BULLETIN

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PLANT SCIENCE

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

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THE BOTANICAL SOCIETY OF AMERICA
Leading Scientists
and
Educators
since 1893

This issue continues our series featuring brief histories of outstanding (or formerly outstanding) botany departments. Cornell University (PSB 53-3) and the University of Chicago (PSB 54-1) are major research universities that are prominent and well-known for preparing outstanding botanists to lead the profession. Eastern Illinois University does not produce Ph.D.'s but it also has a long history of incubating young botanists and providing outstanding botanical instruction. As an undergraduate I was given a copy of Transeau, Sampson & Tiffany's *Textbook of Botany* that I could use to "supplement" the newer textbook we were using that was "weaker" in several areas (we were using Cronquist's *Introductory Botany*). I always associated Transeau with Ohio State (and Otis Caldwell with the University of Chicago). As you will read, their formative teaching careers were spent at Eastern Illinois where they laid the foundation for a department that thrived until recently when it was merged with Zoology. I hope you will find Jernegan et al.'s article to be as interesting a read as I do.

And then the mergers - - the gradual but steady demise of botany programs has been a concern in these pages for several decades. In fact, I recently contacted individuals at more than 60 institutions to provide updated information about botany courses, course enrollments, and botany graduates for the past year (If you were contacted and have not yet accumulated the data, it's not too late - - please send it in). The good news is that we are not alone in our concern. The Chicago Botanic Garden recently received a grant from the National Fish and Wildflife Foundation to help support the "Botanical Capacity Assessment Project." Government agencies and NGO's are concerned that they cannot find personnel adequately trained in organismal botany - particularly taxonomy. We will have an important part to play in generating data - - you will learn more, hopefully as soon as the annual meeting in Snowbird.

-The Editor

News from the Society

Upcoming Annual Meeting

Botany & Mycology 2009
Snowbird, Utah, 25-29 July

Plenary Address

Bringing the Food Back Home: Plants, Algae, Lichens and Fungi in the Food Traditions of Indigenous Cascadia

Nancy J. Turner
School of Environmental Studies, University of Victoria, Victoria, B.C., CANADA V8W 2Y2

Indigenous peoples of northwestern North America are identified by anthropologists mainly as fishers and hunters. Yet, their traditional food systems include many, diverse plant species, as well as some marine algae, lichens and fungi. Plant foods include roots and other underground parts, green leaves and stems, many fruits, inner bark of trees, and a range of beverage teas. These foods collectively provide essential nutrients and have been part of a healthy Indigenous diet over thousands of years. The knowledge required to use these nutritional resources effectively and sustainably is part of an overall system of knowledge that incorporates ecological understanding, taxonomic, and biogeographical expertise, specialized practices of harvesting, processing, and maintaining resource populations, and belief systems that guide their use and management. Women have been the holders and practitioners of much of this plant-based knowledge.

In recent years, for a variety of reasons, many of these important Indigenous foods have been declining in use, a dietary trend known as the "nutrition transition," that is occurring with local and

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Indigenous Peoples' food systems worldwide. People who once gathered and prepared healthy local food are turning towards more processed and marketed foods many of which are high in unhealthy fats and refined carbohydrates. The result is increased risk of diabetes and heart disease and other health problems. Today, Indigenous communities are using a range of strategies to maintain and strengthen their use of their original foods, and have found partners in universities, NGOs, and government agencies to support this endeavor. In this presentation, I will describe some of the diverse Indigenous "wild" foods of the Cascadia Region, including Angiosperms, Gymnosperms, and some Algae, Lichens and Fungi, and discuss the ways in which Indigenous Peoples have maintained and enhanced these resources, what has happened to these food species, and how they are now being reclaimed and re-incorporated into Indigenous Peoples' foodways.

Soltis, Pamela S. - University of Florida, Florida Museum of Natural History, PO Box 117800, Gainesville, FL, 32611-7800, U.S.A.

Hirsch, Ann M. - UCLA, Department of MCD Biology and Molecular Biology Institute, 405 Hilgard Avenue, Los Angeles, CA, 90095-1606, USA.

Poston, Muriel E. - Skidmore College, Biology Department, 815 N. Broadway, Sarasota Springs, NY, 12866, USA.

Women in Science Luncheon and Discussion.

The Women in Science Luncheon will be followed by a panel discussion. Women scientists from different botanical disciplines and different backgrounds and career paths will discuss their experiences. The panel will also respond to questions from the audience. The organizers especially encourage their male colleagues to attend and participate. For more information contact:

BSA Science Education News and Notes

BSA Science Education News and Notes is a quarterly update about the BSA's education efforts and the broader education scene. We invite you to submit news items or ideas for future features. Contact: Claire Hemingway, BSA Education Director, at chemingway@botany.org or Marshall Sundberg, PSB Editor, at psb@botany.org.

PlantingScience — BSA-led student research and science mentoring program

Watch Us Grow!

That is the line on the T-shirts PlantingScience teachers and mentors received for participating in the mentored inquiry sessions. If you served as a mentor in the Fall or Spring Online Session and did not receive a T-shirt, let us know. T-shirts, Certificates of Meritorious Service, and letters of support are small tokens of our appreciation for your contributions to change the way students experience and understand science.

Thanks to you, ~2,140 students in 55 classes had the opportunity to communicate online with scientists while conducting plant investigations in their classrooms. Interest in the project continues to rise at a rapid pace (another doubling in participation this year). Your volunteer efforts make this program possible!

Have you wondered what impact this student-teacher-partnership might have?
Here are a few thoughts from participants.
" … Thank you so much for being a great mentor. You really helped us learn alot! Planting science was a great way for us to be a part of science! Thanks agian!" — St. Rose of Lima student

"The part I most liked about this experiment was communicating with our mentor and learning things from her. I also liked how other people from other teams commented our page and how we commented there page." — Marshall Middle School student

"Just wanted to let the mentors know what a fantastic job they are doing. I love how they are actually 'guiding' my students through the scientific thinking process and not simply telling the students what to do. Even though some of my students are a bit frustrated, I like the 'thinking' that is going on in their minds." — Mark Hurst, Galena High School teacher

"My kids have been really excited…Thanks to ALL of you for your time to help the kids!...they are working in small groups, they are discussing and asking questions-which is GREAT!! I've seen that many have also logged in during non-school hours. wow." — Jennifer Forsyth, Woodstock High School teacher

Over the summer, we will be busy offering teacher workshops, recruiting new teachers and mentors for the fall session, and making project improvements. Please send any suggestions to psteam@plantingscience.org.

2008 Master Plant Science Team Recognition — Call for 2009-2010 Applications

Members of the Master Plant Science Team are a special group of primarily graduate students who receive a few perks for their commitment to serve for an academic year and mentor ~4 teams in both the fall and spring session.

Our deep thanks to the 2008-2009 Master Plant Science Team. We are grateful for the insights and extra efforts of those field-testing new inquiries (underlined below).

The Botanical Society of America sponsored:
Rob Baker, Alona Banai, Katie Becklin, Michelle Brown, Marian Chau, Nick DeBoer, Frank Farruggia, Kelly Gillespie, Jennifer Gray, Kandress Halbrook, Dr. Diana Jolles, Rucha Karve, Rachna Kumar, Courtney Leisner, Dr. Jason Lando, Julia Nowak, Amber Roberston, Dr. Aurea Siemens, Roxi Steele, and **Genevieve Walden.**

The American Society of Plant Biologists sponsored:
Brunie Burgos, Eliana Gonzales-Vigil, Lisa Kanizay, Josh Rosnow, and **Ashley Spence**.

Would you like to join the 2009-2010 Master Plant Science Team? Graduate students and post-doctoral researchers are particularly invited to apply. For information on perks, requirements, and an online application form, please see the Scientist page on www.plantingscience.org. Or use the link below.
http://www.plantingscience.org/index.php%3Fmodule=pagesetter%26func=viewpub%26tid=4%26pid=62

Spotlight on PlantingScience Teachers' Acheivements

Our hats are off to several teachers in the PlantingScience program for honors and recognition they have received for their contributions to education. Congratulations. Kudos to you.

Naomi Volain – Teacher of the Month in Springfield, Massachusetts Public Schools, Information and Instructional Technology Solutions Department.

Naomi participated in last year's inaugural PlantingScience Summer Institute, and then in both the fall and spring online sessions. Naomi has a long-standing interest in integrating technology in the classroom and involving students in participatory science projects, including Forest Watch (from her alma mater, University of New Hampshire) and ground-truthing cloud observations for the NASA CERES S'COOL.

Dr. Michael Hotz – Recipient of Teaching **Environmental Stewardship Award** from Science Pioneers, and his school Wyandotte High School wins the Kansas Green School Award from the Kansas Association of Conservation and Environmental Education.

Participating in the Summer Institute and online session are just a few of Mike's green education activities in his school and across the district. The courtyard gardens, flower and vegetable gardens he built on the school grounds provide enriching outdoor learning experiences.

Valdine McLean, Tamica Stubbs, Cappi Coleman – Society for Science and the Public Fellows.
Ten high school teachers from across the country were selected to build independent scientific research in their underserved communities. Three of the ten members in the inaugural class of the SSP's Fellows Program are Planting Science teachers. What a showing! We wish them well as they strive to support promising students in their community to pursue independent research through out their high school years. Read more about the Fellows Program:
http://www.societyforscience.org/outreach/FellowsMarch09.pdf

Valdine has been a part of PlantingScience since 2005, and active in developing and field-testing new inquiry units.

Tamica joined the PlantingScience Summer Institute last year.

Cappi Coleman has participated in PlantingScience since 2007.

Science Education in the News

Nine steps to transform agricultural education in the face of changing times — Solving many of today's societal problems will rely on innovative interdisciplinary approaches to scientific agriculture. The recently released National Research Council report, Transforming Agricultural Education for a Changing World, recommends a suite of steps for colleges and universities with undergraduate programs in agriculture to prepare students for the evolving agricultural workplace.

http://www.nationalacademies.org/ag_education

More underrepresented minorities earn PhDs in science — Hard data show payoffs in programs aiming to boost participation of underrepresented minorities in science, technology, engineering, and math (STEM) fields, according to the recent AAAS report. The annual percentage of PhDs awarded across all STEM fields to underrepresented minorities rose to 33.9% among the 66 institutions in the Alliances for Graduate Education and the Professoriate (AGEP). In the biological and agricultural sciences, the percent of PhDs awarded to minorities in 2008 increased to 55.9%, up from 38.3% in 2001.

http://nsfagep.org/publications.php [pdf of report available under Info Briefs]

http://www.aaas.org/news/releases/2009/0401minority_phd.shtml [news release with video of Shirley Malcom discussing the good news]

What do American adults understand about basic science? — Unfortunately, only one in five American adults could answer basic science questions about life on planet Earth, according to a national survey commissioned by the California Academy of Science. Only 53% of respondents know how long it takes Earth to revolve around the Sun. How does your science understanding compare? A link to the online quiz is available on the California Academy of Sciences' website.

http://www.calacademy.org/

Editor's Choice

Chanchaichaovivat, Arun, Bhinyo Panijpan and Pintip Ruenwongsa. 2008. Yeast biocontrol of a fungal plant disease: a model for studying organism relationships. *Journal of Biological Education* 43(1): 36-39.

This activity demonstrates the inhibitory effect of the yeast, *Saccharomyces cerevisiae*, on growth of the fungal pathogen *Botrytis cinerea* both in culture and when inoculated into wounds on fresh red chili peppers.

Catley, Kelyn M. and Laura R. Novick. 2009. Digging Deep: Exploring college students' knowledge of macroevolutionary time. *Journal of Research in Science Teaching* 46: 311-332.

Student questionnaires in a multi-problem booklet were used to survey students in a large class at a private research university and a small class in a private science and technology university. The students had a range of previous science coursework from only an introductory course to several courses including an upper-level course in evolution. All students underestimated the time since major historical events (age of the earth, 1st fossils, eukaryotic cells, Cambrian explosion, 1st mammals, dinosaur extinction, and 1st hominids. Most discouraging was that there was no significant difference between students with little background, science majors, and science majors who had completed an evolution course!

Applications Solicited, Editor, *Plant Science Bulletin*, 2010 – 2014

Are you looking for a meaningful way to serve the Botanical Society of America? Are you interested in desktop publishing? Would you like to correspond with botanical colleagues in many disciplines about books, articles, and matters of interest to the BSA? The BSA is soliciting applications for the 5-year position as Editor of the *Plant Science Bulletin.*
If your answer to ANY of these questions is yes, please communicate your interest to Dr. Pat Herendeen (Chair, BSA Publication Committee). PATRICK HERENDEEN, Chicago Botanic Garden, 1000 Lake Cook Road, Glencoe, 60022 **Phone:** 202/994-5828, 847-835-6956. E-mail pherendeen@chicagobotanic.org

Applications are welcome any time and no later than July 1, 2009. The BSA Publication Committee will begin reviewing interested candidates during summer of 2009.

For a description of the *Plant Science Bulletin* see: http://www.botany.org/plantsciencebulletin/

Supermarket Botany – A Fresh Approach

Geoff Burrows and John Harper
Charles Sturt University, Wagga Wagga
gburrows@csu.edu.au & jharper@csu.edu.au

The use of Supermarket Botany is a popular approach to teaching plant structure and plant life cycles. It uses a student's existing knowledge of everyday food items to explore the differences between:

- fruit and vegetables,
- roots, stems and leaves, and
- flowers (with ovaries and ovules) and fruits (with seeds).

We aimed to produce a resource that was botanically accurate, with a reasonable level of detail and that was presented in an engaging format. Please see:

http://www.csu.edu.au/research/grahamcentre/education/

The web site is divided into two main areas:
· a tutorial that explains the differences between roots, stems and leaves, and also examines the differences between vegetative and reproductive tissues, and
· a test (called 'The Challenge') that allows students to apply the knowledge gained in the tutorial.

In 'The Challenge' students select an item from 'The Shelf' and are then required to select whether its major component is root, stem, leaf, flower, fruit or seed. We have done extensive surveys and have identified the common Supermarket Botany misconceptions. Thus we are able to customise the incorrect answer responses to give hints as to the correct answer. Once the correct answer is selected students go to the 'Why?' page, where high-quality images provide supporting evidence.

Quantitative testing indicates the web application has similar learning outcomes to a traditional laboratory-based session, although it is designed to support, not replace, hands-on learning. Student responses include "I understood more in 15 min (using Supermarket Botany) than 2 hours of textbook reading."

Announcements

In Memoriam:

Peter Robert Bell 1920 – 2009

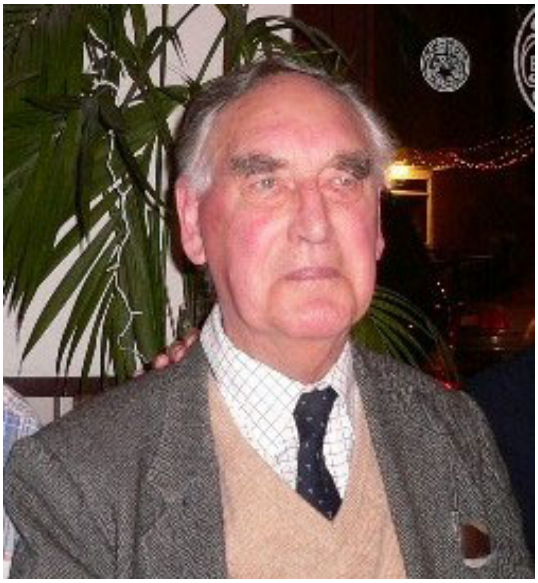
Peter Bell, who has died at age 88, was a leader in the study of the reproductive biology of ferns and gymnosperms, a pioneering electron microscopist, and author of the widely-read 'Diversity of Green Plants'. He spent much of his career at University College London, as Professor, Quain Professor and Head of the Department of Botany and Microbiology, and Chairman of the Faculty of Science.

Peter was a proud and dedicated botanist and enthusiast for all of plant life. An enduring interest in the pteridophytes meant that, for him, Lycopodium, Selaginella and each of the ferns held great fascination and wonder. The 'alternation of generations' became the center of Peter's research interests. He aimed to understand the changes in gene expression that accompanied the transition for sporophyte to gametophyte and back again, and how these changes were organized to establish the nature of the generations. He took this on in the decade before the advent of molecular biology, and used the techniques of the day, including autoradiography and early immunocytochemistry, to search for answers.

His studies involved analysis of the antherdia and archegonia that were borne by the gametophytes, fertilization, and the nature and development of the zygote. Peter became convinced that biochemical isolation of the cells that gave rise to the gametes was essential to separate the gene expression of the gametophyte from that of the gametes and therefore of the sporophyte that they combined to establish. This isolation was to be followed by a purging of the gamete cytoplasm of the RNAs that were characteristic of the gametophyte, and their replacement with others that were necessary to build the very different nature of the sporophyte. It was in this way that Peter envisioned the sweeping biochemical changes that stimulated the 'phase change', and that he held were at the center of the control of the alternation of the generations.

Peter's work was published widely and includes more than 100 papers. His 'Diversity of Green Plants' set some of his own work into the broader context of plant evolution from the algae through the flowering plants; reprinted several times, this remains a standard text at colleges and universities through Europe and the US.

Peter Bell was born to a humble family in Whitstable in Kent, south of London, on February 18, 1920. His father Andrew was a market gardener who specialized in tomatoes and apples. His mother Mabel used the vegetables with which she was surrounded to develop a quintessentially British style of cooking – organized around a piece of grilled or roasted meat served with potatoes, a green vegetable, and gravy, and with an apple pie or similar for desert – that both Peter and Elizabeth Bell continued to practice throughout their lives; these were taken to the pinnacle of development so that dinner parties at the Bell household, were notoriously British but more notoriously delicious.



Peter took a First class degree in Natural Sciences from Cambridge.

Peter was a Quaker, and from an early age he held very strong pacifist beliefs. During the war he was a conscientious objector, and in the early days of the Campaign for Nuclear Disarmament, in 1960, was brought to court for refusing to pay the part of his income tax that he calculated would be used by the Government to build nuclear armaments.

Arriving at University College at the very end of the war, Peter became a part of a coterie of plant science leaders and thinkers, including Dan Lewis and Jack Heslop-Harrison, who made the Department of Botany and Microbiology a center for plant science research through the 1970s and early 1980s. When the focus shifted toward medical science in the 1990's, the Quain chair of Botany (of which Peter was a prior occupant) remained unfilled, and when the Department of Biology replaced Peter's beloved 'Botany and Microbiology', he felt a great disappointment that never left him. For many of his later years, Peter lobbied single-handedly to restore the Quain chair and the department, only giving up his campaign when enfeebled by age.

Throughout his career and his life, Peter lived simply and with great independence. His lab, overlooking Gower Street and on the site of Darwin's London residence, boasted fine wooden surfaces for bench, desk and cupboard, although an alarming absence of equipment other than microscopes, and little in terms of technical help or administrative support – Peter was fond of saying that instruments were very good substitutes for ideas, and that the state of decay of a Department could be best measured by the degree of proliferation of the secretaries. At home, Peter took great pride in paneling bathroom, attic and study, measuring each panel in its anticipated location, taking said panel to garden, cutting and preparing it, and screwing with great precision in to place. Lamps, chairs, and knife and fork handles were fashioned similarly, fireplaces copper-plated, and conservatories and greenhouses built! A cistern in the garden collected rainwater, kitchen refuse was composted, salads grown, and apples and damsons turned to jam and jelly.

Peter taught himself German, so that he could read Hofmeister in the original, and maintained great enthusiasm for all things German, including his adored Siemens electron microscopes and BMW motor cars, throughout his life. He read Die Zeit every day, with a Wahrig German dictionary in easy reach. When confronted by a graduate student (RP) exclaiming an interest not in German but in French, Peter – with great deliberation – would exclaim 'But for what possible reason? And such a (with exasperation) 'barbaric language!'

Peter traveled and 'botanized' widely. He was fond of saying that 'only by visiting the tropics can we see what plants can really do'. He spent a sabbatical year at Zurich and one at UC Berkeley, where he came to admire the great morphologists Ernest Gifford and Don Kaplan. He loved the mountains of Europe and the US and maintained enormous affection for Switzerland and California throughout his life. Ireland, through Elizabeth's heritage, Spain and the northeast of England through Jerry and Mike Bell's relocations, were also special places. The Rioja of Cosme Palacio was Peter's other enduring pleasure, and his visit to the La Guardia winery was the center of his last visit to Spain.

Late in his career, Peter became a visitor to Buckingham Palace. Once, on the day after an evening at the Palace, he offered one of us (RP) this clear advice: 'Now, Roger, remember this. If ever

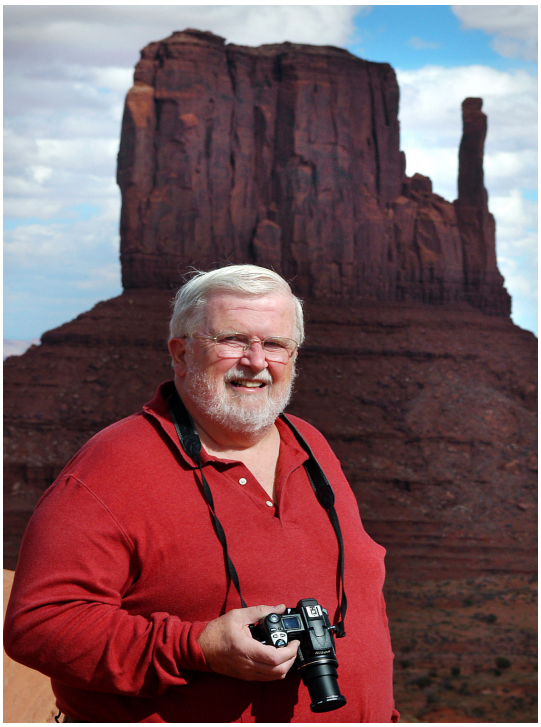
you are invited, under no circumstance need you hesitate to accept'.

Peter died of Parkinson's disease on January 10, 2009, in London. He leaves Elizabeth and Mike Bell in London, and Jerry Bell in California.

-Roger Pennell – Los Angeles
rpennell@ceres-inc.com
-Hugh Dickinson – Oxford
hugh.dickinson@plants.ox.ac.uk

William Ray Bowen 1936-2009

William Ray (Bill) Bowen, 72, of Maumelle, passed away at his home Monday, January 19, 2009 following a long battle with cancer. Survivors include his beloved wife of 48 years, Janet Bowen; two sons, Jeffrey Bowen and his wife, Lori, of North Little Rock, and Scott Bowen and his wife, Kelly, of Little Rock; grandsons Hunter Bowen and Austin Bowen; granddaughter, Emma Bowen; and two brothers, Robert Bowen and John Bowen of Springfield, Missouri. A sister, Barbara, preceded him in death.



Mr. Bowen was born October 15, 1936, in Iowa City, Iowa, to the late Esther and William Bowen. He earned a BA in biology from Grinnell College (Iowa) in 1960 and an MS and PhD in botany from the University of Iowa in 1964. He taught botany/biology at Western Illinois University and Ripon College (Wisconsin) before joining the faculty of the University of Arkansas at Little Rock (UALR) in 1975. In 1990, he joined Jacksonville State University in Alabama as Head of the Biology Department. He was instrumental in the modernization of the department, and in creating the Little River Canyon Field School and the Little River Canyon Center, a facility shared with the National Park Service. Mr. Bowen retired from JSU as Professor Emeritus in 2001 and, in 2002, he and his wife returned to Arkansas.

During his lifetime, Bill was an avid tennis player and amateur photographer. After relocating to Maumelle, he participated in the Pulaski County Master Gardener program and he and Jan developed a backyard wildlife garden. Together they enjoyed travel to the western states, Canada, Europe, Australia, New Zealand, China, Tibet, and Central and South America.

The family requests that memorials be made to the JSU Foundation, William R. Bowen Student Research Fund, c/o Biology Department, Jacksonville State University, 700 Pelham Rd, N., Jacksonville, Alabama 36265.

Bernard O. (Bernie) Phinney 1917-2009

UCLA and plant biology lost an important member of their respective communities with the death of Bernard O. Phinney of heart failure on April 22, 2009 in Los Angeles. Bernie was born July 29, 1917 in Superior, Wisconsin. He earned a B.A. in 1940 and a Ph.D. degree with Ernst C. Abbe as his advisor at the University of Minnesota in 1946. While a Ph.D. student, Bernie heard a seminar given by George W. Beadle, which so impressed him that he went to Caltech to work with Beadle as a postdoctoral researcher from 1946-1948. It was this experience that led Bernie to make major scientific contributions towards understanding the function and metabolism of gibberellins. His observations were some of the first to show that this class of plant hormones, which affect such critical developmental phenomena as seed germination, stem elongation, and fertilization, could be understood using a biochemical genetics approach.

In 1947, Bernie was hired as an instructor at UCLA, went through the professorial ranks, and became a

full professor in 1961. It was during his early years at UCLA, however, that Bernie began to test the concept of linkage between phenotype and genotype. In this research, he showed that dwarf mutants of maize became tall if given an external application of gibberellin, showing that dwarfness was linked to a deficiency of this hormone. Because maize dwarfness segregates as a Mendelian recessive, the results strongly suggested that the mutation occurred in a single gene. This seminal research paper was published in 1956 in the Proceedings of the National Academy of Sciences. The findings were so insightful that they were later incorporated into textbooks along with the classic picture of dwarf maize before and after gibberellin treatment. A 1957 paper in the same journal co-authored with Charles A. West, Mary Ritzel, and Peter M. Neely of UCLA identified gibberellin-like substances from a number of different families of angiosperms. Although Japanese scientists had already discovered gibberellin production by the fungus, *Gibberella fujikuroi*, the causative agent of "foolish seedling disease", Bernie and his graduate student Calvin Spector identified a gene controlling a step in gibberellin biosynthesis. These three papers set the stage for Bernie's lifelong synthesis of chemical, genetics, and physiological approaches to answer research questions. He and his co-workers, many from the U.K. such as Jake MacMillan and Clive Spray, or from Japan, Nobutaka Takahashi, Saburo Tamura, and Masayuki Katsumi, later elucidated the various biochemical pathways required for the synthesis of several distinct gibberellins.

Bernie earned numerous awards during his career including a Research Medal from the International Plant Growth Substances Association (1982), and the Stephen Hales award from the American Society of Plant Biologists (ASPB) (1984). In 1985, he was elected to the U.S. National Academy of Sciences. Bernie received a Certificate of Merit for "meticulous research in plant physiology" (1986) and a Centennial Award from the Botanical Society of America (2006). He joined the BSA in 1946 and remained a member his entire life. He was elected Honorary Foreign Member of the Japanese Society of Chemical Regulation of Plants (1988). Bernie was elected and served as the President of the ASPB from 1989-1990 and was honored as a member of the inaugural class of ASPB Fellows in 2007. In 1989, he was awarded an Honorary D.Sc. from the University of Bristol in the U.K., and a Research Fellowship from the Japanese Society for the Promotion of Science in 1991.

Bernie became Professor Emeritus at UCLA in 1988 but he did not slow down. He continued his research and outreach activities until about two weeks before he died. Well into his 90's, Phinney continued his research in the UCLA Plant Growth Center, usually testing an extract of marah (Cucurbitaceae) on dwarf mutants of Arabidopsis. He also tested various gibberellins on some dwarf mutants of *Melilotus alba* Desr. (white sweetclover) that my lab studied. Bernie loved our new Plant Growth Center and spent a great deal of time working with his plants, almost daily. It was very important for him to keep on doing research even after years of retirement. After being in the Botany Building for more than 40 years, his office was moved to the 3rd floor of the Life Sciences Building near other labs working on Arabidopsis. Here he had the opportunity to interact with graduate students and postdocs, helping them by writing them letters of recommendation, and giving advice. He loved relating anecdotes about science and stories about people he had know.

In addition to his enthusiasm for plants, especially for the ferns and orchids that he grew in his home greenhouse, Phinney loved skiing, fishing, eating sushi (actually, he liked everything Japanese, including art and architecture), and listening to classical music, often when driving in his fiery red convertible with the top down. He used to drive a VW camper with the license plate GA1. As a one-time passenger in this vehicle, I can tell you that driving down Wilshire Boulevard with Bernie at the wheel was an experience not to be forgotten.

His wife Jean; four children, Scott Phinney, Katcha Burnett, Peter Phinney, and David Phinney; and eight grandchildren survive him. The Phinney family will be holding a memorial service for Bernie at their

home in Los Angeles, CA on Saturday, May 30, at 3 p.m. Contributions in Bernie's memory can be sent to: the Bernard and Jean Phinney Graduate Fellowship in Plant Molecular Biology, University of Minnesota Foundation, 200 Oak St SE, Suite 500, Minneapolis, MN 55455.

-Ann M. Hirsch, Department of Molecular, Cellular and Developmental Biologoy, UCLA, Los Angeles, CA.

May 1, 2009

Bernie and I got to know each other one hot summer (in the early 50s) in the cornfields of Minnesota. I was a grad student, he a relatively new Ph. D. We were charged with propagating Ernst Abbe's dwarf corn stocks. I have no doubt that observing the diversity of dwarfs expressing differently on four different inbred lines must have tweaked his scientific curiosity. I remember him as a friendly, sociable person, always showing concern for the individual. Thus at scientific meetings, he did not take kindly to people who would leave the room before the last (often young) speaker was finished. His interest in people persisted throughout his life. He was careful in preserving his individuality whether in unusual clothing or riding in his convertible car, which ran on bald tires. It did serve him well, however, in attracting good-looking coeds!

At the end of the summer, Bernie left for the West, carrying with him some of the corn. He did well until he was stopped at the Arizona-California border by agricultural inspection and told to shell all the corn off the cobs. Bernie spent the day there shelling corn!

We continued to keep in touch—primarily through science meetings but also when he came East to visit relatives. On the way, he would always stop by the old botany building and visit with his (and mine) old advisor, Ernst Abbe. One summer it misfired. Bernie had come to collaborate with Abbe on a paper. Abbe decided to spend his time refinishing the floors of his house instead. Bernie was not amused. But to his credit he continued his loyalty even to Abbe's last years, when visiting him surely must not have been easy.

All of us rejoiced when Bernie became a member of the National Academy. Being Bernie, this honor did not change him—he continued to be the same decent and modest person we all knew.

-Otto L. Stein, 140 Red Gate Lane, Amherst, MA 01002
413-253-9572

Personalia

Peter Crane appointed Dean of the Yale School of Forestry and Environmental Studies

(Media-Newswire.com) - New Haven, Conn. — President Richard C. Levin has appointed the distinguished evolutionary biologist Sir Peter Crane as dean of the Yale School of Forestry and Environmental Studies.

The John and Marion Sullivan University Professor in the Department of Geophysical Sciences at the University of Chicago, Crane is the former director of England's renowned Royal Botanic Gardens, Kew. Earlier in his career he also led the scientific programs at the Field Museum of Natural History in Chicago.

"Peter's impressive record of research and conservation achievements and his stellar leadership of important scientific organizations will make him a superb dean of Yale's environment school," Levin said. "I am confident that he will add to the school's century-long legacy of leading research and education in an era when advancing knowledge of the natural world and mankind's impact on it has never been more important."

Crane's research is focused on the diversity of plant life; its origin and fossil history, its current status, and its conservation and use. Seeking to understand large-scale patterns and processes of plant evolution, he has worked extensively on questions relating to the origin and early diversification of flowering plants and, together with Paul Kenrick, published "The Origin and Diversification of Land Plants" in 1997. He has written several other books and nearly 200 articles and essays.

Prior to his current appointment at the University of Chicago, Crane served from 1999 to 2006 as director and chief executive of Kew, one of the most influential botanical gardens in the world. At Kew, which has the world's largest and most comprehensive collection of living plants, Crane worked on the initial establishment of the Millennium Seed Bank and a variety of other programs in plant conservation.

He directed the Field Museum from 1995 to 1999, where he established the Office of Environmental Programs and had overall responsibility for the museum's work in science and conservation. His association with the Field Museum began in 1982, and he served as curator, department chair and vice-president. At the University of Chicago, Crane was a professor in the Department of the

Geophysical Sciences from 1992 to 1999.

He earned his B.Sc. and Ph.D. in botany at the University of Reading, United Kingdom. He is a Fellow of the Royal Society, a Foreign Associate of the U.S. National Academy of Sciences, a Foreign Member of the Royal Swedish Academy of Sciences and a member of the German Academy Leopoldina and member of the Botanical Society of America. He was a Senior Mellon Fellow of the Smithsonian Institution and serves on the board of the Smithsonian's National Museum of Natural History. Crane also serves on the boards of the Global Crop Diversity Trust based at the United Nations Food and Agriculture Organization in Rome, and the Gaylord and Dorothy Donnelley Foundation, which facilitates land conservation in the Chicago area and the low country of South Carolina.

He was knighted in the United Kingdom in 2004 for services to horticulture and conservation. His many awards include the Schuchert Award of the Paleontological Society, the Henry Allan Gleason Award of the New York Botanical Garden, the Hutchinson Medal of Chicago Botanical Garden and the Botanical Society of America Centennial Award.

Crane's appointment at Yale as the Carl W. Knobloch, Jr. Dean is effective September 1, 2009. He succeeds James Gustave Speth, who Levin said has provided "superb leadership" since 1999.

"The new dean will inherit a school that has seen remarkable growth in faculty, student applications, and the availability of scholarship assistance over the past 10 years," Levin said. "Dean Speth, a passionate advocate for a greener Yale, has played a key role in increasing national and international awareness of climate issues."

Debra Edelstein Joins New England Wild Flower Society as Executive Director

Framingham, MA - New England Wild Flower Society announced today the appointment of Debra Edelstein as its Executive Director. Society Board of Trustees Chair Frances H. Clark stated, "The Board of Trustees is delighted to welcome Debbi as the new leader of New England Wild Flower Society. She brings a deep commitment to conservation and a breadth of experience in managing non-profit organizations. We were impressed by her enthusiasm, expertise, and creativity and voted unanimously for her to lead us in the challenge and excitement of these coming years. The native plants will thrive under her charge."

Edelstein started February 17 and manages the Society's headquarters and staff at the 45-acre botanical museum Garden in the Woods, Framingham; Nasami Farm and Sanctuary, Whatley; conservation programs; education programs; and ten sanctuaries located throughout New England.

In her most recent position at NESCAUM, the regional organization that provides scientific and policy expertise to the air agencies of the eight Northeastern states, she established a new collaborative effort by the states and the US EPA to reduce diesel emissions, secured $15 million in new project funding, created industry workgroups and multi-state task forces, and organized successful public workshops.

As Vice President and Executive Director of National Audubon Society/Audubon Washington, she published the country's first "State of the Birds" report, garnered a unanimous legislative vote for a first-in-the-nation state law adopting Audubon's Important Bird Areas into the Natural Heritage Database used for land use and management decisions on both public and private land, produced the first "State of Environmental Education" report at the request of the Washington legislature, and provided fiscal stability to Audubon Washington.

As Bioreserve Project Manager for The Trustees of Reservations, she led the Trustees' role in creating the 13,600-acre Southeastern Massachusetts Bioreserve, the Commonwealth's largest land-protection project.

She has also been a consultant offering environmental planning, education, and communication services, a marketing director, editor, and writer. She holds a MCP (Master in City Planning) in Environmental Policy and Planning from Massachusetts Institute of Technology, and an AB in English from Bryn Mawr College.

"We look forward to an exciting, extended period of leadership by Debra Edelstein. She is poised to take the next steps to bring New England Wild Flower Society to even greater heights of national awareness, while realizing our conservation mission, horticultural interests, and educational prowess," concluded Board of Trustees Chair Clark.

Founded in 1900, New England Wild Flower Society is America's oldest native plant conservation organization, promoting the conservation of temperate North American flora through education, research, horticulture, habitat preservation, and

advocacy. The Society's vision is a future where vigorous native plant populations live in healthy, balanced, natural ecosystems-protected, enjoyed, and beneficial to all life.

Carnegie's Arthur Grossman Receives Gilbert Morgan Smith Medal

Stanford, CA—The National Academy of Sciences has awarded Arthur Grossman, of the Carnegie Institution's Department of Plant Biology, the 2009 Gilbert Morgan Smith Medal "in recognition of excellence in published research on marine or freshwater algae." The award was established through the Helen P. Smith Fund.

Grossman is a pioneer in studying a broad range of topics about *Chlamydomonas*, a tiny green alga affectionately called Chlamy, which is present in soil and freshwater. He also brought Chlamy into the age of genomics by leading the project that helped to define its full genome sequence and then exploiting the genomic information. Chlamy performs photosynthesis like plants, but it diverged evolutionarily from flowering land plants about 1 billion years ago and therefore contains many characteristics common to all plants, as well as characteristics associated with animals but not with flowering plants. Grossman's research is important both for understanding basic mechanisms in photosynthetic organisms as well as their evolution. He has investigated metabolic processes and the acclimation of algae and cyanobacteria (formerly called blue-green algae) to changing environmental conditions, the diversity of genomes of photosynthetic microbes in hot spring mats and the physiological functions encoded by those genomes, and energy use by photosynthetic microbes in the marine environment. In addition, he is part of a team working with new methods to study gene expression or transcriptomics in alga.
"Art is recognized worldwide as a major figure shaping our understanding of algae," remarked Carnegie president Richard A. Meserve. "We congratulate him on this honor."

Grossman has been a staff scientist at Carnegie since 1982 and professor by courtesy at Stanford University. He received his B.S. from Brooklyn College, and his Ph.D. from Indiana University. Grossman received the prestigious 2002 Darbaker Prize for his microalgae work from the Botanical Society of America. He has served on numerous panels and editorial boards, including Current Genetics, Eukaryotic Cell, Molecular Plant, Plant Physiology and the Annual Review of Genetics. He regularly reviews papers for journals such as *Science*, *Nature* and *PNAS*.

Nagib Nassar , BSA Member, Celebrates 50 Years Teaching And Research

My love of plants goes back to very early life at the age of 12 onwards, planting shrubs in our house garden, accompanying their growth and thinking in them every moment. They were my enjoyment, my hobby and my entertainment. At the University I began to examine flowers and learn about their systematics. This opened for me the door to a very exciting world of botany in which I live up to this date. For my Ph.D. study I applied cytogenetic data to the taxonomy of Chenopodiaceae in what is known now as cytotaxonomy.

My fifty years teaching were divided into 16 years with Cairo University from 1958 to 1974 and 34 years with the University of Brasilia. This multi-cultural experience exposed me to a broad range of learning styles and allowed me to acquire a number of different teaching methods. At Cairo University I taught horticulture and conservation of plant genetic resources. At Brasilia I taught plant breeding, organic evolution, evolution of cultivated plants, basic cytogenetics, cytogenetics methods and techniques, economic botany, plant breeding of perennial crops, and botany of *Cassava* to both graduate and post-graduate students. I have taught several of these courses at the federal universities of Goias, Vicosa, Rio Grande do Sul, Brasilia, Feira Santana, and Sao Paulo in Brazil, the Pan American center in Costa Rica, and Bern University in Switzerland.

Professor Nassar with students at the University of Brasilia

My teaching experience has been very rewarding. It is from my experience with teaching that I have gained my greatest strength. Teaching for me was like composing a piece of music, and for years and years I had the aspirations of being admired by my students the same way they admire their idols of musicians and artists. I always try to create a strong friendship with my students from the moment they joined my class up to their graduation.

In 1975, I began my first mission to collect wild *Manihot* species in Brazil on behalf of IITA (International Institute of Tropical Agriculture). I was at that time a visiting scientist sponsored by the Brazilian Ministry of Foreign Relations stationed at the University of Sao Paulo. The financial support of IITA was so small that did not permit me to hire any assistant to accompany me in my collection trips. By the end of four months trips I was able to collect seeds of more than 20 wild species native to 8 Brazilian states.

Collecting wild species for IITA encouraged me to plant and propagate a living collection at the Universidade de Brasilia. My goal was not only to propagate and conserve them but to use them for crop improvement. Five years later, I was able to provide IITA with hybrid seed that gave rise to cultivars now planted on about 4 million hectares in Nigeria making it the top-ranking producer of cassava all over the world. "Your breeding approach shows the benefits of preserving biodiversity … for enhancing casava germplasm…[and]new methods for the propagation of this crop…" says Rodomiro Ortiz , director of IITA.

See http://www.geneconserve.pro.br/iita2.gif and http://www.geneconserve.pro.br/decades_of_cassava.pdf

The success of my work on wild *Manihot* in the decade 1970s encouraged the International Board of Genetic resources-IBPGR to delegate me for a mission of 3 months collecting wild *Manihot* native to Mexico. Since the1980s I continued working on cassava and for the last decade I have concentrated on embryology of this group . This led me to the most important discovery ever made in these species, the discovery of apomixis and transference of its genes to cultivated forms, producing the first apomictic cultivars of this crop. This shows how much botany could serve breeding programs and botanists.

Most recently I was involved in developing cassava hybrids that are rich in protein. The first such hybrid was bred by me early in the 1980s. We can now release hybrids that are very productive and contain high protein and essential amino acids.

Conserving wild cassava, *Manihot* species native to Brazil and Mexico. was the most fascinating work in my career, which began 35 years ago. My knowledge of the botany of this group enabled me collect and conserve them and manipulate them for crop improvement. I emphasize to my students that knowing the botany of a certain crop is the principal step towards improving it. You cannot successfully use a wild species in an improvement program or breed it with cultivated forms without knowing in what habitat it grows. This provides clues to important characteristics that may be incorporated into the cultivar. Breeders must also understand the reproductive system of his crop to choose adequate methods of breeding.

-**Nagib Nassar**, Departamento de Genética e Morfologia, Instituto de Ciências Biológicas, Universidade de Brasília, Campus Universitário, Darcy Ribeiro, Asa Norte, 70910–900, Brasília –DF, Brazil
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Dr. Susan Pell, Brooklyn Botanic Garden Scientist, Returns from Successful Plant Research Expedition in Papua New Guinea.

Brooklyn, New York – March 10, 2009. Dr. Susan Pell, Brooklyn Botanic Garden Scientist, and member of the Botanical Society of America, recently completed the first botanical survey of the three main islands of Papua New Guinea's Louisiade Archipelago in 50 years.

Throughout the five-week adventure, Dr. Pell, the Garden's plant systematist and laboratory manager, worked with BBG's web team to keep a blog detailing her team's challenging work climbing mountains, fording rivers, and sleeping on a small boat in order to make over 800 plant collections that are sure to greatly expand the existing knowledge of the Milne Bay flora.

Their exploration and study of the three main islands of the Louisiade Archipelago, Misima, Rossel, and Sudest, is key: These islands are home to many species found nowhere else in the world. The work done in Papua New Guinea by Dr. Pell and her team include the collection of a plant that has been collected only twice before – and never described –

giving the explorers a rare glimpse into some of the world's most exciting flora.

The five-week expedition was more than five years in the planning. Dr. Pell and her five-member team, including scientists from New York Botanical Garden, Botanical Research Institute of Teas, and Conservation International, set out in early January to work with local naturalists to survey the flora of the area, compile a conservation assessment, and identify members of the cashew and frankincense plant families. Data from the project will become an integral part of an online tree flora database of New Guinea, and new plant specimens will be housed in the PNG National Herbarium, BBG's herbarium, and other herbaria in Papua New Guinea and stateside.

Throughout her trip, Dr. Pell's blog, Expedition: Papua New Guinea, provided a gripping, frontline reality show imbued with all the challenges and curiosities that only a scientist can capture and share. And Dr. Pell's stunning photos offer a window into a part of the world few have ever seen, especially in such a personal way.

Dr. Pell was selected as a Wings WorldQuest Foundation explorer for this expedition. The foundation is the leading resource and advocate for women explorers worldwide. Dr. Pell will be available for interview to recount her incredible field research experience and the making of her web diary: bbg.org/blogs/expedition.

Contact: Leeann Lavin, LeeannLavin@bbg.org or 718-623-7289 to arrange interviews.

Award Opportunities

GRANTS FOR ORNAMENTAL HORTICULTURE

The Stanley Smith Horticultural Trust invites applications for grants up to $20,000 for education and research in ornamental horticulture. Not-for-profit botanical gardens, arboreta, and other tax-exempt organizations are eligible.

The deadline for applications is August 15, 2009. For current guidelines, send a brief message that indicates a potential project and identifies your organizational affiliation to: Thomas F. Daniel, Grants Director, SSHT, Dept. of Botany, California Academy of Sciences, 55 Music Concourse Dr., Golden Gate Park, San Francisco, CA 94118, USA email: tdaniel@calacademy.org

Symposia, Conferences, Meetings

International Orchid Symposium January 12-15, 2010 Taichung, Taiwan

Welcome to the first International Orchid Symposium, organized by the International Society for Horticultural Science (ISHS) Orchid Working Group. Academics, scientists, and industry leaders are invited to participate in the sharing of research-based information on orchids.

This meeting will be held January 12-15, 2010 in Taichung, Taiwan. Taiwan is home to large-scale commercial production of orchids, particularly phalaenopsis, as well as numerous scientists focused on orchid research.

The primary topics of the meeting are:
1. Orchid anatomy and morphology
2. Orchid ecology
3. Orchid genetics and breeding
4. Orchid micropropagation and seed germination
5. Orchid production (including pest and virus control)
6. Orchid postharvest and marketing

This symposium will be held at the National Museum of Natural Science (NMNS, http://www.nmns.edu.tw) in the downtown of Taichung City (the west-central region of Taiwan). There are two lecture theaters (each with a capacity of 200 people) with modern facilities for holding the international symposium.

International symposium participants are encouraged to arrive into Taoyuan International Airport (formerly known as Chiang Kai-shek International, or C.K.S. airport.), which is located outside of Taipei. From Taoyuan International Airport, it takes about 2 hours to reach Taichung City by bus.

For more information see:
http://www.hrt.msu.edu/ios/

56th Annual Systematics Symposium Missouri Botanical Garden

"Angiosperm phylogeny: not just trees, but insects, fungi, and much more"

9-11 October 2009 With support from the National Science Foundation

REGISTRATION

SATURDAY-SUNDAY, October 10-11

Kevin Boyce: Ecophysiology of early angiosperm evolution
Bryan Danforth: Bee phylogeny and angiosperm diversification
Peter Endress: Floral morphology and eudicots
Else-Marie Friis: Early angiosperm fossils
Thomas Givnish: Whole genomes and major branchings in monocots
Conrad Labandeira: Paleohistory of plant/insect interactions
Paula Rudall: Monocot floral development and diversification
Vincent Savolainen: Phylogeny of the monocots
Christopher Schardl: Endophytes and plants, especially Poaceae
Doug Soltis: Broad-leaved angiosperm diversification

SPACE LIMITS REGISTRATION TO 400; PLEASE REGISTER EARLY Registration must be accompanied by an $85.00 registration fee, which also covers the cost of refreshments at the Friday mixer and lunch and dinner on Saturday. Information on local hotels and motels will be available to registrants. No refunds will be granted after 24 September. There is no guarantee of food being available if you register after 30 September. For electronic payment, see future updates on symposium webpage.

I plan to attend the Systematics Symposium. Enclosed is my $85.00 registration fee. Please make checks payable to "Missouri Botanical Garden" I enclose my registration fee of $85.00 _____
I request vegetarian meals: _____
My name and professional address: _____
_____
_____
_____

Phone:_____ Fax:_____ e-mail address:_____
Please indicate if you are a)a graduate student _____ or b)an undergraduate student _____

Mail registration form to: Systematics Symposium Missouri Botanical Garden P.O. Box 299 St. Louis, MO 63166-0299 **For further information**, contact: P. Mick Richardson Email: mick.richardson@mobot.org Tel: 314 577 5176 Fax: 314 577 0820

VII International Congress of Systematic and Evolutionary Biology, ICSEB 7

"Extending the Darwinian Panorama"

Veracruz, Mexico
5-10 July 2009

for more informaiton see:

http://www.botanik.univie.ac.at/ICSEB7/

Other News

Lecture Celebrates Monumental Anniversaries of Two Botanical Gardens

"Kew, Missouri Botanical Garden and the Global Botanical Network – Powerhouse for a Better Future,"

Professor Stephen D. Hopper
Director of Royal Botanic Gardens, Kew

WHAT: "Kew, Missouri Botanical Garden and the Global Botanical Network – Powerhouse for a Better Future," a lecture by Professor Stephen D. Hopper, director of the Royal Botanic Gardens, Kew

WHEN: Monday, June 1, 2 p.m.

WHERE: Monsanto Center, 4500 Shaw Blvd., south St. Louis (two block west of the Missouri Botanical Garden at the Shaw-Vandeventer intersection)

NFO: www.mobot.org; (314) 577-9400, 1 (800) 642-8842 toll free

As the Missouri Botanical Garden celebrates 150 years of botanical research, science education and horticultural display, the Royal Botanic Gardens, Kew, near London is celebrating its 250th anniversary. Join Kew director and plant conservation biologist Professor Stephen D. Hopper for a lecture, "Kew, Missouri Botanical Garden and the Global Botanical Network – Powerhouse for a Better Future," on Monday, June 1 at 2 p.m. at the Missouri Botanical Garden's Monsanto Center, 4500 Shaw Blvd. The event is free and open to the public.

Hopper is best known for pioneering research leading to positive conservation outcomes in southwest Australia (one of the few temperate-zone global biodiversity hotspots). He collaborated on the descriptions of 300 new plant taxa and has authored over 200 scientific publications. Hopper has explored Australian deserts since 1980, and conducted research in South Africa and the USA.

As Foundation Professor of Plant Conservation Biology at the University of Western Australia from 2004 to 2006, he developed new theories on the evolution and conservation of biodiversity on the world's oldest landscapes, and led the establishment of new degrees in conservation biology.

The Missouri Botanical Garden and the Royal Botanic Gardens, Kew share a unique connection. From 1849 to 1851, Missouri Botanical Garden founder Henry Shaw traveled extensively in the United States and Europe. During one of his trips to England, Shaw was inspired to give the people of St. Louis a garden like the great gardens and estates of Europe. Shaw was encouraged to build a garden involved with scientific work like the great botanical institutions of Europe. With the assistance of Harvard botanist Asa Gray and Sir William Hooker, director of the Royal Botanic Gardens at Kew at the time, Shaw was persuaded to include a herbarium (collection of botanical specimens) and a library.

A Garden to Die For: Wicked Plants at Brooklyn Botanic Garden

The awesome power of plants is on display this summer with Wicked Plants at Brooklyn Botanic Garden, from May 31 through September 6, 2009.

Although plants have nourished and succored, seduced and delighted humans throughout history, this summer, BBG highlights a rogue's gallery of the most nefarious, troublesome, and even potentially deadly members of the plant kingdom. Wicked Plants at Brooklyn Botanic Garden introduces visitors to over 50 plants in the Garden whose capacity to injure, poison, or perhaps just irritate humans is a powerful reminder to tread lightly in the plant world.

Inspired by the upcoming release of author Amy Stewart's *Wicked Plants: A Book of Botanical Atrocities*, Brooklyn Botanic Garden's summer interpretive highlight gives visitors a closer look at the sometimes problematic relationship between people and plants. In ten areas throughout the Garden, on-site text and the Garden's first-ever audio tour, featuring its science and horticulture staff, share facts, advice, and tales of close encounters with wicked plants. Visitors will learn about such botanical menaces as monkshood (*Aconitum* sp.), a member of the buttercup family used to tip spears for killing prey—and people; ricin (*Ricinus communis*), an extract of the castor bean that was used to poison a Bulgarian dissident in the 1970s; and the jumping cactus (*Cylindropuntia fulgida*), which terrorizes hikers by seeming to leap onto clothing or exposed skin.

Yet, for every "villainous" aspect of a particular plant, BBG's interpretation will shed light on plants' redemptive characteristics. The foxglove (*Digitalis* species), for example, tellingly also called "witch's gloves" or "dead man's bells," causes violent reactions when ingested; but the plant is also used to make digitalis, which helps regulate the human heart—a boon to victims of cardiac distress.

Reports and Reviews

Botany at Eastern Illinois University

Marissa C. Jernegan Grant, Nancy E. Coutant, and Janice M. Coons
Biological Sciences Department, Eastern Illinois University, Charleston, IL 61920

ABSTRACT
Eastern Illinois University was established in 1899, and from its beginning the importance of the botanical sciences was recognized. Two terms of botany were required for the four year program. Dr. Otis W. Caldwell, a botanist, was one of the original faculty members. He taught all of the biology courses and initiated the acquisition of a greenhouse. Caldwell was the first in a series of talented and dedicated botany professors including Edgar N. Transeau, Ernest L. Stover, Hiram F. Thut and John E. Ebinger. These and many other professors incorporated a field component into almost all classes. This dedication to the study of plants in their natural habitat led to one of the finest programs in the nation for training field botanists. By 1923, a formal Botany Department was established and in the late 1960's EIU began awarding a M.S. in Botany. In the 60's, the department greatly expanded with 15 faculty hires and over 40 different undergraduate and graduate courses were offered with 95% having a lab component. The excellence of the program was recognized in Illinois where organizations such as the Illinois Department of Natural Resources and the Illinois Natural History Survey relied on graduates from the EIU Botany Department for their field botanists. In 1992, the American Phytopathological Society recognized the department for its contribution to plant pathology. Between 1913 and 1993, six hundred and nine students graduated with degrees in Botany, and 121 continued to receive their doctorates in botanical fields. Although numbers of botany majors rose during early to mid 1990's, an administrative decision was made in 1998 to combine the Botany Department with the Zoology Department into a Biological Sciences Department. Since the merger, the B.S. in Botany was eliminated. Unfortunately, the elimination of this Botany Department is another example of past national trends to eliminate Botany Departments even with exceptional reputations.

EARLY YEARS
IIn the past two decades, a trend has occured for many colleges and universities to allow their plant biology programs to be replaced with a pre-medical or cellular and molecular biology curriculum (Salopek, 1996). Occasionally, independent departments focusing separately on botany and zoology are merged, thus squeezing botany classes into the general biology degree where often they lose their individual niche. According to the Chicago Tribune, a misguided emphasis is placed on "big science," keeping researchers in the lab and students in the classroom instead of exploring the outdoors and discovering what field botany offers (Salopek, 1996). Eastern Illinois University dissolved its nationally recognized Botany Department in 1998. The program had a very strong organismal focus. With more and more botany programs disappearing or condensing, we were inspired by the Historical Section at the 2007 Botanical Society of America meeting to report on the history of the once renowned Botany Department at Eastern Illinois University.

Eastern Illinois Normal School was established in September of 1899. The City of Charleston had donated "Bishop's Woods," a 40-acre tract, to the cause of the Normal School. This area was partially covered by a grove of trees. The north half of this tract of land, from pictures, was quite well wooded, but the south half was cleared, presumably for farming purposes. In this grove was where the one building (Old Main) for the Normal School was built, along with its power house some 150 feet directly south. The two were connected by a heating tunnel. As a training school for teachers, it offered one, two, three, and four year teaching diplomas. Botany classes were one of the first required course offerings, and interestingly enough, zoology was an elective. During the tenure of Eastern's first president, Mr. Livingston C. Lord, a Biological Sciences Department was established. The Botany and Zoology Departments became separate entities in the early 1920's. Of the eighteen original faculty members initially hired by President Lord, Dr. Otis W. Caldwell, a botanist, was the only faculty member to hold a doctorate degree (Coutant and Crofutt, 1996; Thut, 1967). Caldwell taught all of the biology classes along with coaching the football team for three years. He was the entire department. He offered General Botany, (Plant) Ecology, (Animal) Physiology, and Zoology. General Botany was a two quarter course, and the course was described in the university's catalog as follows: "In this course, a general survey of the plant kingdom will be made, beginning with the lowest plants and considering representative forms through all the great groups. An attempt will be made to show some of the relationships existing between the various groups. Throughout this course, the points of view will be those of morphology and physiology, while sufficient attention will be given to taxonomy to give acquaintance with quite a number of plants, which may be looked upon as representatives of the entire plant kingdom". Ecology was taught for one quarter in the spring. The course catalog described Ecology as a field of botany that "has to do with the

relationships existing between plants and their environment, and with the effects which have been and are being produced upon plants through these relations. While the physiology of plants concerns itself with the inner life processes, ecology has to do with the external life relations." Moreover, the catalog stated that "the department is well equipped with laboratory space and appliances; twenty-five good microscopes." Large oak museum cases housing specimens, sturdy oak tables and stools also furnished the laboratory, along with excellent charts and prepared slides to enhance teaching (Thut, 1967). At that time all classes were taught in Old Main, the only building on campus.

Build in 1903 the greenhouse was the second building on campus.

As part of Caldwell's vision for reshaping the campus for better teaching, he initiated the acquisition of a greenhouse, which was completed in 1903, being the second building on campus. The greenhouse plants were used for fresh material in classes and to propagate plants to beautify the grounds. Caldwell also helped to plan the school garden, where each class in the training school (which prepared elementary and secondary teachers for Illinois schools) had a plot. He also assisted in selecting the school's first gardener, Mr. Walter Nehrling from the Missouri Botanical Garden. Caldwell also wrote several books, including one on plant morphology. Caldwell taught at Eastern until 1907, when he accepted a position at the University of Chicago as a Professor of Botany (Connelly, 1969; Thut, 1967). After retiring in 1935, Caldwell became the General Secretary of the American Association for the Advancement of Science (Thut, 1967).

Dr. Edgar N. Transeau came to Eastern in the Fall of 1907 after the departure of Caldwell. He obtained his Ph.D. in Botany from the University of Michigan. Transeau was a very dynamic character and entered his work with enthusiasm, remembers fellow professor Dr. Hiram Thut (1967). While at Eastern, Transeau published on a wide variety of topics in many different journals, including *School Science and Mathematics*, *Botanical Gazette*, *Illinois Arbor and Bird Day Annual*, *American Journal of Science*, *Ohio Journal Science*, and *American Journal of Botany* (Thut, 1967). A total of 21 papers were published by Transeau while he was at Eastern. Transeau will be remembered as a very inspiring teacher, resulting in a number of students under his direction continuing in the field of botanical study. Three of Transeau's Eastern students who contributed greatly in botanical areas were Ferdinand Steinmetz, Lewis Tiffany and Homer Sampson. Steinmetz, after graduating from Eastern, earned a doctorate at Minnesota, and eventually was the chairperson of the Botany Department at the University of Maine for several years. Tiffany followed Transeau to The Ohio State University, where he earned a Ph.D. Tiffany wrote several books and became a prominent phycologist. Sampson also continued studying at The Ohio State University with Transeau. According to Thut (1967) both Tiffany and Sampson became professors at The Ohio State University.

Edgar N. Transeau came to Eastern replacing Caldwell and offered Botany 1 & 2, Advanced Morphology of Algae and Fungi, Ecological Anatomy, Local Flora, General Principles of Evolution, the Green Algae, and Agriculture

During Transeau's time, because of the great variety in background experience of entering students, Botany I and II became required courses for all four year students who had only a grammar school education (Thut, 1967). Other botany courses offered at this time, included Advanced Morphology of the Algae and Fungi, Ecological Anatomy, Local

Flora, General Principles of Evolution, The Green Algae, and courses in agriculture.

Transeau left Eastern in 1915 for a position as a Professor of Plant Physiology at The Ohio State University, where he soon became chairman of the department, which a few years later became one of the largest in the country (Thut, 1967). While at Ohio, Transeau wrote a botany textbook, *General Botany*, with two of his former students from Eastern, Homer C. Sampson and Lewis H. Tiffany. For a number of years, this botany textbook was the accepted text in colleges across the country, including Eastern (Connelly, 1969). In 1940, Transeau became the President of the Botanical Society of America (Botanical Society of America, 2008). In 1956, Transeau received a Botanical Society of America Merit Award "For his lifetime of support and encouragement of botanical science in its broadest sense, both its educational and scientific aspects. He has made substantial contributions to plant ecology, algology, and to botanical education at all levels, from high school to graduate school" (Botanical Society of America, 2008).

In 1915, after Transeau's departure, Dr. Arthur G. Vestal began at Eastern as an instructor of Biology. He held a Ph.D. in Botany from the University of Chicago. During his tenure at Eastern from 1915-1920, his interests were in plant geography and plant ecology. While at Eastern, he published three articles in *Transactions of the Illinois State Academy of Science*. After leaving Eastern, he taught at Stanford University and the University of Illinois in their Botany Departments. The elementary Botany courses offered by Vestal were Morphology of Lower Plants, Morphology of Seed Plants, and Processes and Adjustments of Plants. The advanced courses were Plant Ecology, Local Flora, Economic Botany, and Forest Botany. In 1920 Eastern Illinois Normal School became Eastern Illinois State Teachers College with B.S. and education degrees (Coutant and Crofutt, 1996; Thut, 1967).

Earl H. Hall was a botanist who was employed at Eastern from 1920-1923. Little is known about him, except that he served as an advisor for a class for one year, and after leaving Eastern, he taught and became head of the Botany Department at North Carolina State College for Women at Greensboro (Thut, 1967).

FORMATION OF THE BOTANY DEPARTMENT

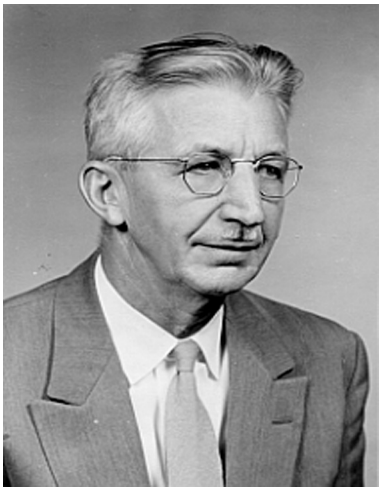
In 1923, Dr. Ernest L. Stover, a botanist who received his Ph.D. from the University of Chicago, joined Eastern's newly formed Botany Department (Coutant and Crofutt, 1996). Stover believed in acquiring good, fresh material for class and in preserving specimens from his frequent field trips.

1903 garden Otis W. Caldwell, one of the 18 original faculty helped plan school gardens, where each class in the model training school had a plot.

His collections were added to those of Caldwell, Transeau, and others that were stored in large glass-walled, oak-framed cases in the botany labs. Stover prided himself on making "excellently" prepared microscope slides. The slides that he made and those he had purchased, added to those collected by other professors, made a complete set for general botany and advanced classes (Thut, 1967). Stover had a long and very successful career at Eastern spanning 37 years. He was the first head of the Botany Department starting in 1923 until he retired in 1960 (Life Sciences Pamphlet, 1963). During his time at Eastern, he witnessed the completion of the Science Building in 1940, now known as the Physical Sciences Building. It housed six departments: Botany, Chemistry, Geography, Hygiene, Physics, and Zoology. This building was a step forward from all the science classes being taught in the Livingston T. Lord Administration Building or Old Main, as it is currently called. The herbarium was started in 1899 and specimens that Stover collected date back to 1947 (Ebinger, personal communication). At Stover's retirement in 1960, the herbarium was named in his honor for his efforts in collecting over 2,000 specimens (Coutant and Crofutt, 1996).

Other changes also occurred during Stover's time. In 1947, Eastern Illinois State Teachers College became Eastern Illinois State College. In 1949, Botany Club was established and became a central part of the Botany Department. Sixty years later, the club is still strong with speakers, fundraisers, and field trips, including an annual trip to the Smoky Mountains from the 1950's to 2007. In the 1950's the Cryptogamic Herbarium was created which now includes over 10,000 specimens of fungi and lichens (Eastern Illinois University, 2008). In 1957 Eastern Illinois State College became Eastern Illinois University (Coutant and Crofutt, 1996; Thut, 1967).

While Stover was at Eastern, Ms. Ica Marks (student teacher coordinator) was hired in the 1933, and retired in 1963, after 30 years and was the only woman to retire as an emeritus professor from the Botany Department. She started her service teaching general science at the lab school. Drs. Hiram Thut and Kenneth Damann joined the Botany faculty in 1932 and 1947, respectively. Thut, an active member of the Botanical Society of America, taught for 37 years and was the second chair of the Botany Department from 1960-1963. Towards the end of Thut's career, the Life Science Building was completed in 1963, with the Life Science Annex being completed one year later. Botany and Zoology Departments moved into this building in 1963 (Coutant and Crofutt, 1996). The new building included an herbarium to facilitate the systematic study of plants (Life Sciences Pamphlet, 1963). "The new building was more spacious, but they could not seem to control the temperature," recalls Dr. Wesley Whiteside (personal communication), a mycologist hired in 1960. Thut, who was head of the Botany Department at the time when bids were being made for the Life Science Building, had requested $100,000 for a new greenhouse. Eastern President Quincy Doudna agreed that it was a reasonable request but did not know from where the money would come. When an alternate bid for the greenhouse and Life Science Building was made, President Doudna asked Thut how soon he could have plans for a new greenhouse prepared. It was 4 p.m. when the two spoke, and the plans were in the President's office by 8 a.m. the next morning. The greenhouse was constructed in 1964 directly adjacent to the Life Science Building. The new greenhouse essentially mirrored the same plans that Thut provided, but the size of the rooms shrank considerably. In 1969, the greenhouse was named the H.F. Thut Greenhouse, in honor of Thut, who was known for collecting and using fresh materials in teaching (Connelly, 1969; Coutant and Crofutt, 1996). The greenhouse mainly was used to propagate flowers to beautify the campus grounds, but the Botany Department was allowed access to it for fresh material in classes. In 1982, the greenhouse officially became a Botany Department facility, and still is used to provide plant materials for classes.



Hiram F. Thut became the second chair of the Botany Department from 1960-1963. Land on campus was given to the Botany Department for an arboretum. Nearly all of the 1,000 trees and 100 shrubs were planted by Thut of with his supervision

With the new building came the Division of Life Sciences (Life Science Pamphlet, 1963). Dr. Walter M. Scruggs was the head of the division (Botany and Zoology Departments) for the first 4 years, and Dr. Leonard Durham was in charge of the Division for the next 15 years while it lasted until 1982. The administrative position existed as part of a plan to handle the continuing growth of the university. People were afraid that the Division was one step closer to combining the two departments. However, at its end in 1982, the departments still were separate (Durham, 1995). The Division staff contained 24 faculty with Doctorates from leading universities throughout the United States. Faculty were qualified to teach and do research in biology, botany and zoology and also in bacteriology or microbiology, entomology, fisheries, mycology, ornithology, parasitology, and anatomy, cytology, ecology, embryology, histology, genetics, physiology, and taxonomy (Life Science Pamphlet, 1963). The Botany Department had 16 faculty (Crofutt, personal communication).

Eastern's campus grounds and surrounding areas were full of plant species to spark young botanists' interests. An arboretum was established on campus in 1958 with land given to the Botany Department to start it. Nearly all of the 1,000 trees and 100 shrubs were planted by Thut or with his supervision. Having a small campus lake and being in close proximity to the Embarras River, also gave students an excellent opportunity to explore aquatic plants. In the 1950's Eastern acquired its first land gift, a 10 acre woodlot now called Burgner Acres. In1969, Baber Woods, a 50 acre old growth upland forest was donated to the Nature Conservancy, and in 1983, Rocky Branch, a 150 acre natural area with unique sandstone outcrops was dedicated as an Illinois Nature Preserve. Both Baber Woods and Rocky Branch were used and managed by the Botany Department. All three of these natural areas are still managed by Eastern (Blackmore and Ebinger, 1967), and used by faculty and students for research projects.

Thut was known for using local material exclusively. Thut's habit of using fresh material was the

backbone of Eastern's strong field botany courses, recalled Dr. John Ebinger (personal communication), a plant taxonomist who was hired in 1963. "Too many instructors today teach from books, charts, and prepared slides, and students have no acquaintance with their environments." Thut also believed that "the use of fresh material no doubt accounts for so many of our students going into graduate work. They simply fell in love with the plants". Numerous graduates have received their Master's and Doctorate degrees - a very high proportion in terms of actual majors (Connelly, 1969). Mr. Laurence Crofutt, a microbiologist who joined the department in 1967, recalls that Thut had a boat and he would come to the building on Saturdays, asking students if they would like to go and look at the lotus (personal communication). Thut was a firm believer in getting into the field and getting your hands dirty.

EXPANSION BEGINS IN 1960'S

In 1963, the Botany Department had seven full-time professors. In the new building, Eastern's Botany Department continued to make improvements on its well-developed field botany program. With the additions of Dr. Wesley Whiteside (1960-1987), Dr. Derrell B. White (1962-1964), Dr. Barbara Blackmore (1963-1965), Dr. John Ebinger (1963-1995), and Mr. Oren Lackey (1963-1980), the department was growing. During 1963-1966, Dr. Kenneth Damann was chair of the department. He taught at Eastern for 19 years. A sampling of courses being offered in the 1960's were General Botany, Plant Physiology, Anatomy, Morphology, Plant Taxonomy, Plant Ecology, Economic Botany, Experimental Plant Physiology, Systematic Botany, Genetics, and Microtechnique. At this time, the Life Sciences Division offered a Bachelor of Science in Education, Bachelor of Arts, Bachelor of Science and a Master of Science in Education, all with an area of concentration in Botany (Life Sciences Pamphlet, 1963).

Dr. Whiteside, who is an emeritus professor, deserves special recognition for his contributions. Whiteside taught a variety of fungi and lichen classes and established a 5 acre botanical garden a few miles east of campus. His garden is a botanical "gem" and an exceptional resource not only for Eastern, but the entire state. The garden includes many native plants, but also many horticultural species. Many rare and unusual plants such as carnivorous plants (*Nepenthus)*, hart's tongue fern (*Asplenium)*, blue lily of the Nile (*Agapanthus*), false camellia (*Stewartia*), Mexican white pine (*Pinus*), Ben Franklin tree (*Franklinia*), Japanese Jack-in-the-pulpit (*Arisaema*), Mormon tea (*Ephedra*), beaver-tail cactus (*Opuntia*), yellow lady's slipper orchids (*Cypripedium*), Himalayan pine (*Pinus*) and yellow foxglove (*Digitalis*) to mention just a few. The garden has a large collection of hostas, many unusual types of magnolias, and a huge collection of daylilies, which Whiteside breeds to create new selections especially ones that are later to bloom. Whiteside allows faculty, students, and community members to use the gardens for research projects, teaching purposes and sheer enjoyment.

During the early 1960's, if a student wished to pursue a teaching degree, the Bachelor of Science in Education with a major in Botany or Zoology prepared them to become a teacher in biological science. If Botany was chosen as the major, then they had to minor in Zoology and vice versa. They also were required to take a year of chemistry, a certain number of other biology classes, and a liberal number of general education classes to ensure that they had the best possible academic training (Life Sciences Pamphlet, 1963). Mr. Oren Lackey was hired into the Botany Education program. He was an experienced high school teacher and

Typical EIU botany classroom in the 1960's

was hired to teach the methods course and to supervise student teachers (Crofutt, personal communication). Crofutt remembers him as doing a very fine job.

The botany program continued to grow. In the late 1960's, authorization came for a Master of Science degree in Botany. In the 1970's, 21 botany classes were offered, including Mycology and Lichens (Eastern Illinois University, 1970-1971). In the 1979-1980 course catalog, specialized Botany courses were offered, including Outdoor Home Horticulture, Indoor Home Horticulture, Ethnobotany, Taxonomy of Aquatic Macrophytes, and Plant Geography (Eastern Illinois University, 1979-1980). Also in 1979-80, 13 graduate courses were offered. In 1985, 35 undergraduate classes and 13 graduate classes were offered in botany. Enrollment in the botany program was very substantial. Before the merger of the Botany Department with the Zoology Department in 1998, numerous specialized upper division classes in botany were offered.

Several new people were hired in the 1960's. Dr. Terry Weidner came to the department in 1964 with an expertise in plant physiology. John Husa came to Eastern in 1966 and was department chair from 1966 to 1968, leaving the department in 1970. In 1965, Dr. Charles Arzeni, a bryologist, and Dr. Richard Smith, a phycologist, joined the department. Arzeni is remembered most for his bryology collecting trips and the Tropical Botany course he taught. The Tropical Botany course included five weeks of study and collection at the Technical Institute in Monterrey, Mexico. This course was one of the first study abroad Botany classes offered. Arzeni also led student groups to locales such as the Amazon and the Yucatan Peninsula. As a result of the many trips, Arzeni had many interesting and exciting tales. After experiencing a volcanic eruption in Guatemala, Arzeni remarked, "Hearing that terrible sound, feeling the tremble and excitement of the volcano erupting - that raw power - I could understand why primitive man was in awe of volcanic eruptions." After all his dealings and traveling experiences, Arzeni concluded, "You just can't get a full education staying in Coles County" (The Warbler, 1973). Also hired in 1965 was Richard Smith (1965-1988), a phycologist, followed by Grant Gray (1966-1990), a plant pathologist. Mr. Lawrence Crofutt, was hired in 1967 and taught bacteriology until his retirement in 1993. The department will long be in debt to Crofutt for the years he spent as the faculty advisor for the Botany Club and for his sole coordination of the annual Smoky Mountains spring trip (Coutant and Crofutt, 1996). Because of Crofutt's dedication to the field botany program, he was always organizing either day or week long field trips. Crofutt also kept a database for botany alumni contacts and helped write "The Leaf" (Botany Department Newsletter). In 1968, David Murphy (student teacher coordinator until retirement in 1990), Dr. Steven Becker (plant anatomist and later greenhouse supervisor until retirement in 1999) and Dr. William Scott (aquatic mycologist) joined the department. Dr. Zeno Bailey (plant genetics, 1969-1987), Dr. John Speer (morphologist/cytologist, 1969-1994) and Dr. William Weiler (bacteriologist, 1969-1996) joined the department in 1969. Weiler was very instrumental in the building of the Environmental Biology program. From 1968-1976 William M. Scott was the chair. Weidner was chair of the Botany Department from 1976-1992, when he entered higher administration, where he was in the Provost office during the merger years.

Two more faculty were hired in the early 1970's, and then a gap in hiring occurred until the late 1980's. In 1970, Dr. Roger Darding, a plant physiologist, joined the department (retired 1998). Plant ecologist, Dr. Douglas Zimmerman, joined the department in 1972 (retired 1997). He routinely took his plant ecology classes to Florida and Texas. Other faculty hired in the late eighties early nineties include Drs. Mark Boudreau (plant pathology), Janice Coons (Horticulture and plant physiology), Steve Daniel (microbiologist), Elizabeth Harris, (plant anatomy/ morphology), James McGaughey (teacher certification), Andrew Methven (mycologist), Henry Owen (plant genetics), Charles Pederson, (phycologist), Eileen Sutker (plant pathologist), and Gordon Tucker (plant systematics). Dr. William A. Weiler was department chair from 1992-1993.

In 1971, the Life Sciences Division added its newest major, Environmental Biology. In its inaugural year, the program only had five students. In fall 1975, a mere four years later, enrollment jumped to 154 students. Durham noted that "We are probably one of the most successful programs in placing our graduates." At the time, Eastern was the only school in Illinois with the Environmental Biology program (The Warbler, 1976). This major was unique because it was joint between the two departments in the Life Sciences Division. Environmental Biology students were required to take both botany and zoology classes. This major became a very large program, and kept the lab classes full.

In referring to the Botany Department, Thut says "The older Botany Department was firm in the conviction that field trips for the purpose of looking at flora and gathering materials for class were an indispensable part of nearly every botany course" (Connelly, 1969). Because of Thut's strong drive to make field botanists, 95% of the classes still had a lab component in 1985 (Questions, 1997). Ebinger always brought fresh material to class to use for keying plants. Field trips were taken often in Plant Ecology and Taxonomy, remembers Ebinger. Many students enjoyed the field trips and were hired to work in field botanist positions. In the mid-1970's, the Illinois Department of Natural Resources performed a natural areas inventory and discovered that almost one-third of their field workers were field botanists from Eastern who had trained with Ebinger.

In 1974, Ebinger was the first Eastern faculty member to be elected a Fellow of the Illinois State Academy of Science. He was one of two scientists to receive the honor that year, and was also the keynote speaker at the meeting headlined "Why Save Plants?" (Daily Eastern News, 1974) He has been an active member of the Academy since he came to Eastern in 1963. In 1995 when Ebinger retired, the Herbarium was renamed the Stover-Ebinger Herbarium. At that time the herbarium had 51,000 specimens, 20,000 of which Ebinger had collected. Now it has 73,000 specimens (Tucker, personal communication). Since Ebinger's retirement, he continues extensive research and publishing on the flora of Illinois. He has expertise with the

acacias, and is working on this group for the Flora of North America sponsored by the Missouri Botanical Garden.

Ebinger felt that one thing setting EIU's botany program apart from others was the numerous excursions. These excursions could be a brief trip during class, a weekend trip during the semester or a month-long trip in the summer. Such excursions might take students as near as a local state park south of Charleston or as far as Big Bend National Park in Texas. Ebinger recalls that students would flock to these trips for the chance to venture out with faculty members to learn and collect specimens. On most trips, early in the history of the department, faculty would bring their spouses and children along on the weekend or summer trips. The families would stay together and the students would stay in dormitories. The meals would be cooked together and plenty of good food was always available to eat. It seemed as though every spring break and summer, Ebinger and Zimmerman were taking students on field trips. For many years, Ebinger and Dr. Vincent Gutowski of the Geology/Geography Department at Eastern, led students on summer trips to locations such as New York state or Colorado to study plants and geography.

Much collaboration occurred between the Botany and Zoology Departments. In the late 1970s, Richard Andrews, a wildlife biologist in the Zoology Department, designed a course for the Life Sciences Division in environmental assessment that was taught by Andrews and Ebinger. These environmental assessments were performed for private companies to evaluate the environment. The class taught the methods of writing environmental impact statements for such purposes as power plants and road right-of-ways. All the reports from these courses were bound into a book (Ebinger, personal communication). Another field oriented experience that was offered to students was the chance to do paid research in an area of environmental concern. Interested students could go to Florida to work with the red woodpecker or to Horseshoe Lake in southern Illinois or to Chain-O-Lakes in northern Illinois, among other places (Ebinger personal communication).

REPUTATION IN THE 1990's

In 1992, a special celebration dinner was hosted by the Plant Pathology Department of the University of Illinois at Urbana-Champaign for the American Phytopathological Society North Central Division meeting. At that time, an engraved plaque was presented as a tribute to the numerous botany alumni from Eastern who had successfully completed doctoral programs in plant pathology at a number of major universities. The plaque read "With sincere appreciation, the University of Illinois Plant Pathology Department and the American Phytopathological Society recognize the Department of Botany of Eastern Illinois University for their contribution to the science of plant pathology." When asked about the success of Eastern's Botany Department, William Weiler, Acting Chair, replied, "The Botany Department at Eastern Illinois University has always prided itself in the production of fundamentally good organismal and population botanists. Our graduates are well-prepared, in the more traditional aspects of Botany," (Phytopathology News, 1992). From the time Eastern started conferring B.S. degrees until 1993, 609 students graduated with a B.S. degree in Botany, and of those, 121 continued to receive their doctorates, most in botanical fields, but a few were in areas of medicine, chiropractic, dentistry or in one case jurisprudence (Crofutt, personal communication).

As far as quantitative performance indicators in the mid-1990's, Eastern's Botany program was doing quite well. In comparing majors with Botany programs in Illinois from 1994 to 1996, Eastern's numbers rose while other programs in Illinois fell in the number of students in their programs. In 1995, Dr. Peter Davies (Chairman for the section of Plant Biology at Cornell University) conducted a survey of nearly forty research institutions and around thirty non-Ph.D. schools. It showed that Eastern offered 27 plant courses with a faculty of 16. Of the 45 schools responding to the survey nationwide, with both Botany and Biology Departments and Ph.D and Non-Ph.D programs, Eastern offered the greatest number of plant courses (Questions, 1997). From 1991 to 1995, Eastern had the highest number of Botany graduates when compared to other Illinois programs. An external review was conducted by the Council on Undergraduate Research (CUR) of the Departments of Botany and Zoology, including all of their interdisciplinary programs during fall 1996. Comments from the review were highly favorable towards Eastern's Botany Department. "Another advantage to separate Botany and Zoology Departments is that this structure sets Eastern apart from most other Primarily Undergraduate Institutions (PUIs), thus providing a foundation upon which the department's unique strengths may be enhanced" (CUR Review, 1996).

In 1992, a student satisfaction survey was sent to Botany majors from the preceding 20 year period. The results from this survey speak highly of the department: 91% rated their overall educational experience better than average, 94% felt that the Botany faculty interacted with students, and 92% felt that the botany faculty were very accessible. When asked what satisfied them most about the botany program, 64% responded that it was the

positive, encouraging, professional attitudes of faculty. This survey also showed that 63% of Botany graduates entered graduate school, 72% of Botany graduates were employed in a botany-related field, and 93% felt that the botany faculty members were effective teachers.

In the early 1990's the M.S. in Botany was combined to form a M.S. in Biological Sciences. In 1995 the EIU administration actively started to discuss merging the Botany Department with the Zoology Department. The majority of the Botany faculty did not support the merger. Past and present faculty, current students and alumni presented a case to retain the separate departments or at least separate degrees even if the two departments were merged. At the idea of the Botany and Zoology Departments at Eastern merging, many people outside of the university wrote letters which demonstrated the uniqueness and national reputation of the botany program.

Following are quotes from a few of those letters:

"[There is a] shortage of applicants with the necessary field training to satisfy the current need. EIU Botany continues to graduate students with well rounded backgrounds, that fit perfectly into agencies like the Indiana Department of Natural Resources…….[T]he unique role filled by the Botany Program....is another reason why the State of Illinois can be proud of its university system."
John A. Bacone, Director, Division of Nature Preserves, Indiana Dept. of Natural Resources.

"[W]e cannot get along without botanists trained in classical botany…In Illinois, this approach is being emphasized and taught virtually nowhere else than Eastern Illinois University. Without your program, we simply will be unable to accomplish the work we need, and in fact are required, to conduct."
Susan E. Lauzon, Executive Director, Illinois Endangered Species Protection Board

"At EIU, the Botany Program curriculum is quite diverse and its quality exceeds that offered by most universities…[T]he Botany Program there is a rare example of a training program that is both successful and progressive, and prepares its students in multiple ways to meet their future goals."
Terry A. Woodford-Thomas, Assistant Professor of Pathology, School of Medicine, Washington University in St. Louis

Even with strong support for maintaining the Botany Department as a separate entity from the Zoology Department, the two departments were merged in 1998. Janice Coons was the chair of the Department (1993-1998) until the merger in 1998. She was the only female chair during the existence of the Botany Department. She was a valiant leader and her efforts, along with the efforts of many others, helped to postpone the merger until 1998.

The degrees offered by the current Biological Sciences Department are a B.S. in Biological Sciences, a B.S. in Science with teacher certification (Biological Sciences specialization), and an M.S. in Biological Sciences. At the time of the merger, the Botany Department had 15 tenure-line faculty. Unfortunately, the elimination of Eastern's Botany Department is an example of a past national trend to eliminate Botany Departments even with exceptional reputations.

BOTANY AWARDS

The Botany Department received great support from Botany alumni. Many Botany alumni donated money to the program for equipment, and many of the Botany scholarships were alumni funded. Every spring since 1973, a banquet has been held at Eastern to celebrate academics in biological sciences and to award scholarships. The Ernest L. Stover Scholarship is in memory of the first Botany Department Chair, and is awarded to outstanding juniors and seniors in Botany based on academic achievement, a demonstrated interest in Botany, service, and promise as a future researcher or teacher. The H. F. Thut Award is in memory of former Botany professor Hiram Frederick Thut, and is presented to promising sophomores and juniors in Botany based upon scholarship and interest in Botany. The Errett and Mazie Warner Presidential Award in Botany was established by Errett Warner and honors Botany scholars of junior or senior standing. Not only do Botany alumni support student scholarships, but many accounts also are established to support both undergraduate and graduate research projects for students. Money to support students comes from the Richard Smith Incentive Fund and the Lewis Hanford Tiffany and Loel Zehner Tiffany Botany Graduate Research Fund. The Richard Smith Fund was established by alumni in memory of Richard Smith, a Botany Department faculty member who taught phycology and microbiology for many years. The Tiffany Fund was established by the family of Lewis Tiffany, who was one of Transeau's EIU students. The Tiffany Award is for graduate student research in botany. Although the Botany Department is gone, these awards are still presented to Eastern students with botanical interests.

ALUMNI CONTACTS

The Botany Department maintained contact with its alumni and was very proud of them and their accomplishments. Alumni symposia were scheduled periodically to bring alumni back to

campus for socializing and listening to talks by fellow alums. Great "feeds", like pig roasts, also were held for Eastern botany alum at many of these gatherings (Crofutt, personal communication). Two to three times a year, the Botany Department sent its newsletter, "The Leaf," to Botany alumni (1975-1997). Several faculty helped with the newsletter over the years, but Larry Crofutt was the constant driving force behind the newsletter. This newsletter was not only helpful for obtaining donations, but also informed the alumni about happenings in the Department as well as around campus. It also included a section for alumni updates, where things such as mailing addresses, marriages, new jobs or new children could be listed. Awards and honors that were presented to students and faculty also were mentioned in this newsletter.

NOTEWORTHY ALUMNI

Many noteworthy Botany alumni (some of the accomplishments of Tiffany and Sampson already noted) graduated from Eastern. A few will be highlighted here. Dr. Allyn Cook, who received his bachelor's degree in Botany in 1947, then received his M.S. and Ph.D. from the University of Wisconsin. He received the Distinguished Alumni Award in 1977 for his work as a professor of plant pathology at the University of Florida, where he researched virus and bacterial diseases and taught classes on diseases of tropical plants (The Leaf, 1977a). Cook is also the author of "*Diseases of Tropical and Subtropical Fruits and Nuts*" (The Leaf, 1977b). Dr. Franklin M. Turrell (B.S. 1929) received his M.S. and Ph.D. degrees from the University of Iowa. As a plant pathologist working at the University of California, Riverside, he published over 165 scientific papers and contributed to many books, including a chapter in Vol. III of *The Citrus Industry* (The Leaf, 1981). Professor Willard F. Yates (B.S. 1958) was the Acting Chair of Butler University's Department of Botany, and is known for having successfully cloned a staminate ginkgo tree. He was able to find the mix of chemicals and hormones necessary for ginkgo tissue to form a callus, which produces embryos and eventually produces the desired tree (The Leaf, 1987). Some noteworthy alumni from the Botany Department that received Ph.D.s include Philip Arnholt (B.S. 1963), a professor and Chair of the Biology Department at Concordia. Lloyd Loftin (B.S. 1950) is retired as President of Casper College. Jim Birchler did important work in maize genetics at the University of Missouri, and Richard Sikora is a professor at the University of Bonn in Germany.

Many alumni used their field botany skills in Illinois. John Bacone (B.S. 1971) and Randy Nyboer (M.S. 1975) were two of five field representatives in 1975 working for the Landscape Architecture Department of the University of Illinois on a statewide inventory of natural areas (The Leaf, 1975). Bacone was the Director of the Division of Nature Preserves for the Indiana Department of Natural Resources. Nyboer helped to delineate and protect many natural areas. He was Head of the Endangered Species Protection Board and is presently in charge of the field portion for the continuation of the natural areas inventory (Ebinger, personal communication). Rick Phillippe (M.S. 1972) earned his Ph.D. from the University of Tennessee and worked at the Illinois Natural History Survey, where he is the curator of the herbarium. He also publishes extensively on the flora of Illinois (Ebinger, personal communication). Bill McClain (B.S. 1966) is a retired natural heritage biologist for the Illinois Department of Conservation, which is now the Department of Natural Resources. He published over 100 scientific and popular articles (Ebinger, personal communication) including a pamphlet on prairie restoration (The Leaf, 1984). Rick Larimore was a field botanist for the Illinois Natural History Survey. Bob Edgin works for the Illinois Nature Preserves Commission. Linda Kull (M.S. 1976) works for the National Soybean Lab. Larry Coutant (M.S. 1976) was a phycologist for the Illinois Natural History Survey for 10 years and now owns Prairie Heritage Seed Company. Janice Coons (B.S. 1975) was elected as a Fellow of the Illinois State Academy of Science in 2008.

BOTANY CLUB

The Science Club was created on Eastern's campus on January 31, 1931 (The Warbler, 1931). In 1935, the Zoology Seminar was formed as a branch of the Science Club (The Warbler, 1935). The Science Club and Zoology Seminar served Eastern through World War II and held the interests of the science students (Lulich, 1990). From the interest in Science Club, came the Botany Club in 1949.

Botany alums know that a historical account of the Botany Department at EIU would not be complete without talking about Botany Club. The Club started in 1949 and was a central part of the Botany Department. The club is still very active today, and is one of the oldest recognized student organizations on Eastern's campus. The Botany Club at Eastern Illinois University has a prosperous and extensive history. Since its formation, its ultimate purpose was to serve those who share a common interest in the botanical sciences (Lulich, 1990). The Botany Club had no dues, no constitution, and no bylaws when it first started (The Warbler, 1953). It was the sheer interest of students that was the driving force behind organizing a Botany Club (Lulich, 1990). A voluntary contribution was taken at meetings to help cover the cost of refreshments (The Warbler, 1953). In the early days of Botany Club, most student members were majoring in Environmental Biology,

Botany or Zoology. The Botany Club, as it does even today, also welcomed anyone not affiliated with the sciences to attend the meetings and participate. In fact, the Botany Club president from 1973-1974, Bob Gerling, was a history major (Crofutt, 1967). As an officer of Botany Club, students developed their public speaking, organization and time management skills by running the club, while making new friends in the process. Botany Club officers pursued great careers and exercised leadership qualities within those careers (Lulich, 1990) In large part, the success of the Botany Club is due to Laurence Crofutt, who was the faculty advisor for the Botany Club for 25 years, from 1968 to 1993. Due to Crofutt's dedication, many of the traditions that were present during the early years of Botany Club are still in existence. "The goal of the bi-weekly meetings is to have speakers that were technical, but not over the heads of students," remembers Crofutt. He also recalls that the speakers were all people that Botany Club officers had chosen, and usually they focused on what sorts of job opportunities were available for botanists. Before the presentation, the Botany Club officers and advisors have developed a tradition of taking the speaker to dinner which is a great way for the students to make professional connections and talk in detail about the subject of botany. At the meeting, popcorn and lemonade have been served as the refreshments of choice since at least the 1960's. In 2005, this tradition was expanded with the appointment of an official Baker, as one of the club officers. If students are interested in getting involved in the Club, they can come early to help make lemonade and cook popcorn to put in the Botany Club's heavy crockery ceramic bowls, or stay late to help clean up. Since there are no membership dues and free food is offered, seats fill quickly and more seats often are required.

To build friendships and raise money, the Botany Club has a wide variety of fundraisers. In the past they sold carnations. The Botany Club would buy them at wholesale and deliver them on Valentine's Day. However, they made the bulk of their money selling soft drinks or water. They owned and stocked their own vending machine, which was the only one in the department. The Club once sold a cookbook with botany club members' favorite recipes. Nowadays, the Botany Club sells homemade caramel apples and spring bulbs in the fall, homemade candy bars in the early spring, and native plants in the spring. Another favorite Club activity to raise money is to have a Botany Club T-shirt design contest. Once the design has been chosen, shirts are printed and sold for just slightly over cost.

The Botany Club is a very social group. In the past as well as the present, many picnics and camping trips are held. Whether it is a fish fry at Fox Ridge State Park or a potluck at the campus pond, a great deal of interaction occurs between students and faculty, and students are always willing to advise newcomers about what professors to take. The camping trips that the Botany Club have taken play a major role in building the field botany program. The Botany Club had an extensive assortment of camping equipment— everything from rain ponchos to wash basins. Whenever other school sponsored groups, including the summer study abroad programs, went on trips, they borrowed the equipment of Botany Club. One camping trip that the Botany Club still maintained through 2007 was an annual trip to the Smoky Mountains after the spring semester. Crofutt led this trip for 25 years. Every year, he claimed that he would never do it again, but then he would see students that had never seen anything beyond Charleston and he would prepare for the next year. For students who had never camped before, the club had plenty of extra supplies. While nobody knows for sure when the club starting going to the Smoky Mountains, Dr. John Speer, a botany professor, spoke of going as a student in 1958 (Crofutt, personal communication). The Club created a song book for nights at the camp fire.

Today, the Botany Club has a constitution and a large slate of officers ranging from the traditional positions of president, vice-president, secretary and treasurer, to a baker, a public relations person and a trip planner. A few things have changed for the Club as we use plastic bowls instead of the ceramic ones. The work of the students and their advisors has kept the Botany Club active and popular. The current faculty advisors are Nancy Coutant, Janice Coons and Barbara Carlsward.

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Books Reviewed In this issue:

Pollen Terminology: An Illustrated Handbook. Hesse, M., Halbritter, H., Zetter, R., Weber, M., Buchner, R., Frosch-Radivo, A., Ulrich, S. 2009, ISBN: 978-3-211-79893-5 (Cloth US$349.00) 263 pp. Springer-Verlag GmbH, Sachsenplatz 4-6, 1201 Vienna, Austria.

This is a beautifully illustrated, wonderful book that will serve as an important text and reference on pollen terminology for years to come.

The book is laid out in four parts. Part one, the "General Chapter," contains an introduction to and discussion of pollen terminology. The "Illustrated Glossary" is the largest portion of the book and contains both a textual and illustrated glossary of terms. The "Alphabetic Glossary" is an alphabetical list of terms and their definitions, keyed to the pages of the Illustrated Glossary. The last section is the "Annex." The Annex contains bibliography and an Index to Plant Taxa.

The General Chapters cover a basic introduction to pollen morphology and palynology, as well as a discussion of pollen development, preparation methods, and a discussion of the important issues of categorization, interpretation, and fuzzy terms. Although of very high quality overall, these chapters appear to have been written by different authors and are somewhat uneven in their presentation. With a few notable exceptions, the chapters provide an excellent introduction to palynology.

The book is beautifully illustrated throughout. Every page has at least one illustration. The illustrations are well placed in the text, and are extremely informative. Color is used appropriately to highlight important features, and as an indexing method. Each page contains a small semicircle of color that bleeds to the edge of the page and is thus visible when the book is viewed from the side. These colored half semicircles allow the reader to easily flip between the sections of the book.

My only complaint about the illustrations in the General Chapters is that it is sometimes difficult to determine which illustration goes with which portion of the text. The illustrations are neither numbered nor referenced in the text. It is up to the reader to make the connection between the illustration and the appropriate section of the text. This layout gives the book a beautiful visual appearance, but sometimes makes it difficult to determine which illustration goes with which part of the text. For instance, the chapter on pollen development contains a full page illustration of the stages of pollen development from the pollen mother cell stage through pollen germination. Small numbers next to each drawing in the figure are linked to numbers enclosed in square brackets in the text. This is the only place in the book where there is a direct reference between a figure and the text. Because of this, and because the illustration occurs on a different page from its first citation, the reader flounders for some time before making the connection between the citation and the drawing in the full-page figure. It is a small detail, but it mars the presentation of an otherwise extremely beautifully presented book.

One exception to the high quality of the introductory material concerns the discussion of pollen polarity and the orientation of the pollen grain in the tetrad. While the polarity of the grain is well explained with respect to tetrahedral tetrads, the orientation of the grains in planar tetrads is not directly addressed. Although it is not difficult for a well-trained morphologist to extend the discussion of tetrahedral to planar tetrads, students will likely have a great deal of trouble in this regard. This is a shame, because in most respects the book provides an excellent introduction to the subject. Similar problems exist with the explanations of aperture arrangement and how this arrangement relates to the position of the grain in the tetrad. These are difficult concepts to convey and the authors make a valiant effort to clarify them. My criticisms need to be seen in the context of the extremely high quality of their presentations. If I'm critical, it is only because the beauty of the presentation leads me to expect perfection.

The chapters on categorization, interpretation and fuzzy terms are important but are a bit superficial. A tremendous amount is known from cognitive psychology about the process of categorization. It is a tremendous oversimplification to reduce this knowledge to the statement "categories are artificial and always limited by an individual or collective convention, mostly not by nature." I heard almost exactly the same words from Rogers McVaugh when I was a young graduate student in 1975. We have learned a tremendous amount about the process of categorization since then. It's a shame that scientists who spend their lives in the pursuit of optimal categories know nothing of this literature. Still, what is presented in these chapters is very useful. The practical aspects of applying terms to pollen grains are thoroughly discussed and well illustrated. These chapters will be a real asset to anyone working in palynology.

The main part of the text is the Illustrated Glossary. Each page consists of a term, it's definition, and six images illustrating some aspect of that term. In some cases a term is illustrated on more than one page. Color is occasionally used to highlight a specific part of the pollen grain to which the term

refers. Six small boxes at the top of the page provide information on the images and the techniques used to create them. Three of these boxes are easy to interpret. LM, SEM, and TEM clearly refer to preparation techniques. Unfortunately, I was unable to interpret the coloring scheme used on these boxes and so do not know what information they provide about each plate. I was also unable to find a key to their meeting. The meeting of the other three boxes is more obscure. These boxes contain the abbreviations "mo," "ana," and "fnc." I am sure that important information is contained here, but I have been unable to decipher it.

The use of at least of six images to illustrate each term is important from a cognitive point of view. Some of the research in cognitive psychology that I referred to earlier has supported the idea that concepts in code two types of information. First, they encode information about a typical member of the class of objects to which the term refers. This is the aspect of concepts with which we are most familiar, and which is most often used when presenting information in texts. Besides information about a typical member of the class, concepts also encode information about variability. Certain experimental results can only be explained if this is true. The inclusion of a number of photographs to illustrate each term helps the reader form a more complete picture of the structure to which that term refers. He or she is able to study and encode the variability into their concept of the term. The use of multiple images is one of the strongest points of this book. For this reason alone it is a "must buy."

The images themselves are absolutely beautiful. They are technically perfect and illustrate the terms beautifully. The use of color to highlight important points on certain images is a big asset. For instance, the pseudocolpus of *Lythrum salicaria* is easily visible because it has been colored ocher. My only regret is that the authors did not use this procedure on more images.

All in all, this is a beautiful book and deserves a place in every university library, and on the shelf of any scientist with even a moderate interest in palynology.

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The Biology of Deserts. Ward, David. 2008. ISBN-13: 9780199211470. ISBN-10: 0199211477. (paper US$55) pp. 339. Oxford University Press.

"The Biology of Deserts" is the (lucky) 13th volume in Oxford University Press's *Biology of Habitats* series. It is an ambitious book, in which David Ward attempts to summarize and synthesize state-of-the-art ecology of desert plants and animals, including eco-physiology and evolutionary ecology. He cites papers published in 2008, as well as many other papers from this decade, which is quite a feat. This book provides a decent orthodox introduction to the literature. The book is nicely laid out in bite-sized pieces, with usually well-delineated headings and subheadings within each chapter, although a few of the headings sound vaguely like science fiction ("Evaders and evaporators"). The writing is accessible. Ward has done extensive, excellent ecological work in the deserts of southern Africa and Israel, which will be obvious to any reader.

This volume begins with the onerous task of defining deserts. It then launches into three chapters on abiotic factors and how plants and animals may have adapted to these factors. This is followed by four chapters on biotic interactions, including competition, predation, parasitism, mutualism, and food webs. Next is a chapter on larger-scale phenomena of biodiversity and biogeography. The book ends with a pair of chapters on human influences, desertification, and conservation.

While this book usually describes things that many desert ecologists know, there are some interesting and possibly seldom known facts interspersed. We usually think of desert or other terrestrial ecosystems as closed systems, but Ward cautions us that in coastal deserts, especially west coasts of the Americas and Africa, one of the major oft--forgotten inputs to the food web are marine life, such as terrestrial invertebrates feeding on marine algae or terrestrial mammals feeding on marine mammal carcasses. Another fun example is various *Bursera spp.* that squirt terpene resins from chewed leaves, squirting these in a syringe-like-fashion up to 1.5 metres, as a deterrent to phytophagous animals. However, some beetles in the genus *Blepharida* can disable this mechanism by investing 1.5 hours cutting the resin canals, even though they can then eat the leaf in 10-20 minutes! We also learn that endolithic lichens fix atmospheric nitrogen. Snails then eat the lichens, secreted rocks and all, thereby adding useable nitrogen to the ecosystem. While not botanical, we learn that some spiders avoid being eaten by rolling down dunes at rates of up to 2650 rpm and 1.5 m/sec.

The author's discussion of desertification has some conventionally bad aspects and some refreshingly

good aspects. I never understood why replacement of herbaceous plants by woody plants is bad, unless your criterion is based on utility to those who eat products of mammals. Vegetarians and especially vegans should have no problems with the transition from herbaceous to woody vegetation in deserts. Ward also claims that one of the primary reasons for increase in desert fire intensity and frequency is encroachment of woody vegetation. While this may be true in Israel or southern Africa, in the Americas, the major new ecological fire risk is fast-burning exotic annual grasses. Woody plants are not always bad for deserts and herbaceous plants good. To his credit, Ward highlights that woody vegetation is advantageous insofar as it provides a larger carbon sink than herbaceous vegetation, which is no trivial matter in an era of accumulating anthropogenic carbon dioxide accumulation.

While this book starts with the famous quote from Dobzhansky that "Nothing in biology makes sense except in the light of evolution," the only evolution discussed in this book is adaptation and selection. Other evolutionary forces are undoubtedly important, especially in deserts. Kevin Ross (2006; *Evol. Ecol. Res.*) showed that fossorial animals incur higher mutation rates due to radon build-up in their burrows, while I hypothesized that cactus evolution is much more driven by drift than selection (2009; *Bradleya*). By contrast, as an example, Ward invokes the following adaptation-centric trichotomy of seed dispersal in plants: adaptation for long-distance dispersal (telechory), adaptations to prevent dispersal (antitelechory), and lack of adaptation for dispersal (atelechory). The closest this book comes to mentioning drift or mutation is a brief mention of effective population size in the final chapter on conservation.

Ward does an exemplary job juggling both plant and animal ecology, as well as deserts at opposite ends of Africa. He is human and can only have so much breadth. So it should not be too surprising that he errs slightly with details when discussing North America. He uncritically accepts an age of over 10,000 years for some clones of creosote (*Larrea tridentata*). He uses long-outdated nomenclature for the barrel cactus *Ferocactus acanthodes*, which should be *F. cylindraceus*. Juggling both plants and animals may have also resulted in using an outdated family name for his native species of *Aloe* (Liliaceae vice Asphodelaceae). For reasons I do not comprehend, he classifies *Aloe* (African) as a leaf succulent and *Agave* (North American) as a stem succulent, despite *Aloe* having the more arborescent forms of these two woody monocots. I was also befuddled by his comparison of supposed convergent evolution of *Aloe* and *Yucca*, two closely related monocots, with convergent evolution of cacti and euphorbias, two distantly related eudicots. Despite these foibles, his broad-brush views of desert ecology seem to reflect consensus views.

One curiosity that Ward mentions several times throughout this book, always matter-of-factly, is that all desert ecosystems are nitrogen-limited, except for Australian deserts that are phosphorus-limited. This will stoke up both the 'nitrogen nuts' and 'phosphorus fanatics' in the ecological stoichiometry debate (apologies to my friends and colleagues involved in this debate). My naïve guess is that much less stoichiometric work has been in Australia and those working there simply have a predilection towards the phosphorus side of this ongoing debate. That said, I hope more people test the idea that Ward puts forward of Australia's old flat geography driving phosphorus limitation.

Unfortunately this book suffers from inconsistent editing (maybe something to do with lucky 13?). Here, I provide a short list of these problems, which appear throughout the book. Many of the data plots fail to show significance levels, e.g. standard error, correlation coefficient, p-values, overall F-statistics. One cannot therefore discern whether the purported results are valid, forcing readers to go back to the primary literature. There is no detailed table of contents, despite the nicely numbered subheadings in each chapter. And some of the subheadings are downright misleading. Subsection 4.1.1. titled "snails" actually covers snails, frogs, birds, spiders, squirrels, termites, and marsupials. Many of the photos are poorly enough reproduced to be of no use. Too many captions are careless and/or incomplete. On figure 5.20, the x-axis labels are cropped, deleting the bottom half of all subscripts. Abbreviated versions of binomials are used, even when the genus name was last used and spelled-out 30 pages earlier, e.g. *Boscia albitrunca*. This editorial deficiency severely detracts from an otherwise good, overview textbook.

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Did you know - -

The *American Journal of Botany* is one of the 100 most influential journals over the last 100 years in the field of Biology & Medicine, based on the recent survey by the BioMedical & Life Sciences Division (DBIO) of the Special Libraries Association (SLA).

Lost Worlds of the Guiana Highlands. McPherson, Steward. 2008/ ISBN 978-0-9558918-0-9 (Cloth £29.99) 385 pp. Redfern Natural History Productions, Poole, Dorset, England.

Lost Worlds of the Guiana Highlands arrives as one of several recent books from Stewart McPherson. While the book is self-published, the author is very highly respected among botanists specializing in carnivorous plants, and he had the book read by several of the best known experts in this area before its publication.

"Lost Worlds" refers to the tepuis, the table mountains of eastern South America which are mostly found in Venezuela, Brazil, and Guiana. They are the only remains of the ancient Guiana Highlands, a plateau once several thousand feet higher than the current surrounding gran sabana lowlands. The tepuis generate their own weather, with very frequent rains generating impoverished soils and a carnivore-rich flora to survive there. In addition, there are many unique animals accompanying the plants, including the world's most primitive surviving frogs, which are unable to hop. Because their sides are nearly sheer, it is conceivable that no human walked the summit of any tepui until the 19th century. The mysterious allure of the tepuis led Arthur Conan Doyle to set his cryptozoological tale *The Lost World* on top of a tepui.

Throughout, McPherson provides a very much in-depth perspective on every aspect of the tepuis, including their geology and history in addition to the details of their flora and fauna. From the point of view of carnivorous plants, the tepuis host most of the species of *Heliamphora*, the third genus of the Sarraceniaceae and the only genus of that family not found in North America, along with some of the most difficult-to-cultivate species of *Utricularia*, such as *U. campbelliana*.

Perhaps the greatest strength of *Lost Worlds*, besides the detailed accounts provided by the author and reference to very rare primary sources from the 15th century on, are the photographs. McPherson is a master photographer, and images such as scarlet-colored Jasper Creek (pp. 186-188) would alone make the book worth buying.

Who should buy *Lost Worlds*? It belongs in all college and university libraries as well as the professional libraries of botanists working in any of the fields on which it touches. In addition, the unique and thrilling nature of the place and the plants combined with the stunning images should make any botanist salivate at the prospect of owning a copy.

Finally, it should be mentioned that McPherson shares the proceeds from his books with organizations dedicated to the conservation of rare plants, especially carnivorous plants. For an example of the work supported, readers should look at *www.pitcherplant.org* and follow the link to the Joseph Pines Preserve. Buy a copy today!

-Douglas Darnowski, Department of Biology, Indiana University Southeast.

If your department has produced "A History of the Botany Department...." please feel free to forward a copy to the BSA office which can serve as an archive and repository for botany throughout the country.

If you're interested in submitting a brief, previously unpublished history of your department to the Plant Science Bulletin, please let me know.

-The Editor

Science and the Garden: The Scientific Basis of Horticultural Practice. 2nd edition. Ingram, David S., Daphne Vince-Prue, and Peter J. Gregory (eds.). 2008. 350 pp. Published for the Royal Horticultural Society by Blackwell Publishing, Oxford, U.K.

As promised in the foreword, this book deals more with "why" than "how." That is, why do plants grow, reproduce, and respond to the environment the way they do, rather than how a gardener can cause plants to grow or respond in a particular manner. *Science and the Garden* addresses science in the garden more than it provides science for the gardener. It is aimed at (and will appeal more to) students of horticulture rather than to gardeners wishing an overview of plant biology. That said, as a botanist, gardener, and teacher (and, in the interest of full disclosure, co-author of Timber Press's *Ecology for Gardeners*), I enjoyed much of what I read.

The text covers a great deal of plant biology, from anatomy and physiology, to genetics and ecology. Yet the emphasis is sometimes confusing. Mitosis and meiosis are addressed in detail in the chapter on plant breeding (not the chapter on reproduction), yet alternation of generations is explained under reproduction. We learn of the distinction between

somatic and germ cells in reference to the germ line, yet the text does not point out that in plants, germ lines are not sequestered – of great importance to plant development, evolution, and plant breeding. Some sections flow better than others. I appreciated the chapter on light and water, especially some of the "why" in that section. Why are stomates spaced as they are? In part, due to the diffusion rate of water. Why do plants close stomates even though this affects their ability to take up carbon dioxide? To avoid wilting, of course, but also because closing stomates limits water loss more than it limits carbon dioxide uptake. This book covers a lot of ground, but it's not always obvious in which section a given topic is addressed. There is also a great deal of "see above" and "see below," perhaps a result of it being a multi-author, edited volume.

Some particularly challenging topics, for example, the red/far red balance, the effects of blue light, and C4 and CAM metabolism are treated well, while other subjects are addressed in too much detail. The book has a comprehensive glossary and a helpful index. The writing sticks pretty close to the facts, yet I did enjoy occasional light moments. In addressing the practice of double digging, we are warned that "apart from its virtue as a form of exercise and a good reason for being out in the fresh air on a bright spring morning, it is vastly overrated." I couldn't agree more!

Science in the Garden is nicely illustrated, including over 100 photos with well-written, helpful captions. The book's 50+ tables usually (though not always) enhance the text and photos. North American readers will quickly learn this is a British text that is unapologetic in its focus on British gardening. True, plant hormones, light, and meristems do not behave differently in Britain than in North America or Asia, but virtually all publications, product names, public gardens, and professional organizations mentioned in the book are British.

Later chapters move onto more practical topics, such as seed germination, propagation, and ways to deal with pests and weeds. In the chapter titled "Controlling Undesirables," practical but rarely heard advice is offered: "Sometimes the damage caused by weeding is greater than that caused by the weeds themselves." Gardeners looking for a "how-to" book, though, should look elsewhere.

Few readers will wish to read this book cover to cover, as I did. But for gardeners or plant biologists who want a readable, illustrated reference, this is a good place to turn.

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A Zapotec Natural History – Trees, Herbs, and Flowers, Birds, Beasts, and Bugs in the Life of San Juan Gbëë (by Eugene S. Hunn). The University of Arizona Press, Tucson. 2008. ISBN 978-0-8165-2617-8

Aviso: Though I am not an ethnobotanist, I am very interested in the subject, and have served on a number of graduate committees of students doing ethnobotanical projects. Recently, as a parent of a 7th grader attending Secundaria in Veracruz state, Mexico, I have been exposed to a lot of new information on indigenous languages and cultures. For this reason, I offered to review this book about the Zapotecs in Oaxaca, a state with much more indigenous peoples than most of the rest of this big country.

Professor Eugene S. Hunn has written a beautiful book about how the people of San Juan Gbëë regard all the other living things around them, and how they use the vast majority of these things for food, medicine, or a combination of the two. The book is beautifully illustrated, but unfortunately, not many of the illustrations are actually in the book itself; rather they are on a companion CD that comes in a pouch inside the back cover. In this way, the author could add many essential tables and figures that the publishers no doubt deemed excessive. Yet many of the tables referred to in the text would be much nicer to have in hand, rather than have to use the computer to see. The photos are beautiful, in color, very clear, but I would really like to have seen more of them in black-and-white versions in the book itself. Professor Hunn writes vividly of the personalities and actions of his friends and informants, and I think the reader's appreciation would be greater with a photo every few pages, at least. But these are the challenges of publishing in the modern world! A very nice aspect of the CD inclusion is there are a number of sound clips of church bells, dawn chorus of birds, and some popular songs, which are all very evocative.

Hunn is an emeritus professor of anthropology, and consequently paid a lot of attention to the language of the people and its relation to Spanish and other languages. Sometimes this provides evidence of where the knowledge of use of plants originated. The use of "hot" and "cold" to categorize foods and the medicines that can ameliorate various health conditions in the indigenous cultures has been viewed by many scholars as a streamlined version of the Old World system that originated in India more than 3,000 years ago, subsequently influencing thinking from China to the Mediterranean, and then on to the new world via Spanish priests. Other scholars (including Professor Hunn) think that a similar, but different, hot/cold classification arose

independently in Mesoamerica, and, rather than the indigenous groups being 'confused' about the classifications of diseases as hot or cold (as if they had misunderstood the Spanish priests), they were interpreting things differently on the other side of the world.

Hunn is a scholar, and places his work in the context of others who have studied indigenous peoples of Mexico and other parts of the world. He looks at the natural world through the eyes of the Zapotec, considering first the people and their knowledge (very impressive, from an early age the children know most of the plants and animals in their world). He then considers the town and its organization, and the influences they wield on the surrounding environment. Much of the text is directed to the naming of plants and animals (his love of language is evident), then chapters on the milpa (agricultural field), plant medicines, and flowers complete the book. Much of the information (what plant is used for what, for example) is found in tables on the CD, rather than in the book itself. The final chapter, entitled "The Children," is about the future of the village, reiterating the amazing abilities of young children to identify plants and understand their uses – what Hunn calls "precocious acquisition." He feels that the existence of these abilities in the young of the Zapotec provides evidence that there are innate predispositions to acquire such knowledge. Perhaps current curricular emphases on experimentation and theoretical discovery are "unnatural," and may be less likely to meet with success in children, who may have innate abilities for absorbing and retaining natural history knowledge.

I will use some of the insights gleaned from this book to guide some approaches to learning in my class "Nature Teaching," and it will also be useful in presenting material and conducting activities in our Local Flora class. I am glad I read A Zapotec Natural History. I liked this book and recommend it to anyone who is interested in how people use plants, and also to those interested in different ways of relating to the natural world.

-Suzanne Koptur, Florida International University, Miami, Florida
and
Fulbright Garcia Robles Fellow, Instituto de Ecologia, Xalapa, Veracruz, Mexico

Plant Biotechnology and Genetics: Principles, Techniques, and Applications. Steward, C. Neal Jr. 2008. ISBN 0470043814 (Cloth US$100.00) 374 pp. John Wiley & Sons, Inc. Hoboken, NJ (2008)

A good idea finally put into print. Over the years many of us have taught a variety of students, bits and pieces of the material and principles in this book. It seems that this is the first time it has been gathered together in one place, other than the internet, which is a rather diffuse medium. The editor, C. Neal Stewart, developed the ideas for this volume while preparing a capstone course for an undergraduate concentration within a plant science department. While there are many books on particular aspects of plant biotechnology, or plant breeding, or basic genetics, the editor notes that they are either too advanced in basic science, or too applied with insufficient basic science. This volume was developed to find a suitable balance.

One could work their way through this book in a year at a pace of one page per day. In a one semester course it would require somewhat more focus. But the pace is still only about one chapter per week of a typical semester. However, some of those chapters could be a very steep learning process for students without prior exposure. Of course many students should have had some course with a significant amount of classical genetics, and a course in biochemistry including some discussion of recombinant DNA, by the time they reach their last undergradaute year.

This book was developed for a specific context, with students drawn from the College of Agriculture at University of Tennessee, Knoxville. Many of their previous course experiences would be in courses related to horticulture and turf grass, forestry and agronomy. The listed pre-requisites for such students include only limited exposure to classical and modern genetics. So at the very least a good review of this area is essential. I am not sure it is possible to do it justice in less than 20 pages which is all that is allocated here. As it is, it feels a bit like the Reduced Shakespeare Company's production of the bard's works. If you know the originals you can appreciate the allusions, but otherwise it may simply be too little to spark your synapses. I also noted the old and erroneous claim that all seven traits studied by Mendel were on separate chromosomes. They were unlinked, but not all on different chromosomes. I'm sure specialists in other areas could find similar minor faults with most chapters. Some typos and grammatical infelicities could have been improved by a bit more extensive editing in a number of places.

With 25 coauthors to corrall, I'm certain Stewart had his hands full producing this volume in a timely

fashion. In general he has succeeded well. As a capstone course, the purpose is to look more broadly at the field than one would in a lower level course, so topics including regulations, field testing, intellectual property, controversies over transgenics, and "the future" take up a substantial fraction of the whole text, about the last quarter. Graham Brookes provides a useful introductory overview (14 pages) on "The impact of biotechnology", right at the beginning. Mary-Dell Chilton has a very interesting foreward to the book and at the end of the first chapter she and Norman Borlaug are featured in interesting short bio-sketches, of two pages each.

Stewart comments in the preface that he finds the bio-sketches one of the most interesting features of the book. I agree. Some of the subjects are very well known, for instance Gurdev Khush, of IRRI, and Ingo Potyrkus of "Golden Rice" fame (or notoriety depending on which continent you live.) Other pioneers, particularly those working in large companies, remain relatively unknown in the academic community, except in very narrow specialty areas. This book may help bring some measure of balance to that inequity. I hope it proves fascinating to students in biotechnology courses.

Although classical genetics gets (in my opinion) short shrift, Tinker's 30 pages on plant breeding helps compensate for that by discussing practical aspects of the implications of Mendelian genetics for plant improvement. Then, in a logical progression, plant development and physiology is briefly reviewed , tissue culture techniques are presented, and finally one reaches the level of "molecular genetics of gene expression". Each of these takes about 20 pages, while slightly longer chapters examine vectors, genes of interest, and use of markers and promoters. Transgenic plant production, and analysis, conclude the technical aspects.

Because the content of the previous chapters is all based on what might be termed conventional academic science, there exist myriad reviews of some aspects, often at a level readable by advanced undergraduates. That is much less true of the materials in the last quarter of the book, dealing with social aspects of GMOs. Having written acouple of review articles in this area, I am aware of how difficult it is to find accurate, readable discussions.

McHughen has written a clear, concise description of regulations and biosafety issues with GMOs. He describes some important differences in current regulatory approaches, as well as providing a good short history of how regulation evolved in the U.S. International perspectives and the many controversies that plague introductions into the EU countries receive relatively little discussion. Bartsch et al have a very nice clear example of how field testing of transgenic plants is actually done, discussing Bt maize in Germany. Then Bennett et al discuss some of the intellectual property issues that surround efforts to implement genetic engineering of plants. As a case study they examine a useful enzyme promoter found in tomatoes and show how a family of patents can produce a thicket that is difficult to navigate. They present an alternative strategy for open access, which should be of particular interest to academic researchers, and those working on "small" but important crops, where the patent thicket may make advances prohibitively complex and expensive.

Finally, Douglas Powell tackles the fear factor, examining the question of "why transgenic plants are so controversial". He does a credible job, but never mentions the precautionary principle. This is a major philosophical basis for at least the more rational responses to GMOs in Europe. There are quite a number of serious publications by serious people who legitimately claim this principle and explicate it. While it is a more conservative position, than is mine or Bennett's, it needs to be addressed directly, if we are ever to make headway in dealing with European concerns about biotechnology. Each instructor needs to consider what fraction of a course should be allocated to such societal concerns, but this seems a great opportunity to advance student's ethical thinking processes. This chapter, and the book as a whole, would be much stronger if greater recogition were given to this aspect of biotechnology.

In closing, Stewart and Ow take a look at "the future of plant biocechnology". As exemplars of future techniques, they discuss Cre-lox specific recombinases and zinc finger directed nucleases. In addition they mention a few interesting scenarios, such as restoration of the American chestnut through biotechnology, and all of the ramifications of such a reintroduction.

As an afterthought, or so it seems, the publishers have added a CD containing, in one file, all of the graphics from this book. Overall, the book has more than 150 illustrations. Perhaps half are not under copyright elsewhere. Many more could be found in the cited references, if needed for a class discussion. The CD would provide a convenient beginning for someone wanting to use this book fairly directly in a course for advanced undergraduates or perhaps beginning graduate students. I could also envisage this course taught in an intensive fashion over about three weeks during a summer session, to provide a common basis of experience for a cohort of students in, for instance, a Master's of Biotechnology program.

All chapters contain references, typically 20-30. Some range back to the 18th century but most are from 1990-2005, as would be expected. These would generally provide sufficient access to original literature for anyone with a desire to delve deeper. The book is well produced with a 16 page color insert tipped in at the middle, repeating black and white illustrations found elsewhere throughout the text. The color figures all have their original legends so it is possible to quickly find their appropriate locations. In many, thought not all, instances, the color is really essential to understand the illustration, as for instance when looking at multiple fluorescent probes of a single tissue.

I would like to take a shot at a course like this in my institution. This book would provide a solid basis for such an effort.

-Lawrence Davis, Kansas State University, Manhattan, KS.

Field Guide to the Sedges of the Pacific Northwest. Barbara L. Wilson, Richard Brainerd, Danna Lytjen, Bruce Newhouse & Nick Otting of the *Carex* Working Group. 2008. ISBN 978-0-87071-197-9 (paper, US$35.00). 432 pp., 650 color photographs + line drawings, Oregon State University Press, Corvalis.

Nobody knows the exact number, but there are about 1900 *Carex* species worldwide, including 480 known from North America. The book under review deals with 151 *Carex* and two *Kobresia* species known from Oregon and Washington. The core of the illustrations consists of original color photographs. Some drawings are from acknowledged earlier publications. All species are accurately illustrated by their perigynia, inflorescences, habits, and often also by their habitats. Point maps illustrate the distribution of each species in Oregon and Washington. The extensive identification key seems to be relatively friendly. Beginner botanists will appreciate introductory chapters on *Carex* classification and morphology. Updates on the key, text, and maps are available at http://www.carexworkinggroup.com.

I expect that this book will be used also in northern California and southern British Columbia. As I count them, out of 135 Californian *Carex* species, 96 (71%) are in this book. For the rest of the Californian species, one has to look at the beautiful drawings by Leslie Randall in Botti (2001)or photographs and drawings in Hurd et al. (1998). Also, out of some 142 *Carex* species in British Columbia, 80 (56%) are in this Guide. Several local manuals will have to be consulted for photographs and/or drawings of the remaining B. C. species. Taylor's (1983) book is still very useful.

Field botanists and wetland ecologists working in the Pacific Northwest will not make a mistake in ordering this book. The authors (*Carex* working group formed in Oregon in 1993) should be congratulated for this highly professional, beautiful Field Guide.

– Marcel Rejmánek, Department of Evolution and Ecology, University of California, Davis, CA 95616.

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Flora of China, Volume 7, Menispermaceae through Capparaceae. Editorial Committee for the Flora of China. 2008. Science Press, Beijing; Missouri Botanical Garden Press, St. Louis. xii + 500 pages. ISBN 978-1-930723-81-8 (hardbound). US $125; www.mbg press.info/.

For the convenience of specialists, it might be helpful to list the families that fall here, in the Cronquistian system: Menispermaceae, Illiciaceae, Schisandraceae, Magnoliaceae, Calycanthaceae, Myristicaceae, Lauraceae, Hernandiaceae, Papaveraceae, Cleomaceae, and Capparaceae.

It is impressive, the number of foundations, clubs, and individuals who are acknowledged for their monetary contributions to this volume, ranging from the National Science Foundation to Mr. William Tao to the Hillsborough Garden Club of Hurdle Mills, North Carolina. In this and in the other volumes of the series, there is a great deal of science and discovery, and much of importance to horticulture, too. The Magnoliaceae in the present volume are a good example; the point is made that all the species are ornamental and many are grown both in China and in the rest of the world. As for the

classification, the discussion makes it clear that on molecular evidence as well as morphology, the family is comprised of two subfamilies, Magnolioideae and Liriodendroideae, each of which is monogeneric: *Magnolia* and *Liriodendron*. Apparently, the authors could not agree, with the result that there is a nomenclator spread across four pages of all the names the plants would take if treated as *Magnolia*, followed by a key to twelve genera with all their appropriate combinations: *Talauma, Michelia, Oyama, Liranthe*, and so on. (It may be noted that the work by Frodin & Govaerts, 1996. World Checklist and Bibliography of Magnoliaceae, recognizes 7 genera.)

Within the nomenclator, there are embedded new names and new combinations. For example, *Michelia elegans* cannot be transferred intact into *Magnolia*, because the epithet has already been used for another species; hence, we have a nomen novum, *Magnolia elegantifolia* Nooteboom. This substitute name (on page 49) is **not** given in the synonymy of *Michelia elegans*, on page 90. Similarly, the nomenclator includes a new combination, *Magnolia guangdongensis*, based on *Michelia guangdongensis*; but the treatment of that species, under *Michelia*, says nothing about its name as a *Magnolia*. In the body of the text, there is but one *Magnolia*, the introduced *Magnolia grandiflora* of the SE USA, and under the treatment of the genus its range is given as entirely New World, with only 20 species, as if everything else on the subject of the generic limits of the genus had never been published. This is all very odd and unexpected in a flora. All the other family treatments are conventional.

The volume has a list (pages 451 and 452) of all the nomenclatural novelties in the volume; there are about 80 of these, about equally divided between *Corydalis* (Papaveraceae), which contains 357 recognized species in China alone, and *Magnolia* and its segregates.

Like all the volumes in the series (16), this one is marked by the close attention to details of format and organization that we've come to expect from the good people at Missouri Botanical Garden. There is even a precise date, 2 December 2008, in support of the nomenclatural items. Previous volumes that contain nomenclatural innovations are all precisely dated; volumes that lack these innovations are simply dated by year only. There are 8 more volumes of text yet to appear, including volume 25 (Orchidaceae) and volume 10 (Fabaceae).

- Neil A. Harriman, Biology Department, University of Wisconsin-Oshkosh, Oshkosh, Wisconsin 54901, harriman@uwosh.edu

Orchids of Western Australia. Brown, A. P. Dundas, K. Dixon, and S. Hopper. 2008. ISBN 9780980296457 (Hardcover) 421 pp. University of Western Australia Press, Crawley, Western Australia 6009.

In 1972 on a bitterly cold and windy winter day in a field just outside Perth, Alex George of the Western Australia Herbarium introduced me to the orchids of Western Australia (WA). He seemed oblivious to the awful weather. I shivered wishing we were inside in a nice warm room until he showed me a *Drakaea* flower with its amazing hinged insect-like labellum and explained why it is called the hammer orchid. He also showed me *Calochilus* flowers with their amazing beard-like labella, spidery *Caladenia* blossoms, mule- or donkey-like *Diuris,*- and several other species. On subsequent sunnier and warmer days we saw many more species while being besieged by the famously aggressive Australian flies. The shiny enamel-like flowers of -*Elythranthera brunonis* and *Elythranthera emarginata* interested us to the point of (legally) collecting flowers and drying them so that I could take them home to identify their anthocyanins (George et al., 1973; Strauss et al., 1974). –Thus, looking at the orchid paintings in this book was like seeing portraits of old friends.

Most "Orchids of . . . " books contain introductory chapters about the Orchidaceae. These chapters are not always impressive or even worth reading. The introductory chapter in this book is well worth reading because it goes beyond describing the family, its characteristics and the rules that govern naming of species. It goes into specific details regarding the orchids of WA. For example, one can learn from this chapter that Robert Fitzgerald (the author of a magnificent series of large early books on Australian orchids) found as far back as 1870 that *Thelymitra* species can self-pollinate and that pseudocopulation was first observed in *Caladenia barbarosa* in 1900. There are also specific details about coloration, nectar production, mimicry, odoriferous compounds, deception and many other details.

Paintings, more than 185 of them, are the centerpiece of this book. They are beautiful and a pleasure to behold. The paintings were originally painted life-size and reduced to fit the dimensions of the book (a scale and ratio indications are included). As a result I get the same feeling I had while looking at orchids in the WA field near Perth. This is nice and pleasant, but I found myself wishing for magnified drawings showing details the *Drakaea* labellum joint, *Caladenia* beard, *Microtis* and *Zeuxine* flowers, *Pterostylis* trap and *Dendrobium* spur. The absence of such details does not detract from the book, but having them would have greatly enhanced it.

Species descriptions are not as detailed as those in other "Orchids of . . . " books. There is information about the height of plants and number and size of flowers, but there are no details about the size of floral segments, leaves, pseudobulbs, and stem diameters. On the other hand, there is information about distribution and when species were collected for the first time. More details would have been welcome.

Rhizanthella gardeneri, the famed underground orchid of WA is the most interesting species in the book. Two pages are devoted to it. They contain interesting information. Those who wish to learn more should refer to a more extensive treatment elsewhere by one of the authors of the book (Dixon et al., 1990).

A glossary, an index and a list for "further reading" conclude the book. All provide welcome additional information for the interested.

Altogether, this is a beautiful and interesting work that can double as a scientific volume of value and a coffee table book of beauty. For me it was also a nostalgic reminder of an interesting, instructive and productive visit to WA, an old friend in the herbarium there, a companion of long ago, and a bitterly cold miserable day during which I had great fun flipping the *Drakaea* labellum.

- Joseph Arditti, Professor Emeritus, Department of Developmental and Cell Biology, University of California, Irvine, CA 92604-2834

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Tropical Trees of Florida and the Virgin Islands. T. Kent Kirk 2009. ISBN 978-1-56164-445-2 (paperback US$22.95) 208 pp., over 500 color photographs, Pineapple Press, Inc., Sarasota, Florida.

This field guide covers 90 tropical tree species that can be seen in Virgin Islands (V. I.). About 40 of them are introduced, cultivated, and some of them naturalized. Each species is properly described and illustrated by at least five color photographs of the whole tree, bark, leaves, flowers, and fruits. Species identification is facilitated by their grouping into nine blocks based on leave morphology. This book will be particularly useful in V. I. I suspect that the author's original intention was to produce a guide to trees of V. I. only, and Florida was later attached for commercial reasons. There are only a very few common native trees of V. I. that are not included in this guide (*Chrysophyllum pauciflorum, Cordia alliodora, Guazuma ulmifolia, Hymenea courbaril, Inga laurina, Schefflera morotoni*). However, there are many tree species native to tropical Florida that are not in this book. Besides 11 tropical tree species listed on p. 9, some other tropical trees of southern Florida are not included (*Annona glabra, Chrysophylum oliviforme, Sapindus saponaria*), as well as many more tree species that are not exclusively tropical. Among commonly naturalized species, *Schinus terebintifolius* should be covered. Also, two important sources could be listed on p. 205 (Barrett 1956, Tomlinson 1986). Nevertheless, this is a nice and useful book. Morphological descriptions of included species and data about their distribution are professional and accurate. Photographs are excellent. Price is affordable. All botanists interested in Caribbean dendroflora should get this guide!
-Marcel Rejmánek, University of California, Davis.

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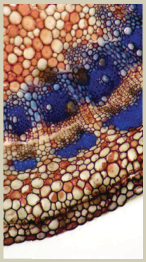

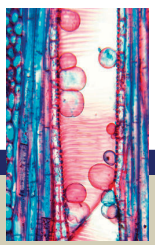

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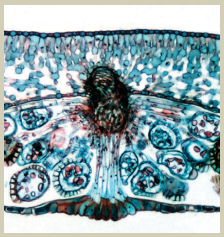

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