

BULLETIN

FALL 2000

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NUMBER 3

PLANT SCIENCE

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

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Editor: Marshall D. Sundberg
Division of Biological Sciences
Emporia State University
1200 Commercial Street, Emporia, KS 66801-5707
Telephone: 316-341-5605 Fax: 316-341-5607
Email: sundberm@emporia.edu



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The Bernhardt Top Ten

Many of us complain about the deficiencies in the botany textbooks available to us for use in our classes - particularly at the freshman level. "This" is missing or "that" is missing; there is too much detail or too little detail; some of the information is misleading or outright incorrect. So what are our options? Of course, many of us require or recommend additional reserve readings or supplemental texts. In many cases this means readings from the primary literature or perhaps from secondary sources such as *Scientific American*. There is an interesting alternative, however, and that is to use material written for the general lay reader. Not only is this frequently a source of technically correct botanical information, but it is written in an engaging style and frequently put into a larger context. In this issue I asked two botanists who have written extensively in this genre, or have written extensively about it, to provide a list of their ten favorite general audience botany books and some background information on how they use these in their own teaching. Peter Bernhardt has written three such books. His most recent title, *A Rose's Kiss*, is currently in review for the *PSB* - a review scheduled for the winter issue. David Hershey has published extensively in *The American Biology Teacher* and *BioScience* on teaching botany more effectively in school and college classrooms. It is interesting to note that while both Drs. Bernhardt and Hershey provide lists of potential supplemental readings, such works can, in fact, form the backbone of readings in successful (and ultimately content-rich) freshman-level courses (Sundberg, unpublished). But that is another topic. Here are Peter and David's thoughts -

-editor

For the past 15 years I have used popular books on plant life in general botany, upper division and graduate courses. However, I have gradually eliminated lists of "recommended reading" from all of my syllabi. It's my experience that books listed as "recommended" are almost never read by the students. Therefore, some popular books have become part of a course's required reading list. I feel no guilt as books produced by a commercial press are usually far cheaper than standard texts.

Popular works are also offered as "references" during labs or as introductory materials during "workshop" sessions. My three upper-division courses (Pollination Biology, Ethnobotany, and The Biology and Classification of Orchids) must function without labs. Lecture hours actually break down into true lectures followed by field trips and workshops in which students are expected to examine and dissect specimens or make wet mounts. Popular books are extremely useful at these moments for two, overlapping reasons. First, they provide easy access to the history of a discipline. Second, they relieve a certain amount of student anxiety before they are introduced to unfamiliar concepts, techniques and organisms. No student feels intimidated by the topic of Phenology after thumbing through Mabel Osgood Wright's *Flowers and Ferns in Their Haunts*. Workshop sessions are also augmented by reprints from more general periodicals including *American Scientist*, *Natural History*, *The New York Times* and defunct magazines like *Garden*.

Readers will ask, "Do I use my own books in these courses?" Of course I do but, due to the workshop motif, I need not ask a student to purchase copies of anything I've written. My most recent book, *The Rose's Kiss* (1999) has been useful as an introduction to the optics and bio-

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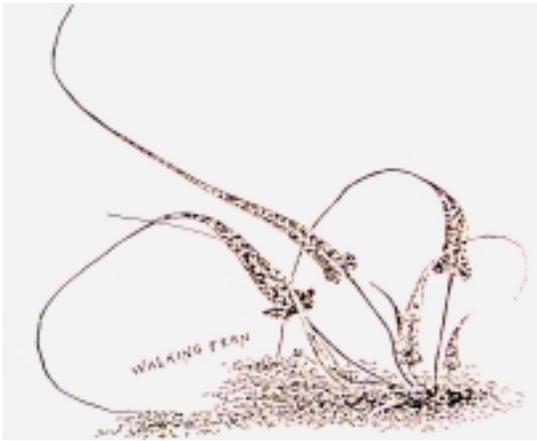
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POSTMASTER: Send address changes to:

Kim Hiser, Business Manager
Botanical Society of America
1735 Neil Ave.
Columbus OH 43210-1293
Phone/Fax: 614/292-3519
email: hiser.3@osu.edu

Address Editorial Matters (only) to:

Marsh Sundberg, Editor
Div. Biol. Sci., Emporia State Univ.
1200 Commercial St.
Emporia, KS 66801-5057
Phone 316-341-5605
email: sundberm@emporia.edu



-from Wright's *Flowers and Ferns in Their Haunts*

chemistry of flower pigments and scents. Selected chapters in *Wily Violets & Underground Orchids* (1989, 1990) offer bits on the history of Orchidology while two chapters in *Natural Affairs* (1993) treat heterostyly and the biology of nectar, respectively.

Below is a list of ten of what I've found are the most dependable books for certain courses. In fact, I could have compiled a list exceeding ten selections but I've restricted the list to books that can perform in more than one course and of those that students will appreciate because they help answer very specific questions. I will not apologize for using books for workshops that are long out of print. I've been collecting botany, natural history, and horticulture books at second-hand shops since I was 12. College students should be in a position to exploit some of their professor's long-term obsessions.

1) Barth, Friedrich G. 1985. *Insects and Flowers; The Biology of a Partnership*. Princeton University Press, Princeton, New Jersey. I have used this book in Pollination Biology courses in conjunction with a drier, more technical textbook such as A.J. Richard's *Plant Breeding Systems*. Upper division

and graduate students appreciate Barth's extensive use of color photography, pen and ink drawings. Barth's prose is relatively devoid of terminology.

2) Brodie, Harold J. 1975. *The Bird's Nest Fungi*. University of Toronto Press, Toronto and Buffalo. A personal favorite offered during the fungus labs in my general botany course (B1-326) as students are expected to distinguish between the structural morphology and life cycles of gasteromycetes and hymenomycetes. St. Louis suburbs have experienced population explosions of bird's nest fungi in recent years due to bulldozing dead wood into dark ravines and over application of chip wood mulches sold in most nurseries. The easy to follow figures and text help explain both our prepared slides and spirit collections of fruiting bodies.

3) Cox, Paul A. 1997. *Nafanua; Saving the Samoan Rain Forest*. W. H. Freeman & Co. Upper-division students responded positively to the more humorous passages in this book that discussed the active role of a botanist in conservation. I plan to make this required reading the next time I teach Ethnobotany.

4) Darwin, Charles. 1984. *The Various Contrivances by Which Orchids are Fertilised by Insects*. University of Chicago Press, Chicago and London, second edition revised with a new forward by Michael Ghiselin. Selected sections are assigned to students in Pollination Biology and The Biology of and Classification of Orchids before we take our annual field trip to the orchid show at the Missouri Botanical Garden. I also give them Darwin's little equation of how many generations it would take for one species to cover the planet if all the offspring produced by a helleborine orchid (*Epipactis*) capsule survived.

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Editorial Committee for Volume 46

P. Mick Richardson (2000)
Missouri Botanical Garden
P.O. Box 299
St. Louis, MO 63166
mick.richardson@mobot.org

Vicki A. Funk (2001)
Department of Botany
Smithsonian Institution
Washington, D.C. 20560
mnhbo003@sivm.si.edu

Ann E. Antlfinger (2002)
Biology Department
Univ. of Nebraska - Omaha
Omaha NE 681823
antlfinger@unomaha.edu

Norman C. Ellstrand (2003)
Department of Botany and Plant Science
University of California
Riverside CA 92521-0124
ellstrand@ucacl.ucr.edu

James E. Mickle (2004)
Department of Botany
North Carolina State University
Raleigh, NC 27695-7612
james_mickle@ncsu.edu

5) Hollingsworth, Buckner. 1958. *Flower Chronicles*. Rutgers University Press, New Brunswick, N.J. This book is used in conjunction with Segal (1990, see below) to stress the spread of plants via cultural diffusion. Hollingsworth emphasizes the historical use of flowers as medicines, dyes, perfumes, and flavorings before they were exploited for ornamental purposes. Her treatment of the history of "tulipomania" is particularly interesting especially her documentation of the many items traded for a single bulb.

6) Mann, John. 1994. *Murder Magic and Medicine*. Oxford University Press Inc., New York (paperback edition). Much loved by students taking Ethnobotany as it unites plant secondary compounds with their historical "abuses". The section on witchcraft and the vaginal application of alkaloid-rich "flying ointments" never fails to bring down the house.

7) Nabhan, Gary Paul. 1993. *Songbirds Truffles and Wolves; an American Naturalist in Italy*. Pantheon Books, New York and San Francisco. Nabhan has written far more important books tying cultures to both their cultigens and native vegetation but this book offers the simplest introduction to the role of cultural diffusion in plant distribution. A graduating senior (a double major in Art and Biology) took a copy with him on his vacation in Italy.

8) Randolph, Vance. 1947. *Ozark Magic and Folklore*. Dover Publications Inc., New York (paperback edition). This book has proven to be invaluable when invited to address the first year medical students taking a course in Alternative Medicine at the St. Louis U. Medical School. The text teaches students the vernacular such as difference between "yarbs" (wild medicinal herbs) for teas (infusions) vs. oozes (decoctions) illustrating the fine line between folk medicine and quackery.

9) Segal, Sam. 1990. *Flowers and Nature*. Hijink International b.v., Amstelveen, The Art Gallery of New South Wales, Australia. The book is based on an exhibition of Dutch and Flemish still lifes (representative paintings and illustrations from 1500-1986) that toured the Pacific rim. Plants and animals in each painting have been identified to species. Students viewing these plates are given the opportunity to see artistic documentation of the introduction of tropical fruit to Europe, products of early glasshouse culture and can contrast wild species to early varieties and hybrids. Some paintings depict Eurasian plant in bloom according to season. The book is especially useful when used in conjunction with text from Hollingsworth (1958, see above).

10) Wright, Mabel, Osgood. 1928. *Flowers and Ferns in Their Haunts*. The Macmillan Company, London, second edition. Graduate students appreciate this book when they are introduced to the role of phenological studies in Plant Ecology and Systematics. Wright's prose, early photographs, sepia drawings, and extensive descriptions of the flora of New England make this book more accessible to an American classroom than the seminal work of Gilbert White. Readers who are interested in the prospect of a third edition should write editors at Timber Press.



-from Wright's *Flowers and Ferns in Their Haunts*

Hershey's Top Ten

Popular botany books, including the vast gardening/horticultural literature, provide a rich source of supplemental readings for a botany course. Popular books allow exploration of areas typically not covered in botany texts or allow a particular subject to be explored in greater depth. Popular books also tend to be less dry than textbooks so may better hold a student's interest. In this list I have included books with excellent illustrations.

1) Johnson, Lady Bird and Lees, Carleton B. 1988. *Wildflowers Across America*. New York:Abbeville Publishing. (288 pp.) I am fairly certain this is the only botany book ever coauthored by a former First Lady but the hundreds of color photos actually are the main attraction. Topics covered include the history of plant exploration, regional wildflowers and the landscape beautification movement.

2) Mee, Margaret. 1988. *Margaret Mee: In Search of Flowers of the Amazon Rain Forest*. Suffolk, England: Nonesuch Expeditions. (303 pp.) Starting at age 47 in 1956, Margaret Mee spent 32 years exploring the Amazon as a botanical artist to document new species. Her dairies and artwork provide a unique story of the adventures of a modern botanical artist/explorer and the rain forest destruction she witnessed.

3) Hepper, F. Nigel (editor). 1982. *Royal Botanic Gardens Kew: Gardens for Science and Pleasure*. Owings Mills, MD: Stemmer House. (195 pp.) The history, plant collections, and current research of one of the world's great botanic gardens are examined in this well illustrated volume. Research projects discussed in depth include seed banks, plant exploration and conservation, and crocus.

4) Lewington, Anna. 1990. *Plants for People*. New York: Oxford University Press. (232pp.) This is a popular economic botany book but with lavish color illustrations not found in college economic botany textbooks. Plants are examined by use as toiletries, foods, clothing, medicines, entertainment, and transportation.

5) Vertrees, J.D. 1987. *Japanese Maples*. Portland, Oregon: Timber Press. (189 pp.) A world expert details the history, taxonomy, cultivation, propagation, and over 250 cultivars of *Acer palmatum* and *Acer japonicum*, both valued as landscape trees or shrubs for their stunning leaves. This book is representative of hundreds of color illustrated horticultural books examining a cultivated species or all or part of a cultivated genus.

6) Camus, Josephine M., Jermy, A. Clive and Thomas, Barry A. 1991. *A World of Ferns*. London: Natural History Museum. (112 pp). The shortest book in this list but a top notch introduction to the biology and diversity of ferns, with a few other seedless plants included here and there. Most of the book examines ferns by habitat including wetlands, tropics, arid zones, temperate zones, mountaintops and polar areas. There are also sections on the fossil record, fern myths, economic uses, and cultivation.

7) Attenborough, David. 1995. *The Private Live of Plants: A Natural History of Plant Behaviour*. Princeton, NJ: Princeton University Press. (320 pp.) A wide-ranging discussion of plants based on the popular six-part BBC TV series. Among the topics covered are seed dispersal, carnivorous plants, unusual plant-pollinator relationships, ant plants, parasitic plants, and aquatic plants. Not to be confused with the pseudoscientific *Secret Life of Plants*.

8) Hewes, Jeremy Joan. 1981. *Redwoods: The World's Largest Trees*. New York: Gallery Books. (192 pp.) The main focus is *Sequoia sempervirens*, its natural history, taxonomy, exploitation, and protection. Dawn redwood and giant sequoia are examined to a lesser extent. Superb illustrations including many archival photos of early redwood logging.

9) Slack, Adrian. 1980. *Carnivorous Plants*. Cambridge, Mass.: MIT Press. (240 pp.) Perhaps the best illustrated of the many popular books on carnivorous plants even though the majority are black and white photos. Describes over 50 species, focusing on trap mechanics and cultivation.

10) Lampe, Kenneth F. and McCann, Mary Ann. 1985. *Handbook of Poisonous and Injurious Plants*. Chicago: American Medical Association. (432 pp.) This is a useful and fascinating identification manual of poisonous plants with over 400 color photos plus chapters on general management of plant poisoning, plant dermatitis and mushroom poisoning. About 150 poisonous genera are profiled in detail including toxic part, toxin, symptoms and treatment.

News from the Society

YES WE DID have a **GREAT** meeting in Portland!

(If you weren't there -- you should have been!)

Wayne Elisens, Jeff Osborne, and all the organizers, presenters and participants deserve a round of applause from the entire Society. Nearly 600 talks and posters were presented in BSA-sponsored sessions in addition to those sponsored by co-meeting societies. For the first time in decades we had a cohesive conference of all participating societies. It was a "smaller" meeting than we experienced at many past gatherings under the AIBS umbrella. Perhaps because of this it seemed friendlier and more personal. If the Portland meeting is any indicator of things to come, we can anticipate future meetings with lots of interactions between all participants, whether presenting or simply attending. What a great way to gather with friends and colleagues!

There were very few conflicting sessions between similar society sections and there was a single conference-wide poster session - including a new "Recent Topics" section. The coordination between participating societies was immediately evident from the format of the final program. A uniform numbering system for all sessions of all societies, along with the "Program-at-a Glance"

graphic and “Scientific Program-at-a-Glance,” made it easy for participants to plan and follow a daily schedule. Perhaps the only down side to the conference is that many presenters used their full allocated time and, at least in the sessions I attended, there was no time for questions or only a single question was allowed. The Developmental and Structural Section’s “Open Space” provided a prescient mechanism for questions and discussions. Hopefully this format will be expanded at future meetings. All-in-all it was a very productive meeting - - and lots of fun too! **Start planning now for Albuquerque, August 12-16, 2001!**

-editor



Reports of Executive Committee, Editors, Committees, Sections, and Representatives

(NOTE: All reports, except those of the Business Manager, are available electronically in their entirety at <http://www.botany.org/bsa/membership/2000reports/>)

PRESIDENT’S REPORT

- Prepared Fall letter
- Official letters to all new committee members
- Official letter of thanks to former committee members
- Appointed Publications Committee (new)
- Appointed Annual Meeting Coordination Committee (new)
- Appointed two ad hoc committees (Development, Endowment)
- Official letters to new Corresponding Members
- Wrote letters to Governors of Kansas and Tennessee regarding the teaching of evolution.
- Formulate Associate Editor policy for the American Journal of Botany
- Letters of invitation to government officials to provide official opening of BSA meeting in Portland:
- Letters of invitation to other societies for Portland
- Letters of invitation to other societies for Albuquerque

(IOPB will meet with us)

- Corresponded with presidents of ASPT, ABLs, AFS regarding meeting plans (increase support and alleviate misconceptions about “cost sharing”)
- An initial strategic Plan for BSA was developed to establish future goals and priorities for the society.
- A series of information Papers was established to be added to BSA website. The goal of the series is to provide the facts and information behind various (controversial) topics. The first two contributions will be provided by Dr. R. Mack on Invasive Species and Dr. C. S. Prakash on Genetically Modified Organisms.
- Several by-law changes were proposed and approved.
- Gary Nabhan invited to be the Plenary speaker in 2001.
- Final appointments made to webpage, Publications and Annual Meeting Coordinating Committees.
- The new Editor of PSB, Marshall Sundberg, began his term of service (Jan 1, 2001). Marsh was chosen by a committee composed of Allison Snow (chair), Donald Galitz and Joe Armstrong.
- Wayne Elisens and Carol Baskin visited possible sites in Florida for our meeting in 2003.
- Bill Dietrich chosen as the outreach speaker for the meetings in Portland.
- Presidents of PSPT, ABLs, AFS, and IAPT were invited to participate in opening ceremony of Portland meeting. Tod Steussy agreed to sit in for G. Prance to represent the IAPT at the opening ceremony.
- Publication of Abstracts in AJB will be discontinued. Abstracts will be printed separately and the monetary savings dedicated to “Special Publications/Initiatives.” The Publications Committee (Judy Jernstedt, Chair) was notified of this EC decision and given the responsibility of planning for this “Special Publications/Initiatives” in 2001.
- Illegal use of copy written material (involving Wendy Zomlefer’s illustration of *Rosa palustris*) is discussed and the problem rectified through the efforts of Wayne Elisens and Clyde Calvin. I discussed the problem with Wendy and wrote a formal letter of apology in which all of Wendy’s concerns are addressed.
- Tim Lowrey agreed to be local representative for the 2001 BSA meetings in Albuquerque, N.M. Diane Marshall later agreed to assist as a second local representative.
- The late Drs. Richard and Deana Klein provided a sizable contribution to BSA endowment

(\$200,000)

-Letters of thanks were sent to David Marvin for handling the Klein estate and notifying BSA of the contribution of R. and D. Klein

-AJB Endowment effort – Karl Niklas initiated a fund-raising effort to support the growing needs and future plans of the AJB. This effort has now been coordinated with the fund-raising efforts of the FAC (Harry Horner, chair)

-The BSA organized its own meeting for the first time in many years (through the hard work of Wayne Elisens). Conferon was enlisted to assist with this undertaking. Wayne and I signed numerous contracts with Conferon and Portland State University. Wayne was given permission by EC to sign contracts as needed (rather than redirecting these to the President)

-The Presidents of ASPT, ABLs, and AFS were again notified that no "profit sharing" is to be implemented regarding the Portland meetings. The Presidents of these societies are also notified of the perks they will initially receive (Registration waiver, free space at conference center, etc). The topic of profit sharing can be addressed again after the success of the Portland meeting is evaluated.

-Wayne Elisens's daughter, Karen, was hired to assist in Portland.

-New BSA office staff person was designated as a high priority item. Ed Schneider provided a job description. This position will be filled in the fall of 2000.

-Prepared Spring letter

-Doug Soltis, President

Past President's Report

The Past President chairs the Corresponding Member Committee, Election Committee and the Plenary Session Committee (see separate reports), evaluates nominations for the Young Botanist Awards and organizes the Past President's Symposium.

1) Plenary Session Committee. Members of the Committee were Clyde Calvin (Local Representative, Portland State University), Wayne Elisens (BSA), Chris Haufler (ASPT), Barbara Hoshizaki (AFS) and Brent Mishler (ABLS). The primary function of the Committee was to find a speaker for the opening session of Botany 2000 in Portland, OR, on 6 August. The Committee was very pleased that Elliot M. Meyerowitz (California Institute of Technology, Pasadena) agreed to give this address. His title is "Genes, genomes, and plant developmental biology."

2) Young Botanist Awards. Thirty-four nomina-

tions were received for Young Botanist Awards in 2000. Twenty-one students were awarded the CERTIFICATE OF SPECIAL ACHIEVEMENT, and 13 were awarded the CERTIFICATE OF RECOGNITION. Kim Hiser took care of sending the letters and certificates, and I really appreciate her efforts.

3) Past President's Symposium. Wayne Elisens suggested that the Past President's Symposium should be the Theme Symposium for Botany 2000 rather than a symposium on a specific research area. Thus, the title of the symposium is "New frontiers in botany," which is the theme of the meeting. The speakers are: Peter R. Crane, "Paleobotany: Back to the future"; Michael J. Donoghue, "Frontiers in phylogenetic biology"; Douglas W. Schemske, "Ecological genetics of adaptation and speciation: Merging the old and the new"; and Tamara Ledley, "Global climate change: An earth system perspective."

-Carol C. Baskin, Past-President

Secretary's Report

The following list summarizes my activities as BSA Secretary during the 1999-00 year.

1. I sent names of Society and affiliated award winners announced at the 1999 annual social to Joe Leverich, PSB Editor, for publication. Where appropriate, I sent the titles of the awardees' presentations.

2. I maintained correspondence directed to the BSA Secretary.

3. I made copies of all meeting agendas, minutes, reports, and formal correspondence from the 1998-99 year for deposition at the BSA Business Office in Columbus, OH, and in the BSA Archives at the University of Texas, Austin, TX.

4. I collected (electronically) the annual reports of all Officers, Editors, Section Chairs, and Committee Chairs, compiled them, and posted them on the BSA webpage. Thanks to Scott Russell for preparing the site.

5. I established a file of templates for all correspondence and documents routinely used by the Secretary. The file will be passed on to Jennifer Richards, BSA Secretary-Elect following this year's annual meeting.

6. I initiated the revision of the BSA Officers' Handbook. With so many of the Officers' activities being conducted electronically, many of the responsibilities described are outdated. In addition, the BSA now has a Webmaster and a Meeting Coordinator, and the duties of these Officers have not been formally described. The revised booklet will be completed in time for the 2001 elections.

7. Most of the Secretary's duties fall in the summer. These include helping to plan the BSA Council and Business Meetings and the agenda for the BSA

Banquet, distributing the agenda for the Council meeting, coordinating the receipt and distribution of reports for the Council meeting, and coordinating the Society and affiliated awards.

8. Following this year's meeting, I will conclude my duties as BSA Secretary by

- a. filing the award winners' names with PSB Editor Marsh Sundberg
- b. preparing the minutes of the 2000 Business Meeting for the Fall BSA mailing
- c. filing copies of all Secretary's documents from 1999-00 with the BSA Business Office and the BSA Archives
- d. transferring all materials to Jennifer Richards, Secretary-Elect

9. Thank you to the BSA for the opportunity to serve the Society. My term as Secretary has been a very rewarding experience!

-Pamela S. Soltis, Secretary

TREASURER'S REPORT

The financial position of The Botanical Society of America remains strong. The BSA Endowment Fund assets, invested through Salomon Smith Barney (SSB) as of June 27, 2000 include:

Money Funds & Dividends \$	239,259.35
Mutual Funds	\$1,553,233.06
Certificates of Deposit . .	\$ 75,000.00
Total	\$1,867,492.41

The BSA Endowment fund, including special accounts, has grown 31% since June, 1999 (\$1,423,622) and has grown 111% since its inception 6.5 years ago (12/93; \$884,317). This represents an average increase of about 17% per year. Cash assets held at Santa Barbara Bank and Trust as of May 31, 2000 include:

Non-Profit Checking Account	\$ 38,724.95
Business Savings	\$149,296.09
Total	\$188,021.04

* A current and detailed Financial Statement will be distributed at the Executive and Council meetings

Change to the new fiscal year (October 1 – September 30), as approved by the membership, was completed with submittal of IRS forms, declaring July 1, 1999- – September 30, 1999 a short fiscal year. The budget for the new fiscal year mirrored the budget approved during the 1999 BSA Council

meeting for FY 1999-2000.

Close cooperation continues between the BSA Business Office in Columbus, Ohio, Mary Dawson, the BSA Certified Public Accountant, and the Treasurer's Office. Approximately 150 checks for routine bills and awards were distributed from the Treasurer's Office. Most requests for checks utilized the Electronic Check Request available at the following site:

<http://www.botany.org/bsa/membership/reimburs.html>

Quarterly reports to the BSA Council, section, and special fund chairs/officers were posted electronically for the first time. The BSA financial statements can be accessed at HYPERLINK <http://admin.botany.org/budget> The financial statements for section and special fund accounts will be updated on a bi-monthly basis. Sectional cash accounts beginning with the third quarter in FY 1998-99 have continued to be awarded 2% per quarter; 8% per annum with balances of \$1,000. Special Funds with a balance of \$2,500 have been earning the equivalent rate as the Soloman Smith Barney BSA Mutual Fund investments beginning with the third quarter in FY 1998-1999. Rates for the first third quarters of the new fiscal year have been 17.2%, 3.8%, and -4.7 % for a return of 16.3%.

The annual performance evaluation of the Business Manager, Kim Hiser, was completed by the Executive Committee and Treasurer.

MasterCards under the Botanical Society of America name are now held by the Business Manager and the BSA Treasurer. These have a \$5,000 allowance and are used primarily to reduce the number of checks that need to be written and speed up payment times on BSA purchases.

The BSA has received a generous gift of more than \$200,000 (last payment to made Fall 2000) from the estate of Richard and Deana Klein, longtime members of the BSA. Two articles were featured in the last PSB dealing with their gift and the Endowment Fund. The BSA Financial Advisory Committee will finalize the development of a planned giving brochure ready for distribution by the end of 2000.

The development of a Job Description for the new full time BSA office staff member (Title: Administrative & Meeting Assistant) was coordinated by the Treasurer and submitted to Ohio State University for processing. It is anticipated that the new staff member will be hired and 'in place' sometime this fall.

All members are encouraged to submit budget ideas during the annual call for budget requests made in June/July of each year. This year

\$27,841.00 of special Initiative/project money will be made available from interest earned from the BSA Endowment Fund.

Recommended Actions for FY 2000 2001

As the BSA Treasurer I recommend that the Society conduct an 'operational audit' of the Business Office.

-Ed Schneider, Treasurer

BSA Meeting Coordinator

I. BOTANY 2000 MEETING

1. The amount of work greatly exceeded projections and quickly superseded the personnel and clerical support of the BSA business office, committees, and officers. A recommendation was forwarded to the EC indicating that additional full-time help was required in the Business Office to assist with meetings-related items.

Key personnel for Botany 2000 include: Clyde Calvin (BSA local rep), Keith Karoly (Botany 2000 Fieldtrip Coordinator), and Caroline Spinner (Conferon Account Planner). David Kramer coordinated staffing for the BSA booth. Since March 2000, Ms. Johanne Stogran, working out of the BSA business office, has been coordinating exhibitions and several other aspects of the meeting. Ms. Kim Hiser has been assisting with meeting logistics and, along with Ed Schneider, has been overseeing the meeting account and bookkeeping.

2. BSA contractual obligations — BSA is the responsible financial organization for the planning and implementation of the Botany 2000 conference.

3. Meeting-related publications and giveaways — Major publications undertaken for Botany 2000 included: Exhibitor Prospectus (600 printed in Norman, OK; mail/fax to 250 potential exhibitors), Registration Brochure (5000 printed in Columbus, OH; mailed to members of all participating societies), Abstract supplement (printed as an AJB supplement), the Final Program (1000 printed in Portland, OR; handed out on-site to conference registrants), and the Final Program Addendum. Giveaways printed for the conference included 1100 zippered tote bags with the conference logo and 1100 3-ring binders with the logo.

4. Exhibitors, advertisers, and sponsors — There were 16 paid exhibitors; complimentary booths were provided for AFS, ASPT, and BSA (ABLS declined). Botany 2000 and the ESA meeting were direct competitors for exhibitors.

5. Budget Preparation, Revenue Projections, and Financial Accounting — A full meeting budget was prepared based on anticipated expenses for meet-

ing functions. To date, registration numbers and exhibition sales are at 80% of projections, although the online vs. mail/fax and student vs. regular registrant percentages were close to predictions (82% and 32% respectively). A full financial report on the conference budget will not be ready until fall 2000.

6. Conference Lodging — Projected bookings at contracted hotels were affected by the registration shortfall. BSA is responsible for any lost revenue (the 'attrition' clause) on only the peak night (Monday).

BOTANY 2001 MEETING:

12-16 August, Albuquerque Convention Center, NM

Current status — Contracts are signed for four hotels. There are no dorm rooms available, although a motel block was obtained at \$68 sgl/dbl. Participating societies are the ABLs, AFS, ASPT, BSA, and IOPB. With IOPB, attendance projections should be greater than Botany 2000. The BSA local rep is Tim Lowrey.

BOTANY 2002 MEETING:

2-7 August, University of Wisconsin Pyle & Lowell Conference Centers

Current status — Letter of agreement is signed with University of Wisconsin conference centers for use of meeting rooms, space in the UW Union, and campus hotels and dorm space. Contracts are pending for nearby hotels. Participating societies: AFS, ASPT, BSA, CBA/ABC. We recommend that PSA and IAWA be given renewed invitations to attend. Local rep is Ray Evert, with strong support from the UW Botany Department. Utilize UW conference services to assist with staging the meeting.

V. BOTANY 2003 MEETING:

Recommendation — 27-31 July, Mobile Convention Center, AL.

Site visits for 2003 meeting venue — Carol Baskin and I conducted site visits to Jacksonville, FL and Mobile, AL in May, 2000.

Summary of recommendation to contract with Mobile — The primary DISADVANTAGES may be the hot and humid weather in Mobile in July, and the relative scarcity of BSA members in and around Mobile. The ADVANTAGES of Mobile as a meeting site are the following: 1) Cost of lodging; 2) Placement of hotels and meeting site; 3) Ease of staging; 4) Good botanical resources and interest;

5) Outstanding potential to interface with additional societies such as PSA, AABGA, and/or the Society of Wetland Scientists; and 6) Interesting history, cuisine, and attractions within walking distance of convention. .

VI. BOTANY 2004 MEETING

Sites under consideration — St. Paul, MN (good facilities and local support); Spokane, WA; Salt Lake City, UT; Reno, NV. Site visits have been conducted to St. Paul and Reno.

- Wayne Elisens, Meeting Coordinator

PROGRAM DIRECTOR

The Scientific Program for Botany 2000

Summary Information. All BSA disciplinary Sections have some function(s) scheduled at Botany 2000 except for the Mycological and Tropical Botany Sections. Detailed schedules for the sectional programs are presented in the Final Program. However, summary information for the number of presentations and sessions for the entire conference is presented below.

Total number of presentations	597
Talks	448
Contributed papers	394
Symposium presentations	49
Special lectures and addresses	5
Posters	149
Regular submissions	119
Recent Topics	30
Total number of sessions	49
Contributed papers	40
Symposia	8
Posters	1

New for the 2000 Meeting. As Botany 2000 is the first annual meeting in many years that the BSA has completely organized, many planning aspects were new. However, several major changes and new features were incorporated into the scientific program for the 2000 meeting.

Program organization. Rather than each participating society having separate listings in the Final Program with different session numbers that are variously cross-referenced, as has been done in the past, the scientific program for the entire meeting in chronologically listed with conference-wide session numbers. The days of

the week are clearly indicated by vertical tabs on the page edges. In addition, components of the scientific program are presented in five 'At-a-Glance' sections. The intent of these changes is to make the scientific program more cohesive for the conference as a whole and to make the Final Program a more user-friendly document.

Recent Topics posters. A new poster session was introduced for Botany 2000 with an extended abstract submission deadline. 'Recent Topics' is designed to accommodate research results that may not have reached fruition by the March deadline. Abstracts were accepted on a first-come, first-served basis until all available poster slots (40) were filled, or by an absolute deadline of 15 July 2000. Thirty posters were submitted and, of these, only three presenters already had another presentation(s) scheduled for the meeting.

Single, conference-wide poster session. A single, conference-wide poster session was included into the scientific program, with sectional posters grouped together. The intent was to schedule the poster session at a time when no other conflicting paper or symposium sessions would be scheduled. However, this goal was not realized for Botany 2000.

Public Outreach Lecture. In order to begin expanding the educational and outreach components of the Society's mission, a public outreach lecture was incorporated into the program for Botany 2000. The Lecture is free and open to the Portland-area public. The Lecture is also sponsored by Portland State University, who is helping to advertise the event both locally and regionally.

Future Annual Meetings

2001 – Albuquerque, New Mexico.

Calls. The "Call for Symposia," "Call for Workshops," and "Call for Field Trips" for the 2001 Annual Meeting were distributed in the BSA-wide Spring 2000 mailing and posted on the website. The "Call for Papers" will be distributed in the BSA-wide Fall 2000 mailing, as well as posted on the website.

Abstract Volume. Beginning in 2001, I support no longer publishing the abstracts of the annual meeting as a supplement to the American Journal of Botany. This change will afford significant cost savings, more flexibility in the timing and presentation of abstracts, and potentially a later deadline for submissions.

2002 – Madison, Wisconsin. The Executive Committee has approved a proposal to ex-

pand the educational and outreach components of the annual meeting, with the hope of beginning in 2002. The expanded format will include a separate meeting that focuses on educational and outreach issues on Friday and Saturday, but that is linked to the annual scientific meeting on Sunday via workshops and field trips. I will be working with a separate 'planning committee' and the Education Committee to organize the new meeting. In addition, disciplinary Sections will have the opportunity to play an important role in the new meeting.

-Jeffrey M. Osborn, Program Director

The American Journal of Botany

1. Publication status

Year	MS Received	Total Pages	Papers
1999 – 2000	325	1,804	118
1998 – 1999	301	1,820	181
1997 – 1998	325	1,802	212
1996 – 1997	323	1,728	181
1995 – 1996	325	1,618	176

On average, 150 pages per issue; 16 papers et al. per issue; 9.5 pages per article. Does not include TOC, indices, ads, etc. 2173 regular papers; 7 brief communications; 3 special papers; 6 book reviews.

2. Current manuscripts

	99,2000	1998,99	1997,98	1996,97	1995,96
Accepted or at Allen Press	166	113	105	92	95
Tentatively accepted	28	48	57	75	58
Out for review	47	73	68	42	46
total	241	234	232	209	199

(Does not include 64 'split decision manuscripts currently out for revision by authors)

3. Current production schedule

	1999-2000	1998-99	1997-98	1996-97	1995-96
Receipt to final editorial decision	1.2	1.1	1.0	1.1	1.0
split decisions	7.44	6.9	6.7	6	6
Receipt to publication	8.35	7.7	7.5	6	6

Out of the 325 manuscripts received in this time

period, ~50% were accepted, ~ 30% were declined, and ~20% received 'split reviews' (subsequent rejection rate is ~ 45%).

4. Highlights: Effective with the August 2000 issue, I have decrease the size of our Times Roman font to reduce the time of receipt to publication since this change is projected to save ~ 15 pages per issue, which translates into ~ 17 or 18 additional manuscripts that can be published per year.

5. Recommendations: Raise an endowment to subsidize the production of the AJB. Reduce backlog by increasing pagination. Reinvest savings. E.g., we can save ~\$5,500 per year by changing to 50 paper-grade. The savings could be reinvested to pay for additional pages. E.g., sell more on-line advertisement space (within legal limits). Institutional subscriptions continue to decline. Nonetheless, free on-line access to the AJB should be maintained

- Karl J. Niklas, Editor-in-Chief

Plant Science Bulletin

Volume 45. 1999.

1. Four issues, 120 pages, were published on schedule. This was down slightly from the 140 pages published in 1998, but it is comparable to previous years.

2. 102 items (books, CD-ROMs, Videos) were received for review; 43 reviews were published. Again, this was down slightly from the 133 items received and 62 published reviews the previous year.

3. Four articles were published as well as News from the Society and Announcements as received.

4. The PSB continued to be posted on the BSA webpage following publication.

5. Joe Leverich completed a very successful five-year tenure as editor and turned over responsibilities to Marsh Sundberg, effective 1 January, 2000.

Volume 46. 2000

1. Several format changes were implemented with this volume, including: a new cover page design, a feature lead article has been solicited for each issue, inclusion of photo illustrations, and production of both a PDF and HTML format file for the web page. (As of 1 July, there have been approximately 250 "hits" to the Bulletin in each format.)

2. Two issues, 64 pages, have been published on schedule.

3. 46 items have been received for review; 20 reviews have been published.

4. Lead articles have been on "Growing an Undergraduate Botany and Plant Pathology Program" and "Hunt Institute for Botanical Documentation: A Center for Science and History." Individuals interested in submitting a lead article should contact the editor with a prospectus.

-Marsh Sundberg, Editor

Webmaster's Report

Total page requests: 584,844* (from March 4, 1997 to June 30, 2000) (*no logs for Oct 99-Jan 2000).

Main web site: In June 2000 (the last month for which statistics were available), there were 30,772 page requests (126,489 total requests) with logons from 7,711 distinct hosts and 75 countries (5 more than the previous high). The amount of data downloaded was 790.846 Mbytes (~6MB above the previous high) or 26.369 Mbytes/day! Number of unique files downloaded: 932. This represents a new high for the number of bytes downloaded and countries logged. The highest month was May 2000 with 34,184 page requests (156,522 total requests) with logons from 10,210 unique hosts. Each month of this year has so far exceeded the monthly counts from 1999. June 1999 had the highest number of different countries of visitors: 70. The highest daily usage ever was July 28, 1997 when the site was featured as site-of-the-day by Yahoo!!, receiving 3,966 hits on that day. The second highest was March 1, 2000, with 9751 total requests and 2,402 page requests. A total of 120 countries outside the U.S. have been logged on the BSA website, from January 1998 to the present.

Activity on the BSA image site reflects the academic year. The total number of pageviews for this site, based on 2400 images from the BSA Teaching Section's collection, was 24,543 for the last year ending July 25, 2000. The following chart shows the usage in pageviews per week. Most of the usage is from North America. Detailed webstats are available from <http://usa1.viewstat.nedstatbasic.net/cgi-bin/viewstat?name=botanyimages> and from <http://images.botany.org/webstats/>.

American Journal of Botany Online has now been in operation for a year. During that time, a total of 200,000 page retrievals occurred in the last year (~7,100 per week) with a total of 32.35 Gigabytes of data downloaded (16 GB in the last ~6 months) and >58,000 PDF files (~reprints) downloaded, with 30,200 in the last ~6 months. Over the last year, growth has been approximately 100%.

BSA now runs its own webservers, do-

main name servers, mail service and security systems. Steve Wolf runs the BSA Directory. In addition to the time and expense, there are also hacker attacks and constant upgrades and maintenance to consider as expenses to this undertaking. The task of the webmaster continues to expand and hopefully aspects of it can be shared with others. The web version is increasingly becoming the reference site for the BSA. Future Secretaries of BSA should increasingly archive their digital correspondence on the web as a means of promoting the dissemination of information within the BSA membership and leadership.

-Scott Russell, Webmaster

Committee on Committees

BSA Committees for 2000-2001 will be listed in a later issue. They are available on the web site.

Conservation Committee

The mandate of the BSA Conservation Committee is to: „accumulate information on environmental problems, disseminate such information to the membership at its discretion, and bring matters of significance to the attention of the Council.“ Over the past year, the Conservation Committee has endeavored to address these goals through increased contacts with other conservation groups, monitoring of activities that pertain to the study of plant conservation, and evaluation of best strategies for future efforts.

1) Collaboration with other conservation groups to further the protection and conservation of rare and endangered plants. We have developed stronger ties with the Plants Program at the International Union for the Conservation of Nature (IUCN) through the Species Survival Commission and several plant specialist groups of the IUCN-SSC.

2) Participation in Workshops of the Committee on Recently Extinct Organisms. While the conservation of still extant species of plants is of primary importance to the Conservation Committee, assessment of possible extinction must also be considered when a species has not been observed for some period of time. The Committee on Recently Extinct Organisms (<http://www.creo.org>) conducted a workshop on the development of protocols and mechanisms of dissemination of information on species that have gone extinct since the rise of anatomically modern *Homo sapiens*. The numerous problems associated with assessment of extinction status are particularly acute with plants and the BSA Conservation Committee was asked to participate in a workshop held in 1999.

BSA members George Yatskievych (Missouri Botanical Garden), Warren L. Wagner (Smithsonian Institution), and Bill Hahn presented different perspectives on plant extinction in the US and elsewhere. Portions of these presentations are available on the CREO web site. Additionally, we are contributing data to the CREO extinct species database that will be incorporated into their web site.

-William J. Hahn

Corresponding Members

The Society presently has 50 Corresponding Members, thus the Committee had no reason to prepare any nominations. -Carol Baskin

Education Committee

The committee continued work on several major projects:

1. Improvement of Pre-College Science Education

Again this year, the Education Committee and the Teaching Section cooperated in representing the BSA at annual meetings of the National Association of Biology Teachers in Ft. Worth, TX (October 27-30, 1999) and the National Science Teachers Association in Orlando, FL (April 6-9, 2000).

NABT: BSA did not have a booth, however, Rob Reinsvold and Ethel Stanley presented a workshop as part of the program. We will be represented at the 2000 meeting in Orlando.

NSTA: Rob Reinsvold and Ted Gerber staffed the BSA booth. Again this year the booth was strategically located adjacent to booths sponsored by ASPP, American Phytopathological Society, Wisconsin Fast Plants, and C-Fern. This area was dubbed "The Plant Place" by convention participants and was very popular. Conference attendance totaled 20,000 teachers (of all the sciences) and we had direct contact with approximately 1,000 of them. Visitors to our booth received a handout describing activities with "15-bean soup!" This outreach was supported by a \$10,400 appropriation to our committee by last year's Council. The success of this outreach effort attests to the need for expansion of these efforts. If we can find BSA members who are willing to attend regional conferences of these organizations, we want to encourage that. Those who have been directly involved with this outreach are convinced that it is a very effective means of reaching teachers and that we need to continue this level of involvement. We also need to expand our commitment to presenting workshops and we need to develop hands-on activities and other inexpensive teaching ma-

terials (e.g., posters) that can be distributed from our booths.

2. Digitized Botanical Images

The BSA's collection of 35mm slides have been converted into digital images available through the web page. The images went online on August 1, 1999 so have been on our web site, <http://images.botany.org/>, for one year. From August 1, 1999 to July 21, 2000 (almost one year of publication) there have been 24,324 hits on this site! That's an average of 68 hits per day. The Education Committee wants to expand this collection and we will repeat the request that appeared in *Plant Science Bulletin* asking members to donate their best slides to this project. Scott Russell expertly maintains this web site and is prepared to digitize and add additional slides to the collection.

3. Participation in Workshops of Project Kaleid scope (PKAL).

David Kramer and Robert Reinsvold attended a 4-day PKAL workshop, "The Future of Plant Biology," at Keystone, Colorado. David presented a description of BSA educational outreach activities as part of a panel discussion on the role of professional societies in improving plant biology education. Rob led field trips, not so much to show us the Colorado flora but to demonstrate field trip techniques that encourage students to make their own discoveries when we take them into the field.

4. Calling Attention to the Pedagogical Literature in Plant Biology.

David Hershey, not a member of BSA but a long-time contributor to the pedagogical literature of botany, published an e-mail list of recent publications in botanical pedagogy. We asked him to publish this bibliography in *Plant Science Bulletin* but he refused! However, Kramer persuaded him to allow the Education Committee to publish his list and attribute it to him! It was published as Kramer, David W. 1999. Report: The literature of plant science education. *Plant Science Bulletin* Vol. 45 (2) Summer 1999, pp. 35-36.

5. Symposium at the International Botanical Congress

Of course we met last year with the IBC and Peter Hoch asked BSA to organize a symposium on botanical pedagogy. We did! Members of the Education Committee and other BSA members developed the plan and David Kramer was the organizer. "Botanical Literacy for the Next Millennium: What to Know and How to Know It," was the only one of the more than 200 symposia dealing with education. It was well received.

6. Symposium at the Portland BSA Meeting.

Don

Total \$1,867,492.41

Buckley and David Kramer organized a symposium, "Using Educational Technology to Foster Learning Centered Pedagogies."

7. Poster(s). Teachers need inexpensive materials for their classrooms. We are currently negotiating with an Ohio artist/photographer to get the rights to several of his works (serial photos of plant development). Our plan is that the posters will be printed with the BSA logo and will be accompanied by printed materials that will explain the content of the poster and then suggest a number of hands-on activities related to plant development that can be carried out at several grade levels from K through the university.

8. Future Goals. To publish hands-on, discovery-type plant biology exercises for use in schools as well as at colleges and universities. To publish an educational poster and accompanying materials (see above). To publish web-based case studies in plant biology. To offer assistance to publishers who are seeking professional review of manuscripts for plant biology and general biology books. To publish instructions for growing plants in the classroom with a list of easy-to-grow plants that illustrate various morphological and/or taxonomic principles. To add images to our online plant image data base and also to improve the captions on many of the images. To work with Program Chair Jeff Osborn to develop his outstanding suggestion for a new format for the 2001 meeting scheduled for the University of Wisconsin.

-David W. Kramer

Elections Committee

Elections were held for the offices of President-elect and Secretary, with two nominees for each office. The Committee greatly appreciates the fact that all four candidates were willing to serve the Society if elected. Judy Jernstedt (University of California, Davis) was elected President-elect, and Jennifer Richards (Florida International University, Miami) was elected Secretary.

-Carol C. Baskin

Financial Advisory Committee (FAC)

The FAC has the responsibility of managing the BSA Endowment Fund. The BSA assets are invested through Salomon Smith Barney (SSB) and are divided among (as of June 27, 2000):

Money Funds & Dividends	\$ 239,259.35
Mutual Funds	\$1,553,233.06
Certificates of Deposit	\$ 75,000.00

The BSA Endowment fund, including special accounts, has grown 31% since June, 1999 (\$1,423,622) and has grown 111% since its inception 6.5 years ago (12/93; \$884,317). This represents an average increase of about 17% per year.

The FAC did make several changes in the Endowment investments during the past fiscal year, and it did enter into dialogue with SSB regarding the management strategy of the BSA Endowment Fund. This dialogue will be highlighted at a meeting in Portland, OR of the SSB Managers and the FAC. A variety of topics will be discussed to further improve the investment portfolio and growth of the Endowment Fund.

The BSA has received a generous gift of more than \$200,000 (last payment to be made Fall 2000) from the estate of Richard and Deana Klein, longtime members of the BSA. Two articles were featured in the last PSB dealing with their gift and the Endowment Fund.

The FAC anticipates that the market will remain strong for this coming year. As a result, it anticipates that the growth of the Endowment Fund will equal or exceed its present rate.

Recommendation 1: The FAC recommends that \$27,841 be used from the Endowment Income for the 'special initiatives' during the 2000-2001 fiscal year, as determined by the Executive Committee and Council per Guideline 4. (see below).

Recommendation 2: The FAC recommends that an endowment letter and brochure be sent out this Fall to selected members of the BSA per Guideline 3. (see below) for the purpose of solicitation for the Endowment Fund.

Request: The FAC requests a sum of \$1500 (actually \$1000) to cover the cost of the brochure, the letter and the postage to mail it to selected members. \$500 has already been provided from discretionary funds to develop the brochure.

Karling Student Research Award

Purpose and Funding: The Karling Graduate Student Research Award was instituted by the Society in 1997 with funds derived through a generous gift from the estate of the eminent mycologist, John Sidney Karling (1897-1994), and supports and promotes graduate student research in the botanical sciences. To be eligible, an applicant must be a member of the Botanical Society of America (BSA), a registered fulltime graduate student, have a faculty advisor who also is a member of the BSA, and not have won the award previously. Initially, in 1997, two awards were presented, but

interest in the program was so great that in 1998 the Society began supplementing funds from interest on the original \$10,000 gift with moneys stemming from proceeds of sales of BSA logo items. In 1998 and 1999, ten awards were presented annually. In 1999, the Council approved a further major influx of funding for the program, now renamed the BSA/Karling Graduate Student Research Award, and authorized up to 15 awards for the 2000 competition.

2000 Submissions: The number of submissions for the 1999/2000 competition held steady at 43 proposals (equal to the number submitted last year). As in previous years, the generally high quality of the proposals made the selection process very difficult. Although several proposals were equally applicable to two or more disciplinary sections, a summary of the submissions by primary BSA sectional affiliation is as follows:

- Bryological and Lichenological	1
- Developmental and Structural	1
- Ecological	12
- Economic Botany	2
- Genetics	1
- Paleobotanical	1
- Pteridological	1
- Systematics	20
- Tropical Biology	4

2000 Awards: Fifteen BSA/Karling Graduate Student Research Awards will be presented at the 2000 BSA banquet. Each awardee will receive a certificate and a \$500 Award.

Membership and Appraisal

In 1999 (see previous annual report), an attempt was made to contact approximately 320 members of the Botanical Society of America who had previously agreed to serve as Campus Representatives for the Society — the responsibilities of Representatives is to distribute recruiting materials and promote membership in the Society. On average, 65 percent of those contacted responded, with over 90 percent agreeing to continue in their role as Campus Representatives. In order to increase the number of Representatives, as well as the campuses represented all Society members having e-mail addresses were subsequently contacted requesting their participation on this Committee of Representatives. As a result of these efforts, the Campus Representatives now comprise 243 individuals representing 47 states

and 11 countries. In July 2000, Kim Hiser (BSA Business Office) informed the Committee that a shipment of new posters and brochures was anticipated and should be available to mail to Campus Representatives prior to the beginning of the 2000-2001 academic year. The Chair of this Committee provided the list of addresses to the Business Office.

Recommendations: 1) maintain and annually update the database of Campus Representatives, 2) identify under-represented states, e.g., Minnesota, and unrepresented institutions, e.g., University of Michigan, from which “volunteers” should be solicited; and 3) mail materials to Campus Representatives annually (or every other year), prior to the beginning of the academic year.

-Leo Bruederle

Merit Awards

There were two nominations for BSA Merit Awards this year and one was approved by the committee. The committee is pleased to recommend that the BSA Merit Award be granted to Dr. Leslie Gottlieb with the following citation.

Dr. Leslie Gottlieb has had a profound impact on the direction of plant systematics and has been one of the most influential plant evolutionary biologists over the past several decades. His 1977 paper in the *Annals of the Missouri Botanical Garden*, laid the foundation for the intelligent application of allozyme data in plant systematics. His 1982 paper in *Science* is a classic study of the duplication and conservation of isozyme loci in plants. His 1984 paper in the *American Naturalist* has been called one the most important papers in plant evolutionary biology during the past half century. However, his greatest contribution may have come through his influence on the careers and research of a substantial number of plant evolutionary biologists, including many of the people most active in this field today. Despite the fact that his research has often been more genetic or molecular in nature, Leslie has remained a botanist at heart.

-John Doebley

Moseley Committee

The Maynard F. Moseley Award was established in 1995 to honor a career of dedicated teaching, scholarship, and service to the furtherance of the botanical sciences.

No award was presented in 1999 because of the International Botanical Congress.

-Larry Hufford

Pelton Award

After a careful review of a set of strong nominations, the Pelton Award Committee of the Botanical Society of America has decided to give the year 2000 award to Prof. Ben Scheres. We ask the Conservation and Research Foundation to act on our recommendation for the Jeanette Siron Pelton Award in Plant Morphogenesis.

Dr. Scheres is currently a full professor in The Department of Molecular Cell Biology, University of Utrecht, The Netherlands. He has made important, and even seminal, contributions to our understanding of root morphogenesis. Through the application of techniques such as laser ablation and enhancer traps, he has been able to study the role of cell lineage and the control of root development, especially in *Arabidopsis*. Two of his most significant accomplishments are described below.

To address the idea that root patterning is set up and modified by the root meristem, Prof. Scheres has elegantly used lasers to ablate certain cells in lineages just behind the apex. He demonstrated that when a cell is ablated, that it is replaced by a cell from an adjacent lineage, the character of that cell is determined by signals coming from the basal portion of the root. This work thus suggests that pattern and cell specification in the root apex are influenced by acropetally moving signals, and is not solely determined by activities of the apical meristem.

Prof. Scheres has also provided new, although controversial, views on the quiescent center, a population of cells in the root that appears to be composed of only 4 cells. Scheres has shown that the quiescent center keeps adjacent initial cells in an undifferentiated, mitotic state. If a quiescent center cell is destroyed, the contacting initial ceases dividing and differentiates into the cell type of the file of which the initial cell is part. This is a most significant finding since it provides for the first time evidence of a role for the quiescent center in root development.

Ben has also written a number of influential reviews on root development. These reviews, as is characteristic of his papers, are always carefully illustrated, and reach out well to the non-specialist. His reviews bring excitement to the field of root development.

He has been invited to speak at many meetings and symposia, including the recent International Botanical Congress in St. Louis. He serves as an Associate Editor of the journal *Development*, and is now International Secretary of the International Society for Developmental Biology.

He is deeply involved in graduate education at his university and has a relatively large group of graduate students for whom he serves as mentor.

We strongly believe that Dr. Scheres is highly deserving of this award.

-Fred Sacks

Publications Committee

Two topics have been considered at length by our committee: (1) how and when to initiate special issues of the *American Journal of Botany*, and (2) how to reduce the backlog of accepted manuscripts for the *American Journal of Botany*. These are interrelated issues and will involve a substantial commitment of resources from the Society.

1. Special issues of the *American Journal of Botany*

a) Background: At the Spring 2000 meeting, the Executive Committee of the BSA decided to pursue the publication of special issues of the *AJB* and charged this committee with devising a possible mechanism to do this.

b) Call for nominations: Nominations for topics for special issues must be received by a June 1 deadline each year. Notices announcing this deadline and describing the information required for a nomination will appear in the December/Fall mailing, the Spring mailing, the *Plant Science Bulletin*, on the BSA web page, and in the *American Journal of Botany*. Possible contents of proposed special issues include BSA meeting symposia, single topic collections of papers, and review articles. Members, sections, symposia organizers, and the *AJB* Editor-in-Chief and Associate Editors will be solicited for suggestions. Nominations must include a detailed outline of the contents of the proposed issue, including authors, estimated pages, projected illustrations, and a detailed timeline for submission of manuscripts, for revision of manuscripts, and for return of page proofs.

c) Selection process: The ad hoc Publications Committee and the Editor-in-Chief of the *American Journal of Botany* (already an ex officio member of the Publications Committee, but for this purpose, a voting member) will recommend one proposal for publication in a special issue of *AJB*. Any person directly involved in a nominated proposal, e.g., as an author, will not participate in the vote. The results of this process will be reported as a recommendation to the BSA Executive Committee, who will make the final selection and determination of whether or not to proceed with

publication.

d) Implementation: The first call for nominations for special publications shall occur when the backlog of accepted ready-for-press manuscripts for the AJB as been reduced by 75%. The Editor-in-Chief will be asked to supply the number in the current backlog (the starting point) and to provide periodic updates indicating the progress in reducing the backlog.

e) Financing: To be funded in part by a portion of the ca. \$15,000 savings (estimated) realized by not printing and distributing the meetings abstracts as a regular part of the AJB. (Note: Even if we convert to completely electronic publication of abstracts, which is supported by some although not all of the Publications Committee, there will still be costs associated with the abstracts. Thus, not all of the estimated \$15,000 will be available for special issues.) A portion of the annual investment income (ca. \$20,000 total) may also be requested for a special issue.

2. Reduction of backlog of accepted manuscripts for the *American Journal of Botany*

a) Background: In spite of the efforts of the Editor-in-Chief, the *American Journal of Botany* has a large and increasing backlog of manuscripts which have been accepted for publication, revised by the author(s), and are in the queue for publication. This backlog has reached an unacceptable point and will eventually affect the calibre of papers submitted to AJB. Since the Editor-in-Chief has already implemented changes in font (to save space), split-review manuscript rejection, and other procedures to encourage authors to be concise, the only tenable solution appears to be to publish more pages per issue and volume. In order to make a significant dent in the backlog of accepted manuscripts, the Publications Committee proposes that each issue of AJB be increased by 3 signatures, or 48 pages. This will result in 576 additional pages published in Volume 88 (2001), and is estimated to clear the backlog in approximately 18 months.

b) Mechanism: A \$45,000 addition to the AJB budget for volume 88 (2001) is proposed. This figure is based on an estimate from Allen Press for 3 additional signatures (48 pages) per issue x 12 issues per year, and includes related increases in postage and electronic media services that each larger issue will require.

c) Finances:

Savings from not publishing abstracts in AJB = \$10,000 (estimated)

Increase in institutional subscription rates generates an additional \$36,000.

(\$20 increase/subscriber for 2001 x 1800 subscribers = \$36,000)

50% of investment income = \$10,000 (pending approval of EC and Council)

Gain of estimated 15 pages (KJN) by font change = \$1,000

Total Available: \$57,000

d) Implementation: Immediately, with the approval of the 2000-2001 BSA and AJB budgets and the beginning of Volume 88 (Jan. 2001)

Web Page Committee

The past year has been an incredibly busy and dynamic year for the BSA website. Essentially all aspects of our web service are now done on in-house on servers controlled by BSA.

Web service record on the botany.org domain:

BSA website established on the International Thomson Publishing server: March 4, 1997. Domain purchased 2/3/97.

BSA Image server (images.botany.org) opened August 1, 1999

BSA website moved to the Brooks/Cole Publishing, Inc. server: December 5, 1999. With this change, we lost access to a hot port and therefore all changes, no matter how inconsequential or how urgent had to be emailed to a tech. This was in violation of the contract and when we questioned this near the end of January, we were informed that our free web service was due to be cancelled anyhow, as the ITP reorganization resulted in increased cost for web service.

BSA website and domain name service (DNS) moved to the University of Oklahoma, under the direction of Scott Russell: February 3, 2000. Soon thereafter, additional server sites opened, including a BSA administrative site (admin.botany.org), an announcement site (announce.botany.org) and two meeting sites (botany2000.org and botany2001.org). BSA Directory moved to California State University-Stanislaus, under the direction of Steve Wolf: February 10, 2000

Numbers of pages served for botany.org:

1995-96: No records at <http://falk.ucdavis.edu/bsa/>

1997: 58,994 hits (March 4, 1997 through December 31, 1997)

1998: 184,266 hits (January 1, 1998 through December 31, 1998), up 212%

1999: 252,344 pro-rated estimate based on 189,251 hits

(January 1, 1999 through September 30, 1999)*, up 40%

2000: 182,847 pro-rated estimate to 6/30/00 based on 152,373 hits (February 1, 2000 through June 30, 2000)*, up 45%

Total hits: 584,844 hits (from March 4, 1997 through June 30, 2000)*

*Logs were unavailable due to change of servers for Oct 1999 through Jan 2000. Without this interruption, the number of page requests would have been ~100,000 more).

Other sub-domains and virtual servers of botany.org:

In addition to the <http://images.botany.org/> site, there are also some other virtual servers. To handle BSA announcements, a new server <http://announce.botany.org/> has been created. Two meeting sites, <http://www.botany2000.org/> and <http://www.botany2001.org/> are now available for the next two years of meetings.

A summary of webpage request activity on the numerous BSA web servers is available on the web.

In addition to the activity on the web servers, the domain name servers have logged over 120,000 requests per week for DNS information.

American Journal of Botany Online service:

A summary of the activity of the American Journal of Botany Online server run by Highwire Press on behalf of the Botanical Society of America is available on the web. There was an increase in user-ship of nearly 100% in one year. Highwire Press finds these overall statistics surprisingly high among clients of similar size and mission.

Initiatives:

Steve Wolf runs the BSA Directory. He coordinates with Kim Hiser to make sure that the database is up to date.

BSA now runs its own web servers, domain name servers, mail service, FTP and security systems. In addition to the time and expense, there are also hacker attacks and constant upgrades and maintenance to consider as expenses to this undertaking. The web site continues to expand and hopefully aspects of it can be shared in coordination with all of BSA's other electronic activities.

Numerous CGI scripts drive a number of automated or semi-automated functions including the creation of the electronic abstract submission site (~600 abstracts this year). The abstract volume

was composed using Perl scripts, so there was never a 'manuscript' in the hardcopy sense. The text was submitted electronically to the Allen Press FTP site at a savings of over \$3,000 this year.

"Amazon Associate" links have been added for many of the book-related online pages of the Plant Science Bulletin, including 'Books Received' and 'Book Reviews'. These will return a fraction (from 5% to up to 30%) of the cost of the linked books to the BSA. The requirement from Amazon.Com is that a link be directly made to a specific book page. The referral data is kept within one click of the original reference, so users intending to benefit BSA by their purchase should immediately add the book to their shopping cart if they are considering buying it. Simply returning to the page later may not qualify (as the server may not associate the purchase with the BSA referral). Funds generated through this means will be available for support of BSA's general activities, including research grants.

The web versions of documents are increasingly becoming the preferred reference materials for the BSA. Hopefully, future secretaries of the Society will help to use the potential of the web site to continue to strengthen our electronic outreach efforts. The membership of the Council, in general, is also invited to put materials on the web site, as are the sections.

Additional images are welcomed on the image server. We need people to prepare the images according to our requirements and upload them to our servers. Volunteers are desperately needed, as for the original project, and the webmaster can give guidance on how to mount these.

President Soltis is organizing informational documents on scientific issues of broad impact and these will be mounted as available. This is discussed further in his strategic plan.

Future of the BSA Web Site:

"Ask a botanist" is a project that has languished in the midst of other higher priority projects. People's questions are being answered, but not in such a coordinated manner. The interface should be operational in 2001 as proposed by President Soltis. I envision this as part web bulletin board and part listserv. Questions would be asked through the listserv and answered through a web page. Questions and answers will be threaded at the site and searchable. Development time for programming will be approximately 40 hours.

Development of a corporate member shopping mall is highly desirable to attract new corporate

members. If these turn into partnerships, it will build our relationships with vendors, which will also spill over into meeting exhibition and other activities in association with the Society to our mutual benefit. The level of this activity should be restrained to fitting within applicable tax laws for an organization of our type and mission.

Upgrade of the machines and the Internet connects would be highly desirable. I am exploring purchasing a Pentium III system to serve as the primary web server for BSA and upgrading the Ethernet lines of the service. The editorships have been on a rotation basis of five years. I feel that it is also best to have a rotation of webmasters as well. It may be in the best interests of the Society to establish the position of webmaster on a similar five year term. I began my service to the Society in the summer of 1996, with my appobotany.org domain. As of the annual meetings in 2001, I will be completing my fifth year of service to the Society as webmaster. A major term administrator and for special projects, but will not be able to consider serving as webmaster for another term.

-Scott Russell, Webmaster

BSA Endowment Fund Prioritization Committee

Our committee makes the recommendations listed below for expenditure of the 1999-2000 interest from the BSA endowment funds. In carrying out our charge we first sought suggestions from the BSA membership by placing the announcement (below) on the BSA website and by circulating it to all members of the BSA Council. We also sent individual messages to chairs of BSA committees. In all, we received just seven suggestions for expenditure of funds and rank these below. One of the most exciting initiatives, proposed by Joe Armstrong, was to make the BSA a „Botanical Society of the Americas“ and to use our funds to reach out to the Americas south of us by encouraging memberships and subsidizing subscriptions and travel to annual meetings. We hope that this initiative will be discussed and acted upon by the Executive Committee.

Announcement: The BSA ad hoc committee on the expenditure of the 1999-2000 interest from the BSA endowment funds is seeking suggestions from the BSA membership on how this year's amount of \$23,000 might best be spent. The Endowment Fund guidelines from the BSA Financial Advisory Committee are: The purpose of the Endowment Fund is to increase the monetary assets of the Society in order to provide income to fund major initiatives, travel grants, >>scholarships, and other activities that enhance the effectiveness of the

Society to fulfill its Mission“ Our mission statement (from Article 1 of the BSA bylaws) is: „to sustain and provide improved formal and informal education about plants; to encourage basic plant research; provide expertise, direction and position statements concerning plants and ecosystems; foster communication within the botanical community and between botanists and the rest of humankind through publications, meetings, and committees. The ad hoc committee invites all members of the BSA to make recommendations regarding the expenditure of this year's interest (keeping the above guidelines in mind!) The committee will then rank these and make our recommendations to the BSA Executive Committee by March 1, 2000. Please forward your suggestions to the chair of the committee, Nancy Dengler (dengler@botany.utoronto.ca) by February 1, 2000.

Recommendations:

1. Karling Research awards (\$5000). The Society should continue to award Karling Research awards to the most meritorious graduate student proposals at the level of recent years or better (10 awards at \$500 each). The committee felt that this was the single most important initiative that fulfilled the mission of encouraging basic plant research and providing support for a new generation of botanists and BSA members.
2. Conant Travel Fund (\$5000). The Conant Travel fund traditionally has been used to fund travel to the International Botanical Congresses. As part of a broader initiative for the BSA to become a „Botanical society of the Americas“, we recommend that funds be made on an annual basis for travel costs for professionals from less developed countries and/or BSA member graduate students to attend BSA annual meetings.
3. Subsidy of BSA memberships for botanists in Mexico, Central, and South America (\$5000). Memberships in the BSA and subscriptions to AJB should be made affordable and accessible to members from throughout the Americas.
4. Annual meeting Plenary and Outreach lectures (\$5000)
5. *American Journal of Botany* Special issue (\$18,000).
6. Conservation Committee symposium (\$2500).
7. Part-time fund raiser (\$23,000).

Developmental and Structural Section

Although our section did not hold a business meeting at St. Louis last year, we were present, both in the symposia that we sponsored, and in the students whose registration we paid for. We will be resuming normal activities with this meeting. We are sponsoring only one Symposium this year, "Open Space", and will be evaluating its success at the section's annual meeting.

-Jean Gerrath, Section Chair

Ecological Section

The section sponsored four symposia at the IBC in 1999. Stephen Scheckler organized "*Archaeopteris*, the world's first forest tree", Brenda Casper organized "Rooting strategies and below ground competition", Carol Baskin organized "Ecology and evolution of specialized seed dispersal, dormancy and germination strategies" and Maxine Watson organized "Developmental phenology and its influence on plant ecology", along with their foreign co-organizers. Section money was used to defray registration expenses for the overseas speakers in these symposia. Because of the IBC, there was no student paper or poster competition in 1999. However, awards (\$150 each) were presented to the 1998 competition winners at the 1999 BSA banquet. Jochen Schenk, UC Santa Barbara, won the best student paper award for his presentation "Directional, spatial patterns in a desert community". Bruce Robart, Illinois State University won for his poster "Double functional pollination as a transitional stage in the evolution of the beaked floral form among taxonomic varieties of *Pedicularis bracteosa*".

We will again be sponsoring awards for the best student paper and poster at Botany 2000. Judging this year is to be organized by Pati Vitt of the Chicago Botanical Garden. Six papers and two posters have been entered in the competition. These numbers are low. Please encourage your students to participate in next year's competition. The section also will sponsor a mixer at Botany 2000.

This year we successfully established a section email. Over the course of the coming year, we will seek to convert the email list to a web based listserve and establish links with related listserves established by other BSA sections and related groups outside of the BSA. This listserve hopefully will create a means for greater interaction among section members and serve as an attracter of new members.

Section membership continues to fall. Last year the section dropped below 500 members. With that drop the allotment to the section from the BSA General Fund dropped from \$1000 to \$700. It is critical that we bring up membership over the com-

ing year.

-Maxine Watson, Chair

Genetics Section

The Genetics Section co-sponsored one symposium at the 1999 meeting, Genome Evolution in Hybrid Plant Species, organized by Malika Ainouche and Jonathan Wendel.

There was no 1999 Margaret Menzel Award. The Section is still in need of a Secretary/ Treasurer.

-Jeri Higginbotham, Chair

Economic Botany Section

At the International Botanical Congress in St Louis we hosted a Symposium titled, "Anthropogenic Plant Migrations: Habitat Transformations by Overt and Inadvertent Introductions" organized by the past Section president David Lentz of the New York Botanical Garden, and C. Edelmira Linares and Robert Bye of the Jardin Botanico del Instituto de Biologia UNAM. The speakers included Robert Bye and C. Edelmira Linares, Lawrence Kaplan (Biology Department, University of Massachusetts, Boston), David Lentz, Daniel Harder (Missouri Botanical Garden), Richard Mack (Department of Botany, Washington State University, Pullman), and Deborah Pearsall (American Archeology Division, University of Missouri, Columbia).

Following the Symposium at the IBC, Felix Coe of Tennessee Technical University was elected Section Chair replacing David Lentz. We thank David for his dedication and service to the Section.

The Economic Botany Section will not be hosting a symposium at the Botany 2000 Meeting in Portland nor will we be judging the annual Student Award. We look forward to strengthening interest in the Section during the coming year and expect to support a full symposium and continue the Student Award program in 2001.

Treasurer's Report: As of March 31, 2000 the Economic Botany Section had \$700.00. Of this balance expected expenditures for this year include: \$700.00 to be used for the luncheon to be held on Tuesday, August 8th between 11:30 and 1:00 pm at the Oregon Convention Center. Prof. Walter Lewis of Washington University will be the speaker at the luncheon.

-Daniel Harder, Secretary Treasurer

Paleobotanical Section

The Paleobotanical Section currently has 344 members (259 regular members, 13 emeritus regular members, 51 affiliate members, 5 emeritus affiliate members, and 16 honorary members. Current officers are James Basinger, Chair; Steven Manchester, Secretary-Treasurer; Patrick Herendeen, Editor, with new Chair and Editor to be elected at the 2000 Business Meeting of the Paleobotanical Section.

This year the Section provided ten travel awards of \$1000 each to student members of the Paleobotanical Section presenting papers at the 6th International Organization of Paleobotany Conference (IOPC) in Qinhuangdao, China (July 31-August 3, 2000). In addition to our participation in the IOPC, the section has an active program for Botany 2000, including 53 contributed papers and posters submitted by members of the Paleobotanical Section. A paleobotanical dinner has been organized for Monday, August 7, 2000, for which 65 people have registered. The annual business meeting will be held August 9th at 8:30am.

The Bibliography of American Paleobotany for 1999, including the current section membership directory, was mailed to members and to 39 institutional subscribers in May 2000. Copies will be provided for the BSA Archives and for the editor of the Plant Science Bulletin. Others may purchase copies for \$18 each.

The Paleobotanical Section continues to receive donations in support of endowment funds, including the Cookson, Becker, Cichan, and Remy funds. Each year, proceeds from the sale of buttons (this year: "will work for fossils") go to the paleobotanical endowment.

The section web site <http://www.dartmouth.edu/~daghlian/paleo/> is currently maintained by Charles Daghljan. Recent entries include photos of paleobotanists at the 1999 International Botanical Congress. The Section also continues to maintain a Paleobotany News List (PALEOBOT) on the internet. To subscribe to the list, interested persons should send an e-mail message to PALEOBOT@dartmouth.edu containing the following message: "subscribe PALEOBOT your name."

-Steven R. Manchester, Secretary-Treasurer

Phycological Section

The Phycological section of BSA did not receive any requests for, and consequently did not fund any symposia in 2000. None of the general funds were spent.

An election was held to fill the position of Secretary of the Phycological Section of BSA, currently held by Jeff Johansen (who kindly served beyond his term). Mark Buchheim and Richard McCourt were the two nominees for this position. Richard McCourt will begin his term as secretary at the conclusion of the Annual BSA Banquet.

-Louise A.

Lewis, Section Chair

Phytochemical Section

This past year the Phytochemical Section has been planning a symposium on „Anthocyanins“ for the 2001 Meetings in Albuquerque, NM. There is nothing else to report.

-James. W. Wallace

Pteridological Section

The Pteridological Section of BSA co-sponsored, along with the International Association of Pteridologists and the American Fern Society, the following six symposia at the International Botanical Congress 1999 in St. Louis, MO.

DEVELOPMENTAL MECHANISMS IN FERN GAMETOPHYTES. Organizers: Banks, J. and Wada, M.; Speakers: Hass, B., Banks, J., Wada, M., Murata, T., Kanegae, T., Hickok, L.

PTERIDOPHYTE BIOGEOGRAPHY. Organizers: Moran, R. C. and Ollgaard, B.; Speakers: Skog, J., Collinson, M., Gradstein, R., Smith, A., Parris, B., Brownsey, P., Dassler, C.

FERN PHYLOGENY WITH EMPHASIS ON RELATIONSHIPS OF BASAL LINEAGES. Organizers: Pryer, K. and DuBuisson, J-Y.; Speakers: Pahnke, J., Wolf, P., Phipps, C., Gandolfo, M., DuBuisson, J-Y., Ranker, T., Cranfill, R.

EVOLUTION AND DIVERSIFICATION OF THE LYCOPODS. Organizers: Taylor, W. C., Wikström, N. and Grauvogel-Stamm, L.; Speakers: Gensel, P., Pigg, K., Grauvogel-Stamm, L., Wikström, N., Therrien, J., Taylor, C., Hickey, J.

HOMOLOGIES AMONG PTERIDOPHYTES. Organizers: Conant, D. S. and Schneider, H.; Speakers: Hill, J., Stein, D., Renzaglia, K., Brown, R., Steeves, T., Farrar, D., Schneider, H.

SPECIES AND SPECIATION IN PTERIDOPHYTES. Organizers: Haufler, C. H. and Watano, Y.; Speakers: Tuomisto, H., Schneller, J., Masuyama, S., Gemmill, C., Wagner, W. H., Vogel, J., Werth, C.

At IBC99, the Pteridological Section also granted the following awards:

Two Edgar T. Wherry Awards of \$100 each for Best Poster:

Petra Korall, Stockholm University, „Phylogeny of Selaginellaceae based on rbcL gene sequences“ (co-authored by Paul Kenrick)

Catherine Cardelus, University of Connecticut, „Habitat segregation of epiphytic and terrestrial ferns“ (co-authored by James Watkins, Jr., Iowa State University)

Four Pteridological Section Travel Awards of \$100 each:

Angel R. Maden, Southern Illinois University, „Ultrastructure of the spermatozoid of *Huperzia lucidula*“

Catarina Ryden, Stockholm University, „Phylogeny of Isoetes, Lycopsida: Resolving basal relationships using rbcL“

Gretchen Moeser, University of Chicago, „Marsileaceae sporocarps and spores from the late Cretaceous of Georgia“

Su-Juan Lin, Rikkyo University, Japan, „Systematic study of Asian *Lindsaea* ferns“

The Pteridological Section contributed \$400 to the publication of *The Annual Review of Pteridological Research*, Volume 12, 1998.

-Tom A. Ranker, Secretary-Treasurer

Systematics Section

In FY 1999 the Systematics Section provided support (\$1000.00) for graduate student attendance to the International Botanical Congress (St. Louis, Missouri). Peter Hoch (Missouri Botanical Garden), Secretary General of XVI IBC, saw to the disbursement of award funds for XVI IBC. The awards were not more than \$300.00, and designated for graduate students who are members of BSA. BSA was acknowledged for this support.

In FY 2000 the Systematics Section provided support for two symposia: New frontiers in plant systematics: The next 50 years, organized by Wayne Elisens and Tod Stuessy (SESSION 30); and Historical biogeography of the Northern Hemisphere, organized by Paul S. Manos and Michael J. Donoghue (SESSION 48). The section provided equal financial support to these symposia (\$350.00 each), utilizing the section's entire budget allocation (\$700.00).

-J. Mark Porter, Chair

Tropical Biology Section

The section co-sponsored two symposia

organized by the Association of Tropical Biology at the IBC in 1999. Marisa L. Martínez and R. A. Lubke brought together a symposium on “Coastal Sand Dunes: Their Ecology and Restoration” and Patricia C. Morellato and Lucinda McDade organized a symposium on “Phenological Studies in Tropical Plant Communities.” The Section's allotments of \$700 each for FYs 1998-99 and 1999-2000 were used to defray registration expenses for speakers from developing countries in these as well as other IBC symposia relating to tropical botany (of which there were many).

For the Portland meeting, only one contributed paper was received by the Section, which was transferred to the Society's Ecology Section. An apparently relatively low attendance of biologists with tropical leanings at the Oregon meetings may have to do with the recent (June) meetings in Bloomington, which were held jointly by several societies including the Association for Tropical Biology and which drew numerous tropical ecologists and systematists.

Over the course of the coming year, we will seek to convert our email address list to a web based listserve and establish links with listserves established by other BSA sections and related groups outside of the BSA. This may result in greater interaction among section members. By late 1998, the Tropical Section had 210 members in the USA and 95 in other countries.

-Susanne Renner, Chair

Pacific Section

The Pacific Section met at Southern Oregon University on June 11-14, 2000 with the Pacific Division of the American Association for the Advancement of Science. The program consisted of a symposium of seven speakers entitled „Pollinator-Plant Interactions“ organized by Dr. Carol Ferguson, Department of Biology, Southern Oregon University, Ashland, OR 97520, and a noon lecture on the „Fen Floras of the Serpentine“ by Dr. Frank Lang, Department of Biology, Southern Oregon University, Ashland, OR 97520. Dr. Lang and Dr. Ronald Nitsos, Department of Biology, Southern Oregon University, Ashland, OR 97520 offered a field trip entitled „The Coast, Redwoods and Serpentine Soils. Dr. Lang also led a second field trip entitled „Rare Plant Endemics of Serpentine Soils.

In 2001, the Pacific Section will meet with the Pacific Division of the AAAS at the University of California, Irvine on June 17-20, 2001.

-David E. Bilderback, Chair

Southeastern Section

The annual business meeting of SE-BSA was held during the 61st Annual Meeting of the Association of Southeastern Biologists, hosted by The University of Tennessee at Chattanooga, April 5-8, at the Hilton Hotel.

Elections were held for Chair of the Section, with James Mickle from North Carolina State University unanimously approved for 2000-2003. Larry Davenport (2001), from Samford University in Birmingham, AL, currently serves as Secretary-Treasurer and Frank D. Watson (2002), from St. Andrews College in Laurinburg, NC, is Chair of the Activities Committee.

No teaching workshop sponsored by SE-BSA was held this year.

Hornberger expressed concern that membership in the Section had fallen off about 25% from last year. Various reasons were cited, but she encouraged members to renew.

SE-BSA was one of seven professional organizations represented at this meeting. Over 150 papers and posters listed in the program were botanical in scope, including several symposia: invasive exotic pest plants, species restoration, and sustainable development and urban ecosystems.

-Kathleen Hornberger, Chair

Representative to Association for Systematic Collections (ASC)

The major activity of the current year was the annual meeting of ASC held in Baltimore, MD 13-15 May 2000, at which I represented the Botanical Society of America. The wrap-up of the meeting is detailed in the June 2000 ASC Newsletter (see also the ASC website at <http://www.ascoll.org>), but here are a few highlights: over 150 registrants attended, a record number, which included directors, staff, and faculty from more than 65 museums and universities, as well as many officials from U.S. government agencies. There was a wide-ranging program of plenary sessions and panels on a variety of topics such as innovative collaborations and partnerships in biodiversity, information technology, museum programs, as well as a separate concurrent program of online and web-based demonstrations of museum and university databases, etc. An address was presented by the Director of the U.S. Geological Survey on the partnership of the biological community and the role and future of the National Biological Information Infrastructure, this was followed by a funding

workshop that included representatives from NSF, NASA, U.S. Dept. Commerce, and the Inst. of Museum and Library Services. The meeting's keynote speaker was Dr. Rita Colwell, NSF Director, introduced by Senator Paul Sarbanes, as part of the special festivities at the ASC meeting to honor NSF's 50th Anniversary. Also unveiled was ASC's Web Gallery of NSF-funded project, which can be seen at the ASC website.

The Field Museum, Morton Arboretum, Illinois State Museum and the Illinois Natural History Survey will host the next ASC annual meeting in Chicago during May 2001. Exact meeting dates have not yet been determined.

Throughout the year ASC continued to distribute on-line a bi-monthly newsletter of ASC activities, called Washington Initiative, which highlights of recent news about systematic collections, in addition to the printed ASC Newsletter. The electronic newsletter is available to ASC member institutions and societies, and can be sent to interested recipients on request.

Various requests for information received from ASC were forwarded to BSA Business Manager Kim Hiser.

-Laurence E. Skog

Review Open Space at Botany 2000 compiled by Bruce Kirchoff, UNC Greensboro kirchoff@uncg.edu

During the meetings in Portland the Developmental and Structural Section experimented with a new conference format to reintroduce discussions to our meetings. Approximately 35 people attended Open Space, a format where time is set aside for discussions. Often the discussion sections are scheduled on the day of the meeting, but they can also be scheduled in advance. We used a mixture of these two scheduling methods in Portland. Two discussions were scheduled prior to the conference, and three were added on site. In addition, a room was set aside when people could meet on an informal basis over coffee. A number of informal discussions took place in this room. Free coffee was provided for all participants. Prior to the conference Nancy Dangler and Peter Stevens agreed to lead discussions on Mentoring Graduate Students and Organisms, Form and Characters, respectively. In Portland the following discussions were added:

Victoria Hollowell Electronic Publication of Journals

Fengjie Sun A Phylogenetic Study of *Cy-mopterus* and Related Genera

Jean Gerrath, Establishing your Independent Research Program

Various scientists Open discussions over coffee

A brief summary of some of the discussions follows.

Mentoring Graduate Students (Nancy Dengler)

Approximately 20 people attended this discussion of topics related to the effective mentoring of graduate students. The participants raised and discussed the following questions.

1. How can we get (non-science) undergraduates interested in science?

- Be willing to teach generalist courses or courses for non-scientists.

- Be imaginative in our presentation of course material. e.g, teach a course in the „use and abuse of science.“

- Undertake outreach activities

2. How should we train undergraduate students?

- Help students see how to connect ideas; how to synthesize facts.

- Make students aware of the complexities and conflicts in science.

- Convey our enthusiasm for the subject.

- Make personal connections with students.

- Provide opportunities for informal interactions with students: tea, beer, sherry.

3. What makes a person a good graduate student supervisor?

- Be accessible and proactive in encouraging students raise questions and problems.

- As the students approach completion, train them to be politically aware, to use time effectively and be good time managers.

- Encourage students to seek advice directly from experts via e-mail, phone and attendance at meetings.

4. How can new faculty be mentored effectively?

- Make use of formal and informal mentoring programs. Base these programs on volunteers.

- Be proactive in mentoring. Do not wait for the new faculty to come to you. Go to them and offer help.

Electronic Publication of Journals (Victoria Hollowell)

The electronic publication session was immensely

useful to me (*Annals of the Missouri Botanical Garden, Novon*), and I think also for Tod Stuessy (*Taxon*), Pieter Baas (*Blumea*) and Scott Russell (*American Journal of Botany*). It gave this group of editors (and a few others) an additional forum in which to freely interact. I thoroughly enjoyed and appreciated the opportunity to meet with colleagues and discuss these issues.

A Phylogenetic Study of *Cymopterus* and Related Genera (Fengjie Sun)

In the first 15 minutes, I gave a talk on *Cymopterus* (Apiaceae). Then, in the next 15 minutes, we discussed the current phylogeny of the Apiaceae and especially the Rocky Mountain Umbels. The participants were interested in the phylogeny in Apiaceae and were „shocked“ by the current unresolved state of the phylogeny in both Apiaceae and Araliaceae, a family closely related to Apiaceae. They expressed a desire for a symposium on the phylogeny of Apiales (Apiaceae+Araliaceae) at a future meeting.

A graduate student's review of the discussions follows: "My name is Erin Riggs. I am a graduate student at Portland State University. Carol Wilson is my major professor. I found the open sessions to be very informative and exciting. I attended the Character States session, it was a great learning experience, and neat to see professionals discuss a subject with passion. I was quite inspired to learn more on the topic. I also attended the Graduate Student Mentoring session, again it was very informative and very encouraging, especially I think for a grad student. In general having the opportunity for open discussion at this meeting was excellent. At the paper presentations there is no room for real discussion, and in debate I feel idea exchange can happen rapidly."



Announcements

Symposia, Conferences, Meetings

International Maple Symposium

Throughout a large part of the world, people depend upon maple trees to enhance their cities, neighborhoods, properties, and thus, their quality of life. To ensure that maples will continue

to beautify our cities, selections of tougher trees need to be made and yet the genetic diversity of the selections must be increased. In order to accomplish this, additional genetic resources need to be accessed, new techniques need to be developed for selecting superior individuals, and production barriers to the culture of certain species need to be overcome.

The Morton Arboretum in Lisle, Illinois, will host an international symposium on maples (Acer) October 25-27, 2000. Plant researchers and industry professionals from North America, Europe and Asia will present research, discuss critical issues, and review industry trends related to the selection, production, and use of maples in the urban landscape. This includes: worldwide issues of maple conservation, biodiversity, and genetic resource utilization; research on selecting and breeding maples for tolerance to environmental stresses and resistance to insect pests and diseases; techniques and advances in the propagation and nursery production of ornamental maples.

This symposium will attract a broad audience of academic researchers and industry professionals. A symposium proceedings will be published and made available to plant professionals internationally. Following the symposium, there will be a 6 day field tour to see maples and sites of botanical and horticultural interest between northern Illinois and the Smoky Mountains of southern Tennessee.

In addition to the international experts already slated to speak at the symposium, contributed papers and posters are being solicited. Abstracts of approximately 150 words describing research on maple systematics, ecology, stress tolerances, pathology, propagation, and production are being accepted through June 1, 2000 for possible presentation, poster session, and publication in proceedings.

To submit an abstract or learn more about the symposium or post-symposium tours, contact:

Dr. Wm. Carvell, Dir. Of Education

The Morton Arboretum
4100 Illinois Route 53
Lisle, IL 60532_1293 USA
Phone: 1 630 719_2460

FAX: +1 630 719_2440

Email: maples@mortonarb.org

André Michaux International Symposium

15-19 May 2002

PRELIMINARY ANNOUNCEMENT AND SOLICITATION OF INTEREST. A major international symposium featuring the life, works and times of André Michaux, noted French explorer, collector and botanist, is being planned for May 15-19, 2002. The symposium will feature various talks and academic presentations, workshops, field trips, historical re-enactments, and other activities that, altogether, should appeal to a variety of audiences. The goals of the symposium are to call attention to Michaux's important botanical contributions in North America; to place Michaux in his historical context and honor his life, work and legacy; to raise awareness of plants in the local environment; and to spark interdisciplinary studies involving France, the French language, science, gardening, botanical illustration, early American history and exploration, and geography. It is expected that the symposium proceedings will be published.

André Michaux (1746-1802/3?) was not only a major botanist, but also an important historical figure. He is remembered for his contributions to botany, horticulture and agriculture. With French government sponsorship, Michaux traveled widely outside France in search of plants to improve the agriculture and forestry of his home country. He led an adventurous life, traveling and collecting in the Middle East, in North America, and in the tropics. Hardship, hard work and danger were his constant companions. The routine hardships of wilderness travel meant nothing to him. He survived many armed robberies, capture by hostile tribes, encounters with dangerous beasts, even shipwreck. He overcame the most difficult obstacles and won the admiration of his colleagues and acquaintances. He magnificently represented French science in all the countries he visited.

Much of Michaux's work in the 1790s occurred in the Carolina Piedmont. The setting for this symposium is Gaston County, North Carolina, and the symposium will occur in the bicentennial year of Michaux's death. A partnership consisting of Belmont Abbey College, Daniel Stowe Botanical Garden and Gaston Day School was formed to organize and promote the symposium. Major funding has been secured and other cooperators are also involved in the planning for this major event.

The symposium will feature three days of talks, which may variously include keynote addresses, invited and contributed paper sessions, workshops, and panel discussions. In order to assist the planning at this stage, the André Michaux International Symposium (AMIS) organizers solicit

and welcome proposals from all persons who may wish to participate in the symposium as speaker or presenter on any topic related to Michaux as outlined as above, from botanical science to history to gardening and other areas. This preliminary indication of interest will permit a determination of expected participation and the development of the program outline, especially pertaining to invited and contributed paper sessions. A formal Call for Papers will be issued approximately one year before the symposium date. By Dec. 1, 2000, please send brief paper proposals of no more than 200 words to:

Michael J. Baranski, Ph.D.

Telephone: (704) 637-4442

AMIS Program Chair

Fax: (704) 637-4204
Department of Biology

E-mail: mbaransk@catawba.edu

For further information on AMIS, please visit the web site at: <http://www.michaux.org>

Third International Conference on the Comparative Biology of the Monocotyledons will be hosted by Rancho Santa Ana Botanic Garden on 30 March-5 April 2003. If you are interested in receiving information about the meetings as it becomes available, please send your postal and electronic mail addresses to Ann Joslin (ann.joslin@cgu.edu).

Positions Available / Fellowships

Curator of the UNC Herbarium.

The Curatorship is a non-tenure track professional research, teaching, and public service position that reports to the Director of the North Carolina Botanical Garden at the University of North Carolina at Chapel Hill. The Curator is responsible for the overall management of the UNC Herbarium, a collection currently of 660,000 plant specimens. The Curator supervises the international specimen exchange and loan program, authenticates and approves plant material added to the collection, and supervises the Assistant Curator, graduate students, undergraduates, and volunteers in specimen curation, record keeping, and acces-

sioning. The Curator also writes grants for the collection, as well as for his/her own research projects. The Curator is responsible for the overall direction of computerized data bases and the availability of Herbarium related information on the World Wide Web. The Curator trains undergraduate and graduate students in curation techniques, teaches extension courses at the North Carolina Botanical Garden, and may be appointed to an adjunct position with the Department of Biology in order to teach and serve on student committees. We will begin to review applications on October 1, 2000. Send a letter of application, curriculum vitae and three letters of reference to Peter White, Campus Box 3375, North Carolina Botanical Garden, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3375. 919-962-0522. pswhite@unc.edu. The University is an affirmative action/equal opportunity employer.

Postdoctoral Fellowship, Rancho Santa Ana Botanic Garden

Rancho Santa Ana Botanic Garden seeks a postdoctoral fellow, funded by the Mellon Foundation, to join our active research group in plant evolutionary biology and systematics. The focus of the postdoctoral fellowship is open, but preference may be given to those knowledgeable in FISH/GISH techniques. The position will become available in September 2000. Applicants should provide a letter stating his or her research interests, a CV, and the names, postal and e-mail addresses, and telephone numbers of three references to Ann Joslin, Assistant to the Director, Rancho Santa Ana Botanic Garden, 1500 North College Avenue, Claremont, California 91711-3157, U. S. A. For more information, please contact Elizabeth Friar at (909) 625-8767 ext. 223 elizabeth.friar@cgu.edu

or Clem Hamilton at (909) 625-8767 ext. 220 clem.hamilton@cgu.edu.

Visiting Scholar, Rancho Santa Ana Botanic Garden

Rancho Santa Ana Botanic Garden seeks a visiting scholar to augment its graduate program in botany. The person chosen will teach a course, seminar, or workshop(s) in his or her area of expertise and participate in our active research program in plant evolutionary biology and systematics. The visiting scholar will have an excellent track record in research and enjoy mentoring and collaboration. Duration of the visit will be one semester (possibly longer), starting as early as

January 2001. Funds are available via a grant from the Mellon Foundation for remuneration. For additional information, contact Clem Hamilton at (909) 625-8767 ext. 220 clem.hamilton@cgu.edu. For consideration please provide a CV, a letter suggesting possible course/seminar/workshops(s) that may be offered and proposing the research to be conducted while at the Garden, and the names, postal and e-mail addresses, and telephone numbers of three references. Send to Ann Joslin, Assistant to the Director, Rancho Santa Ana Botanic Garden, 1500 North College Avenue, Claremont, California 91711-3157, U. S. A.

Harvard University

Bullard Fellowships in Forest Research

Each Year Harvard University awards a limited number of Bullard Fellowships to individuals in biological, social, physical and political sciences to promote advanced study, research or integration of subjects pertaining to forested ecosystems. The fellowships, which include stipends up to \$30,000, are intended to provide individuals in mid-career with an opportunity to utilize the resources and the interact with personnel in any department within Harvard University in order to develop their own scientific and professional growth. In recent years Bullard Fellows have been associated with the Harvard Forest, Department of Organismic and Evolutionary Biology and the J. F. Kennedy School of Government and have worked in areas of ecology, forest management, policy and conservation. Fellowships are available for periods ranging from six months to one year and can begin at any time in the year. Applications from international scientists, women and minorities are encouraged. Fellowships are not intended for graduate students or recent post-doctoral candidates. Further information may be obtained from: Committee on the Charles Bullard Fund for Forest Research, Harvard University, Harvard Forest, P.O. Box 68, Petersham, MA 01366 USA or email (drecos@fas.harvard.edu). Annual deadline for applications is February 1. More information is available on the Harvard Forest web site: <http://LTERnet.edu/hfr>.

ASSISTANT PROFESSOR, Department of Horticulture, University of Wisconsin-Madison invites applications for a 12-month tenure track position, 70% research 30% instruction, available January 1, 2001. The incumbent will provide leadership in research serving Wisconsin's cranberry industry. Emphasis will be on whole plant physiology or ecology, which may include rhizosphere ecology, nutrient uptake and utilization, root-microbe interaction, water management and quality or reproductive biology.

Emphasis should be on basic research that will ultimately be transferable to the field for utilization by growers. A program integrating laboratory and field research will be encouraged. The successful candidate will be required to secure extramural research funding. Additional annual funding is available from an endowment supporting this position. Partial funding will be available on a competitive basis from the Wisconsin Cranberry Board, Inc., and other industry groups. Teaching responsibilities will include an upper division course in temperate fruit crop production, and the opportunity to develop an advanced course in an area of interest. Applicants must have an earned Ph.D. in Horticulture, Agronomy, Ecology, Botany, Plant Physiology or a related field. The salary is competitive and commensurate with training and experience.

Applicants should send their curriculum vitae, a statement of professional goals and names of four references to: Dr. Teryl R. Roper, Chair, Search & Screen Committee, Dept. of Horticulture, 1575 Linden Drive, Madison, WI 53706. Telephone 608-262-9751 Fax: 608-262-4743. Applications received by October 15, 2000 will be assured consideration.

The Rupert Barneby Award

The New York Botanical Garden is pleased to announce that Gery Allen, currently a post-doctoral fellow at the Laboratory of Molecular Systematics, National Museum of Natural History, Smithsonian Institution, Washington, D.C., is the recipient of the **Rupert Barneby Award** for the year 2000. Dr. Allen will be studying the phylogenetic systematics of *Lotus* (Fabaceae) and other genera of the Loteae (Faboideae).

The New York Botanical Garden now invites applications for the **Rupert Barneby Award** for the year 2001. The award of US\$1000.00 is to assist researchers to visit The New York Botanical Garden to study the rich collection of Leguminosae. Anyone interested in applying for the award should submit their curriculum vitae, a detailed letter describing the project for which the award is sought, and the names of 2-3 referees. Travel to the NYBG should be planned for sometime in the year 2001. The application should be addressed to Dr. James L. Luteyn, Institute of Systematic Botany, The New York Botanical Garden, Bronx, NY 10458-5126 USA, and be received no later than December 1, 2000. Announcement of the recipient will be made by December 15th.

Anyone interested in making a contribution to **The Rupert Barneby Fund in Legume Systematics**, which supports this award, may send their check, payable to The New York Botanical Garden, to Dr. Luteyn.

Other News

HUNT INSTITUTE ELIMINATES PAGE CHARGES FOR *HUNTIA*

Pittsburgh, PA—The Hunt Institute for Botanical Documentation is pleased to announce that we no longer impose page charges for our journal *Huntia*. As always, we welcome external contributions to *Huntia*. Before submitting manuscripts for consideration, please request our "Guidelines for Contributors," which also are available on our Web site (huntbot.andrew.cmu.edu).

We publish on all aspects of botanical history and documentation, including exploration, art, literature, biography, iconography and bibliography. For example, the 11(1) issue, published in June 2000, contained the following articles: E. Charles Nelson, "Patrick Browne (ca. 1720–1790), Irish physician, historian and Caribbean botanist: A brief biography with an account of his lost medical dissertations"; P. H. Oswald and E. Charles Nelson, "Jamaican plant genera named by Patrick Browne (ca. 1720–1790): A checklist with an attempt at an etymology"; Elizabeth Fortson Wells and Rebecca Louise Brown, "Naturalized alien plant species at Mount Vernon, Virginia"; Robert W. Kiger and James L. Reveal, "A comprehensive scheme for standardized abbreviation of usable plant-family names and type-based suprafamilial names"; Dominik Wujastyk, "An unknown botanical album in Kathmandu"; Book Reviews and Announcements.

Editorial correspondence should be directed to Scarlett Townsend. Day Phone: 412-268-7304

Email: st19@andrew.cmu.edu Books for announcement or review should be sent to Charlotte Tancin, the book reviews and announcements editor.



A JOURNEY THROUGH KEW GARDENS

The Royal Botanic Gardens official video of Kew Gardens - **A Journey Through Kew Gardens** - is now available in North America from Willowbank Video. The Royal Botanic Gardens, Kew is one of the most beautiful gardens in the world. As a leading center of scientific research and conservation, Kew is also striving to ensure better management of the Earth's environment, increasing knowledge and understanding of the plant kingdom - the basis of life on Earth. Within the Gardens 300 acres the collections incorporate 40,000 different species - including 5,000 species of Orchids - making it the largest and most diverse global collection of living plants.

This official video, **A Journey Through Kew Gardens**, is introduced by Anna Ford, a Trustee of Kew, and highlights the remarkable landscape and architecture of the Gardens. Using rare archival material and new aerial footage, **A Journey Through Kew Gardens** takes us on a tour of the best of Kew - from the informal Woodland Gardens to the Temperate House (the largest glass house at Kew). We enjoy the wonderful Aquatic Garden and the Princess of Wales Conservatory, housing amazing giant water lilies within its 10 climatic zones. Tranquil woodland glades provide a beautiful background to the exuberant Azalea Garden and Rhododendron Dell. Kew's collection of 9,000 trees is one of the world's most important, fully documented, living libraries of trees with over 2,000 species and varieties.

The fantastic and varied buildings at Kew - some known for their architectural merit, others for their royal connections - are also explored by this video. There is the recently restore Japanese Gateway, Queen Charlotte's Cottage, and an incredible 10-story Pagoda. Perhaps the most famous building at Kew is the spectacular Palm House, designed by Decimus Burton, an amazing feat of Victoria engineering and determination.

This official video **A Journal Through Kew Gardens** is an ideal way to sample the beauty and vitality this special botanic garden that is Kew. Approx. 60 minutes, VHS, \$24.95 + shipping and handling,

Order from: **Willowbank Video**, (800) 669-9080, fax: (914) 679-4093 234 Meads Mountain Road, Woodstock, N.Y. 12498

Other videos from Willowbank include: MONET'S GARDEN AT GIVERNY, CHELSEA FLOWER SHOW 2000, RHS PRACTICAL GUIDE TO WATER GARDENING, and PRACTICAL GUIDE TO BONSAI.

For further information please contact: Deborah Day at Willowbank Video (914) 679-4024, fax: (914) 679-4093,

Literature Award Recognizes Excellence in Botanical Literature

The Council on Botanical and Horticultural Libraries, Inc. presented its first Annual Literature Award to Daniel E. Moerman, author of *Native American Ethnobotany*, and Timber Press, the book's publisher, on May 3, 2000 at the Smithsonian Institution. The award was created to recognize significant contributions to the literature of botany or horticulture. Moerman's work is an outstanding example of botanical literature that relies on exhaustive scholarly research. It comprehensively reviews how Native Americans used plants for medicine, food, and other purposes. The book met or exceeded all criteria for the Literature Award, including excellence of intellectual content, usefulness, and uniqueness.

Amazon Associate Links

Here is a way to help the society if you're a bibliophile and are interested in any of the books reviewed or received by the *Plant Science Bulletin*. Links have been added from the on-line version of PSB directly to Amazon.com's specific book page. If you order a book directly (by clicking first on our hot-link in PSB On-line), the Botanical Society will receive a 5% to 30% return of the cost from Amazon. The requirement from Amazon.com is that a link be directly made to a specific book page. The referral data is kept within one click of the original reference, so users intending to benefit BSA by their purchase should immediately add the book to their shopping cart if they are considering buying it! Funds generated through this means will be available for support of BSA's general activities.

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The Secret Life of Plants Series. Lawrence Jensen and Andrew Chung. www.sbs.auckland.ac.nz/nzplants/index.htm. This colorful series of instructional videos address the reproductive strategies of plants. Mosses, ferns, pines, and flowering plants are each represented in separate video installments of the series. All four installments feature remarkable computer animation and modeling of a representative in the taxa.

The life history of *Funaria* (Bryales) is described in the installment on mosses. Both the independent gametophyte and “parasitic” sporophyte are illustrated. For ferns, *Pteridium* (Filicidae) is depicted, with computer modeling depicting variations such as indusium-covered sori. The “catapult” sporangium dehiscence is especially well suited to computer animation. As with mosses, the alternation sporophyte and gametophyte generations is described.

The life cycle of *Pinus*, including easy-to-understand animations of male and female stroboli anatomy, is described in the pine installment of the series. An educator might also use this segment to illustrate the life history of other gymnosperms (Cycales, *Ginkgo*).

The narrator in the installment on flowering plants identifies *Lilium* as a model, and the animation of the flower morphology supports this. However, *Lilium* exhibits a tetrasporic 8-nucleate Fritillaria type gynosporeogenesis. Three fused haploid daughter cells at the chalazal end result in three triploid antipodal cells in the mature female gametophyte. In the carpel animation sequence, the more typical monosporic 8-nucleate polygonum type is illustrated. The development of a female gametophyte is significantly different in these two systems, and deserves clarification in the final production. Microsporogenesis is described as it occurs in most angiosperms. Four microsporangia fused with connective vegetative tissue form the six anthers (again, *Lilium*). The development of mature pollen grains from microspore mother cells is well described.

The quality of the computer animation in this series is remarkable. Computer-generated images of accelerated anatomical growth are displayed in eye-grabbing color with realistic lighting. The viewer is whisked around organs as tissues are peeled back and described by the narrator, as though the viewer is traveling in some miniature helicopter. The background audio is varied and compliments the stunning visual depictions of reproduction. The most common piano tune is spooky and eerie at times, lending considerable drama to the presentation. The music is augmented by sounds of forest (birds singing, etc.). The visual animation and audio serves well to hold the attention of the audience.

Particularly valuable for educators, each installment is divided into “simple”, “intermediate”, and “advanced” versions of the material presented. Each version begins with an essentially identical introduction to the taxa, often depicting the organism in its habitat, followed by a computer-animated description of reproduction that varies in

complexity.

The simple version describes the reproduction of the taxa the simplest of terms. For example, the simple version of *The Secret Lives of Ferns* describes the prothallus gametophyte as “a tiny, heart-shaped plant”. In restricting anatomical and morphological descriptions to simple terms, less botanically sophisticated audiences are provided with a solid, easy-to-understand introduction to the taxa. Simple versions in the series are about 10 minutes long. The intermediate version uses the same computer animation sequences as the simple version, although with more advanced nomenclature. The intermediate version is also punctuated by summaries of the information presented. Again from *The Secret Lives of Ferns*, the gametophyte prothallus is described in the intermediate segment as “a small, heart-shaped...bisexual gamete plant”, underscoring the concept of alternation of generations. Due to the periodic summaries, intermediate versions are several minutes longer than either the simple or advanced versions. The advanced version of *The Secret Lives of Ferns* describes the gametophyte prothallus as a “heart-shaped bisexual gametophyte, or prothallus”, providing the most sophisticated level of scientific terminology. This series also presents a good value to the educator. Separate versions of a description of reproduction allow a degree of customization in lesson design, to accommodate the botanical sophistication of the students. -Thomas Benenati, Department of Biology, Emporia State University, Emporia, KS 66801.

Seed Germination a Guide to the Early Stages Natalie V. Obroucheva. 1999. ISBN 90-5782-040-4. (paper US\$40.00) Backhuys Publishers B.V., P.O. Box 321, 2300 AH Leiden, The Netherlands. -- This book provides a technical review of the stages of seed germination concentrating on the early stages of the germination of mature and even immature seeds.

The author considers the initiation of growth with reference to topics such as cellular elongation followed by examination of the importance of seed hydration and metabolic activation in the initiation of growth during seed germination. In the first chapter, the author should have more gradually introduced the topic of seed germination rather than jumping abruptly into a discussion of the stages involved in this process. The first chapter does provide very nice diagrams of developing embryos and germinating seedlings, though a general review like this might have included many more species.

Cellular elongation in axial organs fills an entire chapter, followed by treatment of the overall case of the germination of quiescent seed. Finally, a brief conclusion reemphasizes the earlier-stated importance of water in seed germination for both biochemical and biophysical reasons. This overriding role of water in seed germination forms the main theme of *Seed Germination a Guide to the Early Stages*. The text is followed by an extensive set of references.

Even though the author is not a native speaker of English, the English in the text is generally quite good—e.g., “In viable air-dry quiescent or non-dormant seeds, the axial organs can be considered as a system which readily changes from being almost inert to becoming an actively metabolizing unit capable of growth initiation” (p. 103). However, this is not always the case as seen in examples such as: “The organs of the seed embryo start their development in a certain order in accordance with morphological patterns of young seedlings that vary between species” (p.1) and “Since the morphology of early seed germination have received little attention, it is appropriate to inspect it here. This is especially true in regard to current discrimination between radicle and hypocotyl.” Editing should have been performed with greater care, especially in the first chapter after which the quality of the writing improves noticeably.

One item of value presented by this book, beyond the ostensible purpose stated in the title, is the access which it provides to Russian literature on seed germination. This may be particularly true for earlier papers that may not be covered in currently available electronic databases.

The text is excellent in that it covers information from disparate subdisciplines of plant biology. A limited amount of mathematics is introduced in the description of cellular division time (p.25), and both classical and molecular details are noted. This is seen in the case of cellular growth where both the proteins known as expansins and the older acid growth hypothesis are considered in the chapter on cell elongation and axial organs (pp.93-94). Though molecular detail is considered, no gels are depicted, which some readers will find a blessing and others will find a curse. This lack does not detract from the overall treatment of the subject at hand.

The audience for *Seed Germination a Guide to the Early Stages* will be of interest most obviously to those working on seed germination for a variety of reasons, but particularly to those working on seed, embryo, or seedling development. The discussion may be too technical for introductory level students, but this book would fit nicely on reading lists for graduate classes and perhaps for upper level undergraduate courses. It does certainly belong in research libraries and in the libraries of researchers working on seed germination. -Douglas Darnowski, Department of Biology, Washington College, Chesterton, MD 21620.



Applied Population Ecology: Principles and computer exercises. 2nd edition. Akcakaya, H.R., M.A. Burgman, and L.R. Ginzburg. 1999. ISBN 0-87893-028-0 (cloth US\$39.95) 285pp. Sinauer Associates Inc. P.O. Box 407, Sunderland, MA. - In this book, the authors introduce various concepts in population biology and use computer modeling to illustrate the concepts and their applications. The applied problems at the end of each chapter are likely to appeal to many readers. The computer exercises illustrate how population biology and computer modeling can help evaluate different conservation strategies, or identify the variable(s) that most impacts population growth. The use of computer modeling to illustrate concepts in population biology and demonstrate their application is a useful and refreshing approach that facilitates the understanding of the concepts. The book covers current topics in applied ecology, and the arguments are easy to follow. The authors state in the preface: „we hope that the software tool we provide, in combination with our practical approach, will make population ecology easier to learn and to teach“. I would argue that the authors have reached their goal.

The book contains eight chapters and covers single and metapopulation models, age and stage structure models, stochasticity, sensitivity analysis, population viability analysis, and natural resource management. Exponential and density-dependent models of population growth are introduced in chapters one and three respectively. The sources of stochasticity and their impact on population growth and risk of extinction are presented in the second chapter. The next two chapters discuss age- and stage-structure and introduce matrix models. The explanation of how to estimate a Leslie matrix from a life table was very informative and well presented. In the next chapter we are introduced to metapopulation models, where a species is divided into many populations. Chapter six illustrates the impact of spatial correlation of environmental variation and of dispersal on extinction risks. It also demonstrates the use of metapopulation models to quantify the impact of habitat fragmentation, corridors, and reserve design on species conservation. Population viability analyses, defined as the use of models to combine all relevant factors in the evaluation of extinction risks, are discussed in chapter seven. The last chapter discusses how computer models can help us make more informed decisions regarding the management of natural resources. The last two chapters build on the knowledge gained in the previous chapters.

This book is well suited for an upper division undergraduate class or a graduate class in applied population biology. I would also recommend this book to anyone interested in learning how computer modeling can facilitate the process of decision making in conservation biology and resource management.

This is the second edition of this book. There were no major changes in the text relative to the first edition but the computer programs now run under Windows rather than Dos and are easy to use.

My only disappointment with this book is that it concentrates on single-species problems, presented either

in single or many populations (metapopulation). It does not cover two- or multiple species interactions such as competition, predation, parasitism, and herbivory, topics which are typically covered in a population biology class. In applied population biology two-species interactions are important for bio-control and for invasive species. Examining how computer modeling can influence methods of biocontrol and control of invasive species seems timely. The learning and teaching of population biology would only benefit from the application of the valuable approach developed in this book to problems involving multiple species interactions. I strongly recommend this book to anyone interested in population biology. —Johanne Brunet, Dept. Botany and Pl. Path., Oregon State University, Corvallis, OR 97331.

Australian Rainforests: Islands of Green in a Sea of Fire, by D.M.J.S. Bowman, Cambridge University Press 2000, ISBN 0-521-46568-0. 345 pages.

- As an ecologist who has worked in an area (southern Florida) where tropical forests intermingle with temperate forests and fire is an important natural disturbance, I eagerly anticipated reviewing this book to learn what ecologists in Australia know about this question. In the introduction, Bowman states that readers will have to look elsewhere for a detailed coverage of the floristics and phytogeography of the Australian flora. Instead, this book is a review of the main hypotheses that have been developed to explain the distribution of rain forest in Australia.

After two introductory chapters, the main part of the book is organized into chapters examining the data pertaining to these hypotheses. Bowman sets up the first few arguments (Chapters 3-7) as straw men in order to show that the available data does not support these ideas. These unsupported or simplistic arguments include the problem of defining rainforest as non-sclerophyllous, the idea that rainforest is dependent on soil phosphorus or particular soil types, and the idea that rain forest is dependent on certain climatic variables including water, light, and temperature. While acknowledging that some of these variables are related to the distribution of rain forest, they do not appear to be the primary reasons. The remainder of the book (chapters 8-13) discusses the role of fire as the primary factor in determining the distribution of rain forest in Australia. These chapters include a discussion of field studies, the interaction of fire and nutrients, the importance of fire frequency, the use of fire by aboriginals, historical climate change and the evolution of flammability, and how fire management is important in the conservation of Australian rainforests. Bowman shows that fire has been an important element of Australian ecology long before aboriginals began to use fire culturally, although it is acknowledged that our understanding of aboriginal settlement patterns is still unsettled.

For readers from outside Australia, knowledge of Australian geography will be beneficial. I found myself reaching constantly for the world Atlas to remind myself where the different states, parks, mountain ranges, and place names are located. I also was interested in learning

that Australians have a much broader use of the term "rain forest". In addition to the tropical, subtropical, and temperate rain forests that are recognized in the Americas, Australians place what Americans would call "tropical dry forest" as a type of "rain forest" called "dry rainforest or dry monsoon forest".

In conclusion, this book should be of interest to researchers, graduate students, and land managers in Australia and elsewhere in the world where fire is an important natural disturbance. Besides being well-written and referenced, the book is packed with figures and tables from the review of the literature that summarize many of the observational and experimental studies that have examined these hypotheses. I would recommend this book, along with another excellent book from Australia, *The Ecology of Fire* by Robert Whelan (Cambridge University Press, 1995), as good texts for a course on fire ecology. -Dr. John B. Pascarella, Dept. Biology, Valdosta State University, Valdosta, GA 31698

Halophyte Uses in Different Climates I. Ecological and Ecophysiological Studies. H. Leith, M. Moschenko, M. Lohmann, H.-W. Koyro, and A. Hamdy (eds.). 1999. ISBN 90-5782-038-2 (softcover 150 Netherland Guilders (definitive); approx. US\$75.00). xii + 258 pp. **Halophyte Uses in Different Climates II. Halophyte Crop Development: Pilot Studies.** A. Hamdy, H. Lieth, M. Todorovi, and M. Moschenko (eds.). 1999. ISBN 90-5782-025-0 (softcover NLG 85 (definitive); approx. US\$42.50). ix + 144 pp. Both published by Backhuys Publishers, PO Box 321, 2300 AH Leiden, The Netherlands. E-mail: info@backhuys.com. — In the last several decades, as agricultural lands have been degraded by over-use of fertilizers, salt-water intrusion, loss of topsoil, and desertification, scientists and agronomists have focused research attention on using salt-tolerant plants (halophytes) in agricultural systems. One prime driver of this research has been the European Commission, which supports a Concerted Action program in the utilization of halophytes. These two volumes are the first synoptic presentation of the results of this research program; the included papers were presented at the 1998 International Congress of Ecology (INTECOL) in Florence.

Volume 1 primarily covers ecophysiology and basic ecology of a the relatively small number of halophytes being considered for saline agriculture: *Beta vulgaris* ssp. *maritima*, *Suaeda fruticosa*, *Spartina maritima*, *Halimione portulacoides*, *Arthrocnemum fruticosum*, and *Laguncularia racemosa*. These plants are being examined for use as sugar, oil, and forage crops, or for agro-forestry. The eleven contributions in this volume, span a diversity of continents: Europe, Africa, the Middle East, and North America, but most share a common methodology. The responses of individual species to different levels of salt crossed by nutrients, normally in the greenhouse, but occasionally in the field, are reported, and implications for their use in agriculture is discussed. Volume 2 presents the

case-studies: attempts at reclaiming degraded lands for saline agriculture and agroforestry in Italy and the Middle East. Some of the case-studies are actual examples, whereas others are basic reports similar to those presented in Volume 1.

The quality of the papers in these volumes is highly variable. Although all papers are written in English, for all but one of the papers across both volumes, English is not the primary language of the authors. The manuscripts clearly were not edited by a native English speaker, and so reading the papers can be slow and confusing for native English speakers. The figures and tables are generally clear, though, so the main message of each paper is apparent.

To me, the most valuable aspects of these two volumes are two review chapters. In volume 1, Menzel and Leith present version 2.0 of their halophyte database. This database of over 2600 species, complete with synonymies (from Index Kewensis), their salt tolerance, and references to the literature (incomplete, but a complete internet-based list is promised for the future) is a gold-mine for individuals interested in determining what plants might be suitable for saline agriculture and agroforestry. In volume 2, the same authors tabulate the published uses of 69 halophytes (24 of which are species of *Atriplex*), along with their origin, region of cultivation, salinity tolerance, and photosynthetic type (C3 or C4). Finally, there is a one-page table (Annex [or Appendix] 3 in Volume 1) that gives conversions for commonly-used salinity measurements. In one place, I can now look up the relationship between parts-per-million, dS/m, mmhos, meq/L, mol/m³, μS/cm, and nmol/kg of NaCl. This conversion table will allow one to make some sense of the myriad units used for salinity in the vast literature on halophytes, as there is no established SI standard unit for salinity. Climate diagrams are provided for all study sites referred to in both volumes.

These volumes are aimed at a narrow audience: individuals interested in saline agriculture. The price seems quite high, given that many potential buyers are in developing countries, or at state agricultural universities facing declining library acquisition budgets. The papers are of archival value, but the on-line database (no URL is provided) will be of more long-term utility. -Aaron Ellison, Dept. Biology, Mount Holyoke College, South Hadley, MA 01075.

Savannas, Barrens, and Rock Outcrop Communities of North America. Anderson, R., J. Fralish, and J. Baskin, (eds.) 1999. ISBN 0-521-57322-X (hardbound) Cambridge University Press. - The three ecologists serving as editors of this treatise on savannas and related communities have provided an excellent, multi-authored summary of a voluminous and scattered literature. This compilation of 26 papers is an outgrowth of the North American Conference on savannas and barrens held at Illinois State University in 1994; it emphasizes regional areas in the United States and Canada (east/southeast; central/midwest; western/southwest; northern), but includes communities as diverse as oak savannas, jack pine woodlands, alvars, and serpentine

barrens. The book would be very useful for graduate seminar courses, and is indeed an invaluable reference for grassland and forest ecologists and for conservation managers interested in these vegetational areas. The potential for use as an undergraduate text is much more limited--i.e., the prose is readable, but fairly dense in information content at that level. Undergraduate libraries, however, will find it an useful reference for ecology students and faculty pursuing research or teaching areas that overlap with the book.

This review evaluates the major strengths and weaknesses of the book, with reference to particular chapters as appropriate. Overall, the papers consistently include sections related to the history of the region, the climate, geology and soils, flora and fauna, and authors often discuss the primary threats that might influence management and conservation. Each paper ends with a concise summary of its major content. Other common elements (see introduction) include a focus on „environments that restrict tree growth,“ and also either harbor many unusual endemics or support sometimes fragile communities growing under extreme environmental conditions. Some rich refugial areas (e.g. cliff system, Niagara escarpment) show remarkable vertical as well as horizontal stratification, and are being heavily degraded by climbers and recreational enthusiasts. Hopefully, the book will further raise awareness of the importance of conserving and restoring a set of historical landscapes that have already been reduced to as little as 1% of their original area.

The introduction effectively sets the stage for the book, providing helpful definitions and notes on the ambiguity in usage of key terms as a result of history and geography. (For example, „savanna“ has been variously applied to treed and treeless areas, and „cedar glades,“ like the common name „cedar,“ can have multiple meanings!). Yet the book overall could be strengthened by: a) reducing the redundancy across chapters from redefinition of „barren,“ „savanna,“ „woodland,“ and „serpentine,“ and by b) including more explicit discussion of the importance of these communities relative to the „ecological services“ they provide. Some redundancy in definitions is unavoidable since scientists may read chapters selectively and because some areas pose special cases. However, the definitions were clearly repetitive at times, garnering space that could have been more effectively utilized if this aspect had been more closely scrutinized.

Coverage of historical and current literature and illustrative material is excellent overall but varies considerably by chapter and author. For example, literature cited sections in some chapters (e.g., Menges, chpt. 1; West, chpt 18) provide very thorough inclusion of post-1996 publications and/or recent dissertations, while others (e.g., Gibson et al., New Jersey pine barrens; Shure, granite outcrops), are useful primarily for relatively older, historical sources. Some articles (i.e., Baskin et al.) incorporate the very early, classic works of Transeau, Braun, and Kuchler. Examples of excellent illustrative material include: climatic diagrams linked to distribution maps (Archibold's aspen parklands), Knight's excellent

black-white photos of ponderosa pine woodlands, photos of subarctic lichen woodlands, and diagrams of tree growth relative to climate (Johnson & Miyanishi). Useful synthetic tables are important throughout the book, and are evident in the chapter on oak savannas inhabiting sand substrates; sparse discussion of calcareous oak savannas suggests these are less well-studied. Some authors insufficiently cited sources in text (e.g., p. 395, gypsy moth effects in southern Ontario; p.376-383 on alvars) or occasionally in illustrations (e.g. maps for figures 5.1, 5.2). In future editions, readers would benefit considerably if some of the longer lists of taxa in text were placed instead in clearer, more accessible tables.

In general, I learned much from this recent compilation. Most authors appeared to be very aware of shifts in ecological theory on community dynamics (e.g., contra Clementsian models), and of the effect of this theory on management practices. In a well-organized chapter, Platt (chpt. 2) notes that contrary to early studies, SE pine savannas are increasingly recognized as persistent rather than as successional communities. The authors of the chapter on shale barrens emphasize the hypothesis testing approaches now used to examine the physiological requirements of barren heliophytes and stress the relative importance of below-ground factors that were previously overlooked. Impressive alder root growth also occurs right through the bedrock of cedar glades (Baskin & Baskin). The fauna was effectively described in many papers, including some very specific interactions such as that of squirrels and pine in Rocky Mountain woodlands.

Helpful discussions of fire ecology abounded in many chapters and were much appreciated. (In fact, an integrative summary of the role of fire across these many systems would be a useful paper!) Interestingly, in some areas fire suppression has markedly influenced the habitat (e.g., Great Lakes pine barrens; open woodlands of Ill, KY, and TN) while in others climate plays a more significant role than fire or grazing (lichen woodlands). In aspen parklands, the morphology and height of stands can also be used to infer its history. Paleochronologies in some chapters (e.g., Big Barrens, KY) were also exceedingly helpful in understanding community histories. Even so, determining presettlement vegetation can be quite challenging (e.g. savanna vs. forest in the Ozark Plateau). Anecdotal histories during settlement were also enlightening: Nuttall apparently described the western „cross-timbers“ area that pioneers „crossed“ during early expeditions as a „pathless thicket of somber timber“ (chpt. 14). Finally, many papers stress the need for more research on a diversity of topics related to the development, conservation, or restoration of these unique communities. Topics mentioned include: plant-animal interactions in granite outcrops, autecology of high-elevation rock outcrop species, and fire ecology in general. We still have much to learn about controversial fire-suppression policies and about how to manage areas of very different sizes (e.g. 72 million acres of juniper-pinon savannas relative to 3 million hectares of shiner oak) and ownership—e.g., predominantly public lands (e.g. 60% of SW oak savanna) vs.

private holdings. One wonders too what policies are actually being pursued for publicly-held oak savanna to ensure that this community and its associated flora and fauna are being adequately protected.

In summary, I found Anderson et al.'s book to be an outstanding collection of very interesting papers on diverse landscapes, most of which need urgent and aggressive protection. The text is a fine addition to the libraries of professional managers, ecologists, systematics, and anyone interested in these unique habitats. — Susan R. Kephart, Dept. Biology, Willamette University, Salem, OR 97301.

Rangeland Desertification, Ed. O Arnalds & S. Archer. Kluwer Academic Publishers, Hardcover \$95.00. - **RALA Report no 200**. Case Studies of Rangeland Desertification. Proceedings from an International Workshop in Iceland, \$25.00 (plus \$13.00 postage) order from Agricultural Research Institute, Keldnaholt, 112 Reykjavik, Iceland. Also downloadable from **Rangeland Desertification** - This is geobotany at its best. The situation of grassland plants in their ecosystems, both natural and socio-economic is delineated so well that one has the sense of actually being there. Desert books tend to be rather dry. These two are a good read. I could not put either of them down. The title „Rangeland“ instead of „Grassland“ should not deter botanists. The primary focus is plants. It is a collection of papers read at the 1997 Rangeland Desertification Workshop in Iceland. The workshop was convened in response to the United Nations Convention to Combat Desertification (UN-CCD) of 1994. Unfortunately the book lacks an index. The chapters/papers are not numbered and the title pages of the papers are unnumbered. Otherwise the papers and their references are thorough and excellent. The first section contains rigorous studies and discussions of the various processes involved in desertification. The second section surveys efforts to determine the extent of the problem and to remedy the ongoing loss of rangelands. The references cover most of the recent literature and are almost worth the price of the book. O. Arnalds in „Desertification: an appeal for a broader perspective“ (p. 5) argues persuasively for an extension of the term to more humid areas such as his own Iceland. His description of the ecological disasters in Iceland was a surprise to this arid lands specialist. I found myself arguing for and against his proposal and on purely semantic grounds rejecting it. Perhaps „degradation“ instead of „desertification?“ He wishes to have Iceland included in the Convention and it is politically easier to change the definition of „desertification“ than to broaden the context of the Convention. Thinking of bare fields in humid areas that „look like desert but worse,“ I have reservations about my semantic rejection. Archer and Stokes describe „Stress, disturbance and change in rangeland ecosystems“ (p. 17) and then raise the philosophical question of definition of „degradation: ecological or socioeconomic?“ For a cattleman the loss of

grasses is degradation. For an herbal supplier the proliferation of *Larrea tridentata* is improvement. This paper is full of interesting challenges to some of our present ecological paradigms. Ludwig and Tongway in „Viewing rangelands as landscape systems“ (p. 39) offer an interesting change of perspective that merits serious consideration. Tongway and Hindley join the landscape system view to „Assessing and monitoring desertification with soil indicators“ (p. 89). This system is similar to a course called „walking the terrain“ which has been of great value to me. These two papers should be read consecutively. Thurow’s excellent „Hydrologic effects on rangeland degradation and restoration processes“ (p. 53) is excellent. Of all the geobotanical aspects of deserts, hydrology is the least understood and even if understood, often ignored. So this successful method of restoration is very exciting, though labor intensive. Pierson describes „Erosion models: use and misuse on rangelands“ (p.67) and offers hope that mechanistic models promise more robust erosion predictions. Will his models be more accurate than those of the landscape system? Considering the amount of data required is modeling feasible at all? Havstad, Herrick and Schlesinger discuss „Desert rangelands, degradation and nutrients“ (p. 77) which process they describe as „poorly understood.“ They remark unfavorably on the fact that most studies of plants are made on plots or in a laboratory. Failure to study the *in situ* factors of desert plant growth frequently results in the apparently inexplicable failure of remedial efforts. Such studies in the Sonoran desert surprised those who attempted to propagate certain plants. A careful reading of this paper should cause all of us to rethink our procedures. Imeson & Cammeraat offer an interesting attempt to bridge fieldwork and modeling: „Scaling up from field measurements to large areas using the Desertification Response Unit and Indicator Approaches“ (p. 99). And Hoffman in „Agricultural and ecological perspectives of vegetation dynamics and desertification“ (P. 115) takes both perspectives in an examination of the Namam-karoo biome of South Africa. A quotation from his abstract: „Because of the relative isolation of ecological science in general, this research has had relatively little influence on (agricultural) managers in the region.“ It will be difficult to break through that isolation but we should attempt to do so, as the managers are unlikely to initiate communication. Cardy in „The United Nations data bases on desertification“ (p. 131) gives an excellent list of Internet sources for desert information. My favorite is „Scientists in third world countries now have access to materials their institutions could never provide for them. The remaining papers are not of specific botanic interest but do not ignore them as they may offer a means of understanding and communicating with managers. Sanders’ „Implementation of soil conservation programmes“ (p. 143), is an excellent explanation of why such programs succeed or fail. He has tremendous insight into and perception of third world cultures, particularly in regard to women. As a Middle Eastern specialist I was most impressed with Narjisse’s „Rangelands issues and trends in developing countries“ (p. 181). It is concise, cogent and so accurate that one wonders

how he dared publish it. **RALA Report no. 200**

The Workshop papers are all of interest to botanists. They are also unnumbered and not indexed. Fernandez & Busso’s „Arid and semi-arid rangelands: two thirds of Argentina“ (p. 41), is superb. New Zealand’s grassland is carefully delineated by O’Conner, Nordmeyer and Svavarsdottir: „Changes in biomass and soil nutrient pools of tall tussock grasslands in New Zealand“ (p. 125). This usually dull subject is enlivened here. Sinha, Bhatia & Vishnoi, „Desertification control and rangeland management in the Thar desert of India“ (p. 115) describes mixes of exotics with native species. The authors admit: „the desert dwellers are not happy“ with alien Israeli *Acacia tortilis*, preferring their own *Acacia senegal* for a long list of reasons (p.117). Since the authors also say the Israeli and native trees are about equally successful one wonders why the agricultural managers insist on planting the alien species. Perhaps they would benefit by reading Sanders’ paper in the Rangeland volume.

The rest of the papers touch on the Mediterranean, China and Mongolia and Africa. Future RALA Conferences will hopefully cover an even wider range of countries. I have already referred colleagues to pertinent papers in these books. Almost every method described has much wider application than rangeland and desertified landscapes. They should be required reading in advanced ecology courses. -Sarah Delle Hultmark, Grand Junction, MI 49056.

Biologically Active Natural Products: Agrochemicals. 1999. H.G. Cutler and S.J. Cutler (eds). CRC Press LLC. 299pp. -It’s relatively easy to overlook that fact that for most organisms, chemicals mediate the interactions with other organisms because humans-like all larger organisms-rely primarily on other modes of sensory perception-sight and sound. Smallish creature use chemicals to screen potential mates, seek out conspecifics, find important resources and, ultimately defend those resources (and themselves) from aggressors or competitors. A couple of examples serve to illustrate; a fungal spore that has landed in a suitable area for growth may secrete chemicals to inhibit faster-growing bacteria but may tolerate a conspecific that is a potential mating partner. And plants are notorious producers of unusual chemicals that serve to defend their acquired resources from bacteria, fungi and herbivores. We’re just beginning to get a handle on how other organisms perceive and respond to their environment, and other organisms in that environment, through chemistry. Our understanding of the role played by chemicals was, not long ago, limited by time and expense in the isolation and identification stages. Time and expense are becoming less of a problem and the pace of chemical discovery continues to increase; a trend powered by faster computers, increasingly refined analytical techniques, and better equipment. Our ability to truly ‘know’ the function of these chemicals is still limited, but more by the lack of suitable, discrete bioassays that would help us decipher their functions. This book outlines some

truly remarkable success stories of identifying novel functions of important natural chemicals, isolating, identifying, discovering their mode of action, and ultimately finding ways to make them work for us - in agriculture.

This is one of two books that derive from the 1997 (Las Vegas) American Chemical Society symposium on chemistry in the fields of Agrochemicals and Pharmaceuticals (a companion book covering Pharmaceuticals is also available). As the editors point out in the preface, we are entering an unusual phase where natural products chemistry, which has traditionally been applied to pharmaceutical problems, can now be applied to agricultural problems. Until recently, only pharmaceutical applications had any potential for economic viability (what is the value of a human life?). Any agricultural application involving chemistry could not exceed the value of the crop to be protected. Subsequently, the early days agrochemicals focused on synthetic (hence cheap and easy to mass-produce) chemistry such as DDT and methyl bromide. More recently, as the environmental and human health costs of synthetics have been factored in, synthetics have become less viable and many have been or soon will be removed from our agrochemical arsenal. This has spurred the search for novel pesticides with high toxicity, high specificity (non-toxic to animals), and short time of residence in the environment. The relatively recent success in genetically engineering *Bt* toxin into crop plants shows that even major product can be profitable; though the long-term viability of genetic engineering is not yet certain given the recent wave of fear and distrust fostered by the anti-genetic engineering protests.

When searching for natural agrochemicals, the logical sources include bacteria, fungi, and plants, while logical target organisms include bacteria, fungi, plants, insects, nematodes and animals. Four examples serve to illustrate the breadth of approaches outlined in this book. A chapter by Robert Hoaglund addressed phosphinothricin (PPT), a tripeptide found in *Streptomyces* bacteria that has broad herbicidal activity but is non-toxic to animals. A gene for PPT production has been used to transform plants allowing for effective control of weeds. Transgenic PPT plants also have the potential to reduce plant-pathogenic bacteria and fungi, though microbes rapidly develop resistance. Two other chapters illustrate that there are a number of other bacterial peptides (cyclic oligopeptides) with potent herbicidal and pesticidal activities that are currently being explored. A chapter by a group of NC State researchers illustrates their work to find ways that will maintain tobacco as a cash crop to benefit small-scale farmers. Their approach is to use tobacco as a bioreactor to produce a wide variety of valuable products (interestingly, low nicotine plants are preferred for this type of work). A group of Japanese scientists present an excellent idea to suppress biosynthesis of aflatoxin (a known carcinogen) by *Aspergillus* fungi commonly found on crops like peanuts and corn. This research highlights the successful use of bacteria aflastatins and balsticidins, both complex polyketides, to specifically block aflatoxin biosynthesis without harm to fungus, thereby avoiding problems with

emergence of resistance. Finally, a group of New Zealanders address problems of plant disease control through the use of beneficial biological control agents that serve to either 1) induce natural plant defenses, 2) parasitize pathogens, 3) control pathogen growth through antibiotic production, or 4) competitively exclude pathogens. One thing to note is that though chemistry is central to the theme of this book and may chapters provide detailed examinations of chemical compounds, the other theme is agriculture so there is a great deal of interesting biology as well. This book is very well written and each chapter is richly illustrated with chemical structures, raw data, summary data, HPLC traces, pictures, tables, and graphs. Each chapter is thoroughly reference, editing was exceptional, and the writing was overall of very high quality.

There are a few improvements that I would suggest for any similar project. The editors provided no walk-through summary of the book and never put the chapters into any kind of context. A couple of chapters didn't seem to fit well into the overall theme of the book, or if there was a connection I could have used some help to see it. Other than a grouping of allelopathy (plant-plant interaction) chapters, there seemed to be little attempt to organize the chapters in any significant way, making the lack of context more glaring. The vast majority of chapters dealt with plant-plant (8 chapters) and plant-insect (6 chapters) interactions but plant-based work is relatively new compared to work with microbial metabolites so all of these chapters tend to end by saying 'there is potential'. The most impressive chapters dealt with bacterial and fungal chemicals used (or potentially useful) against bacteria, fungi, plants, and/or insects. I thought the book would have benefitted from a greater balance of chapter topics, with reduced emphasis on plant-plant and plant-insect interactions and maybe a little more on basic research and biotechnology issues. Many authors did a fine job of placing their study into a larger perspective but several chapters were highly technical and would have benefitted from a broader introduction. Some of the more chemical-laden chapters mentioned Latin binomials of their organism but I had to delve into the literature to find whether this referred to a bacterium or fungus. Other chemical chapters talked of *in vitro* alterations to specific carbons but failed to provide the numbering scheme for the parent molecule that would let a non-specialist figure out what they are talking about. Overall, these criticisms are minor and the book is excellent. The chemistry can get pretty heavy at times, but this book will appeal to a much wider audience. I highly recommend this book for institutional libraries and the personal library of those interested in the future of biotechnology. -Timothy Morton, Dept. Ecology and Evolution, University of Chicago, Chicago, IL 60637.

Biotechnological Approaches in Biocontrol of Plant Pathogens. Edited by K.G. Mukerji, B.P. Chamola and R.K. padhyay. Kluwer Academic/Plenum Publ., 1999. -The present book has an interesting title, which promises comprehensive information on

the thrilling topic of biological pathogen control. Considering pathogen-induced yield losses in agricultural production, as well as the monetary cost of and the effort spent on pathogen control by pesticides, the development of this branch of applied biology is timely. Furthermore, in view of the environmental sustainability of pest control measures, the use of natural predators or competitors represents a suitable alternative to chemical plant protection. Future biologists and agronomists should be thus made aware of these techniques and their practical applications. Hence, a comprehensive textbook on this topic is urgently needed.

However, the present book does not accomplish this task appropriately. Only 4 out of 12 chapters are of high quality. These are the review papers on yeast species for biocontrol of apple postharvest diseases, biological control agents of canola and rapeseed diseases, innovative applications of microbial agents for biological weed control and the application of the lux-gene technology in the control of soil borne diseases.

The remaining chapters are of poor quality, in respect to content and style. In some chapters, text passages are hardly readable due to numerous misspellings and syntax errors. At times it was obvious that the copy editing was deficient. The introductory passage on host parasite specificity has a good literature compilation but also a lengthy and tiresome parasite listing, leaving the reader with a insubstantial description of simple symptoms, such as development of necroses, damping off or wilt; this type of presentation is also found in most other chapters of the book. Since some of the editors also function as co-authors in most chapters, they were, unfortunately, overburdened with the task of covering a field of such scope and depth. The index section is, however, nice. The categorical index is arranged alphabetically, where the reader finds major categories such as actinomycetes, angiosperm hosts, bacteria, biological control and more, and underneath terms sorted alphabetically.

In conclusion, I cannot recommend this book. It leaves the reader unsatisfied, rather confused and with the impression that the important field of biological pathogen control is not presented professionally. -Peter Schröder, Institute for Soil Ecology, GSF National Research Center for Environment and Health, 85764 Neuherberg, FRG.

***Azadirachta indica* A. Juss.** 1999. R.P. Singh and R.C. Saxena, Eds. ISBN 1-57808-041-X. (cloth US\$88.00) 322 pp. Science Publishers Inc., P.O. Box 699, Enfield, New Hampshire 03748, USA. — This volume is a collection of 29 papers presented at the 1996 International Neem Conference, which was held at The University of Queensland Gatton College in Australia.

This book provides a look at some current areas of research related to the neem tree. Neem is described as the “tree of life” to some cultures, and in 1992 the National

Research Council referred to neem as “the tree for solving global problems.” Since ancient times the people of India have valued this tree as a medicinal plant and as a natural insecticide. Traditionally, neem leaves were placed in seed storage bins and in cupboards to deter insects. Also, neem twigs were used to clean teeth and neem tea was used as a tonic. Today, scientists around the world feel the prospects for neem are unlimited with over 200 bioactive compounds already identified. Azadirachtin appears to be the most important insecticidal compound in neem. It is found in many parts of the plant, but the highest concentration is in the mature seed. Neem has multiple effects on insects: as a repellent, an antifeedant, a growth inhibitor, and as cause of abnormal development. In addition to its pesticide applications and its medicinal uses, neem trees are being used in reforestation in semi-arid tropical areas. It is valued for its lumber, which is strong and resistant to termites, and its ability to reduce erosion.

The papers are organized into 11 topics areas; however, the primary focus of the book is on the pesticidal activity of neem extracts, which was the main theme of the conference. Ten chapters describe the effects of neem extracts, neem dust, neem oil, or other neem products against various insect pests. These compounds were shown to be effective either alone or in combination with other treatments. A paper by J.F. Walter is especially informative. Walter described the commercialization and use of neem in the field since its approval for use in the U.S. This chapter provided a good review of the topic and describes how neem functions as an insecticide. Because of the multifaceted mode of action, Walter suggests that resistance is unlikely to develop in insect populations. Walter also showed that used in rotation with other products, neem will increase the efficacy of both products. Several chapters discussed the effectiveness against nematodes and one reported success using neem and other plant extracts to control a fungal pathogen of chili peppers. A chapter by H. Schmutterer, one of the scientists who first began scientific studies of neem, is an excellent review of the effects of neem products on beneficial pests of insects and insect predators. Generally, the effects on predatory insects are negligible. Predatory insects showed low sensitivity or were not affected at all. In cases where there was sensitivity to neem products, the effects were less than those caused by synthetic pesticides.

There are also several papers that deal with other topics such as reforestation and the uses of neem lumber, plantation growing, neem pests and pathogens. Neem trees have been introduced through the tropical areas of the world, but the tree does best in dry tropical areas. Other species of *Azadirachta* can be grown in humid tropical areas. The azadirachtin content of neem seeds vary considerably even among trees in the same plantation. In addition, there is year-to-year variation in azadirachtin content. Lalljee described the use of neem cake as a soil additive to inhibit nitrification. In some tropical areas, ammonium fertilizer is rapidly converted to nitrate; the nitrate is lost from the field and enters the watershed. Neem cake inhibits this nitrification and prevents nitrogen loss, thereby increasing the efficiency of fertilizer application.

Hellpap and Leupolz discussed the prospects of using homemade neem insecticides in some developing countries. They discussed some of the factors that may limit the usefulness of neem in humid or wet tropical areas. The problems they described include the variation in azadirachtin content and the need to purchase neem seeds in areas where trees cannot grow. In some cases the cost of neem seeds will equal the cost of synthetic pesticides. Another problem is the need for training by extension specialists. Because neem pesticides are not contact poisons, farmers need training to obtain positive results. One approach to the variability of azadirachtin content is the production of this compound by callus cultures. However, a paper by Wewetzer showed a high degree of variability in the amounts of azadirachtin in tissue culture as well as in the field.

I was disappointed that there was only one paper that focused the medical uses of neem. Kak and Kavathekar described the development of a database by the Publications and Information Directorate in India. This database centralizes and catalogs the vast literature on the medicinal uses of neem. I would have liked to read about some of this research instead of just the database.

As someone who was somewhat familiar with the uses of neem but not involved in neem research, I gained a lot reading this book. However, I felt the volume needed a good overview chapter and/or a good concluding chapter to tie things together. The only introduction was a very brief preface. The book was a collection of papers. Even though many of the papers were quite good, it lacked cohesiveness. There were also a number of typographical errors throughout the book. The book will find its greatest use to neem researchers around the globe; however, scientists interested in ethnobotany and those involved in integrated pest management may want to add this to their bookshelves as well. — Estelle Levetin, Faculty of Biological Science, The University of Tulsa, 600 S. College, Tulsa, OK 74104.

Myxomycetes a Handbook of the Slime Molds. Steven L. Stephenson and Henry Stempen. 2000. Timber Press, Portland, OR. This book is not the usual offering from Timber Press. It might seem surprising that a book on the acellular slime molds, a group of organisms which is excluded from plants defined in a modern sense, comes from Timber Press, which usually concentrates its efforts on books concerned with botany and horticulture. However, for historical reasons these creatures have at times been variously classified with the fungi and the protozoa. It seems that since they have been at times classified with the fungi, and since the fungi are traditionally subjects for botanists, Timber Press has published the work.

The book opens with an introduction to the group. This is followed by a consideration of the structural features which define these organisms and which are used to differentiate among members of this group. Methods for the collection and culture of these organisms come next, followed by descriptions of their distribution and ecology.

Finally, the classification of different Myxomycetes is presented with descriptions and line drawings of various taxa.

Several points make this book useful for beginners. Foremost, the text is clearly and simply written. Details which are useful for considerations beyond botany or protozoology are noted, such as the dramatic cytoplasmic streaming to be found in these organisms which makes them very valuable for teaching students about this crucial phenomenon. Simple methods for culturing the Myxomycetes are described which could be useful for undergraduate classes or for those not intimately familiar with the myxomycete slime molds but who are doing ecological research and need to survey the Myxomycetes occurring in a particular locale. The authors present an excellent explanation of the Latin binomial, in part because this is a group of organisms without common names.

One point that should have been made earlier in the text is the meaning of the terms acellular and cellular as applied to the Myxomycete slime molds. The first chapter states: "For most of its life, a myxomycete exists as a thin, free-living mass of protoplasm." (p.14), but the authors wait another ten pages to clearly state that "The myxomycete plasmodium is an acellular, multinucleate mass of protoplasm bounded by a cell membrane [emphasis added], and for some types, enclosed by a slime sheath." (p.24)

The myxomycetes exist for much of their lives as multinucleate masses, giving them the name plasmodial slime molds, while the cellular slime molds exist much of the time as independent cells. Readers may be familiar with examples from these two groups in the popular model organisms *Dictyostelium discoideum*, a cellular slime mold, and *Physarum polycephalum*, an acellular slime mold.

An introductory student or someone not already familiar with these organisms might mistakenly believe that acellularity implies the lack of a plasma membrane and extracellular matrix. Terms like coenocytic and syncytial are more commonly used in textbooks to describe organisms such as fungi with which the introductory reader may be more familiar.

While *Myxomycetes a Handbook of the Slime Molds* is well illustrated by line drawings and reproductions of color paintings, the quality of the illustrations, particularly the paintings, could be significantly improved. In their place or in addition, more photographs, even if only in black and white, would greatly improve clarity and precision of description. Nevertheless the color paintings do serve well to illustrate the dramatic coloration of these tiny organisms.

Myxomycetes: a Handbook of the Slime Molds has a wide potential audience. With the exception of a few points above, this book would be useful for beginners, such as undergraduates using it to understand better the lives of these fascinating and wide spread creatures. It would be a valuable addition to the university library, course reading lists, the professional library of a botanist, or the library of any interested amateur. —Douglas Darnowski, Department of Biology, Washington College, Chesterton, MD 21620.

Fossil Plants and Spores: Modern Techniques, T. P. Jones and N. P. Rowe (eds.), 1999. ISBN 1-86239-041-X. 396pp. The Geological Society Publishing House, Unit 7, Brassmill Enterprise Centre, Brassmill Lane, Bath. BA1 3JN, UK. -The editors of the book have solicited 78 contributors who are specialists currently involved in their fields of research. The book is divided into ten sections with sixty chapters. The first section, *Extraction Techniques*, begins with an introductory chapter on how to locate and collect fossil plants and spores (chapter 1), followed by two chapters on how to extract lignitic and fusainized fossil plants (chapter 2), plant mesofossils and megafossils by bulk acid maceration (chapter 3). The remaining three chapters of the first sections deal with techniques on how to extract small (chapter 4) to large (chapter 5) palynomorphs and how to extract palynomorphs from peat, lignite and coals (chapter 6); The second section, *Morphology*, describes the surface preparation of plant megafossils (chapter 7), analysis of compressed plant and spore in sediments (chapter 8). The remaining chapters deal with macrophotography (chapter 9), light microscopy of fossil pollen and spores (chapter 10) and cuticles (chapter 11), and scanning electron microscopy of mega- and mesofossils (chapter 12); The third section, *Anatomy*, consists of eight chapters. This section provides different "recipes" on peeling (chapter 13), embedding (chapter 14), thin sections and wafering (chapter 15), polished blocks and reflected light microscopy (chapter 16), opaque petrification techniques (chapter 17), lignified and charcoalified fossil wood (chapter 18), fabric and biomechanical analysis (chapter 19 and 20); The fourth section, *Ultrastructure*, includes four chapters on the analysis of ultrastructures of fossil cuticles (chapter 21), plant cell walls (chapter 22), megaspores (chapter 24), and pollen and spores (chapter 25); The fifth section, *Geochemistry*, includes eight chapters. This section reviews the procedures on how to collect, store and prepare plant fossils for geochemical analysis (chapter 25), stable carbon isotopic analysis (chapter 26), applications of pyrolysis and chemolysis of fossil plants remains to paleobotany (chapter 27), solid state ¹³C nuclear magnetic resonance of fossil plants (chapter 28), DNA analysis (chapter 29), mineral and geochemical analysis (chapter 30), spore color measurement (chapter 31), and analysis of provenance and diagenesis using geochemistry as a guide (chapter 32); The sixth section, *Conservation, Databases and Protocols*, focuses on the plant fossils record database on the internet (chapter 33), taxonomic and nomenclatural alternatives (chapter 34), curation in museum collections (chapter 35); The eight chapters of the seventh section, *Sedimentology, Taphonomy, and Stratigraphy*, deal with experimental sedimentology (chapter 36), palynofacies analysis (chapter 37), particle orientation and paleoenvironments (chapter 38), coal ball sampling and quaternification (chapter 39), taphonomy (chapter 40), analysis of paleosols (chapter 41), biostratigraphy of megafossils (chapter 42) and spores and pollen (chapter 43); The six chapters of the eighth section, *Paleoclimatology*, describe different proxies of paleoclimates, including leaf characters (chapter 44), com-

pared paleobotanical data (chapter 45), fossil tree rings (chapter 46), stomatal density and index (chapter 47 and 48), and the nearest living relatives (chapter 49); The ninth section, *Paleocology*, is composed of 10 chapters. This section provides different methods in paleoecological analysis, including palynology/ecology interfaces (chapter 50), analysis of unconsolidated lake sediments in quaternary Paleocology (chapter 51), paleoecological studies in coastal-deltaic settings (chapter 52), analysis of fossil calcareous algae in soft sediments (chapter 53), archaeobotany (chapter 54), dendrochronology (chapter 55), ¹⁴C dating method (chapter 56), ¹³C/¹²C in growth rings and leaves (chapter 57), plant-anthropod interactions (chapter 58), and plants and animal diets (chapter 59); The last section, *International Laws*, provides some information on the restrictions on fossil collecting an exporting in some countries including Australia, Belgium, Canada, China, France, Netherlands, Spain, South Africa, United Kingdom, and United States of America.

The contributors to the book have brought together traditional as well as cutting edge techniques of many fields as diverse as paleobotany, geochemistry, paleoclimatology, paleoecology, sedimentology, taphonomy etc. It is a comprehensive collection of "recipes" of methods or lab procedures scattered among other research journals. Indeed, readers from the entire spectrum of paleobotany are likely to find at least a few chapters of interest in this book. This book is a must for anyone who works on paleobotany or related areas. It would be very appealing as a graduate level course textbook. It is an important resource book both for students and professionals interested in employing these techniques in their research.

It would be nice if this volume included a chapter dealing with digital imaging techniques such as film scanning, a technique to capture and store a digital image of the individual frames in a roll of film. With the development of computer technology, more and more publishers now prefer the submission of manuscripts in electronic format. Typically, paleobotanical articles always involve a lot of illustrations of the fossil materials. The reason for digitization is that it is easier to archive the image data in a non-chemical form so that it can be recreated many years from now. Also, it may be to allow digital processing of the image data or to allow modification of the original data. - Hongshan Wang, Florida Museum of Natural History, Gainesville, FL. 32611.

Penstemons . Nold, Robert. 1999. ISBN 0-88192-429-6 (cloth US\$29.95) Timber Press, 133 S.W. Second Ave., Suite 450, Portland, OR 97204. This book stands out from many other horticultural works due to the clarity of its style and the balance of its perspective. Among the usually fine works on horticulture from Timber Press, this work ranks among the better volumes. This book concentrates on the genus *Penstemon* (Scrophulariaceae), the members of which generally go by

common names that include the term penstemon.

One of Nold's principal goals in writing this book is to call for a change in the species which are used in the modern American garden, particularly those found in drier parts of the American West. He wants to change a situation which he views as: "Our gardens are little more than middle-class slums, where junipers purchased at the cheapest 'box' store are the lone sentinels of a threadbare lawn." (p.7-8) In trying to reach this goal, Nold provides careful descriptions of various Western soils so that the reader can adjust garden conditions appropriately for maximal success, along with other valuable information designed to allow the reader to understand how these plants grow in the wild. That is not to say that *Penstemons* limits itself to consideration of Western species, since the genus represents itself well in wetter areas of the United States as well.

Penstemons runs through the usual list of topics, such as an overview of the genus, consideration of the cultivation of its members, their native habitats, and descriptions of the various members of *Penstemon* and of the taxonomic groupings within the genus. Excellent appendices providing information on topics such as sources of plants and societies devoted to them, lists of penstemons with flowers of particular colors, and an extensive bibliography round out this volume.

This book is not a monograph: "A monograph would require examination, including field study, of all the type specimens and a comparison with other specimens and what the literature says about them. With some 270 species this is hardly the task for a normal lifetime." (p.64) This is not unreasonable, given that that author has the promotion of penstemons for horticultural use as a major goal, yet a useful amount of basic botanical information is included.

A well-balanced view of botanical as well as horticultural, detail pervades *Penstemons*. This lies not just in the way in which each species receives a careful description and various topics are treated, e.g. the fine points of anther morphology for *Penstemon* taxonomy. Even the name changes, which often wrack horticulturalists when imposed by taxonomists, are treated in an even-handed fashion: "Gardeners and horticulturalists tend to be suspicious of botanists (the reverse is probably true, too) when it comes to plant names. No sooner have the plant labels been printed than the name has been changed and the labels are now wrong... This is just a fact of life in horticulture, but as I see it, less of a burden than some gardeners think it is. New knowledge, if it tells us more about the plants we love, is always worth the inconvenience." p. 62

The paintings that illustrate *Penstemons* are truly lovely, done in a realistic style in which these members of the genus shine with a semi-translucent beauty. The photographs are also quite nice, though these could have been improved by an increase in contrast, and interspersed of the photographs and paintings throughout the text, closer to the descriptions of the relevant individual species, would also have made an improvement.

Penstemons makes an excellent addition to any college or university library, or for a private library of a

horticulturalist or an amateur gardener interested in these plants. Purchase of a copy is strongly recommended, as is inclusion of this work on reading lists of appropriate courses at the undergraduate and graduate levels.

- Douglas Darnowski, Department of Biology, Washington College, Chesterton, MD 21620.



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