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PLANT SCIENCE

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We had to make one significant change on the cover of the *Plant Science Bulletin* this year, the number 2000, so we thought a whole new face would be appropriate. Although the cover looks different, the format carries on the tradition of my predecessors and depends almost entirely on your input as member/contributors. You are the reason this newsletter has been so successful! As I begin my tenure as editor, I want to acknowledge two people whose help has been essential. Meredith Lane, editor from 1991 until 1994, established the current *PSB* format and instituted the Book Reviews as a regular section. Joe Leverich, my predecessor, was particularly helpful in smoothing the current transition. He's left me some pretty big shoes to fill!

In addition to regular contributions from members, sections and the society, I will be soliciting articles that I think may be of interest to the membership as a whole. With that in mind, let me provide a brief introduction.

Plant Biology at the Beginning of the New Millennium

In 1995 several interesting and useful documents were published by the Society. One, *Botany for the Next Millennium*, examined the status of the plant sciences and recommended goals and actions for the membership in order to maintain botany as a vital field of natural science. In that document the following statement was made: "In many cases, respondents described an erosion of plant biology research and teaching as some institutions have reorganized their botany departments." This, unfortunately, is not a new concern. Over the past three decades, several articles have appeared in these pages, and elsewhere, expressing the concern that the reorganization and loss of botany departments was weakening the discipline and ultimately contributing to a decrease in public understanding of the impor-

tance of plants. One of these (Eshbaugh, 1983, "Plant Biology in the Future," *PSB* 29:) presented a table of data gathered from the 1968 and 1983 printings of a *Guide to Graduate Study in Botany*. The 8th edition of this document was a second society special publication in 1995. Following is an expanded version of Eshbaugh's table including the more recent data. Of course some "apples and oranges" comparisons are made here. For instance, UC Davis now records all of the plant sciences as opposed to just one department and I'm reasonably confident that the number of Ph.D.'s shown for Illinois is a typo. Nevertheless, this table seems to present both good news and bad. The good news is that in some places plant science is holding it's own - - the bad news is that even "holding its own" is not keeping up with gains in other places. And the trend is continuing. My former department at LSU, Botany (Plant Biology), is now part of a biology department. This is also true for several other departments listed as Botany in the '95 table. What is not evident from the table is some of the best news. Our graduate programs depend on interest generated at the undergraduate level, and there are some good examples of where this interest is thriving and growing. In the following article, Frank Ewers describes the successful program he directs at Michigan State University. There are a number of components that contribute to this success, many of which can be adapted to our own institutions — from 2-yr colleges through Research I programs. Lets give it a try! —Ed.



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TABLE 1. Departments of Botany as Reported in a Guide to Graduate Study in Botany 1968,1983,1998.

	Faculty per Botany Department			Grad Students per Botany Dept			Botany Ph.D.'s in past 5 Years		
	1968	1983	1995	1968	1983	1995	1968	1983	1995
Arizona State Univ.	9	11	32	38	27	64	5	13	11
U. of Arkansas (biol)	10	9	(7)	14	19	(6)	7	5	(2)
Brigham Young Univ.	13	—d	—	34	—	—	1	—	—
U. of Calif. (Berkeley)	15	15	(21+8)	56	38	(60+15)	30	43	(19+16)
U. of Calif. (Davis)	21	30	107	53	43	102	42	46	69
U. of Calif. (Los Angeles)	14	Biol.	(14)	53	Biol.	65	56	Biol.	116
U. of Chicago	11	Biol.	(2+6)	23	Biol.	—	30	Biol.	—
Claremont Grad. School	6	—	12	8	—	10	13	—	9
Cornell Univ.	24	—	45	34	—	45	25+	—	53
Duke Univ.	16	18	25	54	51	50	36	35	33
U. of Florida	17	16	18	28	42	35	20	9	15
U. of Georgia	18	Biol.	24	33	Biol.	51	16	Biol.	36
U. of Hawaii	14	—	14	34	—	32	10	—	20
U. of Illinois	19	25	15	61	43	31	34	29	335
Indiana Univ. (biol)	14	Biol.	(18)	46	Biol.	—	29	Biol.	—
U. of Iowa (biol)	10	20	(15)	33	20	—	19	12	—
U. of Kansas	12	13	14	27	21	15	26	10	10
U. of Kentucky	6	—	—	10	—	--	3	—	--
U. of Maryland	18	18	26	57	44	52	17	27	24
U. of Massachusetts	21	18	25	43	25	45	5	20	16
Miami Univ.	11	14	19	40	24	36	(1967)	20	23
U. of Michigan	25	—	24	56	—	28	35	—	—
U. of Minnesota	14	14	23	51	29	34	12	17	53
Mississippi State Univ.	6	Biol.	--	15	Biol.	—	(1965)	Biol.	—
U. of Missouri (biol)	11	—	9	32	—	—	10	—	—
U. of Montana (biol)	10	9	8	20	22	—	1 (1964)	5	3
U. of Nebraska (biol)	10	Life Sci.	23	13	Life Sci.	—	7	Life Sci.	—
U. of New Hampshire	10	11	22	24	8	30	11	5	7
North Carolina State Univ.	14	27	18	42	46	35	12	24	13
Univ. of North Carolina (biol) 19 (6)		Biol	(13)	47	Biol.	—	12	Biol.	—
Ohio State Univ.	24	20	16	49	26	40	38	14	19
U. of Rhode Island	9	14	7	26	23	11	6	12	8
Rutgers	10	Biol.	34	43	Biol.	25	26	Biol.	20
Southern Illinois Univ.	14	16	21	33	51	43	7	16	17
U. of Tennessee	17	26	18	49	40	31	13	18	14
U. of Texas	20	27	20	70	48	68	55	37	31
Utah State Univ. (biol)	11	Biol.	10	30	Biol.	—	7	Biol.	—
U. of Utah (biol)	8	—	12	40	—	—	5	—	—
U. of Vermont	9	10	11	5	16	20	3	2	5
Washington State Univ.	12	13	12	33	25	23	15	20	19
Washington Univ.	15	—	—	38	—	—	15	—	—
U. of Washington	11	18	39	37	42	40	18	30	26
U. of Wisconsin (Mad.)	18	20	16	63(5)	53	30	27	32	—
U. of Wisconsin (Mil.) (biol)	13	—	8	30	—	—	(1976) ^e	—	—
Total	609	432	831	1625	826	1107	758	500	1042
Average	13.8	17.3	20.8	36.9	33.0	35.7	18.9	20.0	35.9

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Growing an Undergraduate Botany and Plant Pathology Program

Michigan State is a large research university with a strong graduate program in Botany and Plant Pathology, but for many years in the 1980's we had less than 10 undergraduate majors in our department. To revitalize an undergraduate program in plant biology requires effective leadership. When we hired a new Department Chair, plant pathologist Gustaaf de Zoeten, in 1990, he argued that a strong, visible undergraduate program was essential to the long-term survival of botany and plant pathology at Michigan State. He set a goal of having 100 undergraduate majors in our department. We currently have over 80 undergraduate majors and we expect to reach the goal of 100 within the next few years. We reformed our undergraduate program starting in the early 1990's, with changes in curriculum, advising policies and the insertion of extracurricular activities. In fact, we made so many changes that it is difficult to tell which ones were most important to the gradual but steady revitalization of our program.

First we surveyed our alumni, posing the question, "How well did our program prepare you for employment or graduate school?" Then, as now, about one half of our graduates went on to graduate school, but the other half sought employment directly with their bachelor degree. Students who had gone on directly to graduate school felt our program had served them well, but those who sought employment with a B.S. from our department felt ill prepared. For various reasons they found it difficult to get their "foot in the door" for suitable entry level employment. The other issue that needed addressing was that prospective majors were not aware of the wide range of opportunities that were available within the plant sciences, and they were not sure how we differed from our sister departments at Michigan State such as Horticulture, Forestry, and Crop and Soil Science. To remedy these problems, we installed a number of curriculum changes.

We began to offer tracks or "concentrations" within our major in 1991. Currently we offer a B.S. in Botany and Plant Pathology with concentrations in General Botany, Anatomy and Cell Biology, Botanical Gardens and Conservatories, Ecology, Systematics and Evolution, Pathology and Mycology, Physiology and Molecular Biology, and Plant Protection. The various tracks differ only slightly from one another, but they highlight different career tracks that a student could follow, plus they act as a "built in" advisor for students with particular career interests. We added a B.S. program in Environmental Biology/Botany, in 1997, which has been growing slowly but steadily.

We also initiated requirements for all our majors to do at least one semester of Undergraduate Research (BOT 498), followed by a Senior Seminar course (BOT 499). Almost every professor in our department has sponsored students in Undergraduate Research over the last several years. Undergraduate

Research not only gives the student hands-on experience, it also provides a link to a particular laboratory. In some cases the student is directly guided by the professor, in other cases the undergraduate will work more closely with a graduate student, a post-doc, or a technician in a research laboratory. Some projects have provided opportunities for field research at Kellogg Biological Station, along Lake Michigan sand dunes or remote sites in exotic locations such as Alaska, Puerto Rico, Costa Rica and Nepal. Financial support for undergraduate research has come from various sources including NSF-REU (Research Experience for Undergraduates) awards, competitive college level research scholarships for undergraduates, and college and university level Study Abroad scholarships. In 1998 the University built for us a new teaching greenhouse, in part, to support Undergraduate Research Projects. As a result of Undergraduate Research each student gains a better understanding of the scientific process, gains practical skills, and usually can obtain a good or excellent letter of reference. In the Senior Seminar course the student develops their own CV and web page, and they polish their skills in public speaking, computer science, and scientific writing. The course culminates with the students each giving a public seminar on their research project.

We also made a number of changes to improve the "culture" of the undergraduate experience in our department. Michigan State is an extremely large university where the undergraduate student often feels ignored or isolated. In addition to requiring Undergraduate Research, we instituted several other programs or policies to enrich the undergraduate experience, to eliminate anonymity, and to link undergraduate with the mainstream of our department.

Three professors in the department serve as academic advisors, and there is an undergraduate secretary to answer the student's questions, help them with enrolment problems, and so forth. Each semester we mail to each of our majors an individualized letter commenting on their academic progress within the program, reminding them who is their advisor, and providing other essential information. Our goal, not always met to date, is for a particular student to have the same academic advisor throughout their undergraduate career in our department, maximizing continuity from year to year. We have a bulletin board within the department with identification photos of all our undergraduate majors, notices for internships and jobs, and undergraduate club news. The photo board helps our faculty and staff to learn who are our undergraduate majors, and it also helps the students to identify each other. Tracking down our majors to take their photo can be a challenge, but it is worth it. All of our majors are also put on an email list-server so that we can send them messages such as the weekly departmental "News-O-Gram" which includes notices of jobs and internships. At Michigan State most undergraduate students work part-time and summer jobs as they go to school. We have

made special efforts to place our undergraduate majors with part-time and/or summer employment opportunities within the department and we have had virtually 100% placement of interested students. This helps in their resume development and links them more strongly to the department.

Once we had a “critical mass” of majors, in 1995, we initiated a student lead, faculty advised Undergraduate Botany and Plant Pathology Club. The students set the club agenda each year, which usually includes field trips, career development and outreach activities. The club has its own web site to help promote and organize their activities. Several members of the club also serve as “peer advisors”, to provide students with insights regarding courses at Michigan State and to supplement the official advice that students get from their academic advisor. About half of our majors participate in club activities from time to time. We found that offering free pizza and soft drinks helps improve the turnout for organizational meetings!

Each fall we have an evening roundtable panel discussion on “Graduate Schools in the Plant Sciences”, to inform students of everything they ought to know about applying for graduate schools. This year for the first time we will also have a roundtable panel discussion on “Non-Academic Careers in the Plant Sciences.” Several of our alumni have volunteered to serve as panel members, to guide and inspire the undergraduates.

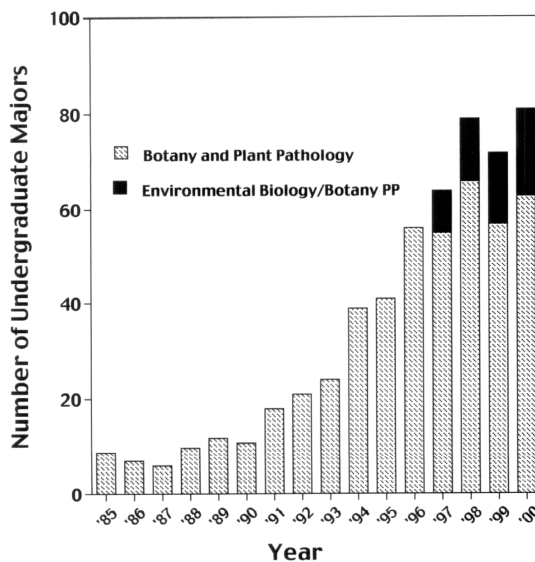
We pay special attention to our Seniors. Each year in our main hallway we have a bulletin board showing profiles of all our graduating Seniors, and the profiles are organized into a yearbook which is given to each graduate in the spring, at a departmental graduation reception. We also track student careers after graduation. Alumni success stories boost the moral of our present majors and they help with recruiting new students. Our alumni also notify us of job opportunities for graduating seniors.

Compared to departments such as Zoology and Horticulture at Michigan State, we still have a small undergraduate program. As such, we are able to provide our majors with considerable individual attention. That may be the key ingredient for growing an undergraduate program in plant biology at a large research university. Further information on our program is available from our Website: <http://pilot.msu.edu/unit/botany/>

By way of a postscript, the winds of administrative restructuring are currently blowing through our department. Of course, this is not the first time. Our first graduating class, in “Botany and Vegetable Physiology” was in 1861, back when Michigan State was called the “Michigan Agricultural College”. We have been the “Department of Botany and Plant Pathology” since 1932. A likely outcome of ongoing administrative shifts is that the plant pathologists in our department will form a separate department in our College of Agriculture and Natural Resources, while Botany, perhaps to be renamed “Plant Biology”, will remain in the College of Natural Science. Although in the last four years, only 7% of our undergraduate majors have actually

specialized in the Plant Pathology and Mycology track, a high percentage of our undergraduate majors have worked part-time and/or summer jobs in plant pathology labs within the department. Partly as a result of those experiences, 43% of the Senior Seminar research talks have been in the area of plant pathology, and many of our botany majors have gone on to graduate programs in that field. Our majors get the complete view from theoretical to applied plant science. Given this mostly happy marriage, I dearly hope that our Botany and Plant Pathology undergraduate program will remain intact, in both name and spirit, lest we loose our critical mass.

— Frank Ewers, Department of Botany and Plant Pathology, Michigan State University



The number of undergraduate majors in Botany and Plant Pathology at Michigan State University increased steadily throughout the 1990’s

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TEACHING SECTION

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Chair (2000):
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Secretary-Treasurer (2002):
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BSA Committees for 1999 - 2000

Standing Committees:

ANNUAL MEETING PROGRAM COMMITTEE

Jeffrey M. Osborn (2002) (Chair)
Program Organizer of each Section
Chair, Local Organizing Committee
Representatives of Other Societies meeting with BSA

ANNUAL MEETING COORDINATING COMMITTEE (3 members; 3 year terms) (new committee: 1999)

Wayne Elisens (2002), Chair
Peter Hoch (2002)
Barbara Schaal (2002)
Chris Haufler (2002)

ARCHIVES AND HISTORY COMMITTEE (2 members; 5 year terms)

Ronald Stuckey (2003) (Chair)

NORTHEASTERN SECTION

Chair (1996):
*Karl Anderson
Rancocas Nature Center
794 Rancocas Road
Mount Holly, NJ 08060

Darleen DeMason (2000), Immediate Past Secretary,
ex officio
Lee Kass (2004)

COMMITTEE ON COMMITTEES (6 appointed
members; 3 year terms)

Patricia Gensel (2000), President Elect, Chair, ex
officio
Cynthia Jones (2000)
Bijan Dehgan (2000)
Gar Rothwell (2001)
Richard McCourt (2001)
Linda Graham (2002)
Tom Ranker (2002)
Pamela Soltis (2000), Secretary, ex officio

CONSERVATION COMMITTEE (6 members; 3 year
terms)

William Hahn (2001) (Chair)
Larry Zettler (2000)
Kaius Helenurm (2000)
Diane Elam (2001)
Dan Watts (2002)
Pati Vit (2002)

CORRESPONDING MEMBERS COMMITTEE (Past
Presidents)

Carol C. Baskin (2002), ex officio
Nancy Dengler (2001), ex officio
Daniel Crawford (2000), ex officio

DARBAKER PRIZE COMMITTEE (3 members; 3 year
terms)

Annette Coleman (2000) (Chair)
David Garbary (2001)
Louise Lewis (2002)

EDUCATION COMMITTEE (6 members; 3 year terms)

David W. Kramer (2001) (Chair)
Douglas Soltis (2000), President, ex officio
Donald S. Galitz, (1999), Secretary of the Teaching
Section, ex officio
Pamela Soltis (2000), Secretary, ex officio
Marshall Sundberg (2004), Editor of the Plant Science
Bulletin, ex officio
Chester Wilson (2000)
J.S. Shipman (2000)
Steve Rice (2001)
David Leutz (2002)
Rob Reinsvold (2002)

ELECTION COMMITTEE (3 members; 3 year terms)

Carol C. Baskin (2000), Past President, ex officio
(Chair)
Pamela Soltis (2000), Secretary, ex officio
Darlene Southworth (2000)
John LaClaire (2000)
Gerald Gastony (2002)

ESAU AWARD COMMITTEE (3 members; 3 year terms)

Jean Gerrath (2000) (Chair)
Phil Gibson (2001)
Jeff Carmichael (2002)

EXECUTIVE COMMITTEE

Douglas Soltis (2001), President
Carol Baskin (2000), Past President
Patricia Gensel (2002), President Elect
Jeffrey Osborn (2002), Program Director
Scott Russell (2001), Council Representative
Pamela Soltis (2000), Secretary
Edward L. Schneider (2001), Treasurer

FINANCIAL ADVISORY COMMITTEE (3 members; 3
year terms)

Harry T. Horner (2001), (Chair) Representing Doug
Soltis, President, ex officio
Joseph Armstrong (2000)
Judy Jernstedt (2001)
Charles Daghlian (2001)
Edward Schneider (2001), Treasurer, ex officio
Edith Taylor (2002)

KARLING AWARD COMMITTEE (6 members; 3 year
terms)

George Yatskievych (2000) (Chair)
Cynthia Jones (2000)
Kathleen Kron (2001)
Diane Greene (2001)
Carolyn Howes Keiffer (2001)
Jeffrey Osborn (2000)

MEMBERSHIP AND APPRAISAL COMMITTEE (5
members; 5 year terms)

Leo Bruederle (2000) (Chair)
David Giannasi (2001)
Kathleen Shea (2002)
Diane Marshall (2002)
Donald Hauber (2003)
Lyn Loveless (2004)

MERIT AWARDS COMMITTEE (3 members; 3 year
terms)

John Doebley (2000) (Chair)
Douglas Soltis (2000), President, ex officio
Linda Graham (2001)
Maxine Watson (2002)

MOSELEY AWARD COMMITTEE (3 members; 3 year
terms)

Larry Hufford (2000) (Chair)
Michael Frohlich (2001)
Bill Stein (2002)

PELTON AWARD COMMITTEE (3 members; 3 year
terms)

Fred Sack (2000), Chair
Michael Christianson (2001)
Scott Russell (2002)

Edward Schneider (2001), Treasurer, ex officio
Kim Hiser, Business Manager, ex officio

PUBLICATIONS COMMITTEE (5 members; 3 year terms) (new committee: 1999)

Judy Jernstedt (2002), Chair
Pam Diggle (2002)
Darleen Demason (2002)
Jonathan Wendel (2002)
Joe Leverich (2002)
Karl Niklas (2004), Editor, AJB ex officio
Marshall Sundberg (2004), Editor, PSB ex officio
Scott Russell, Webmaster, ex officio
Kimberly Hiser, Business Manager, ex officio

WEBPAGE COMMITTEE (5 members; 3 year terms) (new committee: 1998)

Scott Russell, Webmaster & Chair
Wayne Elisens (2000)
Chuck Daghlian (2001)
J. S. Shipman (2001)
Ross Koning (2002)
Steven J. Wolf (2002)
David W. Kramer (2001), Education Committee Chair, ex officio
Marshall Sundberg (2004), Editor, PSB ex officio
Karl Niklas (2004), Editor, AJB ex officio
Pamela Soltis (2000), Secretary, ex officio
Kimberly Hiser, Business Manager, ex officio

Ad Hoc Committees:

DEVELOPMENT AD HOC COMMITTEE

Judy Jernstedt, Chair
Joe Armstrong
Dan Crawford
John Herr
Kim Hiser
Ed Schneider

ENDOWMENT PRIORITIZATION AD HOC COMMITTEE

Nancy Dengler, Chair
David Baum
Chris Haufler
Patricia Holmgren
Ruth Stockey

PUBLICATIONS OF THE SOCIETY

American Journal of Botany
Karl Niklas, Editor-in-Chief (2004)

Plant Science Bulletin
Marshall Sundberg, Editor (2004)
Editorial Committee for Volumes 45/46
P. Mick Richardson (2000)
Vicki Funk (2001)
Ann E. Antlfinger (2002)
Norman C. Ellstrand (2003)
James Mickle (2004)

Representatives to Various Organizations:

AAAS COUNCIL
Vacant

AIBS COUNCIL
Judith Verbeke (2001)

ASSOCIATION OF SYSTEMATICS COLLECTIONS
Laurence E. Skog (2003)

BIENNIAL INCORPORATION, STATE OF CONNECTICUT
Kent E. Holsinger (2000)

COUNCIL OF SCIENTIFIC SOCIETY PRESIDENTS (EACH PRESIDENT-ELECT)
Patricia Genzel (2000)

NATIONAL RESEARCH COUNCIL COMMISSION ON LIFE SCIENCES BOARD OF BASIC BIOLOGY
Pam Soltis (2000), Secretary, ex officio



News from the Committees:

Electronic *American Journal of Botany*

The electronic site of the American Journal of Botany is just one year old now. I think that it can be judged a success unequivocally. During the past year, there have been 681,310 hits to the site. The number of distinct files served has been 200,607. The number of unique hosts was 79,764. The amount of data downloaded: 16,892,223 KBytes (16.8 GB). There were 30,064 PDFs (reprints) downloaded from the site. The weekly stats are more meaningful for the number of distinct files and unique hosts (since there is no week to week memory of who logged in). Hits per week: 13,102. Distinct files served: 3,858 (a very good reason why we outsource this!) Unique hosts per week: 1,534 (this is a good estimate of the number of computers and thus users logging in). Each week approximately 324,850 KB of data were downloaded. The average number of PDF files downloaded per week is 578. We will soon be considering whether we should continue free access at the online site (currently to April 2001). Schools and academic use is high. The hits on the site are very responsive to school years.

Botany 2000!

Oregon Convention Center
6-10 August, 2000 Portland, OR

Symposia and Symposium **Organizers**

PAST-PRESIDENT'S SYMPOSIUM

„New Frontiers in Botany“ (half-day; Monday, 8-10 am). Organizer: Carol C. Baskin, School of Biological Sciences, University of Kentucky, Lexington, KY 40506-0225. Tele: (606) 257-8770, Fax: (606) 257-1717, E-mail: <ccbask0@pop.uky.edu>.

DEVELOPMENTAL AND STRUCTURAL SECTION

„Open Space“ (half-day). Organizer: Bruce Kirchoff, Department of Biology, University of North Carolina, P.O. Box 26174, Greensboro, NC 27402-1674. Tele: (336) 334-5391 (ext. 37), E-mail: <kirchoff@uncg.edu>.

HISTORICAL SECTION

„Botany in the Age of Mendel: A Symposium in Honor of the Centennial of the Rediscovery of Mendel, and the 50th Year Anniversary of the Publication of G. L. Stebbins' Variation and Evolution in Plants“ (half-day). Organizer: Vassiliki Betty Smocovitis, Department of History, 4131 Turlington Hall, University of Florida, Gainesville, FL 32611-7320. Tele: (352) 392-0271, Fax: (352) 392-6927, E-mail: <bsmocovi@history.ufl.edu>.

PTERIDOLOGY SECTION-AMERICAN FERN SOCIETY (AFS)

„Biology and Conservation of the Ophioglossaceae“ (full-day). Organizers: Cindy Johnson-Groh, Department of Biology, Gustavus-Adolphus College, 800 West College Ave., St. Peter, MN 56082-1498. Tele: (507) 933-7043, Fax: (507) 933-6285, E-mail: <cjgroh@gac.edu>, Donald R. Farrar, Department of Botany, Iowa State University, Ames, IA 50011. Tele: (515) 294-4846, Fax: (515) 294-1337, E-mail: <dfarrar@iastate.edu> & Warren D. Hauk, Department of Biology, Denison University, Granville, OH 43023. E-mail:

<Hauk@cc.denison.edu>.

SYSTEMATICS SECTION-ASPT

„Historical biogeography of the Northern Hemisphere“ (half-day). Organizers: Paul S. Manos, Department of Botany, Duke University, Box 90338, Durham, NC 27708-0338. Tele: (919) 660-7358, Fax: (919) 660-7293, E-mail: <pmanos@duke.edu> & Michael J. Donoghue, Harvard University Herbaria, 22 Divinity Ave., Cambridge, MA 02138. Tele: (617) 496-3374, Fax: (617) 495-9484, E-mail: <mdonoghue@oeb.harvard.edu>

SYSTEMATICS SECTION-ASPT-IAPT

„New frontiers in plant systematics - The next 50 years“ (half-day). Organizers: Tod Stuessy, Institut für Botanik, Universität Wien, Rennweg 14, Vienna, A-1030, Austria. Tele: 43-1-4277-54140, Fax: 43-1-4277-9541, E-mail: <tod.stuessy@univie.ac.at> & Wayne Elisens, Department of Botany & Microbiology, 770 Van Vleet Oval, University of Oklahoma, Norman, OK 73019. Tele: (405) 325-5923, Fax: (405) 325-7619, E-mail: <elisens@ou.edu>

SEVERAL BSA SECTIONS-ASPT-ABLS-AFS

„Scientific outreach for the next millennium“ (half-day). Organizer: Andrea D. Wolfe, Department of Evolution, Ecology, and Organismal Biology, The Ohio State University, 1735 Neil Ave., Columbus, OH 43210-1293. Tele: (614) 292-0267, Fax: (614) 292-2030, E-mail: <wolfe.205@osu.edu>.

TEACHING SECTION

„Using Educational Technology to Foster Learning Centered Pedagogies“ (half-day). Organizers: Donald P. Buckley, Office of Instructional Technology, School of Health Sciences, Quinnipiac College, 275 Mt. Carmel Ave., Hamden, CT 06518-1940. Tele: (203), 287-3467, Fax: (203) 281-8706, E-mail: <Don.Buckley@quinnipiac.edu> & David W. Kramer, Department of Evolution, Ecology, and Organismal Biology, Ohio State University at Mansfield, 1680 University Dr., Mansfield, OH 44906-1547. Tele: (419) 755-4344, Fax: (419) 755-4367, E-mail: <kramer.8@osu.edu>.

Expenditure of 1999-2000 interest from BSA endowment funds

The BSA ad hoc committee on 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 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 professional 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 (dnelger@botany.utoronto.ca) by February 1, 2000.

News from the Sections:

Including Discussion in the Annual Meetings Open Space at BSA August 2000

The Developmental-Structural section is beginning to experiment with a new symposium format at this year's meeting. Open Space is a format that allows the participants to determine the content and organize the sessions on the day of the event (Owen 1997). As such, Open Space allows a group to deal with the topics that are new, or which were not recognized as important prior to the start of the conference.

The impulse for Open Space came from the observation that the most valuable parts of a conference are the informal meetings that take place during coffee and meal breaks. During these times participants meet old friends, discusses

important issues, and makes plans for the coming year. Open Space is designed around the idea of a structured coffee break.

Open Space begins in a room set aside as *The Marketplace*. A facilitator gives a brief introduction of the concept of Open Space and previews the activities to follow. After the introduction, participants are asked to come forward to suggest topics for discussion or presentation. Each topic becomes one of the sessions offered during the symposium. The person who suggests a topic becomes that session's convener. The convener is responsible for the session. He may lead a discussion, present a lecture, or simply open the floor to contributions from the people in attendance.

After presenting their idea for a session, the conveners post their topics to a time/room grid, thus scheduling it for later in the symposium. Participants continue to come forward until the grid is filled, or there are no more suggestions from the floor.

The main duties of the session conveners are to start the session and to assure that a record is kept of any discussions. Taking notes can be especially important because it is a way to share the discussion with participants in other sessions. The conveners prepare the notes in a legible form and post or distribute them in *The Marketplace*. Other people can then read the notes and add their own comments. In this way, everyone receives something from every session, whether they attended it or not.

The Marketplace plays a special role in Open Space. This is the "coffee break" room. Drinks and snacks are continuously available there. The availability of food and drinks allows participants to visit *The Marketplace* whenever they wish. This is particularly important because of the Law of Two Feet. The Law of Two Feet is the only rule of Open Space. It states, "If you find yourself in a session for which you have little or no interest, then it is acceptable to leave." If a session does not "speak to you," you can leave. When you leave you can join a concurrent session, or return to *The Marketplace*. By doing this you remain an active participant in Open Space. You may have something to contribute to a concurrent session based on your experience in the one you left, or you may have a good

conversation over coffee in *The Marketplace*. In any case, you now become a kind of “convener of one” and may have something unique to share with other participants.

At the end of the event everyone meets for a final short session in *The Marketplace* to exchange ideas. This is NOT a time for the coordinators to report on their sessions. This is done by way of the notes that are distributed to participants. Rather it is a time when anyone can bring up an issue or a question, a time when the group begins to chart a path toward the next meeting.

I hope you will join us on Wednesday, August 9 when we gather in Open Space to discuss the latest Botanical Research!

Owen, Harrison 1997. *Open Space Technology: A User's Guide*. 2nd edition. Berrett-Koehler

-Bruce Kirchoff. Department of Biology, University of North Carolina, P.O. Box 26174, Greensboro, NC 27402-1674. 336-334-5391 ext. 37. kirchoff@uncg.edu



Announcements

In Memoriam:

Joseph Andorfer Ewan, 1909-1999

Joseph Andorfer Ewan, after a long and productive career as researcher, author, botany professor, and bibliophile, died peacefully, with his wife Nesta Dunn Ewan at his side, on Sunday, December 5, 1999. He was 90 years old.

Joe was Professor Emeritus at Tulane University, where he had taught botany and the history of natural history from 1947 to 1977. Throughout his life, he collected books on the history of natural history. He sold his collection of more than 5,000 volumes, many of them rare and valuable, to the Missouri Botanical Garden in 1986,

along with his professional papers. He and Nesta, who by then had become his professional assistant, moved to St. Louis to continue their research and publication. They moved back to Louisiana to be close to family in 1997, after Joe had a stroke.

Joe held many honors, including Guggenheim Fellow and Smithsonian Regents' Fellow; Founders' Medalist of the Society for the History of Natural History; Botanical Society of America Award; and the Missouri Botanical Garden's highest honor, the Henry Shaw Medal. He held honorary doctorates from the College of William and Mary and Tulane University. Joe, assisted by Nesta, authored more than 400 books, essays, articles, and reviews, which are listed in [Ewaniana: the writings of Joe and Nesta Ewan](#). A second edition of [Ewaniana](#) is planned.

Perhaps one of Joe's greatest accomplishments was that of being a mentor to those who were curious about the natural world. He would treat the most innocent inquiry as a seed to be nurtured, so that with one question, the questioner was led through many new doors of knowledge. Joe encouraged others to reach new heights, perhaps inspiring a student to get more education; or infusing a floundering career with new meaning; or providing the spark of interest that would spur his protégé on to investigate a subject until it turned into a book.

In addition to Nesta, Joe is survived by his daughters Kathleen Harris, Dorothy Nemecek, and Marjorie Ewan; five grandchildren; and countless friends. True to character and clear of mind until the very end, among Joe's last words were "Tell everybody good-bye." While we mourn his death, all of us who knew Joe Ewan can be grateful we had his presence in our lives for as long as we did.

-Connie Wolf, Missouri Botanical Garden

William Campbell Dickison, 1941-1999

William C. Dickison died after a long battle with bone marrow cancer on November 22, 1999. He was born on March 12, 1941 in Jamaica, New York and grew up in Illinois. Bill received a B. S. in Education in 1962 from Western Illinois University at Macomb, an M. A. in Botany in 1964 from Indiana University and his PhD. from Indiana in 1966. Bill studied under the direction of Prof. James E. Canright, specializing in morphology and anatomy

of flowering plants, specifically the Dilleniaceae. Upon completion of the Ph.D., Bill accepted a faculty position at Virginia Polytechnic Institute; three years later, he joined the Botany Dept at the University of North Carolina at Chapel Hill. He rose through the ranks to Professor, initially in the Botany, then in the Biology Department at UNC. Bill's research interests centered on plant anatomy, especially as it could be applied to understanding the systematics and ecology of some of the more basal lineages of flowering plants. He also maintained a strong interest in general aspects of plant morphology, paleobotany and evolution.

Bill was dedicated and conscientious in his teaching, research, and service to the department, university and botanical community. He taught such botany courses as plant morphology, plant diversity, plant anatomy, and angiosperm phylogeny, and in later years, introductory biology. Bill trained several M. A. (thesis degree at UNC) students and PhD.'s, some of whom are themselves in academics and others who work in the public sector. In all cases, he was exceptionally well organized, always prepared, and maintained high standards for students and himself. Both in teaching and research, Bill possessed the gift of grasping the essence of a topic or concept, and then conveying it effectively.

Bill was a member of the Botanical Society of America, International Association of Plant Taxonomists, International Association of Wood Anatomists, Sigma Xi, The Association for Tropical Biology, The Torrey Botanical Club, and The American Society of Plant Taxonomists. He also belonged to the Elisha Mitchell Scientific Society, serving as Secretary-Treasurer (1972-1975) and Editor of the *Journal of the Elisha Mitchell Scientific Society* (1975-1981). He helped restructure the council of the International Association of Wood Anatomists in 1972. He was an invited guest professor at the Botanische Garten und Institut für Systematic Botanik at the University of Zürich, Switzerland in 1982. He co-organized, with Richard A. White, an international symposium dealing with contemporary problems in plant anatomy in 1983, and they edited a volume of papers from this, entitled *Contemporary Problems in Plant Anatomy*, published in 1984. For the past few years, he has served as editor for the multi-volume series *Anatomy of the Dicotyledons*, 2nd edition.

Bill systematically studied the wood, flowers, leaves, and pollen of families of angiosperms such as Dilleniaceae, Connaraceae, Cunoniaceae, Theaceae, Clethraceae, Ebenaceae, etc in order to better work out their phylogeny, evolution-

ary patterns, and response to diverse environments. His 1975 paper on vegetative anatomy in the "Bases of Angiosperm Phylogeny" volume of the *Annals of the Missouri Botanical Garden* is a major contribution, showing the utility of anatomy in solving problems of angiosperm evolution. More recently, some of his students have coupled such morphological work with molecular phylogenetic analysis. His 85+ publications on the structure of woody flowering plants provide basic information about a large number of angiosperm families. Bill delved into ecological plant anatomy a bit, being among the first to point out the need for examining more than one anatomical feature of a plant in order to deduce modifications reflecting environmental conditions. He presented many invited talks at national and international meetings that dealt with angiosperm phylogeny or the systematics of specific groups of flowering plants (Leguminosae, Hamamelidae). At the time of his death, Bill had just completed a book manuscript entitled "*Integrative Plant Anatomy*" which now is in production with Harcourt/Academic Press and should be published this year.

Bill is survived by his wife of 36 years, Marlene, a son, Christopher and wife Cheryl, three grandchildren, his two brothers and one sister. Donations in his memory can be made to the North Carolina Botanical Garden, CB# 3375, University of North Carolina, Chapel Hill, N. C. 27599-3375.

- Patricia G. Gensel, University of North Carolina

Jane Gray, 1929-2000

Jane Gray was born in Omaha, Nebraska on April 19, 1929. She was the only child of Muriel Barrett Gray and Col. Earnest Gray, a West Point graduate. She spent much of her youth on Long Island while her father was in charge of the Port of New York for the Quartermaster Corps during World War II. Gray received her B.S. degree from Radcliffe College in 1951. While at Radcliffe/Harvard she studied under Elso Barghoon who interested her in palynology and paleobotany. She began her graduate studies at the University of Illinois and while there applied for and received a National Science Foundation fellowship to study palynology in Copenhagen under Johs. Iversen. Following on her work in Copenhagen Gray returned to America and entered graduate school at the University of California at Berkeley where she studied under Ralph Chaney. She received her Ph.D. from UC-Berkeley in 1958. Her dissertation

dealt with fossil pollen and spores of the Miocene in eastern Oregon. She served as an Instructor in the Department of Geology, University of Texas-Austin, for several years until marrying a fellow professor in the Biology Department, which automatically led to her dismissal owing to nepotism rules in force at that time. Unable to find a suitable post in Austin she took a research position at the Desert Research Institute, University of Arizona-Tucson where she continued her work on Tertiary pollen and spores. While at Tucson she became friends with the paleobotanist Lucy Cranwell Smith who whetted her interest in early land plants. She then moved to the Museum of Natural History, University of Oregon-Eugene. Subsequently she joined the Department of Biology at the University of Oregon where she served until her death. She taught both undergraduate students and graduate students in biology, geology, geography, and anthropology.

Gray is best known for her work on the early evolution of land plants. In a series of papers published from the 1970s to the 1990s she overturned a prevailing paradigm regarding the origin of the first land plants. Gray showed that land plants, embryophytes, first appeared in the Middle Ordovician 40 millions years earlier than had been previously accepted. Her extensive work on Ordovician marine deposits from around the world established beyond a doubt that resistant-walled spores that could not be attributed to algae, were geographically widespread, and occurred in large numbers at this time.

Further, Gray's work changed our concept of the nature of the earliest plants. Previous authorities had thought that vascular plants preceded bryophytes, but Gray mounted convincing arguments that bryophytes were first. Evidence that she cited for this conjecture included comparative studies of fossil spores and those of modern bryophytes, and ecophysiological data. Subsequently, more detailed comparative analyses and molecular phylogenetic data have substantiated Gray's views.

At the time of her death Gray was investigating the tenor of atmospheric carbon dioxide from the Cambrian to the present. Her compilation and correlation of a massive amount of botanical and geologic data will substantively revise previous estimates of the amount of atmospheric carbon dioxide. This work will be completed by her colleagues. She was also working on a groundbreaking account of the evidence for a widespread

Precambrian nonmarine biota, chiefly at the bacterial level.

Jane Gray was known for her passionate writing style, extraordinary attention to detail, and command of the literature. Her interests extended to evolutionary process, and the effects of physical geological factors and paleoclimatology on ancient floristic communities. Because her ideas were ahead of her time and iconoclastic, Jane Gray encountered considerable resistance among her scientific colleagues. But she persisted, accumulating data that could not be ignored. Because it is classic and pathbreaking, her work will continue to be cited in future books and articles on early plant evolution.

Jane Gray taught and mentored many students who found her passion for science inspiring. Her enthusiasm encouraged many to forge ahead in their respective areas. Her death on January 9, 2000 of cancer deprives the scientific community of a highly original, innovative worker who undoubtedly would have provided even more significant contributions had time permitted. She will be sorely missed by many colleagues, students, and friends.

-Arthur J. Boucot, Oregon State University

-Linda Graham, University of Wisconsin

-Patricia Sanford, University of Wisconsin

G. Ledyard Stebbins Jr., 1906-2000

Dr. G. Ledyard Stebbins Jr., Professor Emeritus of Genetics at UC Davis, died January 19th, 2000 at his home in Davis, California. He was 94.

At Ledyard's memorial service at UC Davis there were many stories about his driving and singleness of purpose when in the field. There was the story about his driving toward an interesting plant and straight into a four foot ditch, an event he barely noted, as he got out of the car and continued to walk straight on toward the plant of interest. There were several stories about how fast he walked, striding toward the summits of mountains, refusing help, even as his health declined in later years. He was an avid botanist and plant collector until he lost his sight; in looking through his things, we found his last plant collections, still in his press – oaks collected in 1994.

In looking through Ledyard's plant collections, one notes the great breadth of his interest – floras of areas near Davis and the Sierra Nevada of California, the systematics of *Navarettia*, *Antennaria* and, of course, grasses. Some of Ledyard's last articles were in the publication "Grasslands", the newsletter of the California Native Grass Association. In one issue (April, 1997), there is a useful compilation of many of the articles written by Ledyard on the Poaceae. It is a great resource for those needing exact citations for his early publications on grasses.

Ledyard asked that memorial contributions in his name be sent to the UC Davis Herbarium. The Herbarium houses thousands of Stebbins collections, including all of his vouchers from Stebbins Cold Canyon Reserve. For his 90th birthday, Ledyard had contributions sent to the UC Davis Herbarium so that we could begin administering a student grant in his name (part of our larger student grant program). These grants are to be used for field botany projects that result in specimens that will be deposited in the UC Davis Herbarium. Any monetary contributions made to the Herbarium in Ledyard's name will be used to continue the G. Ledyard Stebbins student grant program. For more information, please contact me at eadean@ucdavis.edu.

-Ellen Dean, University of California-Davis

ART KRUCKEBERG REMINISCES ABOUT

G. LEDYARD STEBBINS

From: Arthur Kruckeberg
<ark@u.washington.edu>

During my graduate days at UC Berkeley, Stebbins became a focal point of my intellectual growth. I took his course in Evolutionary Mechanisms around 1948, at the time he was writing his seminal book, "Variation and Evolution in Plants" (Columbia Univ. Press, 1950). So he was in top form, delivering exciting lectures, coupled with stage antics to boot: stumbling off the podium and making cartoon animals on the blackboard.

Stebbins was on my PhD thesis committee and was intrigued with my research on edaphic races of common plants on serpentine soils. But he fell asleep during my orals, not an uncommon event for him. Once, at a California Botanical Society meeting, he introduced the famous palaeo-

botanist, Olaf Tedin. Tedin halted briefly during his lecture, which prompted dozing Stebbins to leap up and start clapping, thinking the talk was over. One took one's life in his hands to be in a car driven by Stebbins. Once, crossing the San Francisco Bay Bridge on our way to the famous serpentine at Tiburon, he turned to talk to us in the rear, and veered into the oncoming lane. We survived without incident, except for near heart failure. Before leaving Berkeley, I became Stebbins' research assistant. At that time he was looking for drought resistance in native grasses. So I made the hybrids and tested the progeny. Again, fearsome auto trips with him at the wheel, as we sped through the fog on the way to transplant sites at Davis. His last paper merits reading by all those interested in plant evolution: "A brief summary of my ideas on evolution" *Amer. Jour. of Botany* 86(1999):1207-1208. My favorite Stebbins quote: "The only generalization or law that holds in biology is that exceptions exist to every law."

Warren H. Wagner, Jr., 1911-2000

Professor Warren H. Wagner, Jr. (known affectionately to all as Herb) died on 8 January 2000; he was in his eightieth year. He was probably the best-known botanist ever to work at the University of Michigan. After Navy service in the Pacific during World War II, Wagner did his Ph.D. at the University of California at Berkeley, spent one year at Harvard as an instructor, and came to the University of Michigan as Assistant Professor of Botany in 1951. His primary research focus was the systematics, hybridization, evolution, and evolutionary history of ferns and fernlike plants, but his interests went far beyond ferns, to include (among many other things) oaks and other difficult groups of flowering plants, butterflies, and minerals. His energy was boundless and his enthusiasm famously contagious, which made him one of the most successful teachers of both undergraduates and graduate students in the University. After retirement he continued to participate in the teaching of courses in plant systematics in both Biology and Natural Resources; indeed, he taught more in retirement than many younger colleagues ever do. He chaired or co-chaired 45 doctoral committees and served as a member of over 240 graduate committees, certainly a record in Biology if not in the University. He served a term as director of the Matthaei Botanical Garden from 1966 to 1971, but administration was never his strong suit. He had more fun stirring things up and getting people excited than smoothing over rough places and finding consensus solu-

tions to little problems that did not really matter in the „big picture,“ which was one of his favorite phrases. In the 1950s and 60s, working in collaboration with his wife, Dr. Florence S. Wagner, he published a series of elegant studies showing that ferns hybridize freely and that hybridization is a major source of new species in plants. That idea is now widely accepted, but 45 years ago it contradicted a dogma that had been imported into botany uncritically from zoology, and the Wagners' beautifully documented research helped botanists realize that the constraints of plants' habits and habitats and reproductive styles made a different species concept appropriate for them. Wagner's attempts to infer the ancestors of the Hawaiian fern genus *Diellia*, and his desire to teach undergraduates how to think about evolutionary history, led him to propose a method of deducing phylogeny that was radical at the time, and with characteristic missionary zeal he went around the country and the world exhorting botanists to abandon their traditionally sloppy approach to the inference of phylogeny and start using methods that are explicit and testable.

Wagner's success and influence were widely recognized during his life. His many honors included election to the National Academy of Sciences in 1985 and the Asa Gray Award from the American Society of Plant Taxonomists in 1990, and he served as president of seven professional societies [including the Botanical Society of America, 1977]. He was in wide demand as a speaker to groups of professional botanists and amateurs, and after the talk he was likely to sit down at a piano and entertain the astonished guests with lively honky-tonk playing. He is survived by his wife, Florence, their children Margaret and Warren, both of Ann Arbor, and two grandsons.

-William R. Anderson, University of Michigan

Personalia

Dr Keith Ferguson

Dr Keith Ferguson recently retired as Deputy Keeper of the Herbarium, Royal Botanic Gardens, Kew was appointed an Officer of the British Empire - OBE in the Queen's Birthday Honours in 1999 for services to Palynology, Botany and the Royal Botanic Gardens Kew. The Investiture carried out by Queen Elizabeth at Buckingham Palace took place in late October 1999.

A CAREER THAT BLOSSOMED

Dr. Shirley Tucker wins the University of Minnesota's Outstanding Achievement Award.



When Shirley Tucker left the University of California-Davis in 1956 armed with a Ph.D. in botany, she ran headlong into the barriers then facing women in science. For 10 years, she was able to find only temporary teaching positions with “no potential to gain university status or research funding,” says University of Minnesota plant biology associate professor Iris Charvat. That, Charvat believes, is the root of Tucker's commitment to encouraging students in botany. „She frequently goes out of her way to give a junior scientist or student a rewarding experience,“ says Charvat, „and she maintains a high level of interest throughout their career.“

Tucker's interest in nurturing the next generation of plant biologists--along with her internationally known research in floral anatomy and morphology, plant taxonomy, and lichenology--led the University of Minnesota to recognize her with an Outstanding Achievement Award in September. The award is the highest the University grants to its alumni.

Tucker's exceptional career stemmed from a very early interest in botany: Her father was a plant pathologist at the University, where she would often play in the greenhouses. „My idea of paradise was to be in the warm greenhouse in the middle of winter,“ she recalls. Naturally, Tucker pursued botany degrees at the University, studying with renowned botanist Ernst Abbe, who became

an early influence and mentor. As she completed her master's program, Abbe and others counseled her that the University of California-Davis „was the best place in the country at that time to study plant anatomy . . . so off I went,“ she says.

From 1956 to 1966, Tucker worked in non-tenure research and teaching positions--but it was these early career challenges that led her to excel in more than one research area. As Charvat points out, „lichens differ greatly from higher plants, and it is most unusual for a scientist to attain distinction in both areas.“ As Tucker herself remembers it, she sometimes didn't have access to certain equipment needed to do plant pathology- and botany-related work, so she took to outside work in lichenology. „This was a good alternative when I didn't have access to labs,“ she says. Lack of lab access didn't keep her from pursuing external funding. She received her first National Science Foundation grant in 1957 and has had nearly continuous NSF funding since then, a strong endorsement of her research capabilities. „Shirley is a highly regarded botanist in the U.S. and internationally because of the quality and consistency of her work,“ attests noted plant anatomist Ray Evert, who worked with Tucker in the Botanical Society of America.

In 1968, Tucker finally found a tenure-track, assistant professorship at Louisiana State University. By 1982, she had achieved the highest possible rank at LSU: the Boyd Professorship, awarded on the basis of national and international distinction. Louisiana's environs were especially suitable for Tucker's research projects and field trips, she says, and adds with a laugh, „It's wild there. Poisonous snakes, quicksand. But, happily, I can report we never lost a student.“

Tucker, who retired from LSU in 1995, lives in California with her entomologist husband and is an adjunct professor at UC-Santa Barbara. Her long list of accomplishments includes serving as president of the Botanical Society of America and the American Society of Plant Taxonomists. Ever dedicated to her alma mater, she chaired the 90th anniversary celebration of CBS' Lake Itasca Forestry and Biological Station this fall[1999].

-By Angelo Gentile. Photo of Shirley Tucker with her Outstanding Achievement Award at a symposium in her honor by Tom Foley - reprinted with permission of: *Frontiers* fall 1999.

Symposia, Conferences, Meetings

NSF CHAUTAUQUA SHORT-COURSE THERAPEUTIC PLANTS: BIOLOGICAL, CHEMICAL, CULTURAL, AND LEGAL ASPECTS

July 30-Aug. 3, 2000, Taos, New Mexico

The burgeoning use by the public of herbal medicines and "nutraceuticals" demands greater attention from academic programs that relate to medical training. This course is intended for professors in biology, medicine, environmental studies, and anthropology who want introduce their students to a wide range of issues impinging on the use of effective medicinal plants, i.e., not only chemistry and biological activity, but also the impact that increasing exploitation of these plants has on the environment, the cultural context of utilization, and governmental interest in regulating trade. Lectures will focus on summarizing each aspect, as well as integrating them into an interdisciplinary whole. Emphasis will be on applying these general concepts to selected therapeutic plants of the Southwest. Integration of the concepts will be promoted by the field trips, lab exercises, and discussions. This course will be conducted at SMU-IN-TAOS AT FORT BURGWIN, (Southern Methodist University's Fort Burgwin field campus in the Sangre de Cristo Mountains near Taos, NM). Participants will be housed on-campus and will be responsible for costs associated with travel, lodging, food, and incidentals. Instructor: Roger W. Sanders, Research Associate, Botanical Research Institute of Texas, Fort Worth, 817-332-4441. Web sites: <http://www.engrng.pitt.edu/~chautauq> and <http://www.smu.edu/~smutaos>

Eleventh Wildland Shrub Symposium Shrubland Ecosystem Genetics and Biodiversity

13 - 15 June 2000

The Shrub Research Consortium and Brigham Young University Conferences and Workshops are sponsoring the Eleventh Wildland Shrub Symposium, June 13-15, 2000 at Brigham Young University, Provo, Utah. The general theme is Shrubland Ecosystem Genetics and Biodiversity. A mid-symposium field trip to southeastern Utah will feature the systematics, genetics, and diversity of native shrublands, especially chenopod shrublands. The symposium will also celebrate two other anniversaries: the 25th anniversa-

ry of the establishment of the USDA Forest Service Shrub Sciences Laboratory and the 100th anniversary of the rediscovery of Mendelian genetics. As part of the Shrub Sciences Laboratory 25th anniversary celebration, A. Perry Plummer, USDA Forest Service Research, and Howard C. Stutz, Brigham Young University, will be honored for their instrumental roles in the establishment of the laboratory.

Contributed oral and poster presentations are invited on shrubland ecosystem genetics and biodiversity as well as other aspects of shrubland biology and management. The proceedings will be published by the USDA Forest Service, Rocky Mountain Research Station. If you would like to present a paper, send a title and abstract (< 200 words) to Dr. E. D. McArthur, Shrub Sciences Laboratory, Rocky Mountain Research Station, 735 North 500 East, Provo, UT 84606-1856 by March 31, 2000. telephone (801) 377-5717, email dm-carthur/rmrs_provo@fs.fed.us.

Please send an electronic version on a 3.5" diskette following the format on the web site (<http://coned.byu.edu/cw/shrub>) or submit the abstract directly through the web site. To receive pre-registration materials and additional information please contact Julie Jimenez, Conferences and Workshops, Brigham Young University, 147 Harman Building, PO Box 21516, Provo, UT 84602-1516; (801) 378-6757.

“Legumes Downunder“

The Fourth International Legume

Conference

2-6 July 2001

The Fourth International Legume Conference will be held July 2-6, 2001 on the campus of Australian National University in Canberra, Australia. The scientific program includes symposia on systematics, utilization, infraspecific genetics, land rehabilitation, symbiosis, phytochemistry and electronic resources. Field trips throughout Australia are being planned in conjunction with the meeting.

Co-organizers are Mike Crisp, Australian National University, Jim Grimes, RBG Melbourne, Joe Miller, Centre for Plant Biodiversity Research, Canberra, and David Morrison, University of Technology, Sydney.

For further details and to express interest in attending the conference please check the website at <http://www.science.uts.edu.au/sasb/legumes.html>

Announcements

USDA-ARS

The USDA-ARS Subtropical Horticulture Research Station is beginning a new effort to expand its National Germplasm collections of tropical ornamental species, returning to a tradition begun by David Fairchild in the early years of the station's history. We would thus like to solicit contributions from researchers and graduate students in the botanical community who may have accumulated living collections of potentially ornamental species during the course of their research and either wish to dispose of these collections at the termination of a project or merely wish to deposit living vouchers of these collections in a climate where such germplasm can be maintained and, in the case of woody species, achieve reproductive size. The SHRS encompasses 230 acres of diverse soil type, hydrology and microclimate. USDA respects and obeys all international rules and regulations regarding biodiversity, and hopes that this new program can contribute to tropical conservation goals as well. Material will be accessioned into the GRIN database and will be available to bonafide researchers unless requested otherwise by the contributor. Particular curatorial interests include Acanthaceae and Rubiaceae, but all plant families are of interest. Please contact Alan W. Meerow, Research Geneticist and Systematist at (305) 254-3635, email: miaam@ars-grin.gov. Visit our web site at: <http://www.ars-grin.gov/ars/SoAtlantic/Miami/homeshrs.html>.



PRIVATE GARDEN FOUNDATION FUNDS MAJOR PLANT PROJECT

The Chanticleer Foundation of Pennsylvania has awarded major funding to the *Flora of North America* project to continue the production of the *Flora* volumes. The foundation has committed \$432,000 for 2000, with the expectation of funding at that level for six years, for a total of nearly \$3 million.

Flora of North America (FNA) is large-scale, collaborative project involving many botanical institutions. Started in the early 1980s, it is undertaken by more than 800 North American botanists to provide authoritative, up-to-date information on the names, relationships, characteristics, and distributions of the approximately 20,700 species of plants that grow naturally in North America north of Mexico. It is a compilation of the best knowledge available on the patterns of biodiversity among plants in the continental US and Canada.

The 2000 grant will be administered by Nancy R. Morin, executive director of The Arboretum at Flagstaff. She is former convening editor of the *Flora* and now is the Southwest Regional Coordinator for the project. Three volumes have been published and a fourth is in press, out of a total of 30 volumes to be published by Oxford University Press-U.S. Authors, reviewers, and editors contribute their time to FNA while working at their home institutions. In the past, the FNA project has received grants to fund support staff located initially at Missouri Botanical Garden in St. Louis and now also at several other editorial centers. That funding had come to an end in 1999 and, although editorial centers donated additional staff time to keep the project going, the future of the project was uncertain. Support from the Chanticleer Foundation will make it possible to hire sufficient staff at a number of editorial centers to continue the project and increase production significantly.

The Chanticleer Foundation was established by Adolph Rosengarten, Jr. to provide the framework to develop and maintain his 31-acre estate as a pleasure garden open to the public. Located in Wayne, Pennsylvania, on the Main Line outside Philadelphia, Chanticleer has become a garden of remarkable beauty under the leadership of Christopher Woods, its director. It was opened to the public in 1993 and has been featured in many books, magazines, and television programs on gardens and gardening.

In addition to supporting the Chanticleer garden, the Chanticleer Foundation Board supports important local and regional horticultural activities and wished to support a horticultural and

educational project of national and international significance. They selected *Flora of North America* to fulfill this goal. Many of the plants treated in this work are important horticulturally, others are relatives of cultivated plants, have potential for ornamental horticulture, or contain genetic material that may be important in developing new horticultural varieties. *Flora of North America* treats all plants of conservation concern and all invasive plants.

More information on *Flora of North America* can be found on the Internet at [more information on Chanticleer can be found at](#)



Images of Vascular Plant Type Specimens at The New York Botanical Garden are now live!

Approximately 2400 high-resolution images of herbarium specimens from the families Annonaceae, Ericaceae, Lecythidaceae, and New World Rutaceae can be found by searching our catalog or by viewing the lists of taxa at <http://www.nybg.org/bsci/hcol/vasc/>. Eventually, all of NYBG's 75,000 vascular plant type specimens will be imaged and viewable through our on-line catalog. Images of Cyperaceae, Elaphoglossum, and Scrophulariaceae types will be added to our catalog in the near future. A full description of the project, including a manual (in PDF) for imaging plant specimens can be found at: http://www.nybg.org/baci/herbarium_imaging/. The New York Botanical Garden acknowledges the Xerox Foundation for funding and students of the Biomedical Photographic Communications Department of the Rochester Institute of Technology for technical assistance. Please direct any questions or comments about NYBT's imaging project to Gord Lemon (glemon@nybg.org).

Positions Available

Collections Manager

The Louisiana State University Herbarium, Department of Biological Sciences, invites applications for the position of collections manager. Minimum qualifications include a Masters degree or equivalent in plant systematics or related field and 2-4 years related experience, or a Ph.D. specializing in plant systematics. Research and publication history sufficient to qualify for Graduate Faculty affiliate status is desired. Herbarium experience and familiarity with our regional flora and knowledge of computers and database management preferred. Responsibilities include herbarium collections management; the supervision and training of students and others workers in herbarium activities, development and management of digital herbarium data bases; assisting the scientific community, general public, and governmental agencies in plant identification and the provision of pertinent technical information; and participation in funding raising and grant proposal preparation. The position provides opportunities for research related to plant systematics or herbarium management and participation in the academic development and research of graduate students. Salary commensurate with qualifications and experience. Start date is approximately June 1, 2000; application deadline March 31, 2000, or until an applicant is selected. Send letter of application, resume, and names of at least three references to L. Urbatsch, Department of Biological Sciences, 508 Life Sciences Building, Ref. log # 000183, Louisiana State University, Baton Rouge, LA 70803, Phone (225) 388-8555, FAX (225) 388-2597, email: leu@lsu.edu.

K-8 Teacher Training

Lucille Slinger (School of Education/University of Wisconsin - La Crosse) and D. Timothy Gerber (BSA member, Biology Dept./UW-L) were awarded a 3 year, \$120,000 Eisenhower grant to develop a K-8 teacher training program in association with the School District of Onalaska, WI. "Lead" teachers who participate in the program will (1) be exposed to plant-based resources and materials, (2) develop instructional plans for plant-based classroom activities which meet state and national science standards, and (3) write mini-grant proposals to

local funding agencies to support classroom activities. Each participant will disseminate this information to other teachers within the school district and through a webpage which will be constructed as the program progresses. The intended purpose of the program is to emphasize the importance of plants and plant biology in K-8 science curriculum.

-D. Timothy Gerber, Biology Dept., University of Wisconsin - La Crosse, 1725 State St. La Crosse, WI 54601. 608.785.6977 (office) 608.785.6959 (fax)



Graduate (M.S.) Assistantship - Plant Anatomy/ Development - Emporia State University

Funding is available for a master's - level graduate research assistantship in the field of plant anatomy and development. Support could begin as early as summer, 2000. Research will focus on various aspects of the developmental anatomy of the Kansas noxious weed, *Lespedeza cuneata*, *serezia lespedeza*, and be part of a broader, multiple year, research program to understand the basic biology of the plant.

Emporia State University is a comprehensive university in the Kansas Regents System. It is located in Emporia, Kansas, on the eastern flank of the Flint Hills, half an hour from the National Tallgrass Prairie Preserve and several large federal reservoirs. Additional information about the university and the department may be found at the following sites: <<http://www.emporia.edu/>> and <<http://www.emporia.edu/biosci/biology.htm>>.

Interested students should apply for admission to the University through the Department of Biological Sciences. All necessary forms can be downloaded from the Biology Division web site under Degree Requirements. For additional information contact: Marshall Sundberg, Division of Biological Sciences, Emporia State University, Emporia, KS 66801. Ph: 316-341-5605, FAX 316-341-5607, E-mail sundberm@emporia.edu.

Book Reviews

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The Emergence of Agriculture. Bruce D. Smith. 1998. ISBN 0-7167-6030-4. (paper US \$19.95). 231 pp. Scientific American Library, W.H. Freeman & Co., 41 Madison Ave., New York, NY 10010—The 1997 American Archaeology Book Award for the hardback edition of *The Emergence of Agriculture* (1995), justly honors Bruce Smith's efforts to tell the story of our early agricultural beginnings. Reviewers across a spectrum of disciplines also have given laudatory praise to the accomplishments of this book. Now the paperback edition is out, with significant changes and updates, all at an enticingly low price—a bargain for such a colorfully illustrated book with an engaging scientific tale. In piecing together the puzzle of when, where, why, and how human societies moved from hunting/gathering to agriculture, Smith weaves an elaborate tapestry of evidence into a readable story that depicts the common threads linking the independent foundations of agriculture on five continents. *The Emergence of Agriculture* shows how necessary it is to integrate the complementary perspectives and scattered findings of archaeology and biology, if we are to successfully decipher our pre-historical agricultural beginnings. As Smith notes in the Preface, the topic is typically treated in isolated pieces whether from the narrow perspective of one scientific discipline or from a limited handling restricted to either plants or animals and to one region rather than a global view. In trying to remedy this situation with his book, Smith does an admirable job of attaining his goal to present „a comprehensive consideration of the origins of agriculture“.

Kudos aside, there are other reasons to pay attention to this book. From the perspective of the plant sciences, it has promising potential as a classroom text, either alone or as a companion to Jack Harlan's *Crops and Man* (American Society of Agronomy, 1992). And here I reveal my bias in selecting *The Emergence of Agriculture* for review. From my own educational soapbox, I hold it out as both a book and a subject to which plant science educators should pay attention. There are two reasons for this - (1) agriculture is not divorced from evolution and (2) biotechnology is rapidly changing the picture of domesticated species. Students of agriculture should be taught the pre-historical beginnings of their subject. Students of evolution, particularly those who have never considered domesticated plants beyond the grocery shelf and home garden, should be challenged with the evolutionary model that domestication presents. Also, if we fail to give more attention in the classroom to the roots of agriculture, we risk being ill prepared for the evolutionary surprises, and fear-driven societal resistance, that lie ahead with genetically manipulated organisms. Bruce Smith has provided an ideal educational tool for these tasks. He has produced a carefully crafted book for the layman and scientist alike. -Laura A. Morrison, Department of Crop & Soil Science, Oregon State University, Corvallis, OR 97331-3002.

Fundamentals of Weed Science, 2nd edition, Robert L. Zimdahl, 1999. ISBN: 0-12-781062-5. (hardcover US \$59.95). 556 pp. Academic Press, 525 B Street, San Diego, CA 92101. This text is currently used for undergraduate/graduate courses in weed science. It gives a broad view of weed management - what weeds are, what ecological and physiological factors must be considered in weed control, which control methods are appropriate for a given weed problem, how herbicides operate. In this respect, Robert Zimdahl deserves credit for the comprehensive scope of his book. However, from the view of a botanist, he does not offer a careful presentation of weed biology. Zimdahl handles weeds as if these unwelcome plants are biological entities that are separate and apart from their brethren in the plant kingdom. Whatever definition one chooses, the concept of a weed embodies a human bias directed against a given plant species. In the *Fundamentals of Weed Science*, this perspective is pervasive. Treatment of fundamental components of plant science—taxonomy, reproductive biology, ecology, and plant competition—is structured on this artificial concept of weeds. It would be more accurate to discuss the biology of plants that evolve in the ever-changing ecology of human disturbances. Other weaknesses mar the text. In Chapter 20. *Weed Science: The Future*, Zimdahl refers to the genetic phenomena of epistasis and pleiotropy in a speculative discussion of the risks of genetic engineering. His definition of epistasis, the suppression of gene expression by one or more other genes (p. 509), is either a bad choice of wording or an error in his understanding of epistasis—more accurately defined as one gene mask[ing] the effects of another (Verne Grant: *Genetics of Flowering Plants*, 1975). A similarly inexact handling of the terminology and principles of biology is common throughout the text. Another problem is the small number of citations to recent research in weed science and relevant disciplines. In a discussion of documented crop/weed hybridization and gene flow events, Zimdahl cites two newspaper articles rather than the current (and growing) scientific literature on herbicide-resistant plants. A great deal of information is covered in this text, but it is not very well organized and often shows a superficial handling of complex subjects. -Laura A. Morrison, Department of Crop & Soil Science, Oregon State University, Corvallis, OR 97331-3002.



C4 Plant Biology Rowan F. Sage and Russell K. Monson, editors. 1999. ISBN 0-12-614440-0 (cloth US \$84.95) 596 pp Academic Press 525 Street, Suite 1900, San Diego, California 92101-4495 USA. -Of the approximately quarter million described flowering plant species, roughly 90% rely upon C3 photosynthesis for carbon gain. Another 7% fix carbon, to one degree or another, by way of Crassulacean acid metabolism (CAM), a physiology often associated with succulent plants from arid habitats. C4 photosynthesis, a physiology best known in tropical grasses, is only found in 2,000 to 8,000 plant species. Given that this photosynthetic pathway accounts for, at best, a trifling 3% of flowering plant species, one might well ask if there is sufficient interest in C4 plant biology to warrant an entire volume on the topic. But after reading this new book on the subject edited by Rowan F. Sage and Russell K. Monson, I was left wondering why it hadn't been written sooner! The details and consequences of C4 photosynthesis touch upon every imaginable facet of plant biology; from the fine tuning of photosynthetic gene expression to the origins and expansion of agriculture, from the intricacies of leaf structure to the uncertainties of ecosystem responses to changing climates, from deciphering the evolutionary history of flowering plants to describing existing patterns in plant biogeography. Moreover, the discussion of any one photosynthetic pathway only has meaning in a comparative context. Thus, in a broad sense this book is really about all of plant biology. The breadth and the depth of this subject is impressively rendered in Sage and Monson's book, *C4 Plant Biology*.

In multi-authored volumes on a single topic it is not unusual to find that the coverage runs thick on some subjects and thin on others, a bit like a patchwork quilt. This is not the case with this book. The editors have done an outstanding job of identifying the topics to be covered, selecting the invited contributors, and arranging the material in a thoughtful and inviting sequence. Although writing styles varied from chapter to chapter the writing standards were consistently high. When there was subject overlap the information was complementary rather than repetitive. For example, the "multiple flavors" of C4, characterized by the bundle sheath decarboxylation step in different C4 species (NADP-ME, NAD-ME, PEP-CK), is discussed from several contrasting vantage points over the course of the book. Early on we are given the details of how these different subgroups vary in terms of biochemistry and regulation. In another chapter, the history is recounted of how these distinctions were first experimentally unveiled nearly 30 years ago. Later we are told how these differences in biochemistry translate into differences in leaf development and structure. In subsequent chapters we find out how these different C4 subgroups perform in ecological and agricultural systems. Finally, we are cautioned that considerable phylogenetic and physiological variation exists within, as well as, between each of the C4 subgroups. Rather than being redundant, the varied coverage on this one topic left me with a new, enriched appreciation of what is often presented as a subtle, if not trivial, distinction. This example is typical of the book as a whole and I found there

to be little unnecessary repetition of subjects. I was also left with few unanswered questions on the subject of C4 plant biology that had not been posed by the authors themselves. This multi-authored volume is better compared to a rich and well-planned tapestry than to a patchwork quilt.

With all this discussion of the superb execution of *C4 Plant Biology*, it is worth outlining the actual structure of the book. It is divided up into five multiple chapter sections. Part I called "**Perspectives**" contains a chapter by Sage that incorporates ecophysiological, paleoecological, and evolutionary perspectives to help explain why the CO2 concentrating mechanism of C4 photosynthesis might exist at all. This chapter simultaneously provides a useful and informative overview for the rest of the book. Part I also includes a chapter by one of the grand old gentlemen in plant biochemistry, Marshall Hatch. Hatch, one of the first to identify and elucidate C4 photosynthesis, gives his personal historical perspective to how the initial discovery was made and to subsequent findings on the mechanisms of this photosynthetic pathway. This chapter also highlights some questions that remain unanswered including the poor quantification of bundle-sheath leakiness, an issue that resurfaces many times in the book. Part II, entitled "**Structure-Function of the C4 Syndrome**", reviews the biochemistry and regulation of C4 photosynthesis, describes the developmental anatomy of leaves in C4 plants, and summarizes a model of C4 photosynthesis linking cellular biochemistry to leaf gas exchange. Part III, entitled "**Ecology of C4 Photosynthesis**", outlines aspects of the ecophysiology, community ecology, and the biogeography of C4 plants. Alan Knapp and Ernesto Medina contributed a chapter which compares the ecology of C4 grasses in neotropical savannas to that of the grasslands of North America. I was afraid this comparison, and the chapter itself, would be contrived and of little value. To the contrary, this comparison was quite informative and I found myself wishing that other C4 dominated ecosystems had been considered in the same way. Part IV, entitled "**The Evolution of C4 Photosynthesis**", includes chapters that consider comparative biochemistry and ecophysiology of known C3-C4 intermediate species, review the current understanding of the phylogenies of C4 species, and examine the paleontological records on C4 plants, climate, and ecosystems. Part V, entitled "**C4 Plants and Humanity**", contains a chapter by Harold Brown which reviews the agronomic implications of C4 photosynthesis. Information contained in this chapter may be useful to those of us who find ourselves sometimes explaining photosynthesis to students with no interest in the subject. Perhaps by pointing out some of the "real world" statistics presented in Brown's chapter (e.g., 14 of 18 of the most economically important weeds in the world are C4 plants), the details of photorespiration and carbon concentrating mechanisms will begin to have more relevance to some of our more recalcitrant students. Part V also has a chapter on the position of C4 species in agricultural origins and the development of human societies. This final section ends with a chapter on the taxonomic distribution of C4 photosynthesis. This chapter by Sage, Li and Monson is an important contribution. It includes several tables listing

known C4 taxa down to the level of genus. This will be valuable for ecologists, taxonomists, and others seeking information on photosynthetic pathway identification. Although such lists have existed before they have not been as readily accessible. This text will be easily retrieved at most libraries with a simple search under "C4 plants", or better yet, it will be as near as your bookshelf!

Despite my encouragement that this volume be read in its entirety I know that more often it will be used as reference and consulted for information on specific topics. This leads me to my only substantial criticism of this book. The index is inadequate. Many keywords were not even listed in the index. One obvious example is CAM. Neither "CAM" or "Crassulacean acid metabolism" appear in the index even though it is discussed at least 18 different times in the book. There are also keywords in the index for which all the entries are not included. "Photorespiration" is listed in the index as having only one entry (in chapter 1) even though it is also an important part of chapters 6 and 7 and is discussed explicitly at least five other times in the book. Unfortunately this will hinder the use of this book as a quick reference on many relevant subjects.

Despite this one deficiency, *C4 Plant Biology* will be of great value to people with interests in photosynthesis and plant ecophysiology. Sage and Monson's book also has much to offer to a broader audience, including anthropologists, paleontologists, and plant biologists of every kind. An A+ for C4! -John Skillman, Department of Biology, California State University, 5500 University Parkway, San Bernardino, CA. 92407-2397.

Plant Responses to Environmental Stresses : From Phytohormones to Genome Reorganization. H. R. Lerner (Editor); 1999; Marcel Dekker Inc; ISBN: 0824700449 (\$195) -Plants have a remarkable ability to cope with a wide variety of challenges from their environment. A list of these stresses includes temperature extremes, flooding (or water deficits), pathogens, nutrient deficiency, oxygen deficiency, and excess salinity. Some of these challenges are transient while others may become more or less permanent throughout the life of the plant. As the title implies, this work discusses environmental stresses from the perspective of many levels of organization. The topics discussed are very relevant to agriculture and biotechnology.

Plant Responses to Environmental Stresses provides a comprehensive review of stress physiology for an advanced audience. The book is divided into two parts of fifteen chapters each, and the chapters are written by a group of international experts in their respective fields. Although the first part is supposed to provide the reader with general concepts while the second part contains information on specific stresses, the organizational difference really is more fluid. Each chapter has a considerable list of references, and

in most cases (although not all), these references are current to 1997.

The first two chapters, while providing general background to stress physiology, also had extensive consideration of issues related to the philosophy of how to conduct scientific research. Chapter 2 entitled "The importance of individuality" had a fascinating discussion on the merits of a reductionist approach versus a more holistic approach to science.

As is typical in such large work with multi-authored chapters, the quality of the treatment is uneven. Some of the chapters are well written with nice figures and excellent summary tables while others have dense prose and lack the latest references. In general, I would have liked to have seen more illustrations and summary diagrams to make for a more user-friendly book for those outside the immediate field. However, most of these review-type articles are very useful and timely.

This book is for advanced graduate students and researchers in the field of stress physiology. I also recommend it for acquisition by university libraries since it will provide a good resource for students and faculty in the plant sciences. -John Z. Kiss, Department of Botany, Miami University, Oxford, OH.

American Bamboos. Emmet J. Judziewicz, Lynn G. Clark, Ximena Londoño, Margaret J. Stern. 1999. ISBN 1-56098-569-0 (cloth US \$45.00). 392 pp. Smithsonian Institution Press, 470 L'Enfant Plaza, Suite 7100, Washington, D.C. 20560 -Emmet J. Judziewicz et al. have delivered a volume that is as useful as it is beautiful. *American Bamboos* has the benefit of having been prepared by individuals on the forefront of bamboo and grass systematics. It therefore has the strength of their expertise and years of experience in its presentation of the bamboos of the Americas.

Even amongst botanists, the grasses and their allies are frequently viewed as enigmatic. Their flowers are small, and to the untrained eye indecipherable. Many of us never progress beyond the adage, "Sedges have edges, rushes are round, and grasses are hollow like holes in the ground". The authors introduce to their anatomy with clear simple language and many illustrations. This is not surprising considering that one of the authors, Lynn G. Clark, was the editor for the recently republished, *Agnes Chase's First Book of the Grasses*.

The authors then provide us with a key to the tribes of the American bamboos and basal grasses. This key is followed by sections devoted to the woody and herbaceous bamboos and the basal grasses. The sections of woody and herbaceous bamboos each has a key to the genera within the tribe. Each genera is introduced with a concise description of the genera and what is known about it. The descriptions

include distribution maps, photos, illustrations, a listing of all known species, and a synopsis of what is known about their ecological role and human usage. Clearly both the keys and the descriptions will be a boon to researchers in the Americas.

This volume is the first to provide an alternative to F. A. McClure's 1973 publication, *Genera of Bamboos Native to the New World*. McClure's volume will be well known to bamboo systematists and enthusiasts, but is likely to be unknown to anyone else. It is out of print, and is passed from hand to hand by those with need of it. Needless to say, since its 1973 publication date DNA and phylogenetic systematics have continued to expand our understanding of grass and bamboo systematics. Judziewicz et al. have effectively placed this information within the reach of all, as *American Bamboos* has the affordable price of \$45.00.

American Bamboos is not only a terrific scientific reference and basic introduction to grass anatomy, it is a beautiful book. The pages are peppered with photographs and illustrations that any botanical enthusiast will be pleased with. My only criticism is that the text, though clear and concise, is far from lyrical. I recommend this book to beginning botanists wanting to learn grasses and bamboos as well as researchers in the American tropics. I would also highly recommend this volume to grass and bamboo systematists, but they are likely to have already purchased a copy. -Annemarie Jameson, University of Miami, Department of Biology, P.O. Box 249118, Coral Gables, FL 33124-0421

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Clark, Lynn G. and Richard W. Pohl (Eds.) 1996. *Agnes Chase's First Book of the Grasses: The Structure of Grasses Explained for Beginners*. Smithsonian Institution Press. ISBN: 1-56098-656-5

McClure, F.A. 1973. *Genera of Bamboos Native to the New World (Gramineae: Bambusoideae)* Thomas R. Soderstrom (Ed) Smithsonian Contributions to Botany Number 9.

Flora of the Northeast. A Manual of the Vascular Flora of New England and Adjacent New York. Magee, Dennis W. and Harry E. Ahles . 1999. University of Massachusetts Press, Amherst, MA 01004. Hardcover, xxxi + 1214 pp., ISBN 1-55849-189-9. \$69.95. -One suspects there are more floras covering all or part of New England than any other similar-sized piece of North America. Now there is another, but different in so many ways from its predecessors.

The first author is vice-president of Normandeau Associates, Inc., an environmental consulting firm at 25 Nashua Road, Bedford, New Hampshire 03110. Flora writing has now migrated from the museum and academic world into the business world. That's not a bad thing: I suspect both worlds will be the better for it.

The second author, Harry E. Ahles, passed away in early 1981. *Manual of the Vascular Flora of the Carolinas* (1965), which he co-authored, is well known in

the botanical community and is still in print.

Magee makes it clear that the contribution of Ahles to the present work is very significant, that Ahles had compiled vast amounts of information toward such a flora, all left behind at the University of Massachusetts. From Ahles came the notion of extending the coverage to a more natural western boundary, the Hudson River. Hence, the easternmost tier of counties in New York is included, from the Canadian border south to and including all of Long Island. All the counties are shown and named on an outline map on page xvii. At a reduced size, this outline map is repeated as a dot map (one dot per county) for each species covered in the manual.

The book has artificial keys to a fare-thee-well. The stress is on identification. The book is so far removed from the academy that the distinction between artificial and natural keys isn't even made. Generally, it seems that professorial types cannot resist calling attention to the distinction. There is a nice glossary but way at the back. The sequence of families is Engler & Prantl, without apology, justified on the basis of familiarity to most botanists. The authors do treat Liliaceae narrowly, and treat the remainder in ten other families. Fashions change.

Nearly all generic names and specific epithets are translated or explained, in the pattern of *Gray's Manual*. After *Rubus arenicola*, [sand dweller], we're told that the specific epithet is for Arundel, York Co., Maine; this is surely one of those errors that prove we are all human, that no amount of proofreading will ever prevent. (The intention was to account for the name *Rubus arundelanus*, which is synonymized under *Rubus arenicola*.) Each scientific name is given an acute accent mark to indicate where the stress falls; some will quibble, but I expect most of these are fairly usual, and they are helpful in getting students past the barrier of pronouncing Latin names. Family and generic descriptions are ample, species descriptions are essentially absent.

Every genus has at least one species illustrated in line drawings by Abigail Rorer. She is credited both on the cover and the title page, and she deserves it. Her drawings, with the reduction from lifesize indicated, are clear, simple, and diagnostic. There are 995 of them, it says in the preface. One is better than the next, and Ms. Rorer is to be congratulated on a difficult job well done.

The antecedents of this manual are almost unmentioned. One might have expected a generous dose of history, but there is none. No explanation is offered, but I suspect the sheer bulk of the book militated against making it any larger. The eighth edition of Gray's *Manual* is mentioned in passing, along with two editions of Gleason & Cronquist. There are a few other works that are acknowledged, but the citations cease with 1992. There is no mention whatever of Frank Conkling Seymour's *The Flora of New England*, second edition, fifth printing with supplement, 1997. (I believe this is the latest edition and printing.) But even the first edition, 1969, is unmentioned. Tryon & Moran, *The Ferns and Allied Plants of New England*, 1997, is not cited. No monographs are cited; *Flora of North America* is not mentioned. There are no nomen-

clatural innovations, so far as I could detect, and nomenclatural remarks are suppressed throughout, even to the extent of not indicating when a name is officially conserved.

Many botanists will want to buy this book. Before you do, check some websites, especially bestbookbuys.com. Prices (including shipping) range from \$54 to \$81. A few weeks ago, the lowest price I found was \$45. (By contrast, the range in price for the New England ferns book is four cents!) – Neil A. Harriman, Biology Department, University of Wisconsin-Oshkosh, Oshkosh, WI 54901; harriman@uwosh.edu.



Flora of Russia. The European part and bordering regions. Andrej Aleksandrovich Federov (ed.). Vol. 2. English translation, 1999. ISBN 9054107529 for this volume, 9054107502 for the set (hardcover US\$100). xvi + 323 pp. A.A. Balkema Publishers, Old Post Road, Brookfield, VT 05036. – The original in Russian dates from 1976. Both versions include Orchidaceae, Juncaceae, Cyperaceae, and Commelinaceae. In English translation, volumes 1-4 have appeared (or will shortly); volumes 5-11 are expected to appear through 2003. (Most of this information is copied from www.koeltz.com, and is not given in the book.)

Vast political changes have swept the region since the Russian original was prepared; in modern terms, the flora covers Russia east to the Ural Mountains and on the west Estonia, Latvia, Lithuania, Belarus, Ukraine, and Moldova. The map on p. xiv has not been updated, and properly so, because that would have involved updating all the range statements as well.

The treatments are those of a quarter of a century ago; this is a faithful translation, not a restudy. The English features such terms as “ecdemic,” which I cannot find in a modern dictionary; resorting to an older tome, I find it means “not endemic; of foreign origin.” Stands to reason, but it was a new one to me. In general, it appears the English is quite colloquial – the translators are not credited, but they have labored well.

The peculiar language of taxonomic botany was probably unknown to the translators, however. Hence, we have on p. 148 (of the translation, p. 114 of the Russian original) a remark on *Eleocharis oxystachys*, to the effect that “this name, in fact, was never approved.” This occurs again on p. 152 (p. 116 of the original), this time with respect to *Eleocharis carinata*. There is no approval process in matters nomenclatural; I suspect the statement might have been rendered more freely as “this name, in fact, was never properly published by the rules of the International Code of Botanical Nomenclature.” This sort of thing must be very vexing to a translator, who can only render the translation but not the meaning. [Both names are given in *Index Kewensis* as having been published in 1977, a year after this volume appeared in Russian.]

There are few illustrations, and as reproduced are often overinked, but I suspect they were in the original, too. The keys appear to be artificial and generally workable. There are sometimes no species descriptions, but the legs in the keys often run to five or more lines, which accomplishes the same thing. Nomenclatural references are amply cited, including type localities. For further particulars, one could go to the massive *Flora USSR* for more detailed descriptions of the species, or one might consult *Flora Europaea*, whose original volumes are approximately contemporaneous. (Volume 5 of *Flora Europaea*, which includes these four monocot families, was published in 1980; the relevant volumes of *Flora USSR* date from 1935.)

Flora Europaea does not render these volumes on the flora of European Russia useless, because the Russian authors are allowed to deal at some length with questions of synonymy, local variation, problems of typification, and the like – the format adopted for *Flora Europaea* encouraged brevity, not prolixity. There are nomenclatural innovations included, though their priority dates from the original, not from this translation. A relatively inaccessible literature is now opened and an unfortunate linguistic barrier is crossed. – Neil A. Harriman, Biology Department, University of Wisconsin-Oshkosh, Oshkosh, WI 54901; harriman@uwosh.edu



Wild Orchids of Texas J. Liggio and A. O. Liggio with D. H. Riskind as scientific advisor, 1999. ISBN 0-292-74712-8 (hard cover, no price given). 228 pp. University of Texas Press, P. O. Box, 7819, Austin, TX 78713-7819. – Most native orchids in the U. S. A. are terrestrial, not easy to find and see, small and therefore hard to appreciate even if attractive as well as not easy to grow and recalcitrant when it comes to germination and propagation through tissue culture. They are also endangered, threatened and not subject to as much interest as their large, showy attention-grabbing tropical cousins. This is unfortunate because our orchids are every bit as beautiful as their better known relatives. And, every state has its own native species. Every state . . . even Texas.

This book refers to the orchids of the Lone Star state as Texas Treasures and then proceeds to show that this is exactly what they are. As a result the book is pretty, but is also serious and erudite. It is also a treasure itself.

Like so many other orchid books this one starts with a general discussion of the plants themselves. It does not describe vegetative characteristics of orchids in general, but it includes short descriptions of flowers, pollination, apomixis, seeds and their germination, mycorrhiza, dormancy, habitats, ecology and growth habits.

Most of the discussions are illuminating. A glaring exception is the section on the so called saprophytic orchids. The entire concept is wrong. There are no saprophytic orchids. The so called saprophytic orchids are actually parasitic on their fungi. They do not “derive nutrients from decaying leaves and vegetable matter.” All of the so called parasitic orchids derive nutrients from their fungi. They are mycotrophic parasitic plants. It is incorrect to write about them as saprophytic plants which can be referred to as mycotrophic.

A welcome section which classifies the Texas orchids by color precedes the genus and species descriptions which occupy most of the book (pp. 61-203).

The descriptions are generally detailed, clear and include many details. They are accompanied by distribution maps and photographs. Some even include details that have been ignored in other books as, for example, a note about the allergic reaction caused by *Cypripedium*. Most descriptions are illustrated by excellent photographs. *Deiregyne* is an exception for a good reason: *Deiregyne confusa* has not been found in the United States since 1931. Still, if an older (or any kind of) illustration exists it should have been included just to give an idea about this orchid.

The photographs are excellent. However in some cases they do not show enough detail as for example *Listera australis* on pages 119 and 120 and all of the *Malaxis* species (pages 123, 125 and 127). It would have been nice to include closeups as was done with *Spiranthes odorata* (pages 180, 182), *Spiranthes magnicamporum* (pages

174, 175) and *Spiranthes parksii* (pages 182, 184).

Appendices dealing with the sources of scientific names, excluded species and distribution by county, listings of literature as well as a good index conclude the book.

I am sure that as with all orchid books there will be taxonomists which will not agree with at least some of the classification and nomenclature used by the authors. This is not because some of the species may or may not be misnamed or misclassified. It is because orchid taxonomists can never agree with each other. For the most taxonomic and nomenclatural squabbles are of little or no relevance. An orchid by any other name . . . or even a rose . . .

Until now Texas was thought of as the home of oil, longhorns (of the football and four legged variety), great Tex Mex food and hail as large as the wallets of some oilionaires. This handsome, informative, well written and solidly produced book which describes 54 orchids should change that. In the future Texas should also be thought of as the home of the beautiful Grass Pink, attractive Tway-blade and pretty Ladies Tresses (not of the kind on the Dallas Cowboys' cheerleaders) and a book that does them justice. – Joseph Arditti, Department of Developmental and Cell Biology, University of California, Irvine, CA 92604-2834.

Updated Positions Available Listings At BSA Website

Current position announcements are maintained on the Botanical Society's website Announcement page at URL <http://www.botany.org/bsa/announce/index.html>. Please check that location for announcement which have appeared since this issue of Plant Science Bulletin went to press. To post an announcement, contact the webmaster: <srussell@ou.edu>.

Books Received

If you would like to review a book or books for PSB, contact the Editor, stating the book of interest and the date by which it would be reviewed (15 February, 15 May, 15 August or 15 November of the appropriate year). Send e-mail to <sundberm@emporia.edu>, call or write as soon as you notice the book of interest in this list, because they go quickly!—*Ed.*

* = book in review or declined for review

** = book reviewed in this issue

Catalogue of Portraits of Naturalists, Mostly Botanists, in the Collections of the Hunt Institute , The Linnean Society of London, and the Conservatoire et Jardin Botaniques de la Ville de Genève. Part 3. Portraits of Individuals. E-H. Karge Anita L., Sharon Tomasic, Margot Walker, Gavin D.R. Bridson, Hervé M. Burdet, Marie-Martine Chautems and Tina Moruzzi-Bayo (compilers). 1999. ISBN 0-913196-50-9. (paper US\$20.00) 230pp. Hunt Institute for Botanical Documentation. 5000 Forbes Avenue, Pittsburgh, PA 15213-3890.

The Fertile Triangle: The Interrelationship of Air, Water, and Nutrients in Maximizing Soil Productivity. Wolf, Benjamin. 1999. ISBN 1-56022-878-4. (cloth, US\$69.95) 463 pp. Food Products Press, 10 Alice Street, Binghamton, NY 13904-1580.

Forage Seed Production, Vol 2: Tropical and Sub-tropical Species. Loch, D.S. and Ferguson, J.E., eds. 1999. ISBN 0-85199-191-2. (cloth US\$160) 479 pp. CABI Publishing. 10 E. 40th Street, Suite 3202, New York, NY 10016.

Halophyte Used in Different Climates I. Ecological and Ecophysiological Studies. Lieth, H. et al., eds. 1999. ISBN 90-5782-038-2. (paper US\$75.00) 258 pp. Backhuys Publishers B.V., P.O. Box 321, 2300 AH Leiden, The Netherlands.

Halophyte Used in Different Climates II. Halophyte Crop Development: Pilot Studies. Hamdy, A., et al., eds. 1999. ISBN 90-5782-025-0. (paper US\$42.50) 144 pp. Backhuys Publishers B.V., P.O. Box 321, 2300 AH Leiden, The Netherlands.

Heterosis and Hybrid Seed Production in Agro-nomic Crops. Basra, Amarjit S., ed. 1999. ISBN 1-56022-876-8. (cloth US\$79.95) 269 pp. Food Products Press, 10 Alice Street, Binghamton, NY 13904-1580.

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Inducible Gene Expression in Plants. Reynolds, P.H.S., ed. 1999. ISBN: 0-95199-259-5. (cloth US\$85.00) 247 pp. CABI Publishing. 10 E. 40th Street, Suite 3202, New York, NY 10016.

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Penstemons. Nold, Robert. 1999. ISBN 0-88192-429-6. (cloth US\$29.95) 259 pp. Timber Press, 133 S.W. Second Ave., Suite 450, Portland, OR 97204.

Plant Breeding Reviews, Vol 17. Janick, Jules, ed. 2000. ISBN 0-471-33373-5, ISSN 0730-2207. (cloth US\$180.00) 338 pp. John Wiley & Sons, Inc. 605 Third Ave., New York, NY 10158.

Plant Nutrition - Molecular Biology and Genetics: Proceedings of the Sixth International Symposium on Genetics and Molecular Biology of Plant Nutrition. Gissel-Nielsen, G. and A. Jensen, eds. 1999. ISBN: 0-792-35716-7. (cloth US\$210) 444 pp. Kluwer Academic Publishers, 101 Philip Drive, Assinippi Park, Norwell, MA 02061.

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Rangeland Desertification. Arnalds, Olafur and Steve Archer. 2000. ISBN 0-7923-6071-0 (cloth US\$95.50) 209 pp. Kluwer Academic Publishers, 101 Philip Drive, Assinippi Park, Norwell, MA 02061.

The Sedges (*Carex L.*) Of Russia and Adjacent States (Within the Limits of the Former USSR). Egorova, T.V. 1999. ISBN 0-915279-67-3. (cloth US\$49.95) 772 pp. Missouri Botanical Garden Press, 4344 Shaw Boulevard, St. Louis, MO 63110.

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