DEPARTMENT OF BOTANY www.botany.wisc.edu

ALUMNI NEWSLETTER

Letter from the Chair

DEAR ALUMNI AND FRIENDS

The past year has been a busy and successful one for the Department of Botany. As you will see in the pages that follow, many Botany faculty, staff, and students have garnered awards and other markers of success. **Sara Hotchkiss** and **Marisa Otegui** both breezed through their reviews for promotion to Associate Professors, with tenure. Likewise, **Ken Cameron** was promoted from Associate to Full Professor and we had the pleasure of celebrating **Ted Cochrane's** 40th year as a curator in the Wisconsin State Herbarium. As outlined in the pages of this newsletter, the Botany Department "family" has grown by the addition of several new faces.

At the other end of the career spectrum, we celebrated the retirements of three long-term staff members, **Sue Bader, Claudia Lipke,** and **Loraine Pilgrim,** and had to say goodbye to our information technologist, **Tom Maher,** who moved to Pittsburgh.

Tim Allen surprised us by announcing his intention to retire at the end of 2010. Tim has informed and inspired thousands of students during his 40 years of teaching at UW. It is hard to imagine Botany without Tim's lectures reverberating (literally and figuratively) throughout the building. We will be celebrating Tim's accomplishments at a dinner on January 14 at the Arboretum (details to be posted on the department website).

This year, once again, many department members were honored for teaching accomplishments. Also, we received the good news that the National Research Council's ranking of US Doctoral Programs showed UW–Botany as the top program in many categories, with the **best overall ranking score.**

Over the summer we heard from the National Science Foundation that new grant proposals submitted by Botany faculty members, amounting to about $7.5 million, will be funded. When added to the abundant research activity that is already underway, we can feel very good about the large quantity of high-quality science that is happening in the Botany Department.

In other good news, the college has allowed us to begin a search for a new Assistant Professor in the area of plant biochemistry. Faculty searches are always energizing, since they allow us to examine the brightest young scientists' accomplishments and hear great talks. In all likelihood we will have made an offer, and maybe even have a new colleague on staff, this time next year.

Overall, the Botany Department is thriving, thanks in no small part to the support and encouragement of our many friends and alumni! On behalf of the entire department I would like to thank you all and wish you good health and deep fulfillment in all your personal and professional ventures!

David Baum, Chair

Comings and Goings

Neil McLaughlin joined the Botany front office as a University Services Associate in May, 2010. Prior to working at the UW, Neil worked as a contractor at the Disability Determination Bureau for 2 years, and for many years before that as a manufacturing engineer for Seal Graphics and L. A. Darling Company, both in Sun Prairie. Among Neil's many responsibilities is collecting information for the newsletter, so readers are encouraged to keep sending news botany@ls.wisc.edu!

Sarah Friedrich joined the Botany Department as a Media Specialist in April 2010. She comes to the department as a student of the Graphic Design and Illustration program at Madison College, from which she will graduate in December. Prior to that, Sarah graduated from the UW with a double major in German and Art History and worked as a trademark infringement researcher. In her free time, Sarah likes to stay active, playing soccer, softball, tennis, biking, kayaking and camping. She also tries to find time for her own art projects.

Distinguished lichenologist Dr. Thomas H. Nash III has relocated to Madison after retiring from Arizona State U. after nearly 40 years of service. He is now a Senior Scientist within the Department of Botany and shares office space within the State Herbarium where he will continue to study North American lichen taxonomy and help coordinate the Consortium of North American Lichen Herbaria. We are delighted to have Tom join the Botany Department!

Dr. Nash was recognized for his lifetime achievements in Lichenology at the International Mycological Congress in Edinburgh in August 2010. The first Acharius Medal was made by the Royal Swedish Mint for the Royal Swedish Academy of Science in 1846. At their 1990 meeting, the International Association for Lichenology resolved to honor professional achievement and commemorate Erik Acharius (the "Father of Lichenology") by presenting a medal in his name. The Swedish Mint still had the dies for the 1846 medal, and Tom became the 34th recipient of this highly prestigious award.

This past year, the Department bid farewell to three retirees: **Claudia Lipke**, Nov 2009; **Loraine Pilgrim,** Jan 2010; and **Suzanne Bader**, Aug 2010. Thank you all for your many years of wonderful service!

Claudia grabbed retirement by the horns.

Loraine has found retirement to be a piece of cake.

Sue "retired" to another job, now has a little extra time for her horse Scout.

Awards and Kudos

Undergraduates

Brianna Laube • Raper Prize for the highest GPA.

Ariel DeBroux • John Curtis Award.

Jessica Skarlupa • Folke Skoog Award.

Alexandria Musial • The Frits Went Award

Tom Kleist • University Book Store Academic Excellence Award.

Botany Graduate Students

Newcomb Teaching Award • **Phil Gonsiska**

ON & EK Allen fellowship • **Shelley Crausbay** & **Ben Grady**

Croxdale Award • **Jane Bradbury**

Eldon & Joy Newcomb Fellowship • **Brent Berger**

Davis Summer Research Fellowship • **Abigail Mazie & Robert Wernerehl**

Davis Research Grants • **Rafael Arevalo, Andrew Gardner, Elizabeth Georgian, Emily Sessa, Brian Sidoti, Brian Walsh**

Raper Travel Grants • **Brent Berger, Rafael Buono, Shelley Crausbay, Brian Drew, Michelle Haynes, Beth Lawrence, Emily Sessa, Izak Smith, Brian Walsh, Evelyn Williams**.

Brent Berger was inducted into the UW–Madison Teaching Academy as a Future Faculty Partner. **Alison Scott** received an Advanced Opportunity Fellowship. **Abigail Mazie** received a research award from Graduate Women in Science. Keep up the great work!

Faculty

We are proud to announce that **Marisa Otegui** and **Sara Hotchkiss** were promoted to Associate Professor, that **Ken Cameron** was promoted to Full Professor, and that **David Baum** was elected Fellow of the UW-Madison Teaching Academy. In addition, Chadbourne students recognized **Tim Allen, Simon Gilroy, Tom Givnish,** and **Don Waller** as excellent teachers.

Phytomorph project Awarded $4.1 million.

The National Science Foundation recently funded **Edgar Spalding's** team to find the effects of genes on plant development using imaging and computation. The grant will advance a Dept. of Botany project focused on discovering the functions of plant genes by computationally analyzing digital images of seedlings undergoing development.

Spalding leads the interdisciplinary Phytomorph project in collaboration with Professor Nicola Ferrier (Mechanical Engineering). The machine vision technologies utilized in this research supply the high throughput and precision needed to characterize the growth and development, or phenotype, of seedlings in genetically-structured populations of maize and *Arabidopsis*. The computational resources supplied by the UW's Center for High Throughput Computing run by Professor Miron Livny (Computer Sciences) make it possible to map the phenotype displayed by an individual to its genotype. In this way, the genes controlling aspects of seedling development, important in nature and in the cultivated crop, may be learned, which is a prerequisite for rationally modifying their effects. Congratulations Edgar!

Dimensions of Biodiversity project awarded $3 million.

Don Waller, **Tom Givnish**, **Ken Cameron**, and **Ken Systma** together received a $3M, 5-year grant from NSF's new Dimensions of Biodiversity program. Building on classic work by J.T. Curtis and colleagues from the 1950's, they are using modern resurveys to understand patterns of species loss, invasion, and biotic homogenization, using these patterns to infer the drivers of ecological change in Wisconsin's forests, prairies, and pine barrens. The new award extends this work to barcode all plant species in Wisconsin, allowing the researchers to explore the role of phylogenetic relationships and how particular plant characteristics map onto this tree. They will then evaluate how these traits and phylogenetic relationships are affecting contemporary species and community dynamics and genetic variation in selected species. We congratulate this team that combines our strengths in ecology and systematics.

Congratulations to all!

Of Interest to All

Ted Cochrane celebrates 40 years at Herbarium

On July 29, 2010 the Herbarium hosted a luncheon to recognize Senior Academic Curator **Theodore Cochrane**'s 40 years of service. A constant presence in the herbarium, Ted has been the "go to" man for countless Botany students as well as government scientists and the general public. His tireless efforts have kept WIS collections growing and in tip-top condition. After thanking **Ken Cameron** and **Mark Wetter** for arranging the party, Ted said:

"I'm not quite as old as the herbarium, which, having been established in 1849, is only one year short of being as old as the university itself. Yet, it is true that I have been here a good while, for as of June 29, 2010, I have been a curator in the department for 40 years. It scarcely seems possible that as of this fall, I will have been a denizen of the UW–Madison campus and Birge Hall for 50 years. My very first university class, Zoology 1a lecture, was taught by Seymour Abrahamson at 7:45 a.m. on September mornings, 1960, in Room 145 Birge. Later, I worked for 12 years directly upstairs, in Room 245, and since then for 28 years immediately next door, in Rooms 160/166. One could say I haven't made it very far in this world.

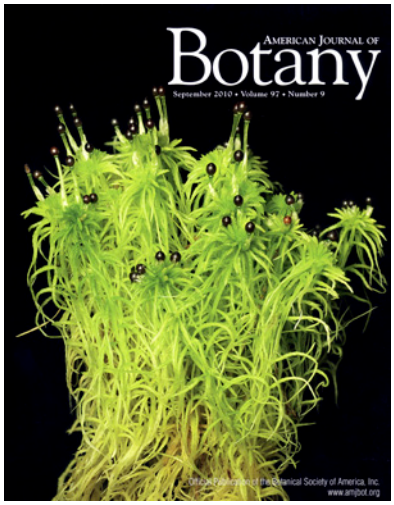
"The innumerable hours I spend in this building are always satisfying. Not everyone has the luxury of spending the entirety of his working life doing what he truly loves to do, and working here is made all the nicer when you are surrounded by such great people, be they faculty, graduate students, administrators, or other staff. The mission of the herbarium is to provide resources for botanical research, education, and public service, and I look forward to continuing to advance that mission and continuing to work with all of you."

Marya McIntosh follows grandparents' footsteps.

"As a first year graduate student in the Nelson Institute, professors and fellow students often ask 'Why UW?' My interests in interdisciplinary approaches to resource management and restoration ecology drew me here academically, but my connections to this institution run much deeper. My beloved grandparents, **Robert and Joan McIntosh,** both completed graduate work in the Botany Department. As any plant ecologist will know, my grandfather (**PhD 1950**) was a student of John Curtis and worked closely with him on establishing the continuum theory based on their studies of plant communities in Wisconsin. I am exceedingly proud to walk in Bob and Joan's footsteps and grin broadly when his work is acknowledged in class or conversation. Bob turned 90 years old on September 24th, so please join me in thanking him for his contributions and wishing him well."

Marya Johnston-McIntosh

Peat moss can eat sugar!



A handsome photo of *Sphagnum compactum* on the cover of the *American Journal of Botany* calls attention to a new paper by **Linda E. Graham, Eunsoo Kim, Patricia Arancibia-Avila, James M. Graham,** and **Lee W. Wilcox,** which describes the evolutionary and ecophysiological significance of sugar utilization by peat moss and its algal associates. Graham's team found that uptake of sugars may help charophycean algae and peat moss maintain positive carbon balance under carbon or light limitation. They conclude that plant mixotrophy is trait that evolved early in the invasion of land.

The first Annual Hugh H. Iltis Lecture in Plant Systematics & Botanical Excursion

In 2010, the Wisconsin State Herbarium initiated a new annual event, the "Hugh H. Iltis Lecture in Plant Systematics." The Lecture honors the tireless dedication and commitment to local, national, and international systematics offered by our friend and colleague Professor **Hugh Iltis,** who served as Director of the Herbarium at UW-Madison from 1955-1993. Dr. Iltis earned his place in history as an equal to such botanical luminaries as **Increase Allen Lapham, Leyland Cheney, John T. Curtis, John Jefferson Davis,** and **Norman Fassett.** To commemorate his accomplishments, a formal portrait of Hugh now hands alongside these other great men within the State Herbarium.

The first Iltis Lecture was presented by Dr. **Scott A. Mori,** who is the Nathaniel Lord Britton Curator of Botany at The New York Botanical Garden. Dr. Mori was born in Janesville, WI, and awarded his Ph.D. in botany from UW–Madison in 1974. He is an expert on the Brazil nut (Lecythidaceae) family and on the lowland Amazonian flora. He and his collaborators published *An Illustrated Guide to the Vascular Plants of Central French Guiana* for which they were awarded the Engler Medal in Silver for 2002 by the International Association of Plant Taxonomists. He is a co-editor of *The Flowering Plants of the Neotropics* and a co-author of *Seed Dispersal by Bats in the Neotropics* published in 2009. Dr. Mori is a former Executive Director of Flora Neotropica, a past President of the Torrey Botanical Society and a current member of its Council, and an adjunct professor at the City U. of New York, the Center for Environmental Research and Conservation centered at Columbia U. and the Yale School of Forestry and Environmental Studies. Dr. Mori was recently awarded the David Fairchild Medal for Plant Exploration and (like his mentor Dr. Iltis) the Asa Gray award by the American Society of Plant Taxonomists for lifetime achievement for his study of the classification of New World tropical plants.

In future years, the Hugh Iltis Lecturer will attract speakers of similar standing who, like Hugh and Scott, bring together knowledge and passion to elucidate botanical diversity.

Scott Mori and Hugh Iltis

In conjunction with the Hugh H. Iltis Lecture, the State Herbarium organized a local field excursion, so the speaker and the entire department could share in the joy and excitement of botanical exploration. On September 7, 2010, a group of 32 faculty, staff, and students visited the Pleasant Valley Conservancy near Black Earth, WI, where Drs. Kathie and Tom Brock described their 14 years of effort restoring prairies and savannas. Photos appear on the department's facebook page. Botany alumni interested in joining next year's excursion should contact Dr. **Ken Cameron.** In order to cover travel expenses and speakers' fees, donations of any size to help support the Iltis Lecture & Field Excursion are most welcome (see Gift Giving on the Botany website).

Blossoms behind Birge attract birds and bees

Two years after planting, a small prairie behind Birge Hall put on a dramatic show of flowering. **Tom Givnish** and the Arboretum provided seeds and plants, and **Joy Zedler's** class planted the native species to replace the hillside lawn. Rapidly growing forbs such as brown-eyed susan, yellow coneflower, bee balm, and Indian plantain began blooming en masse this year, attracting large numbers of pollinating bees and creating a "buzz" in and around Birge! Slower growing grasses, including big and little bluestems, Indian grass, and prairie dropseed, should flower in force next year.

The bulb garden behind Birge (contributed by Tom Givnish) produced spectacular blooms, with those of *Lilium canadense* being the most spectacular (~20 large, reddish, bell-shaped flowers). Hummingbirds were invited but not spotted—maybe next year. Tom is working with **Mo Fayyaz** and his greenhouse team to plant more bulbs in the circular infield of the Botany Garden monocot area, to add substantial diversity to the monocot families and create a striking visual display of thousands of blooms in spring 2011. Thank you Tom, on behalf of the birds, the bees, and all who enjoy the flowers!

Brown-eyed susies and *Monarda* perfumed the new prairie above the back parking lot.

The gorgeous purple-flowering Magnolia, tucked beside the little prairie and the fire escape from Birge's 145 lecture hall, bloomed all summer and into September!

The "grassy knoll" will bloom with spring flowers in a few months.

Wanted: Alumni to celebrate Birge Hall's100th birthday

The case for: The Botany Department is strongly linked to this building through our continuous occupancy since 1912 and the fact that the Botany greenhouses and the herbarium so much define its footprint.

The case against: It is a building that is shared with Zoology and is considerably younger than the Botany Department itself, which dates back at least to 1881. What do you think? If you have ideas on whether and how to celebrate this wonderful old building, and ESPECIALLY if you would like to HELP organize an event, please email botany@ls.wisc.edu sometime before January 1, 2011.

News from former UW Botany Professors

Orie Loucks, former Botany student (PhD 1960, **John T. Curtis** advisor), and professor in our department from 1962–1978, was honored in August by his students and associates at the annual meeting of the Ecological Society of America in Pittsburgh. Those attending the event testified to Orie's fine role as a mentor, his significant accomplishments as a scientist, and his leadership in conservation. Speakers were **Roger Anderson, Becky Anderson, Charles Canham, Jim Fralish, Ray Gorman, Ed Johnson, Dennis Knight, Eric Menges, Bob Peet, Don Waller,** and **Jianguo Wu.** Orie left Wisconsin in 1978 to become Science Director for The Institute of Ecology in Indianapolis, and in 1983 he became the Director of the Holcomb Research Institute at Butler University. Six years later he was appointed Ohio Eminent Scholar in Applied Ecosystems Ecology at Miami U, where he recently retired. During his career, Orie received the Mercer Award from the Ecological Society of America, the Distinguished Service Award from the American Institute of Biological Sciences, the Oak Leaf Award from The Nature Conservancy, and the National Conservation Achievement Award from the National Wildlife Foundation. At Miami U. he brought faculty together from science and business departments to form the Center for Sustainable Systems Studies. Orie continues to publish in the ecological literature and serve on important committees. Attending the event with Orie were his wife Elinor and their daughter Kimberly. The Loucks live in Oxford, Ohio.

Gary Breckon, Assistant Professor of Botany during the 1980's, left UW before coming up for tenure to take a job in the Department of Biology at the U. of Puerto Rico-Mayaguez. He retired from there in June 2010 and moved with his wife and dogs (!) back to the continental USA to be near his daughter and her family in Topeka, KS.

Notes from the Wisconsin State Herbarium:

Type Specimen Digitization

The Herbarium completed a second year of type specimen databasing and digitization with support from the Andrew W. Mellon Foundation. A grant for two additional years of financial support was awarded from the foundation, with WIS serving as coordinator for a greater Midwest effort to database types held in herbaria from other Wisconsin herbaria, as well as partner institutions in Minnesota, Nebraska, and Iowa.

Herbarium Goes Hollywood.

A documentary on the life of Scottish-born American naturalist John Muir is currently in production for the PBS series American Masters. A film crew based in Madison for several weeks took advantage of the herbarium's collection of late 19th century botanical specimens by using them as authentic props in staging the young Muir studying at the UW–Madison in the early 1960s.

Seeds from the 2001 blooming of Botany's titan arum *(Amorphophallus titanum)* have all found homes. These offspring of "Big Bucky" (ovule donor) and "Mr. Magnificent" (pollen donor) are now blooming for the first time worldwide. UW–Horticulture's arum bloomed September 21 in the D.C. Smith greenhouse. (Right, portrait by Kandis Elliot).

On October 12, UW-River Falls experienced its first titan arum bloom–70.25 inches tall! In shape and height, this plant certainly takes after its "mom".

Titan info: http://botit.botany.wisc.edu/Titan_Arum_Archive/index.html

Lab News

Tim Allen Lab

Professor **Tim Allen's** well-deserved retirement in December is the big news. He continues the weekly sandbox to discuss systems issues. He has had applause every lecture for Plants and Man so far: they know something great is passing.

Graduate student **Nissa Enos** finalizes a project applying Grime's CSR model to species faithfulness on Wisconsin prairies. Graduate student **Devin Wixon** addresses patterns in the soil microbial response to elevated temperatures. Separately, in 2010 she co-authored two papers and a chapter. In IES, **Megan Pease** will have her PhD soon with a dissertation on alternative fuels for long distance trucking. **Marc Brakken** will finish by Christmas on a theoretical discourse on how we know about ecological situations. **Peter Allen,** MS in hand, works on restoration and green buildings. PhD candidate **Steve Thomforde** is researching biotic controls maximizing ecosystem function by regulating energy, matter, and nutrient flows. Welcome to **Julie Collins** working on narrative in ecology. **Cassandra Garcia** finishes soon with a dissertation on policies and action in municipal wells in Madison. **Keith Doyon** continues to work on ecological good faith response of the US Army. The lab is happy and buoyant, if wondering what retirement is going to be like.

Cecile Ané lab

Our lab continues to work at the interface between biology and statistics. Graduate student **Yujijn Chung** (Statistics) continues to work on the problem of estimating evolutionary histories on the basis of multiple but conflicting gene trees. She explored the performance of statistical methods for reconciling gene trees. She now studies methods to detect recombination breakpoints from genome-wide alignments.

Satish Kotha completed his MS (Computer Science): he expanded the capabilities of the software BUCKy to perform Bayesian concordance analysis. The software webpage was re-designed and the program was downloaded across the 5 major continents. NSF funding will help pursue this work further, with the integration of more biological realism into the models of gene tree discordance. Graduate student **Lam Ho** (Statistics) is studying the power of certain statistical models for detecting selection, from the comparison of traits across species. He will start working on monocot evolution, in collaboration with **Tom Givnish.** As always, **Cecile Ané** enjoys bridging biology and quantitative disciplines. She had the opportunity to do so beyond campus, by organizing the inaugural iEvoBio conference in Portland, OR (June 2010), which drew over 300 participants from diverse backgrounds.

David Baum lab

The 2009–2010 academic year began with the departure of one graduate student (**Ivalú Cacho,** to a post-doc at UC–Davis) and one post-doc (**Ning Liu,** to a postdoc at Ohio State). Graduate student **Raul Correa** (with the help of 15 undergraduates!) further developed an experimental approach called transgenomics. He identified a piece of the genome of *Leavenworthia alabamica* that reduces fruit length when it is introduced as an extra, single copy into the *Arabidopsis thaliana* genome. He hopes to figure out the genetic and evolutionary significance of this result before graduating in December 2011. Graduate student **Talline Martins** determined how a combination of spatial and temporal regulation of genes in the anthocyanin biosynthetic pathway explains different petal-spot patterns observed in *Clarkia gracilis*. During her final year (funded by a prestigious Ford Fellowship), she plans to extend these findings to other closely related species of *Clarkia*. Undergraduate **Jeremy Berg** (mentored by Talline) received a Frits Went award to work with the Gilroy lab to study the biochemical activity of four *C. gracilis* DFR proteins. Graduate student **Abigail Mazie** developed an exciting project on the evolution of stellate trichomes in *Physaria* (Brassicaceae), and the possible roles of the genes STICHEL and BLT in their development. She received a Graduate Women in Science research award. Graduate student **Pulikesi Rajangam** ("Puli") made progress in determing the role of meristem identity genes in the development of *Leavenworthia alabamica*.

Ken Cameron lab

Three new graduate students became members of the Cameron Lab in 2009. **Deniz Aygoren** is being supported by the Turkish government. She intends to study the systematics of ladies' tresses orchids *(Spiranthes)*. **Pan Li** is a visiting doctoral student from Zhejiang U. in Hangzhou, China. His research focuses on systematics of catbriers *(Smilax)*. **Elsy Buitrago** was a visiting MS student during the summer months, during which time she completed a molecular phylogenetic analysis of *Porroglossum* orchids. These new students join **Brian Sidoti** and **Rafael Arevalo,** who study *Tillandsia* (Bromeliaceae) and *Mormolyca* (Orchidaceae), respectively.

During the year **Ken Cameron** and his students traveled extensively. He gave keynote addresses at the Third Andean Orchid Congress in Quito, Ecuador, and at the 50th annual Mid-American Orchid Congress in TN. He was one of six invited foreign guests to the Guangxi International Orchid Conservation Conference in China, and together with several students attended the North American Native Orchid Conference in Green Bay, and the Botany meeting in Snowbird, UT. He and Rafael Arevalo, along with herbarium curator **Mark Wetter,** participated in the All Plants Initiative Meeting in Medellin, Colombia, where the "Digital resources of The Wisconsin State Herbarium" were profiled.

Of the many papers Cameron published in 2009, the most notable is one in a series of articles in *American Journal of Botany* that profile the influence of Charles Darwin's botanical publications. He also co-authored a groundbreaking paper in the Proceedings of the National Academy of Sciences, "Botanists Recommend a DNA Barcode for Land Plants".

Donna Fernandez lab

The Fernandez lab has had a busy year with a complete changeover in personnel. Dr. **Chieh-Ting Wang** arrived from Virginia Tech to take over a project on control of flowering time by MADS-domain repressors in *Arabidopsis*. These grow quite a bit faster than the poplar trees he worked on previously! He is also working on a quadruple mutant combination that blurs the otherwise sharp boundary between vegetative and reproductive growth. **Jessica Skarlupka** completed her senior thesis entitled "Development of a temperature-sensitive allele for investigation of SECY2 function in chloroplasts" and received the Folke Skoog Award for Undergraduate Research for this accomplishment. Her alleles will be very useful for ongoing work on the SECY2 translocation system. Two other undergraduates completed Independent Study projects in the lab and have moved on to careers in human health fields. We wish them well and thank them for their contributions.

Simon Gilroy lab

Scientists in the Gilroy Lab delved into the root of the matter with recent discoveries in how roots control their branching pattern via mechanically-induced calcium signaling, in addition to revealing the dynamic nature of the ion fluxes regulating root and root hair growth. The team completing these studies included **Gabrielle Monshausen,** who moved on to a faculty position at Penn State University.

We are very happy that **Won-Gyu Choi** and **Amy Briggs** joined us as post-docs. Won-Gyu's research includes a NASA-funded project to investigate how cytoplasmic calicum is involved in gravitropic signaling in plants, and Amy will study hormone signaling in rice. Our graduate student **Alexandra Chanoca** is busily characterizing the role of calmodulins in the development of root system architecture.

We are also very fortunate to have a great group of undergraduates. **Kohl Boydston** and **Mike Gardner** have been working with post-doc **Peter Dowd** on understanding the controls on rice seed germination; **Aarushi Agni** is working with Assistant Scientist **Sarah Swanson** on calcium and growth control; and **Amanda Miller** is helping Won-Gyu work on a screen for plants with altered root architecture. Kohl presented his results at the UW Undergraduate Research Symposium this year, and both Mike and Kohl's work was showcased at this summer's meeting of the American Society of Plant Biologists in Montreal.

All our projects rely on the Botany Greenhouses and the Plant Imaging Center. Doing research in the Botany Department is truly a group effort!

Tom Givnish lab

Graduate student **Emily Sessa** continued research on *Dryopteris* phylogeny and physiological ecology, including field work at the Huron Mountain Club, collaboration with **Tom Crow Dog** on common-gardens in North Carolina, and a well-received

presentation at BSA. **Stephanie Lyon** gave birth to son Akiva last year, presented some of her results in the Philippines on *Corybas* evolution, and will travel to Borneo and south Pacific other islands this fall. **Phil Gonsiska** defended his Ph.D. on *Catopsis* phylogeny and evolution, and is seeking a career in a tropical botanical garden. **Bob Wernerehl** is studying the causes of differential distributions of prairie grasses, expecting to defend his PhD in December. **Kate Gerndt** is completing her Master's study of the structural habitat of the endangered pine marten. Post-doc **Mercedes Ames** gave birth to a son this summer (adding to the lab's "r"!) and continued sequencing the plastid genome of several monocots using next-generation technology.

Tom Givnish, Mercedes and 16 collaborators analyzed an avalanche of data produced by such plastomes—including 81 genes and more than 130,000 aligned bases per species. Their paper (in press) reports relationships among monocots, traces the evolution and determinants of wind pollination in the Poales (grasses, sedges, bromeliads, and relatives), and was an invited presentation at the Missouri Botanical Garden. Givnish also published a major synthesis of the ecology of plant speciation.

Linda Graham lab

The Graham lab continues to work on land plant origins and using algae to solve energy and environmental sustainability problems.

Together with PhD alumni **Martha Cook** (ILSTU) and **David Hanson** (UNM), we published two articles in *American Journal of Botany* providing several lines of evidence that an ancient fossil known as *Prototaxites,* which reached tree-trunk dimensions long before vascular plants achieved much height, likely derived from extensive, degradation-resistant, rolled liverwort mats. In another AJB article, with Ph.D. alumni **Eunsoo Kim** (Dalhousie U), **Patricia Arancibia** (U BioBio, Chile), and **Lee Wilcox,** we showed that early-diverging land plants are mixotrophic, i.e., get part of their organic carbon from the environment, not exclusively via photosynthesis, a trait inherited from algal ancestors.

In his first year as a graduate student, **Christopher Cardona-Correa** earned a master's degree and continues to explore physiological aspects of bryophyte evolution and ecology. Meanwhile, **Reese Zulkify** and **Izak Smith** continue to work with UW–Milwaukee and engineering colleagues, supported by a UW–Intercampus Research Incentive Grant, to develop algae as a source of biomass that can readily be harvested for P-recovery and lignin-free cellulose that is readily hydrolyzed to support growth of microbes engineered to produce next-generation biofuels.

Sara Hotchkiss lab

Shelley Crausbay received the Deevey Award for her presentation at the annual meeting of the Ecological Society of America and also a new grant for work on physiological constraints on high-elevation plants on Haleakala, Maui. She published a paper titled "Strong relationships between vegetation and two perpendicular climate gradients high on a tropical mountain in Hawai'i" in the Journal of Biogeography. **Jennifer Schmitz** spent the summer working at the LacCore National Lacustrine Core Facility at the University of Minnesota, investigating the response of lake ecosystems to drought, fires, and logging. **Shana Ederer** joined us this year to continue her work on bryophytes and their cyanobacterial associates on a dune chronosequence. Postdoc **Michael Tweiten** is developing new methods for investigating how climate, substrate, and other species affect the abundance of plant species in Hawaiian wet forests. He is also analyzing paleoecological data on the response of Wisconsin plant communities to past climate change. Scientist **Marjeta Jeraj** is pursuing archaeobotanical investigations of charcoal in Hawaiian archaeological contexts, and Senior Scientist **Patricia Sanford** is honing in on some interesting histories of zooplankton in lakes in northern Wisconsin as well as the arrival of a new species in some sites.

Marisa Otegui lab

Our lab continues to work on cellular trafficking in plant cells. MS student **Maren Roe** graduated this past summer. Her research work was on an interesting plant-specific endosomal protein called SKIP2. PhD graduate student **Rafael Buono** is working on another group of endosomal proteins call IST1-12 and analyzing the diversification of this protein family in plants. Postdoctoral fellow **Christoph Spitzer** continues his work on the CHMP1 protein in endosomal trafficking in *Arabidopsis thaliana.* Postdoctoral fellow **Francisca Reyes** is working on protein trafficking mechanisms in the corn endosperm and endosomal sorting in *Arabidopsis.* Postdoctoral fellow **Christine Ondzighi-Assoume** and

undergraduate student **Brittany Sheldon** are working on genes involved in secondary cell wall formation in a project funded by the Great Lakes Bioenergy Research Center (GLBRC). Undergraduate student **Alexandra Musial** was awarded a Frits Went award to study endosomal lipid-binding proteins. Postdoctoral fellow **Guang Wu** has moved to California to do research in plant incompatibility systems in Sheila McCormick's group. We wish him all the best.

Ken Sytsma lab

The collaborative study of Angiosperm phylogeny funded through NSF–A Tree of Life grant is wrapping up in the Sytsma lab. Recently submitted is a study of 660 species (330 families) using 17 genes from the three plant genomes—making this one of the largest phylogenetic studies ever conducted.

On-going studies of *Clarkia* (Onagraceae), Bromeliaceae, and Ericales are underway. The 2009–2010 academic year saw the departure of **Rachel Jabaily,** to a post-doc at Old Dominion, following the completion of her Ph.D. on South American *Puya*. Graduate student **Bryan Drew** is completing his study of the South American and Californian mint genus *Lepechinia* and relatives and presented at the BSA meetings in Rhode Island. Graduate student **Ben Grady,** now an Allen Fellow, received additional funding from the Department of Interior for his study of adaptive radiation onto different soil types in Western U.S. *Eriogonum* (Polygonaceae). Graduate student **Brent Berger,** honored at the campus level for his teaching, presented phylogenetic and biogeographic results on the pantropical family Combretaceae at BSA and continues his study of pollination biology of *Combretum*.

The lab welcomes new graduate student **Daniel Spalink,** who worked under Botany alum **Tim Evans.**

Don Waller lab

The Waller lab remains busy studying historical and contemporary plant communities and drivers of ecological change. New PhD **Erika Mudrak** just moved to a new post doc at Iowa State while post-doc **Kathryn Amantangelo** moved on to Brown to study aquatic plants.

We welcome new MS students **Katie Frerker** (Botany) and **Megan Pulver** (CBSD), and Botany PhD students **Alison Scott** and **Michelle Haynes** (returning from a year in Yunnan, China). **Sarah Johnson** is finishing her PhD on long-term change in lowland Wisconsin forests. **Evelyn Williams** (Botany PhD student) finished her field work on *Botrychium* ferns in the UP of Michigan.

Lisa Maas (CBSD MS student) started field work on the interaction between deer and garlic mustard using exclosures in nearby State Parks. With funds from the Huron Mountain Club and Michigan Nature Conservancy, we also constructed several 2-ha (!) deer exclosures to explore how deer affect both plant and bird communities in the UP.

Between reading theses and erecting fences, **Don Waller** managed to write a few papers and, over the next five years, will study the roles of functional, phylogenetic, and genetic diversity in structuring and sustaining plant communities through environmental change (see new NSF project, above).

Joy Zedler lab

Three stars completed MS degrees in 2009–10: **Sally Gallagher** for culturing tussock sedges for use in restoration, **Erik Olson** for explaining Eurasian milfoil invasions in the Chippewa Flowage, and **Jim Doherty** for showing that, over time, diversity-ecosystem function relationships can shift from positive to negative in a California salt marsh that was restored in 1997. Sally now works on Wisconsin's Ice Age Trail, while Erik and Jim opted to pursue PhD's at UW.

Beth Lawrence submitted her paper on tussock formation and composition (first paper of her forthcoming dissertation) and gave birth to Iris Fahey, not necessarily with that priority.

Hadley Boehm studied the outcome of seeding native plants into the Arboretum's new Stormwater Management Research Facility (SMRF), aiming for an MS degree in 2011, and **Charlie Tucker** became the Botany Department's first MS student in our Ecological Restoration Program.

With Steve Loheide (ecohydrologist) and Anita Thompson (biosystems engineer), **Joy Zedler** acquired funding from the Environmental Protection Agency to develop innovative ways to treat urban runoff—a part of President Obama's Great Lakes Restoration Initiative. The Nature Conservancy will use results from the SMRF experiments to create a national "model watershed plan" for the Pensaukee-Duck basin, which drains into Green Bay.

Alumni News

Adamczyk, Ben (PhD 2009) works for GeneData, Inc in Lexington, MA. Ben's dissertation title was "Analysis of MIKC*-type MADS-domain Proteins: Regulators of the Pollen Transcriptome in *Arabidopsis thaliana*."

Boyle, Owen (PhD 2004) is the Southeast Region Ecologist at the Wisconsin DNR, Endangered Resources Program where he Co-coordinated and co-edited Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need: A State Wildlife Action Plan.

Christian, Julie (MS 2009) secured a position based at Hawaii Volcanoes National Park and works with Corie Yanger (BS 2006) for the Inventory and Monitoring Division of the Pacific Island Network. Julie's thesis title was "Native Shrub Recovery and Browsing Effects on Santa Rosa Island, CA."

Coop, Jonathan (PhD 2005) is currently a visiting professor of Biology & Environmental Studies in the Natural & Environmental Sciences Dept and the Center for Environmental Studies at Western State College located in Gunnison, Colorado. Jonathan's dissertation title was "PhD: Environmental Determinants of Subalpine Treelines in the Valles Caldera, New Mexico."

Denslow, Julie (PhD 1978) recently retired from the USDA Forest Service where she was a research scientist and team leader for the invasive species unit at the Institute of Pacific Islands Forestry in Hilo, Hawaii. Julie's dissertation title was "Secondary Succession in a Colombian Rainforest: Strategies of Species Response Along a Disturbance Gradient."

Ebert, Thomas (B.S. 1961) read about the herbarium in *On Wisconsin,* which led him to visit the herbarium web site, where he found records for the many plants that he had collected as a undergraduate! Recollecting: "I spent the summer in Rusk Co. as an assistant to Gene Likens and John Peturka doing limnological/ fish things. I had taken Thompson's class on the spring flora of Wisconsin, which I thought was great fun, and so talked with Hugh Iltis about taking another class based on collection and identification…I spent my spare time during the summer of 1960 collecting and pressing plants using a drier made of an orange crate with a light bulb inside. I collected a bit over 400 plants and so spent the fall semester identifying them." Tom is now Courtesy Professor, Dept. Zoology, Oregon State U. and Professor Emeritus, Dept. Biology, San Diego State U.

Gallagher, Sarah (MS 2009) completed her thesis on "Use of Nitrogen and Water Treatments to Manipulate *Carex stricta* Lam. Propagules." She then put her training to work for planning and implementation of the Ice Age Trail.

Habeck, James (BS 1954; MS 1957; PhD 1959) retired as a Professor of Botany at the U. of Montana at Missoula, 1960-1995. His major professor was John Curtis. James arrived at UW just after Walter Mueggler had graduated, and both spent their entire careers in the Northern Rocky Mountains, Walt as a research scientist at the Bozeman Forestry Sciences lab, and James at the U. of Montana. Over the decades the two met at meetings and exchanged information about plant ecology problems in the Intermountain West. James still hikes and botanizes in the mountains of western Montana, also known as "The Last Best Place!" James' dissertation was titled "The Ecology of White Cedar Swamps in Northern Wisconsin with Special Attention to Their Role as Winter Deer Range." (Correction from Alumni Newsletter 2009).

Jabaily, Rachel (PhD 2009) is a Post-Doc researcher working with Tim Motley at Old Dominion U. Rachel's dissertation title was "Systematics and Evolution of *Puya* (Bromeliaceae)."

Kelly, Tara (BS 1999 in Botany & BAC; MS 2005 in Land Resources) is the Director of Ecological Restoration at Belwin Conservancy, a non-profit nature preserve that owns and manages over 1300 acres of land in the St. Croix Valley. Tara's daughter Brooke Ellen was born in November 2009. Tara's senior thesis was titled "Genetic variation and spatial patterning within two species of the endemic Hawaiian genus *Cyanea* (Lobeliaceae)."

Kim, Eunsoo (PhD 2006) is a Post-Doc Fellow of the Tula Foundation at Dalhousie U. working in the Centre for Comparative Genomics & Evolutionary Bioinformatics. Her advisor is Professor John Archibald. Her dissertation was titled "Molecular Phylogenetics & Untrastructure of Pivotal Protist Flagellates."

Klionsky, Sarah (MS 2009) lives in Boston, MA. Her thesis title was "*Rhamnus cathartica* L. (European Buckthorn) has Above- and Below-Ground Impacts on the Germination, Survival, Growth, and Reproduction of Native Herbs."

Konchar, Katie (MS 2009) completed here thesis on "The Influence of Biogeography, Management, and Timing of Harvest on the Phytochemical Efficacy of a Traditional Chinese Medicine, *Fritillana cirrnosa,* in Southeast China."

Koopman, Margaret (PhD 2008) is an Assistant Professor at Eastern Michigan U. Maggie's dissertation title was "Diversification and the Maintenance of Species Boundaries in the Hibiscus Tribe (Malvaceae) on Madagascar."

Larkin, Daniel (PhD 2006) is a Conservation Scientist at the Chicago Botanic Garden and an Adjunct Assistant Professor at Northwestern U. Daniel is in the joint CBG-NU Graduate Program in Plant Biology and Conservation and conducts research in restoration and wetland ecology. Dan's dissertation title was "Effects of Spatial & Temporal Heterogeneity on Fish Use and Trophic Structure in a Restored Tidal Marsh."

Lewis, Daniel (PhD 2007) is a Post-Doc Research Associate in the Biology Department of Wake Forest U. Dan's dissertation title was "MDR-Like ABC Transporters Function in Auxin Transport Required for Plant Development & Response to Environmental Cues."

Lu, Yan (PhD 2005) is a Visiting Research Associate in the Dept. of Biochemistry & Molecular Biology at Michigan State U. Yan's dissertation title was "Maltose Metabolism During Transitory Starch Degradation."

Millam, Kendra (PhD 2006) is an Adjunct Assistant Professor in the Dept. of Biological Sciences at Wright State U., where team teaches biogeography. Kendra's dissertation title was "*Trillium erectum* Species-Complex (Melanthiaceae): Insights from Molecular Systematics & Biogeography."

Mudrak, Erika (PhD 2010) has a Post-Doc position with Kirk Maloney in the Dept. of Ecology, Evolution, & Organismal Biology at Iowa State U. Erika's dissertation title was "Linking Local Population Structure to Regional Trends in Community Structure of Wisconsin Upland Forest Plants."

Oldham-Haltom, Rebecca (MS 2003) is an Associate Scientist II at BioTech in Madison. Becky's thesis title was "Floral Development in *Paronia.*"

Peet, Robert (BA 1970; MS 1971) is a Professor in the Dept. of Biology at the U. of North Carolina-Chapel Hill. Robert's thesis title was "Problems in the Study of Diversity in Southern Wisconsin Upland Forests."

Qi, Zhi (PhD 2005) is an Assistant Professor at Inner Mongolia U., People's Republic of China. His dissertation title was "Electrophysiological Investigations of Potassium/Sodium Homeostasis & Functions of Glutamate Receptor Channels in the Root Cells of *Arabidopsis.*"

Rinna-Olivares, Ricarda (PhD 2006) is a Post-Doc Researcher Real Jardin Botanico, CSIC in Madrid, Spain, in collaboration with the U. of Michigan. Rikki's dissertation title was "Molecular Systematics of the Neotropical Dragon's Blood Trees *Croton* Sect. Cyclostigma (Euphorbiaceae)."

Rogers, David (PhD 2006) is an Assistant Professor at UW–Parkside in the Biological Sciences Dept. He teaches Botany, Conservation Biology, Ecology & Organismal Biology. David's dissertation title was "Fifty-five Years of Change in Southern Wisconsin Forests: Patterns of Species Loss & Homogenization."

Smith, Stacey Dewitt (PhD 2006) finished her NIH NRSA Post-Doc Fellowship at Duke U. and became an Assistant Professor in the Biological Sciences School at the U. of Nebraska-Lincoln this fall. Stacey's dissertation title was "Floral Diversification & Pollination Biology of the Andean Clade Iochrominae (Solanaceae)."

Sulman, Joshua (BA 2003; MS 2010) is doing consulting work in Wisconsin. Josh's thesis was titled "A Study of the Phylogeny & Ecology of *Sparganium* (Typhaceae)."

Swan, Frederick (MS 1961) retired in August 1999 from ATC Associates, New York City as an Operations Manager and Certified Industrial Hygienist. He taught Ecology, Botany & Man in this environment from July 1994 until retirement. From 1988-1994, Fred was an Industrial Hygienist at Clayton Environmental Consultants in Edison, NJ, and from 1966-1988, he was at West Liberty State College near Wheeling, WV. "I benefited immeasurably in my teaching, research and industrial hygiene investigations from my experiences at the UW in the Plant Ecology Laboratory!" Fred's thesis title was "Lianas in S. Wisconsin Forests."

Van Ee, Benjamin (PhD 2006) recently became an Assistant Professor of Plant Systematics at Black Hills State U. in Spearfish, SD, where he teaches general and introductory science for non-majors and majors and is a curator at the herbarium. Ben's dissertation was titled "Molecular Phylogenetics Within *Croton* (Euphorbiaceae s.s.)."

Wiberley, Amy (PhD 2008) was a Post-Doc Researcher working with another Botany alum, Dr Eric Singsaas (PhD 1997) at UW-Stevens Point on engineering bacteria to make biofuels from paper mill waste. She is now back in Madison working with Paul Bethke in Horticulture. Amy's dissertation title was "Molecular & Biochemical Regulation of Isoprene Emission from Plants."

Wiedenhoeft, Alex (BS 1997; MS 2001; PhD 2008) works at the Center for Wood Anatomy Research, Forest Products Laboratory, Forest Service, USDA, here at UW–Madison. Alex's thesis title was "Preliminary wood anatomical characterization of some lightweight-wooded species growing in a seasonally inundated Venezuelan igapo forest." His dissertation title was "Tracking the Phylogeny of the Crotoneae with Comparative Wood Anatomy."

Zhang, Ru (PhD 2009) was a postdoctoral researcher in the Dept. of Biochemistry & Molecular Biology at Michigan State U. and is now a postdoc at Stanford U. Ru's dissertation title was "The Effects of Moderate Heat Stress on Thylakoid Reactions of Photosynthesis in Light-Adapted, Intact Leaves."

In Memoriam

Ahmed, Noazesh (PhD 1960) died on November 24, 2009. His dissertation was titled "Influence of Nitrogen, Phosphorus, & Temperature on Certain Phases of Growth of Corn."

Barnes, William (PhD 1972) died on January 2, 2010. His dissertation was titled "The Autecology of the *Lonicera* × *Bella* Complex."

Beckman, Katherine (MS 1950) died on February 20, 2009. Her thesis was titled "Developmental Study of the Caryopsis of Thorne Wheat with Special Reference to Vascular Differentiation."

Bowman, Donald Eugene died at age 80 in Baltimore. He was a major donor to the Botany Garden. An investment counselor and economist, he joined T. Rowe Price Associates Inc. in Baltimore in 1956 and later became its president and CEO. In 1979, he established the Bowman Financial Management Co. He also served as director of the University of Wisconsin Foundation.

Gries, George (PhD 1942) died on November 11, 2009. His dissertation was titled "Factors influencing fat production by *Aspergillus fischeri,* Wehmer."

Henderson, James (MS 1940; PhD 1943) died on December 3, 2009. His dissertation was titled "The effect of respiratory intermediates and inhibitors on the growth and respiration of tomato roots."

Hine, Ruth (MA 1947; PhD 1952) died on February 23, 2010. She retired from her position as the Consulting Naturalist for Bethel Horizons Camp/Retreat.

Kepper, Heinz (BS 1968) died on December 20, 2009. He retired from the UW–Madison where his position was Microbiologist/Virology.

Panzer, Max died on January 21, 2010. Max was a friend and donor to the Botany Department.

Pavcek, Martha (BSE 1936; MS 1940) died on July 25, 2009. Martha retired from the Milwaukee Public Schools where she was an Elementary Teacher.

Radolf, Jessica (BA 1976) died on March 3, 2009. Jessica was employed by the US Environmental Protection Agency in Chicago, Illinois.

Smith, Dale (PhD 1947 in Agronomy/Botany/Plant Pathology) died on January 9, 2010 after retiring as Professor of Agronomy.

Stewart, Elizabeth Chavannes (MA 1937; PhD 1940) died May 1, 2010. Elizabeth's dissertation was titled "Steep prairies of southern Wisconsin & their invasion by forest."

Stowell, Ewell (MS 1947; PhD 1955) died November 13, 2009. Dr Stowell taught Botany at Albion College and was responsible for the establishment of the Whitehouse Nature Center. Dr Stowell retired from Albion College in 1988. Dr Stowell's dissertation title was "A study of *Entomosporium* on *Crataegus.*"

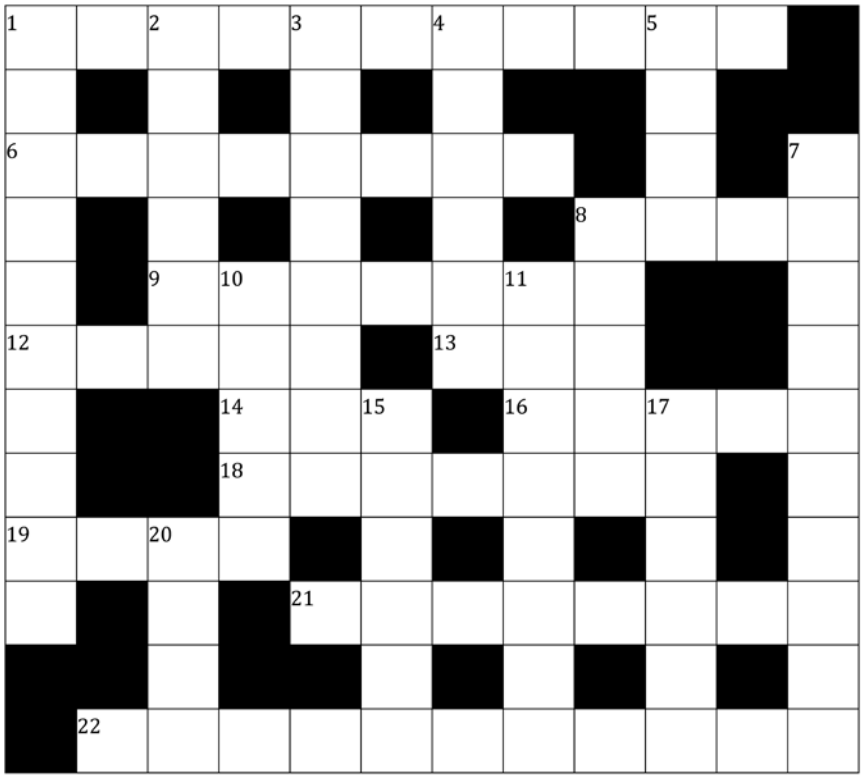
Wilson, Lloyd (MS 1950; PhD 1957) died on October 14, 2009. Lloyd retired from Michigan State U. in 1985. His dissertation title was "Relative Effectiveness of Various Wavelengths of Ultraviolet in Inducing Biochemical Variants in *Penicillium chrysogenum* NRRL 1951."

Our electronic future

Would you like to receive the Alumni Newsletter electronically and in color? If so, please forward your email address to botany@ls.wisc.edu. Not only will you be first on your block to receive the news, but also, we will save the cost of printing and mailing…Thank you!

BOTANY CROSSWORD

Contributed by David Baum.

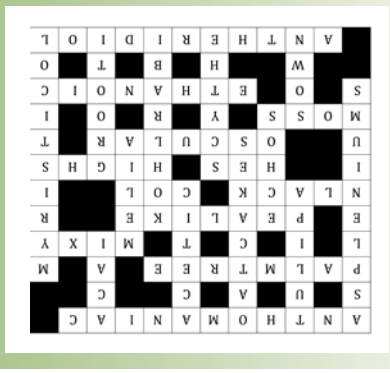


Across

1. Flower lover (like most botanists)
6. A member of Arecaceae
7. Suffix to apo- (asexual)
8. Resembling a *Pisum*
10. What a plant in need of fertilizer might be suffering from
11. __lenchyma
12. Staminate version of "she's"?
14. What some cultivars of *Cannabis sativa* are said to induce
15. Concerning small, mouth-like openings
16. Bryophyte
19. Chemical name of 4
20. Hormone that induces male gamete development

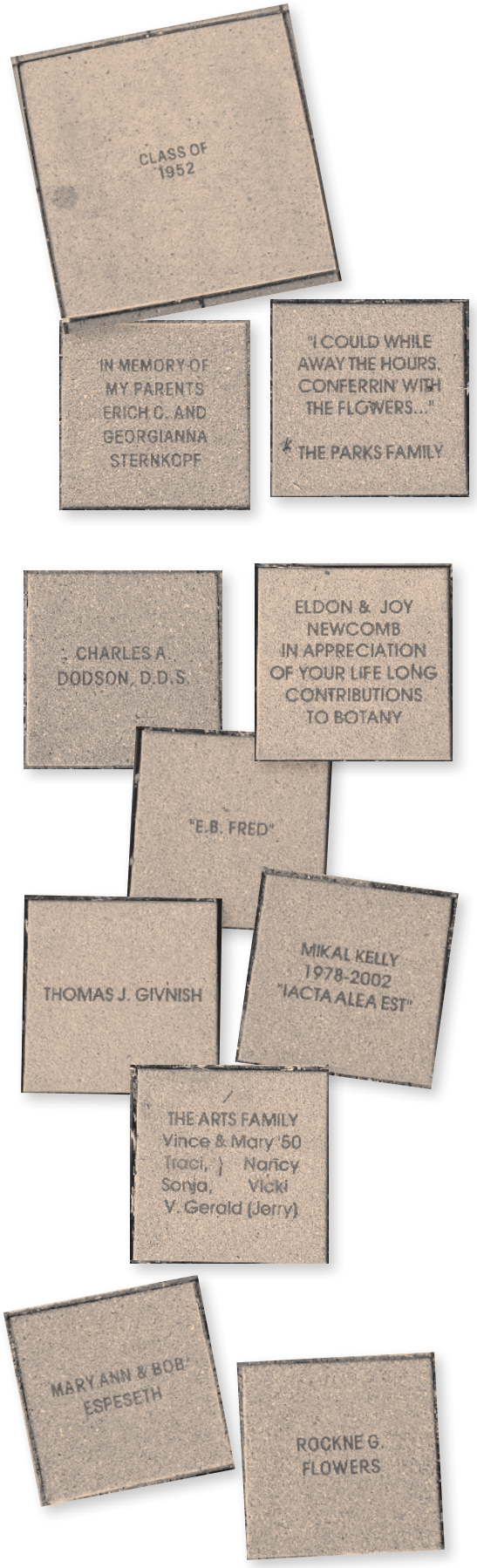
Down

1. Spleenworts
2. Bulb genus
3. Scottish crackers made from *Avena sativa*
4. Simple organic acid
5. "Berry" (actually a drupe), marketed as a dietary supplement, and produced by a 6
7. Component of nutmeg oil
8. Type genus of the mahogany family
10. Reverberations from Reflected Grapeferns?
11. *Brassica* crop
15. A tool for cutting Gramineae (Poaceae)
17. Species epithet of Groot's Leaffish
20. What is done to wild oats and other seeds



The Botany Garden continues to evolve into a beautiful gathering place for departmental, campus, and visiting folks.

- Above, the pond gets a makeover with boulders and new plumbing.
- Left: the new pond fills with water and sunshine.
- Below, September gathering to welcome students, faculty and staff. Ken Sytsma, center, introduces his lab's new grad students.



Botany Garden
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$520

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Please accept my contribution in the amount of $_____ (enclosed) which is designated for:

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- ❒ Folke Skoog Fund—memorial fund to support Dr. Skoog's research and teaching initiatives.

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- ❒ Paul J. Allen Memorial Lecture—supports a lecture by an eminent scientist in the Botany Colloquium series.
- ❒ John J. Davis Fund—supports research activities of the department, including graduate student fellowships, travel support, and funds to provide speakers for the Botany Colloquium series.

For donations to these two funds, please make checks payable to the University of Wisconsin and send to:

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