ASPB News

THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS

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Inside This Issue

ASPB Members Delmer, Quail, Bennetzen Elected to National Academy of Sciences

Deborah Delmer of the Rockefeller Foundation, Peter Quail of the University of California at Berkeley, and Jeffrey Bennetzen of the University of Georgia have been elected to the National Academy of Sciences (NAS), the NAS announced April 20, 2004. "The Academy has elected three outstanding members who have made extraordinary contributions to plant science," commented ASPB President Mary Lou Guerinot of Dartmouth College.

Deborah Delmer

"I was stunned! But pleased and honored to join such an outstanding group of scientists. I just never considered I would be a candidate," Delmer remarked after hearing of her election.

Delmer, a past president of ASPB, is associate director, Food Security, at the Rockefeller Foundation, New York City. In this position, she is science and policy adviser for the Foundation in its support of research related to the advancement of agriculture in developing countries.

Delmer graduated with distinction and departmental honors with an undergraduate degree in bacteriology from Indiana University (1964). In 1968, she was awarded a Ph.D. in cellular biology from the University of California San Diego, where she was a National Institutes of Health (NIH) predoctoral fellow.

Delmer's positions have been varied, starting as an NIH postdoctoral fellow, Department of Chemistry, University of Colorado (with Peter Albersheim, 1968–1969). She was then an NIH postdoctoral fellow, Department of Biology, University of California San Diego (with Stan Mills, 1969–1970). She continued as a research biologist and lecturer (1970–1973) and then an acting assistant professor (1973–1974). In 1974, she started as an assistant professor, Michigan State University–U.S. Energy Research and Development Administration Plant Research Laboratory and Department of Biochemistry and became associate professor with tenure in 1981. Also in 1981 she was visiting professor, Department of Biological Chemistry, The Hebrew University, Jerusalem (where she would later become associate professor and then professor, Department of Botany, Institute of Life Sciences). In 1982, she was a visiting scientist, then a principle scientist, at ARCO Plant Cell Research Institute, Dublin, California. From 1993 to 1994 she took sabbatical leave at Calgene Inc., Davis, California. In 1997, she was professor and chair, Section of Plant Biology, University of California, Davis. In 2002, she came to her current position at the Rockefeller Foundation.

Delmer's past research interests have included biosynthesis of tryptophan in higher plants, sucrose biosynthesis and metabolism, circadian rhythms in fungi, and mechanism of glycosylation and secretion of plant proteins. But her long-standing major research interest involved studies on the plant cell wall with emphasis on the mechanism and regulation of the synthesis of cellulose in higher plants. This work included the first identification of a CesA gene

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Deadline for November/December 2004 *ASPB News:* October 5, 2004

NOTICE: The *ASPB News* no longer carries job ads or meeting announcements. Job ads appear online at www.aspb.org/jobbank. The list is updated every Friday. Meeting notices can be posted at www.aspb.org/meetings.

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ASPB News

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Contact: Nancy A. Winchester, Editor, *ASPB News,* 15501 Monona Drive, Rockville, MD 20855-2768 USA; nancyw@aspb.org; 301-251-0560, ext. 117.

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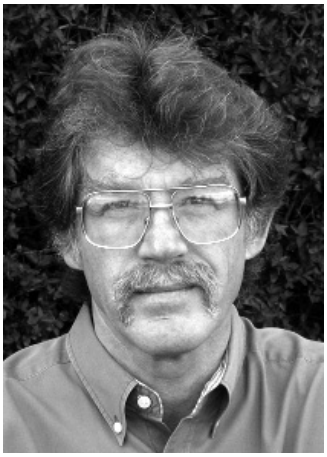
in cotton that encodes the catalytic subunit of cellulose synthases. Other studies have included genomic studies on CesA gene family in maize and Arabidopsis, studies on role of sterylglucosides in cellulose synthesis, mode of action of herbicide(s) that affect the process of cellulose biosynthesis, biochemistry of callose synthesis, and characterization of cotton fiber development including cell wall structure and the role of redox regulation in regulation of cell wall synthesis. She is currently responsible for decisions on how plant molecular biology/biotechnology can be used wisely in support of Rockefeller Foundation programs for improvement of crops for the developing world. She also deals extensively with issues of access to intellectual property for humanitarian purposes. Delmer has 83 published peer-reviewed articles, 28 book chapters, and two patents.

Peter Quail



Quail noted that he was "Thrilled and honored to be elected to the National Academy of Sciences. There is no greater honor than to be recognized by one's peers. I feel truly fortunate to have had such wonderfully talented students, postdocs, and associates over the years who have contributed to the research that has made this possible. I am enormously proud of their achievements and wish to share this recognition with them."

Quail is research director, Plant Gene Expression Center, and professor, Department of Plant and Microbial Biology, University of California at Berkeley. He earned his bachelor of science in agriculture in 1964 and his Ph.D. in 1968 from the University of Sydney.

In 1968, he was a research associate, Michigan State University–Atomic Energy Commission Plant Research Laboratory. In 1971, he traveled to West Germany where he was a research associate at Biologisches Institut, Universität Freiburg. In 1973, he became a research fellow and group leader, Photobiology Laboratory, Research School of Biological Sciences, Australian National University, Canberra. From February to April 1977, he was a visiting scientist, plant genetics, Weizmann Institute of Science, Israel. Later he was a senior fellow, Department of Biology, Carnegie Institution, Stanford University. In 1979, he became an associate professor of Botany, University of Wisconsin–Madison, and then professor in 1984. In 1987, he became research director, Plant Gene Expression Center, and professor, Molecular Plant Biology, University of California at Berkeley. Since 1989, he has been a professor in the Department of Plant and Microbial Biology, University of California at Berkeley.

Quail has published 184 refereed journal articles, 41 invited reviews and book chapters, and two patent applications. Recent coauthored articles have included "Arabidopsis *PSEUDO RESPONSE REGULATOR 7 (PRR7)* Is a Signaling Intermediate in Phytochrome Regulated Seedling De-etiolation and Phasing of the Circadian Clock" in *The Plant Cell* and "*EARLY FLOWERING 4* Functions in *Phytochrome B*-Regulated Seedling De-etiolation" in *Plant Physiology.*

Jeffrey Bennetzen

"This is a great honor that deserves to be shared with the outstanding students and other colleagues who have inspired and accomplished the research in my lab over the past 23 years," Bennetzen remarked.

Bennetzen is Norman Giles Professor of Genetics at the University of Georgia, Athens. He received his undergraduate degree from the University of California San Diego (B.A. with highest honors in biology) and his Ph.D. in biochemistry from the University of Washington in Seattle (1980). While there, he was involved with the first cloning of genes by complementation in yeast (*ADH1*—the alcohol making gene) and the first study of codon bias in microbes (yeast and *E. coli*). His postgraduate work included a one-year postdoctoral fellowship between three universities: Washington University, St. Louis; University of California at Berkeley; and Stanford University.

Bennetzen then worked in industry at the International Plant Research Institute (San Carlos, California) from 1981 to 1983. While there, he cloned the maize *adh1* gene and cloned the first active transposable element from plants (*Mu1*). He took a faculty position in the Department of Biological Sciences at Purdue University in 1983, eventually rising through the ranks to become the Umbarger Professor of Genetics.

While at Purdue, Bennetzen discovered epigenetic modification/regulation of plant transposable elements, identified the first case of gene acquisition by a transposable element in any plant species (*Bs1*), demonstrated that a plant disease resistance gene (*Rp1*) is highly unstable by a process of unequal recombination, performed the first comparative mapping of any two cereal species (maize and sorghum), proposed the "grasses as a single species" model, determined the general structure of the maize genome (since shown to be similar for all other investigated plant genomes) as small gene islands in a sea of nested retrotransposons, developed a new method to date transposable element insertions, determined that transposable elements have inserted into plant genomes very recently and that an active process of small deletions (mostly illegitimate recombination) is rapidly removing these sequences, developed a number of techniques that can allow effi-

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cient shotgun sequencing of complex plant genomes, and began the process of sequencing the maize genome.

Bennetzen has served on various federal granting panels and chaired the Plant Genome Panel at USDA in 1999. He helped found, and served as the first elected chair of, the Maize Genetics Executive Committee. He is coeditor for several journals and a reviewer for many journals and grant programs. He has published more than 140 manuscripts and served nearly eight years as a coeditor for *The Plant Cell.*

Since August 2003, he has been the Giles Professor of Genetics and the Georgia Research Alliance Eminent Scholar in Molecular Biology and Functional Genomics in the Department of Genetics at the University of Georgia.

The election was held the morning of April 20 during the business session of the 141st annual meeting of the academy. Election to membership in NAS is considered one of the highest honors that can be accorded a U.S. scientist or engineer. NAS is a private organization of scientists and engineers dedicated to the furtherance of science and its use for the general welfare. The 72 members elected to NAS this year bring the total number of active members to 1,949.

ASPB Election Results

President-Elect
Michael Thomashow

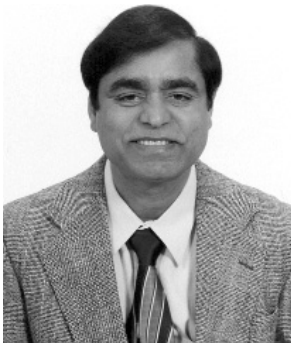
Elected Member
Bonnie Bartel

Corresponding Members
Joseph Hirschberg
Peter Hedden
Yukiko Sasaki

Full stories will appear in the September/October 2004 issue of the *ASPB News.*

People

Henry Daniell Elected Member of Italian National Academy of Sciences



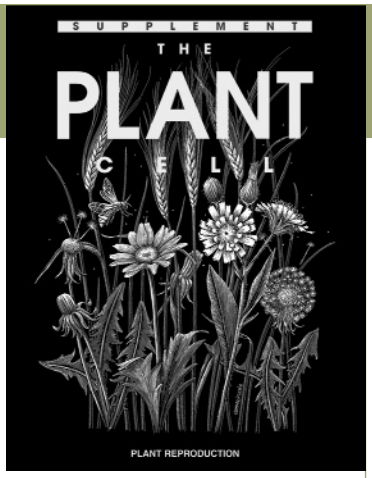
Dr. Henry Daniell, Pegasus Professor and Trustee Chair, Department of Molecular Biology and Microbiology, University of Central Florida, was elected a member of the Italian National Academy of Sciences at its 222nd annual inauguration in Rome on April 29, 2004. He is the 15th American national to be elected in the history of this academy. Past members include Benjamin Franklin and Albert Einstein.

Daniell was recognized for his pioneering inventions on chloroplast genetic engineering. He developed and advanced this concept, which overcomes concerns of transgene containment, low levels of transgene expression, gene silencing, position effect, pliotropic effects, or presence of undesirable foreign DNA sequences (*Nature Biotech* **20:**581; *Trends Plant Sci* **7:**84). His laboratories used this concept to confer plant traits, including herbicide (*Nature Biotech* **16:**345), insect (*PNAS* **96:**1840), and disease (*Plant Physiol* **127:**852) resistance; salt tolerance (*Plant Physiol*, in press); drought tolerance (*Mol Breeding* **11:**1); and phytoremediation (*Plant Physiol* **132:**1344).

Furthermore, the chloroplast genetic engineering concept has been used in his laboratory to express several therapeutic proteins including human interferon, human serum albumin, antimicrobial peptides, and vaccine antigen against anthrax, plague, cholera, and canine parvovirus. Chloroplast-derived therapeutic proteins were properly folded and fully functional (*Encyclopedia of Plant Crop Science,* 2004, p. 705). Carrot has been developed as an ideal system for oral delivery of therapeutic proteins. Recently, the Daniell lab has extended this technology to several major crops, including cotton (*Plant Mol Biol,* in press). Multigene engineering via the plastid genome with exceptionally large accumulation of foreign proteins (*Nature Biotech* **19:**20) has opened the door for engineering foreign pathways for nutritional enhancement or multivalent vaccines in a single transformation event.

Daniell is the technical founder of Chlorogen, Inc., which has received multimillion-dollar investment to commercialize this technology. His pioneering publications in *PNAS* (1987–1990) have resulted in several U.S. and foreign patents with broad claims to facilitate commercial development.

Daniell has been a member of ASPB since 1980, when he was a postdoctoral fellow at the University of Illinois, Urbana–Champaign. Since then, he has served on the faculty of Washington State University, University of Idaho, Auburn University, and University of Central Florida and was on sabbatical with the late Professor Lawrence Bogorad at Harvard University. Daniell is a dedicated teacher and has received several awards for his teaching accomplishments. His forthcoming book, titled *Molecular Biology & Biotechnology of Plant Organelles* (coedited by Christine Chase and published by Kluwer Academic Press), features 24 chapters contributed by pioneering authors from 10 countries.



A Supplement to *The Plant Cell*

Plant Reproduction

Edited by Robert B. Goldberg

This unique collection of papers provides timely reviews and current perspectives on all aspects of plant reproduction from seed development to flowering. In 19 papers, experts in the field document the progress that has been made in our understanding of plant reproduction since 1993, when the first *Plant Cell* special issue on this subject was published.

"The field of plant reproduction is at a crossroads, as is the entire area of plant biology. Reading the articles contained in this volume reveals the remarkable discoveries that are being made in every aspect of plant reproduction—discoveries that have critical applied implications."

—RBG

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- fruit development
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- endosperm formation
- using plant reproduction to improve crops

Plant Reproduction is part of the 2004 subscription to *The Plant Cell*. It is available to subscribers online at www.plantcell.org. Copies of the publication may be purchased for $30.00 by visiting http://www.aspb.org (or calling 301-251-0560). Inquire about multiple-copy discounts. To subscribe to *The Plant Cell,* contact knoone@aspb.org.

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International Plant Physiology/Biochemistry Cooperation in Mongolia

In this article, long-time ASPB member Clanton C. Black shares some of his experiences with science teaching abroad and discusses opportunities available to other scientists.

After the collapse of the Soviet Union, a chance arose to work on plants new to me in Mongolia. That opportunity presented numerous ways to share plant physiology/biochemistry knowledge and to gain new knowledge of plants that exist in different environments and are used in ways not familiar to me. Hence, I have worked with many interested persons not only in Mongolia but in other places as well—for example, along what we know today as the ancient Silk Road. Such opportunities are open essentially worldwide to anyone who is interested.

I'd like to recount some of my own experiences in hope of encouraging other biologists to become more personally engaged in finding international partners and sharing through international plant biology. There is a widespread need for personal international cooperation among plant physiologists/biologists, particularly in lesser known places and countries.

I spent a fall semester as a Fulbright lecturer at the National University of Mongolia, Ulaanbaatar, where I taught plant physiology/biochemistry and shared my experiences with a bright, eager bunch of junior-level students. During many faculty and student interactions, I shared my thoughts on what today's plant biology is and what opportunities are available. As an extra, my wife taught conversational English to first-, second-, and third-grade students. She and they loved it! I recently saw that former third-grade bunch of students; now they are "grown" and can carry out conversations in what is close to impeccable English. It's wonderful to chat with them and to see the self-confidence they gained from learning another language.

Indeed, one need I saw very clearly was the desire of young students to learn English. To assist with that, we planned, wrote, and assembled a bilingual plant physiology textbook at the National University. In 2002, the text *Plant Physiology* was published in Ulaanbaatar, Mongolia, in Mongolian and English. It has now been distributed and used by other Mongolian-speaking universities. This bilingual text is a good example of international cooperation in that Professor Bill Outlaw at Florida State University gave us permission to use and translate his class notes in text form while three Mongolians wrote special chapters on medicinal plants, secondary metabolism, and environmental stresses in Mongolia. That gave us a textbook that simply needed translating into two languages, editing, and publishing. The expenses of publication were paid by several groups in Ulaanbaatar. Another distinct advantage of such an endeavor was the low cost in Mongolia; students now have the book for about $5. We had two major aims: (1) to give students and faculty sound plant physiology and (2) to let them learn/practice English by comparing two languages side by side. In my evaluation, this type of modern science instruction sharing could be repeated in numerous languages.

Last fall I was in Mongolia, and we organized a workshop out of which the Mongolian participants wanted to publish their research in English. Finding it very difficult to locate a publisher for a mixed set of articles, our solution was to place their articles online at the University of Georgia's Biochemistry and Molecular Biology site. So their ideas, theories, and work will soon be readily available worldwide, later this year we hope.

I've been engaged in similar cooperative efforts in four other Central Asian countries. Each situation has its own opportunities and challenges that one can approach differently in context.

This account is offered to interest and engage other plant scientists in international partnership, especially in countries where opportunities and needs are evident. The opportunities are numerous; how and where they might be pursued is limited only by one's persistence and imagination. Certainly I am available to chat and offer experiences with anyone who is interested.

Clanton C. Black
ccblack@bmb.uga.edu

Membership Corner

ASPB members share a common goal of promoting the growth, development, and outreach of plant biology as a pure and applied science. This column features some of the dedicated and innovative members of ASPB who believe that membership in our Society is crucial to the future of plant biology.

If you are interested in contributing to this feature, please contact Kelley Noone, ASPB membership and marketing manager, at knoone@aspb.org.

Name: David E. Salt

Title: Associate Professor

Place of work or school: Purdue University

Research area: Molecular Physiology of Metal Hyperaccumulation and Tolerance

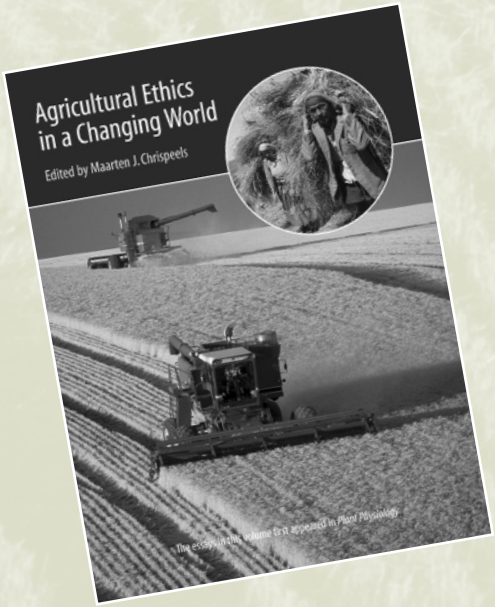
Member since: 1991

1. **Has being a member of ASPB helped you in your career? If so, how?**
   Yes, by giving me the chance to meet and collaborate with other plant biologists
2. **Why has being a member of ASPB been important?**
   Since I came to the United States in 1990, after my graduate education had finished, it was very important for me to meet the plant biology community in the USA. Being a member of ASPB and attending the annual meetings helped me achieve this.
3. **Was someone instrumental in getting you to join ASPB?**
   I first joined ASPB when I was a postdoc in George Wagner's laboratory at the University of Kentucky. George motivated me to join so that I could attend the annual meeting in Albuquerque.
4. **What would you tell nonmembers to encourage them to join?**
   Attending the annual meeting is a great way to find like-minded drinking buddies who also happen to be plant biologists!
5. **Have you found a job using ASPB job postings or through networking at the annual meeting?**
   No, not directly, but contacts in the plant biology community have certainly helped.
6. **Have you hired anyone as a result of a job posting at the meeting or on our online Job Bank?**
   Yes, several postdocs.
7. **Do you still read print journals? If so, where do you usually read them?**
   Almost all the articles I now read are printed from online pdf files that I read in my office.
8. **What do you think is the next "big thing" in plant biology?**
   Two areas that I am excited by are what I call "post Arabidopsis genomics" and "in silico biology." The first is the use of Arabidopsis tools to study interesting biology in close relatives of *Arabidopsis thaliana.* There are many species out there with similar genomes to Arabidopsis that do really interesting things like tolerate high salt, drought, cold, heavy metals, and low nutrient levels; produce floral scent; and the like. I think we can leverage the tools and information we have on Arabidopsis to learn more about these processes. The second area, "in silico biology," will require the development and use of integrated data-mining tools to perform experiments in a synthetic environment on the computer. Such experiments would lead to sophisticated predictions that could then be tested with "wet experiments." I think such an approach should help us leap-frog over a lot of the preliminary range-finding experiments that we have to now do before we hit on the really insightful experiments.
9. **What person, living or dead, do you most admire?**
   I would say that it has to be Mahatma Gandhi and Winston Churchill, both amazing leaders who were able to mobilize people to achieve extraordinary goals.
10. **What are you reading these days?**
    The last four books I read were *Elvis, Jesus, & Coca-Cola,* by Kinky Friedman; *The Botany of Desire: A Plant's-Eye View of the World,* by Michael Pollan; *White Mughals, Love and Betrayal in Eighteenth-Century India,* by William Dalrymple; and *The Piano Tuner,* by Daniel Mason. I am not sure what the connections are, but they were all great fun to read.
11. **What are your hobbies?**
    I will interpret this as what do I do when I am not at the university. The answer would be spend as much time outside on my five-acre mini-farm as possible. This would involve anything from having fires in my woods, tending the vegetable garden, looking after the sheep, making repairs on the barn and farmhouse, and all sorts of other "physical, getting dirty" type of stuff. I find this is a good counterpoint to all the "mind work" that I do at the university.
12. **What is your most treasured possession?**
    The ability to not treasure possessions.
13. **What do you still have left to learn?**
    How to see the wood for the trees.

Now Available!

Agricultural Ethics in a Changing World

Edited by Maarten J. Chrispeels



"Ethics is about choices, and agricultural ethics is about choices for people engaged in agriculture either directly as farmers, or indirectly as government regulators, extension agents, researchers, CEOs, industrial workers, lawmakers, technology developers, consumers, or protestors. Although all of us make choices, few of us actively engage in an ethical analysis of our actions or can provide reasons for the choices we make."

— **Maarten Chrispeels**
Plant Physiology, May 2003

Agricultural Ethics in a Changing World is an important compilation of articles from Maarten Chrispeels's series in *Plant Physiology* on Agricultural Ethics. Many experts in the field contributed to this edited volume.

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Morel Memories

It's been an uncharacteristically rainy week, but despite the mud I went for a run along trails in a nearby state park. The hillsides were dripping with moisture and shrouded in mist, creating the illusion that I was running on the damp foggy moors of England instead of the dry desert-like foothills of the Colorado Rockies. As I climbed higher, I left the open grassy slopes and entered a pine–oak forest. The dampness increased; I stopped to scrape the globs of mud from my shoes, and it was then I began to notice them—mushrooms! An impressive display of all sizes, textures, and colors: large boletes, slimy yellow jelly fungi, shiny brown tree ears, little white puffballs, and those look like…tiny orange-yellow chanterelles! I slowed to a walk and kept my eyes peeled for the one I love best, that most-prized and elusive of all mushrooms: the morel. I didn't really expect to see any, and if I did, I would almost certainly lie about their location.

I fondly recall my first successful morel hunting experience, nearly 20 years ago in Minnesota. I knew almost nothing about mushrooms at the time, but one cannot live in Minnesota for long without hearing something about the state mushroom, *Morchella esculenta.* Those "in the know" would speak of them in hallowed terms, their eyes wistfully gazing off into the distance as they dreamed of finding that first batch of succulent beauties around the time the lilacs came into bloom. I had heard all the stories, and had even looked for them—unsuccessfully—on my own from time to time. I rather doubted their existence. I don't remember exactly how it happened, but a friend who was leaving our fair state one day offered to show me his morel hunting grounds before he moved away. So on a fine Saturday morning, we headed off into the woods, full of hope. Those hopes dimmed after one or two hours of trudging through the woods with no signs of the mythical creatures. Then in a flash, my world was forever changed; I spotted the distinctive convoluted creamy brown cap of a morel growing near the base of an old oak. I have read that one morel "induces a dream and a mystical experience," and it was certainly true for me. Slowly we began to find more…and more. Suddenly they were everywhere! The day was transformed from a walk in the woods to a journey of discovery in a fantastical fairy-like forest. Upon arriving home, I laughed with delight to see Jenny's look of stunned amazement at our haul, and we cooked up one of the most delectable meals imaginable: fresh morels sautéed in butter with a bit of garlic and splash of white wine, served on toast.

Morchella esculenta: elusive little rascal

There are lots of "rules" about where to find morels: in abandoned orchards; near pine, elm, beech, ash; more rarely around maple or oak (ha!). Perhaps the best description I have read of where morels grow is "wherever they feel like it." They are sneaky, and liable to pop up just when your back is turned. I have lately heard that morels are particularly fond of burned forest areas. Unfortunately for many creatures, this is a rather common feature of the landscape in Colorado. There is, in fact, a brand-new 9,000 acre burn site just a few miles from my home, and what with this weather, I may have to take a little walk up there soon. Morels just might be a bit of silver lining in the dissipating clouds of wildfire smoke.

Nan Eckardt
neckardt@aspb.org

Reminder!

In consideration of the low member subscription rates to the print versions of *Plant Physiology* and *The Plant Cell* and the free online access to both journals that all members enjoy, members agree to retain their personal copies of the journals for at least three years from the date of issue, not depositing them in any library or institution before the end of this time. Members also agree not to release their personal access code, assigned by ASPB, to any other party for the duration of their membership in ASPB. Thank you!

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American Philosophical Society Research Programs

All information, and forms, for all of the Society's programs can be downloaded from our website, http://www.amphilsoc.org. Click on "Grants" on the homepage.

Franklin Research Grants

Scope

Since 1933 the American Philosophical Society has awarded small grants to scholars in order to support the cost of research leading to publication in all areas of knowledge. In 2003 the Franklin Research Grants program awarded over $300,000 to 80 scholars. The Franklin program is particularly designed to help meet the costs of travel to libraries and archives for research purposes, the purchase of microfilm, photocopies or equivalent research materials, the costs associated with fieldwork, or laboratory research expenses. The Society does not pay overhead or indirect costs to any institution, or costs of publication. Franklin grants are made for non-commercial research. They are not intended to meet the expenses of attending conferences.

Eligibility

Applicants are expected to have a doctorate, or to have published work of doctoral character and quality. Pre-doctoral graduate students are not eligible, but the Society is particularly interested in supporting the work of young scholars who have recently received their PhDs. American citizens and residents of the United States may use their Franklin awards at home or abroad. Foreign nationals must use their Franklin awards for research in the United States. Applicants who have received Franklin grants may reapply after an interval of two years.

Maximum Award: $6000
Deadlines: October 1, December 1
Decisions are reached in late January and in March.

Tax Information

Grants and fellowships are taxable income, but the Society is not required to report payments. It is understood that grant and fellowship recipients will discuss their reporting obligations with their tax advisors. Grants and fellowships made to non-resident aliens require additional processing time.

Contact Information

Questions concerning the eligibility of a project or the use of funds are accepted at 215-440-3429, via email to eroach@amphilsoc.org, or in writing to Franklin Research Grants, American Philosophical Society, 104 South 5th Street, Philadelphia, PA 19106

Include the following information:

- indication of your eligibility; specify the name of the program
- nature of the research (e.g. archival, laboratory, fieldwork, etc.)
- proposed use of the grant funds (travel, purchase of microfilm, etc.)
- Foreign nationals must state what objects of research they need access to, available only in the United States.

Information Updated: May 2004

NEW "PARTNERS PROGRAM" MEANS DISCOUNTS FOR ASPB MEMBERS

As an added benefit of membership, the Society's new Partners Program allows ASPB members to receive discounts on products and services offered by an array of vendors.

Go to the ASPB members-only page at **http://www.aspb.org/membersonly.cfm** for discounts on products and services from

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Discounts with new companies every month!

We are adding vendors on a regular basis. If you have any suggestions for vendors you would like to see enrolled in this program, please e-mail Kelley Noone at knoone@aspb.org.

CALL FOR PROPOSALS

WSSA Undergraduate Research Award—2005

The Weed Science Society of America has developed an Undergraduate Student Research Grant designed to encourage and involve exceptional undergraduates in agricultural research. Interested faculty members are encouraged to identify potential award candidates and discuss the possibility of sponsoring a research project. Awards may be used as a stipend, for research budget expenses (travel, supplies, etc.), to defer fees, to defray living expenses for summer research, or any combination of these items.

Award

Up to $1000 for support of undergraduate research to be conducted over a minimum of one quarter/semester during 2005. This award may be used to defray the cost of research supplies or as a stipend. Support of a faculty sponsor is required. Awards will be made to the student, to be administered by the faculty sponsor's department.

Applicant

The applicant is an undergraduate student with a strong interest in Weed Science. Students majoring in all related disciplines may apply.

To Apply

Applicants should prepare a 2-3 page research proposal including name, address, phone number, title, objective, experimental approach, discussion, budget and references. The discussion section of the proposal should describe the expected results and their possible significance to Weed Science. The student should provide a cover letter in which general academic and career goals are discussed. A copy of the student's academic transcripts should also be provided.

Faculty Sponsor

Any faculty member who is actively engaged in Weed Science research is qualified to be a sponsor. The faculty sponsor should review the research proposal with special attention to the budget; the distribution of funds should be approved by both the student and sponsor. In addition, the sponsor should provide a letter of reference including a statement of his/her willingness to supervise the proposed research and to provide needed space, equipment and supplies above those requested in the proposal. The sponsor is encouraged to assist the student in presenting his/her results at a regional Weed Science Meeting.

How to Apply

The completed proposal, academic transcripts, cover letter and faculty letter of support should be forwarded to: Dr. John Jachetta, Dow AgroSciences, 9330 Zionsville Road, Indianapolis, IN 46268-1054; Phone: (317) 337-4686, Fax: (317) 337-4649, E-mail: jjjachetta@dow.com. Proposals should be received no later than November 15, 2004. Funding decisions will be made by January 22, 2005 and presented at the 2005 WSSA National Meeting General Session.

Deadlines for *ASPB News*

We invite you to submit articles and letters to the *ASPB News.* Deadlines for submission of copy follow:

Issue	Deadline
November/December 2004	October 5, 2004
January/February 2005	December 5, 2004
March/April 2005	February 5, 2005
May/June 2005	April 5, 2005
July/August 2005	June 5, 2005
September/October 2005	August 5, 2005

Sixth Annual Fall Symposium 2004

"Cellular Mechanisms of Plant Development"

Friday, September 24, 2004
2:00 p.m.-9:00 p.m.

Saturday, September 25, 2004
8:00 a.m.-9:00 p.m.

Plenary Speakers:

Natasha Raikhel, UC-Riverside
Luis Herrera-Estrella, CINVESTAV, Mexico

Poster Session

Session Topics:

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Nonvascular Plants
Cell Wall Biogenesis
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Donald Danforth Plant Science Center
975 N Warson Rd
St. Louis, MO 63132

Contact:
Joni Patton, 314.587.1452
jpatton@danforthcenter.org
Christine Ehret, 314.587.1626
cehret@danforthcenter.org

Organizers:
Dr. Eliot Herman
Dr. Erik Nielsen
Dr. Mark Running

For more information, visit:
http://www.danforthcenter.org/fall_symposium/FS2004.htm

CALL FOR APPLICATIONS

West Virginia State University – Biochemistry

The Department of Chemistry at West Virginia State University solicits applications for the newly endowed position, the Dow Chemical Company Professor Chemistry Research and Education. This is a non-tenure track position, renewable for up to 5 years. Candidates for this new position will have a PhD in biochemistry. Both postdoctoral research and experience in securing externally-funded grants are desired. The successful candidate will be expected to interact with members of the Department of Chemistry and other researchers in the campus Land Grant Programs and to strengthen the corporate partnership between Dow Chemical Company and West Virginia State University. In addition, participation in the new MS in Biotechnology program is encouraged. The successful candidate is expected to teach biochemistry courses and to establish a research program in her/his area of expertise, which should complement ongoing activities within one of the programs sustained in the USDA 1890 Land-Grant Plan of Work: applied, industrial, or environmental microbiology and biotechnology; horticulture and alternative agriculture; environmental biology or environmental chemistry; aquaculture. This research will attract external funding and active participation by undergraduate and graduate students. Many modern instruments are available at www.wvsc.edu. Send a resume, a brief outline of research accomplishments and interests, contact information for 4 references, and a statement on research and teaching philosophy to Dr. Katherine L. Harper, Dean of Natural Sciences and Mathematics, West Virginia State University, Institute, WV 25112. Email inquiries should be directed to wilkerfj@wvsc.edu. Screening of applicants will begin on July 31, 2004 and will continue until the position is filled. The successful candidate should be prepared to start by January 15, 2005. WVSU is a historically black university, which has evolved into a fully accessible, racially diverse, and multi-generational institution, serving approximately 5,000 students. It is the largest institution of higher education in the Charleston metropolitan area, and is an affirmative action, equal opportunity employer.

House Subcommittee Recommends 10 Percent Increase for NRI, ARS

The U.S. House Appropriations Subcommittee on Agriculture approved on June 14 an increase of $17 million, or 10 percent, for the USDA National Research Initiative Competitive Grants Program (NRI) for fiscal year 2005. This increase would bring funding for the NRI to $181 million compared to $164 million in current-year funding. USDA had requested an appropriation of $180 million for the NRI for FY2005.

The subcommittee also approved an increase of $113 million, or 10 percent, for the Agricultural Research Service (ARS), bringing the recommendation to $1.259 billion for the FY2005 budget.

These increases recommended for the NRI and ARS are higher than some observers had predicted and are particularly welcome in view of the lower overall spending allocation the subcommittee had to work with for FY2005.

The full Committee on Appropriations was expected to take up the bill the week of June 21. There are many steps still to go in the annual appropriations process, but this recommendation of the Appropriations Subcommittee on Agriculture is a strong demonstration of support for the NRI and ARS in this first major action on the spending bill.

ASPB members who sent letters or conducted visits to their congressional offices contributed to this increased support for the NRI when possible cuts were being projected earlier.

ASPB shared with a number of other science societies the alert sent to ASPB Campus Contacts in March urging letters of support for the NRI. Several other science societies subsequently sent alerts to their members on behalf of the NRI.

Senator Bond, Joined by ASPB, AAU, Upholds NSF Grant Eligibility Standards for Scientists

ASPB joined with **Senator Christopher Bond (R-MO)** and the Association of American Universities in raising concerns over a resolution (NSB-04-48) approved March 26 by the NSB that would make federal researchers at the Smithsonian Institution (SI) eligible to apply directly for grants from the National Science Foundation.

Senator Bond sent a letter to NSB Chairman **Warren Washington** April 23 noting that the resolution sets a dangerous precedent that will negatively affect NSF's current activities—especially those programs targeted toward underrepresented populations that are currently underfunded by NSF.

Bond urged Washington to stop the process of negotiating a memorandum of understanding (MOU) with the SI and to allow the White House Office of Science and Technology Policy (OSTP) to review this matter. "OSTP has already begun a government-wide review of federal researchers who compete for other federal funds," he noted.

In a letter sent to Washington May 7, ASPB President **Mary Lou Guerinot** and Committee on Public Affairs Chair **Thomas Sharkey** said the March 26 resolution raised serious concerns.

"The resolution makes all full-time and post-doctoral scientists of the SI eligible to apply for NSF grants through the normal merit review process," Guerinot and Sharkey said. "The resolution also authorizes the NSF director to negotiate an MOU with the SI undersecretary for science that will provide the specific details and protocol by which NSF will accept SI proposals and make awards to the SI. The MOU shall be submitted to the NSB for approval prior to implementation, the resolution noted."

"The OSTP has begun a review of federal researchers who compete for federal funding. Completion of the OSTP examination of this issue is needed before further consideration of implementation of the resolution," Guerinot and Sharkey added.

The ASPB letter then noted the benefits of the action by Washington to await further study before implementing the resolution.

"We commend you for the actions you took recently concerning the SI as outlined in your letter sent April 27 to Senator Christopher Bond," Guerinot and Sharkey commented. "In that letter, you noted that you have asked the NSF Acting Director to discontinue negotiations between NSF and SI to develop draft MOU implementation language and procedures. You also noted that you would recommend at the NSB's May 3–4 meeting that the Board consult further with Congress and OSTP on this issue. You also said that you would recommend that the Board not take further action toward implementing such a policy change until OSTP has completed its government-wide review and consensus on the resolution could be reached by Congress.

"Your thoughtful recommendations and actions as outlined in the April 27 letter will

continued on page 14

continued from page 13

allow for further consideration of more comprehensive information needed on this issue," Sharkey and Guerinot said.

AAU President **Nils Hasselmo** had also sent a letter to Washington voicing concerns with the March 26 SI resolution and the precedent it could set. The ASPB letter to Washington noted agreement with AAU's concerns.

Washington sent a letter to Guerinot and Sharkey on May 24 responding to their May 7 letter. Washington explained in the letter to ASPB as he had to Senator Bond that the board will take no further action toward implementing a policy change until the OSTP has completed a government-wide review of federal researchers who compete for other federal funds and until consensus has been reached on this issue with Congress.

ASPB Public Affairs forwarded the letter sent to Washington from Guerinot and Sharkey to OSTP and has been in discussions with an NSB board member on this issue. In a meeting with NSF Acting Director **Arden Bement** that ASPB Public Affairs staff attended May 18, Bement noted that he has halted discussions between NSF and SI officials regarding implementation of the resolution. ASPB will continue to follow developments on this issue.

"Senator Bond has provided valuable assistance to the science community in asking NSB to refrain from implementing the SI resolution while we await further study results," Guerinot remarked.

Western Section, American Society of Plant Biologists

Integrating Plant Omics Research

October 22–23, 2004

University of Nevada–Reno

Grant Cramer and John Cushman
Co-organizers

The Western Section of the American Society of Plant Biologists is organizing a meeting on Integrating Plant Omics Research. The meeting will present advances in our understanding of fundamental biological processes in plant growth and development and responses to environmental stresses and signals using integrated genomic approaches. While mRNA and protein expression profiling and metabolite profiling are providing genome-wide insights into pivotal processes in plant growth and development in response to physiological and environmental stimuli, the current challenge facing plant scientists is to be able to integrate these large data sets and mine useful information that will increase our understanding of signaling and regulatory pathways. This meeting will include participants whose research is at the forefront of these fields and provide a forum for the exchange of ideas and discussion amongst undergraduate and graduate students and postdoctoral researchers in the Northern California and Nevada region. To facilitate this exchange, each conference session will spotlight presentations by graduate students and postdoctoral fellows. First- and second-place cash prizes of $250 will be awarded for the best oral presentation and the best poster.

Number of participants limited to 120.

Keynote Lecture:
Richard Dixon, Plant Biology Division Director, S.R. Noble Foundation, Ardmore, OK

Session 1: Proteomics and Metabolic Processes
Chair: David Shintani

Session 2: Developmental Processes
Chair: Ron Mittler

Session 3: Signaling and Transport
Chair: Jeff Harper

For registration and more information, visit http://www.aspb.org/meetings/.

Inter-Agency Efforts Support U.S./Developing World Research Collaboration in Plant Genomics/Biotechnology

Legislation sponsored by **Congressman Nick Smith (R-MI)** and **Congresswoman Eddie Bernice Johnson (D-TX)** that was included in the 2002 authorization bill for the National Science Foundation (NSF) authorized basic genomic research related to crops grown in the developing world.

Smith and Johnson have taken a lead in the House in support for plant genome research that would benefit people here and in poor nations. **Senator Christopher Bond (R-MO)** continues to be a leader in the Senate in supporting plant genome research for the benefit of Americans and those in developing countries.

In answering "questions for the [hearing] record" posed by the House Science Committee on implementation of the legislative language, NSF outlined the responsive actions it has taken in this area. Among the actions taken by NSF is announcement of the availability of funding to augment existing grants for activities designed to foster research collaborations between U.S. scientists and scientists from the developing world.

The following question and response was submitted April 30 by NSF for the hearing record:

Plant Genome Research

The recently enacted NSF authorization law includes an authorization for basic genomic research related to crops grown in the developing world.

Q: Within NSF's proposed plant genome research activities and international programs for fiscal year 2005, what resources are being made available to implement this new budget authority?

A: To encourage international collaboration on crop plants important to the developing world, the Plant Genome Research Program Announcement soliciting proposals for FY2004 and FY2005 includes the following language:

> "NSF encourages international research collaborations, particularly with investigators from developing countries, and especially where there is a common research focus or system."

In FY2004, the Plant Genome Research Program released a Dear Colleague letter entitled "Developing Country Collaborations in Plant Genome Research" (NSF 04-563 at http://www.nsf.gov/pubs/2004/nsf04563/nsf04563.htm) to announce the availability of funding to augment existing grants for activities designed to support research collaborations between U.S. scientists and scientists from the developing countries. The focus of the added support would be on research on crops grown in the developing world and/or on traits that are important to crops grown in the developing world. The NSF Office of International Science and Engineering and the U.S. Agency for International Development (USAID) provided substantial input to the Dear Colleague letter. USAID has agreed to provide assistance to principal investigators in identifying potential scientists and institutions in developing countries.

In addition, the Interagency Working Group on Plant Genomes, an NSTC subcommittee involving NSF, the Department of Agriculture, USAID, the Department of Energy, the White House Office of Science and Technology Policy, NASA, and the White House Office of Management and Budget, is discussing an interagency joint program to support research collaboration in plant genomics/biotechnology between U.S. scientists and scientists from developing nations.

Furthermore, database and genomic tools developed through NSF-funded research will provide the basis for future international cooperation. The development of tools for rice is an excellent example. These tools can be used to identify genes governing economically important traits such as drought tolerance, flowering time, and disease resistance across a range of rice species, including African cultivars, which are distinct from those grown in Asia.

It should be noted that NSF-supported researchers are already collaborating with institutions in developing countries, utilizing results from previously funded research. Examples include a collaboration between the group studying a model legume (Medicago) and a group in India studying chickpea, and the group studying sorghum genomics with groups working on sorghum in Africa. NSF supported a training workshop on maize in Mexico City that was attended by students and researchers from Africa who received travel support from USAID.

CLARIFICATION: The discovery of the wheat vernalization gene described in the May/June 2004 issue of the *ASPB News* was the result of research led by University of California, Davis, scientists Liuling Yan and Jorge Dubcovsky. It is published in the March 12, 2004, issue of *Science* (Yan et al., *Science* **303:**1640–1644).

United Nations FAO Strongly Endorses Agricultural Biotechnology

Cites Need for More Research on Subsistence Crops in Poor Nations

In its most sweeping endorsement yet of the applications of plant biotechnology to crops, the Food and Agriculture Organization (FAO) of the United Nations (UN) released the report "The State of Food and Agriculture 2003–04" May 17 at news conferences held in Washington, DC, and Rome.

ASPB staff attended the news conference in Washington, DC. At the news conference, **Prabhu Pingali,** FAO director, Agricultural & Development Economics Division, said, "Biotech should be looked at as one tool in a basket of tools." He noted the high rate (15 percent) of yearly global expansion in planting of genetically modified crops.

"Transgenic crops have delivered large economic benefits to farmers in some areas of the world over the past seven years," the report said. In several cases, per hectare gains have been large when compared with almost any other technological innovation introduced over the past few decades.

"In China [genetically modified] cotton yields are up 20 percent compared to conventional cotton. There has also been a 70 percent drop in pesticide use. This is a drop of some 78,000 tons in pesticide use [in 2001]," Pingali said. This represents a reduction equal to about one-quarter of the total quantity of chemical pesticides used in China. As a result, farmers of (genetically modified) cotton experienced fewer pesticide poisonings than those growing conventional varieties, the report said. Some 4 million small farmers are growing insect-resistant cotton on about 30 percent of China's total cotton area.

The report noted that biotechnology holds great promise for agriculture in developing countries, but so far only farmers in a few developing countries are reaping these benefits.

Six countries (Argentina, Brazil, Canada, China, South Africa, and the United States), four crops (maize, soybean, canola/rapeseed, and cotton), and two traits (insect resistance and herbicide tolerance) accounted for 99 percent of the global area planted in transgenic crops in 2003, the report said.

Basic food crops of the poor such as cassava, potato, rice, and wheat receive little attention by scientists, FAO said. "Neither the private nor the public sector has invested significantly in new genetic technologies for the so-called 'orphan crops' such as cowpea, millet, sorghum, and tef that are critical for the food supply and livelihoods of the world's poorest people," said FAO Director-General **Dr. Jacques Diouf** in a news release on the report.

"Other barriers that prevent the poor from accessing and fully benefiting from modern biotechnology include inadequate regulatory procedures, complex intellectual property issues, poorly functioning markets and seed delivery systems, and weak domestic plant breeding capacity," he added.

> The challenge is to develop technologies that combine several objectives: increase yields and reduce costs, protect the environment, address consumer concerns for food safety and quality, enhance rural livelihoods and food security.

Although the potential benefits and risks of GMOs need to be carefully assessed case by case, the controversy surrounding transgenics should not distract from the potential offered by other applications of biotechnology such as genomics, marker-assisted breeding, and animal vaccines, FAO said.

Agriculture will have to sustain an additional 2 billion people over the next 30 years from an increasingly fragile natural resource base. The challenge is to develop technologies that combine several objectives: increase yields and reduce costs, protect the environment, address consumer concerns for food safety and quality, enhance rural livelihoods, and food security, FAO said.

Agricultural research can lift people out of poverty by boosting agricultural incomes and reducing food prices, the FAO noted.

More than 70 percent of the world's poor still live in rural areas and depend on agriculture for their survival. Agricultural research—including biotechnology—holds an important key to meeting their needs, according to the FAO report.

Biotechnology should complement—not replace—conventional agricultural technologies, FAO said. Biotechnology can speed up conventional breeding programs and may offer solutions where conventional methods fail.

Biotechnology can provide farmers with disease-free planting materials and develop crops that resist pests and diseases, reducing use of chemicals that harm the environment and human health. It can provide diagnostic tools and vaccines that help control devastating animal diseases. It can improve the nutritional quality of staple foods such as rice and cassava and create new products for health and industrial use, FAO added.

But poor farmers can only benefit from biotechnology products if they "have access to them on profitable terms," the report said. "Thus far, these conditions are only being met in a handful of developing countries."

"There are no major public—or private—sector programs to tackle the critical problems of the poor or targeting crops and animals that they rely on," the report said.

Even though transgenic crops have been delivered through the private sector in most cases, the benefits have been widely distributed among industry, farmers, and consumers, according to FAO. "This suggests that the monopoly position engendered by intellectual property protection does not automatically lead to excessive industry profits," the report said.

The report also noted that the scientific evidence concerning the environmental and health impacts of genetic engineering is still emerging. "Scientists generally agree that the transgenic crops currently being grown and the foods derived from them are safe to eat, although little is known about their long-term effects," Diouf commented. "There is less scientific agreement on the environmental impacts of transgenic crops. The legitimate concerns for the safety of each transgenic product must be addressed prior to its release. Careful monitoring of the post-release effects of these products is essential."

FAO recommends a case-by-case evaluation that considers the potential benefits and risks of individual transgenic crops. The report says that although some benefits have been observed, adverse environmental effects have not been detected in commercial production. Continued monitoring is needed, FAO stressed.

ASPB Committee on Public Affairs member **Daphne Preuss** gave a presentation to the UN November 6, 2002, on the potential benefits genetically modified foods offer to developing nations. Her talk was part of a seminar series hosted by UN Secretary-General Kofi Annan and organized by Bruce Alberts, president of the National Academy of Sciences (see *ASPB News,* vol. 30, no. 1).

Veneman Cites USDA's Efforts to Bring Plant Biotech Products to Hungry Nations

Department of Agriculture Secretary **Ann M. Veneman** addressed the department's Advisory Committee on Biotechnology and 21st Century Agriculture on June 3 in Washington, DC. On a number of fronts, Veneman and the administration have ratcheted up U.S. efforts to bring products of plant biotechnology to developing and developed nations.

The Advisory Committee on Biotechnology & 21st Century Agriculture, which includes ASPB member **Carole Cramer,** provides guidance to the department on issues related to the application of biotechnology in agriculture. The committee also examines the long-term impacts of biotechnology on the U.S. food and agriculture system.

Following are some of the comments Veneman made to the committee:

"One of the things that we thought could be done is to really help people understand how science and technology can impact particularly those areas of the world where the most hungry people are and where agriculture is also at a subsistence level, where so much of economic activity centers around agriculture as a means to allow people to have enough to eat.

"So we hosted the ministerial conference in Sacramento last June. It really exceeded our expectations in terms of its success. We had over 1,000 participants. We had about 120 countries represented. We had 119 people at ministerial levels. These were ministers of Agriculture, of Science and Technology, of Environment, of Trade, Commerce—a whole range of people that participated, with speakers.

"**Norman Borlaug** spoke and made a really powerful presentation that I think really hit home, particularly with the African countries. And he talked about the Green Revolution, which he's attributed as being the father of, and he said, specifically directed at the Africans, that 'You missed the Green Revolution. You cannot afford to miss the gene revolution.' That was the central message of his comments.

> "[Africa] missed the Green Revolution. [It] cannot afford to miss the gene revolution."
>
> —Norman Borlaug

"We had such interest in this conference, and we didn't just focus on biotechnology. We focused on a range of technologies…one of the issues that came out [was] water and water availability and quality and…some of the basic technologies that can help that. And of course that ties in with biotech as well because we need…help the science be directed toward drought-resistant varieties of things like cassava…and test resistance of things that they eat in impoverished areas of Africa.

"Let's share our expertise on regulatory systems, on recognizing the need for strong sanitary and phytosanitary systems. We have another regional conference scheduled in Burkina Faso in June—again, to look at some of the specific issues around the needs of Africa.

"We've also promoted farmer-to-farmer dialogues. Certainly we've had a lot of discussions with countries about how we work together in the whole structure of biotech. So I know there's a tremendous amount of work that you all are doing to look at all of the various issues relating to these emerging technologies. I think it's very important that we set the…course in the right direction to make sure that we harness the value of these technologies while making sure that we protect the food supply and appropriately regulate.

"So again, we appreciate your efforts and look forward to working with you. And thank you again for your willingness to serve."

ASPB staff attended a portion of the two-day committee meeting. ASPB members **R. James Cook** and **C. S. Prakash** served on the department's biotechnology advisory committee in previous years. Dr. Borlaug was the Perspectives of Science Leaders speaker at the ASPB annual meeting 2002 in Denver. He received the 2002 ASPB Leadership in Science Public Service Award.

Daniel Gallie's Research on High-Protein Maize Could Save Lives in Developing World

A genetically engineered breed of corn with half the usual amount of carbohydrates but twice the oil and protein has been created by ASPB member **Daniel Gallie** and his colleagues of the University of California, Riverside.

Daniel Gallie

Nature reported May 11, 2004, that Gallie's main hope is that the new corn breed will supplement protein-deficient diets in Africa and South America. Malnutrition caused by a lack of calories is usually accompanied by a lack of protein in the diet. Protein-energy malnutrition is the leading cause of death in children in developing countries.

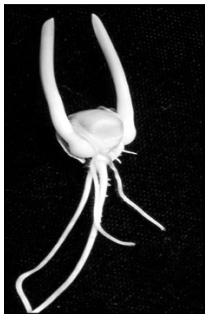
The protein-packed corn could also offer benefits to farmers who want high-energy corn for their pigs, chickens, and cows.

The increased protein, low-carbohydrate trait might be bred into other strains of corn such as sweet corn.

Gallie said several companies are interested in developing the crop for consumers adhering to low-carbohydrate diets. As with other genetically modified crops, there remain some regulatory steps before this corn could be planted.

See "Corn Cuts the Carbs" by **Helen Pearson** from Nature News Service. The complete article can be read online at http://www.nature.com/nsu/nsu_pf/040510/040510-1.html.

Further scientific information on this subject can be found in the following: **Young, T. E., Giesler-Lee, J.,** and **Gallie, D. R.** (2004). Senescence induced expression of cytokinin reverses pistil abortion during maize flower development. *Plant Journal* **38:**910–922.



Two seedlings emerge from a kernel produced from a plant that contained the cytokinin-synthesizing gene isopentenyl transferase (IPT) under the control of the senescence-inducible promoter SAG12.

ASPB Members in Rice Genome Consortia Recognized with 2004 Secretary's Honor Awards at USDA

The U.S. Department of Agriculture Cooperative State Research, Education and Extension Service (CSREES) hosted its recognition ceremony for the 2004 Secretary's Honor Awards group leaders and individual winners at the Ronald Reagan Building June 25.

Category

Enhancing Economic Opportunities for Agricultural Producers

United States Rice Genome Consortia, Tucson, Arizona

Rod A. Wing, *group leader*

For leading the United States partnership in the multinational achievement to decode the rice genome to advance knowledge, improve nutrition, and alleviate world hunger.

Group Members

USDA, Edward K. Kaleikau

National Science Foundation, Judith Plesset

Department of Energy, Sharlene C. Weatherwax

Rutgers, The State University of New Jersey Group Members

Joachim Messing, Rentao Song, Arvind Bharti, Galina Fuks, Victor Llaca

Institute for Genomic Research Group Members

C. Robin Buell, Qiaoping Yuan, Jia Liu, Shu Ouyang, Kristen Gansberger

Cold Spring Harbor Laboratory Group Members

W. Richard McCombie, Melissa Kramer, Lance Palmer, Robert Martienssen, Maureen Bell, Sujit Dike, Lidia Nascimento, Andrew O'Shaughnessy, Lori Spiegel

Washington University School of Medicine Group Members

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University of Wisconsin Group Member

Jiming Jiang

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Clemson University Group Members

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North Carolina State University Group Member

Ralph A. Dean

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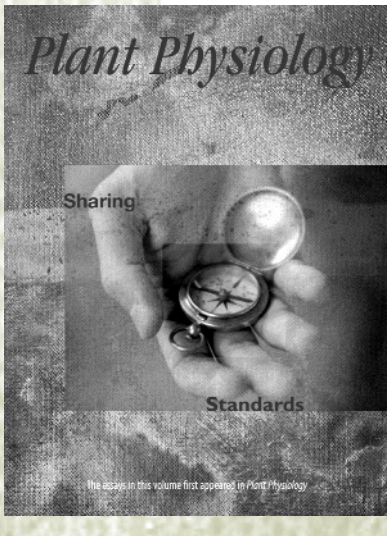
Edited by Robert Last, Associate Editor, *Plant Physiology*



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—Robert Last
Plant Physiology, May 2003

So begins the exciting and informative *Plant Physiology* editorial series on sharing biological data and materials, edited by Associate Editor Robert Last. Over the past year more than a dozen papers on this important subject have been presented in *Plant Physiology,* covering a wide range of topics including

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Compiled and edited by Sheila Blackman, Grand Valley State University, Biology, One Campus Drive, Allendale, MI 49401, blackmas@gvsu.edu

Planting Seeds of Knowledge in Golden Minds

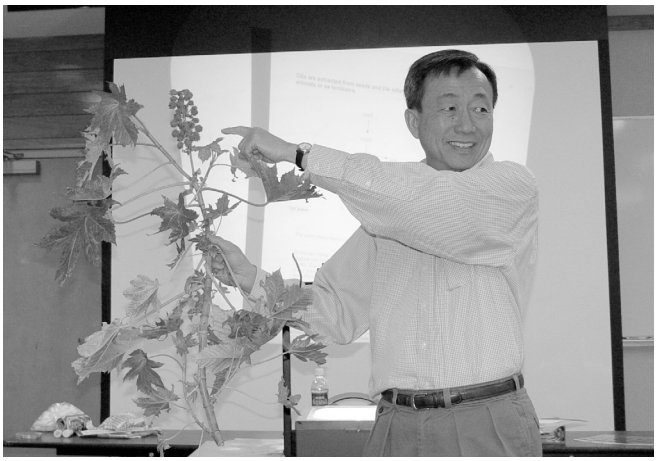
ASPB members have been active in educational outreach to K–12 students, as evidenced by numerous articles in the *ASPB News*. We want to educate our budding scientists and encourage them to become plant scientists and other plant-related professionals.

However, let's not forget senior citizens. They are unlikely to become plant scientists, but many have become more curious about the world. Education should be for all curious minds.

In a practical sense, senior citizens are active in politics because they know how to get things done and because they have the time to petition the media and elected representatives. Who better to champion the ASPB agenda than well-informed senior members of our Society?

Recently, I gave a formal course on "Plants and Human Affairs" to senior citizens. The course was administered by the Osher Lifelong Learning Institute through the university extension system. The institute was created two years ago by the Osher Foundation to provide education for people 50 years and older and has since expanded to 41 colleges in 11 states. At the institute at the University of California, Riverside, students pay $150 per quarter to enroll in up to three courses. Each course has an average enrollment of 30 students. The students come from all walks of life and presumably represent better educated or more affluent senior citizens. Many of the instructors are university non-tenure lecturers and junior college teachers. The institute provides funds for teaching materials and pays the lecturers $50 per hour. Some instructors, such as myself, donate the honoraria to other campus causes.

In my course, students were not expected to have a science background. They included retired professionals and a few homemakers. Although I have volunteer-taught at the K–12 level, I had to tailor-make the lectures for senior citizens. The course had 16 lectures, each with an academic title and an appealing subtitle, such as *Vegetable Oils: What Cooking Oils Should You Buy and Use?* Instead of asking the students to purchase a textbook, I provided them with about eight pages of lecture outlines to study in advance of each lecture. The institute's policy dictated no examination. I gave homework assignments (from solving simple Mendelian genetic problems to reading news items about plants).



Anthony Huang during a lecture. The castor bean in the fruiting branch contains the toxin ricin and the laxative castor oil.

I addressed the class as "mature students" instead of "senior citizens." My style was largely show-and-tell. I followed the lecture outlines and left abundant time for questions and discussion. The students had plenty to say because of their life experiences but were very considerate about allowing others to participate. The participation was tremendous, especially compared with that in regular undergraduate courses.

Before one of the lectures, a student asked me if I had heard of artemisinin. He showed me a major article in that day's *Wall Street Journal* about this new plant drug that could kill quinine-resistant malaria-causing organisms. I replied that we coincidentally would talk about it in today's lecture and politely mentioned that I had described the drug in the lecture outline distributed the week before. The student was impressed that the outline was up-to-date and a bit embarrassed that he had not read it in advance.

Three students became so interested in biology that they bought used general-biology textbooks. When they proudly showed me their new acquisitions, I bit my tongue not to show disrespect for those black-and-white, 20- to 30-year-old books. Imagine how thrilled these students were when, the following week, I gave each a brand new biology textbook still wrapped in plastic and including a CD, authored by Neil Campbell (*Biology*, 5th edition, published in 1999). Afterward, they all wrote to the author, thanking him for his gift.

The university extension, without prior notification to me, administered student evaluations late in the course. I was gratified that the students overall gave very generous evaluations. Still, the experience was not all rosy. Some students did not read the lecture outlines in advance and came to class as if they were attending a social gathering. In the future, for each lecture I will assign one student as a discussion leader, who in turn will allocate individual subtopics to several students for preparation.

ASPB members interested in educating senior citizens could find a local academic institution housing the Osher Institute (http://www.osherlli.org) or get involved in the numerous local senior citizen groups. You don't have to wait for retirement to begin teaching, and you don't need to give up active research. The reward is great personal satisfaction. Promotion of plant science is a bonus.

Anthony Huang
University of California, Riverside

Harry Beevers

Plant physiology has lost a guiding light. Harry Beevers, an outstanding plant physiologist, a beloved classroom teacher, a mentor of students and postdocs, and an excellent leader in administration, passed away at the age of 80 on April 14, 2004, at his home in Carmel, California, after a brief illness.

Harry was a member of the National Academy of Sciences and the American Academy of Arts and Sciences. He was president of the American Society of Plant Physiologists and a recipient of the Stephen Hales Prize and the Charles Reid Barnes Life Membership Award from the Society. He was awarded honorary degrees from Purdue University, the University of Nagoya, and the University of Newcastle-upon-Tyne.

Born in County Durham, England, in 1924, Harry's early secondary education was directed toward a career as an arts and crafts teacher. However, shortage of supplies during World War II eliminated that curriculum, and thus somewhat fortuitously, Harry embarked late in his secondary education on his scientific training. He earned his B.Sc. and Ph.D. degrees in botany from King's College at Newcastle-upon-Tyne, then part of the University of Durham. As part of his Ph.D. research under the mentorship of Meirion Thomas, Harry demonstrated carbon dioxide fixation in the dark in leaves of the succulent *Bryophyllum.* This contribution paved the way for future researchers to identify Crassulacean Acid Metabolism (CAM) as an alternative pathway for carbon assimilation.

Following completion of his Ph.D., Harry joined the Medicinal Plant Research group at Oxford under the directorship of W. O. James, an authority on plant respiration. During his four years at Oxford, Harry studied phenol oxidases and other enzymes of alkaloid metabolism. He also collaborated with Eric Simon in demonstrating that the influence of various herbicides was determined by pH, which, in turn, influenced the dissociation of the weak acid herbicides.

Capitalizing on the ready availability of *Arum* spadices in the woodlands around Oxford, Harry was able to investigate cyanide-resistant respiration, which has led to contemporary investigations into alternative electron transport pathways and thermogenesis in plants.

In 1950, Harry moved to Purdue University, where he started his own laboratory and during his 19-year stay established West Lafayette, Indiana, as a center of excellence for studies of respiratory metabolism in plants. Early inhibitor studies delineated the operation of the glycolytic pathway and TCA cycle in plants. The availability of ultra centrifuges, chromatography, and 14C-labeled compounds led to the extension of these studies and the isolation of mitochondria. Summers spent at Brookhaven National Laboratory with Martin Gibbs introduced Harry to the use of isotopes in his studies of respiratory metabolism and enabled him to demonstrate the operation of the pentose phosphate pathway in plants. These studies were paralleled by identification and characterization of the appropriate enzymes by a cadre of graduate students and postdocs.

Harry was intrigued by the metabolism of germinating oil seeds in which acetate, derived from storage lipids, serves as a source of carbohydrates rather than entering the TCA cycle. During a sabbatical with Sir Hans Krebs in Oxford in 1956–1957, Harry and Hans Kornberg demonstrated the operation of the glyoxylate cycle in extracts from the castor bean endosperm. Succinate produced from acetate in the cycle served as the precursor for glucose by a reversal of glycolysis; this represents the theme of gluconeogenesis. The outcomes of these early investigations into respiratory metabolism and gluconeogenesis were published in 1961 in Harry's book *Respiratory Metabolism in Plants* (Harper & Row, publ.)

In studies of the utilization of acetate, investigators in Harry's lab between 1960 and 1966 demonstrated the presence of separate pools of metabolites later shown to be associated with different subcellular organelles. As exciting as identifying the gluconeogenic pathway was, the investigations were eclipsed in 1966 by the discovery that the enzymes of the glyoxylate cycle were confined to a newly identified organelle, the glyoxysome. This discovery was followed by the demonstration that other similar organelles, peroxisomes, and gerontisomes belonged to a family of microbodies. In 1969, Harry moved his research group to the University of California, Santa Cruz, then a new campus in the University of California system. Harry's lab rapidly expanded the study of the biogenesis of the components of the glyoxysomes. The castor bean endosperm served as an excellent source of intercellular membranes. Investigations extended the study of anabolic activity of the endoplasmic reticulum. Protein bodies, vacuoles, functional ribosomes, lipid bodies, and a multitude of enzymes were characterized. These findings have led to a comprehensive picture of the major metabolic reactions of castor bean endosperm, their location in the cell, and the sites of synthesis of the organelles.

The outstanding research on the glyoxysome represents an unusual accomplish-

ment in biological sciences, in that the studies of the organelle in plants preceded investigations of similar metabolic compartments in mammals, protozoa, and yeast.

Details of Harry's research can be found in his prefatory chapter in the *Annual Review of Plant Physiology and Plant Molecular Biology* (**44:**1–12, 1993) and Tom ap Rees's article "Harry Beevers," in *Molecular Approaches to Compartmentation and Metabolic Regulation,* A.H.C. Huang and L. Taiz, editors, pp. 22–29, 1991 (ASPP, publ.).

Harry established such an excellent reputation in research and mentoring apprentices that he attracted budding scientists to join his lab from the four corners of the world. To have the privilege of joining him as a student or postdoc was to serve a scientific apprenticeship as rewarding as anyone might wish. Harry was a brilliant and innovative experimental scientist with a gift for leading by example and instilling confidence where it was needed. But more than this, he showed apprentices that science could be fun. His warmth, unfailing patience, and good humor permeated all of his interactions with his students and postdocs. There was no scientific mountain too large to be climbed, no possibility of failure too overwhelming to be contemplated. During the second half of his career he put in even more effort, at great personal sacrifice, to help apprentices establish their own careers. Soon after apprentices had left Harry's lab they would send him manuscripts from their research that he would carefully edit, and it was not unusual for him to cross out his name as co-author.

A serious teacher, Harry was always in command of his subject, the class, and the blackboard. His classes were intense, but the students were never bored. Passing information from teacher to student was not a product of passive osmosis but rather the result of Harry's dynamic, challenging, and engaging style of teaching, and not a day went by that students did not laugh out loud during class. Every student who took one of his courses remembers when Harry would decide that breaking into a song, with the appropriate scientific content, was the only way to get his point across. His courses naturally received rave reviews from students. His outstanding teaching earned him a place in the "Book of Great Teachers," a permanent wall display in the Purdue University Memorial Union.

Harry was famous for being an outstanding speaker. Few who attended one of his talks would have forgotten it, ever. He was humorous and highly gifted in attracting the attention of the audience, be they scientists or nonscientists. Singing songs with scientific content and even dancing were not uncommon entertainment tools. Over the years, Harry accumulated a broad repertoire of these songs, many with lyrics he had composed. His rendition of theses songs and quick wit made him the life and soul of many parties and in high demand as an after-dinner speaker. His Stephen Hales speech at the ASPP annual meeting held at Asilomar, California, during which he was able to conjure up a severe summertime storm with constant thunder and lightning intermingled with seconds of total darkness, is surely remembered by everyone there and serves as the model of excellence for award acceptance speeches.

During his early days at Purdue, Harry was involved in the formation of the Midwestern Section of ASPP. In 1961–1962, he was ASPP president. One of the most significant decisions he made as president was to appoint Martin Gibbs as editor-in-chief of the journal *Plant Physiology.* Martin held the post for 29 years and made the journal the premier publication in the field of plant physiology. At the national level, Harry served as a member of review and advisory panels to the National Institutes of Health and the National Science Foundation. He was recognized by his peers for his dedication and service to both Purdue University and the University of California, Santa Cruz.

Harry met his wife, Jean, while they were both students at Wolsingham Grammar School, Wolsingham, County Durham. Like Harry, Jean obtained a B.Sc. degree from King's College, University of Durham at Newcastle-upon-Tyne. The two were married in 1949 and emigrated to the United States in 1950. Their son Michael was born in West Lafayette, Indiana, in 1951. Throughout the years, Jean has been a constant source of help and support to Harry. She has provided warm welcome and hospitality and has established lasting friendships with many of the researchers associated with Harry's laboratory. She also wholeheartedly met the compelling demands of Harry's diabetes and the consequences of the side effects that come from prolonged treatments. She was always there for her husband in this and every other regard.

Harry is survived by Jean, of Carmel, California; his son Michael, his daughter-in-law Susan, and granddaughter Angela, of Fresno, California; sisters Win Allinson, Ripon; Edna Emerson, Wearhead; Elsie Chapman, Portsmouth; and Vera West, Canterbury, England; and brothers Alec Beevers, Stourbridge, England, and Leonard Beevers, Norman, Oklahoma (a prominent plant physiologist in his own right and a former president of ASPP).

A memorial service will be held September 25, 2004, at the Arboretum at the University of California, Santa Cruz (write to Daniel Harder, Arboretum director, dkharder@cruzmail.ucsc.edu for information).

This tribute to Harry Beevers was contributed by many of Harry's former students, postdocs, and colleagues.

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