



Department of Botany

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*Bluestem* is published annually to inform alumni, faculty and friends about the issues, activities, and news of the Botany Department.

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## Arabidopsis: The Little Weed that Could

Soon after he joined the Botany Department at OSU in 1982, Dave Meinke gave a seminar on the genetics of *Arabidopsis thaliana* (Mouse-ear Cress), a small weedy plant in the mustard family. Although few had heard of *Arabidopsis* at the time, Dave predicted that it would soon be the plant of choice for studying genetics and development. That prophesy has come true. In fact, Dave and his research group at OSU have played a major role in showing how *Arabidopsis* can help unravel the genetic control of such processes as embryogenesis, vegetative development, flowering, and plant responses to environmental signals.

*Arabidopsis* is a model plant for genetic studies. Standing about 6 inches tall at flowering, several thousand plants can be grown in just a few growth rooms by Dave's research group. It reaches maturity in only 5-6 weeks, allowing many generations to be grown in a year. The *Arabidopsis* genome is among the smallest in the plant kingdom, only a small fraction of the wheat or corn genome.

Dave and his research team, which over the years has included more than 40 undergraduate students, have focused on genes involved in embryo development. They have identified 250 mutants defective in many different stages of embryogenesis. These mutant genes encode proteins



*Dr. Dave Meinke and Undergraduate Assistant Jennifer Stanfield examine a batch of Arabidopsis ready for harvest.*

*Continued on page 5*



# New Faculty Member Sent to Siberia

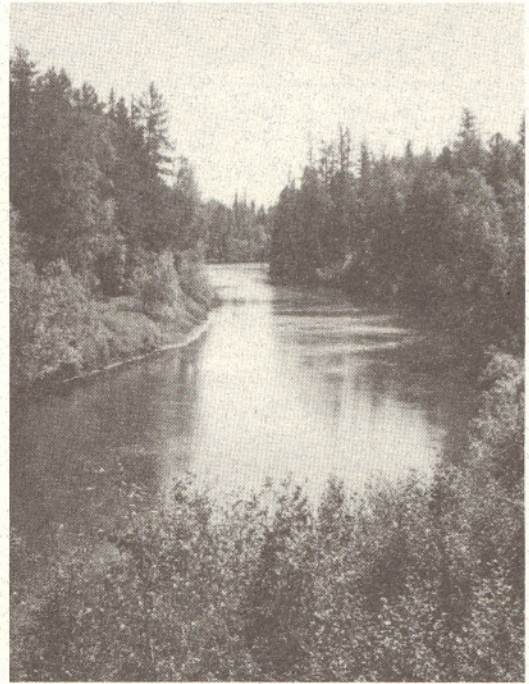
After a long day hiking the taiga, there is nothing quite like a hot sauna complete with birch bough switching, followed by generous rounds of vodka and Russian folk songs. This report comes from Anne Cross, who was part of a team of eight young American scientists who toured the Western Siberia Plain from July 13 to August 2. Sponsored by the National Academy of Science's Young Investigator Program, their goal was to examine current forestry practices and to examine the effects of oil and natural gas drilling on the natural taiga vegetation.

The first stop was Moscow, where the group met their host, the Russian Academy of Science. After 3 days of meetings with Russian scientists in Moscow they took the 1:00 a.m. red-eye special to Nizhnevartovsk, an oil boom town of 250,000, located east of the Ural Mountains at 61° N latitude. As guests of the Ecological Committee of Nizhnevartovsk Region, the group toured a village of the Hanty/Mansijsk indigenous people and several oil drilling projects in the Nizhnevartovsk Region including a new Russian/Belgian joint venture. The highlight of the trip was a flight in a vintage helicopter to the Sabun River area, where they spent 2 days camping and

studying vegetation in the proposed national park. In the Taiga region the extensive floodplains were characterized by *Sphagnum/Carex* peat bogs, and a uplands of the pine-white moss (lichen) forest of *Pinus sylvestris* and *P. sibirica*, interspersed with birch, spruce and fir. The understory genera would be familiar to most American botanists: representatives of *Aconitum*, *Vaccinium*, *Actaea*, *Linnea*, *Stellaria* and *Calamagrostis* were common.

Although the vegetation was somewhat familiar, customs like eating turkey wings and mashed potatoes for breakfast were not. The group did learn to cope with fish soup and tea served with almost every meal, while the the tasty bread earned praise from all.

The Nizhnevartovsk visit culminated with an evening boat trip up the vast Ob River. Before returning to Moscow, the American and Russian participants signed a joint resolution supporting development of the national park at Sabun. In the next phase of the project, members of the Ecological Committee will visit the U.S. and study sustainable forestry practices in this country, in 1997.



View of the Sabun River in the proposed Sabun Zapovednik in Western Siberia .



Dr. Anne Cross (left) and Ms. Natalie Brand, who represented the U.S. National Academy of Sciences, model the latest in Russian sportswear at the camp along the Sabun River.



# Graduate & Undergraduate Student News

Graduate students in the Botany Department garnered two major awards for academic excellence this past year.



**Rhonda Hampton** was honored at the College of Arts & Sciences Awards Banquet in April as the Outstanding Teaching Assistant in the College. She served as a TA in the Introductory Plant Biology course the past 3 years, and finished her M.S. degree under Dr. Ron Tyrl this past summer. Rhonda's research focused on the Amaranthaceae. For her thesis she wrote taxonomic keys and technical descriptions of amaranth genera as part of the Flora of Oklahoma project.

Another of Ron Tyrl's students, **Linda Gatti Clark**, added to her list of accolades with the 1996 Doctoral Phoenix Award.



Linda Gatti Clark

This award is given by the Graduate Student Association each year to a doctoral student at OSU for outstanding research, teaching, and scholarship. Readers of the *Bluestem* may recall that Linda was awarded a \$500 McAlester Scottish Rite Fellowship the previous year. Linda will finish her Ph.D. this Fall. For her dissertation, she conducted a morphometric analysis of *Pappophorum*, surveyed the vascular flora of the Boehler Seeps and

Sandhills Preserve in Atoka County, and developed a delta character list for the Asteraceae for the Flora of Oklahoma project.

In addition to these awards, **Sophonia Roe**, who began work on an M.S. degree with Mike Palmer in Spring 1996, was awarded an OSU Foundation Endowed Graduate Fellowship last summer. This award provides \$2000/yr for educational expenses, and can be renewed for up to three years. **Asuka Itaya**, working with Biao Ding in the new Ph.D. in Plant Sciences program, was awarded a S.R. Noble Graduate Student Fellowship. Funds from this award will pay for Asuka's research supplies, travel, and, most importantly, her salary. Two undergraduate students in Dr. Ding's lab, **Heather Hickman** and **Bryan Lowery**, were each awarded \$2000 Oklahoma Partners in Biological Science scholarships. Heather and Bryan are learning *in situ* localization and immunocytochemistry techniques that will help them in graduate school.

Thanks to the generosity of alumni and friends of the Department, the McPherson Fund granted \$2300 in support for research and travel by graduate students in Summer 1996. Among the notable new projects supported were **Kim Shannon's** collection and identification of vascular plants at her study site, Pennington Creek Nature Sanctuary in Johnston County; **Yi Yin's** research on the effects of iron limitation and high light on photosynthesis in *Synechococcus*; and Martin Zocher's studies of allelopathy in *Lespedeza*. **Steve Thompson** and **Karol Ezell**

attended the Ecological Society of America meetings in Providence, Rhode Island, while **Sophonia Roe** spent 2 weeks at the Highlands Biological Station in Highlands, North Carolina.

This year's Spears Fellowship recipient is **Cheryl McCreary**. Cheryl, a senior majoring in botany, is an Honors student from Oklahoma City. In addition to learning herbarium curatorial skills, she and Dr. Lynne Richards in the Department of Design, Housing & Merchandising are studying the natural dyes in native plants of Oklahoma.

## Botany Department Sponsors Angel

Last Christmas, the Botany Department raised \$80 for the Salvation Army Angel Tree Fund, thanks to efforts by Administrative Assistant Kathy King and Unit Assistant Paul Shryock. Our "angel" Derrick, who is 3, received clothing, shoes, and toys, including a Ford Ranger truck and several matchbox cars.



## Alumni notes and news

**August Vlitos** (B.S. in Plant Pathology 1948) completed his M.S. at Iowa State in 1950 and Ph.D. at Columbia in 1956. He spent 24 years with Tate & Lyle, Ltd. first as Director of Research in Trinidad, and later as Chief Executive of R&D in England. From 1983-1995 he was Director-General of the World Sugar Research Organization at the University of Reading. August retired in 1995 and lives in Frilford Heath in Oxfordshire, U.K.

**Elmer Brown** (M.S. in 1959 with Imy Holt) completed his Ed.D at OSU in 1974. He is presently Chairman of the Biology Department at East Central University in Ada, and will soon retire after 35 years there. Elmer has earned many honors during his career, including 1981 Wildlife Educator of the Year from the Oklahoma Wildlife Federation, and a 1994 National Conservation Award from the Daughters of the American Revolution. The Browns have been loyal Cowpokes over the years: his wife

and daughter are OSU grads, and a son is currently in the Architecture program.

**Jim Petranka** (M.S. in 1977 with Jim McPherson) completed his Ph.D. in Biology at the University of Kentucky in 1982. He is currently Associate Professor of Biology at the University of North Carolina in Asheville, where his wife, Becky Elkins, is Coordinator of Educational Technology. Jim's current research focuses on biodiversity of amphibians, especially salamanders. He is part of a project involving long-term monitoring of amphibians in parks of the Southeast region. You can get the whole story, including pictures of daylilies that Jim & Becky grew on their farm, at his personal Web site, <http://www.cs.unca.edu/~petranka/>.

**Peter Stahl** (B.S. in Plant Pathology in 1978) obtained his M.S. and Ph.D. degrees in mycology/ecology at the University of Wyoming. He subsequently did a post-doc at the NSF Center for Microbial Ecology at Michigan State, then a second post-doc at USDA-ARS in Ames, IA. Peter has returned to Wyoming where he is Assistant Professor in the Department of Plant, Soil, and Insect

Sciences at the University of Wyoming in Laramie.

**Bill Thompson** (M.S. in 1984 with David Francko) is back in Minnesota, where he lives in Mantonville. He is currently a Project Manager for the Minnesota Pollution Control Agency in Rochester.

**Safaa Al-Hamdani** (Ph.D. in 1988 with Glenn Todd) did post-doctoral work with former Botany Department faculty member David Francko at Miami of Ohio from 1990-1992. He is currently Assistant Professor in the Biology Department at Jacksonville State University in Jacksonville, AL. In addition to teaching, Safaa continues his research on the effects of ultrasound on algal photosynthesis and nitrogen fixation.

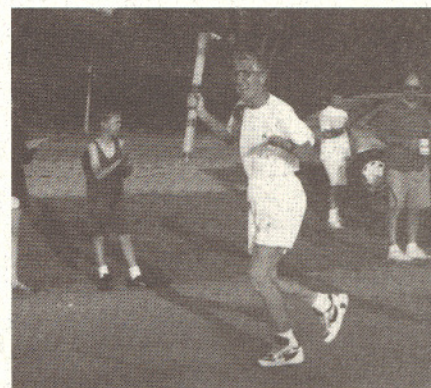
**J. Phil Gibson** (B.S. in Botany in 1988) received his M.S. at Georgia in 1990 and a Ph.D. at Colorado in 1995, where he studied the population genetics of plant mating systems and seed dispersal. He is currently Assistant Professor in the Department of Biology at Agnes Scott College in Decatur, Georgia. Phil reports that he is just keeping his head above water writing new lectures for all the courses he teaches.

## Botany Emeritus Professor Carries Olympic Torch

As the Olympic Torch wended its way toward Atlanta last spring, Dr. Jerry Crockett, Emeritus Professor of Botany, was ready to do his part. At 6:15 a.m. on the morning of May 18, Jerry took the torch from Dr. Patrick Dorr, Professor in the College of Business, and carried it for a half-mile down Main Street to its junction with Hwy 177. A small but enthusiastic group of supporters cheered him on.

Jerry, 68, was a plant ecologist in the department from 1962 to 1966. After a stint at the University of Idaho, he returned to OSU in 1968 and served in the department

until his retirement in 1988. The half-mile jaunt was really no stretch for Jerry, who has been an avid runner since the 1970s. He has competed in two Boston Marathons, and at one time was the top-ranked runner in the U.S. in the 50-55 age group. Although he has slowed a step or two since his best days, Jerry is still very active in running. He currently serves on the Board of Directors of U.S.A. Track & Field, a Congressionally mandated organization that oversees track and field events in the U.S. Jerry also keeps busy as a member of the Board of Trustees of the Oklahoma Nature



*Emeritus Professor of Botany  
Jerry Crockett*

Conservancy, and is Director of TNC's Science and Stewardship Committee. His background as an ecologist serves him well in evaluating potential land acquisitions by the Nature Conservancy.

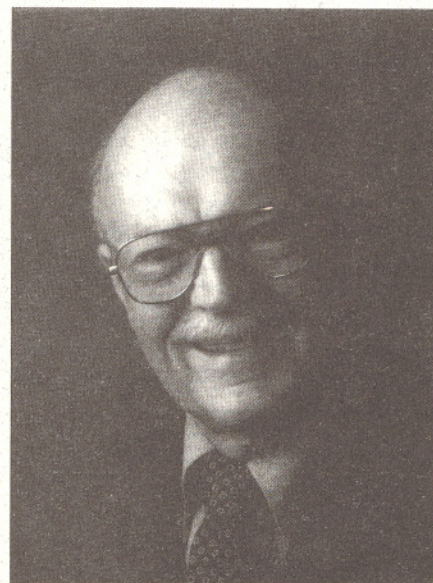


## Alumnus Given Research Award

Dr. Myron Ledbetter, who received his B.S. degree in Botany at OSU in 1948, was given the Distinguished Scientist Award, Biological, during the 54th annual meeting of the Microscopy Society of America at Minneapolis this August. This award is given annually for "...unique and distinguished contributions to microscopy." Among Dr. Ledbetter's achievements were his discovery, with Keith Porter at Harvard, of microtubules in plants; his invention with Robert Dell of the thin-foil aperture as a technical innovation

in EM; and his role in developing the Scanning Transmission Electron Microscope (STEM) facility at Brookhaven National Laboratory.

Although he originally planned a career in music, Dr. Ledbetter was inspired to pursue graduate studies in botany by Professor Orville Schultz of the OSU Botany Department. His M.S. degree from UC-Berkeley and Ph.D. from Columbia followed. After working in the Biological Laboratories at Harvard, he spent much of his career at Brookhaven National Laboratory, from which he retired in 1989.



Dr. Myron Ledbetter

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Continued from page 1

involved in such processes as biotin synthesis, RNA processing, and cytokinesis. A key player in this work has been Research Specialist Linda Franzmann, who joined the lab in 1983. At the present time she is coordinating a large-scale mapping project to determine the chromosomal locations of *emb* (embryogenesis-related) genes.

Dave is currently Chair of the Multinational Science Steering Committee of the *Arabidopsis thaliana* Genome Research Project, which oversees collaborative studies on *Arabidopsis* in over 35 coun-

tries. One of the most ambitious goals of the project is to determine the entire genomic sequence of *Arabidopsis*. About 1% is currently known; the target date for completion is the year 2004. "Knowing the identity of every gene in a single plant will fundamentally change the way plant science is done," says Dave. Considering his previous success in anticipating trends in science, it seems certain that Dave's work on *Arabidopsis* will help make that prediction a reality.



Linda Franzmann



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*home address*

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*home phone*

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*additional education/degrees*

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