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Extraordinary, "Ordinary" American Botanists

Each of the past three issues of *Plant Science Bulletin* has highlighted one of the Presidents of the Botanical Society of America from the era of our 50th anniversary as a Society. In the current issue we add Adriance Foster. One of the goals of this "100th Anniversary Series" was to take advantage of the memories of some of the students and colleagues of these distinguished botanists who could provide some personal insight into the personality and character of these distinguished botanists that most of us know only by their reputation as researchers and frequently as textbook authors. I have found these articles to be fascinating and informative and I'm sure that many of you feel the same way.

But this is really only part of our heritage of distinguished and significant American botanists over the past 100 years. If you are like me, there was one, or maybe two, individual botanists who made a significant impact on your career – perhaps introducing you to botany as a potential career, or turning your path to a specific discipline, or serving as model of integrity and excellence.

If you would like to share a paragraph or two about a particular botanical mentor who had such an impact on you, please send it to me at psb@botany.org for a future article (or series) on the extraordinary, "ordinary" American botanists of the past 50 years.

-Editor

Adriance Sherwood Foster: An Academic Grandchild Remembers

"Don't you know, Stefan, the salient point is . . .." These words will always conjure up the memory of Adriance S. Foster to one of the authors (SJK), who had Foster as a professor for undergraduate classes at UC-Berkeley. SJK was privileged to take Foster's Plant Morphology course and his Plant Anatomy class the final time they were offered prior to Foster's retirement although he did not appreciate at the time how fortunate he was to be taking those classes. AMH was aware of Foster (and E.M. Gifford) as an undergraduate student only through their seminal textbook *Morphology of Vascular Plants*. However, she met Foster when she arrived as a graduate student at UC-Berkeley although by that this time he was already retired. Nevertheless, she asked him to be an examiner on her oral qualifying examination (more about this later). But who was this person that he made such a lasting impression on both of us?

Adriance Sherwood Foster was born on August 6, 1901 in Poughkeepsie, New York. He did his undergraduate work at Cornell University and received a B.S. degree in 1923. He then went on to Harvard University where he earned an M.S. degree in 1925 and a D. Sci. degree under the direction of Irving W. Bailey, the respected wood anatomist, in the Bussey Institution in 1926. The Bussey Institution was established under the Morrell Act with Harvard University in 1872 for research in agriculture and horticulture (1). Foster was a graduate student in the applied biology program, but was a "free spirit" (7), and followed his own research interests for this thesis—bud scales of woody plants. The results from his thesis were published in Biological Reviews in 1928.

Upon completing his degree at Harvard, Foster traveled to England on a National Research Council

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fellowship to do postdoctoral research with the renowned developmental physiologist, J.H. Priestly, at the University of Leeds (6). At the same time, F.C. Steward, who later would achieve botanical fame because he cloned an entire carrot plant from individual, cultured carrot cells, was working on his doctoral degree at Leeds. The two became friends, and later Steward would be influential in bringing Foster to Berkeley (7).

After Leeds, Foster took a position at the University of Oklahoma (1928-1934). It was here that Foster met Helen Vincent, who would later become his wife. Helen was working on her Master's degree at the University. During this time, Foster did research on foliar determination of hickory (*Carya buckleyi*); this work was published in the Oklahoma Proceeding of the Academy of Science and the American Journal of Botany. Foster was at the University of Oklahoma during the heart of the Great Depression. Adding to the economic desperation of the Depression was the local environmental catastrophe. Oklahoma was a drought-stricken dust bowl in the 1930's. For eight years, the winds blew and the rains failed, destroying crops, covering houses with dust, and making everyday life impossibly difficult for Oklahomans. Many of these, the so-called "Okies", drifted west to California looking for a new life away from the unending dust storms. Foster was a part of this exodus. George Cross, who eventually became the President of the University of Oklahoma, succeeded Foster in the plant anatomist position. Ultimately, Foster's doctoral student from Berkeley, Norman Boke, assumed the plant anatomy professor position at the University of Oklahoma (7).

Foster in 1954. Photo from M.S. Cave.

Steward, Foster's old friend from Leeds, was a postdoctoral researcher with Dennis R Hoagland, a plant physiologist, at UC Berkeley. Partly through this connection, Foster came to Berkeley in 1934 to a newly reorganized Department of Botany that not only included plant taxonomy, but also plant nutrition, cytology, and structure (2). Foster was the University's first plant anatomist (6). At Berkeley, Foster studied bud scales of *Ginkgo* (which he pronounced "Jin-Ko" much to the amazement of a young SJK), and thus began his seminal research on shoot apical meristems (SAM). When Foster looked at sections made through the SAM, he observed that some cells were extremely vacuolated whereas others were not. Previously, researchers had been interested primarily in following cell lineages and assumed that all the cells of the SAM were identical. The Ginkgo SAM was not homogenous in terms of cell types, and cell lineages

were not obvious. The different sizes of the cells, their cytoplasmic density, wall thickness, etc. all led Foster to use cytological characters to define the SAM. He was the first person to do this, and now his concept of zonation in the SAM not only has been validated, but also extended by the use of molecular

Foster in1936. Photo from the Bancroft .

markers to delimit the different zones.

His interest in meristems led him to Cuba on a Guggenheim Fellowship to collect *Microcycas*. San Pedro, a field biologist, who co-authored a publication with Foster in 1942 on their research in Cuba, took a picture of Foster next to the cycad in Cuba; the photograph can be viewed in *Morphology and Evolution of Vascular Plants* (p. 361, the third edition; 4). Foster was also interested in dichotomous leaf venation because this was considered to be an ancestral trait. He chose *Kingdonia* and *Circasester*, two herbaceous members of the Ranales. AMH and SJK remember Foster in his office on the second floor of the old Life Sciences Building, with jars of cleared leaves of these Ranalean species. Publications about dichotomous venation started in the 1950's and continued until the 1970's right before his death. Also, Foster's work on cleared leaves had an impact on other fields. He recommended their use in paleobotany, especially for studies of species composition, paleoecosystems, and paleoclimate, because more information can be gleaned from leaf venation patterns than just from leaf shape and size alone (http://www.ucmp.berkeley.edu/museum/ucmp_news/2003/8-03/leaves1.html). Many museums now house diverse collections of cleared leaves, which are mounted between pieces of glass or plexiglass for viewing by microscopy. From 1955-1960, Foster took on the responsibility of the chairmanship of the Botany Department during a period of expansion at UC Berkeley (6). At the same time, he and Gifford were working on the first edition of their book and Foster was teaching plant anatomy and morphology classes as well as doing scientific research. Foster always followed his instincts and interests rather than the current trends in his choices of research topics (6). As a consequence, he was much less well known than some of his plant morphologist/anatomist contemporaries although he served as president of the California Botanical Society in 1954 and Botanical Society of America in 1955 (6). He passed on his independent spirit to the doctoral students that worked with him, or jointly with him and Lincoln Constance. He also bequeathed his high standards and quality of workmanship. Over twenty Ph.D. students studied under his direction, many of them also became leaders in the field of plant structure: Herbert Wagner, Sherwin Carlquist, Ernest Gifford, Norman Boke, Ernest Ball, Howard Arnott, Donald Kaplan, and Fred Rickson, his last student.

In addition, Foster has had a lasting effect all of us who read his and Gifford's book in introductory plant biology courses. Where else is it possible to learn so much about living and extinct plants in one place? However, this book was not his first literary effort. His book *Practical Plant Anatomy*, first published in 1942, is a tour de force. This textbook, designed as a laboratory manual, was meant to bridge the gap between theory and observation. In addition to suggesting the use of many common plants as subjects for study, Foster not only described what was known about plant anatomy up to the time the book was published, but also asked the student to prepare detailed drawings and notes on the plant material (3). Many of the plants suggested for visualization of collenchyma (celery), sclereids (pear fruit or pea seed coats), and various tissues and organs of the plant are still commonly studied today.

Learning plant anatomy from *Practical Plant Anatomy* with Foster as the instructor was an amazing experience as SJK discovered when he was an undergraduate student. Foster had a deep interest in the differentiation of single plant cells. He was fascinated by idioblasts, which had a significant role in the first lectures and laboratories of the course. While Foster was a fine teacher, he would often not spell out where the path was leading, preferring the student to make the final connections. He would teach the steps along the path and the "Don't you know" (which we frequently didn't know)

would merely give tantalizing hints. He would always help the student along, but he would never spoon-feed them. Foster was the consummate scholar-teacher, receiving the Botanical Society of America's Merit Award in 1959.

Unfortunately, *Practical Plant Anatomy* was not illustrated, thereby leaving a niche open for an illustrated plant anatomy text that was. Katherine Esau, who is thanked by Foster in his preface for reading both the first and second editions of his book, authored *Plant Anatomy* in 1953. Her exceptionally well-illustrated text supplanted *Practical Plant Anatomy* and is considered even today as the "bible" of plant anatomy.

Back in the days when AMH and SJK were doctoral students at UC-Berkeley, one had to take an oral qualification examination no later than the beginning of the third year of graduate school. Unlike today's oral exams, which usually involve writing a grant proposal on some topic outside of the student's Ph.D. research, we were expected to study five diverse fields of plant biology and then to be asked detailed questions about them by five examiners. In addition, the Ph.D. advisor (in AMH's case, Don Kaplan) could not sit on the exam. Hence, AMH had to ask Foster to come out of retirement and sit as the examiner for plant structure on her committee. He graciously agreed to do so. About 90 minutes into the exam, Foster asked AMH a question about the differences between seed structure in gymnosperms and angiosperms and to draw them on the board. As she turned to the board and started drawing, all of a sudden she heard a yelp and smelled smoke. Apparently, Foster, who at that time was a clandestine smoker, had attempted to light a cigarette (these were the days when smoking in conference rooms was not verboten) and instead ignited the entire matchbook, slightly burning his fingers. As AMH turned, everyone on the committee was batting out the flames, and decorum was soon re-established. It was one of the shortest oral examinations on record.

Upon retirement, Foster pursued interests that he had not the time or inclination to follow earlier. He learned how to play the piano, often playing at departmental Christmas parties. He had a wonderful sense of humor and a twinkle in his eye. However, Foster died unexpectedly on May 1, 1973 before SJK and AMH finished their doctoral degrees. Just like grandchildren who, because of the age difference, do not know their grandparents very well, AMH did not really know Foster well before writing this article. Although she had read his book cover to cover and had the privilege of having him serve on her qualifying exam, she knew little about the depth and extent of his influence on research, teaching, and service. SJK was fortunate to have been a student in Foster's plant anatomy and morphology courses the last time he taught them, and hence had the opportunity to witness a dedicated teacher first-hand. Clearly, he has left a lasting impression on us… don't you know?

Ann M. Hirsch, Department of Molecular Cell, and Developmental Biology and Molecular Biology Institute, University of California, Los Angeles, CA90095. Stefan J. Kirchanski, Liner, Yankelevitz, Sunshine,and Regenstrief LLP, Los Angeles, CA 90024.

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News from the Society

Centennial Meeting *begins on 28 July 2006*: The Planning Countdown

The **BSA** Centennial Meeting Planning Committee began its work in autumn 2003. Now, with the help of the **BSA** Office staff and others, we are almost ready for the "**Meeting of the Century"** to begin.

We ***enthusiastically*** invite you to join us in recognizing over one-hundred years of service to the plant sciences community. It goes without saying, we are proud of our past and the people who have brought us to where we stand today. As a Society we look forward to playing an important role in the future of the plant sciences as we work towards fulfilling the mission of the **BSA**. To celebrate our rich heritage and to strengthen our collective vision, this Centennial meeting will include:

1) Betty Smocovitis' publication (going to press soon) and plenary talk on the history of BSA;

2) A specially-designed Centennial medallion to be given to each attendee;

3) Displays of historically-interesting items (if you have things you would like to share, contact Bill Dahl);

4) A recognition ceremony for prominent botanists;

5) Many symposia:
- A Century Of Wood Anatomy and 75 Years Of IAWA
- Botanical Cyber-infrastructure: Issues, Challenges, Opportunities, and Initiatives
- Bringing Together The Living And Dead: Integrating Extant And Fossil Biodiversity In Evolutionary Studies
- Ecological Responses of Bryophytes to Changing Climate
- Evolution, Ecology And Floristics In Northern California-Current Knowledge and Unexplored Realms
- Flora Of North America: Synergy With Other Botanical Projects
- Human Transformation Of California: Botany, History, and Sociology
- Hybridization As A Stimulus For The Evolution Of Invasiveness In Plants
- Land Plant Evolution: Phylogenetics and Beyond
- Lichens as Bioindicators of Air Quality
- New Advances in Fern Ecology
- Paleobotany in the Post-Genomics Era
- The Comparative - Phylogenetic Method Of Reconstructing Evolutionary History
- The Evolution Of Ericales: Recent Insights Using Both Morphology And Molecules

6) Field trips, socials, the banquet and special lectures;

7) Student Job Fair

8) A perspective on Botany from each of the Sections

9) A strategic planning session, "Looking to the Future, Conserving the Past" on Wednesday afternoon, August 2nd.

What is left to do? We **need** to remind everyone *that it is time* to complete their plans to attend the Centennial Meeting. *We look forward to being able to greet you in Chico*!

BSA Centennial Planning Committee
BSA Office Staff

Grady L. Webster Award

The Botanical Society of America is pleased to announce the formation of the **GRADY L. WEBSTER AWARD**, established in March, 2006 by BSA President (1983) Dr. Barbara D. Webster, and daughter Dr. Susan V. Webster to honor the life and work of husband and father, Dr. Grady L. Webster. The **Grady L. Webster Award** is a rotating award presented by the American Society of Plant Taxonomists and the Botanical Society of America in alternating years. Grady was an ASPT President (1982), BSA President (1993), and recipient of both the ASPT Asa Gray Award (2006) and the BSA Merit Award (1997). The American Society of Plant Taxonomists and the Botanical Society of America are pleased to join together in honoring Grady.
The BSA component of the award, the Grady L. Webster Structural Botany Publication Award recognizes the most outstanding paper published in the American Journal of Botany in the field of structural and developmental botany (i.e., anatomy and morphology) over a two-year period, or a book, monograph and miscellaneous publication of significant importance in the same field. The ASPT component of the award, the Grady L. Webster Plant Systematics Publication Award will be given in even numbered years and will represent the paper illustrating the most significant contribution consistent with Grady's own interests and focus in systematics. The first award will be given by the BSA in July of 2007 at the Chicago conference.

Grady is remembered as a person whose contributions has been truly monumental in the recent history of plant systematics and constitutes a massive body of work that rivals anything produced through the initiative and influence of a single individual. More importantly, Grady inspired young

people with his passion and energy for seeing plants in their natural habitat and his global knowledge of vegetation. He will be remembered for the importance of his contributions to our knowledge of tropical and subtropical plants; his infectious, wry sense of humor; and his warm and constant support of his friends and family

Notes From the Office

Botany 2006 is set to be one of the most significant botanical conferences in modern times. It will be a gathering point for plant scientists, bringing together a diverse group of botanists. This group will include members who were on the cutting edge of plant science before and during the Kennedy era, those who built on the foundations of the Society and kept it relevant during changing times. It will also include members who are on the leading edge of science today, those guiding the Society during a period where the plant sciences are becoming ever more important in providing solutions for man made problems. And of course, it will include those who will be the leaders of tomorrow. On behalf of the staff let me say we are looking forward to meeting you all in Chico! Have a safe trip and we'll see you in the golden state.

Please note: Chico will be warm, keep this in mind when planning your visit. For those flying into Sacramento and planning to use the shuttle bus to Chico, please ensure you have made your reservations (https://rce.csuchico.edu/botany2006/Registration.asp).

If we can be of any assistance or help in any way, please contact us. The BSA Office can be reached through bsa-manager@botany.org of by phoning 314-577-9566. Johanne can be contacted at johanne@botany.org or 614-899-9356.

Scientific Inquiry through Plants (Sip^3) continues to develop and take plants, scientific inquiry and scientists into classrooms around the country. We've been in 13 states, 14 different schools, worked with 17 educators and over 1,000 students. We continue to refine the student/teacher/scientist interface as we learn more about online science mentoring and we've made it very easy for you to take part. We now have over 60 scientist mentors participating in the project. The only person missing at the moment is you! To find out more about the Sip^3 project and to register to participate, visit the web site at http://www.plantbiology.org.

Membership renewal starts again in October. I'm aware the Summer PSB might seem a bit early to start mentioning renewal, so I won't. What I'd like you to think about over the summer is the development of new student members. There has never been a better time to encourage or support

Young Botanist of the Year - Certificate of Special Achievement

Name	University	Advisor
John C. Benedict	**Arizona State University**	**Dr. Kathleen B. Pigg**
Meagan Coneybeer	**Denison University**	**Dr. Warren Hauk**
Justin Cummings	**Eastern Illinois University**	**Dr. Scott J. Meiners**
Matthew Dumlao	**University of California, Davis**	**Dr. Judy Jernstedt**
Faiza Fakhar	**Miami University**	**Dr. Michael A. Vincent**
Veder Garcia	**University of Maryland College Park**	**Dr. Todd Cooke**
Scott Gevaert	**Saint Louis University**	**Dr. Janet C. Barber**
Keith Gilland	**Miami University**	**Dr. Carolyn Howes Keiffer**
Vincent Hustad	**Eastern Illinois University**	**Dr. Andrew S. Methven**
Alana Oldham	**Humboldt State University**	**Dr. Alexandru MF Tomescu**
Elizabeth (Ely) Huerta Ortiz	**University of California, Davis**	**Dr. Judy Jernstedt**
Michael J. Patterson	**James Madison University**	**Dr. Conley K. McMullen**
Melissa Schwind	**Miami University**	**Dr. John Kiss**
Dianne Velasco	**University of California Davis**	**Dr. Judy Jernstedt**

students in becoming BSA members. The benefits of a student membership so far surpass the minimal cost that it's scary to mention – award and travel opportunities, student discounts, meetings, peer development…. and the list goes on and on…. **Please think how you might involve more of your students in the activities of the BSA.**

BSA Science Education News and Notes

Welcome to a new section in the Plant Science Bulletin. Science Education News and Notes will encompass happenings about the BSA's education efforts and the broader science education scene. We hope you will look forward to, and perhaps contribute to, these quarterly updates.

Become a Leader in Plant Science Education

Looking for ways to become more involved in and better informed about science education? The BSA offers ongoing and annual opportunities. If you have an inquiry activity that allows students to explore a key concept in plant biology, the **Scientific Inquiry through Plants** program (www.plantbiology.org) welcomes your ideas. Join us for a special workshop to develop new inquiry units during the **5th annual Education and Outreach Forum** (July 29 & 30) in Chico, CA. The Forum promises to be informative and fun, with opportunities to share innovate ways to infuse plants across informal and K-16 formal education efforts. A highlight of the Forum will be keynote speaker Roger Hangarter, whose sLowlife exhibit and award winning Plants-in-Motion website (http://plantsinmotion.bio.indiana.edu) encourage a view of plants as dynamic, sensory organisms.

The 2006 Science and Engineering Indicators are Out, and We have Work to Do

"By the time U.S. students reach their senior year, the report states, "even the most advanced U.S. students perform at or near the bottom on international assessments."

"We know," concludes the National Science Board, "that there is a need to make drastic changes within the Nation's science and mathematics classrooms. If not, our Nation risks raising generations of students and citizens who do not know how to think critically and make informed decisions based on technical and scientific information."

National Science Board. 2006. *Science and Engineering Indicators 2006*. Two volumes. Arlington, VA: National Science Foundation (volume 1, NSB 06-01; volume 2, NSB 06-01A). Available online at http://www.nsf.gov/statistics/seind06/

Students' Understanding of Plant Biology

It is the first day of class. Your new students sit wide-eyed in their desks eager to deepen their understanding of plant biology. And you wonder, what prior knowledge they bring to your class. Two recent studies examine the ideas young learners (K-7) hold about plants. The U.S. and Greek students alike hold common misconceptions (or preconceptions): 1. plants require food from an outside source and 2. plants breathe carbon dioxide and oxygen. Do your students share these ideas about plant growth and photosynthesis?

Edible plants take center stage in a new text for students in grades 9-12. *Garden Genetics* features familiar foods in activities and inquiry-based experiments that integrate genetics, ecology, evolution, and social science.

Barman, C.R., Stein, M., McNair, S., and Barman, N.S. 2006. Students' ideas about plants and growth. *American Biology Teacher* 68(2): 73-79.

Marmaroti, P. and Galanopoulou, D. 2006. Pupils' understanding of photosynthesis: A questionnaire for the simultaneous assessment of all aspects. *International Journal of Science Education* 28(4): 383-403.

Rice, E., Krasny, M., and Smith, M.E. 2006. *Garden Genetics: Teaching with Edible Plants.* Arlington, VA: NSTA Press.

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.

How to Develop and Deliver Botany Workshops for K-12 Teachers

David W. Kramer
Asst. Prof. of Evolution, Ecology, and Organismal Biology
Ohio State University at Mansfield

D. Timothy Gerber, University of Wisconsin-LaCrosse, and I presented a "workshop on workshops" for the Forum at the 2004 meeting of the Botanical Society. Our goal was to help members fulfill that portion of *Botany for the Next Millenium* which urges us to support K-12 teachers. Both of us have planned and implemented teacher workshops and want to share what we learned. Our purpose is to encourage our colleagues to offer such workshops and to help them avoid some pitfalls. We also want to offer our teacher workshops as models.

An outline of the Forum "workshop on workshops" is at http://www.mansfield.ohio-state.edu/%7Edkramer/BSA_Wkshp_Agenda.html.

The site includes links to specific information about the teacher workshops both of us have presented on our campuses. It isn't too early to begin planning for 2007!

News from the Sections

Hello Development and Structure Section Members!

I want to call your attention to funding opportunities that are available for student travel to the Botany 2006 meeting. Students who are presenting papers in Development and Structure Section sessions at Botany 2006 or who are or have advisors who are members of the section are eligible for travel awards from the section. Applications for Development and Structure Section travel awards can be made via the Web at http://www.botany.org.
Please also note that Vernon I. Cheadle Student Travel Awards are available to students who will be presenting papers on topics related to development and structure. Applications for Cheadle awards also can be made via the Web at http://www.botany.org.
There are nine opportunities overall for student travel support listed on the BSA home page at http://www.botany.org. The new Conant "Botanical Images" Award sounds fun and interesting. Be involved to benefit!

Award applications are due on 1 May.
Current graduate and undergraduate students as well as graduate students who completed their degrees within the last year are eligible to apply for awards.

BSA Contact Information

All inquiries for the BSA Business Office should be directed to:

Executive Director: William Dahl and / or
Administrative Coordinator: Wanda Lovan

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Office hours are 7:30 am to 4:30 pm Central Time
http://www.botany.org/

President: Ed Schneider
<eschneider@sbbg.org>

All inquiries about the Botany 2006 meeting (and any other future meeting) should be directed to:

Mrs. Johanne Stogran, Meetings Manager.
Email: johanne@botany.org or
meetings@botany.org
Voice: 614-292-3519 Fax: 614-247-6444
http://www.botanyconference.org/

Announcements

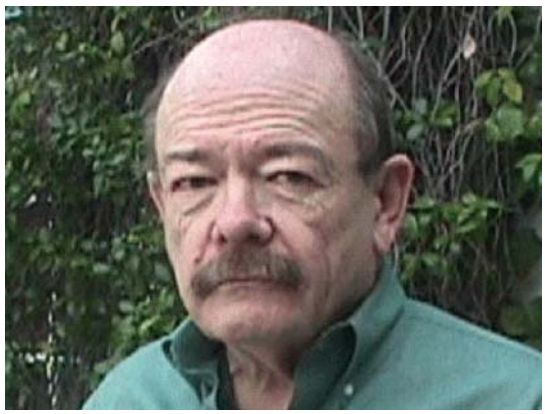
In Memoriam:

Jack A. Wolfe, 1936-2005. Paleobotanist.

On August 12th 2005 the world of paleobotany lost one of its greatest research minds of the last half of the 20th Century. Jack Wolfe was not only an extraordinary systematist with an encyclopaedic knowledge of angiosperm leaf architecture, but he went where few paleobotanists dare go; he ventured into the realms of multivariate statistics in pursuit of uantifying the relationship between foliar hysiognomy and climate. His ability to go well eyond botanical observation and description into using fossil leaves as tools for understanding nvironmental change through time has defined an rea in modern palaeobotany that has found pplication is fields as diverse as meteorology and crustal dynamics.

Born and raised in Portland Oregon, Jack Albert Wolfe attended Franklin High School where, with the encouragement of his biology teacher Anne Bohlen, he first developed his interest in palaeobotany. Anne was the adviser to the school Science Club and in 1952 she arranged a club visit to the fossil museum that Lon Hancock, a retired postal worker had made in his home. Lon was an amateur who had helped furnish localities and material to both Ralph Chaney and Chester Arnold, and was a founder of the Oregon Museum of Science & Industry (OMSI). Lon, under the auspices of OMSI, started a summer field camp in the John Day Basin of central Oregon. Looking for a research project to write up for the Westinghouse Science Talent Search, Jack attended the second year of the OMSI field camp and became fascinated with two classic alaeobotanical sites near the camp: the Clarno nut bed and the Bridge Creek leaf flora. Jack's project must have been impressive because, as one of 40 finalists, he won a trip to Washington and one of the contest judges, the Harvard astronomer Harlow Shapley, encouraged Jack to apply to both Harvard and Princeton. Unfortunately the application and scholarship deadlines had both passed, but still Shaply made encouraging noises. In the end Jack finished in the top 10 and went to Harvard in 1953 on a full scholarship.

At Harvard, Jack did his undergraduate research under the direction of botanist Elso S. Barghoorn and where for almost every day for 3 years Jack had unch and coffee with the group that included I.W. Bailey, Don Whitehead, and Margaret Davis, among others, and visitors such as Sherwin Carlquist. With the stimulation of such company and building on his avid collecting in the Pacific Northwest, Jack had his first paleobotanical publication only a year after being admitted to Harvard. It was on the Collawash flora of the upper Clackamas River Basin and appeared in the Newsletter of the Geological Society of Oregon. During the summers at Harvard Jack gained further field experience joining, on separate occasions, Roland Brown, Dallas Peck and J.F. Smith who were all with the US Geological Survey (USGS). In this way Jack gained a breadth of experience that went way beyond palaeobotany and saw him mapping Cenozoic volcanic rocks of the Cascades and Palaeozoic sedimentary rocks in Nevada.



In 1957 Jack began his graduate studies in paleobotany at Berkeley under Wayne L. Fry, A.S. Foster and Herbert L. Mason and in 1959 was awarded an M.A. in Palaeontology after writing a thesis on the Tertiary Juglandaceae of Western North America. At Berkeley, Jack was particularly influenced by J. Wyatt Durham, the mollusk/ echinoderm worker. Jack realised that mollusk workers had rigorous criteria for identifying their material and this prompted him to try the same approach with angiosperm leaves. With the encouragement of Adriance Foster (an I.W. Bailey connection) Jack starting leaf clearing in 1958 and by 1969 this had evolved into a project to survey modern dicots using cleared leaves. Eventually the USGS cleared leaf collection (now housed at the Smithsonian Institution in Washington) represented around 15,000 species and Jack had become, in his own words, "the largest herbarium beetle known to exist". His rigorous approach was one of the major foundation stones of modern leaf architectural analysis in fossil angiosperm leaf identification and comparative studies.

In 1960 (when still only 23) Jack completed his PhD dissertation on the early Miocene floras of northwest Oregon. This rapid academic advancement was achieved alongside reporting on referred fossils for the US Geological Survey under the supervision of Preston E. Cloud. Jack's industry was rewarded with a post that led him to being Research Geologist with the US Geological Survey, Menlo Park California. Jack remained with the USGS throughout much of his career, mostly at Menlo Park, but with spells in Washington DC (1961-65) and Denver (1982-1992).

In 1969 Jack produced his first major work on fossil floras: it was a synthesis of his findings on the Late Tertiary floras of the Pacific Northwest, which he published in *Madrono* in time for it to be handed out to attendees of the International Botanical Congress in Seattle that year.

In the 1960's Jack also began work on the Tertiary floras of Alaska. In publications with David Hopkins, Clyde Wahrhaftig and Estella Leopold, he presented a first cut on dating the younger floras of the Kenai Lowland as Late Tertiary. Before this biostratigraphic work, many prominent geologists considered the rocks of the Kenai Group as being of Paleogene age. Jack continued and produced in 1977 a monumental and thoughtful work on the Paleogene floras of Alaska and Wrangellia, which still stands as an exceptional monograph. One of the reasons it was so notable is that he established for the first time that truly subtropical floras existed as far north as 60° N. Lat.

Jack's primary role at the USGS was to use plant megafossils for biostratigraphic and paleoenvironmental determinations, but through his collaboration with Elso Barghoorn he also factored the pollen record into his deliberations. He not only undertook fieldwork himself, primarily in the western US including Alaska, but also identified material brought in to him by scores of geologists working throughout the United States. After a long and highly productive career at the USGS Jack retired to and adjunct position with the University of Arizona in 1992, where he remained an active researcher and, as at Berkeley, actively supervised research students, most of whom have continued working in paleobotany and have co-authored papers with him.

One of his important monographs, published in 1979, was the climatic analysis of the forest types in eastern China described by Wang Chi Wu in the 1960's. He adapted the quantitative comparison of mean annual temperature with seasonal range of temperatures in different forest types. It resulted in his development of nomograms that sketch out the climatic parameters of the forest types, not only for eastern China, but for eastern and western North America and Australia. His nomogram models are widely used by botanists today.

While Jack's reputation as a systematist and biostratigrapher will be remembered for a long time, probably his most innovative work was in quantifying the relationship between leaf form and environmental conditions, primarily climate. Following on from the pioneering work of I.W. Bailey and E.W.Sinnott, Jack recognised that leaf form is controlled by an interplay between the genotype honed through evolution and a spectrum of environmental factors. As early as the late 1970's he realised that the best way to decode the complex form/climate relationship was through multivariate analysis. He set about building and testing a unique database of foliar physiognomic characters derived from leaves of woody dicots growing in vegetation for which the climate (weather-station data) is quantified through long term observation. His rigorous collecting methodology incorporated the full observable morphological range rendering the approach remarkably robust in the face of taphonomic filters. The technique, which he named CLAMP (Climate Leaf Multivariate Programme), has found application not only in the North America and Japan where the calibration datasets have their origin, but in Russia, Europe, South America and New Zealand. Most spectacularly the technique yields data on enthalpy, a property of a parcel of air that can be used to determine paleoelevation. In recent years this approach has been applied to the uplift of Tibet and the Andes. However for some years Jack had an interest in the uplift history of the western US and it was here that he tested the technique, something he was still working on when he died falling from an outcrop in the eastern Sierras.

Jack always had an eye for detail and abhorred what he regarded as sloppy work. This, coupled with a tendency to be fairly brusque, a trait that he sometimes resorted to in order to disguise his innate shyness, led to feuds with some colleagues and he was a critical reviewer. Nevertheless those who became his close friends discovered a man of great intellect, loyalty, warmth and generosity.

Jack Wolfe is already sorely missed by his colleagues and students. We have lost a singular leader and scholar of paleobotany. We are privileged to honour his life by following where he led in the study of the major evolutionary and stratigraphic problems, and the relationship between plants and climate: areas of endeavour where Jack blazed an important trail.

Bob Spicer and Estella Leopold.

Personalia

The Rupert Barneby Award

The New York Botanical Garden is pleased to announce that **Rodrigo Duno de Stefano**, of the Centro de Investigación Científica de Yucatán A. C. (CICY), is the recipient of the **Rupert Barneby Award** for the year 2006. He will be studying the family Leguminosae in the Yucatan Peninsula Biotic Province (YPBP), Mexico. With about 60 genera and more than 260 species there, the Leguminosae are one of the most important plant elements of the Yucatan region. This study will also contribute to a revision of four legume genera for the "Illustrated Flora of the Yucatan Peninsula" (G. Carnevali, general editor).

The New York Botanical Garden now invites applications for the **Rupert Barneby Award** for the year 2007. The award of US$ 1,000.00 is to assist researchers to visit The New York Botanical Garden to study the rich collection of Leguminosae. Anyone interested in applying for the award should submit their curriculum vitae, a detailed letter describing the project for which the award is sought, and the names of 2-3 referees. Travel to the NYBG should be planned for sometime in the year 2007. The application should be addressed to Dr. James L. Luteyn, Institute of Systematic Botany, The New York Botanical Garden, 200th Street and Kazimiroff Blvd., Bronx, NY 10458-5126 USA, and received no later than December 1, 2006. Announcement of the recipient will be made by December 15th.

Anyone interested in making a contribution to **THE RUPERT BARNEBY FUND IN LEGUME SYSTEMATICS**, which supports this award, may send their check, payable to The New York Botanical Garden, to Dr. Luteyn.

Symposia, Conferences, Meetings

Integrating Evolution, Development, and Genomics

University of California, Berkeley
May 31-June 2, 2006

We are pleased to announce the first international U.C. Berkeley Integrating Evolution, Development and Genomics Conference May 31st through June 2nd 2006. This meeting is organized by graduate students and is inspired by the integration of evo-devo research programs at U.C. Berkeley. The meeting has been designed to be small in order to offer many opportunities for meaningful interactions between faculty, student, and post-doc attendees.

The meeting will include multiple non-concurrent symposia covering a wide range of evolutionary developmental biology topics, including paleontology, comparative morphology, and genomics. In addition to talks from the confirmed invited speakers listed below, additional, shorter talks and posters will be selected from submitted abstracts. There will also be lunchtime workshops, a dinner for speakers and students hosted by local graduate students at their homes, and receptions around the Berkeley campus.

To register for the meeting, or to submit an abstract, please visit www.evodevo.org. We would like to remind everyone that since conference attendance is limited, we encourage you to register as soon as possible. The registration and abstract submission deadline is April 14th.

We look forward to seeing you in Berkeley this spring,

IEDG 2006 Organizers

Confirmed Invited Speakers:

Patricia Beldade (Leiden University)
Anthony DeTomaso (Stanford)
Mike Eisen (LBL, U.C. Berkeley)
Greg Elgar (Queen Mary, Univ. of London)
Sarah Hake (U.C. Berkeley)
Jukka Jernvall (University of Helsinki)
David Lambert (University of Rochester)
Mike Levine (U.C. Berkeley)
Sally Leys (University of Alberta)
Chris Lowe (University of Chicago)
Jim Mallet (University College London)
Phil Newmark (University of Illinois, Urbana-Champaign)
Nipam Patel (U.C. Berkeley)

Richard Prum (Yale)
Dan Rokhsar (U.C. Berkeley)
Elaine Seaver (University of Hawaii)
Mike Shapiro (University of Utah)
Moya Smith (Kings College London)
Ulrich Technau (SARS,International Center for Marine Molecular Biology)
John Willis (Duke University)
Greg Wray (Duke University

Sponsors:

At the University of California, Berkeley:
Center for Integrative Genomics
Dept of Integrative Biology
Dept of Molecular & Cell Biology
Museum of Vertebrate Zoology
UC Museum of Paleontology
University and Jepson Herbaria

Extramural:
The Crustacean Society
Deep Gene Research Coordination Network

3rd International Orchid Conservation Congress and 2nd International Conference on Neotropical Orchidology.

This event, sponsored by the Orchid Specialists Group of the Species Survival Commission of the International Union for Conservation of Nature will be held March 19–24, 2007, in San Jose, Costa Rica. Organized by the Lankester Botanical Garden (University of Costa Rica) and the Charles H. Lankester Foundation, the congress will provide a forum for sharing knowledge, concerns, and hypotheses about the current status of orchid conservation worldwide.

The primary objective will be to broaden the spectrum of knowledge and instruments of conservation. We aim to include a broad base of professionals, both biologists and non-biologists, to analyze the factors that affect orchid populations and to suggest feasible strategies for conservation. The implementation of an International Agenda for Orchid Conservation will be reviewed and goals will be proposed to support the Global Strategy for Plant Conservation.

For further details see
http://www.jardinbotanicolankester.org/ing/congress.html.

Second Meeting of the International Society for Phylogenetic Nomenclature

Yale University
New Haven, June 28 – July 2, 2006

The Second Meeting of the International Society for Phylogenetic Nomenclature will be held at Yale University from June 28 to July 2, 2006. This meeting is an opportunity to discuss topics that pertain to phylogenetic nomenclature and the PhyloCode. In addition to providing a forum to contribute oral and poster presentations, this meeting will include three symposia with a number of invited guest speakers.

Contact Information
Nico Cellinese (Logistics and general information) and **Walter Joyce** (Program), Peabody Museum of Natural History, Yale University, 170 Whitney Avenue, PO Box 208118, New Haven, Connecticut, 06511, U.S.A. Email: nico.cellinese@yale.edu or walter.joyce@yale.edu

Registration

Registration is set at $165 for regular members and $70 for students who register by May 1, 2006. Late registration is $190 for regular members and $75 for students who register by June 9, 2006. On-site registration is $215 for regular members and $85 for students. To register, please go to www.phylocode.org and download the meeting second circular.

Opening Session
The conference will begin on June 29 with a lecture by **David Hillis** (University of Texas, Austin).

Symposia
Species
ORGANIZERS: **David Baum** (University of Wisconsin, Madison) and **Benoit Dayrat** (University of California, Merced)

SPEAKERS: **David Baum** (University of Wisconsin, Madison), **Julia Clarke** (North Carolina State University), **Benoit Dayrat**, **Matthew Haber** (University of California, Davis).

Implementing Phylogenetic Nomenclature
ORGANIZER: **Philip Cantino** (Ohio University)

SPEAKERS: **Paul Berry** (Washington University), **Philip Cantino** (Ohio University), **David Marjanovic** (University of Paris 6), **Paul Sereno** (University of Chicago)

Phyloinformatics
ORGANIZERS: **Michael Donoghue** (Yale University) and **Nico Cellinese** (Yale University)

SPEAKERS: **Michael Donoghue** (Yale University), **David Hibbett** (Clark University), **Mikael Thollesson** (Uppsala University). Additional speakers will be announced.

EVOLUTION OF THE COMPOSITAE: A SYMPOSIUM

BARCELONA, 3-10 JULY 2006

http://www.institutbotanic.bcn.es/compositae2006/

ORGANISING COMMITTEE

Randall J. Bayer, CSIRO, Canberra (Australia)
Vicki A. Funk, Smithsonian Institution, Washington (USA)
Núria Garcia-Jacas, Botanic Institute of Barcelona (Spain)
Marinda Koekemoer, National Herbarium, Pretoria (South Africa)
Christoph Oberprieler, University of Regensburg (Germany)
Santiago Ortiz, University of Santiago (Spain)
Alfonso Susanna, Botanic Institute of Barcelona (Spain)
Joan Vallès, University of Barcelona (Spain)

REGISTRATION

To register for the Conference, please complete this form and send it to the Technical Secretariat. The Secretariat will confirm the registration once payment has been received.

All those presenting a paper should register before 1st May in order to have the paper published.

Registration fees

	Before 1st May, 2006	After 1st May, 2006
Registration fee	300	340
Student fee (1)	100	130

(1) A certificate being an student will be require

Payment should be made by credit card on line. A 3% will be charged as bank expenses.

Cancellations

Before 1st May 50% of the registration will be refund

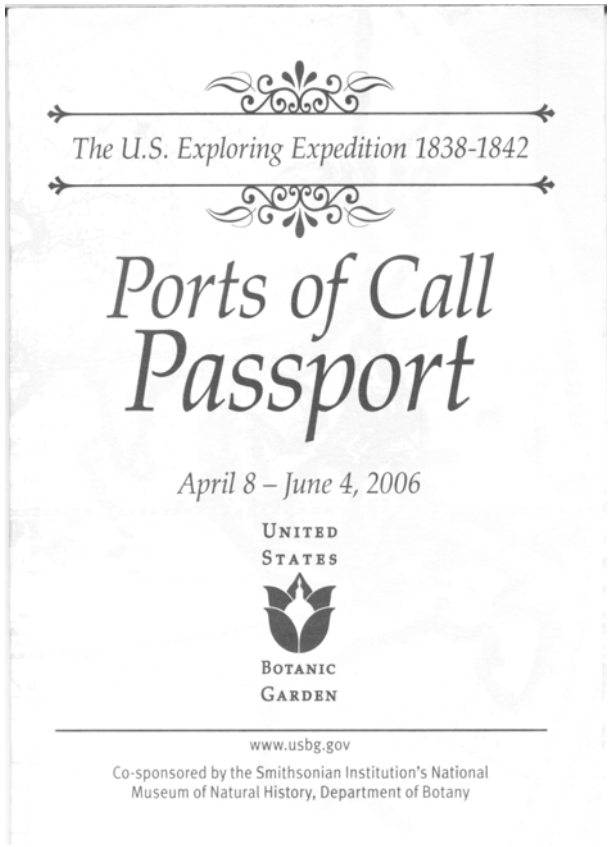
After 1st May there will be no cancellation refunds

Cancellations for the accommodation

Before 31th May 50% of the accommodation will be refund

After 31th May there will be no cancellation refunds

All the cancellation must be send in written to the Technical Secretariat of the congress: compositae2006@manners.es



53rd Annual Systematics Symposium
Missouri Botanical Garden
13-14 October, 2006

Impact of Peter Raven on Evolutionary and Biodiversity Issue in the 20th and 21st Centuries.

Organizing committee: Barbara Schaal, Paul Berry, Peter Hoch, Warren Wagner.

Friday 7:30 – 9:30 p.m. Informal mixer in Ridgeway Center.

Saturday 8:30 am-8:30 p.m. Symposium presentations.

Speakers and Titles of Talks.

Diane Campbell- -Pollinator Shifts, Pollinator Losses, and Floral Evolution.

Paul Ehrlich- - Saving the World (after-dinner talk).

Ulrich Mueller- -Coevolutionary Principles of Insect Fungiculture: Lessons for Human Agriculture.

Stephen O'Brien- -The Moving Landscape of Comparative Genomics in Mammals.

Christopher Pires- - Polyploidy and Chromosomal Evolution.

Barbara Schaal- - Differentiation of Populations: Gene Flow Redux.

Jun Wen- - Evolution of Major Patterns of Plant Disjunctions.

Registration must be accompanied by a $75.00 registration fee, which covers the cost of refreshments at the Friday mixer and lunch and dinner on Saturday. Information on local hotels and motels will be sent to registrants. No refunds will be granted after 28 September.

SPACE LIMITS REGISTRATION TO 400; PLEASE REGISTER EARLY

Registration Information

I plan to attend the Systematics Symposium. Enclosed is my $75.00 registration fee. Please make checks payable to "Missouri Botanical Garden." I enclose my registration fee of $75.00_____ I request vegetarian meals:_____

My name and professional address:

Phone Fax E-mail

Please indicate if you are a a) graduate student_____ b) undergraduate student___

Mail to: Systematics Symposium, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166-0299

Future information will be posted at http://www.mobot.org/MOBOT/research/symposium/welcome.shtml

Or contact
P. Mick Richardson.
Tel:314-577-5176; Fax: 314-577-0820
E-mail: mick.richardson@mobot.org

Positions Available

Plant Collections Manager (Manager of Scientific Collections, UCPEA VII)

Department of Ecology Evolutionary Biology

The Department of Ecology and Evolutionary Biology seeks a dedicated person to manage the botanical holdings in a state-of-the-art combined collections facility. The collections support teaching and research activities of the Department and scientific public. The successful candidate will organize and maintain the vascular and non-vascular plant herbaria and the paleobotanical collection and will identify, prepare, catalog and database preserved plant specimens and living arboretum specimens. The plant collections manager responds to requests from faculty and visiting scientists and shares responsibility for maintenance and operation of the combined collections facility with other collections managers. The plant collections manager maintains professional liaisons with curators at other institutions and assists other agencies with species identifications, status of rare and endangered species, etc. Other principal responsibilities are to manage all incoming and outgoing loans, maintain the botanical collections database and website, mount and label specimens acquired by the herbarium, curate the associated library, and perform related duties as required. This position also involves training of student workers and volunteers, preparation of public/instructional exhibits and facility tours, participation in a collections management seminar, processing of donations and exchanges and purchase of equipment and supplies.

Minimum Qualifications: M.S. degree in botany (or appropriate field); fundamental curatorial skills; knowledge of plant taxonomy and botanical nomenclature; excellent computer and organizational skills; basic knowledge of taxonomic databases.

Preferred Qualifications: Ph.D. in systematic botany or related area and prior experience in herbarium management; detailed knowledge of BG-BASE or similar electronic database; experience in data sharing initiatives (e.g., GBIF, RBGE multisite); detailed knowledge of modern curatorial standards and techniques; knowledge of standard loan protocols and specimen packaging; knowledge of image capture and manipulation.

The review of applicants will begin on May 15, 2006 and will continue until the position has been filled. Please send cover letter, resume and three letters of recommendation to: Dr. Don Les, Chair, Search Committee, University of Connecticut, Department of Ecology and Evolutionary Biology, 75 North Eagleville Road, Unit 3043, Storrs, CT 06269-3043.

Post Doctoral Position

Mechanisms of Pierce's disease transmission in grape vines.

A postdoctoral position is available working with a team of scientists studying Pierce's disease in grapevines at U.C. Davis. Our project is focused on understanding the plant-pathogen interactions that produce accumulation, movement, and systemic infection of *Xylella* bacteria within xylem conduits. We are especially interested the relationship of disease symptoms to water transport and the movement of bacteria downward and across impediments, e.g. pit membranes, transitions from primary to secondary xylem, and graft unions. A qualified candidate will have in depth knowledge of both plant anatomy and plant water relations. Experience with electronic interfaces between instruments and PCs, various forms of microscopy, and *in situ* techniques such as immuno-localization is preferred. Responsibilities will include the independent and/or collaborative design and development of experimental methods, the preparation of grants and scientific manuscripts for publication, participation in the maintenance of a collegial atmosphere in the lab, and the ability to communicate and work with a diverse group of scientists.

Position is available immediately.

CONTACTS: PROFESSOR THOMAS L. ROST, SECTION OF PLANT BIOLOGY; UNIVERSITY OF CALIFORNIA, DAVIS, CA 95616; PH. 530-752-0628; FAX 530-752-5410; EMAIL tlrost@ucdavis.edu

OR

Professor Mark A. Matthews; http://matthews.ucdavis.edu/home.html. Dept. of Viticulture & Enology; University of California, Davis, CA 95616; Phone: 530-752-2048; FAX 530-752-0381; Email mamatthews@ucdavis.edu

Award Opportunities

Grants in 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 similar institutions are eligible. The deadline for applications is August 15, 2006. For current guidelines, contact Thomas F. Daniel, Grants Director, SSHT, Dept. of Botany, California Academy of Sciences, 875 Howard St., San Francisco, CA 94103, USA (email: tdaniel@calacademy.org).

Other

Haseltonia

Haseltonia is the peer-reviewed publication of the Cactus and Succulent Society of America. It is published annually in full color and features papers on all aspects of cacti, succulents and their environs. Recent topics include new species descriptions, taxonomic revisions, conservation reports, biochemistry, cytology, anatomy and physiology, evolutionary biology, ethnobotany, pollination studies, propagation, and pest control. Serious students of cactus and succulent flora, taxonomists, horticulturalists, and botanical libraries will all find Haseltonia a valuable addition to their collection. We strongly encourage authors to submit their manuscripts on cacti or succulents to Haseltonia. There are no page charges, even for color figures. Haseltonia abstracts are indexed on Science Citation Index, Current Contents, and Garden, Landscape & Horticulture Index. URL: www.cssainc.org .

Root Gorelick, Editor (Haseltonia@asu.edu and Gorelick.Root@epa.gov)

Russell Wagner, Managing Editor (Wagner@lmi.net)

Other News

Botanical Research Reports 30 Endangered & Threatened Plant Species at the Franklin Parker Preserve

First time research conducted at Preserve in 100 years

CHATSWORTH, NJ, March 31, 2006 – A two-year study of plant life at the New Jersey Conservation Foundation's (NJCF) Franklin Parker Preserve by Brooklyn Botanic Garden (BBG) research scientists has identified 30 rare, endangered, and threatened species, or about 6.5% of the plant population. The 9,400-acre Pine Barrens preserve was purchased by NJCF in 2003 in the largest private land conservation acquisition in state history and is now managed jointly with the Department of Environmental Protection (DEP).

NJCF asked Brooklyn Botanic Garden to research the plant life on the property because of its expected habitat significance. BBG proposed a comprehensive survey of the plants and vegetation in order to identify the populations of rare plants that grew there allowing the Preserve to better manage the land. Dating back to 1880, botanists had reported that the site contained numerous rare plant populations, but for the past century research was not possible because the land was privately owned and operated as a cranberry farm.

Adjacent to 250,000 acres of state preserved lands, the Franklin Parker Preserve is home to sandy roads that wind through pitch pine forest, blueberry fields, shallow lakes and pristine streams. The Franklin Parker Preserve contains some of the most beautiful wetlands in the Pine Barrens and provides critical habitat for many unique wildlife species, such as the Pine Barrens Tree Frog, in addition to the now documented rare and threatened plant species. The preserve also filters rainwater that feeds into the Kirkwood-Cohansey Aquifer, which is essential to protecting the pristine quality of 17 trillion gallons of underground water. The preserve includes the headwaters of the West Branch of the Wading River watershed, which is known for having some of the rarest and most unique plants in the U.S.

"We knew this was a special property," said Emile D. DeVito, Ph.D., NJCF Manager of Science

& Stewardship. “But we had no idea how many critical species would still occur on the property after all these years. This research is important because it identifies critical natural resources and makes recommendations for managing the property to protect them.”

Dr. Kerry Barringer, Ph.D., Curator of the BBG’s Herbarium, conducted most of the research visiting the preserve every week from May through October of 2005. Barringer was assisted by Dr. Gerry Moore, Ph.D., BBG’s Director of Science. Moore grew up in southern New Jersey and is an expert on the Pine Barrens. In a recent report to NJCF, BBG scientists noted that approximately 465 species of plants are now known to exist on the Franklin Parker Preserve, 30 of which (6.5 percent) are currently recognized as rare, threatened or endangered in New Jersey by either the Natural Heritage Program or the Pinelands. “This percentage of rare plants is extremely high and is especially remarkable considering the high plant diversity in the preserve,” said Barringer.

“For a botanist, this project is a tremendous opportunity to study an extraordinary ecosystem. The preserve is right in the middle of the Pine Barrens, which is recognized worldwide as being a unique place to study plants. Further, because the property was in private hands until fairly recent, the historical records and plant inventory for the preserve were previously unavailable to scientists. Through this collaboration, we were able to search through these collections and plant records.” Subsequently, the botanist used these old records to help guide the fieldwork. Barringer explained, “It was extremely rewarding to help provide part of the data that the Conservation Foundation will use to restore parts of the preserve where these species occurred.

BBG’s Moore added, “In addition, we found some species that had never been reported from the preserve. This is very encouraging because it indicates that additional rare and threatened species have been able to find a home in the preserve. And our collaboration further allows the scientists at the Conservation Foundation to use the same data to identify critical habitats for special preservation or restoration and to protect endangered species.”

“There are many more endangered plant species in New Jersey than there are endangered animal species—roughly triple,” said DeVito from the Preserve. However, there are few programs in place to protect these critical components to the natural systems. “Rare plant species are simply not on the general public’s radar screen,” said DeVito. “If more people could experience the beauty of a Pine Barrens gentian or bog asphodel in bloom, there would be a lot more support for these disappearing species.”

Despite New Jersey’s large number of endangered plant species, there are only a few botanists working throughout the entire state to document and protect these rare plants. NJCF and botanists in the Division of Parks and Forestry are now collaborating to undertake ambitious new management projects. In 2005, NJCF received a $25,000 grant from National Fish and Wildlife Foundation to support this work.

One species that formerly grew in the preserve, American chaffseed (Schwalbea americana), is federally listed as an endangered species; another Long’s bulrush *(Scirpus longii)*, is a candidate for federal listing. One existing species, the bog asphodel *(Narthecium americanum)*, is a candidate for federal listing. Seven species are state endangered. An additional nine species that grow in the preserve were included on the Natural Heritage list until recently. Of the 30 rare, endangered and threatened species, 18 have been found recently. Twelve are known only from historical records, but Brooklyn Botanic Garden’s botanists will spend the next year diligently searching for these species.

“The preserve is home to at least 12 additional plant species that are characteristic of the New Jersey Pine Barrens,” Moore said. “They may be relatively common in the Pine Barrens, so they are not listed as endangered, but in New Jersey they are restricted in their overall distribution to the Pine Barrens.”

As the first research team to explore and catalog the Preserve in more than a century, the sense of discovery was keen throughout the project. According to Barringer, “Maybe the biggest moment for me was on a day in September the first year I worked in the Preserve. I was working along the river, searching for populations of rare plants. It had been a good day, but it was hot and getting late and I had been walking through muck and pushing through thickets. I was heading back to the car, when by pure chance I saw a dry stalk of *Tofieldia,* called false asphodel. It was dry and the seed had been shed and I thought it was something else at first, but when I saw a little patch of dark, sticky hairs on the stalk I knew it was *Tofieldia*. Now, *Tofieldia* is a very rare plant and we had been looking for it since July. The plants that grow in the Pine Barrens are only found in a couple of watersheds. It was a good find — and when I looked up I saw that there were more plants growing nearby. As I was looking around I realized that within a hundred yards of the spot I was standing, there were at least a dozen different species of very rare plants growing: asphodels and orchids, rare grasses and rushes, the showy aster, and the bog goldenrod. They had probably been growing there for a thousand years

or more and would continue to grow there now that they were part of the preserve."

NJCF has initiated several important projects to enhance public access and to restore the preserve to its original wetlands state. In 2005, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) and NJCF launched a wetlands preservation and restoration project at the Franklin Parker Preserve – the largest NRCS Wetlands Reserve Program (WRP) project in the Northeast. NRCS and NJCF are collaborating on the restoration of 1,100 acres of cranberry bogs and blueberry fields that have been altered by historic agricultural practices. NJCF is also partnering with several public and private organizations to restore approximately 150 acres of Atlantic White Cedar forest, which is vital habitat for many threatened and endangered species. The project is particularly important since 80 percent of the Pine Barrens cedar swamp have been lost to non-sustainable timbering practices.

The Garden's Moore said, "We will work in the preserve through this season, as the Conservation Foundation and the Pinelands Preservation Alliance set up long-term monitoring of the rare plant populations. We should be finished with a scientific paper describing the flora and vegetation of the preserve by the end of the year, and we hope to see that published in 2007. "

NJCF has launched a $3 million campaign to help fund restoration and stewardship activities at the Franklin Parker Preserve. To learn more about this effort and NJCF's land preservation efforts statewide, contact the Foundation at **1-888-LANDSAVE** or visit www.njconservation.org.

Rare Plants at the Franklin Parker Preserve

1. *Aristida dichotoma* var. *curtissii* – Curtiss' three-awned grass
2. *Aristida virgata* – three-awned grass
3. *Asclepias rubra* – red milkweed
4. *Aster concolor* or *Symphyotrichum concolor* – silvery aster
5. *Calamovilfa brevipilis* – Pine Barrens Reedgrass
6. *Cleistes divaricata* – spreading pogonia
7. *Gentiana autumnalis* – Pine Barrens gentian
8. *Juncus caesariensis* – New Jersey rush
9. *Lobelia canbyi* – Canby's lobelia
10. *Narthecium americanum* – bog asphodel
11. *Platanthera cristata* – crested yellow orchid
12. *Prenanthes autumnalis* – autumn snakeroot
13. *Rhynchospora cephalantha* – capitate Beak-rush
15. *Rhynchospora pallida* – pale beak-rush
16. *Schizaea pusilla* – curly grass fern
17. *Schwalbea americana* – American chaffseed
18. *Scirpus longii* – Long's bulrush
19. *Scleria minor* – slender nut-rush
20. *Scleria reticularis* – reticulated nut-rush
21. *Solidago elliottii* – bog goldenrod
22. *Solidago stricta* – wand-like goldenrod
23. *Solidago uliginosa* var. *uliginosa* – Bog goldenrod
24. *Sphagnum carolinianum* – peat moss
25. *Sphagnum macrophyllum* – peat moss
26. *Stylisma pickeringii* – Pickering's morning glory
27. *Stylosanthes biflora* – pencil flower
28. *Tofieldia racemosa* – false asphodel
29. *Utricularia inflata* – inflated bladderwort
30. *Xyris fimbriata* – yellow-eyed-grass

Turn Used Gardening Plastic Into Botanical Garden Admission

Plastic Pot Recycling Offered on Weekends From May 20 Through June 25

WHAT: Plastic Pot Recycling
WHEN: 9 a.m. to 4 p.m. weekends only, May 20-21, 27-28; June 3-4, 10-11, 17-18, 24-25
WHERE: Monsanto Center of the Missouri Botanical Garden, 4500 Shaw Blvd. at Vandeventer
SPONSORS: Missouri Botanical Garden; St. Louis–Jefferson Solid Waste Management; Missouri Department of Natural Resources; Environmental Improvement and Energy Resource Authority; Monrovia Growers, Inc.; and Plastic Lumber Company of America, LLC

INFO: (314) 577-9440; www.mobot.org/hort/activ/plasticpots.shtml

The Missouri Botanical Garden is once again giving area gardeners a reason to recycle. Plastic garden pots, polystyrene cell packs and trays can be brought to the Garden's nearby Monsanto Center and exchanged for a complimentary admission pass. Plastic Pot Recycling collections will be held from 9 a.m. to 4 p.m. on Saturdays and Sundays only from May 20 through June 25.

The horticultural waste amassed will soon find a new, alternative use among gardeners. Collections will be recycled locally into co-mingled plastic lumber for use in raised garden bed kits and compost bins available for purchase.

Dr. Steven Cline, manager of the Kemper Center for Home Gardening, started the program in 1998. "This represents the eighth year in our recycling effort to reduce this waste stream that nationally represents over 350 million pounds pitched into our landfills," said Cline. "Imagine Busch Stadium filled one-and-one-half times to the top, and you have a good picture of what is being deposited each year. We are simply closing the recycling loop by offering this service and the products it can make back to gardeners."

Program organizers hope to collect 100,000 pounds of horticultural plastic this year, up from 60,000 pounds in 2005. Proceeds from last year's lumber sales assisted the Garden's purchase of a larger granulator to process plastic into chips, doubling the former capacity. The St. Louis–Jefferson Solid Waste Management District and Monrovia Growers, Inc. have also contributed to the program's continued efforts this year with a combined donation of $60,000.

Plastic Pot Recycling is open to the general public on weekends only, May 20-21 and 27-28; June 3-4, 10-11, 17-18, and 24-25, from 9 a.m. to 4 p.m. Plastic pots, cell packs and trays must be cleaned and free of metal hangers. No household plastic or clay pots will be accepted. One complimentary Garden admission pass will be issued per individual. The Garden's main collection facility is located at the west parking lot of the Monsanto Center, 4500 Shaw Blvd. at the corner of Vandeventer.

Four area garden centers and two municipal recycling centers have also been selected as satellite collection centers for 2006. Waldbart & Sons, For the Garden by Haefners, Summerwinds at Timber Creek, Schmittels Nursery, City of Kirkwood Recycling Center and City of St. Peters Recycling Center will collect horticultural waste during May and June.

Gardeners can purchase the resulting recycled plastic lumber through the Garden's Pots to Planks program. Plastic lumber lasts up to 50 years and is suitable for building decks, walkways, picnic tables, or any other project where wood and water meet. For more information, call (314) 577-9441 or download a brochure at www.mobot.org/hort/activ/PlasticPotsLumBro06.pdf. Proceeds from purchases are reinvested to sustain the Garden's recycling programs in the future.

For more information on Plastic Pot Recycling, call (314) 577-9440 during regular business hours or log on to www.mobot.org/hort/activ/plasticpots.shtml.

Pfizer Plant Research Laboratory to Open on May 16 at The New York Botanical Garden

The Pfizer Plant Research Laboratory, opening on May 16, 2006, marks a new era of scientific advancement at The New York Botanical Garden. The laboratory is the latest addition in a comprehensive 15-year renaissance at the Botanical Garden. The new facility will further the Botanical Garden's urgent mission to discover, decipher, document, and defend Earth's vast biodiversity.

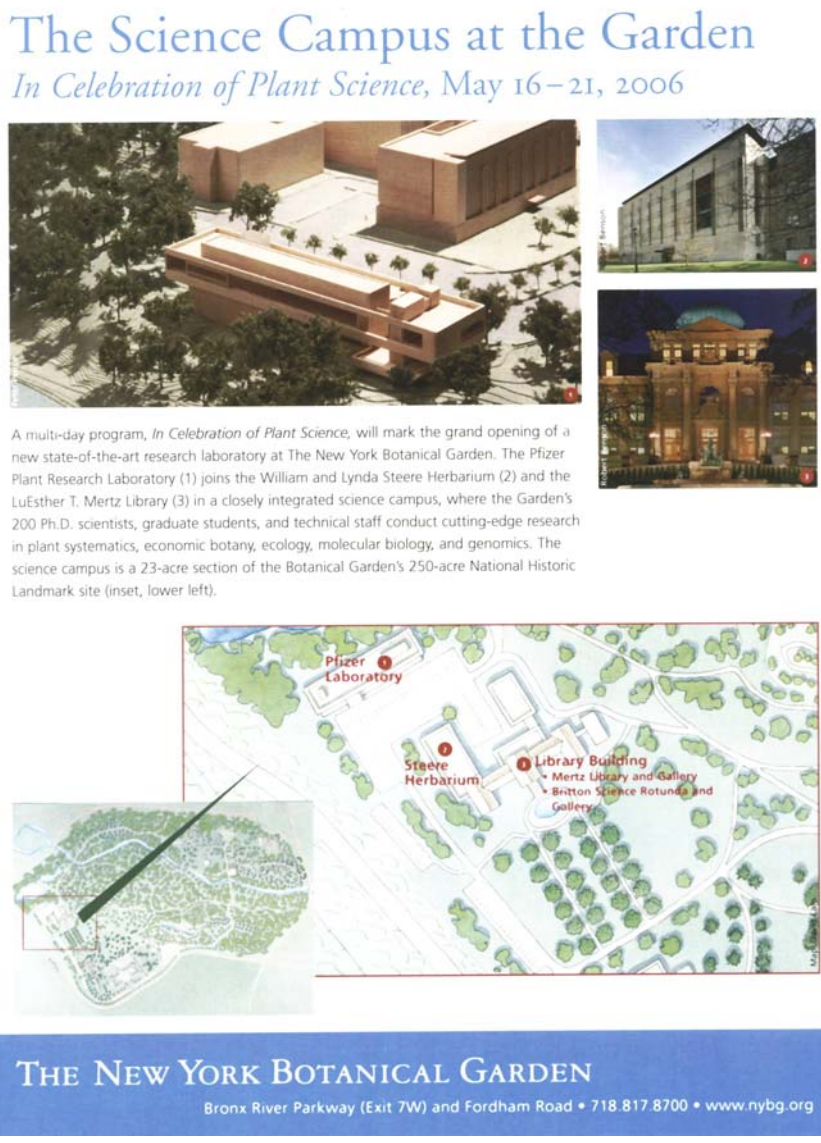
The state-of-the-art Pfizer Laboratory will triple the Garden's current research capabilities and provide much-needed quarters to educate and train the next generation of plant scientists. The laboratory will house the Lewis B. and Dorothy Cullman Program for Molecular Systematics Studies and the Garden's Genomics Program, including the New York Plant Genomics Consortium. It will also serve as a home base for the Botanical Garden's large Ph.D. program and provide meeting rooms for visiting scholars.

Gregory Long, President of The New York Botanical Garden, observes, "The Pfizer Plant Research Laboratory will give the Botanical Garden the most powerful modern tools to investigate plants and fungi. It will provide scientists and graduate students with a laboratory research facility equal in stature to the Garden's recently opened William and Lynda Steere Herbarium, LuEsther T. Mertz Library, and Nolen Greenhouses for Living Collections."

The light-filled, two-story, 28,000-square-foot laboratory will provide highly advanced scientific research facilities, including robotic workstations and a high-throughput DNA sequencer. It will be a center for collaborative research in molecular systematics and plant genomics, serving scientists and graduate students not just from the Botanical Garden, but also from the region and indeed the whole world. The Pfizer Laboratory will be the largest and finest laboratory research facility in any botanical garden in the United States, enabling scientists to reconstruct the geneology of plants and fungi and to unravel the mysteries of genes and genomes.

Opening Ceremonies to Celebrate Plant Science

The New York Botanical Garden will mark the grand opening of its new laboratory with a multi-day program, "In Celebration of Plant Science." The celebration begins on Tuesday, May 16, 2006 with a ribbon cutting and dedication of the Pfizer Laboratory and continues though the weekend. It



will include behind-the-scenes tours of the new laboratory and other key parts of the Botanical Garden's science campus, a scientific symposium, exhibitions on genomics, family and children's programming, lectures, demonstrations, and other events.

With the advent of the Pfizer Laboratory in May 2006, the Botanical Garden may be the only botanical garden in the world that has opened major new facilities for its library, herbarium, and research laboratory all within the last four years. All three facilities are in close proximity to each other, allowing for maximum interaction among research scientists and easy access to research collections as well as laboratory facilities. The integrated efforts of the Garden's 200 Ph.D. scientists, graduate students, and technical staff working in the laboratory, the herbarium, the library, and the field lead to significant botanical discoveries.

New Developments in Plant Research

Although the fact may not be very well known outside the academic and conservation communities, The New York Botanical Garden is one of the world's greatest plant research organizations. We have discovered new information about the plants of the world, especially those of the New World tropics, and disseminated that knowledge through publications and teaching since the 1890's. In service of this mission, we have mounted nearly 2,000 expeditions to collect plants in the wild; assembled the world's largest library about plants and the world's fourth largest herbarium; and built the world's most sophisticated plant information

system online, the Virtual Herbarium (visit nybg.org). The Botanical Garden also has an enormous impact on plant science through our Graduate Studies Program, which has granted 240 advanced degrees in conjunction with five premier universities in the Northeast.

Not all plant research is conducted in the field; much of the work is carried out in the laboratory. Eleven years ago, the Botanical Garden created a program in plant molecular systematics, and five years ago a plant genomics program. Today, we have 50 Ph.D. scientists and graduate students working in these new areas.

Both molecular systematics and plant genomics use DNA data to answer questions about plant biodiversity and evolution. However, molecular systematics explores the relationships and the history of plants species, whereas plant genomics addresses how genes function and their influence on plant growth and structure. The Botantical Garden's molecular research in plant systematics is conducted in the Lewis B. and Dorothy Cullman Program for Molecular Systematics Studies, a collaborative program established in 1994 with the American Museum of Natural History. The plant genomics research is conducted in the newly constituted Plant Genomics Research Program.

Plant genomics came of age about five years ago when the genome of Arabidopsis was completely sequenced. In the New York Plant Genomics Consortium, our formal partners in studying the genomes of plants are New York University and Cold Spring Harbor Laboratory. NYU's strength is mainly in theoretical questions concerning gene function in plants, and Cold Spring Harbor's is in taking the technology they developed to study the human genome and applying it to plants. Our interest, in keeping with our traditional scientific mission, is in biodiversity, and the study of plants and fungi as organisms and populations, both in the present day and throughout evolutionary time. Our university and high-tech partners are excited about working with us because of faculty knows plants, where they live, and the differences between one species and another, and because we can grow plants for gene sequencing and lab analysis in our state-of-the art Nolen Greenhouses. These new developments in plant research are really the modernization of our role as a primary "source" of plant data.

Why the Botanical Garden Conducts this Research

These research initiatives are important to humankind in many ways. The main reasons that the new molecular systematics and genomics work is pursued at The New York Botanical Garden are the following:

1. The plants and animals on earth are highly endangered because of the complexity and drive of economic development and human "progress." It is essential to learn everything possible about all aspects of plants- including their ecology, their relationships to animals, their habitat (and habitat destruction), their usefulness for food or other economic purposes, and their biology at every level – and apply this knowledge toward urgent needs in environmental conservation. The newest type of inquiry is at the level of plant genes, about which science knows very little at this early stage in the discipline of genomics. We feel it is the responsibility of a comprehensive research institution such as The New York Botanical Garden to conduct investigative work at all levels of biology.

2. The positive, fool-proof identification of plants used for human food and medicine is critical to consumers, industry, and government agencies the world over. Useless, ineffective, or dangerous plant-based products are being marketed because the wrong species were used in their manufacture.

3. Understanding the evolutionary history of a plant group, especially the species at the node from which new species branch off, contributes to our knowledge of the natural world. Genomic studies are revealing the genes that are responsible for the differences among plant species.

4. Most current plant genomics research is being conducted in commercial settings. The New York Botanical Garden is a biodiversity organization, not primarily concerned with agricultural questions or commercial applications, and not focused on the genetic modification of economically valuable species. We look at the rest of the plants of the world. This sets us and our partners apart, and we believe too few resources are being invested on understanding wild plants (rather than cultivated plants) at the level of their genes. All of our discoveries are disseminated free of cost to the non-profit research community, as is all of the other information we uncover.

5. Today, the brightest young university students in the life sciences want to pursue molecular systematics and genomics approaches to research questions. It is the way of the future, and The New York Botanical Garden has always wanted the best and the brightest, and we have always wanted to be on the cutting edge.

Books Reviewed

The Golden Spruce: A True Story of Myth, Madness, and Greed. John Vaillant. 2005. ISBN 0-393-05887-5 (hardcover US $24.95) 265 pp. W. W. Norton & Company, New York.

Let me confess that I had an alternative motive for wanting to review this book, besides being intrigued by its title. Augustana is in the second year of a new general education system. Part of this program involves classes called Learning Communities (LC) where students take two classes in different departments over the same theme. After a quick check the book's information on Amazon.com, I thought it might be an appropriate text for an LC that would merge plant science with possibly history, political science, or sociology. We also have a history professor who specializes in Native American history and he and I have briefly talked about developing an LC.

Given this bias I had developed before even opening the book, I must admit that I was a little disappointed in *The Golden Spruce* and will need to rethink how I would use it in an LC. However, I did enjoy the story and would not totally discount its use in other classes. I think it could be a useful supplementary text in an environmental science or ecology course. I also think anyone interested in the Pacific Northwest, the lumber industry, or ecological "detective mysteries" would enjoy *The Golden Spruce*.

The book charts the events leading up to an act of eco-terrorism and the community's reaction after the event. The events take place on the Queen Charlotte Islands in British Columbia that are introduced in the first chapter. The Haida people are introduced in the second chapter in the context of a memorial ceremony for the spokesman of the golden spruce. The emphasis early in the text (especially

chapters 3-5) focuses on the economic history of the Pacific Northwest Coast, first in terms of the fur trade, and later on forestry and the logging industry. I was expecting to learn more about the Haida culture and the role of the golden spruce and plants in their society, but this was pretty much limited to the second chapter.

These beginning chapters go to great lengths to explain the history of lumber and its role in the economy of British Columbia. The focus is on European/North American issues and the dangers faced in harvesting the trees. There is also a lot of information on how advances in technology changed the way natural resources are harvested. By the time we get to the sixth chapter we are introduced to the main character of the story, Grant Hadwin, and this chapter focuses on his 'upbringing' and career in the logging industry. Towards the end there is good foreshadowing or moral compass for the reader in regards to urban society being removed from the resources that we use on a daily basis (As an example, Vaillant suggests that once the trees are turned into paper towels, we tend to forget where they come from). It's my impression that the previous three chapters could have been distilled/shortened to set the stage for this chapter.

The next chapter serves to link Hadwin's history to the Haida and does introduce some of the golden spruce's history. However, Vaillant does not go into much detail on the golden spruce's significance to the Haida culture until chapter nine after the spruce is felled.

The remaining chapters of the book go all over the place. Chapter 10 delves into Hadwin's psychological state and his run from the law. Chapter 11 and 12 discuss cloning attempts of the golden spruce as well as the plant science behind its golden color and other propagation attempts via cuttings. The book ends with messages to the reader about how what appears to be unlimited resources are usually not and we must take care of the world around us. The end also serves to an update the reader on the current state of logging on the Queen Charlotte Islands.

So while I was disappointed in the lack of some details in *The Golden Spruce*, I did learn quite a bit about the history of the natural resources and their extraction in British Columbia in the context of this tragic event as well as the development of the logging industry in that part of the world. I think Vaillant does do a good job of making the reader reflect on humankind's use of the natural world around us.

For another review, I encourage readers to check out Jeffrey A. Lockwood's review in the October-December 2005 issue of *Conservation in Practice* (vol. 6, no. 4, pp. 42-43). I purposely waited to read his review until after I wrote this one. Lockwood describes more of the symbolism and addresses other themes in *The Golden Spruce* that were not as apparent to me when I read it and wrote this review. With Lockwood's comments in mind, I'll continue to think about how I can use *The Golden Spruce*, or sections of the text, for possible Learning Community courses at Augustana.

-Dr. Jason Koontz, Biology Department, Augustana College, Rock Island, IL 61201

Introduction to the Plant Life of Southern California: Coast to Foothills. Rundel, Philip W. and Robert Gustafson. 2005. ISBN 0-520-23616-5 (Paper US$19.95) 316 pp. University of California Press, 2120 Berkeley Way, Berkeley, CA 94704.

As a result of an unusual combination of climate, physical geography, and natural disturbance, Southern California is one of the most floristically diverse regions in the world. In this guide, the authors illustrate this remarkable diversity using an ecological framework; highlighting key physiological and life-history traits that have enabled plant species to adapt to regional environmental conditions as well as interactions between plants and the ecosystems in which they occur. The book is divided into chapters based on vegetation community, including coastal habitats (beaches, dunes), coastal and interior sage scrub, chaparral, woodlands, riparian systems, grasslands, and wetlands. The book also contains discussion on the ecology and disturbance pressures of several of these communities, including chapters on biogeography, fire, invasive species, and biodiversity. There is a separate chapter on the Channel Islands, which host slightly different plant species and growth forms relative to mainland vegetation communities. The book contains beautiful and informative photographs for roughly 300 plant species. While the authors limit their discussion to less than 10 percent of the species occurring in the selected vegetation communities, they do an outstanding job of showcasing the most common or ecologically important species for a given community.

Although the emphasis of the book is clearly the description of common plant species occurring in

various vegetation communities throughout Southern California, the interaction between plants and their environment provides a consistent framework throughout the book. The authors discuss numerous physiological, morphological, and life-history traits that allow plant species to occur in stressful environments, including mechanisms for salt tolerance and seed dispersal as well as variation in leaf phenology and photosynthetic pathways. There is also a discussion of the role of species traits in structuring vegetation communities. For example, the importance of nitrogen fixation, fire tolerance, and seed morphology are discussed in relation to community succession following fire. Due to space limitations, the chapters on invasive species and biodiversity are necessarily limited in scope. These chapters likely provide enough introductory material for hikers using the book as a field guide, but may not be sufficient for an undergraduate course.

In addition to the ecological information accompanying the species descriptions, the authors discuss how Native Americans and early Spanish and American settlers made use of native plant species and how they managed vegetation communities (namely fire management). These descriptions highlight the role of plants in shaping human society will likely help readers understand the importance of preserving these vegetation communities.

As the title suggests, the authors focus on flora in coast to foothill regions. However, Southern California also includes expansive deserts as well as montane coniferous forests. While my own bias is that the authors could have included these vegetation communities, these additions could easily have doubled the length of the book.

This pocket-sized guide will be useful to hikers and to readers interested in the ecology and floristic diversity of Southern California. The book does assume some botanical knowledge and one limitation of the book is the absence of a glossary for the botanical terms used throughout the text. The book does contain a very useful index as well as a table that lists public parks and preserves in Southern California that contain good examples of the vegetation communities discussed in the text. The book could also serve as a starting point for a field course on the flora of Southern California, which could be supplemented by lectures on the various themes included in the book (e.g., regional geology and climate, fire ecology, adaptation to water stress, invasive species).

-Jennifer L. Funk, Department of Biological Sciences, Stanford University, Stanford, CA 94305-5020.

Plant-Provided Food for Carnivorous Insects: A Protective Mutualism and Its Applications. Edited by F. L. Wäckers, P. C. J. van Rijn and J. Bruin. 2005. ISBN-13 978-0-521-81941-1 hardback ISBN-10 0-521-81941-5 hardback. xii + 356 pp. Cambridge University Press, Cambridge, United Kingdom.

This volume with 23 contributions attempts to describe plant-insect interactions from a modified point of view, which is clearly written in the title. This means that plant food-mediated relations are viewed as the most important factors in plant-herbivore-carnivore interactions. Instead of traditional natural enemies relations, mutualism is the focus of these interactions. In this sense the book is an interesting contribution not only to basic ecology but also to applied biological sciences.

Structurally the book contains three parts: the first presents food provision by plants; the second presents arthropod predators and parasitoids feeding on plant-provided food; and the third discusses the plant-provided food and biological control. 11 chapters written by different authors treat these subjects and argue for the need to study carnivore biology and plant-herbivore-carnivore chain relations in depth. The book can be considered an excellent approach to this field.

The highlight of the work is the concept of plant food as a part of the diet for both herbivores and carnivores. Ants, for example, play a key role in the evolution of a range of food-mediated mutualism and plant-provided food alone can have a strong effect on the life-history parameters of predators and parasitoids.

Plant-provided food refers to floral and extrafloral nectars, pollen and honeydew. They are also the primary rewards by which plants recruit pollinators and other insects. The food contains chemical molecules from primary and secondary plant metabolism. Floral nectar, for example, provides carbohydrates, amino acids and some secondary compounds for insects. Feeding does, however, have risks for flower visitors.

The plant produces the extrafloral nectar and uses it to recruit predators or parasitoids. Predators and parasitoids together with plant chemicals safeguard the plant against herbivores. This strategy is very important in plant-carnivore mutualism.

Pollen is important in plant-insect relations. Pollen is considered the primary nutritional motive for pollinating insects to visit flowers. Moreover, honeydew is also important. It can serve, for example, a defensive function when it is collected by ants.

Herbivores and their enemies often differ in regard to their sensory capacities or foraging behavior. This influences interactions in plant-provided food chains. These influences and their strategies also have implications for agriculture and forestry. The development of functional biodiversity programs and biological control in conservation are dependent on these strategies.

There are many interesting topics (chapters) in this book. F.L. Wäckers presents an overview of the food sources provided by plants, especially in terms of their availability, detectability, accessibility, nutritional value, and mortality risks for the arthropods feeding on them (p. 17 – 74). The nectar is considered by S. Koptur as fuel for plant protectors (p. 75 -108). The evolutionary origin of extrafloral nectar is examined and a comparison between floral and extrafloral nectar is made. The food-for-protection strategies in plants are discussed by M. W. Sabelis, P. C. J. van Rijn and A. Janssen (p. 109 – 134). The evolutionary stability of extrafloral nectar production and food-for-protection is the focus of this discussion. Moreover, the food needs of adult parasitoids are described by D. M. Olson, K. Takasu and W. J. Lewis (p. 137 – 147). They discuss the adaptations to the nectarivorous life-style and the ecological consequences of these adaptations. The effects of plant feeding on the performance of omnivorous "predators" are reviewed by M. D. Eubanks and J. D. Starsky (p. 148 -177). The reader can find a review of some experimental studies on the subject. The nectar and pollen-feeding by adult herbivorous insects is presented by Romeis, E. Städler and W. Wäckers (p. 178 – 219). The foraging and feeding requirements of adult herbivorous butterflies, flies, and beetles are discussed in the context of herbivore-plant interaction. The book concludes with some considerations on the possibilities of using plant-provided food in biological control. P. C. J. van Rijn and M. W. Sabelis discuss the impact of plant-provided food on herbivore-carnivore dynamics (p. 223 – 266) and G. E. Heimpel and M. A. Jervis note that empirical evidence matches the predicted host parasitism and suppression (p. 267 – 304). Habitat diversification in biological control is a topic described by T. K. Wilkinson and D. A. Landis (p. 305 – 325) and implementation of food-for-protection strategies in agriculture is presented by G. M. Gurr, S. D. Wratten, J. Tylianakis, J. Kean and M. Keller (p. 326 – 347). Moreover, the large range of literature found in this collection is also significant for future studies of the subject. On the other hand, in the case of biological control potential, it seems that a similarly large range of literature concerning the problems existing in this field is missing. The aim of biological control is not new and there are still many problems in agri-, silvi- and horticulture. Many examples exist in regard to the fact that "beautiful" ecological theories cannot in each case be applied directly to production and technology. It is unfortunate that this valuable book did not consider this problem.

A close reading of the book leads to fascinating findings as well as some critical remarks. Each chapter is followed by a long list of sources. This means that on the average more that 30% of the book is a listing of the literature. The chapter lists of sources are similar and many items are the same. For example, in chapter 7, the percentage of literature common to all chapters is as much as 42%. Moreover, citations leave much to be desired. Two special remarks need to be mentioned, especially for this purpose, when a second edition is planned. For example, on page 188, there are 39 lines with 57 citations, which means that there is more than one citation per line. This is a result of a very mechanical citation process. It also produces defects in the adequacy of citations in source lists. Moreover, some repetitions in different chapters could also be cut in future editions. Some corrections should also be made to eliminate minor language and data errors (for example, pp. 120 and 130). Although the book is not without flaws, it is an interesting and comprehensive treatment of the plant-carnivore mutualism.

-Dr. Tadeusz Aniszewski, Associate Professor in Applied Botany, Department of Biology, University of Joensuu, Finland

Chia: Rediscovering a Forgotten Crop of the Aztecs. Ayerza, Ricardo and Wayne Coates. 2005. ISBN 0-8165-2488-2 (Paper US$14.95) 216 pp The University of Arizona Press, 355 S. Euclid, Ste. 103, Tucson, AZ 85719.

Chia by Ricardo Ayerrza Jr. and Wayne Coates arrives from the University of Arizona Press intended to provide a wide range of information on a lost crop of ancient America, Salvia hispanica. Chia is a paperback, illustrated by a few black and white images but largely reliant on the text and textual figures to make its case. In this it succeeds, admirably raising chia seeds in the reader's consciousness far above the one place most BSA members might have encountered it, in a 3AM infomercial selling Chia PetsÍ.

Chia was a crop of the great civilizations of North and South America, including the Maya and the Inca, though it was most prominently cultivated by the Aztecs. It has a number of remarkable properties

made use of by those ancient cultures and which have potential for agricultural improvement today. Not least among the properties of chia is possession of abundant mucilage, making the seeds very sticky, either for making statues (ancient religious practice) or those Chia PetsÍ, though the oil from its seeds has much greater relevance.

Chia opens with a discussion of agriculture and food shortages around the world, especially among the native peoples of the Americas. Credit is given to Norman Borlag's Green Revolution and to the tremendous advances it made possible in food production. Howevre, problems with the modern Western diet are also highlighted, one of which, the nature of consumed fats, consumption of chia might ameliorate. Chia is especially rich in the omega-3 fatty acids which are important aids to health and which are consumed in flax- and fish-based health supplements. In fact chia is even richer in these oils than flax. Chia oil is also very valuable for making oil paints as it provides extraordinary longevity to the colors used.

The chia crop is considered from an historical perspective, both its use in the Aztec Empire as a staple crop and a means by which conquered peoples paid tribute and its decline with the coming of the Spanish. The authors make the point that chia fell much more deeply into disuse than other Aztec staples such as amaranth due in part to certain pagan religious associations of chia. Along the way, the authors are relatively even-handed, not falling into politically correct stereotypes of Christanity's entry to the Americas, and they even point out the loss of some parts of Aztec heritage due to destruction of codices by the Aztecs themselves under a king who predated the Spanish arrival. One other possible reason for the disuse of chia is the fact that unlike many other Aztec crops, it could not be successfully added to European agriculture. This is because chia is a short day plant which flowers too late for agronomic production in Europe.

Chia comes as the crop for which it is named is experiencing a renaissance, both in its original homes as well as in the US. Though the book chapters could be better ordered, as the presently jump from topic to topic in their present order, and more illustrations, perhaps in color, would make a significant improvement. Chia is an excellent book which belongs in college and university libraries, as well as the libraries of those interested in nutraceuticals or just simply in using this heart-healthy crop.

-Douglas Darnowski, Department of Biology, Indiana University Southeast, New Albany, N 47150.

Growing Hardy Orchids. John Tullock. 2005. ISBN 0-88192-715-5. US $29.95 (cloth). 244 pages. Timber Press: Portland.

This is a delightful horticultural book that should give lovers of native plants the encouragement to grow some of the most charming of native plants: temperate orchids. The author tells us something we long expected, despite contrary lore. Yes, we can successfully cultivate those orchids that previously grew vigorously on the ground before humans started extensively paving, ploughing, polluting, and burning.

This is an imminently practical book. John Tullock not only instructs us on how to prepare the soil and care for temperate orchids, but also tells us where we can legally and ethically acquire the plants. Although his sources for plant materials may someday become defunct and outdated, for now this information is invaluable.

The author, who hails from eastern Tennessee, is at his finest when discussing orchids native to the eastern United States. He also shines in discussing non-native species that he has successfully grown for several years, such as *Bletilla*. Credibility comes from details and anecdotes, which the author provides through much of this book.

This is a horticultural, rather than a scientific volume. For example, no documentation is provided to support the author's contentions that orchid seeds lack endosperm or that adult orchids can survive without mycorrhizae. Fortunately, John Tullock shows us that temperate orchids can be cultivated regardless of whether or not these details are correct.

This book appears to have been written to promote *ex situ* conservation. The first and last chapters provide extensive justification of *ex situ* conservation, in general, and of orchids, in particular. This is a noble cause, but seems somewhat out of place. I am not sure whether most conservation biologists would agree that the practices outlined in this book provide a substantial conservation benefit, especially if only a few clones of each species are propagated. Furthermore, the author may be preaching to the choir insofar as readers of this book do not necessarily need *ex situ* conservation as a rationale for cultivating temperate orchids.

This book's biggest weakness is its extreme redundancies, especially with respect to plants that the author has not grown. In the catalogue of species, often identical information is repeated for

every species in a genus. This roughly hundred page catalogue could have been half that length just by consolidating common information within many genera. The author includes USDA hardiness zone nine and ten orchids, yet almost nobody would consider these plants to be hardy. The author's horticultural experience seems to be almost exclusively with true hardy species. Therefore, these zone nine and ten orchids should have been omitted from the book, leaving more space for photos and anecdotes about the author's own experiences cultivating hardy orchids.

My other comments are relatively minor. The metric to English unit conversion tables seem anachronistic. The USDA hardiness zone map was printed too small to be readily readable. The same photo of a *Platanthera ciliaris* inflorescence appears to be included in two places in text and on the dustjacket. Finally, contrary to the author's assertion, *Epipactis gigantea* is probably native to the United States.

For anybody interested in growing native North American orchids, buy this book. It is reasonably priced and fills a heretofore empty niche, especially the parts written from the author's practical experience.

-Root Gorelick, School of Life Sciences, Arizona State University, Tempe, AZ 85287-4501

The Jade Garden: New and notable plants from Asia. Peter Wharton, Brent Hine and Douglas Justice. Timber Press, Portland Oregon. 2005. ISBN 0-88192-705-8. 228 pages.

The 130 temperate Asian plants described in this book have mostly been collected through exploration of various parts of China and bordering countries to the east by representatives of the Centre for Plant Research which is located at the University of British Columbia Botanical Garden in Vancouver. On site is the well-endowed David C. Lam Asian Garden where there are 2,150 taxa of Asian origin. Those included in this book have all been successfully cultivated there and found to be "esoteric, scientifically interesting, and exceptionally beautiful" according to the preface by the director of this botanical garden.

Before introducing the notable new plants, the authors provide a 30-page description of the natural areas where they had conducted plant collecting expeditions. Although two general maps are provided, neither of them seems to correspond at all to the Four Great Steps of China and their subregions that are subsequently described. The authors do suggest that the reader refer to the *Atlas of China* and *Nelles Maps* to "navigate the formidable array of names and locations mentioned here". Not having access to either of these references, I found the subsequent descriptions of collection areas indeed formidable and was left to simply admire the excellent photographs of the magnificent scenery, plants, natives and researchers. This section might be of interest to someone very familiar with China and eastern Asia, or who might be planning a visit to that area, but did not really tie in very well with the subsequent plant descriptions. I also discovered that not all plants mentioned are from China and eastern Asia. As I randomly checked out plants which could grow in Maine I found that *Linum hypericifolium* is native to the Caucasus mountains and Turkey.

There is a short section wherein the issue of accidentally introducing invasive new plants through horticulture is mentioned indicating that while the plants described in the book have been tested in British Columbia, in other locations there could be the potential for escape. The book also includes a section of brief biographies of historical collectors of Asian plants (which seemed somehow irrelevant to the main subject), a short glossary and a bibliography.

The remainder of the book is divided into three sections: one on perennials (39), one on shrubs (52) and one on trees (39) with each section written by one of the three authors. Listed for each plant selection are common name, family, native distribution, description, hardiness, cultivation and propagation. The very informative descriptions often cover a variety of subjects including details on where the plant was found, its unique morphological characteristics, its growth over time in the botanical garden and taxonomic considerations where controversies exist. These page-long plant synopses are accompanied by one or two excellent photos highlighting the special characteristic of the plant.

Although there is considerable information about each plant, I found it very difficult to imagine how the authors intended this book to be used. The simple alphabetic organization of each of the plant sections makes it very difficult to categorize the material in any useful manner. A series of summary listings which indicate various characteristics such as

height, flower, color, blooming season, and soil requirements would have been very helpful to a gardener planning for a specific landscape. A horticulturalist interested in specific taxonomic groups would also benefit from a checklist listing the plants by family as several of the genera are familiar, such as *Aconitum, Cimicifuga, Impatiens, Persea, Ribes,* and *Fraxinum,* but many are unfamiliar.

Any reader from outside the Pacific Northwest planning to try to grow any of these plants would first be need to know the recommended hardiness zone, yet no summary listing exists directing the reader to plants suitable their own climate. A review of each plant's information showed that over 70% of the plants described will only grow in hardiness zones 6 and higher. In the tree section, Douglas Justice qualifies much of the hardiness information by noting either that few North American trials have been made or that for plants which are widely distributed in the wild, it could be the actual collection location that may determine cold hardiness.

In some cases, for example *Chionanthus retusus*, the plants listed are not really new to non-Asian cultivation, having been introduced or collected on very early expeditions. However many are still only known from botanical garden collections. Although cultivation and propagation information is presented, no sources for plant material are listed. Few sources were found by doing an internet search on several of the plant names. In the preface, there is mention of the legal and political problems, as yet apparently unsolved, of introducing recently collected taxa into the North American trade while compensating the country of origin for sharing its biodiversity.

Overall, I feel this book will have very limited appeal to all but the most advanced gardeners who happen to live where growing conditions are similar to those found at the University of British Columbia Botanical Garden. By making available excellent photos and interesting detailed information about selected Asian plants that have done exceptionally well in cultivation, the authors seem to hope that the horticultural trade will soon recognize these plants for the gems that they are and find some way to make them available commercially.

–Joanne Sharpe, Coastal Maine Botanical Gardens, Boothbay ME 04537

Centennial History of the Carnegie Institution of Washington, Volume IV, The Department of Plant Biology. Patricia Craig. 2005. Cambridge University Press, Cambridge, UK.

As part of their centennial celebration, the Carnegie Institution published five illustrated volumes, which chronicle the Centennial History of the Carnegie Institutions major extant departments. *The Department of Plant Biology* is the fourth in that series researched and written by Patricia Craig, science writer and former editor of articles and booklets about Carnegie scientists and their work. Richard A. Meserve, President of the Carnegie Institution of Washington, sets the stage for all five volumes of the Institution's Centennial Histories in a forward that summarizes steel magnate Andrew Carnegie's brilliant idea— that science could play an important role in the advancement of humankind. To this end, in 1902, philanthropist Andrew Carnegie established the Carnegie Institution of Washington, and provided "exceptional" individuals with the resources they needed in an environment "free of needless constraints." Andrew Carnegie directed the institution to "undertake projects of broad scope that may lead to the discovery and utilization of new forces for the benefit of man."

Craig makes clear that her "history can not claim to be complete" but offers a "microcosm of twentieth-century plant biology within the context of a single funding source, the Carnegie Institution." For her source material, Craig relied on department reports (discontinued in 1983) published in The Year Books of the Carnegie Institution of Washington, correspondence dispersed throughout archives in the United States, and interviews with Carnegie scientists, and former postdoctoral fellows. The result takes us on a journey beginning in Tucson, Arizona in 1903, where the newly established Carnegie Institution set up a Desert Laboratory devoted to the study of desert plants. Carnegie's current Department of Plant Biology, at Stanford, California, evolved from this experiment in the desert, which was the first of what would become a network of Carnegie research departments.

By examining the history of the Department of Plant Biology, Craig takes us from the beginnings of ecology at the turn of the century, through the evolutionary synthesis in mid-century, the origins and investigations on photosynthesis, and the revolution in plant molecular biology, which began in the 1970s. As botanists we are familiar with some of the more well-know and sometimes eccentric players, who, supported with Carnegie funds, made great contributions to our field—Luther Burbank, Frederic Clements; Nathaniel Britton, John Belling, Jens Clausen, David Keck, William Hiesey,

Robert Emerson, Herman Spoehr, Stacy French, Winslow Briggs, Peter Quail, and Christopher Somerville—and who, as exceptional individuals, directed the Carnegie Departments of Plant Biology over the years. Craig also provides insights on many Carnegie researchers and their unpaid spouses, who, though less well known outside of their fields, also made important contributions. Concurrently, she offers a view of department politics; cooperation and competition among investigators; and depicts interactions among Department Directors, the Board of Trustees, and Carnegie Presidents, in setting institutional policy. It is heartening to learn that in the early 1950's the Department of Plant Biology had employed three women biologists and by 1958, the Institution had six women biologists on their staff at other Carnegie departments.

The strength of the book lies in its well documented accounts of the Department as it changes its focus and its name to ultimately become the Department of Plant Biology in 1951. The black and white photographs of field stations and buildings, individuals at their field sites with research instruments often fashioned with their own hands, and groups of researchers and visiting administrators clothed in period dress, are an excellent complement to Craig's perspective. Craig often mentions the common names of researcher's plants (i.e., ocotillo), followed in parentheses by their botanical names (i.e., *Fouquieria splendens*), although she does not give authorities or family associations for those plants. In addition, botanists may find statements such as "Ocotillo was not a cactus, but a perennial" a bit distracting. Readers attempting to follow the changes in administration over the years at both the Department of Plant Biology and at the Carnegie Institution of Washington would have benefited from appendices comprising a list of Department Directors, staff investigators, and Presidents of the Institution, with dates of office.

In the preface to this and the four other Carnegie Centennial History volumes, President Meserve highlights the work of Barbara McClintock, and Alfred Hershey, who both won Nobel Prizes for their pioneering work as Carnegie scientists. Yet there is no centennial volume dedicated to the History of the Carnegie Institution of Washington's Department of Genetics, at Cold Spring Harbor, New York, where they began their "creative and high-risk science." Craig mentions McClintock only once, in relation to the Plant Biology Department's plan to recruit a cytologist from Carnegie's Department of Genetics in 1931. McClintock, however, did not join the staff of Carnegie's Department of Genetics until more than ten years later (Kass 2003). In a separate volume, Garland Allen (2004) provides a brief perspective on Carnegie's Department of Genetics and its relationship to Carnegie's Department of Embryology. Yet, the only other mention of plant biology research in that Centennial History regards Nina Fedoroff's project to identify McClintock's mobile genetic elements in maize (Brown 2004).

Nevertheless, Plant Biologists interested in the history of their field, as well as historians of science, will benefit from reading this informative and well written account of the Carnegie Institution of Washington's Department of Plant Biology, which began as an outpost in the desert and is now on the forefront of the molecular era.

—Lee B. Kass, Department of Plant Biology, Cornell University, Ithaca, NY 14853

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Hormones, Signals and Target Cells in Plant Development. Daphne J. Osborne and Michael T. McManus, 2005, ISBN 0-521-33076-9 (hard cover 110.00), 254 pp, Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211

The book "Hormones, Signals and target cells in Plant Development" authored by Daphne J. Osborne and Michael T. McManus, displays very deep knowledge of a subject that has dodged the scientific community for many years. While a lot is known about plant hormones, signals and the responding cells, this book for the first time integrates and highlights the target cell concept. Although the concept of target cell is well established in research circles in the animal world, its application in the present context enables a better understanding a whole range of a complex processes associated with plant responses to hormones and other signals and their importance to plant development. This filtration of a complex subject puts the book in a unique position in terms of usefulness to the research community.

Daphne J. Osborne a respected plant physiologist has published many articles on hormonal control of physiological and biochemical processes in plant differentiation and development. Michael T. McManus on the other hand, is an outstanding researcher in areas of biochemical pathways in plants including the biosynthesis of hormones. Their combined brilliance enabled the effective introduction of the concept of target cell in the study of plant hormones, signals and plant development. These are presented here with amazing clarity, making the book interesting to read and use.

In the first part of the text, the authors define plant hormones and signals. They present a concise list of the qualifying molecules. Long recognized candidates of plant hormones including IAA, GA, ethylene, cytokinins, ABA and jasmonates are listed. Finally additions to the list of signaling molecules include the likes of Nitric oxide, Oligosaccharins, lignans and peptides. Some of the above are not even considered to be hormones in the classical sense. The synthesis and mode of transport is given a very educating treatment. The detection and response of these and many other substances is consolidated by the introduction of the target cell concept.

The second part of the book focuses on the application of the "target cell" concept and how it enables the development of a coherent concept regarding how cells detect hormones and other signals. The idea that every cell can under the right circumstances or right stage of development act as a target cell is the actual eye opener. Reported here are ingénues experiments where the presumed target cells are micro-dissected by laser. It appears that under these circumstances, neighboring cells can differentiate and take over the functions of the dissected cells. At this point the issue of competence of cells to act as target cells is explained as a factor of development.

The search for receptors for various signaling molecules reveals the tenacity of the effort. The discovery of receptors for various ligands in animals helped solidify the target cell concept. This book reports the ongoing effort to find receptors for various signaling molecules in plants. Receptors for some plant hormones like IAA, ABA and ethylene have been identified. The search for receptors for GA and others continue.

Side by side with the issue of target cell concept, this book brings in the issue of cross-talk in response between target cells. Some plant responses are mediated by multiple signals, while a single signal can have multiple responses. One novel idea conveyed through the book is that most cells have low levels of many signaling molecules. Which one of the multiple molecules the cell responds to depends on among other things, the relative concentration, and for some, the presence of the relevant receptors. The expression of the genes for the receptors in turn is developmentally regulated.

This is a timely book that brings in a new way to look at old ideas. The idea of "target cell" and "hormonal cross-talk" are all put on a firm foundation. The gains and frustrations of the search for receptors for various molecules are presented with new insights. This book will be of special interest, and an essential to researchers involved in, plant physiology, plant development, plant biochemistry and molecular biology.

I highly recommend this text to researchers in fields of plant developmental physiology.

-William Jira Katembe, Department of Biological Sciences, Delta State University, Cleveland, MS 38732.

A Bibliography of Conifers. Farjon, Aljos. 2005. ISBN 1-84246-120-6 (hardback £75.00, ~US$153.00) 211 pp. Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, UK.

Aljos Farjon, the foremost expert on conifer taxonomy, has released a second, updated, edition of one of his conifer classics, *A Bibliography of Conifers*. This is an unusual book in that it is simply a bibliography of literature pertaining (mostly) to conifer systematics and taxonomy. However, within this simplicity lies a wealth of information brought together in one easy to use book. In this second edition Farjon has increased the number of references from 2130 to 3738 and brings the bibliography up to date (as of 2003). Farjon has formatted the bibliography as an alphabetical list of publications, each with its own unique number, separated into 13 sections. The first five sections cover Bibliographies, floras, manuals, general gymnosperm and conifer titles. The next seven sections cover references regarding each of the extant conifer families (Araucariaceae, Cupressaceae, Phyllocladaceae, Pinaceae, Podocarpaceae, Taxaceae, and Taxodiaceae). The Taxodiaceae is given its own section to accommodate older literature recognizing this family as distinct from the Cupressaceae. The last and largest section covers Taxa Below Family Rank.

In this second edition of *A Bibliography of Conifers* Farjon has updated the literature covered by the original edition for the Pinaceae, Cupressaceae (including Taxodiaceae), Taxaceae and Podocarpaceae and greatly expands the range of coverage to include the Araucariaceae and Phyllocladaceae. Non-coniferous gymnosperms are now only treated in the six page section titled Gymnosperms (General Titles) and *Gnetum*, *Welwitschia*, *Ginkgo*, and the cycads are no longer listed in the index of this edition.

At first glance this book seems anachronistic in the face of electronic database systems; however, further perusal reveals that it contains many references that are too obscure or old to be electronically referenced anywhere and so locating them would take many hours following the literature trail from one bibliography to the next. Instead, Farjon has assembled all the most pertinent literature into one handy, easy to use reference work. Nonetheless, one of the most notable drawbacks is that the index is only keyed to taxa. There is no way to look up references by keywords (e.g., DNA, turpines, or China) as one would do with an electronic database.

This book does show some overlap with Farjon's *World Checklist and Bibliography of Conifers* (Farjon 1998, 2nd edition 2001). The differences being that the *Checklist* only addresses nomenclatural references, while this bibliography deals with references related to all aspects of conifer systematics. These two books fill slightly different roles and should be used in conjunction with each other, not one in lieu of the other.

Farjon is an accomplished botanical illustrator and I was disappointed that none of his impressive drawings grace the pages of this book as they (and the works of others) do in the *Checklists* (Farjon 1998, 2001). As with most of Farjon's books, the price puts this book out of reach of all but the most dedicated conifer bibliophiles and libraries. My review copy reached me in rather poor condition; I hope that the publisher plans to pack them more securely for shipping, especially considering the price. Overall, this updated edition of *A Bibliography of Conifers* is a high quality publication containing a wealth of information and I highly recommend this to systematists and taxonomists working with conifers. In the assembly of a bibliography such as this, it is fortunate that conifers have such a dedicated and passionate researcher as Aljos Farjon. Other plants should be so lucky.

-James P. Riser II, USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Lab, Missoula, Montana, 59808.

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***Drosera* (Droseraceae). Flora Neotropica Monograph 96**. Correa A., Mireya D. and Tânia Regina dos Santos Silva. 2005. ISSN 0071-5794 (Paper US$) 56 pp. The New York Botanical Garden Press, Bronx, NY, 10458 (Spanish)

Drosera (Droseraceae), by Mireya D. Correa A. and Tânia Regina dos Santos Silva, seeks to review, in Spanish except for the brief abstract and title page, the carnivorous genus *Drosera* as it occurs in the neotropics. In this they succeed partly, but with some obvious oversights and other deficiencies.

This work provides a wide range of information, from SEM images of pollen and seeds to accurate

and clear drawings of the various species discussed. Distribution maps are also included which clearly show individual locations for the various species as well as an overall map showing the number of species found in various neotropical areas.

Several deficiencies jump out in *Drosera* (Droseraceae). One is that some of the information is inaccurate. For example, on p. 2 the Droseraceae is described as containing four genera. While this was the case for a long time, in the past several years consensus has grown for the removal of the carnvorous/subcarnivorous genus *Drosophyllum*, leaving only three carnivorous genera: *Drosera*, the sundews; *Dionaea*, the Venus Flytrap; and *Aldrovanda*, the Waterwheel Plant. Since this work was published in 2005, there should have been plenty of time to correct this description of the Droseraceae.

In addition, the photographs range from acceptable to useless. The SEM images are among the best, and many details of pollen morphology are clearly visible, though muddy due to low contrast. The in-habitat photographs of plants are weak at best. Figure 1 C and D are truly useless, with the plants as pictured being indistinguishable from grasses or small, rosette weeds. This deficiency is probably due to the reproduction process used rather than to the efforts of the authors.

Finally, there are some species missing. In 2002, Fernando Rivadavia named four new species from Brazil, which of course occur in the neotropics. His work was published in Carnivorous Plant Newsletter, which in spite of its name, a relic of its beginnings as a newsletter, is now a glossy journal from the International Carnivorous Plant Society, edited by two Ph.D. scientists and publishing peer-reviewed work. Rivadavia's work was peer-reviewed, and he added *D. tentaculata*, *D. grantsaui, D. camporupestris*, and *D. viridis* to the genus. Since this work was published three years prior to *Drosera* (Droseraceae) and since Rivadavia is probably the most active and prolific botanist dealing with *Drosera* today in South America, this omission should have been corrected.

Who should buy *Drosera* (Droseraceae)? In spite of the deficiencies noted above, anyone working in or strongly interested in carnivorous plants should get a copy. It belongs in college and university libraries as well. To fully use it, the user will need to be able to read Spanish, or a very fast typist accessing babelfish.altavista.com.

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

Wildflowers & Grasses of Kansas: A Field Guide. Haddock, Michael John. 2005. ISBN 0-7006-1370-6 (Paper US$19.95). 374pp. University Press of Kansas, 2501 West 15th, Lawrence, KS 66049-3904.

This stunning field guide is the latest addition to a fairly extensive technical and semi-technical bibliography of Kansas plants. It illustrates 264 wildflowers and 59 grasses, sedges and rushes commonly found in Kansas. It is intended to help non-specialists identify the most common and characteristic flowering plants in the state. As a result, the author attempts to keep technical terms to a minimum. Most of the terms used are collected and defined in a concise glossary that compliments a brief illustrated section on plant morphology at the beginning of the book. However, several plant descriptions contain descriptive terms not listed in these resources. At the very beginning is a brief physical and biogeographical description of the state. It would have been nice to have a map, similar to the "Generalized Native Vegetation" found in Owensby's *Kansas Prairie Wildflowers*.

Species are grouped by flower color. Within each group, the arrangement is alphabetical by family, genus, and species (with authority). Nomenclature generally follows that of the *Flora of the Great Plains*. The excellent color photographs are close-ups of individual flowers or inflorescences with good depth of field so that vegetative features can usually be examined. In addition to family, other descriptors include common name(s), flowering period (months), distribution (general region of the state), size of the plant (in English units), and distinctive habitat. The latter provides specific site types, eg., exposed limestone, sandy gypsum soils, disturbed areas, upland, bottom land. It does not contain distribution maps.

Plant descriptions are complete but written in a more terse, technical style, similar to Bare's *Wildflowers and Weeds of Kansas*, than other popular guides such as Owensby or Barkley's *Field Guide to the Common Weeds of Kansas*. In contrast, the comments provide very readable and interesting notes on the plants. In addition to expected information, like flowering time of day and native uses, Haddock describes interesting botanical features and historical perspectives. For instance, in *Linum pretense* the petals drop off easily in hot weather or when disturbed, or the extensive taproot of *Liatris punctata* extends as much as 15 feet. We learn that *Tradescantia* is named for John Tradescant, gardener for Charles I of England in the 1600's and that *Eryngium leavenworthii* is named after Melines Conklin Leavenworth (1796-1862), an explorer, army surgeon, and botanist (not Col. Henry

Leavenworth, namesake of the Fort and the state's oldest city).

A useful addition at the end of the book is the finding aid. Though not a dichotomous key, it is based on that principle and distinctive key characters.

This is a handy guide for young students and anyone interested in the flowering plants of the central Great Plains. It fits nicely in a fanny pack! For those plants you might run across that are not found in the book, you must check the author's web site: www.lib.ksu.edu/wildflower. The site now contains nearly 500 species (or varieties) and is constantly growing. The sites organization is similar to the books but with multiple photos (and site locations) for each species, bulleted descriptions and a more extensive section on plant morphology, illustrated with hand sketches that would serve as an excellent model for undergraduate students to emulate.

I'm not suggesting that the state should market this book to promote tourism - - but that might not be a bad idea. I am suggesting that every school, municipal, and college library in the region should have a copy on their shelf - -and you should have a copy to take with you the next time you drive through Kansas!

- Marshall D. Sundberg, Department of Biological Sciences, Emporia State University, Emporia, KS.

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Books Received

If you would like to review a book or books for PSB, contact the Editor, stating the book of interest and the date by which it would be reviewed (15 January, 15 April, 15 July or 15 October). E-mail psb@botany.org, call, or write as soon as you notice the book of interest in this list because they go quickly! - Editor

***Arabidopsis* Protocols 2nd ed.** Salinas, Julio, and Jose J. Sanchez-Serrano (eds.). 2006. ISBN 1-588-29-395-5 (Cloth US$125.00) 469 pp. Humana Press, 999 Riverview Drive, Suite 208, Totowa, New Jersey 07512.

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Erratum

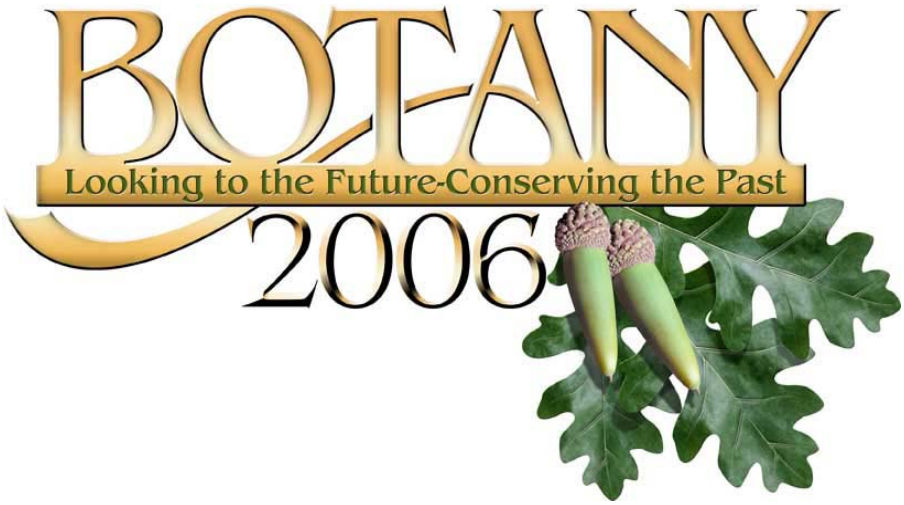
Captions to figures in C.J.A. article by Blackwell in *Plant Science Bulletin* 52(1)

Photo 1
John Peterson's photo of Dr. Alex at Michigan State (from Peterson).

Photo 2
Although Dr. Alex was an academic, teaching and doing research at four different universities over his career, his first job begun while still a graduate student, was as a plant pathologist for the Illinois Natural History Survey. Here he is shown on the running board of the field vehicle used in the search for peach yellows disease (about 1930) (from Blackwell 1988).

Photo 3
Dr. Alex in his office at the University of Texas about 1973. The boxes in the bookcase are his dark green cloth-covered cardboard reprint boxes of myxomycete literature with the papers arranged alphabetically by author and lettered with a marker on masking tape. Also shown in the case is a photograph he made of the Caryatid porch of the Erechtheion on the Acropolis, the place where Athena won for the right to have the city named for her. These maidens are copies. Four of the originals are now protected in the Acropolis Museum; the fifth maiden is in the British Museum, courtesy of Lord Elgin. Dr. Alex was proud of his Greek heritage, and although he usually thought in English, some things such as numbers and prayers were always recalled in the Greek of his childhood. He and Mrs. Alex traveled to Greece many summers and had bought retirement property on Corfu with a view of Albania they were never to use. Dr. Alex's photographs matched those of the *National Geographic*. One summer I stayed at their house to take care of Melanie while they went to Greece to see his parents. He instructed me that if the house caught fire I should try to save in order: i) the copy of the *Myxomycetes* autographed by his coauthor G.W. Martin, ii) his large collection of sorted Kodachromes in a free-standing 6' tall case, and iii) a centuries-old icon with a frame enhanced by beetle galleries –that is if I could get them out without dying in the fire (from Blackwell).

Revised URL for Truman State University's solar clock in *Plant Science Bulletin* 52(1):
//solarclockgarden.truman.edu



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