2: Periodicals with Botanical Content. Compiled by Gavin D.R. Bridson. 2004. ISBN 0-913196-78-9. 2 volumes. (cloth, US $130 plus $9.20 shipping/insurance [shipping /insurance rates higher for international orders]). v–xx + 1,470 pp. Hunt Institute for Botanical Documentation, Carnegie Mellon University, Pittsburgh, Pennsylvania. Any botanist in the business of writing scientific papers knows that BPH is not just that thing that afflicts most men over 60. Rather, it is an essential reference of titles "… that regularly contain … articles dealing with the plant sciences …" and a work that now has served botanical authors faithfully for more than 35 years. The original B-P-H (Botanico-Periodicum-Huntianum) was published by the Hunt Institute in 1968 and has become somewhat of a botanical "Rosetta Stone" for deciphering the myriad of multilingual scientific periodical citations. Consequently, the abbreviated periodical titles compiled in BPH comprise the accepted "standard" citation format that is required by many botanical publications. It should be obvious to anyone that a global compilation of botanical periodical data represents a Herculean task, yet BPH has made extraordinary progress towards the fulfillment of that objective.

The list of indexed titles has grown considerably from 12,000+ in 1968, to 25,000+ in the supplement to the first edition (B-P-H/S), to more than 33,000 titles with over 8,000 cross-references in the new second edition. The expanded coverage in BPH-2 has necessitated a 2-volume format for the first time. Volume I (819 pp.) contains the introductory remarks, a list of "selected references" (that has now grown to 208 titles), a list of state and province abbreviations, and the alphabetical catalogue of titles from A-M. The somewhat thinner volume II (pp. 821-1470) completes the catalogue coverage from N-Z and adds an Appendix that provides a complete list of words used in titles along with their abbreviated form. This list would be helpful for predicting the appropriate abbreviation for any journal that was, for some reason, not included in the catalogue. Good luck finding one! I sat down with a colleague and asked him to "try me" with any obscure plant journal that he could think of. Although we tried quite a few of them, they all were in there. However, I was a bit concerned about the "missing" page 820. Although I'm pretty sure that it simply is the unnumbered blank side of page 819, I feared initially that it was that notorious, proverbial page that should have contained the one reference that I was trying to find. How many times has stuff like that happened to you? Eventually I concluded that there were no pages missing from BPH-2.

Although it is difficult to formulate a review strategy for this type of work, I do want to emphasize that BPH-2 is not simply an addition of titles that have appeared since the publication of B-P-H/S. Indeed, the coverage of journals has been expanded considerably, owing in large part, to an intensive survey (and index of botanical content) made by the Hunt Institute of all pre-1841 scientific, medical and general periodicals (paleobotanical literature remains incompletely surveyed due to its dispersion across more than 2,000 earth science journals). Also, there are numerous additions of new titles that have appeared since the publication of B-P-H/S; e.g., Arnaldoa (1991), Ilicifolia (1996), and Rock Garden Quarterly (1995) to name a few. However, BPH-2 also is the product of an incredible amount

of editorial work devoted to the clarification and correction of information that has appeared in the two previous volumes. Unfortunately, much of this meticulous editorial grooming probably would go unnoticed by most casual users. For example, a major refinement of entry principles has resulted in greater consistency and the elimination of many duplicate title entries. In some cases, these necessary corrections have resulted in a word order that differs from previous versions. Although this might seem like a trivial issue, it is not. When recently revising the literature of a ms. for which the editor now requested BPH-2 citations, I found four entries that had to be corrected from my original BPH/S versions. One example of a subtle abbreviation change is *Bull. Jard. Bot. Belg.* which now becomes *Bull. Jard. Bot. Natl. Belg.* So, if you want to ensure that all of your literature citations are abbreviated correctly, then you will have to use BPH-2. The 5-digit Hunt Institute index numbers have been retained for each accepted entry, making it easy to determine whether a change of title has occurred between the current and past editions. Several improvements have been made by identifying duplicate titles by their geographical place of publication. There are now three listings (cf. one in B-P-H/S) for the quite different "Western Naturalist" journals published in Kansas, Wisconsin and Scotland. The three "Journal of Oceanography" titles (none appearing in B-P-H/S) are distinguished similarly. Less evident to most readers will be the addition of missing diacritical marks to a number of references; e.g., the correction of the phrase "Produccion y proteccion" to "Producción y protección" in the unabbreviated title of *Invest. Agrar., Prod. Protecc. Veg*. on page 574. Another novelty is the removal of hyphens from "BPH" in the title acronym, presumably to accentuate the status of the second edition, i.e., BPH-2. A subtitle "Periodicals with botanical content" has been newly added. The Hunt Institute logo of the Crown Imperial (*Fritillaria imperialis* L.) is retained on the spines of each volume, but has increased substantially in size.

Is there anything wrong with BPH-2? After reading Gavin Bridson's remarks on the trying woes of bringing such a monumental task to fruition, I cannot muster much inspiration to point out any mistakes. But anybody who knows me also knows that I can't resist such a temptation. I did find a typo ("in" for "is") on line 13 of p. vii. I also noticed that there was no diacritical mark above the "i" in Jardín in the citation appearing as Anales del Jardin Botánico de Madrid on p. 75. Our original copy of that journal shows the acute accent mark over the "i." A few minor omissions still persist such as the lack of a cross-reference for the title "Environmentalica" as "Acta Universitatis Carolinae. Environmentalica." Some references contain vague symbols (e.g., <1>, <2>) such as those included in some dates for the series of "Mémoires de la classe des sciences mathématiques et physiques …" titles that appear on p. 748. Apparently, two different titles appeared during three years (1810-1812) as one title eventually superseded the other; however, an explanation for the odd notation should be included in the introduction because it is quite confusing. The work is produced well, but I found the lighter type to be more difficult to read than the darker version used in B-P-H/S (each contains roughly the same number of entries per page). Younger botanists won't even notice. Electronic journals ("e-journals") have not been identified as such, but a reference to a pertinent website is provided. I also wondered whether BPH ever would be released electronically. An electronic version would make searches much easier and would facilitate input of the data into other databases. I also found it a bit peculiar that none of the periodical titles included in the selected references of BPH-2 itself was abbreviated!

All said, I wish that I could produce 1,470 pages of text with such few and mostly "picky" faults. Certainly, the overall level of accuracy and comprehensiveness is simply astounding for a work of this nature. Bridson and colleagues truly have produced a masterpiece of reference literature in the new BPH-2. Although the work is described modestly as "… a fairly, but not wholly, comprehensive listing …", it surely will be an invaluable and reliable reference tool to botanical writers for years to come.

As one last observation, I noticed that the copyright page of B-P-H/S commented that the work had been produced using an Apple Macintosh IIcx. Computer geeks will immediately recognize that this machine (16 mhz 68030 processor, 16 mhz FSB, 1 mb RAM, 80 mb HDD, no ethernet adapter), has been eclipsed by the new G5 PowerMacs (dual 2.5 ghz processors, 1.25 ghz FSB, 8 gb RAM, 250 gb HDD, gigabit ethernet). Although no computer system is identified in the production of BPH-2, just think of it as the "G5" of botanical references! – Don Les, University of Connecticut, Storrs, CT 06269-3043.

Pierre Joseph Redouté's **Choix des Plus Belles Fleurs** arrives in a digital reproduction from Octavo Press, which specializes in producing digital versions of famous and rare works on a range of topics, including botany. The original book was Redouté's last major work and was illustrated with color-printed, hand-finished stippled engravings. It is particularly interesting to see these editions making great works of botanical art more generally accessible at a time when botanical art is experiencing a great renaissance, with works being made today which approach those of the greatest botanical artists, such as Redouté.

The PDF file in which the full text of Choix des Plus Belles Fleurs is included also provides the reader with an introduction discussing the nature and significance of the work as well as several pages on the provenance of the actual volume using in making this edition. That particular copy came from the collection of the California Academy of Sciences, and the introductory material was written by Sandra Raphael.

In this introductory section she discusses the importance of Redouté as one of the finest botanical illustrators of the golden age of botanical illustration. His style, as fans of botanical art will know, involved very smoothly graded images and vivid colors, with ample detail presented. His presentations of leaves tend to be more muted than those of flowers themselves, and in general Redouté ranks as one of the finest botanical artists, along with such as Ehret and the Bauers.

Redouté's two best known works, which are often available as fairly inexpensive editions in large chain bookstores, were on roses and lilies, and they included extenisve amounts of text on the plants described. In contrast, Choix des Plus Belles Fleurs, instead of concentrating like those books on one group of plants, presents a range of species and horticulturally interesting plants, some with their fruits, along with a brief text describing each plate. The pieces of text are grouped at the beginning of the book. The introductory material correctly points out that Redouté's work on fruit was not the equal of his work on flowers—the pomegranate in View 71 is, as Raphael notes, not tempting to eat and oddly colored, though the pomgranate blossoms are elegant and instantly recognizable.

In general, while the few pages of text from the original book were slightly warped and scanned with obvious shadows, the plates scanned flat and without shadows, which would have interfered with the images. The plates are referred to by "View" number, which very helpfully appears in the pdf's margins along with the page number as the reader scrolls through the pages.

Who should buy a copy of this work? Certainly, given the price and the importance of Redouté in the history of science/botany and its value as art, this work belongs in the libraries of colleges and universities. Any botanist would find pleasure in these images, as beautifully rendered as they are, and in particular they might be useful illustrations for introductory horticulture, or just for a lecture on botanical art and its part in the history of science. Douglas Darnowski, Indiana University Southeast, New Albany, IN 47150.

Sex, Botany & Empire: The Story of Carl Linnaeus and Joseph Banks. Fara, Patricia , 2004. ISBN: 0231134266 (Cloth US$19.50) 176 pp. Columbia University Press, 136 S. Broadway, Irvington, NY 10533. While having an interesting and provocative title, this book was somewhat of a disappointment. The story focuses on the famous Carl Linnaeus (1707-1778) of Sweden and Joseph Banks (1743-1820), the British scientist who popularized Linnaeus' system of classification. One of the main points of the author is that both of these scientists were not simply driven by their fascination of nature, but they also were interested in power, money, fame, and in linking science with commercial and imperial development. "Sex" in the title refers to the fact that floral reproductive structures were import in the new classification system.

Most of the material on Linnaeus is well known and has extensively covered in other treatments of his life. Linnaeus developed the binomial system of classification and spent most of his career at the

University of Uppsala. He as well as Banks were excellent at self-promotion. As mentioned in other biographies, a key life-transforming event for Linnaeus was his field work and extensive travels in Lappland in northern Sweden.

The botanist Joseph Banks mixed science with politics in England primarily through the Royal Society, which is the scientific academy of Britain and one of the oldest in the world. Banks was president of the society for an amazing 42 years and exercised an authoritarian grip on the organization. He used his influence to make science central to British culture and to the British Empire. Banks' life transforming event was to serve as scientist on a world expedition of Captain Cook on the ship *Endeavor* from 1768-1771. This voyage took Banks to Tahiti, New Zealand, and Australia. Evidently, while Banks is not well known in the present day United Kingdom, he has become a national hero in Australia. In contrast to Linnaeus, Joseph Banks left little mark in basic scientific research but was influential in "making science work for the state– and making the state pay for science."

The main problem with this short book, which can be interesting at times, is that rather than providing an integrated view of these two influential botanists, it seems to present two separate stories and fails to show the interrelationships between these two men. However, *Sex, Botany & Empire* may have some limited appeal to readers interested in the history of botany and the history of science. - John Z. Kiss, Department of Botany, Miami University, Oxford, OH 45056

The Sacred Tree In Religion and Myth, Mrs. J.H. Philpot ISBN 0-486-43612-8 (paper US$11.95) Unabridged Republication of 1897. The Sacred Tree or the Tree in Religion and Myth. Macmillan and Co., Limited, London and New York. Dover Publications, Inc., Mineola, NY 2004 Dover has, for a long time, been giving the world a wonderful series of reprints of older books. For a reasonable cost, people and institutions have access to a great portion of our intellectual heritage. Hopefully, the newly announced plans to digitalize major libraries will whet appetites for these more versatile and usable book versions, rather than destroy the trade. We shall see.

Unfortunately, no biographical information on Mrs. Philpot is added to this reprint. From internal evidence, she was British, living in or near London. Her sources were classical, biblical, 19th century books, and such, not original fieldwork by the author. Since this book attempts to review a large subject on a worldwide basis, that is to be expected. The illustrations are well chosen and vital to understand parts of the text. Unfortunately, not every example that she discusses in the text is illustrated.

Tree worship was united with astronomy, sacred mountains, calendrical systems, etc. Even today, western civilization has major holidays based upon this world-view. Consider Christmas (Winter Solstice and decorated trees) Easter (Spring and the Cross), the national holidays (flagpoles), May Day (poles and trees), harvest festivals (fruit and nut trees plus nonwoody crops). Cemeteries make considerable use of narrow tall conifers.

A basic artistic convention appears in many countries. A decorated tree or an exalted human figure (hero, king, a god or goddess) is in the center facing us. On each side is a warrior or goddess or fierce beast or chimera, and these face the central figure. In some, the central figure (or else members of the pair) will have a raised arm, often with a forefinger that points up. The sun or a mythic symbol floats above the scene, often left of center.

Many other artistic conventions are widespread. The Scythians cast willow rods, the Germanic tribes threw fruit tree branch segments on a white cloth, Druids had omen sticks, while kings, warlords, and high priests held up scepters, batons, sticks of power. Dowsers hold forked sticks. The Chinese cast yarrow pieces to consult the I Ching.

Paradise gardens are another pattern. The gods reside in them, or else the blessed or heroic dead go to them. Alternatively, the first parents of mankind start off in these lush and sacred places isolated by

an enclosure. Snakes, special fruits, beings holding fire, fountains that often feed four rivers, zodiacal animals, and ambrosial drinks are part of the cast. There is often a final climatic scene of leaving via a gate or over a mountain pass.

These artistic and mythic conventions, or archetypes, or whatever name we chose to hide our basic ignorance of what it all means, have been dominant forces in human minds, in many lands for thousands of years.

This book can be read purely for recreation. That is acceptable, but it can be read for information and understanding, at a more serious level. A drawback is the lack of Latin names for many of the plants. We might laboriously consult various floras that give common names for plants of India and elsewhere, but can we be sure the original sources correctly identified the trees and correctly recorded the local names? Nor do we know if a single species was involved, or several species or a whole genus was involved.

Archeological names and dates are those understood over a century ago. They are shaky in light of what we know today. Whole civilizations of the past, such as the Hittites, are not represented. Our broader, more theoretical paradigms of cultural evolution were formed upon the incomplete evidence plus particular biases and interests of earlier generations of folklore scholars, anthropologists, and archeologists. Recently, William Gruben has written a thriller novel about bizarre murders, set naturally in Miami. *Tropic of Night* challenges us with what it calls, "The Great Silence". Very recent research shows that Homo sapiens, people just like us today, were in Africa and elsewhere for a hundred thousand (or more) years before any literate civilizations that we know of. What were they doing? Gruben suggests they were investing a lot of their time into thoroughly experimenting with the properties of plants and fungi. Plants were power, and if power corrupts…? So Mrs. Philpot, by this current viewpoint, was merely giving us the end of a very long process, not the beginnings of a much shorter one, as she thought.

Ethnobotany was defined for some of us a few days ago, as "the study of the human use of plants." Fair enough. We see this in terms defined by our society and its economy at the time of our studies. The great 16th to 19th century Age of Empire building was much involved with trees. Spices, logwood, tea, coffee, mahogany, ebony, sandalwood, timbers for naval use, rubber plantations and many other examples are obvious. So *The Sacred Tree* reflects that bias. Some present day readers will be irritated at Mrs. Philpot's condescending view of "the natives" as child-like. But we need to learn from other cultures (including earlier versions of our own), not just build walls around the political correctness of our own time. Our own time has some generally accepted academic and popular prejudices that are just as bad – but that is another story.

Trees and empires gave us Frazer's *Golden Bough* and many other works. As late as the mid 20th century Robert Graves, in *The White Goddess*, *The Greek Myths*, etc., entertained us with his own version. But after 1900, empires had largely grabbed what was grabable. The application of Mendel's Laws, the demands of growing populations with massive wars, the rise of agribusinesses, the massive fertilizer industry created a different ethnobotany. Vavilov in Russia, Fairchild, Ames, and Edgar Anderson (and many others) focused on agricultural crops and their lesser-known allies.

In the exploding world economy after 1945, with leisure time and jet airliners for middle class youths, (who had been brain-washed into consumers) food was unexciting compared to recreational drugs. Schultes and his followers (including the Wassons with Robert Graves enlightening us on magical mushrooms) led to Timothy Leary and the wild disorders of 1963 to the late 70's. Psychedelic plants involve complex molecules that do things to human bodies and minds. The pharmaceutical industry jumped in and a new ethnobotany, the search for cures in the rainforest, absorbed hundred of millions of dollars. Some good came of this, but a lot less than expected. I see it all summarized in the movie scene where Sean Connery and Laura Bracca realize it was the ants, not the bromeliads, which cured cancer. Score one for sloppy lab work.

What will the next ethnobotany be? Gruben's "Great Silence" would be great fun, using highly sophisticated techniques. But I suspect it could more easily be ethnobotany of conservation of biodiversity and landscapes, plus sustainability, with deadly clashes of cultures threatening the continuation of both civilization and nature as we know them. So we could go back and revisit Mrs. Philpot's trees (including with our new insights of evolutionary psychology), and also Ames and Anderson's less familiar crops. Now, this could also be fun, be scientifically interesting, and be very useful.

So there may be good reason to read an "out-of-date" book. All of the ethnobotanies just discussed defined "human use" in terms of cultures, the uses of plants by masses of people. Will there ever be an ethnobotany based upon individuals? Evolutionary psychology linked to Mrs. Philpot's fascinating pictures, expressed in art, including music, might

do the trick. Reading *The Sacred Tree* and wandering into bookstores with large displays of *The Da Vinci Code* and similar books will conjure ideas. John Beckner, Marie Selby Botanical Gardens, Sarasota, FL.

The Physiology of Tropical Orchids in Relation to the Industry, 2nd edition. C. S. Hew and J. W. H. Yong. 2004. ISBN 981-238-801-X (hardcover) 370 pp. World Scientific Publishing Co., Pte., Ltd., 5 Toh Tuck Link, Singapore 596224. In my review to the first edition of this book I indicated that the author, Prof. Choy sin Hew (now retired) was part of an impressive group of orchid scientists gathered at the National University of Singapore by the long time and outstanding chair and leader of the Department of Botany at the National University of Singapore (BOTNUS), Prof. Adisheshappa Nagaraja Rao (also retired). The group no longer exists because its members have retired, but its spirit survives in a number of students. This edition is the result of collaboration between Dr. John Yong, one of Prof. Hew's students, now at the Nanyang Technological University in Singapore. The book is aimed at orchid growers and much of the information in it is of the kind horticulturists can use. It contains the same topics covered in the first edition expanded with information generated by post 1997 research findings and covers additional areas.

The book contains information on world orchid markets. Despite being aware that orchids are big business I was amazed to learn that in the year 2000 the total number of orchids plants sold for cut flower plantations and as pot plants was estimated at 1,598,000,000 and their value was $2,061,000,000. Japan alone imported $142.8 worth of orchid cut flowers (less that 10% of that from the Americas) in 1993. The value of the potted orchids market in Japan was $261 million in the same year and exports have grown since. These figures not only explain the attention given to orchids and orchid research in countries which produce and export these plants thy also justify the need for this book.

As in the first edition the second chapter deals with orchid structure and nomenclature. It is well illustrated and very informative. This chapter is an excellent reading to recommend to students and growers (both hobby and professional) in search of a concise, clear and accurate source of information on the basics of orchid morphology and nomenclature.

Chapter three deals with carbon fixation in orchids. It updates the information in the first edition and reiterates that the CAM and C3 pathways are found in orchids, but " . . . direct evidence supporting the occurrence of C_4 . . . is lacking. . . " Appendix II essentially continues this chapter and relates to it very well because it asks and answers the question "Can we use elevated carbon dioxide to increase productivity in the orchid industry?"

The chapters on respiration (four), mineral nutrition (five), control of flowering (six), partition of assimilates (seven), flower senescence and post harvest physiology (eight), and tissue culture (nine) all explain basics very well and then proceed to a more detailed and advanced level. There are two appendixes. One updates the literature citations. The other was mention above. Subject and plant name indexes complete the book.

This is an excellently written, well illustrated and solidly produced book which is very suitable for a wide audience. For me the book also marks an end of an era because Prof. Hew is the last of Prof. Rao's BOTNUS department to retire. I spent many summers and sabbatical leaves at that wonderful department, considered it my second academic home for a long time and often wished it were the first. – Joseph Arditti, Professor Emeritus, Department of Developmental and Cell Biology, University of California, Irvine.

Phytoremediation, Transformation and Control of Contaminants. S. C. McCutcheon and J. L. Schnoor,eds. 2003, ISBN 0-471-39435-1 (hardcover, $120.00) , 987 pp . Wiley-Interscience, John Wiley and Sons, Inc. Hoboken, New Jersey. Pollution is becoming a global concern as the world's population continues to grow. A new industrial ecology, phytoremediation, is emerging as a way to reduce the impact of pollution. Phytoremediation incorporates vascular plants, fungi, algae, microbial mats, and bacteria in the management of wastes and treatment of contaminated air, soil, waste streams, and groundwater. Plants are currently used to reduce brine volume in oil fields, accumulate toxic metals such as selenium in wetlands, create vertical and horizontal barriers, and as landfill covers. Although this is not a new technology, the ways that plants metabolize, store, utilize, and transpire assorted organic and inorganic chemicals are not well understood.

The book "Phytoremediation, Transformation and Control of Contaminants" edited by Steven C. McCutcheon and Jerald L. Schnoor, provides an overview of historical and recent advances in the field of phytoremediation. The book contains 31 papers organized into seven sections. Major topics include phytovolatilization, rhizosphere degradation, phytodegradation, phytotransformation, and phytostabilization. Each section commences with a fundamental contribution that defines the state of the science. Later chapters focus on specific applications and processes in practical settings. Many research groups and leading experts from national, state, and local agencies have authored the various chapters or assisted in the evaluation of the technical quality of each work.

Section I consist of three chapters that provide a basic overview of phytoremediation and its applications. These chapters also address economic, social, regulatory, and technical issues that relate to cleanup procedures. In chapter 2, Burken, J. G. describes and discusses the vital molecular greenliver model for plant metabolism of Sandermann, H. Jr. He emphasizes how both plant metabolism and mammalian livers share specific enzymatic and substrate pathways as well as how xenobiotic compounds are transformed, conjugated, and detoxified. The major dissimilarity is in the ultimate fate – plants sequester compounds in their vacuoles and cell walls whereas mammalian systems often eliminate compounds via excretion. Understanding internal plant processes used in phytoremediation can provide valuable knowledge regarding contamination of food chains and the impact of bioaccumulation of compounds such as dioxin and DDT.

Section II presents five chapters that report on molecular biology and physiological properties of plants that may be responsible in detoxifying xenobiotic chemicals. Major topics include enzyme metabolic processes, proteins and genes associated with plant tolerance, detoxification of organic pollutants (sulfonated and nitro aromatic compounds, nitroesters, and chlorinated contaminants), and physiological processes associated with seed growth, leaf area, and root morphology and development. Parrot feather (*Myriophyllum aquaticum*), giant duckweed (*Spirodela oligorrhiza*), hybrid poplar (*Populus deltoides* and *P. nigra*), willow (*Salix* spp.) and smooth bromegrass (*Bromus inermis*) were common test species throughout these pilot studies. They were abundant, easy to obtain and grow quickly. Many other dicotyledons and monocotyledons were also used. Throughout this section it is made evident that certain plants are able to degrade and transform specific xenobiotic chemicals. For example, poplar and aquatic plants can degrade trichloroethylene to water, carbon dioxide, and chloride through the use of oxidative enzymes. Various grass species tolerant to soils contaminated with 2, 4, 6-trinitrotolune (TNT) are also profiled. In chapter 8, Vose, J. M. *et al*. related the success of phytoremediation processes to transpiration. They quantified and compared transpiration rates of assorted tree species growing at sites in Texas, Colorado, and Florida and investigated how biotic and abiotic factors vary transpiration rates. Their study suggested that ring-porous hardwood species typically had higher sap-flow rates compared to conifers and diffuse-porous species living in the same environment. They added that seasonal variations might alter transpiration rates. Models for sampling and measuring, therefore, need to be calibrated, specified, and evaluated at each site over a several month span.

Sections III - V covered many laboratory (plant cell tissue and root cultures) and field testing investigations for 1) aromatic, phenolic, and hydrocarbon contaminants, 2) explosives, and 3) chlorinated and halogenated compounds respectively. Rhizosphere biodegradation processes were linked to soil microbial populations. Optimizing the dynamic interactions between plants and microbes largely determined the success of volatilization, stabilization, transformation, and degradation of the contaminant in the plant and the rhizosphere. These sections further reiterated that the uptake of xenobiotic compounds is specific to on plant species and that a single species cannot be used in all soil and climatic conditions. In chapter 10, Olson, P. E. *et al*. suggested that native plants and plants that produce secondary

metabolites can be used in effective plant management practices regarding rhizosphere bioremediation. These plants increase the rate that organic compounds are released into the soil. Secondary plant metabolites often excite microorganisms that are involved in the rhizodegradation of recalcitrant pollutants.

Section VI conveyed the latest modeling, design, and field pilot applications involving trees such as *Eucalyptus*, red maple (*Acer rubrum*), poplar (*Populus*), and willow (*Salix)*. This section begins with dynamic well-designed plans to achieve desired cleanup levels in groundwater under both irrigated and nonirrigated conditions. Later chapters (Chapters 22 - 24) discuss the use of trees in effective cost-management and environmentally attractive methods to cleaning up wastewater, landfill leachates, and salty brines associated with natural gas and oil production.

Section VII discusses the latest advances in using plants to help manage, remediate, and detoxify nitrogen oxides and halocarbon atmospheric pollutants, methyl tertiary-butyl ether from soil and groundwater, cyanide wastes in soil, and perchlorate salts contained in wastewater. Genetic engineering and bioinformatics are incorporated in understanding the capabilities of plants to assimilate and detoxify chemicals. The final two chapters introduce worldwide databases of plants and organisms that possess phytoremediation potential and summarize current field studies and evaluations of phytoremediation processes.

The practice of phytoremediation embraces many different allied fields: botany, biochemistry, geology, soil science, agriculture, forestry, genetic engineering, microbiology, chemical and civil engineering, land use planning, hazardous waste management, and so forth. This book is intended as a reference for specialists involved with phytoremediation and for undergraduate and graduate students who are entering the field. Two major strengths of this text are: the chapters are cross-referenced throughout the book which enhances understanding of various phytoremediation concepts and all chapters have a similar format. Each chapter begins with a summary of practical applications. A glossary of important terms often follows a chapter's summary. This book could be useful in assorted college courses that concern phytoremediation. Classroom assignments could be derived easily from practical elements and implications discussed in each chapter. It would be helpful, however, to have an instructor's guide with assignments and laboratory exercises that relate to various topics discussed in this book. - Dr. Nina Baghai-Riding, Delta State University

The Cattleyas and Their Relatives. The Debatable Epidendrums. Carl L. Withner and Patricia Harding. Timber Press, Portland, OR. 2004. ISBN 0-88192-621-3 (Hardcover US$44.95) 300 pp. This series was initially intended to span six volumes and cover cattleyas and their closer relatives, but when the authors were asked why some *Epidendrum* species were left out they replied with this book. It deals with several genera which can be or have been segregated from *Epidendrum* and does so very well. And, as what can be viewed as a bonus it also presents in the introduction a very enlightening discussion of orchid classification in general.

A total of 18 genera and four aberrant species are dealt with in this book, all in appropriate detail with clear keys, good line drawings and mostly excellent and clear color photographs (exceptions can be found on pages 168, 175, 186 and 187). And (fortunately) missing from this volume are the contrived "common names" that plagued the previous volumes. Not missing and very welcome are lists of synonyms for each species, derivations of names, lists of habitats, indications of flowering times and information regarding culture. There are also comments about the taxa being considered in the book and measurements of pseudobulbs, leaves, inflorescences, and floral segments (without indications regarding the number of specimens which were measured to obtain the values which are given in the book; since these are obviously averages standard deviations would have enhanced the information).

There are four pages of "selected references for additional reading." This may not seem to be much but these references are in addition to the numerous literature citations on the text which refer to synonyms and names of species and genera. The book has indexes of persons and plant names, but, alas, not of subjects.

The book does not have shortcomings (at least none that caught my eye), but I would like to complain about is a case of "theitis" in the last paragraph on page 29 where six sentences in a row start with "the." Others may quibble with its taxonomy here and there but it is safe to assume that a day will never come when orchid taxonomists will stop quibbling. And, of course, it is safe and reasonable to assume that future molecular taxonomy research will bring about changes in classification. For me, now and in the past, fine points (real or nit picking) about taxonomy are/were less important than order, cataloging and arrangements which can be of use to growers and other (non taxonomic) scientists. Like the rest of this series this is a well written, carefully edited and solidly produced book. It should be of interest and of use to all those who

grow these orchids, or, like me want to read about them. And, given current book prices this excellent volume is certainly a bargain. – Joseph Arditti, Department of Developmental and Cell Biology, University of California, Irvine.

The Natural History of Madagascar. Steven M. Goodman and Jonathan P. Benstead (eds.) 2003. ISBN 0-226-30306-3. (Cloth US$ 85.00) 1728pp. The University of Chicago Press, 1427 East 60th St., Chicago, IL 60637-2954. With more than 1700 pages and weighing in at about 4 kg, 'The natural history of Madagascar' (NHM) is an appropriate compendium for a unique island such as Madagascar. More than 280 specialists contribute to this extraordinary book, which is recommendable for everyone who is interested in Madagascar's natural history. The book will be a valuable basis for researchers, teachers and interested eco-tourists and it should be on the "must purchase list" of major university libraries and of course in Malagasy research stations. Furthermore, NHM will be an inevitable standard for conservation. Scattered color plates and half tones are in most cases of good quality and give the book aesthetic appeal. Considering the large number of contributors, and its compilation within about 16 months, the editors did an admirable job. As mentioned in their acknowledgements, the book is a measure of the facility of modern communication, specifically e-mail. More than 800 manuscript pages were translated from non-English languages (the bulk of it in French) which is an important service, since scientific work other than in English runs the risk of being neglected.

The reader will find an overwhelming amount of information when browsing through the 14 main chapters, which are: History of Scientific Exploration; Geology and Soils; Climate; Forest Ecology; Human Ecology; Marine and Coastal Ecosystems; Plants; Invertebrates; Fishes; Amphibians; Reptiles; Birds; Mammals; and Conservation. Each of these chapters contains a variable number of contributions, dealing with general topics as well as with more detailed information, particularly under 'systematic accounts'. The contributions differ in length and style and could possibly have been a bit more uniform with precise editorial guidelines. Some chapters contain extensive lists of species, some of which include further information on distribution, endemism or protection. These lists are very valuable in respect of research. For the use as checklists in the field, they should be provided on the www. Ideally the web page of one central organization for conservation and biodiversity would be the most appropriate frame for such a resource. Looking for common threads within NHM, I became aware of three superlatives: First, the exceptional high rate of endemic taxa ; second, the exceptional high rate of endangered species and ecological devastation; and third, the exceptional gaps in our knowledge concerning Madagascar's natural history (Fisher on p. 815, for example, estimates that two-thirds of the ant species still remain to be described). The sobering conclusion of these facts is that it is at least five minutes to twelve for the survival, and in parallel the exploration, of many of Madagascar's unique organisms and biota.

Under 'Conservation' the reader will find a broad overview of what actually happens with respect to nature conservation and destruction. Wright and Andriamihaja (p. 1485ff) give an interesting contribution about the conservation value of long-term research and they highlight that research can be a major factor in conservation effectiveness. On p. 1486 the authors also acknowledge reality, when mentioning that 'No one has come up with a reliable long-term solution to the problem of tavy (slash-and-burn agriculture), and if the destruction of the forest is not stopped, biodiversity loss will continue. Madagascar is one of the world's 'biodiversity hot spots' and more than any other geographic region it may be struggling with the biggest risk of immediate mass extinctions. In this context, we have to consider that effective nature conservation is not an easy task for industrial countries, and that it is even more difficult for developing countries with high analphabetism and high population growth (according to Holloway p. 1449, Madagascar has one of the highest population growth rates in the world). Therefore, Wright and Andriamihaja (p. 1486) are possibly right when mentioning that 'the small number of protected areas and their weak on-

the-ground protection suggest that only a large input of well-managed funding can attain the goal of preserving Madagascar's unique biodiversity into the next decades'. In this context, NHM can also be seen as an emphatic appeal to call attention to the unique biodiversity of Madagascar's natural resources and its risk of extinction.

There is a large number of most impressive creatures, which can act as flagships for conservation. The most prominent are the endemic lemurs, which are addressed in several contributions. The counterpart in plants could be the Malagasy flamboyant, *Delonix regia* (Caesalpinioideae) which is one of the most familiar ornamental trees in the tropics.

Another widely known plant is the traveler's palm, *Ravenala madagascariensis*, which is not a true palm but a member of the Strelitziaceae, and whose principal pollinators are lemurs. And finally one should mention *Takhtajania perrieri*, an up to 9 m high shrub or small tree of Winteraceae. After its first collection in 1909, it was not found again for 85 years, and it was a botanical sensation when the plant was rediscovered in 1994 (Schatz et al. 1998). It is highlighted on the flap of the jacket, that of its estimated 12,000 plant species nearly 10,000 are unique to Madagascar. Deeply impressed by this fact, I was surprised to find the plant chapter a bit sparse. Regarding the number of pages, almost the same proportion as for plants were spent for the approximately 100 Malagasy mammals. As a botanist I also missed plant images on the jacket. Nonetheless, the included chapters give a good insight into several big and important plant groups, such as Pteridophytes, Leguminosae, Euphorbiaceae, Rubiaceae, and about 20 other plant taxa.

Unfortunately the second largest plant family, i.e., Orchidaceae is entirely absent. At least one of the most prominent Malagasy orchids, *Angraecum sesquipedale*, should have been mentioned. Because of its spur which reaches a length of more than 30 cm, and its heavy nocturnal fragrance, Darwin (1862) predicted the existence of moths with a proboscis longer than 20 cm, as pollinators. Darwin was laughed at, but in 1903 Rothschild and Jordan described *Xanthopan morgani praedicta* with a tongue length of about 22 cm. With the epithet 'predicta', the authors refer to its prediction by Darwin. Only recently Wasserthal (1997) demonstrated the pollination of *Angraecum sesquipedale* by *Xanthopan morgani praedicta* in Fort Dauphin. Concerning its conservation, Darwin (1862) also mentioned that 'if such great moths were to become extinct in Madagascar, assuredly the *Angraecum* would become extinct'. In fact, Wasserthal (1993) documents a decrease in pollinator abundance due to fragmentation of the primary forest and thus exceptionally low fruit set in *Angraecum*.

Ratsirarson and Silander (p. 272 ff) mention that little is known about plant-pollinator interaction in Madagascar. In this context it should be mentioned that Darwin observed the *Angraecum* in a greenhouse outside of Madagascar. Like in this case, other spectacular Malagasy flowering plants have been observed outside of Madagascar. Endress (1994) for example, elucidated outstanding peculiarities in floral behavior and morphology of *Delonix regia* which he observed in Australia. Another example is the Malagasy *Dombeya cacuminum* (Sterculiaceae) which has been observed in the Botanical Garden near Funchal (Madeira) and which shows a distinct mode of secondary pollen presentation on its petals (Prenner 2002). Observations in the natural environment, which could lead to new insights into the biological significance of the observed phenomena, are broadly lacking.

To conclude, NHM certainly is a very useful and interesting guide through Madagascar's living world. The compressed amount of information on most of the Malagasy organisms is an invitation to step across the border of one's own special field of interest. In this way it leads to a fundamental understanding of Madagascar's environment. NHM certainly can be an inspiration for many researchers and hopefully it will also be an emphatic sign for policy makers and investors to help saving one of the species richest, most fascinating, and still extant parts of nature. - Gerhard Prenner, Institute of Plant Sciences, Karl-Franzens-University Graz, Austria (Europe).

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The Genus *Paeonia*, Halda, Josef J. with James W. Waddick. Botanical illustrations by Jarmila Haldová. 2004. ISBN 0-88192-612-4 (Cloth $34.95, £25.00) 227 pages. Timber Press, 133 S.W. Second Avenue, Suite 450, Portland, Oregon 97204, in association with the Heartland Peony Society. Peonies belong to a very select group of garden plants that elicit awe and reverence far beyond the ranks of their aficionados. Whether this is due to the long history of medical applications in both Eastern and Western traditions, or the exuberance of the massive flowers, especially in double forms, or some other cause, we cannot say. However, the gravitational pull of peonies seems to be universal. As a child, one of us (MF) surreptitiously unpeeled the buds of his neighbors' plants (please don't tell!), patiently uncovering layer upon layer of petals, dying to see what mysteries lay within. Even the most commonly encountered cultivars draw notice when in full bloom. *The Genus* Paeonia is a gorgeously illustrated volume that is guaranteed to find appreciation among devotees of peonies and a broad spectrum of gardeners. It will also appeal to professional and amateur botanists interested in a concise and up-to-date monograph and key to the species.

This latest effort at treating the diversity and cultivation of peonies follows closely in the footsteps of its predecessor, F. C. Stern's (1946) *A Study of the Genus* Paeonia. By following the organization of Stern's classic monograph and also emphasizing magnificent full-page color illustrations, the authors inevitably invite comparison to the earlier work. Both treatments cover the history of western knowledge of peonies, morphology, cytology, taxonomy and classification, geography, cultivation, and detailed species accounts. *The Genus* Paeonia consists of a taxonomic monograph by the principal author, Joseph J. Halda, cultivation notes by James W. Waddick, and morphologically exact and beautiful illustrations by Jarmila Haldová. Halda's monograph departs sharply from the species concepts of Stern, and of course includes novelties unknown to mid-20th Century botanists. The spate of new taxa described by T. Hong and D.-Y. Hong in the 1990s (e.g., Hong & Pan 1999) are treated, but their significance (usually taxonomic rank) is generally disputed by Halda. Some species recognized by D.-Y. Hong [e.g., *P. ludlowii* (Stern & G. Taylor) D. Y. Hong] are only given scant mention by Halda. Whereas Stern treated 29 species (with an additional 18 subspecies and varieties), Halda recognizes 25 species (including an additional 29 infrageneric taxa). The similar totals at the specific level belie dramatic differences in species circumscription. For example, in the present work Halda recognizes *P. mascula* (L.) Miller as being comprised of seven subspecies, one composed of two varieties. Of these taxa, three subspecies and one variety were described since Stern (1946), two subspecies were recognized as species by Stern, and one subspecies was placed as a variety of a different species recognized by both Stern and Halda. Evaluating the adequacy of these taxonomic renovations is far beyond our combined expertise. We are sure that readers of Halda's monograph will have much food for thought regarding these new concepts in peony species. We only wish to note here that no objective species concept is cited by Halda and in only a few cases are changes of circumscription based on explicit criteria.

Infrageneric classification is also at odds with Stern's treatment of the genus. Stern (1946) recognized three sections, two of which are further divided into two subsections. Halda takes a finer view of relationships, recognizing four subgenera, two of which are composed of two and four sections. The largest subgenus has one of its four sections further divided into four subsections. Halda appears to have made only minor modifications to an infrageneric classification that has been developed by specialists over the last 20 years. Unfortunately, the tremendous advances in classification afforded by modern systematic methods have been thoroughly ignored by Halda. In particular, Halda fails to consider the significant contributions of T. Sang (e.g., Sang et al. 1997) to the infrageneric relationships of *Paeonia*. Reference to these studies would elicit support for some groupings (e.g., subgenera), but conflict with others (e.g., subsection *Anomalae*). In the same vein, it is unfortunate that an absolutely discredited hypothesis of close relationship between *Paeonia* and *Glaucidium* is promulgated by Halda (contra a wealth of morphological and molecular systematic data, summarized by Hufford 1992 and Soltis & Soltis 1997). These lapses in incorporating the current understanding of the evolutionary relationships of peonies will probably affect few readers, however it is most disappointing that another opportunity to introduce modern ideas about systematics to a general audience of plant lovers has been lost again.

The chapter on cultivation is very general but provides some useful guidelines on soils and fertility. The propagation chapter contains good information on root cuttings, grafting, and growing from seed, and the summary at the end of the chapter is quite helpful. In the chapter on diseases and pests, we disagree with the authors' opinion that botrytis is easy to control. In our experience, botrytis rarely kills peonies, but it diminishes bloom size and number every year, no matter how much is cleaned around the plants. We were glad to see the mention of ants and their roles in the lives of peonies. Another note: the high concentrations of sulfur and copper in Bordeaux mix can have serious effects on the soil if applied frequently and throughout

the long life of a peony. The last chapter in the book is extremely useful to general horticulturists wanting to add peonies to their gardens, but who are unsure of the species to try. We liked the information on hardiness and found it actually more helpful than the traditional USDA Hardiness Zone information. However, we believe this chapter would have benefited greatly from the addition of cultivar information, particularly for those species that are so highly hybridized.

It is worth commenting on the production quality of this book. The high standards of Timber Press are maintained here and the devotion of so many pages to the wonderful illustrations is commendable. Comparison of these illustrations to those in Stern's (1946) monograph makes one yearn for a production quality that is no longer economically feasible. Nonetheless, *The Genus* Paeonia is a beautiful book.

Overall *The Genus* Paeonia is a must-have monograph for devotees of peonies. The economical cost makes it a worthy addition to the libraries of those, like us, who relish well-illustrated and botanically detailed generic treatments. Given the recent increase in knowledge of natural populations of peonies in China, this book brings two decades of important new discoveries to a wider audience. We do take this opportunity to offer a plea to the publishers of such books to insist that reviewers require that modern systematic knowledge be considered requisite for popular monographs.- Mark Fishbein, Department of Biological Sciences, and Lane Greer, Department of Plant and Soil Sciences, Mississippi State University, Mississippi State, MS 39762.

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Tree Ferns. Large, Mark F. and John E. Braggins. 2004. ISBN 0-88192-630-2 (Cloth US$39.95) 360 pp. Timber Press, 133 S.W> Second Avenue, Portland, OR. Tree Ferns aims to present a comprehensive look at the various members of the ferns which have a stem which is, to some degree at least, upright. The authors themselves acknowledge that the term "tree fern" is "a somewhat arbitrary term that has been applied to any fern with a large erect rhizome..." (p. 15), and so they take a broad view and include families which are always accepted as tree ferns, such as the Dicksoniaceae and Cyatheaceae, but also other families, such as the Blechnaceae and Marattiaceae, which some might exclude from this informal group.

Throughout, Tree Ferns is clear and concise. It opens with a chapter that provides basic information on taxonomy, ethnobotany, biogeography, and similar topics. This material can be accessed even by non-botanists as basics concepts—such as definitions of sporophyte and gameotophyte—are included in discussions which are specific to tree ferns. Topics are given context, as where the use of tree fern fiber is discussed along with a consideration of when this endangers some species of tree ferns but not others which grow in great abundance in pine plantations, and interesting asides are also covered, such as the famous "vegetable lambs" having been made, in part, from rhizomes of the tree fern Cibotium barometz.

The second chapter then guides the reader through the cultivation and propagation of tree ferns. Tree ferns for both cooler and warmer areas are considered along with general shared features of cultivation, such as low humidity being one of the most common factors in the death of cultivated tree ferns. Readers are instructed in how the ferns are best propagated from spores and how purchased tree ferns arrive as unrooted cuttings.

Chapter three then turns to a description of the various tree ferns. The various families are considered first, with a key, followed by species and genera. Distribution maps are included for each genus, even ones endemic to very small areas. Hundreds of species are considered, each with one or more paragraphs on distinctive features and always including information on the size of the trunk and the degree to which it is erect.

Appendices supplement this information with lists of tree ferns possibly needing taxonomic revision, lists of ferns by native region, and lists of tree ferns suitable for cultivation in warm and cool sites. An extensive bibliography is also included.

The many plates, which are collected in one section, have excellent contrast and brightness. The quality of the photographs is especially striking since the authors had to produce images where the major differences were among shades of only one

color, green. A few photographs cover stages of the lifecycle and ecological details, and Plate 94, with Cyathea smithii growing in the foreground with a glacier in the background, is especially striking.

Tree Ferns is a very pleasing book which will entrance serious undergraduate botanists and which belongs in college and university libraries, as well as the library of any pteridologist and of any gardener in warmer parts of North America. – Douglas Darnowski, Indiana University Southeast, New Albany, IN 47150.

Wild Plants in Auckland. Alan Esler 2004 ISBN 1 86940 329 0 (Paper NZ$ 39.99 ,~US$ 27.00) Auckland University Press Private Bag 92 019 Auckland New Zealand
http://www2.auckland.ac.nz/aup

Auckland is New Zealand's largest city and blessed by a mild climate with abundant rainfall. This distinctive book describes the applied ecology of its largely introduced flora. "Wild" plant is defined as one that is "self perpetuating throughout several generations", without making the distinction between native and exotic plants. Auckland is also self-styled as "the weediest city in the world" although only about 200 of the estimated 615 introduced species are described as weeds. The flora thus includes elements from Europe (the majority) as well as Australia, South Africa, Asia, and the Americas, together with a fair sprinkling of native species. The latter are most easily seen in the many parks and reserves (often styled "Bush") that grace Auckland's urban sprawl. Nevertheless, the visiting botanist is immediately presented with the problem of distinguishing native from introduced flora, a predicament not assisted by the existence of the several excellent New Zealand floras that elsewhere separately describe the two entities. They are here separated in the index. However, the book is not an identification manual, but rather is an account of the ecology of the city's flora, with discussion of the adaptive processes that make an exotic species a successful resident.

Alan Esler claims the intriguing title of "forensic botanist', a profession that has provided him with an opportunity to examine minutely and in the field this fascinating flora. He represents that strong emphasis on field biology that characterizes the New Zealander, living in a country where considerable familiarity with plants is a feature of popular culture. The visitor will thus be challenged by the constant use of common names, especially those of Maori origin, but the index is again of great help. In the absence of diagnostic keys the book still has use in identification because 322 plants are illustrated by excellent line drawings from the author's pen. This is a wonderful talent put to good use.

The ecological description is largely anecdotal and subdivided into the many urban habitats whose diversity appears most clearly in the last-page index to the "plant portraits". There is some historical information, which largely presents the picture of a bracken-infested initial landscape, created by fire, before subsequent cultivation and urbanization. There are numerous insightful vignettes that are often positive in their outlook. The ecology of lawns ("grassy places") is dealt with in some detail and there are recommendations for the preservation of a protective vegetation cover on Auckland's numerous volcanic cones, many of which serve as public parks. If this is often grass, remember that New Zealand has the highest per capita sheep population in the world, with representatives only a short distance from the city center. Cemeteries may be used as wildflower sanctuaries, even though seedlings of the stately Canary Island date palm (*Phoenix canariensis*) are said to "move cemetery slabs faster than any other plant".

The account is very much a tale of good guys (many) and bad (fewer) but the overall picture is one of appreciation for the adaptive features, both vegetative and reproductive that allow a plant to occupy its favored habitat. There is no great emphasis on "aggressiveness" or "invasiveness, seemingly because Alan Esler likes plants too much. The approach is not about the "control" of exotic invaders but to provide insight into the biology of successful aliens based on continued field familiarity. It is almost as if the book is presented from the perspective of the plants themselves, but still emphasizes the ways in which weeds affect us economically. Here is a refreshing book on botany written by someone who has sought enlightenment and entertainment from plants all his life.

Obvious deficiencies are the absence of any mention of family names, any citation of precise sources that would lead a reader onward, and of identifying keys. Nevertheless, a visitor exploring Auckland for the first time should buy this book as it is an effective introduction to the floras of parks and waste places. Then, on to the nearby Waitakere Hills to begin the study of the native flora. There is a lot of botany in New Zealand and here is some of it presented in a distinctive way. - P.Barry Tomlinson, Harvard Forest, Petersham, MA 01366 and The Kampong of the National Tropical Botanical Garden, Coconut Grove, 4013 Douglas Rd. Miami FL 33133

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