This issue of the ASPB News *is dedicated to Martin Gibbs.*

ASPB News

THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS

Volume 33, Number 5
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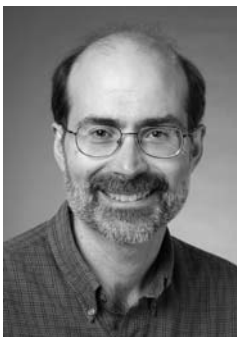
Inside This Issue

Rick Amasino Assumes Presidency October 1

Richard Amasino is ASPB's new president. He succeeds Mike Thomashow, Michigan State University, who became immediate past president on October 1. The Society's new president-elect is Rob McClung, Dartmouth College.



Rick Amasino

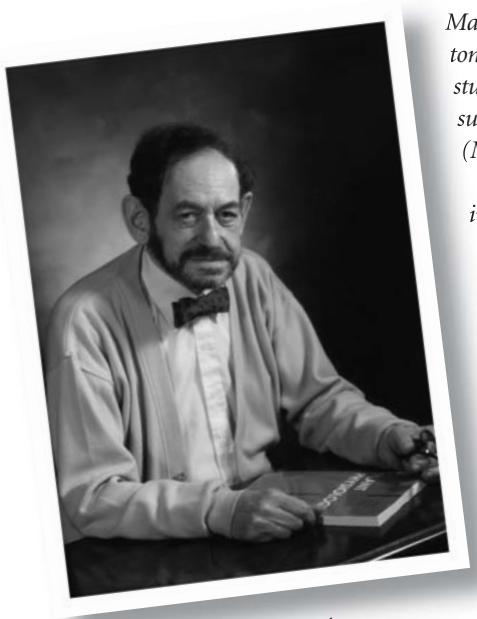
Rick received his undergraduate degree from Pennsylvania State University in 1977. He did his PhD research from 1977 to 1982 at Indiana University in the laboratory of Carlos Miller, where he studied the role of auxin and cytokinin in the growth and morphology of crown gall tumors. From 1982 to 1985 he was a postdoc in the laboratories of Milt Gordon and Gene Nester in the departments of Biochemistry and Microbiology at the University of Washington, where he was involved in the identification of the genes that Agrobacterium has evolved to direct plant hormone production in crown gall tumor cells. Since 1985, he has been a faculty member in the Department of Biochemistry at the University of Wisconsin–Madison.

At Wisconsin, Rick's early research program included studying the regulation of leaf senescence and the role of DNA methylation in the expression of transgenes. His group's recent work has

continued on page 4

Martin Gibbs was editor-in-chief of Plant Physiology *for nearly 30 years. He died on July 24, 2006. Clanton Black has written an insightful and touching tribute to Professor Gibbs, and many of Marty's former students and colleagues have contributed their own personal remembrances of him. We thank all those who submitted their story and are especially grateful to Professor Black and to Janet Miller and Leila Kocen (Marty's daughter and granddaughter) for many of the photos we've included.*

Donations in memory of Martin Gibbs can be made to the Lexington Council on Aging, Supportive Daycare, 20 Mill Street, Lincoln, MA 01773.



Martin Gibbs
Editor-in-Chief, Plant Physiology

Martin Gibbs: 1922–2006

Editor,* Plant Physiology; *International Advocate for Plant Physiology; Educator; and Compassionate Patriarch

The death of Professor Martin Gibbs on July 24, 2006, saddens the community of plant physiologists and scientists worldwide. Professor Gibbs's wake and funeral were held July 27 and 28. He was buried in a wooded glen beside his beloved wife Karen, who died April 7, 2006, in Westview Cemetery, Lexington, Massachusetts.

An active member of ASPP/ASPB for more than half a century, Professor Gibbs edited *Plant Physiology* for three decades (1963–1992) while simultaneously, in his quite personal manner, skillfully promoting

continued on page 7

The *ASPB News* is available online as well as in print. Members will be alerted by e-mail when a new issue is posted. The *ASPB News* welcomes member feedback. Contact the editor at nancyw@aspb.org.

CONTENTS

Deadline for January/February 2007 *ASPB News:* December 5, 2006

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Amasino Assumes Presidency
continued from page 1

resulted in progress toward a molecular understanding of the process of vernalization, particularly the role of chromatin modification in the epigenetic switch that establishes competence of the meristem to flower after exposure to the prolonged cold of a typical winter season.

Rick teaches general biochemistry to junior and senior undergraduates and participates in a graduate-level course on plant development. His professional activities have included many grant review panels for the NSF and USDA–NRI, and he has served on the editorial boards of *Plant Physiology; The Plant Journal; Plant, Cell and Environment;* and *Science.* His honors include a McKnight Foundation Award (1986), the Presidential Young Investigator Award (1989), the Alexander von Humboldt Foundation Award (2001), and election to the National Academy of Sciences (2006).

Rick notes "I knew that ASPB was a great organization, but during the past year as president-elect I have developed a deeper appreciation for it. The Society is engaged in a wide range of important activities, from publishing the top scientific journals in our field to education and outreach that ranges from the general public to minority students to Capitol Hill. And how well all of this is done is impressive, and that is a reflection of the quality and dedication of our membership and our staff at ASPB headquarters."

Richard Amasino
amasino@biochem.wisc.edu


Mike Thomashow

President's Letter

Thank You

Time surely does fly. It is incredible to me that it has been nearly a year since I was handed the helm of the great ship ASPB. And for me, the journey has been wonderful. What I have observed is a highly dedicated crew—the folks at headquarters in Rockville, Maryland—that daily gives its heart and soul to best serve our Society. I have marveled at the amount of time and energy that ASPB members voluntarily bring to the ASPB committees on which they serve to carry out the work of our Society and to chart its future course. As has been chronicled throughout the year in this newsletter, the accomplishments of these committees have been numerous, far ranging, and important.

And then there is the membership at large, a significant portion of which attended the annual ASPB Plant Biology meeting, held this year in Boston. In total, the group is very impressive. However, what I found particularly striking at the meeting was the high quality of, and the enthusiasm for science displayed by, the younger members of the Society. (True, nowadays most people seem young to me, but please stay with my point!) It is clear to me that the future of our Society is in great hands. The young'uns just need to remember to bring a few more Captain Jake Sparrow red bandanas so that we will all be ready when the dancing breaks out on board at future ASPB social gatherings. (For those of you who were unfortunate to miss this year's Plant Biology meeting, which included a fabulously enjoyable dancing session, you should put on your calendar now the annual meeting next year, July 7–11, in Chicago, where there is certain to be yet again, excellent science, interesting and informative workshops, and a social "celebration" that matches The Great Boston Disco!)

Well, I gotta get off the deck and make room for the next helmsman, Rick Amasino. Indeed, as we all know, we are extremely lucky to have him taking over this leadership role. So, let me close simply by saying that serving as president of ASPB has been a privilege and an honor. I sincerely thank you for bestowing upon me this privilege and honor—and for your support over the past year.

Michael F. Thomashow
thomash6@msu.edu

Rob McClung Is President-Elect


Rob McClung

Rob McClung is president-elect as of October 1, 2006, and will serve as president in 2007–2008. For the past three years he has been chair of the Publications Committee and has overseen a number of important initiatives relating to all aspects of the publications program and ASPB's premier journals and books, including *Plant Physiology, The Plant Cell, The Arabidopsis Book,* and *Biochemistry & Molecular Biology of Plants.* In particular he has played a key role in developing the Society's "Ethics in Publishing" series, a groundbreaking set of documents that address professional conduct on the part of authors, editors, reviewers, and the publisher/staff. Furthermore he has co-authored, with Nancy Winchester, a series of articles in the *ASPB News* on ethics in publishing developed to educate the plant biology community about such important topics as image manipulation, authorship, and plagiarism.

Rob earned his bachelor's degree in biology at Queen's University in 1976 and his M.Sc. in biology from Dalhousie University in 1979, investigating bacterial nitrogen fixation associated with the roots of *Spartina alterniflora* in salt marshes with David G. Patriquin. He continued these studies with Robert E. Davis at USDA–Beltsville. His PhD (1986) is from Michigan State University, where he worked with Barry K. Chelm studying the symbiosis between nitrogen-fixing bacteria and soybeans. His postdoctoral research from 1986 to 1988 with Jay C. Dunlap in the Biochemistry Department of Dartmouth Medical School introduced him to circadian rhythms in the model filamentous fungus, *Neurospora crassa.* In 1988, he took a faculty position in the Department of Biological Sciences at Dartmouth College, becoming a full professor in 2001. Since 2004 he has served as the associate dean of the faculty for the sciences.

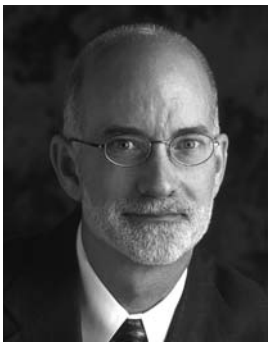
Rob's research at Dartmouth continues to focus on the basis of endogenous biological clocks. The biological clock provides a fascinating challenge. How does an organism endogenously measure time and use that information to coordinate its physiology and behavior with the externally imposed cycle of day and night? The clock coordinates many aspects of biology, including basic metabolism and responses to biotic and abiotic stresses. Additionally, environmental cues and the circadian clock contribute to the decision to reproduce. Proper coordination of the endogenous timing mechanism with the external day confers adaptive advantage, and impaired circadian function is associated with reduced fitness. Rob's work has emphasized the model plant *Arabidopsis thaliana.* He has worked to establish the breadth of processes under clock control and to identify components of the central oscillator mechanism. More recently he has explored natural variation as a source of information on clock function. He has also extended his studies to examine natural variation in clock function in the crop species *Brassica rapa,* which, like Arabidopsis, thrives over a broad latitudinal range and hence under widely differing photoperiodic and climatic environments. In the context of climate change and the need to exploit increasingly marginal habitats, fuller understanding of clock mechanism may offer strategies to improve crop productivity.

Rob's teaching has focused on genetics, molecular biology, and plant physiology, and he has taught both introductory genetics to first-year students and senior seminars in molecular genetics based on the primary literature. In his lab he has trained six PhD students; 10 postdoctoral fellows; and over 60 undergraduates, 14 of whom have completed honors theses with him. In 2002 his activities mentoring undergraduate women were recognized with a Dartmouth Women in Science Project Ten Year Mentorship Award. He currently heads the E. E. Just Program for Students in the Sciences, a program aimed at enhancing participation of underrepresented minorities, especially African Americans, in the sciences. He has chaired the multi-departmental Molecular and Cellular Biology Graduate Program and currently heads a Department of Education graduate student (GAANN) training grant. His professional activities have included grant review panels for NSF, NIH, and USDA–NRI.

In addition to his role as Publications Committee chair, Rob has served the Society as a member of the Women in Plant Biology Committee. He is currently a member of the North American Arabidopsis Steering Committee and the Arabidopsis Biological Resource Center Advisory Committee. Like any good Canadian, he enjoys playing hockey and shoveling snow.

Rob is excited and sobered by the current challenges to ASPB in advancing the science of plant biology. He hopes to emphasize the roles of ASPB in education at many levels. K–12, undergraduate, graduate, and post-graduate education in plant biology is critical to expand and diversify the vibrant pool of talent in the plant biology community. ASPB is also working hard to help its members and its journals address the many intellectual, technical, and ethical issues encountered in the modern publication world. Finally, we always face challenges in explaining the crucial roles of plant biology to the public. We compete for attention (and funding) with many other compelling interests, including health care and lunar and interplanetary exploration. The study of plants is vital, we know, for the long-term health of the planet and its human and non-human populations. Our greatest challenge is to articulate that vital interest so as to make it compelling to the non-academic community.

Steven Huber Is Elected to Executive Committee


Steven Huber

Steve Huber joins the Executive Committee as an elected member on October 1. He will serve for three years.

Steve received his bachelor's degree in 1974 in biochemistry from the University of Wisconsin–Madison and his PhD in 1977 in molecular biology, also from Madison. Since 1977 he has been a plant physiologist in the U.S. Department of Agriculture–Agricultural Research Service (USDA–ARS). From 1977 to 1981 he was assistant professor of botany and crop science; from 1982 to 1985, associate professor; and from 1985 to 2004, professor at North Carolina State University in Raleigh. From 1985 to 1986 he was a visiting professor at Nagoya University in Japan; in 2000–2001, a review officer for the ARS Office of Scientific Quality Review; and from 2003 to present, a professor of plant biology and crop science at the University of Illinois, Urbana–Champaign.

His research interests include the role of protein phosphorylation in signaling by receptor-like protein kinases and in the regulation of photosynthate metabolism in source and sink tissues and the biological mechanisms that control soybean seed protein and oil accumulation. His professional activities and awards include the Sigma Xi Young Scientist Research Award (1981); USDA–ARS Outstanding Scientist of the Year (1985); the Gamma Sigma Delta Research Award (1999); fellow, Crop Science Society of America and fellow, Agronomy Society of America, both in 2000; and Crops Research Award, Crop Science Society of America (2002). His service to ASPB includes monitoring editor, *Plant Physiology,* 1990–1995, and member of the Shull Award Committee since 2000 (chair in 2006).

Other activities include grant panel member for USDA–NRI (1983), NSF (1992–1994), BARD (1986–1988), DOE (1994, 2002), and NASA (1992–1996). From 1984 to 1992, he was a cooperating scientist on the USAID PL-480 Project on Photosynthesis in India. He was a member from 1986 to 1992 of the U.S. National Committee for the International Union of Biological Sciences; in 1988, U.S. coordinator for the U.S.–JAPAN Conference on Biochemical Determinants of Plant Productivity, Hawaii; in 1994, Annals of Botany lecturer in Wales; from 1996 to 2001, an international associate at the Forest Biotechnology Program at Umea University in Sweden; in 1996, chair of the Gordon Research Conference on CO_2 Fixation and Metabolism in Green Plants; since 2000, a member of the Regional Project NC-1142 on Regulation of Photosynthetic Processes; since 2001, a geographic representative for the Americas to the International Society of Photosynthesis Research; and in 2003, Tolbert Lecturer at Michigan State University and member, Faculty of 1000.

Editorial activities include the following: since 1992, editorial board member of both *Plant, Cell and Environment* and *Photosynthesis Research;* from 1999 to 2001, editor, *Plant and Cell Physiology;* since 2000, editorial board member, *The Plant Journal;* since 2002, editorial board member, *Annual Review of Plant Biology;* since 2004, editor, *Biochemical Journal;* and since 2005, editorial board member, *Planta.*

Future ASPB Meetings

2007: Chicago, Illinois
July 7–11
Hilton Chicago

ASPB will hold its 2007 annual meeting in conjunction with the Botanical Society of America (BSA), the American Bryological and Lichenological Society (ABLS), the American Fern Society (AFS), the American Society of Plant Taxonomists (ASPT), and the Phytochemical Society of North America (PSNA). Mark your calendars and look for more information soon.

Plant Biology 2008
Mérida, Mexico
June 27–July 2, 2008

Plant Biology 2009
Honolulu, Hawaii
July 18–22

For more information go to http://www.aspb.org/meetings/.

Martin Gibbs: 1922–2006

continued from page 1

the research and educational career activities of a host of plant scientists both in the United States and abroad. During his editorship, *Plant Physiology* became "the place to publish" as the journal rose to become the premier publication in plant biology. The prestige of publishing in *Plant Physiology,* with its rigorous peer review process, was a great boost for many scientists as they built their careers, garnered support funds, and obtained professional positions. For decades Marty Gibbs was a vigorous influence within the ASPP community. He served on the Executive Committee for many years and offered experienced wisdom at moments of decision. The Society grew consistently during his tenure, and the journal expanded from a single volume to three volumes annually while the numbers of published papers rose from about 175 to well over 600. He began nudging the journal internationally as well, appointing Gleb Krotkov as the first non–U.S. citizen to the editorial board and increasing submissions from outside the United states from 300 in 1984 to over 600 in 1991.

When one surveys the activities of Professor Gibbs regarding the field of plant physiology, his breadth of knowledge and myriad beneficial actions are humbling. He was an engaging conversationalist and delighted in finding and verbalizing the humor in every event and situation. Many students and others who worked in his Brandeis University lab will remember him sitting at his unpretentious little round metallic coffee table coming up with amusing comments about the events of the day and occasionally relaxing with his cigar. He particularly loved to talk and visit with young people; he went out of his way to make such opportunities at numerous professional meetings and in teaching situations. He traveled to many countries, especially into Soviet-dominated places, to give his personal support, advice, and encouragement. His warm, personable manner was so readily evident, making him admired and trusted by scientists around the world. Gleb and Valentina Krotkov, both Russian immigrants to Canada, became his close friends. Marty and Karen formed lifelong friendships here at home, too, notably with Eli and Louise Romanoff, Bob and Eileen Rabson, Mack and Dot Dugger, Tony and Alice San Pietro, and Bill and Winifred Klein, all of whom strongly supported plant research. Over the years these couples often visited, shared ideas and news, and informally evaluated the progress and status of plant biology.

Professor Gibbs was in every deed a compassionate patriarch of plant physiologists. He worked exhaustively to promote the efforts of plant scientists by organizing conferences, seminars, meetings, proceedings, and many publications. There are few plant physiologists during the past four decades who did not benefit, often perhaps unknowingly, from the constant widespread attentiveness of Martin Gibbs toward plant research

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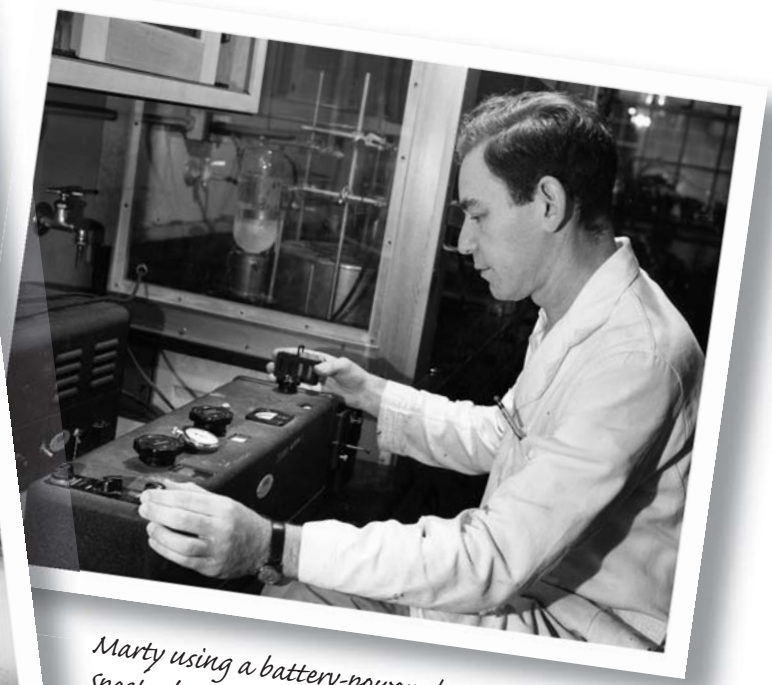
Martin Gibbs as a graduate student at the University of Illinois, hoeing the garden, 1944



Marty using a battery-powered Beckman Spectophotometer at Brookhaven National Lab, 1950

Photo courtesy of Brookhaven National Laboratory

Martin Gibbs: 1922–2006

continued from page 7

and education. He was a patriarch for plant physiology personally and professionally.

The compassion of Martin and Karen Gibbs for each other is legendary. "Isn't she beautiful?" he would say as he gently squeezed her smiling face between his hands. Karen was afflicted with multiple sclerosis for the last four decades of her life and confined to a wheelchair the last 30 years; yet Martin carried her around the world with him. Countless persons witnessed their tender devotion. One memorable trip helps illuminate that devotion: During the 50th anniversary year of D-Day at Normandy, Martin and Karen, myself and my wife Betty, and Marie-Louise Champigny gathered in Paris and drove to Normandy for a week's visit. The genesis of the visit was that Martin's brother Sol Gibbs had landed on the beach, and my father had piloted a Landing Ship Tank onto the beach during the D-Day invasion. We wanted to experience memories of Normandy events and to search for the landing places of our relatives. In a highly memorable and emotional scene, we carried and pushed Karen along our way among the cliffs, emptied bunkers, and beaches of Normandy; indeed, we stood at Sol's landing site and at locations of the naval armada. The mutual devotion of Karen and Martin was evident.

As a scientist Dr. Gibbs was one of the most persistent persons at conducting plant biology research in the 20th century. After he graduated from the University of Illinois in 1947, the distinguished plant physiologist Professor Kenneth Thimann at Harvard University recommended him to the Brookhaven National Laboratory to work with ^{14}C labeling and purifying plant sugars. His production of ^{14}C-labeled sugars from plants for world distribution led to many famous biochemistry labs working on carbon metabolism (H. Gest, I. C. Gunsalus, W. A. Wood, R. D. DeMoss, B. L. Horecker, S. Ochoa, F. Lynen, H. Beevers, O. Kandler). This research established him as an outstanding biochemist and helped establish the anaerobic pentose phosphate pathway and the Entner-Doudoroff pathway of glucose breakdown. Intensive research was also under way in several places to discover how photosynthesis captured CO_2 and synthesized sugars. As the now-well-known reductive C_3 or Calvin/Benson/Bassham cycle was being elucidated and debated, Dr. Gibbs, working with Otto Kandler, discovered that the sugars of photosynthesis were asymmetrically labeled during $^{14}CO_2$ fixation rather than symmetrically labeled as predicted by the proposed C_3 cycle. He tenaciously pursued explanations for the asymmetrically labeled sugars for about four decades. Essentially every student he trained had to learn quantitative biochemistry by laboriously degrading sugars carbon by carbon! After a decade at Brookhaven (1947–1956), he and his growing family (two children were born on Long Island; two in Ithaca, New York; and one in Cambridge, Massachusetts) moved to Cornell University (1957–1964), where his aptitude for inspiring, teaching, and training students was honed. By that time, photosynthesis research had broadened into a variety of biochemical discoveries related to photophos-

"Gibbs & Cigar" in Moscow, 1976

A. A. Shlyk, Laurie Bogorad, Roz Bogorad, Jerry Schiff, Yusef Nasyrov, Martin Gibbs, and Sophie Tageeva in Dushanbe, Tajikistan, October 1972

Martin Gibbs: 1922–2006

phorylation, electron transport, and light capture. In the midst of that intense research, Aubrey Naylor in 1962 asked Dr. Gibbs to become the editor-in-chief of *Plant Physiology* and he accepted that role, a role that lasted much longer than Martin or his students ever imagined it would! With his research in full bloom and the editor's responsibilities looming, the Gibbs Family moved to Brandeis University (1964–1993), where Martin became the Abraham S. and Gertrude Berg Professor of Biology and served as chair of the Department of Biology for three years.

As the new editor of *Plant Physiology,* Dr. Gibbs naturally focused his strong inclination toward biochemistry on journal manuscripts. Subsequently, *Plant Physiology* articles evolved with more rigorous biochemical approaches to understanding plants. An explosive research growth occurred in the United States in the 1970s and 1980s that strongly engulfed the Society and the journal. The field of plant physiology became more heavily funded and attracted more students. In the fall of 1962, the journal received about 200 papers per year and was printed in six issues with about 800 pages total. By 1991 it received 1,300 manuscripts and was printed in 12 issues with a grand total of approximately 5,000 pages and a press run of 5,500 copies. According to surveys (e.g., *Current Contents*), *Plant Physiology* was the most quoted and considered to be the most prestigious plant journal in the world. Clearly the workload increased greatly as the number of manuscripts increased. Professor Gibbs received and made decisions on all manuscripts until 1970. Around then, associate editors were appointed who were assigned manuscripts for decision. Over his three-decade tenure, Dr. Gibbs closely interacted with the printer, making all decisions on paper, format, print size, cover layout, and general instructions to authors.

There are a number of "Gibbs sagas" related to *Plant Physiology* that illustrate Dr. Gibbs's concerns for the journal. In 1963 the business of *Plant Physiology* functioned more like a "mom & pop" operation. Thus, for a half-dozen years, Martin and Bill and Winifred Klein ran the journal printing, publication, and distribution out of their homes and offices. One story relates to the sudden closure of the printer, Craftsmen, Inc., in Kutztown, Pennsylvania. It seems that the young man who owned Craftsmen was neglecting to remit FICA taxes to the IRS. Craftsmen's superintendent alerted Martin on a Friday night that he expected IRS agents to arrive the next day. Martin and the Kleins organized a hurried weekend auto trip to Kutztown, loaded up the galleys, and transported them to Business Press, Inc., in Lancaster, Pennsylvania, to ensure the timely publication of the next issue. At the next Executive Committee meeting, Dr. Gibbs apologized that the November issue of the journal had been a month late. That action demonstrated the detailed attention of Professor Gibbs and the debt of gratitude also owed to Bill and Winifred Klein as they worked, mostly unknown to the *Plant Physiology* community, with Dr. Gibbs to establish sound business operations for ASPP.

continued on next page

C. C. Black, Karen Gibbs, Marty, and P. S. Tang at August 1979 ASPP meeting

(3rd & 4th from right in second row) Karen and Marty at meeting he helped organize in Szeged, Hungary, 1983

Martin Gibbs: 1922–2006

continued from page 9

For more than three decades, numerous actions were taken by the Society in which Dr. Gibbs played pivotal roles. For example, he helped lead the move toward more businesslike functioning for the Society, being involved in the hiring of business managers, executive secretaries, and executive directors. He worked on the establishment of headquarters in Rockville, Maryland, and the Gude property gift that established a permanent site for Society business operations, spearheaded by business manager Pat Richter. And near the end of his term, he had a strong voice in the debate surrounding the creation of the second Society journal, *The Plant Cell.*

Dr. Gibbs was born on Armistice Day—November 11, 1922. His formative years were shaped by the Great Depression, and he was ever mindful of resources and expenditures. Even so, through all these changes within the Society, Professor Gibbs was a wellspring of critical, yet warm and highly supportive, actions for the entire field of plant physiology.

Quite naturally, the host of contributions by Professor Gibbs to science, to plant research, and to the Society were widely appreciated and honored. Some seminal memberships and recognitions include the American Academy of Arts and Sciences (1971); the National Academy of Sciences USA (1974); Marine Biological Laboratory Corporation, Woods Hole (1975); the ASPP Charles Reid Barnes Life Membership Award (1984); the Alexander von Humboldt Fellowship (1988); the French Academy of Sciences (1992); Honorary Life Member of the Canadian Society of Plant Physiologists (1992); the Russian Society of Plant Physiologists (1992); and the ASPP Adolph E. Gude, Jr. Award (1992). In appreciation of his research and service for 30 years as chief editor of *Plant Physiology,* the Society honored him by issuing the Martin Gibbs Medal, to be awarded to a distinguished plant scientist. Since the inception of ASPP in 1924, no living member of the Society has been so honored. The recipient of the medal is invited to organize the Martin Gibbs Symposium for the next national meeting. Professor Gibbs was the first recipient (1992).

Martin courted Svanhild Karen Kvale during his graduate school years at the University of Illinois (1943–1947), and they married on October 11, 1950. They were blessed with five wonderfully attentive children—Janet Helene, Laura Jean, Steven Joseph, Michael Seland, and Robert Kvale—a devoted daughter-in-law, Donna, and 10 grandchildren: William, Leila, Steven, Daniel, John, Douglas, Alec, Samantha, Savannah, and Trevor.

As plant physiologists, scientists, and friends, we can reflect on Martin Gibbs with a sense of loss, but with a finer and truer feeling of having had our lives enriched through the devotion, example, compassion, and wisdom given to us all by Martin and Karen Gibbs. Thanks to them both for entering and beautifying our lives.

Clanton Black
University of Georgia

Marty at Fishermen's Bastion, Budapest, 1985

Ed Tolbert, Marty, and Y. Nasyrov gassing up the car to visit I. Zelitch at the Connecticut Agricultural Experiment Station in New Haven, 1987

Remembrances: Martin Gibbs

I first met Martin (Marty) Gibbs in 1965 when he attended a symposium in Yellow Springs, Ohio, titled "Non-Heme Iron Proteins: Role in Energy Conversion." In 1968 I was honored to accept his invitation to serve on the editorial board of *Plant Physiology.* During my 12 years on the editorial board and one-year tenure as an associate editor, Marty and I developed a very close friendship. We continued to meet at a number of meetings thereafter, some of which we served as coeditors.

Until two years ago, Marty and I served for a number of years on the Panel for the Annual Review of the Biological Hydrogen Production Program supported by the U.S. Department of Energy. During these meetings, Marty continually amazed me by his total recall of information he and his colleagues had collected as well as from published information. In addition, he was knowledgeable in both plant physiology and biochemistry and had published with a well-known biochemist, Bernie Horecker. His knowledge was not confined to science but extended to current affairs and beyond.

Marty was a *Multi Personna*—he was the *Total Person.* A husband like no other, who provided loving care to his wife, who used a wheelchair because of a medical disability. One had only to watch Marty care for Karen to know the meaning of true love. His closely knit family attests to the love and affection his children and grandchildren felt toward their father and grandfather.

His scientific accomplishments are quoted widely, and his editorial success, I believe, is probably unmatched. As a friend his willingness to do for others was boundless. I can personally attest to all he did for me during our 40-year friendship and especially his support for my membership in the National Academy of Sciences.

Although Marty has gone to join his beloved Karen, he will be remembered always by those of us who were privileged to call him a friend.

Anthony San Pietro
Indiana University

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Marty and the Cigar Store Indian, a gift from students on his 65th birthday

Karen and Marty arrive at Martin's surprise 65th birthday party

The following facts about Marty were considered when deciding on a gift: undergraduate at pharmacy school, interest in drug stores, and smoking cigars. Students found the Indian on the North Carolina–South Carolina border and shipped him by Greyhound Bus to Boston. Afterward, the Indian resided in the Gibbs's living room to frighten grandchildren and astonish guests.

Remembrances

continued from page 11

Marty Gibbs was an interesting character and one who engendered all kinds of responses among those he dealt with within the Society. I certainly knew who Marty was long before I joined the Society in 1976 and was reasonably well versed in the debates relating to the existence, or not, of C4 photosynthesis in maize. However, two events happened within the space of a year that allowed me to get to know Marty much better. I joined the Executive Committee of the Society in October 1986, and roughly a year later Marty invited me to become an associate editor of *Plant Physiology.* This was a particularly interesting time for the Society. There was much concern about the perceived inability of the Society to attract the new breed of scientists who were known generally as "plant molecular biologists," either into the Society as members or to *Plant Physiology* as authors. To add to the mix, at that time the editor-in-chief served on the Executive Committee, which made it somewhat problematic to have a truly open discussion about the journal as Marty was notorious for his ability to filibuster, for want of a better term, the Executive Committee on issues about which he felt relatively strongly, which in those days represented just about any issue related to the Society. Indeed, it was only after the Constitution was changed in 1987 to have the chair of the Publications Committee replace the editor-in-chief on the Executive Committee that the issue of how to attract these newer plant biologists went forward and, ultimately, *The Plant Cell* came into being. Oddly enough, Marty's strong opposition to the possibility of changing the highly successful *Plant Physiology* to address the concerns about molecular biologists not finding it an attractive venue in which to publish may well have done the Society a real service at the end of the day. I doubt that any changes, cosmetic or otherwise, that we could have made to *Plant Physiology* at that time would have had the impact that *The Plant Cell* has had. I also do not think that initiating a second journal would have been as likely an outcome had Marty not been as opposed to addressing the concerns cited above through changes in *Plant Physiology.* Support him or not, Marty was a towering figure within the Society, and both his support for and his opposition to various new ideas had a very seminal effect on the Society and have in many ways driven us as a society to where we find ourselves today. It is undoubtedly safe to say that no single individual will ever again be in a position to have as much influence on the Society as Marty did. He was truly one of a kind.

Jim Siedow
Duke University

Marty was already a leader in his field when, newly arrived in the United States to work with Harry Beevers, I first met him at a conference in Madison, Wisconsin, in 1953. I had yet to finish my PhD, but he greeted me more like an equal than a raw apprentice. Subsequently, we were to meet many more times, in each other's labs and in more places than I can remember. On more than one occasion we stayed in each other's home. So I came to recognize a family man of great warmth, integrity, and loyalty. I enjoyed his friendship, his sociability, and his hospitality, and I admired his science and valued his example.

If I were asked to recall and relive one cherished moment, it would be one that took place—in what might well be described as a spit and sawdust pub—in Riverside, California. There we sat together, at peace with the world, eating hot chili and drinking cold beer, for an hour or so of rare relaxation that was both a delight and a privilege.

David Walker, FRS
Emeritus Professor, University of Sheffield

Undoubtedly, everyone will extol the accomplishments of Marty Gibbs as a scientist and an educator, and rightfully so. My memories are of Marty Gibbs the boss, the man.

I first *really* met Marty Gibbs when Houston Baker, then business manager, resigned and left the ASPP headquarters office without a "leader." Since I had some experience with the everyday running of the office, I was asked to take over until a replacement could be found. Marty was hesitant, I am sure, but willing to work with me nonetheless. He was

David Walker and Marty in front of Marty's Lexington home following the Gordon Conference in New London, 1990

Photo courtesy of Renate Scheibe

a tough, rigid, totally in-charge editor, and sometimes a little scary—on the surface. (Underneath, he was a real softy.)

He was unwavering in his devotion to *Plant Physiology* and fiercely defensive of his editors. He could make you shudder and then turn right around and defend you. The editorial leadership was his, and everyone knew it! I remember one time I suggested that a fax machine might save his precious "number of days to publication" a few days or maybe even weeks. Faxing was new, and according to Marty, not proven yet. So, we stuck with snail mail. (E-mail was not even an option in the early 1970s.)

Marty was also a great storyteller and could relate fascinating stories of his travels. He told me that, once in the USSR, he had to share a sleeper train car with his translator. The KGB would, on occasion, put a female in the train car to "lure" information out of the scientists. And that great little American flag on his dinner table was not to honor the USA, but rather to let everyone know that Marty was American and to "stay away." Marty never failed to acknowledge the accomplishments of others, or to make out-of-town visitors feel at home. He was devoted to his wife Karen, and together they made me feel welcome on my visits to Boston. Marty was certainly many things to many people, but mostly, in my opinion, he was a true gentleman and a gentle man.

Pat Richter-Cherry
ASPP Business Manager, 1977 to 1978

I am much saddened by the death of Marty Gibbs. He was a very good friend in addition to a very active plant biologist.

I knew Marty for well over 30 years. We used to get together at the annual meetings of the Society. Occasionally my wife Eileen and I would visit Marty and his wife Karen at their Boston home, not far from our daughter's home. During our visits we would talk about many things in plant biology. We would of course discuss Marty's professional activities, including his long-term editorship of *Plant Physiology.* We would talk about friends we both had, including Folke Skoog, Oliver Nelson, and others. On one or two occasions, Marty took us to visit Eli Romanoff, retired from the National Science Foundation, and his wife Louise.

All in all we had good times together. It is a sorrowful thing to have such a leader in plant biology—and good friend—leave us.

Bob Rabson
(retired) Department of Energy

While a graduate student enrolled in the Institute of Photobiology of Cells and Organelles at Brandeis University, I made a batik tee shirt showing the caricature of a head with the top popped open. A green plant was growing up from inside this head. Underneath the figure was written "Institute of Photolobotomy of Cells and Organelles." I presented this shirt as a gift to my research adviser, Dr. Martin Gibbs. I have no doubt, given his propensity for wearing buttoned shirts with the invariable sweater and bow tie, that Professor Gibbs never donned the colorful attire I created as a testament of my education under his tutelage. But, worn or not, the shirt was my own fanciful interpretation of my mentor's rather profound influence on my ability to think about science. I believe that the seeds Dr. Gibbs planted in many of us over five decades of teaching and molding students such as myself shall grow and remain as testimony to his ability to shepherd young scientists.

Dr. Gibbs employed many approaches to the art of teaching. But most of all, he seemed to have a wellspring of experience that he could apply effortlessly to point out the errors in technical approaches, as well as in the assumptions a student makes about the implications of experimental results. My goodness, as a graduate student, I often wondered how many new ways I could find to be incorrect about an approach, assumption, or conclusion made regarding our research. Gruff and erudite at the same time, he brought me to the blackboard often to teach me a lesson about how to think about the problem at hand.

With Dr. Gibbs, those were the operative words: *how to think!* In the end—I mean when we pass our dissertation exam—that is really what we've (hopefully) accomplished: an appreciation of how to think about science. How to think, how to ask the right questions, and how to employ strategies to obtain a definitive answer to those questions.

I know that I shall be forever grateful that I had a chance to benefit from Dr. Gibbs's mentorship in this regard. When you see me at an annual meeting, and you notice something green growing out of my cranium, know that it most certainly was planted there by this most extraordinary teacher.

Gerry Berkowitz
University of Connecticut

When my late husband Bill Klein came into office as ASPP Executive Secretary–Treasurer, *Plant Physiology* was a bimonthly journal printed in Lancaster, Pennsylvania. When the decision was made to go to a monthly issuance, the Lancaster printers could not accommodate that scheduling. After a careful search, Craftsmen Inc., in Kutztown, Pennsylvania, was chosen. Craftsmen was a small-job printer, operated by a young man with comparatively little experience but powerful persuasive prowess. The deciding factor was the plant superintendent, Mr. John Houck, an older man with impeccable credentials and many years of experience, a highly respected local man.

The changeover was smooth, and the operation proceeded without issue. Marty, Bill, and I made the trip to Kutztown monthly to check on whatever needed attention and to confer with both the owner and the superintendent. We would pick up Marty at the train station and drive to Kutztown, where we would spend most of the day.

Although the young manager was withholding the required FICA taxes, it seems that without anyone else's knowledge, except the bookkeeper's, he was not sending the quarterly payments to the IRS. One Friday night, Marty had a call from Mr. Houck telling him that he expected IRS agents to step in the next day. Marty telephoned Bill, and Saturday morning we picked up Marty and rushed to Kutztown by car, arriving

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continued from page 13

about 9:00 a.m. A truck from Waverly Press (Baltimore) was already there, preparing to take the galleys. (Marty had arranged for that in the interim.) The IRS agents did indeed arrive just after the Waverly truck disappeared through the streets of the town.

Winifred Klein

[*Editor's note:* Printing Corporation of America, which owned both Craftsmen and Business Press, Inc., suggested that the journal operation move to Business Press in Lancaster. Marty wrote in his 1964 Editor's Report (*Plant Physiology* **39:**1061–1062) that "With the transfer of *Plant Physiology* to the Lancaster plant, the journal returns to its birth site. In fact the present plant superintendent's father supervised the operations during the early years of *Plant Physiology.*"]

Martin Gibbs must have been the first and only editor of *Plant Physiology.* At least that's what I thought as a young, new member of the Society. That naive, incorrect impression came from Gibbs's firm and confident hand as leader of a journal destined to be almost overwhelmed by its success during his tenure.

The contact Professor Gibbs and I had was almost exclusively in the context of the editorial affairs of *Plant Physiology,* but the memories are rich and varied. One that immediately comes to mind concerns his letters written "b.e.m." (before e-mail). In those early days, I would occasionally write to him to inquire about some editorial matter. My long letters were invariably answered in as few as 10 or 12 words, followed by a nearly legible "Marty." Eventually I compared the short length of those one-sentence letters with his often lengthy "state of the journal" reports at the annual meetings. Just as Gibbs could condense years of experience into a sentence for me, he was condensing a huge amount of work into what seemed to him to be a short report.

Of course, the associate editors of the journal got to see sides of his personality other members may not have seen. For me this exposure began with Marty's desire, as the journal grew and the editorial staff got larger, to have a midwinter meeting. After one January trip to centrally located and transportationally well-connected St. Louis, home of associate editor Joe Varner, another associate—Johannes van Overbeek—balked. Too cold! Let's meet someplace warmer—like College Station. Marty conceded, probably in unspoken recognition of van O's long battle with Parkinson's disease. The concession was not without cost because most of the associate editors would not brave the small commuter planes serving van O's "city," thus requiring a 90-mile drive from the Houston airport. During the first meeting, on a weekend between semesters, the group worked late and found themselves locked inside the library near the time Mrs. van Overbeek, a local attorney, had dinner planned for the group. A call to the campus police sprung the editors in time not to spoil dinner. At dinner I sensed that Marty was more embarrassed than van O. Nevertheless, Marty was always patient with van Overbeek and always very complimentary of his College Station hostess, perhaps in anticipation of her legal services if the group ever got locked up again.

Eventually the "midwinter" meetings were moved to Riverside, where the airport was larger. For these trips, Marty's wife Karen often accompanied him, and he enjoyed visiting professor status during the local mini-quarter. During those visits, we managed to get locked out of a campus building one morning, thus delaying Marty's tightly scheduled morning session.

Editor Gibbs held these meetings to ensure that all the associate editors would have the opportunity for input on all aspects of the journal. No detail was too minute to escape our attention. When the olive green stock used for the cover was to become unavailable, we discussed the choice of a replacement. Someone commented that they would be happy to see the last of the "olive drab" covers. I learned later in a private comment from Marty that he liked the old covers and was disappointed that we did not choose a color near the old one. One point of this story was that anything put before the group could be decided by the group, and I do not recall Marty overruling us.

That there were solid-color covers instead of beautiful, slick photos or micrographs reflects on another Gibbs characteristic: frugality. For a while, I thought it was frugality for the sake of frugality. Eventually I realized that Marty's career-long battle to keep the price of the journal down had to do with making it available to subscribers for whom price or foreign exchange was a problem. Gibbs protected the Society's treasury in all his official activities. I recall those letters, written on fourth-page stationary, typed by him on a manual typewriter. I remember his explanation of the staffing in his office and wondered how he got the monumental amount of work done with so small a staff. Despite the frugality that he practiced, Marty let the individual associate editors express our values in how we used the company treasury. There was one exception to his frugality: The editorial board dinner at the annual meeting was always a first-class event, and I never heard him cautioning anyone to try to keep the cost down. If an editorial board member's pay was one dinner a year, he wanted it to be a memorable one. I trust they were.

The firm and confident hand that Editor Gibbs used to guide the journal's editorial affairs was never, to my knowledge, used to override any of the associate editors' decisions. Dr. Gibbs always trusted his associates to be scholarly and fair. This relationship of trust and respect fostered a working environment that prevented stress and tension within the group. As a result, our meetings were always pleasant and collegial, for which I give full credit to Marty.

It may come as a surprise to some, but Martin's concern for fair play extended far beyond decisioning manuscripts. As the number of women in the Society and publishing in the journal grew, Marty urged the associate editors to increase their nominations of qualified women candidates to their panels of the editorial board. He pushed this effort, eventually by counting openly by editor the number of female members who were on each of the panels. He also led discussions of likely female board members. Gibbs soon took a similar approach to internationalization of the jour-

nal. He recognized that good manuscripts would follow appointment of good international scientists to the editorial board. He also adopted the cause of scientists in countries where science was hard to do for various reasons. He personally championed the cause of scientists in Russia. However, I never had the feeling that Marty took up any of these "causes" for any reason other than his sense of fairness.

When Marty retired, I was prompted to write him another long letter, this one personal. His faithful care for his wife Karen had been an inspiration to me. Her long, debilitating illness was certainly a burden, but I never saw him falter in his care and concern for her. She traveled with him to most, if not all, of the annual meetings and many of the midwinter meetings. He was always, in my view, patient and supportive. In response to the letter and my comments about his faithful care of Karen, he politely dismissed my expressed compliment for this revelation of character with something like "it's the right thing to do." That seemed consistent with the rest of his life, as I was privileged to see it.

The plant sciences and the American Society of Plant Physiologists/Biologists were influenced in a favorable way by the life and work of Martin Gibbs, scientist and editor.

Page Morgan
Emeritus Professor, Texas A&M University

I was the first Gibbs graduate student. Dr. Gibbs (we never called him Marty) was a very concerned mentor. I suspect he was as nervous as I when I took my qualifying exam, though it never would have occurred to me at the time. He fostered independence. He convinced me to work on purine biosynthesis in plants and not on photosynthetic CO_2 fixation. I administered labeled carbon compounds to *Caffea arabica* leaf squares, isolated caffeine, and degraded it, carbon by carbon. I can't remember getting much advice on setting up the experiments and any advice on which labeled compounds to administer. Amazingly, as I finished one experiment and went on to the next, the labeled compound I needed was always there, in the lab. It never occurred to me that those compounds weren't standard and were being ordered, one by one. And only a year or two after I finished and left Cornell did I realize that if CO_2 and HCOOH had been equivalent, the Calvin cycle might have been put into doubt. As it was, I didn't find a new path of CO_2 fixation, but I did do the first experiments indicating that the origin of the purine carbons is the same in plants and in animals.

Dr. Gibbs fostered independence out of the lab as well. When I arrived in Ithaca I had no car and no driver's license. He must have decided that I needed a license, because one summer day he informed me that I needed to take a state car to Brookhaven to pick up some coffee plants for my research and that Ithaca College needed adults to serve as driving students for the student driving instructors in a short course. (The Brookhaven Lab is on Long Island, about six hours from Ithaca, through New York City traffic.) Ten days later, having imposed on every car-owning graduate student in the department for extra practice time behind the wheel, I passed the New York State driving exam and got my license. Then, amazingly, a couple of experienced drivers in the lab were appointed to go with me to Brookhaven to pick up those coffee plants, and I didn't have to drive a station wagon across New York City two days after getting my first driver's license after all. But I did have a license.

Dr. Gibbs was a superb lecturer. He gave the most interesting exams I have ever taken. We were planning a Gibbs Group Reunion in connection with the ASPB meeting in Boston this past August. It was canceled when we learned of the rapid deterioration of his health. We met at the moving memorial service instead. We will miss his stories, his repartee, and his scientific insight.

Louise E. Anderson
University of Illinois at Chicago

In 1961, when I had recently started to work with chloroplasts (really naked thylakoids, but I didn't know it then), I spent the summer at Brookhaven National Laboratory. I tried, and failed, to set up a rapid flow system to look for post-illumination phosphorylation. However, my summer experience was very far from a failure, because that was when I met Marty Gibbs. It was summertime, and many of us brought along brown bag lunches to eat on the lawn outside the lab. Marty was among us and had fascinating things to say about photosynthesis, about the scientists working on photosynthesis, about theories

continued on next page

Karen and Martin Gibbs

Remembrances

continued from page 15

and philosophies about photosynthesis, about historical details in photosynthesis that were being ignored…. He had tremendous insight and background in the field and was happy to share it with anyone who would listen. That was an invaluable part of my education, and it allowed me to become a better teacher.

There were other good things that came from knowing Marty. He was warm, sympathetic, and humorous. It was very easy to become his good friend, and it was apparent that he had very many. He had funny stories to tell about Cornell's Biochemistry Department and about many other human foibles. But never were his tales mean or spiteful, and he provided a wonderful role model for developing a generous outlook on the world.

Andre Jagendorf
Cornell University

As an Australian postdoc given the chance to join Martin Gibbs's group, I enthusiastically accepted his invitation to come to Brandeis University in 1964 from Professor Krotkov's lab in Kingston, Ontario. I had spent an enjoyable and instructive couple of weeks the previous year at Cornell learning to disassemble glucose molecules. Friendships forged then were to continue at Brandeis.

The first year at Brandeis, with the physical upheaval involved, was at times a bit chaotic, but when the new lab took shape we shared the Dunkin' Donuts and Rose's morning coffee with our mentor and his chalkboard. Martin Gibbs's probing questions and speculations about metabolic pathways certainly helped train us to think on our feet. Yet high spirits, hilarious anecdotes and reminiscences, or baseball sometimes took over. One particular memory I have recalls a day when Boston was pretty well snowed-in. It was quiet. Most had sensibly stayed at home. As Dr. Gibbs and I sat in the window bay watching the snow in a mellow mood, there was a lengthy (and patriotic) discourse on history. I am sure that he wanted all his students to share his own personal vision of an international community of plant scientists. Martin Gibbs and his colleagues have indeed contributed a great deal to its creation.

Garth Everson
Human Research Ethics
Royal Brisbane and Women's Hospital

The date of July 24, 2006, does not make me feel good, and I guess it never will, as I will never hear from Marty again. However, being reminded of that date brings back a lot of pleasant memories of meeting Martin Gibbs and our interactions over 28 years. I first met Martin Gibbs in 1965 in Aberystwyth, Wales,

Martin and Plant Physiology, 1992

Marty viewing poster, 1993

at a NATO-sponsored meeting on photosynthesis. At that time I was a young assistant professor at the University of California, Davis, becoming involved in regulation of starch synthesis in plants. I still remember his encouraging words. Our contacts increased as I started to publish results in *Plant Physiology* and, surprisingly, he asked me to serve on the *Plant Physiology* editorial board from 1969 to 1974 and again from 1978 to 1980. As he wanted to emphasize more biochemistry in the journal, Marty asked me to be an associate editor from 1980 to 1992 or until he retired as editor-in-chief. These were great moments for the journal and for the American Society of Plant Physiologists. As agreed by almost all, it was the foremost journal in plant science at that time, undoubtedly due to Marty's hard work and organizing ability. I remember at the editorial board meetings and at the *Plant Physiology* meetings his ability to project kindness, advice, and great encouragement to many of the younger plant scientists, as well as his great adaptability in reviewing papers that perhaps some would view as not appropriate for the journal. One example was his willingness to accept structural biology papers, and indeed during his time crystal structures of plant-related enzymes (e.g., polygalacturonase) were published. After he retired, my contact with him was much less frequent, but surely I would still get advice from him, along with comments about life and other issues. They were always appreciated. Martin is certainly missed by many.

Jack Preiss
Michigan State University

On July 24, 2006, the community of Bulgarian plant physiologists lost one of the leading personalities, and many of us lost a good colleague and friend, Professor Martin Gibbs from the USA.

Professor Martin Gibbs was a very good friend of Bulgarian science and particularly plant physiologists. He visited Bulgaria two times as a guest of the Bulgarian Academy of Sciences and "Acad. Metodii Popov" Institute of Plant Physiology. In 1987, he participated in The International Symposium on Mineral Nutrition and Photosynthesis as an invited lecturer and presented on the newly discovered physiological process of chloroplast respiration.

Professor Gibbs usually manifested great concern about young scientists. He used to participate in discussions on their scientific interests and results, giving valuable advice that stimulated their scientific career development. When possible he invited some of them to take part in his workshops held at Brandeis University.

Karen and Marty in Moscow with Vladimir Pyankov and Pavel Voronin, 2000

He was always helping to organize international meetings and conferences for young scientists. His name presented in the lists of organizing committees usually attracted many distinguished scientists in the field of photosynthesis.

Through Professor Gibbs, Bulgarian plant physiologists were able to establish fruitful and long-lasting collaborations with Professors Clanton Black, William Outlaw, and Peter Hommann, in whose laboratories many Bulgarian researchers were invited to work and study.

Professor Gibbs's contribution to improving the quality of our publications was also highly appreciated. During financially hard times for Bulgarian science, when it was impossible for us to publish our otherwise good results in such a prominent journal as *Plant Physiology,* he always found a way to assist.

The Institute of Plant Physiology at the Bulgarian Academy of Sciences and the Union of Bulgarian Scientists awarded a medal to Professor Gibbs for his special merit in the field of plant physiology.

I have always felt proud of the support I received from Professor Gibbs. His wisdom and knowledge were the criteria by which I have always verified my scientific findings. From our correspondence of many years, I learned to be strict and to aim high, but also to work with dedication and passion.

When I informed him that I had started to read lectures on photosynthesis while at the Plant Physiology Department of Sofia University, "St. Kliment Ohridski," he asked his students to immediately send me the latest books on the topic issued in the USA. Regarding reading lectures, he always advised me to cut across the framework of textbooks and to acquaint students with the latest scientific achievements. His view was that in this way future Bulgarian researchers would be well prepared to face the challenges of modern plant physiology. When some of my students left to work abroad, he assured me that for science there were no boundaries and that our best ambassadors all over the

continued on next page

Remembrances

continued from page 17

world would be Bulgarian scientists.

Our last meeting was in June 2005 in his home. I was impressed by his clear memories of his colleagues and friends in Bulgaria. We had a lively conversation about the future of plant physiology.

I will miss Professor Gibbs very much. I'll miss his wisdom and kindness and his great love of science. I will miss his gentle smile and aromatic pipe.

I was extremely lucky to cross scientific paths with Professor Gibbs. Professor Gibbs, I thank you for your friendship!

Losanka Popova
Bulgarian Academy of Sciences

During the 1970s, I studied and worked as a postdoctoral associate in Dr. Martin Gibbs's laboratory in the Biology Department at Brandeis University. During my first weeks in Dr. Gibbs's laboratory, he taught me the qualitative and quantitative methods of following the path of carbon during photosynthetic CO_2 assimilation. Using $^{14}CO_2$, he demonstrated how carbon could be traced into phosphorylated sugars, complex carbohydrates, and organic acids in leaves and chloroplasts of both C-3 and C-4 plants. I soon realized that I was most fortunate to be a research associate in his laboratory. Dr. Gibbs was a great teacher and research director, and I continue to realize that I was fortunate and greatly privileged to have been one of his students and associates.

Dr. Gibbs attracted many postdoctoral associates and graduate students who were dedicated to research in various aspects of photosynthetic plant physiology and biochemistry. Some of the postdoctoral associates who were present during my stay were Larry Labor, Grahame Kelly, Roy McGowan, Denny O'Neal, Sue Thomas (now Sue Coad), Martin Steup, Dan King, and David Erbes, all of whom have gone on to have successful careers. During the 1970s, graduate students who earned PhD degrees under Dr. Gibbs included Bernice Schacter, Carolyn Levi, John Perchorowicz, Yok Wah Kow, Dwight Peavey, Gerry Berkowitz, and Changguo Chen. All have achieved meaningful careers in various areas of academic science, teaching, or business. Those of us working in the Gibbs laboratory were assisted by and also helped direct undergraduate students in various research projects in photosynthetic biochemistry. Some of these students have gone on to become medical doctors or biochemists.

During the 1970s, there were occasional visiting plant physiologists and biochemists in the laboratory, e.g., Ralph Anderson of Utah; Erwin Latzko and Martin Steup of Germany; Mordhay Avron, Zvi Plaut, Elchanan Bamberger, Ami Ben-Amotz, and Herman Lips of Israel; and Nichiporovich and Yusef Nasyrov from research institutes in the former Soviet Union. Dr. Gibbs maintained strong friendships with plant physiologists and plant biochemists in the United States, England, Canada, Australia, France, Israel, Germany, the former Soviet Union, Hungary, Czechoslovakia, China, and Japan. He was a most active scientist in establishing good relations and exchanges with many Russian plant physiologists. I always considered this a contribution to world peace and a step in eliminating the Cold War between the Soviet Union and the USA. Those of us in the laboratory enjoyed and profited by what we learned from these visiting scientists; these interactions enhanced our intellectual environment and established lifelong friendships and international connections.

Under Dr. Gibbs's leadership and direction, each of us in the laboratory collaborated with him to make advances in research to better understand various aspects of photosynthetic carbon metabolism. Some of these advances were increased knowledge of carbon metabolism enzymes such as the reversible and irreversible glyceraldehyde-3-phosphate dehydrogenase in the chloroplasts and cytosol of higher plants, greater understanding of the influence of early growth of corn plants in determining the development of C-3 and C-4 metabolism, improved knowledge of the role of oxygen in affecting and regulating photosynthetic carbon metabolism in both C-3 and C-4 plants, and better understanding of hydrogen evolution and metabolism and its influence on carbon metabolism in green algae.

On a daily basis, Dr. Gibbs was constantly busy, not only directing research but editing the journal *Plant Physiology* and lecturing in biology courses, as well as being a father of five children and a dedicated husband. His skilled leadership, unfailing dedication, and intellectual skill as the editor-in-chief of *Plant Physiology* led the way as it became an international premier journal in which to publish research in basic plant physiology and plant biochemistry. He advised those of us in the laboratory to constantly keep up with the literature in plant physiology and biochemistry journals. Often, our daily discussions con-

Marty with view of the Alps in background, 2001

cerned various papers in these journals, and that practice enhanced our knowledge and our experimental approaches.

Those of us who were fortunate enough to have our lives touched by Dr. Gibbs continue to remember his life, his contributions and accomplishments, and his friendship, which will always enrich us and mean so much to us.

(*Author's note:* See Gibbs, Martin 1999. Educator and Editor. *Annu Rev Plant Physiol and Plant Mol Biol* **50:** 1–25. This is Dr. Gibbs's story in his own words. To this writer, this chapter is a wonderful memorial to Martin Gibbs, and I believe it includes his own feelings about the way he would like us to remember him.)

J. Michael Robinson
Research Plant Physiologist (retired)
USDA–ARS

One cannot describe 50 years of friendship in just a few words. Instead, I will attempt to convey humane aspects of Dr. Gibbs through some personal observations, emphasizing his concern for the individual and persistence of interest in that person that lasted a lifetime.

I went from Haverford College to Cornell University in the summer of 1956, hoping to study plant biochemistry under Professor Martin Gibbs. However, the transition from a small college to a huge university was overwhelming to me, and I took medical leave in the spring of 1957 to return home to Tokyo. Even during this first brief year, Dr. Gibbs knew how to guide this nervous, unconfident freshman graduate student. For my first departmental journal club presentation, he suggested a 1954 paper by Borthwick et al., the first description of photo-reversibility of a plant pigment affecting lettuce seed germination. It was a seminal paper, on the cutting-edge subject of phytochrome, and hence there were very few background papers to read. To this day I do not recall what I said on the podium, but I do remember that the presentation was well received.

Three years later, in Tokyo, I married Fumiko Tomoyama and planned to return to Cornell with her. I gave up plans for a career as a research scientist and hoped for training to become a high school science teacher. I then received a kind and surprising letter from Dr. Gibbs, inviting me to return to his laboratory as a graduate student. This letter of encouragement, expressing confidence in me, decided my subsequent career for good. I returned to Cornell with my wife, and Dr. Gibbs became my lifelong mentor. Once Martin Gibbs knew you, he did not give up on you easily.

Dr. Gibbs was a strict but patient teacher. Once I was to prepare potato phosphatase for the whole lab, following Kornberg's recipe. I peeled a large number of potatoes and put them in a garbage can filled with water, to be used for a massive preparation next day. Well, the final product showed zero activity, and I learned the meaning of enzyme fragility the hard way. Dr. Gibbs watched this whole operation with a straight face and let me learn by my own experience.

To "go the extra mile" is the expression used for effort above and beyond the expectation. Dr. Gibbs went those extra miles on our behalf many times, and sometimes literally. He spent the summer of 1963 at the Department of Plant Biology at Carnegie Institution at Stanford University. My aunt, a medical doctor in San Francisco, offered to put her Ford at his disposal during his stay, and in return asked him to deliver the car to her nephew on his way back to Ithaca. He agreed and drove that 1955 Ford to Ithaca in the fall of 1963. Years later, I often wondered if I would make a similar effort for my own student.

Later I witnessed the effort he made in promoting international collaboration, again going that extra mile. Dr. Gibbs, together with Shigetoh Miyachi of Tokyo University, was co-organizer of the U.S.–Japan Cooperative Seminar on Photosynthetic Carbon Flow, held at Lake Arrowhead, California, in 1984. The seminar successfully brought together many active researchers from both countries for the first time, initiating much new collaboration. Dr. Gibbs's behind-the-scenes effort during the preparation for this seminar resulted in the inclusion of a woman scientist, Yukiko Sasaki, in the Japanese delegation. In 2004, she received a Corresponding Membership Award from ASPB.

Dr. and Mrs. Gibbs were also kind advisers to Fumiko and me from our graduate student period onward. Dr. Gibbs's legendary devotion to his family has affected us deeply. He was a great mentor and above all a strong role model. He made the difference to so many people, and so often. Can we emulate this even fractionally? Probably not. But he has motivated us to give it a good try and to keep the legacy going. Thank you, Dr. Gibbs, for showing us what a difference one person can make.

Robert K. Togasaki
Professor Emeritus, Indiana University

We two, Erwin Latzko and Grahame Kelly (EL and GK), remember Martin Gibbs as being a central personality within our professional and personal lives. EL first experienced a lively research visit in Marty's lab in 1965. It was fascinating to work with scientists from five other countries, and that time was so successful that he returned again in 1970. That was when he met GK, a newly arrived postdoc from Australia. For EL and GK, and for so many other graduate students, postdocs, and researchers who passed through his lab, Marty's big heart, lively character, and sinister ability to ask questions rather than offer answers in science kept us connected to him and to each other in spirit long after departing his lab.

Marty made many short reciprocal visits to EL's lab in Germany, first in Freising-Weihenstephan, then later in Münster. While in Münster in 1978, he was delighted to be honored with an Alexander von Humboldt Award. He would usually come in the spring, often with his lovely wife Karen. Marty would bring a fresh live lobster or two packed in ice eight hours earlier at the Boston airport. It would be put to sleep in warm water and cooked, and soon a lobster and Bavarian beer feast was on the table, and no one enjoyed it more than Marty. His great sense of humor and ability to relate vivid tales came to the fore on such occasions. Those were some of the jolliest days of our lives and a time when the Gibbs and Latzko families became very close. Those

continued on next page

Remembrances

continued from page 19

family bonds lasted for over 40 years.

Inasmuch as GK spent the years 1974–1979 in EL's lab, he was lucky enough to join in on the work and adventures during Marty's visits. On one occasion Marty grilled GK over his input to the first draft of a "Gibbs and Latzko" review destined for the *Annual Review of Plant Physiology.* GK was internally upset over the constant cross-examination by Marty and was tempted to comment "this is your review; you fix it!" However, he kept his mouth shut. Then Marty declared, "Well, you have been a great help, young man. I think you should be included, as first author." Was that not magnificent training of a young scientist, both in profession and in patience? The review was published and nine years later became a citation classic (*Current Contents* [1985] **16**(15):20).

On other occasions, brief journeys were made to centers of plant physiology research in various European cities, both east and west. Apart from being annoyed at breakfast when GK tuned in to the short-wave Radio Australia news, which started with a kookaburra laugh (Marty complained "Can't you keep down the volume of that goddamn Australian jackass?!"), Marty thoroughly enjoyed those journeys. Visits were made to Roland Douce in Grenoble, Zdenek Šesták (editor of *Photosynthetica)* in Prague, and Agnes Faludi-Daniel in Szeged (the frog's legs meal in Szeged has never been forgotten). These were three of what must have been dozens of visits that were part of his lifelong devotion to personally fostering connections between plant physiologists worldwide, regardless of politics.

GK returned to Australia in 1980. Marty's visits to EL in Germany continued until 2003. We three never lost touch. Christmas cards were faithfully exchanged every year. On the occasion of Marty's 65th birthday, "Happy Birthday to You" was sung to him by GK's daughters over the telephone from Tasmania. Like thousands of other life experiences, he treasured that. He recalled it when GK, who had not seen Marty since 1989, enjoyed lunch with him and Karen at Jimmy's Steakhouse (Boston) on August 30, 2005.

We feel very sad that Martin and his beloved Karen are now gone. Nevertheless, we are also grateful for the many Marty-memories we have to reflect upon in the years ahead.

Grahame Kelly
Queensland University of Technology, Australia

Erwin Latzko
Professor Emeritus
Freising-Weihenstephan, Germany

In 1954, Martin Gibbs was invited by Professor Alexis Moyse to attend the International Congress that he had organized in Paris. It was the first time the two scientists met, leading to a constant scientific relationship and an enduring personal friendship that got Martin elected into the French Academy of Sciences and a conference report, coauthored with me, published in the *Compte Rendu.* At the occasion of the Botanical Congress in Montreal, Martin invited Professor Moyse and his French colleagues to join other "photosynthesis people" to a friendly dinner at his home. A few years later, after we had discussed scientific problems at the Photosynthesis Congress in Edinburg, Martin invited me to come and work in his laboratory in Waltham. I appreciated his fairness and great knowledge of plant biochemistry.

A very individual aspect of Martin Gibbs's personality was his love for France. He took great pleasure in touring, visiting small places and the countryside. The last visit he made was Normandy and the WWII landing beaches. Besides the historical and sentimental interest (he stepped silently onto the beach on which his brother Sol had landed in 1944), he appreciated the little hotel at Bayeux and another one at Sceaux. He was looking forward to another tour in Brittany, which I had all prepared, but decided not to do it because of his wife Karen's sickness.

Martin Gibbs was a great-hearted man. He showed his gratitude to me by inviting me to Lexington or especially to Woods Hole as often as we had the opportunity to meet. There I felt at home.

We have lost a good, caring friend.

M. L. Champigny
CNRS

Marty was a dear friend. I was surprised and much saddened by the news on July 24 from his granddaughter, Leila Kocen, informing her grandfather's many e-mail friends of his passing. I still remember vividly the countless ASPP meetings when Marty laboriously wheeled his wife Karen in and out of many social functions. He even drove Karen up 6,800 feet to our Big Bear Mountain home outside Los Angeles. Those were the days when they spent their enjoyable winter months on the campus of the University of California, Riverside, mingling with undergrads and attending and organizing several January plant science meetings.

Marty and Karen, 2004

Remembrances

I first met Marty long ago, in the mid-1960s, when he arrived by car to the outskirts of Chicago at Argonne National Laboratory (ANL). He had come from Cornell for research collaboration with my postdoctoral mentor, Solon Gordon, using ANL's giant walk-in spectrograph. He brought with him his student, Clanton Black, and a postdoc from Australia. Marty left his students behind and instructed them to return to Cornell by way of Canada (so that they could pick up for him a long list of liquor supplies). Clanton and his colleague, time and again, had to make calls to Cornell for detailed clarification.

Marty never served as president of ASPP, but his tenure of three decades as editor-in-chief of *Plant Physiology* was legendary. He certainly knew how to give parties for his editorial board during each annual meeting. What a wonderful tradition! We were treated to classy meals including after-dinner drinks and cigars (the latter of which I never tried). In his dinner invitations he would ask each member to list the name of the "wife" whom each wished to bring. Being not blessed with one, I wrote "what about a husband?" During one dinner Marty proclaimed, "I've made an exception; Jane can bring her husband." Though I never brought my husband, I invited my former biochemistry professor Dr. Richard Byerrum (elected executive director of ASPP) to many a fine dining.

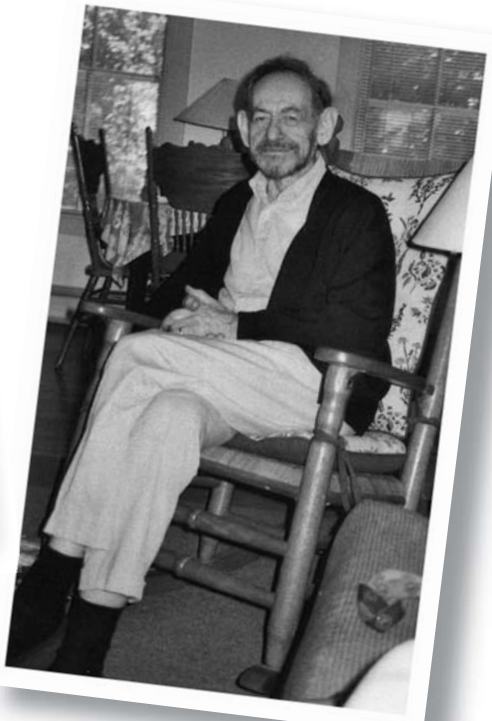
I saw Marty more frequently in Washington, DC, when he visited the Metabolic Biology Program at NSF, which he served as a wise panel member for many years. His association with our common friend, academician A. A. Krasnovsky, presidium of the A. N. Bach Institute of Biochemistry, Russian Academy of Science, Moscow, led to long-lasting discussions on bacterial photosynthesis and conferences. He was so very pleased, in later years, to have a Russian friend in his home to care for Karen. Marty was a wonderful human being, civilized, cultured, and jovial, always full of laughter. He is sorrowfully missed.

J. Shen-Miller
University of California

I am proud to share with Professor Martin Gibbs the title of "DINOSAUR." This was the title bestowed upon us by Alex Hollander as he introduced us to an audience of molecular biologists. We were the generation that took over from Folke Skoog, Kenneth Thimann, J. van Overbeek, and many others who had studied the phenomenology of growth and photosynthesis. It was our turn then to use enzymology and radioisotopes to create the metabolic map that now graces the display cases of laboratories. By 1980 we were, in fact, DINOSAURS, as science had shifted to molecular biology and the cloning of the genes that guided the synthesis of the enzymes of glycolysis, the Krebs cycle, and photosynthesis. How quick the passage of time and how quick the changes in the methodology of science. We stood on the shoulders of others and, in turn, others stand on our shoulders.

Robert S. Bandurski
Doctorus Honorus, Michigan State University

Marty and Grahame Kelly meet for lunch at Jimmy's Steakhouse (Boston) on August 30, 2005



Marty at Woods Hole, 2005

Mike Thomashow

"We used to have the underlying goal of our work to help feed the world and make more nutritious food for humankind. Now in addition there is this green energy component . . . and the protection of the planet as well. ASPB has a role in all of this."

—Michael F. Thomashow
ASPB President

ASPB and CSPP Unite in Boston for Plant Biology 2006

More than 1,500 phyto-enthusiasts gathered at the Hynes Convention Center in Boston for Plant Biology 2006. From Jordan to Japan, from Australia to Estonia, scientists from over 35 countries represented the global community of plant biologists as ASPB and the Canadian Society of Plant Physiologists (CSPP) met to exchange ideas and discoveries and to discuss the role of plant biology in addressing the problems of today as well as those anticipated in the near future.

The general meeting kicked off on Saturday, August 4, with greetings from ASPB President Michael Thomashow and CSPP President Robert Guy. Thomashow began the meeting by expressing what an exciting field plant biology is—especially with new approaches in plant sciences available to address issues such as enhancing nutrition, producing vaccines in plants, and producing biofuels. He likened the potential of plant sciences for revolutionizing plant-based fuels to President John F. Kennedy's vision of putting a man on the moon. According to Thomashow, plant scientists have to strive not only to help feed the world through their work but also to protect the planet and help harness the potential of green energy, all areas that will boost the role of plant biologists in the scientific community at large.

Robert Guy addressed the international audience and expressed his enthusiasm toward this ninth meeting between the two plant societies. He then proceeded to present the C. D. Nelson award, given in honor of the founding member of CSPP, to Greg Moorhead, currently a faculty member at the University of Calgary. Moorhead, who combines protein biochemistry, enzymology, proteomics, and bioinformatics, was recognized as an innovative scientist and teacher and as an internationally renowned leader in the field.

CSPP President Robert Guy presents the C. D. Nelson award to Greg Moorhead.

PLANT BIOLOGY 2006 PHOTOS © NICOLE BURKHART

Meeting Begins by Honoring 2006 ASPB Award Winners

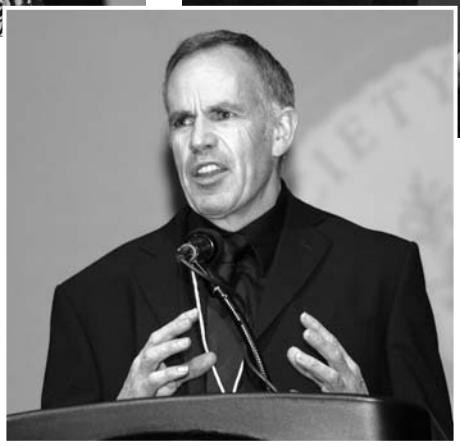
"I like to make the argument that what we learn in chili peppers can be used in rice and other commodity crops. I think in talking to people on the awards committee, it is clear that people recognize that the knowledge we learn about one system can be applied to understand traits in other systems."

—Charles Stewart, Jr.
2006 ASPB–Pioneer Hi-Bred International Graduate Student Prize Winner

Thomashow continued the opening ceremony by granting ASPB's 2006 awards. The ASPB–Pioneer Hi-Bred International Graduate Student Prizes were granted for the first time, honoring three graduate students whose works address important issues relevant to cropping systems. Kateri Duncan from the University of Illinois, Andrea Eveland from the University of Florida, and Charles Stewart, Jr., from Cornell University were the proud recipients of the award. The Early Career Award was presented to Simon Chan for his productivity, creativity, and independence as a researcher. Chan is an assistant professor at the University of California at Davis, where he works on novel genetic mechanisms in plants. Other awards given (which are discussed in more detail starting on page 30) included the Shull Award to Xuemei Chen; the Barnes Life Membership Award to Doug Randall; the Hales Prize to Ken Keegstra; the Kettering Award to Don Ort; the Hoagland Award to Dennis Gonsalves, and a new award this year, the

Kris Niyogi

Maureen Hanson and Bob Buchanan



Steve Long

Lawrence Bogorad Award for Excellence in Plant Biology Research, appropriately granted to Maureen Hanson, one of Bogorad's former graduate students. Corresponding Membership awards were presented to Gynheung An, Jürgen Denecke, and Rana Munns.

2005 and 2006 Awardees Kick Off the Seven Major Symposia

"Maureen Hanson's talk lit up my view of cytology. The fascinating thing is that despite the fact that cytology is an old field, you can make profound discoveries when novel techniques arise."

—Uwe Richter
Graduate Student

Following the Awards Ceremony, in the first of seven major symposia, the recipient of the 2005 Hales Award, Bob Buchanan; the 2005 Shull Award, Krishna Niyogi; and this year's Bogorad Award winner, Maureen Hanson, all presented aspects of their work that contributed to their respective awards. The second symposium of the meeting, "Plants Mitigating Global Change," was organized by Stephen Long of the University of Illinois and offered a new view of the role plants will play in global change and their promise as greener energy sources. Judging from the impressions the talks in this symposium made on attendees, it clearly emerged as one of the most meaningful symposia of this year's meeting. Colleen Doherty, a graduate student at Michigan State University, summed up the symposium as "optimistic." "The biofuels issue will be a great opportunity for the plant community to demonstrate its capabilities, and it seemed like most people at the meeting picked up on this," she said, noting that most talks following the symposium also bore an air of optimism for their respective fields. Fang Chen, a research scientist at The Noble Foundation, echoed her enthusiasm toward the symposium. "I think the new hot topics are biofuels and climate change and what plant biologists can do for this challenge," he said.

Five other symposia continued to engage attendees throughout the rest of the meeting. On Sunday morning, Joseph Ecker, the 2005 Gibbs Medal recipient, organized a symposium titled "Genome Scale Biology." Peggy Lemaux, cooperative extension specialist at the University of California at Berkeley, found the genomics symposium to be especially eye-opening. "I really enjoyed hearing how the Arabidopsis genome is sorting out. I've heard similar talks before, and every time it's like, *wow*—how can you do all of that," she remarked. Other symposia included "Legumes: From Genomes to Biology," organized by Doug Cook, and "Ion Channels and Cellular Signaling," organized by Julian Schroeder.

CSPP President Robert Guy organized the CSPP President's Symposium, titled "Tree Physiology and Genomics," during which the unique features of tree genomes were discussed in contrast to the relatively well-characterized genomes of herbaceous plants.

The meeting concluded with the ASPB President's Symposium, organized by Thomashow. Titled "Plant Responses to the Environment," it featured presentations on how plants respond to metals, seasonal and diurnal changes, light, hormones, and stress from drought and salt. In addition, the well-attended Minority Affairs Symposium held Monday afternoon focused on ethnobotany and the potential applications of products harvested from plants.

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continued from page 23

Minority Affairs Committee Promotes Diversity Awareness Within ASPB Community

"The Minority Affairs Committee for ASPB has been very active in the past few years in promoting an agenda in getting more diversity within the Society."

—Anthony L. DePass
Chair, ASPB Committee on Minority Affairs

Elli Wurtzel organized the Minority Affairs symposium, titled "Medicinal Plants and Ethnobotany." Kathryn Jill Chavez, a graduate student in the field of environmental toxicology at Cornell University, braved the crowd and gave her first presentation at a professional meeting during this event. She noted that she was pleased to see such a large turnout at the symposium, evidence that she says speaks to the importance of this area of plant biology. "Some of the most prominent minority scientists are interested in ethnobotany—a lot of them grew up in South American countries, so it really brings the field to the forefront," she noted. "MAC is doing a great job of getting minorities involved…it's important for them to get out there and see other minority speakers, because you rarely see that."

The committee, called "MAC," also hosted a luncheon on Sunday during which recipients of the MAC travel awards were recognized. Attendees were introduced to the many activities that MAC engages in, including the Diversity Bank, which provides information on mentoring and funding opportunities. For more information on MAC activities and how you and your institution can benefit from MAC resources, check out http://www.aspb.org/committees/minorityaffairs/index.cfm.

Alfred C. Johnson, assistant director of the NIH Office of Intramural Research at the National Institutes of Health, was the luncheon speaker. Johnson encouraged minority students by telling them "It's time to pimp our ride!"—referring to a popular show on MTV. For a full explanation of his inspirational acronym, refer to the sidebar on page 25.

Elli Wurtzel

Kathryn Jill Chavez

Wendy F. Boss

Members of the ASPB Minority Affairs Committee (MAC) welcome the 2006 MAC Recognition Travel Awardees to the ASPB Annual Meeting in Boston

Women in Plant Biology Luncheon: Advice for the Young and the Restless

"Your data are going to be replaced…but your love of science, your approach to science, and your ethics in science are very important, and you can pass those on."

—Wendy F. Boss
Professor

Wendy F. Boss, the William Neal Reynolds Professor of Botany at North Carolina State University, challenged attendees of the WIPB luncheon to think about how they do science and what approaches they take to their job in plant research—what she called the best job in the world—in her lunchtime address titled "Tapping on the Puzzle Piece." During her talk, Boss discussed what it means to leave a legacy in your field. Because science evolves, and discoveries and theories are continually replaced, she suggested that the legacy one leaves is the impact one has on students, those that constitute the future of plant biology. In addition, she encouraged her audience to "pat themselves on the back" and celebrate when things go well and to work together to solve the "puzzle" of plant biology

Mary E. Clutter

as a team. She especially encouraged the young women in the audience to be aggressive about advocating their own research by publishing. After all, your "piece" isn't in the puzzle and your research cannot be built upon until it's published. She sent the crowd home with two primary messages aimed at the young scientists in the field: "You are the future of plant biology" and, drawing on a quote from Dr. Mary Clutter, "We are changing the world."

Mary E. Clutter, Prognosticator Extraordinaire, Reveals the Past and Predicts the Future

"21st-century biology is not the biology that a lot of us learned in school. As one of my old friends would say, 'This is not your mother's Oldsmobile!' "

—Mary E. Clutter
2006 ASPB Leadership in Science Public Service Award recipient

Dr. Mary E. Clutter, the former assistant director of the National Science Foundation and recipient of the 2006 ASPB Leadership in Science Public Service Award, gave one of the most widely appreciated talks of the meeting during the Perspectives of Science Leaders session held on Saturday evening. Dr. Clutter presented a timeline of what she considers to be some of the most fundamental events during the past 30 years that have contributed to advances in plant biology research. Many attendees of this year's meeting found this to be one of the most valuable talks of the meeting because it provided a historical perspective for young students and those new to the field of plant biology. According to graduate student Colleen Doherty, "Mary Clutter gave a 'no-holds-barred' review of how far plant biology has come (along with some interesting personal anecdotes about people I have only read about), but the best part of her talk was her predictions for the future. It was very far-sighted and very optimistic." Peggy Lemaux, from UC Berkeley, who considers herself relatively new to the plant biology field, said "I really enjoyed seeing the timeline and seeing when things happened and how things fell into place." In addition to giving a historical perspective, Clutter's predictions bore exciting implications for the future of plant research. Read her Top Ten predictions in the Public Affairs section of this issue on page 49.

A Wealth of Workshops at Plant Biology 2006

"As a student who is starting to look at postdoc positions, this meeting allowed me the opportunity to see what is out there in terms of research, to be exposed to what is the latest in fields I really haven't been keeping up with, and to meet people who might be interesting to work with."

—Colleen Doherty
Graduate Student

Alongside a hot line-up of minisymposia, attendees had the opportunity to participate in various workshops throughout the five-day meeting. On Sunday evening graduate students and postdocs participated in one of two concurrent career workshops. "Getting and Keeping a Job" catered to those interested in pursuing a career in academia, providing advice on how to both network your way to a job and master the application process and offering important tips to follow on interview day. In contrast, "Where Are the Jobs?" featured six panelists who spoke about their career experiences outside academia in jobs ranging from publishing to science policy to working for nongovernmental organizations and government agencies. Those who attended the Education Workshops were enlightened on how to better integrate their research and outreach efforts and how to make science accessible to broader

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"It's time to pimp our ride!" *exclaimed Alfred C. Johnson, assistant director of the NIH Office of Intramural Research at the National Institutes of Health, when he addressed the audience at the Minority Affairs Luncheon. Here's what he recommends:*

Promote yourself. Do something and tell somebody about it.

improvise. When you get lemons, make lemonade.

motivate. We have to be motivational when we talk to other students.

perform. We have to show what we can do and always do the best we can.

Opportunities. Seek existing ones and create new ones.

understand the rules of the game and push them to the limit.

require respect and recognition.

Resilience. Keep on keeping on.

insightfulness. Know yourself and what you can do.

demand and be demanding.

engage in all aspects of your career as a teacher and as a student.

continued from page 25

audiences. Various technical workshops took place, including the Digital Art Workshop, which focused on how to prepare figures for publication and included a special section on image fraud—a growing issue in this digital age. In addition, Jen Sheen, a professor in the Department of Molecular Biology at Harvard University, held a technical workshop on how to apply protoplast systems to study gene regulatory and signal transduction pathways in plants. Two TAIR workshops were held. The first was a basic workshop, which oriented attendees to the TAIR database. The second explored the Plant Metabolic Database and how to access and utilize functional annotation data. Finally, a grantsmanship workshop catered to both research- and education-oriented attendees, as speakers provided advice on how to tap into federal research and education grant programs.

Undergraduates and PUIs Play an Important Role in ASPB

"As an associate professor at a primarily undergraduate institution (PUI), I don't get this anywhere else. I am pretty much on my own there, and I can choose to stay isolated, or I can get out there and see what is going on in the community. This is the best place to do it."

—A. Bruce Cahoon
Assistant Professor

Undergraduates enjoyed the opportunity to network with each other as well as with established people in the field at the Undergraduate Networking Poster Session. This event, held on the first day of the meeting, offered undergraduates who were attending the meeting for the first time a chance to orient themselves and to learn about what they could expect throughout the rest of the event. In addition, it offered them a chance to give each other feedback and to see what cool hypotheses are being investigated by their peers. According to Robert J. Grebenok, an associate professor at Canisius College, who attended the meeting with two of his rising sophomore students, the undergraduate poster session is one of the most valuable experiences for his students. "Here they get a chance to see what other undergraduates are doing, as well as a chance to be asked by the other undergraduates about what they are working on," Grebenok said. He and other professors from PUIs also benefit from the Small Colleges/PUI Networking Breakfast, which was held early Sunday morning. "We really come here to talk about teaching," Grebenok said, speaking as a professor from a PUI. Bruce Cahoon, assistant professor of biology at Middle Tennessee State University, another PUI, sees the annual meeting as an opportunity to reconnect with his peers in plant biology and get an overview of what is new in the field of plant biology: "Where I am, we don't have people coming in to give talks, so this is the only venue where I get to see the top people in the field talk about what they are doing."

Mel Oliver, Membership Committee chair, leads the inaugural meeting of The Ambassador's Club.

Posters: Science Hot Off the Press!

"Here we can see that WOW!—we are all doing great science!"

—Om Parkash Dhankher
Assistant Professor

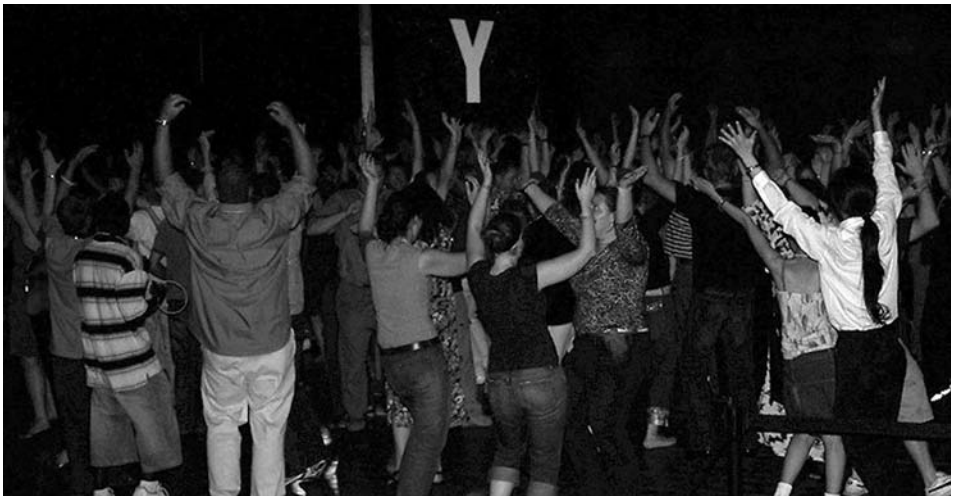
Over 1,200 posters were presented at this year's meeting. Exclusive poster sessions were held on two evenings, the first of which included an opening reception in the exhibit hall. As participants sipped wine or munched on complimentary pizza and pretzels, they had the opportunity to peruse the many and varied posters and to discuss findings with the poster authors. Participant Bruce Cahoon managed to split his time between two posters. "The cool thing is, I get to do two—my hard-core science poster and my outreach poster—and I get great feedback from both the education side as well as from people in the chloroplast field." The exhibit hall, which housed the posters, remained open throughout the meeting, offering ample opportunities to network, exchange ideas, and foster scientific collaborations.

ASPB's Ambassador Club Holds First Meeting

"Hopefully, we can also benefit students more directly by listening to them, finding out how the Society can help them, and bringing their voice to the people in charge."

—Jeremy Coate
Graduate Student

A new program was initiated by the ASPB Membership Committee that taps the graduate student network via graduate student ambassadors who can go out and talk to their peers about the promise of plant science and how ASPB contributes to the plant biology community. Initially, seven highly motivated graduate students were chosen to represent their respective institutions. They



Attendees really let loose on the dance floor at this year's final, Y-M-C-A! party.

met for the first time at the annual meeting to begin to define how the group will manage its task. ASPB's new ambassadors were enthusiastic about the role they will play in promoting the mission of ASPB through increasing membership and graduate student participation. The ambassadors hope that through increasing membership, graduate students can play an important role in helping ASPB garner money for plant research. Colleen Doherty, the ambassador from Michigan State University, is already getting started by initiating a blog for graduate students. "At one time there was a culture where graduate students would feel compelled to be a part of a professional society," she said. "This program is a good indication that the Society thinks that graduate students are important." Graduate students interested in participating in the blog can contact Colleen Doherty at dohert23@msu.edu.

Plant Biologists Strut Their Stuff

"What? The program said it was open bar until 9:30!"

—Anonymous Assistant Professor

Plant Biology 2006 included plenty of time for fun. Ambitious early birds literally hit the ground running on Tuesday morning, during the annual Plant Runners Stampede 5K Fun Run, which took participants around the Charles River. What could have been a competitive affair was reportedly more of a "group jog" this year. Night owls on the other hand cut it up on the dance floor at this year's final party, which had a 1970s disco theme. Although no plant biologists showed up in the same outfits they may have worn as graduate students 30 years ago, the floor was packed with dancers of all ages getting down to "Jungle Boogie" and, yes, the song that gets even the most dance-shy out on the floor, "YMCA."

Sarah Nell Davidson
snd2@cornell.edu

See You in Chicago!

With another annual ASPB meeting behind them, participants returned home, renewed and freshly inspired to incorporate into their research the many new ideas fostered at Plant Biology 2006. We look forward to seeing you all in Chicago July 7–11 for Plant Biology 2007. Mark your calendars!

Thumbs Up and Thumbs Down on PB2006

Everyone loved the poster sessions! This year's ASPB meeting featured 1,200 posters. Presenters shared their top-notch research, and meeting-goers had ample opportunity to peruse the posters and mingle over refreshments to talk plants.

The minisymposia were great! The overflowing crowds at some symposia spoke to their popularity. The topics were well chosen and engaged meeting-goers throughout the meeting.

Dance fever! Attendees really let loose at this year's final party. The dance floor was full, and the DJ provided an evening of danceable tunes.

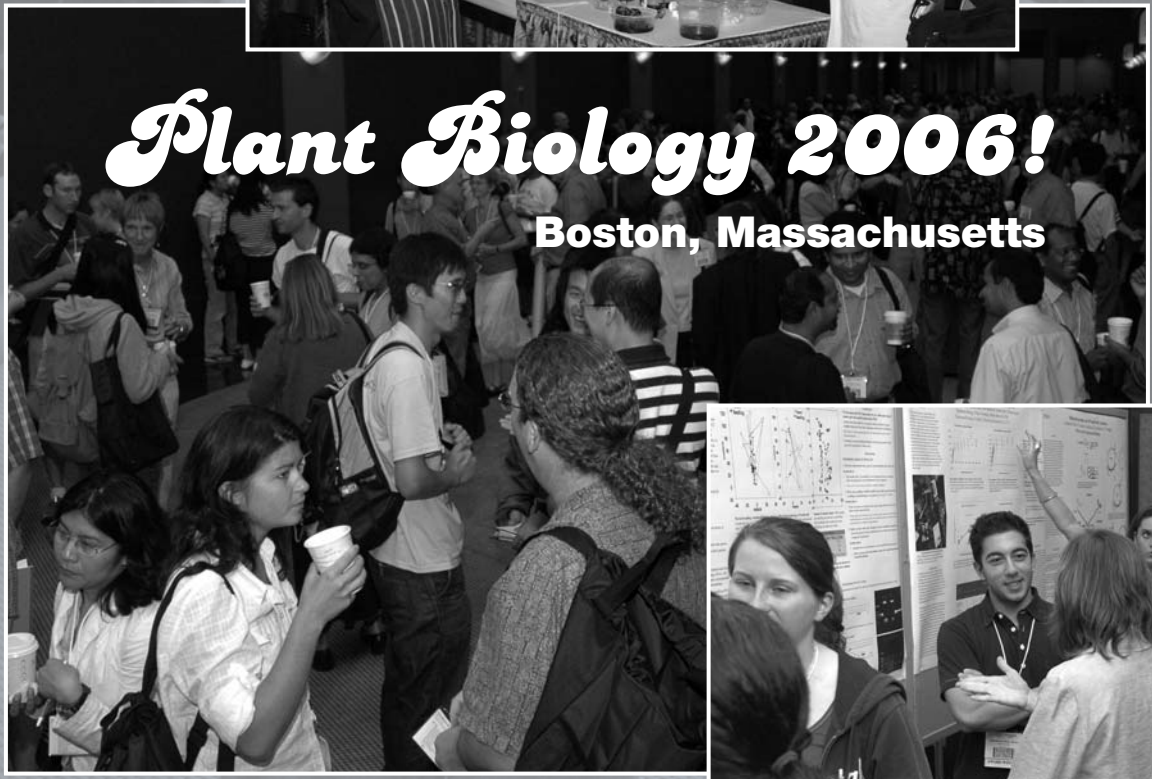
The venue received great reviews. The location of the Hynes Convention Center in Boston offered participants the opportunity to take a quick break from the meeting to explore the center of this historic city.

Fire codes. At some minisymposia the rooms were not big enough to accommodate the crowds. Security would not let people view the talks from the doorway, and eager meeting-goers were sent away.

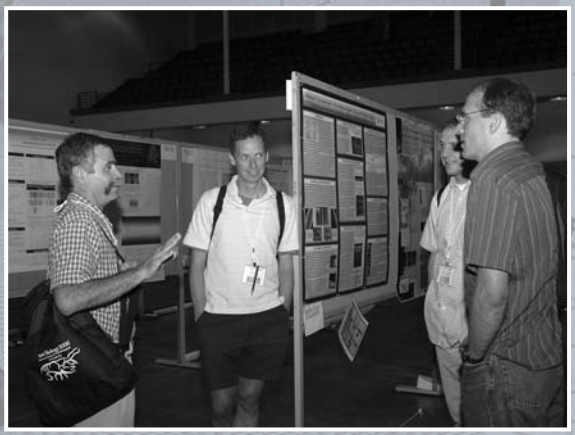
With so many great minisymposia throughout the day, there was nary a moment to go out and get lunch. Some participants suggested having group lunches that would foster more exchange between scientists in an informal setting. One attendee suggested having topical lunches within subdisciplines. Would you care for some chlorophyll with that?

Plant Biology 2006!

Boston, Massachusetts



PLANT BIOLOGY 2006 PHOTOS © NICOLE BURKHART



ASPB presidents past, present, and future. Scary, isn't it?

Award Honorees at Plant Biology 2006

Congratulations to the winners of this year's ASPB awards. The following presentations were made during the opening ceremony of the ASPB annual meeting, Plant Biology 2006, on Saturday, August 5, in Boston, Massachusetts.

ASPB–Pioneer Hi-Bred International Graduate Student Prize

The ASPB–Pioneer Hi-Bred International Graduate Student Prize, given for the first time this year, is an investment in our nation's future scientists and is intended to recognize and encourage innovative research and leadership in an area of plant biology related to important crops. This year's nominees demonstrated an extraordinary range of research projects that address a diversity of important questions relevant to crop systems. The award committee was impressed by the stellar academic records and research projects of all the nominees. Unfortunately, only three awards are available. The winners of the ASPB–Pioneer Hi-Bred International Graduate Student Prize for 2006 follow, in alphabetic order.

Kateri Duncan

Kateri Duncan is a graduate student at the University of Illinois, Urbana–Champaign, in the laboratory of Steve Huber. Through her dissertation research, she is studying sucrose synthase in corn with an emphasis on its role in regulating grain yield and plant development. Her research utilizes innovative biochemical and molecular approaches to understand how different sucrose synthase isoforms contribute to metabolism during vegetative and reproductive development. This research is uncovering important differences in how the isoforms oligomerize and associate with cellular membranes. The results will shed new light on how sucrose synthase channels carbon into different metabolic pathways during different stages of development. In addition to her commitment to research, Ms. Duncan is also developing excellent teaching and leadership skills and plans to use her talents in the academic setting as well as for educational outreach activities.

Andrea Eveland

Andrea Eveland is a graduate student at the University of Florida in the laboratory of Karen Koch. Her research focuses on the regulation of carbohydrate metabolism and stress responses during the development of maize ovules. She has developed robust methods to obtain detailed measurements of floral organ growth and carbon allocation within individual floral organs during pre-pollination development. Her microarray analyses, metabolic profiling, and transcript localization approaches combine with whole plant biology to provide unique insight into how vacuolar invertase mediates early stages of floral organ development. Moreover, her research is investigating how drought stress disrupts early ovule development, which can have devastating effects on seed set. Ms. Eveland hopes to use her training to conduct research that will benefit regions of the world that experience severe drought. Moreover, she is interested in developing outreach activities to increase public awareness of plant sciences in primary schools.

Charles Stewart, Jr.

Charles Stewart is a graduate student at Cornell University in the laboratory of Molly Jahn. Using a candidate gene approach, Mr. Stewart identified the Pun1 gene, which is considered to be the master regulatory gene that controls pungency in pepper fruits. The sequence of Pun1 indicates that it is an acyltransferase, and its expression is specific to the site of capsaicin biosynthesis in the placenta. Moreover, peppers that lack pungency, like Bell peppers, have a large deletion in the Pun1 locus and fail to express genes required for capsaicin biosynthesis. Analysis of the evolution of Pun1 suggests that the deletion in non-pungent species arose early in the domestication of peppers. A paper describing the Pun1 gene identification was published last year in *The Plant Journal.* In addition to his research, Mr. Stewart has worked with rural farmers in Africa, and he is engaged in activities and programs supporting minority achievement in academic science.

Early Career Award

The Early Career Award was instituted by the Society's executive committee in 2005 to recognize outstanding research by scientists at the beginning of their careers. This award is a monetary award made annually for exceptionally creative, independent contributions by a member of the Society who is not more than five years' post-PhD on January 1 of the year of the presentation.

Simon Chan

Simon Chan, a native of New Zealand, was educated in Auckland; earned his PhD in cell biology at the University of California, San Francisco, where he studied telomerase and telomere elongation in chromosome end protection; and moved into plant biology as a Life Science Research Foundation postdoctoral fellow in the laboratory of Steve Jacobsen at

UCLA. Dr. Chan was selected for his exceptional productivity, creativity, and independence. Within a year of entering a new field, Dr. Chan discovered five genes responsible for de novo methylation in plants, DRM2, ARGONAUTE4, RNA DEPENDENT RNA POLYMERASE2, DICER3, and SDE4, and deduced that an RNAi-like pathway guides DNA methyltransferases to initiate de novo methylation. Dr. Chan's postdoctoral mentor states that he has opened up a new line of investigation in the Jacobsen laboratory, which is a key attribute of all the best young scientists, and his mentor adds further that Dr. Chan functioned as an independent scholar, with the ability to run his own program, from the start of his studies. The committee was impressed with letters that attested not only to his deep intellect, superb experimental talent, and sustained excitement about all aspects of biology but also to his positive personal qualities. Dr. Chan is presently an assistant professor at the University of California, Davis, where he will continue to work on novel genetic mechanisms in plants.

Charles Albert Shull Award

Created in 1971 to honor the Society's founding father and the first editor-in-chief of Plant Physiology, *this award is designed to recognize young researchers. It is a monetary award made annually and is given for outstanding investigations in the field of plant biology by a scientist who is under 40 years of age on January 1 of the year of presentation, or who is fewer than 10 years from the granting of the doctoral degree. The recipient is invited to address the Society at the annual meeting the following year.*

Xuemei Chen

Xuemei Chen is this year's recipient of the Charles A. Shull Award for pioneering research in the genetic analysis of developmental mechanisms in plants with an emphasis on the roles of RNA-based gene regulation. She is a brilliant geneticist and developmental biologist and a leading creative force behind our current understanding of microRNAs and small interfering RNAs in the control of plant development. Dr. Chen got her start in the flower development area as a postdoctoral researcher and dramatically extended this area as a faculty member at the Waksman Institute, Rutgers University, and, since 2005, as an associate professor of botany and plant sciences at the University of California, Riverside.

As a postdoc in the Meyerowitz laboratory, she began to address some of the critical but difficult remaining questions of the elegant ABC model for genetic control of organ development. Conducting a screen for new mutants that interacted with *hua* mutants led to identification of *hen-1,* which she subsequently demonstrated, as an independent investigator, to control development through effects on microRNA biogenesis. As a co-discoverer of microRNAs in plants, she identified the specific microRNA *(mir-172)* involved in the *agamous* pathway—a truly remarkable achievement. She demonstrated that *mir-172* represses production of the flower patterning regulator, AP2, which provided the first demonstration that translational control operates along with transcriptional control in the regulation of flower patterning. Another fundamental discovery is that the HEN-1 protein is a methyltransferase that modifies the 2′ hydroxyl of the 3′ terminal nucleotide of plant microRNAs. Methylation prevents a novel uridylation activity from adding an oligo-U tail to microRNAs and thereby increases their stability. The methylation activity was totally unexpected and appears to be unique to plant microRNAs and is undoubtedly a major point of regulation.

Dr. Chen is internationally recognized for her pioneering and seminal research in organ development and RNA metabolism and will continue to have far-reaching impacts on plant biology. As might be expected, she is heavily recruited to present seminars and to speak at major international symposia. She is also crucially involved with a variety of professional activities, including serving as monitoring editor for *Plant Physiology* and as a member of the editorial board for *RNA Biology.* Lastly, she is an involved faculty member, actively teaching and serving on various university committees.

Charles Reid Barnes Life Membership Award

This is the oldest award, established in 1925 at the first annual meeting of the Society through the generosity of Dr. Charles A. Shull. It honors Dr. Charles Reid Barnes, the first professor of plant physiology at the University of Chicago. It is an annual award for meritorious work in plant biology; it provides a life membership in the Society to an individual who is at least sixty years old. Membership is not a requirement for the award, and, if appropriate, every fifth award should be made to an outstanding plant biologist from outside the United States.

Doug Randall

Doug Randall was born in Cheyenne, Wyoming. He received a BS in chemistry at South Dakota State University and a PhD in biochemistry from Michigan State University. He is the Thomas Jefferson Professor in Biochemistry at the University of Missouri–Columbia (MU). He has been on the faculty at MU since 1972 and served as director of the Interdisciplinary Plant Group since 1981.

Dr. Randall taught biochemistry at MU and has trained many graduate students and postdocs. He has published more than 140 refereed papers and edited 11 volumes of *Current Topics in Plant Biochemistry and Physiology* from 1982 to 1992. He continues to organize this outstanding symposium series as part of the Interdisciplinary Plant Biochemistry, Physiology and Molecular Biology program at MU. The 23rd annual symposium was held May 24–26, 2006.

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continued from page 31

Dr. Randall has served on many ASPB and national committees. He chaired the Board of Trustees from 1996 to 1999 and currently serves on the Constitution and Bylaws Committee (2002–2008). He was appointed to the National Science Board in 2002 by President George W. Bush to advise the U.S. National Science Foundation.

Stephen Hales Prize

This award honors the Reverend Stephen Hales for his pioneering work in plant biology published in his 1727 book Vegetable Staticks. *It is a monetary award established in 1927 for a scientist, whether or not a member of the Society, who has served the science of plant biology in some noteworthy manner. The award is made annually. The recipient of the award is invited to address the Society on a subject in plant biology at the next annual meeting.*

Ken Keegstra

Ken Keegstra has made pioneering contributions to our understanding of chloroplast biogenesis, protein import into chloroplasts, and the structure and biosynthesis of the plant cell wall. He has also been a tireless promoter of plant biology at the national level and has rendered distinguished service to ASPB as a member of the editorial boards of *Plant Physiology* and *The Plant Cell,* the Executive Committee, the Committee on Public Affairs, and the Board of Trustees. He was president from 1997 to 1998.

Dr. Keegstra's research on the composition and structure of the plant cell wall as a graduate student in Peter Albersheim's laboratory resulted in a widely used model on how the polymers of the wall are interconnected. He returned to studying the plant cell wall in 1993, adding to his biochemical approaches the new tools of Arabidopsis molecular genetics. He and his collaborators concentrated on the biosynthesis and function of hemicellulosic wall components, starting with the elegant identification and isolation of xyloglucan fucosyltransferase. Subsequently, he and coworkers also identified the gene encoding a xyloglucosyl transferase and showed that the enzymes encoded by the AtCslA gene family are mannan synthases.

Dr. Keegstra's work on chloroplast biogenesis and protein import has been groundbreaking. He and his coworkers provided the first evidence that pre-proteins destined for the chloroplast interior use a common import mechanism and that pre-protein binding is mediated by GTP-regulated receptors. They developed methods for isolating chloroplast envelope membranes and separating the inner and outer membrane components. They characterized outer and inner membrane import components and showed that a stromal chaperone, together with other translocation components, provides the driving force for the transport of proteins into chloroplasts.

Corresponding Membership Award

This honor, initially given in 1932, provides life membership and Society publications to distinguished plant biologists from outside the United States. The honor is conferred by election on the annual ballot. The committee selects no more than three candidates, and these are placed on the ballot for approval of corresponding membership by majority vote. The president notifies successful candidates of their election. Election of a corresponding member is to be considered each year and held if warranted, provided the election will not increase the number of corresponding members beyond two percent of the dues-paying membership.

Gynheung An

Gynheung An was born and educated in Seoul, where he received his undergraduate degree (1972) in botany from Seoul National University. He obtained his MS degree (1977) from Dalhousie University and his PhD (1980) from York University in the laboratory of James Friesen. He obtained the first postdoctoral training in Louis Siminovitch's laboratory at the University of Toronto until 1982 and moved to the laboratory of Eugene Nester at the University of Washington as a postdoctoral fellow. In the Nester laboratory he was involved in the development of the binary T-DNA vector system and plant transformation methods. He took a position as a faculty member in the Institute of Biological Chemistry, Washington State University, in 1984. At the university, his research continued on the development of transformation systems for various plant species. His early research program also included studying regulatory elements of various genes.

Dr. An returned to Korea in 1995 and joined the Department of Life Science, Pohang University of Science and Technology, as a faculty member. Since then, he has been focusing on functional genomics of rice. His team established a public resource of more than 100,000 T-DNA insertional mutants in japonica rice varieties and the insertion site sequence information. More than 1,000 mutants are annually distributed to over 100 laboratories throughout the world. His group's recent work includes study on reproductive development in rice and generation of agriculturally valuable rice cultivars.

At Pohang University of Science and Technology, he teaches genetics to undergraduates and plant molecular biology to graduate students. He also coordinates a biodiversity class for undergraduate students. From 1998 to 2003, he served as editor-in-chief of the *Journal of Plant Biology.* He also served on the editorial boards of *Plant Physiology* (1988–1992), *Molecules and Cells* (1995–1999), *Journal of Biochemistry and Molecular Biology* (1996–1998), and *Plant and Cell Physiology* (2001–2004). He is currently an editor of *Plant and Cell Physiology.* He was a founding member of the Rice Functional Genomics Consortium. He is a member of the Korean Academy of Science and Technology (since 1996) and the Presidential Advisory Council on Science and Technology (since 2005). His honors include

a Centennial Fellowship of the Medical Research Council of Canada (1982–1984), the Presidential Award (1996), and the Excellent Paper Award from the Korean Science Association (1998).

Jürgen Denecke

Jürgen Denecke is a member of the Centre for Plant Sciences, within the faculty of Biological Sciences of the University of Leeds, United Kingdom. He was born and educated in Belgium and received his degree in chemical engineering from the Free University of Brussels in 1986 and a PhD in chemistry at the University of Ghent in 1991. His interest in fundamental research and the plant secretory pathway originated from PhD thesis work that he carried out while at Plant Genetic Systems N.V. with Marc VanMontagu. His postdoctoral work with Professor Tapio Palva at the Swedish University of Agricultural Sciences widened his interests to whole plants and plant stress responses, after which he moved on to the United Kingdom, first as a lecturer at the University of York and then as a senior lecturer and later as reader at the University of Leeds. Since 1999, he serves the plant community as associate editor of *Plant Molecular Biology.*

His early work on the secretory pathway focused mainly on the endoplasmic reticulum chaperone BiP and the mechanism of protein secretion. He established in 1990 that complex proteins could be secreted from plant cells without any active sorting information via bulk flow. In spite of evidence for the existence of export signals on a limited number of membrane proteins, these initial observations remain valid for soluble proteins and have been confirmed repeatedly during the past 10 years. The most recent study of Dr. Denecke's team, showing that BiP can proceed to the vacuole for rapid turnover, imminently reinforces the bulk flow principle. In contrast to popular belief, BiP and its protein ligands are exported regularly to reach the Golgi apparatus and can either return to the endoplasmic reticulum or be disposed of in the vacuoles. The current analysis of the underlying vacuolar sorting signal and its unique properties are not only novel to the plant field but may also open alternative models to explain data obtained from yeasts and mammalian cells. Dr. Denecke was also the first to show that BiP expression is rapidly induced during plant–pathogen interactions and that this is independent of the normal pathogenesis-related response or the unfolded protein response. The role of endoplasmic reticulum "upregulation" during plant defense responses is now under intense investigation by a variety of research groups.

Convinced of the fact that one has to work with the gene products to study gene functions, Dr. Denecke established quantitative methods to measure protein secretion and introduced various novel ways to influence protein trafficking via semi-dominant or dominant-negative approaches. These range from the manipulation of exchange factors and low molecular weight GTPases to ligand-competition assays and more recently, receptor-competition assays. While the field has gathered significant information on protein sorting signals, little is known about the way in which receptors find their way in the secretory pathway, and the established assays have already shown that receptors contain multiple sorting signals themselves and that receptor recycling may be more complicated than previously presumed. It is Dr. Denecke's strong belief that a combination of genetics, biochemistry, and microscopy is more than just the sum of their individual contributions and is urgently needed for further progress to be made.

Rana Munns

Rana Munns is the leading authority on how crop plants adapt to salinity. She has characterized the processes that most limit the growth of salt-affected plants and has done so over a wide range of scales, from ion transporters in cell membranes, through the traffic of sodium and chloride around the plant, to the consequences of this traffic for the well-being of the plant throughout its life cycle. Her uniquely comprehensive knowledge of these diverse but interconnected processes has enabled her to devise an exquisitely sensitive technique for selecting salinity-tolerant crop plants. She has used this technique to identify novel genes that are inherited simply, that are proving valuable in breeding salt-tolerant plants, and that are providing great focus for exploring the molecular genetics of salinity tolerance.

Dr. Munns's most important and influential contribution was her demonstration that differences between sensitive and tolerant genotypes within a species take weeks to show up, and why this is so. She showed that the initial responses to exposure to salinity were essentially the same as those of plants exposed to drought: Over the first few days they are predominantly controlled by hormonal signals from the roots as they experience low water potentials. Consistent with her earlier study of the traffic of salt within the plant, she showed that it was the slow but inexorable buildup of salt in the leaves of less tolerant plants, those whose roots were ineffective in keeping out almost all the salt, that eventually resulted in severe damage to the older leaves and photosynthetic incompetence of the plant as a whole. These discoveries also explained why selecting for salt tolerance had been proving so intractable.

Dr. Munns was born and educated in Sydney, Australia, where she obtained her bachelor's and PhD degrees. She has worked at CSIRO Plant Industry in Canberra for the past 25 years. In addition to her scientific contributions, she has served as secretary of the Australian Society of Plant Scientists and on the editorial boards of *Plant Physiology, Plant and Soil, Australian Journal of Plant Physiology, Physiologia Plantarum, New Phytologist,* and *Plant, Cell and Environment.*

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continued from page 33

Charles F. Kettering Award

This award was established by an endowment from the Kettering Foundation in 1962 to recognize excellence in the field of photosynthesis. It is a monetary award to be given in even-numbered years to an individual for meritorious work in photosynthesis.

Donald Ort

The Charles F. Kettering Award for 2006 is given to Donald Ort. This award, established by the Kettering Foundation in 1962, is intended to recognize excellence in the field of photosynthesis. Through 32 years and 140 publications, Dr. Ort has made major contributions to our understanding of photosynthesis, from investigations of the primary energy-transducing events of electron and proton transport, to field research on whole plant responses, to global atmospheric change. In addition, he has an extraordinary record of service in photosynthesis and plant biology.

As a graduate student and postdoc, Dr. Ort's research was on mechanistic aspects of photophosphorylation. Subsequently, it has diversified into many facets of regulation of carbon metabolism, abiotic stress, photoprotection and, most recently, to implications for global carbon balance. His first achievement as a graduate student was to demonstrate the existence of two separate proton translocation reactions within the chloroplast electron transfer chain, showing that these reactions were associated with water oxidation and the oxidation of plastoquinol. His investigations continued in this area as he detailed the relationship between the onset of the proton motive force and ATP synthesis and confirmed the existence of the Q-cycle, through his postdoc and following his appointment at the University of Illinois, where he is currently research leader of the USDA Photosynthesis Research Unit.

His subsequent development of an interest in the effects of environmental stresses on photosynthesis in crop plants led to several major contributions in the area of chilling sensitivity. For example, contrary to the prevailing hypothesis, his work showed that photosystem II damage is not responsible for inhibition of photosynthesis during chilling in the light, and it elucidated the constraints of chilling on the reductive carbon cycle. His research in this area led to the novel finding that chilling damage can result from disrupting expression of circadian-controlled photosynthetic genes. His pioneering studies on chilling responses have led chilling injury research in many new directions.

More recently, Dr. Ort was a key leader in the development of an open-air, gas concentrating field system, SoyFACE, which is able to fumigate large areas of crop plants with enriched levels of CO_2 or ozone. Research with this system has resulted in important discoveries about the interactive effects of CO_2 and ozone on photosynthesis in crops under natural conditions, which is significant in light of projected future climate changes. It is clear that he has made important contributions to the field of photosynthesis research throughout his career.

We also note his many merit awards from USDA, his selection as ARS Senior Research Scientist of the Year in 1993, and his receipt of the University of Illinois Distinguished Service Award in 2005. In addition to his research, he has given selflessly of his time and shown insightful and creative leadership in myriad activities that serve photosynthesis and plant science research. He was president of the International Photosynthesis Research Society and president of the American Society of Plant Biologists and is currently editor-in-chief of *Plant Physiology.*

Dennis Robert Hoagland Award

This monetary award, established by the Society in 1985 with funds provided by the Monsanto Agricultural Products Company, honors Dr. Dennis R. Hoagland, recipient of the first Stephen Hales Prize, for his outstanding contributions and leadership in plant mineral nutrition. The award, to be made not more frequently than triennially, is for outstanding plant research in support of agriculture.

Dennis Gonsalves

Dennis Gonsalves has distinguished himself among academic scientists in many areas, including research, teaching, and technology transfer. Most well known to the scientific community is his involvement in the development and commercialization of the first genetically engineered fruit crop, papaya. This endeavor involved leadership not only in distinguished plant science research directed toward solving an important crop production problem, but also in assuring that these accomplishments passed regulatory scrutiny and were accepted by and transferred to the farming community. A theme common to all his activities over the years has been the improvement of the situation of small farmers, especially those from underdeveloped countries.

The early work of Dr. Gonsalves focused on plant viruses—attempting to identify solutions to control viral diseases in crop species. In the early 1990s he expanded his research to include controlling disease caused by papaya ringspot virus, which threatened the papaya industry in Hawaii. At a time when transformation efforts were in their infancy, Dr. Gonsalves successfully led an inter-institutional research team that was able to obtain engineered papaya lines with durable viral resistance.

After this technical success, a number of other hurdles had to be resolved before commercial success could be achieved. Dr. Gonsalves orchestrated the deregulation of the engineered papaya varieties for commercial use, which involved demonstrating consumer (FDA) and environmental (EPA) safety, as well as field evaluations (USDA). He negotiated freedom-to-operate agreements from several corporate, university, and government patent holders so that the varieties could be

commercialized—no small feat as anyone involved in these activities will recognize.

The culmination of this work was the commercialization of the world's first genetically engineered fruit crop and the end of the dramatic decline in papaya yield that occurred between the outbreak of the disease in 1992 and availability of the transgenic varieties in 1998. During the period from 1998 to 2001, after the new varieties were introduced, papaya yields increased by 50 percent over the lowest yields experienced in 1998. Dr. Gonsalves's efforts did not stop with helping Hawaiian farmers. With the support of USAID, he began to develop locally adapted papaya varieties for Africa and Bangladesh—efforts aimed at alleviating vitamin A deficiency in those countries.

Perhaps most pertinent to this award is not Dr. Gonsalves's personal accomplishments in plant research, although these are clearly exceptional, but what he has accomplished indirectly by setting an example that demonstrates the role academic scientists can play in the production and adoption of genetically engineered crops to improve agriculture and human health.

Dr. Gonsalves's contributions to agriculture are direct, obvious, and profound. Not only has he provided critical leadership that led to a product of importance in agriculture and human health, but his efforts did not stop there. He made sure the product he developed passed appropriate regulatory hurdles to ensure that it would have a positive impact on the papaya industry, not only in Hawaii but elsewhere in the world.

Lawrence Bogorad Award for Excellence in Plant Biology Research

The ASPB Lawrence Bogorad Award for Excellence in Plant Biology Research was approved by the Society's executive committee in 2005 to honor Dr. Bogorad's many contributions to plant biology, including his influential efforts to bring the techniques of molecular biology to bear on problems in plant biology; his groundbreaking research on chloroplast genetics, biogenesis, structure, and function; and his inspired teaching and mentoring. The ASPB Lawrence Bogorad Award for Excellence in Plant Biology Research is a monetary award made biennially to a plant scientist whose work both illuminates the present and suggests paths to enlighten the future. This award is being awarded for the first time in 2006.

Maureen Hanson

In awarding the Lawrence Bogorad Award for Excellence in Plant Biology Research to Dr. Maureen Hanson, we recognize a pioneering researcher in organelle biology. After her undergraduate studies in botany at Duke University, Dr. Hanson received her PhD degree studying with Dr. Lawrence Bogorad at Harvard University. Her early studies elucidated a genetic contribution from the plastid genome to the biology of this vital organelle. In her subsequent research as a postdoctoral fellow in Fred Ausubel's laboratory at Harvard University, and in her first faculty position at the University of Virginia, she made significant contributions to understanding the role of mitochondrial genes in cytoplasmic male sterility (CMS). After moving to Cornell University in 1985, she continued her studies in different aspects of organelle biology. In 1995, she was appointed the Liberty Hyde Bailey Professor of Plant Molecular Biology at Cornell University in recognition of her scientific achievements and leadership role in guiding the development of plant molecular biology at Cornell.

Dr. Hanson's many research achievements include the discovery of mitochondrial DNA rearrangements that are associated with CMS and the identification of a chimeric mitochondrial gene linked to this condition. She was among the first to clone nuclear restorer genes in CMS. In addition, she was one of the early leaders in defining the role of RNA editing in plants. She helped elucidate the role of editing in splicing, translation, and cis elements. Finally, she has played a key role in describing stromules, dynamic membrane protrusions from chloroplasts, and exploring their role in plastid functions and interactions with other cellular compartments.

Dr. Hanson's work is viewed by her peers as consistently in the forefront of plant biology and spurring interest in each of her areas of work. Thus, she truly "illuminates the present and suggests paths to enlighten the future." In addition to her substantial scholarly contributions, she has been a tireless advocate for plant science. She has been the PI of several training grants in plant biology at Cornell and has been a strong proponent of plant research on a local and national scale. She is valued by her colleagues as an innovative and high-profile scientist who is a role model for excellence with modesty.

Dr. Hanson's contributions to advancing knowledge, training new generations of scientists, and promoting plant science, and her graceful combination of excellence with modesty, most exemplify the characteristics that marked Dr. Bogorad's career. It is therefore especially fitting that the first Lawrence Bogorad awardee is a former student of his whose distinguished career was inspired by Dr. Bogorad himself.

TRIAD FOUNDATION

The Triad Foundation, a supporter of the Lawrence Bogorad Award for Excellence in Plant Biology, was established to honor the legacy of the late Roy Hampton Park. The Triad Foundation is guided by his entrepreneurial values, his hard work and perseverance, his humility, his integrity, his leadership and willingness to take responsible risks and his sense of community responsibility. The Foundation makes grants primarily for graduate fellowships, educational programs serving children and youth, marine and tropical ecology, scientific research and human services.

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Plant Experiments Out of This World: Arabidopsis on the Space Station

John Kiss of Miami University in Oxford, Ohio, and Roger Hangarter at Indiana University in Bloomington have studied how plants perceive and respond to both light and gravity. Now co-PIs, along with Richard Edelmann (Miami University), they have extended their research into space in studies funded by NASA.

In an experiment, part of which was launched with the flight of *Discovery* in July and part of which went up on *Atlantis* in September, they will be studying growth under different conditions of light and gravity and examining the roles of phytochromes A and B (phyA and B) and different light qualities in the phototrophic and gravitropic responses of both wild type (Ler) and mutant Arabidopsis seedlings. While the experiment was launched by two space shuttle missions, it will be performed on the International Space Station this fall.

Aided by video cameras, they will be able to observe growth under white, blue, and red light and under gravity ranging from microgravity to earth gravity (1g) generated in increments (0.1–0.9g) by an on-board centrifuge. They will also be able to determine which genes are expressed in different tissues under these conditions from frozen samples that will be brought back, along with the video data, when another shuttle mission returns in December.

These experiments will be performed in the European Modular Cultivation System (EMCS), a large (655-pound) incubator that provides control over atmosphere, lighting, and humidity in the experimental chambers (EC). The EC growth chambers were developed by Kiss's group and NASA, based on a design by project co-PI, Richard Edelmann, directory of Miami's electron microscopy facility.

Kiss and his collaborators have been awarded more than $1 million by NASA over the past six years for the Tropi project, "Analysis of a Novel Sensory Mechanism in Root Phototropism." The project was approved after an international scientific peer review and a successful technical review by NASA and its international partners. Kiss and Edelmann also had gravitropism experiments on two earlier shuttle missions in 1997, in which they tested hypotheses about the physical mechanisms of the plant gravitropic response.

Left: TROPI hardware (also termed EUE for experimental unique equipment) showing the individual seedling cassette and the experimental container (EC) for the EMCS.

Above: John Kiss (left) and Roger Hangarter in front of countdown clock at Kennedy Space Center. The shuttle *Discovery* is visible in the distance.

Roots respond to both light and gravity, but the interactions are complex. Earlier ground-based studies by Kiss and his colleagues suggested that there are two photosensory systems involved in the phototropic responses of roots: a blue-light photoreceptor system (previously identified) and a red-light phytochrome-based one discovered by Kiss's group. Gravitropism is the predominant tropistic response in roots, but in blue or white light, roots also exhibit negative phototropism that is mediated by the phototropin family of photoreceptors. On the other hand, red light induces a positive phototropism in Arabidopsis roots, mediated by phytochrome receptors. In earlier work, Kiss, Hangarter, et al. found that both phyA and phyB are required for the red-light phototropic response in Arabidopsis roots. However, the phototropic response in roots is much weaker than the gravitational one, which competes with and often masks it. Thus, in the current space station studies, Kiss et al. will use phyA, B, and AB mutants, along with the microgravity conditions available on the space station, to disentangle the effects of light and gravity in plant sensory perception.

NASA chose these studies for the space station because of their potential contribution to the bioengineering of plants that could be grown as crops and that could act as

CO_2 filters and oxygen producers during space flight as well as on extraplanetary colonies. NASA also wants to know how plants and other organisms will function at fractional gravity (such as on the moon and Mars), and this experiment will provide insight because of the fractional gravity to seedlings that is provided by the centrifuge on board the EMCS.

The results from this work on light and gravity perception of plants, as well as gene expression studies, will provide, in the long term, knowledge needed for building space flight bioregeneration systems as well as the terraforming of inhospitable planets for future space colonists.

B. Grabowski
beatrice@aspb.org

ASPB Member Rob Martienssen Elected to British Royal Society

Cold Spring Harbor Laboratory Professor **Rob Martienssen** is one of 44 scientists who have been recognized for their exceptional contributions to science, engineering, and medicine with their election to the Fellowship of the Royal Society, the U.K. national academy of science.

Rob Martienssen

Martienssen's election last month was in recognition of his outstanding contributions to understanding epigenetic control of gene expression in plants, particularly as it relates to plant development.

Following in the footsteps of Isaac Newton, Charles Darwin, Stephen Hawking, David Attenborough, and Tim Berners-Lee (inventor of the World Wide Web), the new fellows have been elected from the United Kingdom and commonwealth countries for their scientific excellence. They come from a wide range of fields, including neuroscience, tropical medicine, plant science, astrophysics, and quantum optics.

See http://www.royalsociety.org/news.asp?id =4719

FOCUS

CALL FOR PAPERS

Plant Physiology Focus Issue on Legume Biology

Deadline for Submissions: February 1, 2007
To submit an article, please go to http://submit.plantphysiol.org.

Plant Physiology is pleased to announce a Focus Issue on Legume Biology to be published in June 2007. The issue will be edited by Carroll Vance and Mark O'Brian. Submissions in all topics of legume biology are welcome, including genomics, model legumes, interactions with microorganisms, nutrient acquisition and metabolism, regulation, signaling, and development.

Authors interested in contributing should indicate this in the cover letter when submitting papers online at http://submit.plantphysiol.org/. Please select "Legumes (June, 2007)" from the Focus Issue list in the online submission system. Articles published within two years before and after the Focus Issue will be considered for inclusion in an online Focus Collection of articles relevant to the focus topic.

Please contact Carroll Vance (vance004@tc.umn.edu) or Mark O'Brian (mrobrian@buffalo.edu) for additional information.

The Bioethics Imperative XXV

Faculty Effort Certifications in a Sea of Change: Unsettled Issues in Current Compliance Practices

"Mokita": The truth we all know and **agree** not to talk about. *Papua New Guinea*

At the core of compliance is each individual faculty member's obligation. In this column I present the first three of my eight "Catch-22s" of Effort Certification (EC) compliance. In the next issue I'll deliver the final five. You'll see that I paint scenarios that end in confusion and that I provide no answers, as there seem to be none at present. Unfortunately for us all, you may find additional Catch-22s of your own.

1. What is total effort (a.k.a. how to lie with denominators)? The standard "9 to 5" job is 40 hours a week. Total effort, the denominator for calculating faculty effort, is a slippery entity when one is not on a strictly monitored time- clock and when the time- clock varies with workload and an individual can set their own denominator at will. Lucky us, in academia we get to vary all three. "*The expression of research effort … will almost always be inconsistent with A-21 if the individual in question works more than 40 h/week*" (1). Let's take an example. Ova Verked Unapyed's workweek varies from 40 to 80 hours, veering to the latter far more often than she would like. She has no idea if she averages out evenly over the year or if, for example, she is always a "slacker" in the summer. If she sets her base salary at 60 hours a week and she really works 70 hours a week in that quarter (almost 120 percent effort), are her ECs noncompliant? Any accountant would tell you that 120 percent effort is impossible. If she needs to write a grant or attends a meeting, does she "fake it" on her ECs or submit the grant unfinished and leave her conversations in mid-sentence in order to remain in compliance? How will the Office of the Inspector General (OIG) react if her co-PI on a grant for which they are equally paid sets a different base of total effort so that one of them looks like they are putting in 50 percent effort and the other is putting in 25 percent effort but being paid the same amount? Ahhh, percentages are so confusing! In practical terms, you need to consult with your institution to comply with the timeframe over which it calculates faculty effort (FE)—that is, over what time period (quarterly or semiannually are the most common)—as well as to determine your total effort to calculate your FE.

2. What is base salary? In determining FE, base salary must be spread across total effort. This becomes problematic when there are multiple components of income for a given faculty member (e.g., medical faculty, administrative duties, endowment, a special lecture, an overload workload that temporarily increases your salary). For example, there might be 10 percent funding of medical salary from the state, 50 percent from clinical revenues, and 40 percent from a physicians' fund. A second example: You have a nine-month appointment and then obtain a book deal that pays your summer salary. Should your FE be 100 percent for 12 months, that is, does the institution own you and therefore your book deal, too? This depends on your university's copyright policies, and it may also depend on whether or not a book deal is classified as "outside work" (a contract with you as an individual) or as part of your regular university responsibilities (a contract with the university). If your pay for the book is an honorarium, your FE does not need to include it. However, if the honorarium is part of your salary, then this becomes part of your FE at the university. There is an exclusion when the work is "outside work," but outside work cannot be greater than some set portion of your week, commonly one day per week. This may or may not be considered part of your FE. Again, check on the specifics with your institution to understand what is included in base salary. Complicated enough for you yet?

3. If I do the work today, can I pay myself at another time—for example, over the summer? The potential Catch-22 is that if the university is paying you during this same time period, this is not considered "outside work," that is, you cannot "double dip." For example, if your deadline is during the academic year and you are fully compensated for your effort during this period, you cannot pay yourself at another time for that work. Your FE cannot be 125 percent for any period of time because the OIG considers this kind of "shell game" illegal (http://www.aspb.org/newsletter/janfeb06/10mandoli23.cfm); you must account for all effort in the time period in which that effort was expended.

Next time: The final five of my Eight "Catch-22s" of Effort Certification compliance.

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I thank Brent Stewart (chair of the Faculty Council on Research, University of Washington) for permission to quote from the FCR report on FECs.

Reference

1. FCR Report to the Faculty Senate regarding Faculty Effort Certification, January 19, 2006.

Balancing Life and Career

It's nearly midday, the "ding" from my computer is telling me to change for yoga, and I want to finish writing to three authors who have been waiting a week too long to hear about their manuscripts. I need to get an annotated manuscript in the post for 2 p.m. Another ding. I change into my yoga clothes, then remember to pack my bike helmet and lock, and my daughter's official vaccination record, so I can pick her up from child care after yoga and take her to the local Maternal & Child Health Centre for her vaccinations during my lunch hour. Can I do that in my yoga gear, or do I need to pack work clothes? I've only been back from maternity leave for two days, and already I'm planning three activities (and sets of clothes) in advance.

We constantly hear stories like these about women juggling career and "other" work, but how do we achieve this balance? Australia recently celebrated the 150th anniversary of the workers' "*8-hour day*" victory. A monument celebrates the concept of eight hours sleep, eight hours work, and eight hours play. However, how many of us really work only eight hours?

I believe that, much as things expand to fill the available space, we fit as much work as possible into the available time! Conversely, I also believe that if we limit the amount of time we spend at work, we can squeeze any number of jobs into that time. A commitment to leaving work at a certain time ensures that we keep working efficiently in the time available, before we leave for our "other job."

The balance between career and "other" life (outside paid work) can very easily be lost, particularly when the pressure is on. Deadlines are tight, the head of department wants his or her pound of flesh and, as women, we are extremely good at running around trying to please everyone! It is not until we come down with a cold, repeated migraines, or the flu from all the stress that we *might* acknowledge that we are at our limit. (My signal is when I find myself kicking the gate that jams, or slamming a door—WARNING! Time to take action and de-stress!) We must then opt out altogether to have a few days on the couch with a box of tissues and some DVDs to recover! Who else has a hard time admitting that they are ill and need to take time out?

So how do we keep life in balance? How do we preserve those all-important family relationships but still keep it together when the pressure is on at work?

Whether you have children that need to be collected from child care, dinner to cook, pets that need to be walked, or an after-work hockey game, it is important to be firm with *yourself* that you are going to leave work at a set time and to stick to that commitment. The only way that your colleagues will take you seriously and realize that you can't run one more PCR, send one more e-mail, or read one more paper is if you are *firm with yourself.* I am happy to work at 110 percent all day, but when the clock ticks around to 5 p.m., I try not to open just one more e-mail or check on those cultures one more time. Luckily, I now work in a family-friendly environment where departing at 5 p.m. on the dot is not seen as lazy, uncommitted, or otherwise slack. If you work consistently hard all day, every day, then occasionally need to leave early to witness the cutting of your son's birthday cake at child care, no one has grounds on which to accuse you of being uncommitted.

At Plant Biology 2005 in Seattle, Jennifer Henry enjoyed a relaxing foot massage at the ASPB membership booth.

Although our feminist upbringing taught us that we can have it all, I disagree. I believe that we can have it all, but not *all at the same time.* All aspects of life (workloads, family relationships, health, household budgets) come under stress at various times and enjoy greener pastures at other times. Picture a lighthouse whose beam falls on one aspect of your life at a time (the few days or weeks when your workload seems under control) while other aspects are in the dark (the car is long overdue for service). Try to keep the under-control area calm by not inviting more work onto your plate (such as putting your hand up for an extra project), which should help conserve your energy to book that car service. At other times, the car, home, and pets will be fine, where extra effort is required at work. I am not suggesting that you lessen your ambition, but rather that you learn to *work smarter* so that you don't have to cope with many areas of stress simultaneously. That is often when we fall ill. When most of the tasks in your life are running smoothly, then one aspect "falls over" (e.g., your daughter breaks her arm at daycare and you need to take her to hospital), you will hopefully find yourself with the energy to cope with that single crisis without bursting into tears!

Strategies for Reducing Stress at Work

- Make a commitment to yourself to take a lunchtime walk outside at least once a week.

continued on page 41

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 ASPB Membership at info@aspb.org.

Name: Jennifer Henry
Title: Managing Editor, *Functional Plant Biology*
Place of Work or School: CSIRO Publishing, Melbourne, Australia
Research Areas: Somatic hybridization, protoplast fusion, and tissue culture in *Pisum* and *Lathyrus*
Member since: 2005

1. **Why has being a member of ASPB been important?**
   I really value being a member of the ASPS in Australia, so I felt ready to demonstrate my commitment to extending my networks internationally. Membership in ASPB helps me feel more connected to plant biology communities outside my own country, giving me an inside view into the personalities, career paths, and types of research carried out internationally. I particularly like the consistent efforts that the Women in Plant Biology Committee (WIPB) puts toward promoting and encouraging women in plant sciences to get together and network. In fact, I was invited to write this issue's WIPB column on page 39!

2. **Was someone instrumental in getting you to join ASPB?**
   John Kiss approached me about contributing to the WIPB column in the *ASPB News,* which increased my awareness of the outreach programs established by ASPB. Then John Long, ASPB's managing editor, sealed the deal by getting me to sign up for membership. This all happened at Plant Biology 2005 in Seattle, and I'm pretty sure those foot massagers at the ASPB exhibit had something to do with it (see photo on page 39!).

3. **What would you tell colleagues to encourage them to join?**
   I would recommend that plant scientists join if they are interested in increasing their networks outside their own plant science community and if they want to access interesting features such as the newsletter and the online Job Bank. I am impressed that ASPB does not limit itself to U.S. members, but recognizes and includes its international membership.

4. **Have you enhanced your career using ASPB job postings or through networking at an ASPB function?**
   Definitely. I love attending the Plant Biology meetings whenever I can (Honolulu 2003, Seattle 2005, aiming for Chicago 2007!), and I really enjoy meeting so many friendly, switched-on, and intelligent people. The friendships and professional relationships forged at these meetings endure. I *love* the States, particularly New York, and would move there in a flash if the right job came up (hint, hint!).

5. **Have you had any success at finding candidates as a result of a job posting at the meeting or on our online Job Bank?**
   I haven't actively searched for a candidate or for a new job for myself in a while, as I absolutely love the job I have right now. However, I would consider posting a vacancy or my résumé on the Job Bank in the future, and I'm impressed with the volume of jobs posted there.

6. **Do you read print journals? If so, where do you usually read them?**
   One of the perks of being a journal editor is the exchange schemes I set up with other plant science journal editors. I regularly flip through the contents pages of *The Plant Cell* and *Plant Physiology.* I admire their beautiful covers and have several cover posters on my office walls. If I want to read a paper in more detail, I will find it online or take it on my next flight.

7. **What do you think is the next "big thing" in plant biology?**
   I have already seen really exciting research coming out of inter-faculty tea-room discussions! There is great potential for discoveries through increased collaboration across disciplines (e.g., physics + cell biology), where scientists can swap ideas and apply them to other fields.

8. **What person, living or deceased, do you most admire?**
   The *character* I most admire is Elle Woods from the *Legally Blonde* series of movies (played by Reese Witherspoon). She is energetic, throws herself with enthusiasm into projects in which she believes, and is not afraid to remain feminine throughout. There is a temptation to be "blokey" if you are working in a male-dominated environment, and Elle works toward her audacious goals bravely and with style. Scientifically, I admire Richard Feynman for his ability to think outside the box, and my high school chemistry master, Jack Kent, for teaching science to girls with such passion.

9. **What are you reading these days?**
   At work, reviewer's reports on manuscripts submitted to *Functional Plant Biology.* At home, childrearing books for tips on how to teach my toddler not to be afraid of the dark! My book club is currently battling its way through *The Tyrannicide Brief* by Geoffrey Robertson (a high-profile English lawyer who mar-

ried an Australian romance novelist and defended Salman Rushdie). The last fiction we read was *The Kite Runner,* and I absolutely love anything by Tim Winton or Ian McEwan.

10. What are your hobbies?

Reading to my daughter, and I enjoy riding my bike to work and running 5 km on foggy mornings with my iPod (but am currently putting those activities on hold for the second half of this pregnancy!). The daily routine of a full-time working mother dictates that most weeknights, dishes must be prepared in 20 minutes or less, so I like to do the opposite when I have time on a weekend and roll up my sleeves to cook a complicated dish that takes a few hours. Opera-going and singing (karaoke and choral) are also on the list, and I am a member of the Melbourne Chorale. We've sung background vocals for artists such as Barbra Streisand and Andrea Bocelli to packed stadiums when they tour Melbourne, and perform regularly with the Melbourne Symphony (Beethoven's 9th Symphony, The Messiah, etc.).

11. What is your most treasured possession?

I was taught never to become attached to a "thing," so I take less pride in my beautiful old mugs or snow globes (even my Twin Towers snow globe) than I used to. I treasure my health, my wonderful daughter Rose, and the love of my husband Mark.

12. What do you still have left to learn?

Science-wise, is there any substance in the Intelligent Design debate? Career-wise, I am gradually learning that plant science journals and editors need not necessarily be enemies! We are competing for the same pool of excellent papers but can learn so much from each other. I want to be *Plant, Cell and Environment* when I grow up! Personally, I am trying to learn to be more forgiving of people when they

continued from page 39

- If you can't leave the building, at least eat your lunch away from your desk (elsewhere in your office if you have no lunch room). Just get away from the in-box and chew slowly.
- Constantly look for ways to be more efficient. If you are responsible for taking minutes in a meeting, take them directly on a laptop rather than handwriting and typing later.
- Hang a whiteboard in your office for jotting down those small or incomplete tasks, so they don't fall off your list.

Strategies for Reducing Stress at Home

- Find yourself a housekeeper—it's worth the investment! You instantly regain two hours or more of your own time to spend as you choose.
- As good at multi-tasking as we are, try to work out what chores really can be left until after dinner. Although it would be great to have the laundry in the dryer, the cat fed, and the dry cleaning collected before dinner, doing these tasks all at once may leave you with a headache! Streamline where possible, and defer the non-urgent chores until you have a little more breathing space.

Finally, don't expect that achieving work–life balance is something that you attain with smooth sailing from then on. Situations constantly change: Departments merge, children grow and change schools, partners move jobs, our parents age. Try to accept that the only thing constant is change, and keep on top of the rolling ball!

Jennifer Henry
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Requiem for a Prairie Dog

My neighbor Alan, who is 10, is so upset that he wrote a letter to the editor of the local newspaper. It seems that local officials have decided to exterminate hundreds of prairie dogs (mainly black-tailed prairie dogs, *Cynomys ludovicianus*), in city-managed natural areas, including one in our immediate neighborhood. The city's rationale for this seemingly drastic measure is that overpopulation of the critters is threatening native plant life (not to mention the fact that they carry the plague). But Alan is learning to be a conservationist, and he has learned that prairie dogs constitute a "keystone species," which the Save the Prairie Dogs website contends is one, such as the black-tailed prairie dog, whose "very presence contributes to a diversity of life and whose extinction would consequently lead to the extinction of other forms of life." Among other things, the site claims that the habits of the prairie dogs enable the growth of a more diverse mixture of grasses and forbs.

However, an assessment of the situation on the ground in our neighborhood suggests a more complex reality. A walk through their town leaves little doubt that in this location the prairie dogs have not recently contributed to a greater diversity of plant life. To begin with, five years ago, the area was a prairie dog ghost town, as well as a bit of a wasteland in need of reclamation. An initial population of 12 prairie dogs was moved to the town from nearby undeveloped sites that now sport new homes (including Alan's). Far from helping reclamation efforts, the expanding population of prairie dogs (grown to 100 or more this year) had created an area that was all but devoid of vegetation. It is probably true that the presence of prairie dogs leads to greater numbers and diversity of fauna, but this can have some mixed results. For example, this

Mexican Hat *(Ratibida columnifera)* and Bouncing Bet *(Saponaria officinalis):* bouncing back in the absence of prairie dog traffic.

spring, a few homeowners called me up (I am president of our neighborhood association) to report that some rattlesnakes had been seen in and around their yards, and asked if anything could be done. A local snake expert informed me that one of the best things we could do to keep rattlesnakes away from homes was to eliminate prairie dogs and fill up their holes in neighborhood open spaces. There are lots of rattlesnakes up on the ridge to the west, and they find the prairie dog holes attractive for nesting—and baby prairie dogs make pretty good rattlesnake food.

The City eliminated prairie dogs in the adjacent natural area about one month ago, and I must admit I was a little sad to see them go. Their empty town looks forlorn and lifeless—that is, until you look a little closer. On a recent walk through the (once again) ghost town, I spotted a number of new seedlings growing in the main thoroughfares—a few weedy species, to be sure, but also blazing star *(Liatrus punctata)*, prickly poppy *(Argemone polyanthemos)*, and some tiny baby Yucca glauca, which appeared to be spreading out from larger parent plants. (Mind you, I did not linger, because the city reported the discovery of plague-infected fleas in the area shortly before the dogs were eliminated.) However, I took some photos and hope to document the recovery of the plant community over the next several years. Perhaps I will invite Alan on a wild flower hike to witness first-hand what the absence of prairie dogs can do for the plant life in an area that is really too small to house a healthy dog town. Besides, the city has not, in fact, eliminated all the local dogs—there is still a thriving town in the much larger adjoining area to the south. City officials have (wisely) determined that prairie dogs in the local environment must be managed to promote overall ecosystem health in our natural areas.

Emily Dickinson famously wrote that "To make a prairie it takes a clover and one bee." Here along the Front Range, we are discovering that to make a prairie, it takes more than a few prairie dogs on a bare plot of land. And Emily was right about one thing—the prairie starts with the plants. As for the prairie dogs living in our immediate neighborhood, revery will have to do.

To make a prairie it takes a clover
and one bee,
One clover, and a bee.
And revery.
The revery alone will do,
If bees are few.

E. Dickinson

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DOE Secretary Bodman Announces $250 Million for Bionergy Research Centers for Systems Research on Plants and Microbes

JOLIET, IL—U.S. Department of Energy (DOE) Secretary Samuel W. Bodman announced that DOE will spend $250 million to establish and operate two new Bioenergy Research Centers to accelerate basic research on the development of cellulosic ethanol and other biofuels. The Secretary made the announcement with Congressman Jerry Weller (IL-11th), local officials, and biofuels stakeholders during a visit to Channahon, IL.

DOE Secretary Sam Bodman
WHITE HOUSE PHOTO BY PAUL MORSE

"This is an important step toward our goal of replacing 30 percent of transportation fuels with biofuels by 2030," Secretary Bodman said. "The Energy Policy Act of 2005 (EPAct) calls for the creation of new programs to improve the technology and reduce the cost of biofuels production. The mission of these centers is to accelerate research that leads to breakthroughs in basic science to make biofuels a cost-effective alternative to fossil fuels."

Four billion gallons of ethanol were produced this year, mainly from corn. EPAct requires that by 2012, at least 7.5 billion gallons per year of renewable fuel be blended into the nation's fuel supply. To meet these goals, future biofuels production will require the use of more diverse feedstocks, including cellulosic material such as agricultural residues, grasses, and other inedible plants.

Universities, national laboratories, nonprofit organizations, and private firms are eligible to compete for an award to establish and operate a center. Awards, based on evaluation by scientific peer review, will be announced next summer. The centers are expected to begin work in 2008 and will be fully operational by 2009.

The centers' mission will be to conduct systems biology research on microbes and plants, with the goal of harnessing nature's own powerful mechanisms for producing energy from sunlight. A major focus will be on understanding how to reengineer biological processes for more efficient conversion of plant fiber, or cellulose, into ethanol, a substitute for gasoline.

The announcement of the Bioenergy Research Centers initiative culminates a six-year-long effort by the DOE Office of Science to lay the foundation for breakthroughs in systems biology for the cost-effective production of renewable energy. In early July, DOE's Office of Science issued a joint biofuels research agenda with the Department's Office of Energy Efficiency and Renewable Energy titled *Breaking the Biological Barriers to Cellulosic Ethanol.* The report provides a detailed roadmap for cellulosic ethanol research, identifying key roadblocks and areas where scientific breakthroughs are needed.

The proposal deadline for this funding opportunity is February 1, 2007. DOE's Office of Science will provide $25 million in the first year for the establishment of each center and up to $25 million per year for the following four years to support the operations of each center—for a total award of up to $125 million per center. Additional details on the funding opportunity and the centers' objectives are available at http://www.doegenomestolife.org/centers.

DOE began supporting pioneering research on microbes and microbial communities in 2000, with the objective of tapping microorganisms' powerful and diverse capabilities to produce renewable energy, clean up the environment, and manage atmospheric carbon. This research has been supported by the Genomics: GTL Program in the Office of Science. Since initiating the Human Genome Project in 1986, DOE has played a major role in advancing modern biotechnology, and the department's recent research on microbes for energy production builds on those advances.

The visionary Advanced Energy Initiative and American Competitiveness Initiative announced by President Bush in his State of the Union address are making possible significant increases in federal investment in research. ASPB continues to be a strong supporter of these major research initiatives, which are bringing a 10-year doubling in funding for the DOE Office of Science, National Science Foundation, and National Institute of Standards and Technology. These initiatives are also making possible new basic research programs, including the bioenergy research centers.

USDA and DOE Jointly Fund Genomics Research for Biofuels

Energy Secretary Samuel Bodman and Agriculture Secretary Mike Johanns announced August 9 that the Department of Agriculture and the Department of Energy (DOE) have jointly awarded nine grants totaling $5.7 million for biobased fuels research that will accelerate the development of alternative fuel resources.

Bodman commented, "These research projects build upon DOE's strategic investments in genomics, to accelerate scientific discovery and promote the development of alternative energy sources vital to America's energy and economic security."

"To be a reliable renewable energy source, farmers and ranchers will need to be able to grow biomass in large quantities," Johanns said. "This joint research initiative will address our nation's need for alternative energy resources and improve the efficiency with which biomass and plant feedstocks are used to produce renewable fuels such as ethanol."

USDA's Cooperative State Research, Education and Extension Service (CSREES) and DOE's Office of Biological and Environmental Research (OBER) awarded the grants in this new plant feedstock genomics program. CSREES and OBER jointly initiated this fundamental research program to facilitate the use of woody plant tissue, specifically lignocellulosic materials, for bioenergy or biofuels. The research projects will focus on poplar, alfalfa, sorghum, wheat, and other grasses.

This is the first year that CSREES and OBER have solicited competitive grants in this joint program. DOE is funding six projects for a total of nearly $3.9 million. USDA granted more than $1.8 million to fund three projects. Initial funding will support research projects for up to three years.

Awards have been given to

- Purdue University, Indiana, $1.4 million
- The Noble Foundation, Oklahoma, $800,000
- Texas A&M University, $800,000
- USDA–Agricultural Research Service, University of Wisconsin, $333,000
- Carnegie Institution of Washington, $359,100
- Brookhaven National Laboratory, New York, $300,000
- North Carolina State University, $700,000
- Kansas State University, $700,000
- University of Georgia, $445,000.

Following is a list of grantees, their institutions, and the title of their research awards:

Principal Investigator (PI): Clint Chapple
Co-PIs: Richard Meilan, Michael Ladisch
Institution: Purdue University
Title: Manipulation of lignin biosynthesis to maximize ethanol production from Populus feedstocks

PI: Richard Dixon
Co-PI: Fang Chen
Institution: The Noble Foundation
Title: Systematic Modification of Monolignol Pathway Gene Expression for Improved Lignocellulose Utilization

PI: William Rooney
Co-PIs: John Mullet, Steve Kresovich (Cornell University), **Doreen Ware** (Cold Spring Harbor Laboratory)
Institution: Texas A&M University
Title: Sorghum Biomass/Feedstock Genomics Research for Bioenergy

PI: John Ralph
Institution: USDA–ARS (University of Wisconsin)
Title: Streamlined Method for Biomass Whole-Cell-Wall Structural Profiling

PI: Chris Somerville
Institution: Carnegie Institution of Washington
Title: Development of a Proteoglycan Chip for Plant Glycomics

PI: Chang-Jun Liu
Institution: Brookhaven National Laboratory
Title: Biochemical Genomics of Wood Formation: O-acyltransferases for Alteration of Lignocellulosic Property and Enhancement of Carbon Deposition in Poplar

PI: Vincent Chiang
Institution: North Carolina State University
Title: Genomic Knowledgebase for Facilitating the Use of Woody Biomass for Fuel Ethanol Production

PI: Bikram Gill
Co-PI: Wanlong Li
Institution: Kansas State University
Title: Genetic Dissection of the Lignocellulosic Pathway of Wheat to Improve Biomass Quality of Grasses as a Feedstock for Biofuel

PI: Charles Brummer
Co-PI: Kenneth Moore (Iowa State University), **Jeff Doyle** (Cornell University)
Institution: University of Georgia
Title: Using Association Mapping to Identify Markers for Cell Wall Constituents and Biomass Yield in Alfalfa

Sharlene Weatherwax of DOE–OBER and **Chavonda Jacobs-Young** and **Ed Kaleikau** of the USDA–CSREES National Research Initiative collaborated in national program development of this important new research program. ASPB commends DOE and USDA for successful collaborative efforts in developing and successfully implementing this important research program. ASPB continues to be strongly supportive of this new research program.

Continued DOE and USDA support for this research program will help the nation transition to a domestically produced, clean burning, plant-based energy supply. This transition to biofuels would reduce reliance on costly, stored carbon-emitting foreign oil. The world's current oil price shock and U.S. dependence on foreign oil are harmful to the nation's many energy-dependent industries, the nation's economy, trade deficit, federal revenue generation, and federal budget. Release of enormous amounts of stored carbon dioxide into the atmosphere through the use of gasoline, petroleum-based diesel fuel, and other petroleum products is generally regarded in the science community as harmful to the environment.

Chris Somerville Explains Scientific Issues Associated with Carbon-Neutral Energy Sources Such as Cellulosic Ethanol

Professor Chris Somerville of the Carnegie Institution of Washington and Stanford University explained advances in plant science research that are both achievable and needed to reduce costs and multiply current levels of production of biofuels from plant cellulose (biomass). He delivered his comments on August 5 during Plant Biology 2006—ASPB's annual meeting—in Boston.

Somerville presented his talk, "Bioenergy: The 21st Century Challenge to Plant Biologists," as part of the major symposium "Plants Mitigating Global Change," organized by Professor Stephen Long of the University of Illinois at Urbana–Champaign.

Somerville noted that the concept that CO_2 emissions may negatively affect climate is not new. In 1895, Arrhenius presented a paper to the Stockholm Physical Society titled "On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground" in which he argued that increased concentration of atmospheric CO_2, such as that caused by combustion of fossil fuel, would lead to the warming of the earth, Somerville commented. "It is apparent that [Arrhenius] was correct and that we must develop alternative sources of energy."

The earth receives approximately 4,000 times more energy from the sun each year than the total projected human usage in the year 2050, Somerville noted. Green plants growing throughout the world capture the sun's (solar) energy and convert it to biochemical energy in a process called photosynthesis. There are vast energy supplies of renewable plant biomass growing throughout the nation and world and widespread interest in returning to the use of plants as widely used sources of renewable energy.

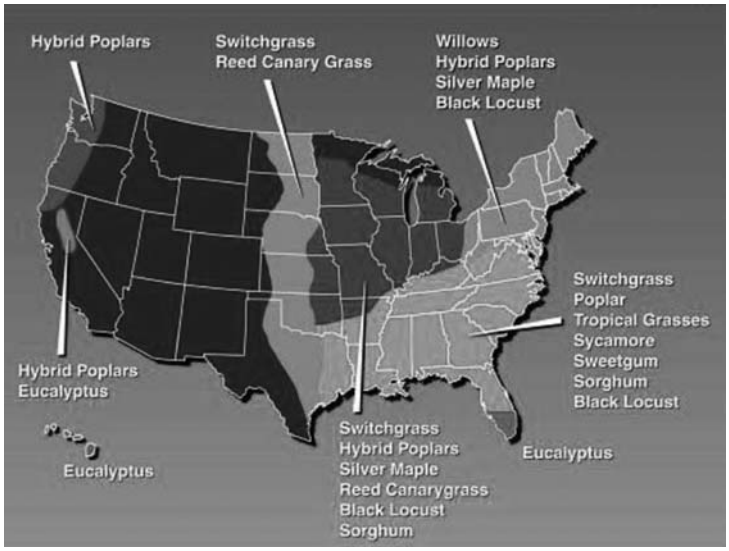
Chris Somerville

"However, because of competing uses for land, a central challenge for 21st-century biologists is to increase the efficiency of solar energy capture to the theoretical limit by rational methods. In order to accomplish this we need to acquire and integrate all aspects of knowledge about plant biology into a systems-level understanding that can support an engineering approach to plant improvement," Somerville said.

Somerville explained specific areas of research that need to be addressed. The Advanced Energy Initiative (AEI), a research initiative announced by President Bush in his 2006 State of the Union address, embraces key recommendations of Somerville's and the plant and microbiological science communities. Somerville called the AEI a visionary research initiative that will help transition the nation's transportation sector to use of domestically produced biofuels. Displacing use of gasoline with biofuels, such as cellulosic ethanol, will dramatically reduce emissions of stored carbon dioxide into the atmosphere, he noted.

This past year, Somerville has been participating in workshops organized by the U.S. Department of Energy Office of Science to address the nation's renewable energy needs. The workshops provided information that contributed to the development of the AEI. The AEI is a landmark research effort designed to help break the nation's addiction to oil.

A member of the National Academy of Sciences, Somerville recently published a guest editorial in *Science* (June 2, 2006, volume 312) concerning bioenergy research. He is a grantee of the DOE Office of Science's Basic Energy Sciences competitive grant awards program for Energy Biosciences research and a member of the DOE Office of Science Biological and Environmental Research Advisory Committee (BERAC). He was the speaker on "Biofuels and the [DOE] Biofuels Workshop Report" at the July 11, 2006, meeting of BERAC. He made a presentation titled "The Prospect for Meeting Our Energy Needs with Biofuels" at the Carnegie Institution May 4, 2006, which attracted scientists from many disciplines and the general public.



There will be a biomass crop for each region of the country.
PHOTO COURTESY OF WRIGHT ET AL. DOE-ORNL-EERE.

NSF Plans to Better Capture and Utilize Plant Genome Data with PSCIC

The National Science Foundation is seeking proposals for the Plant Science Cyberinfrastructure Collaborative (PSCIC). The preliminary proposal (required) target date is November 30, 2006. The full proposal target date (by invitation only) is April 16, 2007.

The goal of this program is to create a new type of organization—a cyberinfrastructure collaborative for plant science—that will enable new conceptual advances through integrative, computational thinking.

The creation of a cyberinfrastructure collaborative for plant science is being undertaken in response to the dramatic expansion of resources for plant science, including genome-scale sequence; expression; and phenotypic data sets, genetic resources, functional genomics assets, informatics tools, etc.

While these resources create the potential for dramatic new progress, this potential will be realized only if these resources can be easily accessed, understood, and used in novel combinations by all in the research and education communities, NSF officials noted. PSCIC will address these needs.

PSCIC will be a new type of organization in many respects. First, the driving force and organizing principles for the collaborative will be the grand-challenge questions in plant science. Second, as the questions change and evolve, PSCIC will constantly reinvent itself and its capabilities, developing next-generation computation and cyberinfrastructure capabilities. Third, the core of the collaborative will comprise a fully integrated blend of plant science, cyberinfrastructure, and computer and information science capabilities, operating at and beyond the frontier in each of these areas. Fourth, the collaborative will develop novel mechanisms for catalyzing synthetic interactions among biologists, computer and information scientists, cyberinfrastructure researchers, and others appropriate to the research questions at hand. It will be an institution by, for, and of the community—enabling scientists and educators in all realms to contribute to progress in plant science, NSF officials said.

The primary means the collaborative will use to pursue grand-challenge questions in plant science are synthesis activities, such as working/task groups that operate on- and off-site, virtual groups that interact remotely, postdoctoral and student fellows, visiting scientists, and the provision of networking and cyberinfrastructure resources that promote broad interaction and participation. The central resources of the collaborative will be computational and cyberinfrastructure capabilities and expertise that are capable of handling large and heterogeneous plant biology data sets. These resources will be used to craft solutions to an evolving array of grand-challenge questions. The collaborative will have a small core of staff members to support the activities of collaborative participants working in real and virtual modes. Resident social scientists will assess how the members of the collaborative community are interacting and using collaborative resources.

The structure of the collaborative may be centralized or distributed, such as a central hub with several branches. Proposals submitted in response to this solicitation must therefore present a clear description of the capabilities, responsibilities, and characteristics of the collaborative and a management plan designed to provide strong, central leadership.

NSF plans to make one award as a cooperative agreement. The award budget is anticipated to be up to $10 million a year for up to five years, contingent on the quality of proposals received and pending the availability of funds. The anticipated award date is September 1, 2007. The initial term of the award is expected to be five years, with the potential for one terminal renewal for another five years, subject to performance and availability of funds. This will be determined after a full site visit review planned for the third year of the initial award. Note that the maximum period NSF will support the collaborative is 10 years. A plan for the transition of the collaborative and, if appropriate, disposition of its resources, including databases, when NSF funding ends is required. This requirement will be implemented through the cooperative agreement governing the award.

The URL for the NSF solicitation is http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13704&org=NSF&from=home.

We appreciate the help of Drs. Machi Dilworth, Chris Greer, Parag Chitnis, Sam Scheiner, Jane Silverthorne, Bill Zamer, and Manfred Zorn in providing this information.

Many Biological and Social Science Societies Join ASPB and FASEB in Seeking Inclusive Priorities in NSF Strategic Plan

ASPB and the Federation of American Societies for Experimental Biology (FASEB) coordinated efforts to develop and circulate a sign-on letter that seeks more inclusion for priorities in the proposed strategic plan of the National Science Foundation. A total of 15 biological and social science societies signed on to a letter sent July 17 to NSF Director Arden Bement.

The biological and social science organizations asked Bement to revise the "Priorities for Investment" section of the draft strategic plan from having priorities "particularly in the physical and engineering sciences" to instead *"improve the nation's research capability in all fields of science, engineering and mathematics."*

Following is the body of the letter sent to Bement and a listing of the organizations that signed the letter:

The undersigned organizations, representing biological, biomedical, and social science researchers, write to thank you for providing us the opportunity to comment on the proposed *NSF Strategic Plan.* NSF is a leader in providing support for basic research and your strategic plan captures much of what is needed. While our organizations are pleased to see NSF taking bold steps to position itself for a successful future, we have one major concern with the agencies' priorities for the coming years.

On page 10, section III, *Priorities for Investment,* the NSF strategic plan states "NSF establishes well-defined priorities to allocate investment funds and internal resources effectively." One such priority is furthering U.S. competitiveness by [promoting] "innovations that improve the nation's research capability, particularly in the physical and engineering sciences, and spur the translation of research results into new applications and products." Based on the above-stated NSF strategic goals, we urge you to take into account the great advances biological and social sciences have had on the success of the U.S. scientific enterprise and change the phrase "particularly in the physical and engineering sciences," to read **"improve the nation's research capability in all fields of science, engineering and mathematics"** in the final draft of the strategic plan.

If we are to truly retain our scientific advantage in the world by boosting the national investment in our future competitiveness and innovation capabilities, we will need to rely inclusively on all basic sciences and technologies from biological and physical to social and behavioral. If this successful vision is to be realized, the NSF strategic plan must be inclusive of more than the "physical sciences" and embrace the broad spectrum of science disciplines that provide critical scientific advances through NSF support. A more inclusive vision would be consistent with the highly respected history of NSF of supporting leading research in many science disciplines. To follow the current narrower vision in the draft strategic plan, *NSF would be selecting winners and losers among science disciplines and making such selection without science-based criteria.*

For more than fifty years NSF has been the premier agency supporting basic research at the frontiers of science, across all fields, and science education programs at all levels. To begin to prioritize one field of research over another now will not only *fracture the successful interdisciplinary nature of the current research structure,* but set us back in our quest to solve many of our most puzzling scientific mysteries.

Therefore, again we urge you to prevent this dilemma by changing the phrase "particularly in the physical and engineering sciences" to **"improve the nation's research capability in all fields of science, engineering, and mathematics"** in section III, *Priorities for Investment—Further U.S. Competitiveness,* in the final draft of the strategic plan.

Sincerely,

American Association of Anatomists
American Institute of Biological Sciences
American Physiological Society
American Society of Agronomy
American Society of Human Genetics
American Society of Plant Biologists
American Sociological Association
Biophysical Society
Crop Science Society of America
Consortium of Social Science Associations
Ecological Society of America
Federation of American Societies for Experimental Biology
The Federation of Behavioral, Psychological, and Cognitive Sciences
National Council for Science and the Environment
Soil Science Society of America

Mary Clutter Accepts ASPB Leadership in Science Public Service Award

Shares 30-Year Perspectives and Predictions for Future

Dr. Mary Clutter was warmly received and applauded by ASPB members in attendance as she was presented the 2006 ASPB Leadership in Science Public Service Award on August 5.

ASPB President Michael Thomashow made the award presentation to Mary at the ASPB annual meeting in Boston. The award recognizes her outstanding contributions to science and humanity throughout her 30-year career at the National Science Foundation. James Siedow of the Committee on Public Affairs opened the program and asked Mike to present the award. Mike offered an enthusiastic tribute to Mary and her many accomplishments as he presented the award.

ASPB President Michael Thomashow presents the ASPB Leadership in Science Public Service Award to Dr. Mary Clutter at the ASPB annual meeting in Boston.

Mary shared her insights of many significant developments in science over more than the past 30 years. She noted that the Pound Report in 1972 was a landmark National Academies report that challenged the land grant system to start funding competitive awards for fundamental research on plants and animals. It was never published, she noted.

In 1976, she arrived at NSF to begin her illustrious career. She was associate program director for the Developmental Biology Program. That first year at NSF, she coordinated a meeting for long-range plans for support of basic research in plant sciences. Bob Rabson, Eli Romanoff, and other key research program officers participated.

Two years later, the USDA Competitive Research Grant awards program was initiated. Ann Holiday (Holly) Schauer played a major role in initiating the program. Mary noted sadly that Holly had recently died (July 30, 2006; see the obituary on page 57 of this issue of the *ASPB News*).

The year 1981 brought the launch of the Cold Spring Harbor plant molecular biology course, which was established to attract outstanding scientists to plant molecular biology, including Barbara McClintock, Machi Dilworth, and many others.

The Cold Spring Harbor Laboratory model organism meeting on July 20, 1989, selected Arabidopsis for further intensive study. The next year, the Arabidopsis Genome Project was started. Mary noted that it was not a sequencing project at the time. However, Jim Watson, as director of the NIH Genome Center, encouraged Mary to sequence Arabidopsis.

Senators Christopher (Kit) Bond (R-MO) and Barbara Mikulski (D-MD) launched the Plant Genome Research Program in fiscal year 1998. They had earlier interacted with the director of the White House Office of Science and Technology Policy (OSTP) to establish an Interagency Working Group (IWG) on Plant Genomes.

The first complete genome sequence of a plant—Arabidopsis—was published December 14, 2000, as the result of an international effort. Sequencing of the Arabidopsis genome was followed by the 2010 Project. This current collaborative effort is exploring functional genomics. Mary cited rice, maize, and other plant sequencing projects.

Before she moved into her predictions for science, Mary recalled that she had accurately predicted the changes in biological research that computers would bring. She said the next biological revolution could be an effort to make sense of all the information in the genome. Increased study will be conducted in epigenomics. She noted how Rich Jorgensen first discovered the phenomenon of RNA interference and that his finding was made in plants. This occurred years before scientists in other areas took interest in this area of study.

Mary called on the science community to overcome 20th-century barriers—to break out of the "boxology" syndrome. She called for crossing over disciplinary barriers, enhancement of diversity, and increased investment in research and offered her own "Top Ten" predictions (see box).

The prediction Mary didn't make that everyone in attendance already knew is that plant scientists and the broader science community will always be grateful to her for her own incomparable contributions.

Mary Clutter's TOP TEN Predictions

10. The brain drain will become the global knowledge flow.
9. The disciplines will merge or coalesce.
8. The federal investment in non-medical biology will grow to equal the medical.
7. Public–private partnerships will increase.
6. The total investment in R&D will quadruple.
5. Students will be trained to be fearless scientists.
4. Diversity issues will no longer be issues.
3. The epigenome will be decoded, leading to a deeper understanding of biocomplexity.
2. A new scientific language will be invented and spoken by scientists not yet born across the globe.
1. Kit Bond will live forever.

Grantsmanship Workshop Offers Insights on Writing Proposals

Officials from the National Science Foundation, Department of Agriculture, and Department of Energy discussed program grant opportunities and guidelines for submitting proposals August 7 at the ASPB annual meeting in Boston.

Department of Energy

Richard Greene became program manager earlier this year of the $35 million Energy Biosciences Program within the Chemical Sciences, Geosciences, and Biosciences Division of the DOE Office of Basic Energy Sciences. He was formerly with the Agricultural Research Service.

Greene explained new basic research opportunities for plant scientists in the Basic Energy Sciences' $34 million solar energy utilization program. Natural photosynthesis research is a component of the solar energy utilization program. "It is important for PIs [principal investigators] to write pre-proposals and take part in this initiative," he noted.

To the extent that plant scientists do not seek to participate in research initiatives like this, support for research advances in their areas can be limited. ASPB had circulated information to ASPB Campus Contacts and posted the new program's request for proposals on the ASPB website.

Greene extended his appreciation to **Mike Kahn,** who served on detail at the Energy Biosciences program prior to Greene's arrival and contributed to awarding fiscal year 2006 grants.

Sharlene Weatherwax, program manager, Genomics: GTL Program, DOE Office of Biological and Environmental Research (OBER), explained a number of research opportunities within OBER. The new DOE– USDA plant feedstock genomics for bioenergy program has awarded nine grants totaling $5.7 million for bio-based fuels research that will accelerate the development of alternative fuel resources. DOE–OBER sponsored nearly $4 million of the program for six grant awards. The USDA–CSREES National Research Initiative sponsored three grant awards with $1.8 million in this partnership with DOE.

Weatherwax noted that the Joint Genome Institute (JGI) has been sequencing the genomes of a number of microbes and plants. The JGI has announced this year genome sequencing initiatives for plants including soybean, cotton, and cassava.

OBER is undertaking a major new research initiative with the announcement August 2 by DOE Secretary **Samuel Bodman** that DOE is seeking grant proposals for two bioenergy research centers. The research centers will conduct systems research on plants and microbes to accelerate basic research on the development of cellulosic ethanol and other biofuels. DOE will invest $25 million per year for each research center, for a total five-year investment of $250 million. Weatherwax has been working with this research initiative.

Department of Agriculture

National program leaders **Gail McLean** and **Ed Kaleikau** participated in the grantsmanship program on behalf of USDA–CSREES and its National Research Initiative Competitive Grants Program (NRI).

McLean said the request for applications from the NRI for its fiscal year 2007 program was expected to be released in late August. The earliest anticipated proposal due date for plant programs will be December 2006. The earliest anticipated date for letters of intent is October 2006. Electronic proposal submission will be required. The 2007 request for applications is expected to have a more streamlined format, modified program organization, focused priorities, and program scope.

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continued from page 49

The recent funding rates for grant applications have been approximately 15 percent. Grant awards have ranged from $5,000 to $1.5 million.

The NRI supports high-priority fundamental and mission-linked research of importance in the biological, environmental, physical, and social sciences relevant to agriculture, food, and the environment. Competitively awarded research, extension, and education grants address key issues of national and regional importance to agriculture, forestry, and related topics.

McLean is national program leader for the Agricultural Plant Biochemistry program and Agricultural Plants and Environmental Adaptation program. Kaleikau is national program leader for the Applied Plant Genomics–Coordinated Agricultural Project.

National Science Foundation

Diane Jofuku Okamuro, NSF Plant Genome Research Program director, discussed Directorate for Biological Sciences' research programs and merit review criteria. NSF is the federal government's largest source of support for competitively awarded fundamental research grants to plant scientists at academic institutions.

PIs seeking to write successful grant proposals were advised to follow a number of recommendations by Okamuro and her colleagues, including the following:

- Propose a brilliant idea.
- Read carefully the proposal guide and program announcement.
- Discuss broader impacts.
- Get needed help with proposal writing.
- Be sure to write for the right audience.
- Avoid annoying reviewers with use of, for example, tiny print.
- Never plagiarize or commit other forms of theft.

Terry Woodin, program director for biology, NSF Division of Undergraduate Education, discussed a number of opportunities for support in undergraduate education. As with NSF research programs, Woodin noted that there is keen interest among grantees for NSF education programs. She commented that on that day she had 900 proposals waiting for her.

Scientists seeking grants were encouraged to contact Woodin, Okamuro, and other program officers with questions on proposals for their programs. Woodin added that in writing a proposal, it is helpful to label the broader impacts section.

Machi Dilworth, director of the NSF Biological Infrastructure Division, helped coordinate and attended the grantsmanship program. She was joined in attendance by **Mary Clutter,** former NSF assistant director for the Directorate for Biological Sciences. (Please see the story on the presentation of the ASPB Leadership in Science Public Service Award to Mary Clutter on page 48.)

Despite the concurrent scheduling with other annual meeting programs, more than 80 people attended the grantsmanship program. A number of attendees met with program officers after the program ended to continue asking questions.

Agency officials participating in the grantsmanship workshop also met with ASPB members at agency exhibit booths during annual meeting exhibit hours.

Research Findings on Rice by ASPB Members Ronald, Xu, Fukao, Ismail, and Bailey-Serres Could Save Millions from Hunger

ASPB Committee on Public Affairs chair Pamela Ronald, fellow ASPB members Keong Xu, Takeshi Fukao, Abdelbagi Ismael, and Julia Bailey-Serres, and colleagues have published research findings in *Nature* that identify in rice a gene tolerant to water submergence. These findings offer to reduce rice crop losses and the resulting hunger for millions of people worldwide. Following is the August 9 news release from the University of California, Davis and URLs for a News and Views commentary and a letter published in *Nature* on the research.

New Flood-Tolerant Rice Offers Relief for World's Poorest Farmers

A gene that enables rice to survive complete submergence has been identified by a team of researchers at the International Rice Research Institute in the Philippines and at the University of California's Davis and Riverside campuses. The discovery allows for development of new rice varieties that can withstand flooding, thus overcoming one of agriculture's oldest challenges and offering relief to millions of poor rice farmers around the world.

While rice thrives in standing water, like all crops it will die if completely submerged for more than a few days. The development and cultivation of the new varieties is expected to increase food security for 70 million of the world's poorest people and may reduce yield losses from weeds in areas like the United States where rice is seeded in flooded fields. Results of this study appeared in the August 10 issue of the journal *Nature*.

"Globally, rice is the most important food for humans, and each year millions of small farmers in the poorest areas of the world lose their entire crops to flooding," said Pamela Ronald, a rice geneticist and chair of the UC Davis Plant Genomics Program. "Our research team anticipates that these newly developed rice varieties will help ensure a more dependable food supply for poor farmers and their families. And, in the long run, our findings may allow rice producers in the United States to reduce the amount of herbicides used to fight weeds."

Pamela Ronald

Background

Rice is the primary food for more than 3 billion people around the world. Approximately one-fourth of the global rice crop is grown in rain-fed, lowland plots that are prone to seasonal flooding. These seasonal flash floods are extremely unpredictable and may occur at any growth stage of the rice crop.

While rice is the only cereal crop that can withstand submergence at all, most rice varieties will die if fully submerged for too long. When the plant is covered with water, its oxygen and carbon dioxide supplies are reduced, which interferes with photosynthesis and respiration. Because the submerged plants lack the air and sunlight they need to function, growth is inhibited, and the plants will die if they remain under water for more than four days.

During any given year, yield losses resulting from flooding in these lowland areas may range from 10 percent to total destruction, depending on the water depth, age of the plant, how long the plants are submerged, water temperature, rate of nitrogen fertilizer use, and other environmental factors. Annual crop loss has been estimated at more than $1 billion.

"For half a century, researchers have been trying to introduce submergence tolerance into the commonly grown rice varieties through conventional breeding," said rice geneticist and study co-author David Mackill, who heads the Division of Plant Breeding, Genetics, and Biotechnology at the International Rice Research Institute. "Several traditional rice varieties have exhibited a greater tolerance to submergence, but attempts to breed that tolerance into commercially viable rice failed to generate successful varieties."

"We're especially pleased that we have been able to use the latest advances in molecular biology to help improve the lives of the world's poor," Mackill added. "We're confident that even more important discoveries like this are in the pipeline."

Results of This Study

Using genetic mapping techniques, the research team identified a cluster of three genes that appeared closely linked to the biological processes that either make rice plants vulnerable to flooding or enable them to withstand the total submergence that occurs during flooding.

The researchers then focused their attention on one of those three genes, known as the Sub1A gene. They found that when this gene is over-expressed, or hyper-activated, a rice variety that is normally intolerant of submergence becomes tolerant.

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continued from page 51

Further studies indicated that the Sub1A gene is likely successful in conferring submergence tolerance to rice because it affects the way the plants respond to hormones, such as ethylene and giberellic acid, that are key to the plant's ability to survive even when inundated with water.

Going one step further, the researchers introduced the Sub1A gene into a rice variety that is especially suited for growing conditions in India. The resulting rice plants were not only tolerant of being submerged in water but also produced high yields and retained other beneficial crop qualities. Development of submergence-tolerant varieties for commercial production in Laos, Bangladesh, and India is now well under way.

In addition to providing a more stable supply of rice in developing countries, the researchers are hoping that the new gene will be useful in suppressing weeds and reducing herbicide applications for conventional and organic rice farmers in developed countries like the United States. If water can be left on the rice for an additional week, it is expected that weed populations will be reduced.

The research team is now trying to identify all the genes that are regulated by Sub1A and to use this information to further improve tolerance to flooding and other stresses.

Funding for this study was provided by USDA's Cooperative State Research, Education and Extension Service's (CSREES) National Research Initiative (NRI) Plant Genome program, managed by Ed Kaleikau, and Agricultural Plants and Environmental Adaptation program, managed by Gail McLean; the U.S. Agency for International Development; and the German Federal Ministry for Economic Cooperation and Development.

In addition to Ronald and Mackill, this international research team included Kenong Xu, Xia Xu, and Patrick Canlas, all of UC Davis; Takeshi Fukao and Julia Bailey-Serres, both of UC Riverside; and Reycel Maghirang-Rodriguez, Sigrid Heuer, and Abdelbagi Ismail, all of the International Rice Research Institute in the Philippines.

http://www.news.ucdavis.edu/search/news_detail.lasso?id=7833

http://www.nature.com/nature/journal/v442/n7103/full/442635a.html

http://www.nature.com/nature/journal/v442/n7103/abs/nature04920.html

ASPB Opposes Government Mandates on Private Publishers in Senate Bill 2695

In a letter sent July 21 to Senator Susan Collins, chair of the Committee on Homeland Security and Governmental Affairs, ASPB President Michael Thomashow explained concerns with S. 2695, the Federal Research Public Access Act (FRPAA) sponsored by Senators John Cornyn (R-TX) and Joseph Lieberman (D-CT). (Lieberman has subsequently filed for election to the Senate as an Independent following the Democratic primary election.)

While ASPB has studied the issue of free access closely and has taken pioneering steps to improve access to ASPB journal articles free of charge, it has warned against the one-size-fits-all approach of a government mandate, such as that put forth in S. 2695.

"We are concerned that S. 2695 will harm the diversity and independence of science publishing in the U.S.; weaken science publishers and the nation's broader science community; redefine copyright law without referral to the Judiciary Committee; infringe upon the rights of private publishers protected under the Constitution; and through needless government interjection, jeopardize the highly successful science peer-review system," Thomashow said.

He added, "It is the private-publisher–supported peer review process that determines whether findings of research merit publication. Manuscripts are improved and made suitable for publication through private-publisher–supported peer review. Substantial costs, not subsidized by the federal government, are incurred by private publishers to establish and maintain the infrastructure needed for high-quality, independent peer review selection of manuscripts based on highest merit. S. 2695 calls for a federal taking and free publishing on a federal website of the private publisher's improved manuscripts without any compensation to private publishers."

S. 2695 calls for "free online public access to such final peer-reviewed manuscripts or published versions as soon as practicable, but not later than 6 months after publication in peer-reviewed journals;…production of an online bibliography of all research papers that are publicly accessible under the policy, with each entry linking to the corresponding free online full text; and…long-term preservation of, and free public access to, published research findings—(A) in a stable digital repository maintained by the Federal agency; or (B) if consistent with the purposes of the Federal agency, in any repository meeting conditions determined favorable by the Federal agency, including free public access, interoperability, and long-term preservation."

These provisions in S. 2695 represent the establishment of the federal government as

the nation's largest science publisher and archivist, directly competing with diverse private publishers, Thomashow noted. At the same time, S. 2695 would not compensate private publishers for the substantial investment they make in reviewing, selecting, and improving the manuscript. S. 2695 also calls for publishing of the private-publisher–improved manuscript immediately in many instances, as soon as practical in most instances, and never later than six months after publication in peer-reviewed journals.

"The Fifth Amendment states that no person 'be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.' S. 2695 would require private commercial and private nonprofit publishers to make manuscripts they have improved freely available on a government-operated website. By infringing on the Intellectual Property rights of science publishers through the government taking and publishing of private-publisher–improved manuscripts without just compensation, S. 2695 violates the Fifth Amendment of the Constitution," the letter argued.

The letter continued, "The First amendment states that, 'Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the government for a redress of grievances.' "

"S. 2695 abridges the freedom of speech of the science press by mandating free and open publication on a government website of private publishers' improved manuscripts. Many paid subscribers will choose to read the improved manuscripts for free as published by the government after implementation of S. 2695 and will not renew paid subscriptions with science journals. This will cause the closure in states across the nation of many science journal publishers who depend upon paid subscription revenues to survive. The subsequent expected closure of many science journals from loss of subscription revenues demonstrates how S. 2695 abridges the freedom of speech of the press."

The letter noted, "As ASPB Immediate Past President Roger Hangarter explained in a commentary published in *The Wall Street Journal* concerning the government-mandated open access movement, 'It is essential to maintain standards for peer-review selection of science articles based on the highest scientific merit, which is currently offered through the diverse private publishing model.' "

S. 2695 would make the science publishing model far less diverse by driving out of business many science publishers dependent on subscription revenues. "When specialty areas of science are no longer served by private science journals, who will make the selection of articles that merit publication?" the letter queried.

The ASPB letter continued:

"The federal government will clearly be the nation's market-dominant science publisher under S. 2695. The bill establishes the federal government as a free access competitor publisher to private science publishers offering a paid access business product. Many subscribers will determine that they don't need to pay for the private publishers' product, because they can easily access for free the private-publisher–improved manuscripts as taken and published by the federal government under the bill."

"The weakening of private science publishers in the U.S. under S. 2695 will also harm the related science communities seeking to publish in those journals. Scientists in a particular area of research—whether it be in plant science, microbiology, neuroscience, organic chemistry, or other area—are dependent upon the existence of leading science journals in their areas of specialization for the peer-reviewed vetting of research and selection of high quality manuscripts for publication."

"Loss of these private science journals resulting from unfair competition with a market-dominant federal government publisher will reduce the number of science journals and number of opportunities for publication of the best research findings across the broad spectrum of science disciplines."

Senator Collins chairs the committee that has jurisdiction over S. 2695 and can determine whether to recommend it for passage. ASPB's letter and those of other concerned science societies were sent when Senator Collins was deliberating whether or not to move on the bill. As of time of submission of this article to the *ASPB News,* the bill had not yet been scheduled for a vote (mark up) in her committee.

50 Years of Plant Physiology *Available*

Anyone interested in old issues of *Plant Physiology* should contact Peter J. Davies at pjd2@cornell.edu.
January 1947 through December 1998
(recipient pays shipping charges)

ASPB, Fast Plants Exhibits Popular with Teachers at NSTA Conference

For the fourth year, ASPB's Education Foundation hosted a booth at the National Science Teachers Association annual conference, which attracted more than 11,000 people during its three-day run in Anaheim, California. Education Committee chair Mary Williams, Purdue University crop physiologist Suzanne Cunningham, and Education Foundation assistant Elizabeth Daerr attended. ASPB member Judy Brusslan, California State University, and Botanical Society of America education director Claire Hemingway also volunteered at the ASPB booth.

Many attendees were impressed by the variety of free materials available to help K–12 educators inspire student curiosity in plant biology. Bookmarks describing metabolic functions, cards explaining genomics, and elementary school activities showing the everyday use of plants were overwhelmingly popular.

Suzanne Cunningham drew in nearly 420 passersby with plant, soil, and environmental experiments adaptable to all age groups. One experiment demonstrated how starch is converted to sugar through enzyme production. Three teachers took the tools necessary to do this experiment back to their elementary school in Reseda, California, for a special student–parent program. The erosion display, using water bottles and various soil amendments, caught the interest of many booth visitors. Middle school teachers were excited about the math that was incorporated into this experiment and its applicability into their earth science lab curriculum.

On a positive note, many of the teachers who taught plant biology said they use Fast Plants, which ASPB hosted in the adjoining booth. It was by far one of the most popular exhibits at the conference. Education Foundation board member Paul Williams, the inventor of Fast Plants, and his staff scarcely left the booth because of its popularity. People waited in line for the opportunity to make miniature gardens started in plastic bottle caps and magnifying glasses from used film canisters. In addition to allowing attendees watch the progress of their gardens, the magnifiers can be used with any digital camera as a macro lens.

Paul hopes the exercise will encourage students to start their own gardens from local native plants. Over the three days, more than 1,000 teachers visited the Fast Plants booth.

Mary Williams thanked the ASPB Executive Committee for providing continued support of the ASPB and Fast Plants exhibits from the Society's Good Works Fund. Teachers visiting the ASPB and Fast Plants exhibits could, throughout their careers, engage thousands of students in the wonders of plant science.

Booth participants (from left) Suzanne Cunningham, Purdue University; Education Committee chair Mary Williams, Harvey Mudd College; and Education Foundation assistant Elizabeth Daerr.

The ASPB Education Booth attracted nearly 600 people during the three-day conference.

Biotechnology a Major Component of Project SMART Summer Institute at University of New Hampshire

From July 5 to 28, 2006, the University of New Hampshire (UNH) hosted a four-week-long summer program for high school students called Project SMART (Science and Mathematics Achievement through Research Training—www.smart.unh.edu) Summer Institute. This was the 16th year of the Project SMART Summer Institute under the directorship of **Subhash C. Minocha,** professor of plant biology and genetics at UNH, a long-time member of ASPB, and secretary/ treasurer of the Northeastern Section of ASPB.


Subhash C. Minocha

The program offers not a standard course in science, but a course about science, scientific thinking, and problem solving. It is an intensive live-in experience for students in which they learn the excitement of modern science and develop a historical and philosophical perspective for understanding the social and ethical issues raised by recent developments in the biological, physical, and chemical sciences. The participants investigated research questions, used modern instrumentation, analyzed data, applied computing techniques to genome and proteome analyses, discussed the interdisciplinary aspects of science, examined science-related societal issues, and explored career options in science. The program offered information, challenge, hard work, and fun—all in just four weeks.

In addition to Space Science and Marine and Environmental Science modules, the 2006 summer institute offered a month of excitement and learning in the fields of biotechnology and nanotechnology; this module was co-coordinated by Minocha. Biotechnology is a vast field covering many aspects of biological sciences, and Minocha brings in appropriate examples from plant systems to highlight the progress in the field and its impact on the human society. This year was unique in that the biotechnology topic was combined with nanotechnology, another field of science that is truly interdisciplinary and that has a strong interaction with biotechnology.

The institute attracted over 40 highly talented high school juniors and seniors, coming mostly from the New England region but with a few from as far away as New York, New Jersey, and even London. About 60 percent of the students were women, and about half came from rural school districts. The students stayed in a dorm at UNH, and in addition to learning and making friends, they experienced first-hand what a college student's life is like.

Glen Miller, associate director of the Center for High-rate Nanomanufacturing, who coordinated the nanotechnology component of the program, noted that "Nanotechnologies will have a profound impact on our lives in the coming decades. The National Science Foundation predicts that new nanotechnologies will add 2 million jobs and $1 trillion per year to the world's economy by 2015." Minocha added that "Many of the advances in nanotechnology will have a profound impact on the success of biotechnology, particularly in the areas of DNA-based diagnostics, development of biosensors and biomonitors, and in drug delivery." Therefore, a joint discussion of the two areas is highly beneficial for the scientists and engineers of tomorrow.

Through lectures, discussions, laboratories, and field trips, using state-of-the-art equipment and facilities, an in-depth experi-

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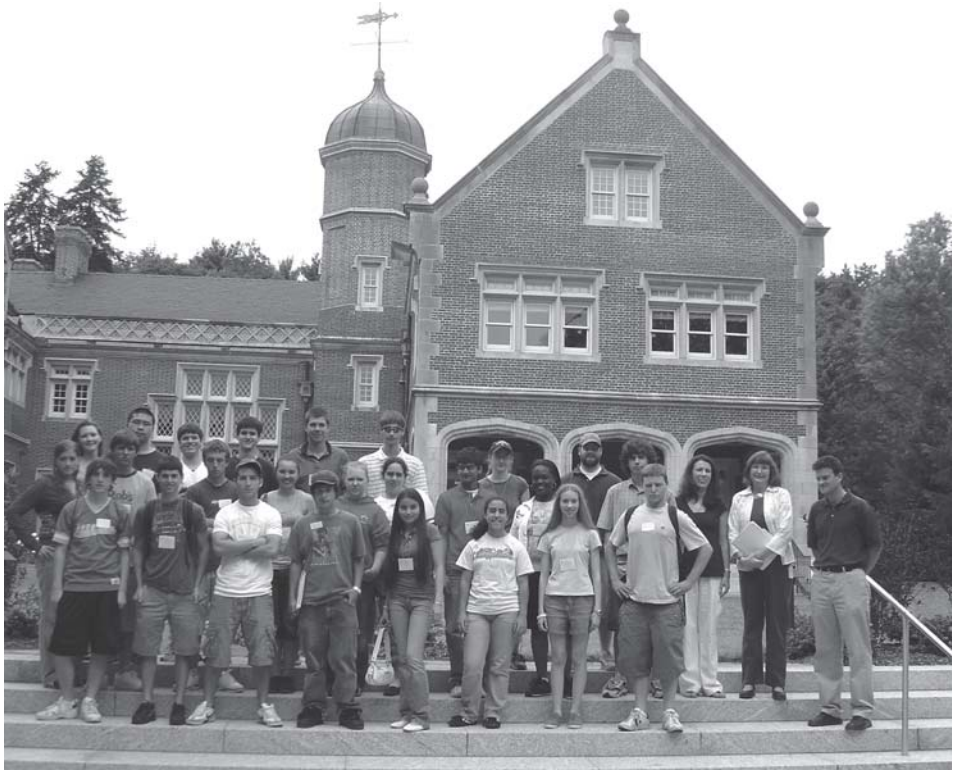
Project SMART Summer Institute 2006 biotechnology students at the New England Biolabs.

continued from page 55

ence was provided to the 23 participants in the biotechnology and nanotechnology module. The students learned the theory and the lab techniques that form the basis of biotechnology and its applications to agriculture, medicine, industrial products, and environmental problems.

Students discussed and debated social and ethical issues raised by recent developments in biotechnology. Legal conflicts such as ownership and patenting of living cells and organisms, concerns about prenatal and job-related diagnosis of genetic disorders, the creation and release of genetically modified organisms (GMOs, particularly plants), and the use of biotechnology in warfare were covered. In addition to Minocha's coverage of the background and techniques of biotechnology and genetic engineering, guest speakers provided up-to-date discourse on several areas of current and future applications of biotechnology through topics such as "Miracle of Vision," "Learning from a Worm," and "The Cancer Genes." A half-day visit to the New England Biolabs in Ipswich, Massachusetts, gave the students an opportunity to witness the process of research, development, and commercial production of enzymes and DNA vectors firsthand and to interact with scientists at work in a real-life industrial situation.

The focus of the summer institute is summarized in the following statement by Minocha: "It doesn't matter if you become a practicing scientist or not. What matters is that you become a scientifically literate citizen who can participate in decisions about the new [bio- and nano-] technologies that will affect our society in an unprecedented manner. In order to participate in decision making, we must understand the concepts and the techniques of scientific discovery." He continues further to state that "In a society where 40-some percent of the people still believe that 'normal tomato plants have no genes and only the genetically modified tomatoes do,' there is a tremendous gap of awareness and understanding of scientific information that needs to be filled before we can involve everyone in decision making on issues related to the applications of such technologies."

On the final day of the program, to which parents, several high school teachers, and UNH faculty, staff, and administrators were invited, the students prepared scientific posters based on their activities, projects, and experiences and made oral presentations to their peers. Following a poster review session and remarks from the UNH president and the provost, students said their goodbyes with teary eyes and left for their home with lasting memories of their experience.

Participants described the summer institute as "exciting," "exhilarating," and "rewarding"; one student said, "It changed my thinking about science." "I feel this program has helped clarify and intensify my interest in biotech greatly," said another student in her evaluation. An upshot of the summer institute is that the academic learning experience is accompanied by long-lived memories of fun, excitement, and development of new friendships among the participants and with the university staff. "I came to Project SMART to learn; I received more than an education and made new friendships and connections that I will hold onto for the rest of my life," said Thomas Santeusanio of North Conway, New Hampshire, a 2005 participant.

Financial support for Project SMART is provided by the offices of the UNH president, the provost, the dean of the College of Life Sciences and Agriculture, the dean of the College of Engineering and Physical Sciences, the NH Space Grant Consortium, the NH Sea Grant program, and the UNH Nanogroup. Graduate assistants were supported by a PROBE (Partnerships for Research Opportunities to Benefit Education) Grant from the National Science Foundation. Donations of cash and laboratory supplies and discounts on supplies and equipment from several biotechnology companies also assisted the program.

Nearly all students participating in Project SMART proceed after high school to college. Many pursue college course study in the sciences.

For more information on Project Smart, contact Subhash Minocha at sminocha@christa.unh.edu, or visit www.smart.unh.edu.

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Education Foundation Grants Five Awards for Education Outreach Proposals

ASPB's Education Foundation Board, chaired by James Siedow, selected five winners of the 2006 Grant Awards Program in August. Through these novel projects, thousands of people will learn about the role of plants in developing medicine, biofuels, and food, as well aspects of plant–microbe interactions. One exhibit will highlight the inspiring accomplishments of George Washington Carver, who overcame the oppressive shackles of slavery to become one of the world's leading scientists. A detailed story on the proposals selected for awards will be featured in the next issue of the *ASPB News.*

Winners

Beth Judy: "The Plant Detective" Public Radio Show $14,250
Regina McClinton: Museum Exhibit on George Washington Carver $14,250
Daniel Scherer: Renewable Biofuels: From *Camarasaurus* to Corn $21,888
David Stern: Radio Stories on Plant Microbe Interactions $9,975
Steven Strauss: Food for Thought Lecture Series via Web-Based Streaming Video $10,450

Professor Daphne J, Osborne (1925–2006)

Many members of the American Society of Plant Biologists will be much saddened by the recent death of Daphne Osborne. Well known for her work on plant hormones and DNA repair, Daphne died on June 16, 2006, at age 81, after a short illness.

Daphne J. Osborne as a young woman

Something of a workaholic, Daphne continued active laboratory research until shortly before her death, leaving a legacy of over 200 research papers (20 of them in *Nature*) and a lasting impression on her students, professional associates, and the many people she met and encouraged at countless scientific meetings worldwide. Among some notable scientific achievements was a strong contribution in the late 1960s and early 1970s to positioning ethylene in its rightful place as a natural plant hormone with key regulatory functions, especially in controlling senescence and abscission of leaves, fruit, and shoots. No less important has been her development of the "target cell" concept as an aid to understanding how a relatively small number of hormones can have so many different and spatially separated effects in plants. She was also a world-renowned authority on seed aging and DNA repair and at the time of her death was involved in a project examining DNA repair in plants affected by radioactive fall-out from the Chernobyl nuclear power station in the Ukraine.

Her scientific work attracted a number of honors and awards, including an honorary professorship at the University of Kiev (Ukraine), honorary doctorates from the Open University (United Kingdom) and University of Natal (South Africa), and an honorary research fellowship from Somerville College, Oxford University (United Kingdom).

Daphne Osborne was an innovative scientist who loved the intellectual challenge of discovery and turning hard-won results into highly readable science that graced the pages of a great many journals and books since her first publication (with R. L. Wain, in *Science*) in 1951.

Mike Jackson
University of Bristol

Anne Holiday (Holly) Schauer

You may have heard scientists attribute their success to the fact that "we stand on the shoulders of giants" (John of Salisbury, 1159) in reference to the generations of researchers who have come before us. But in this day and age, it is also true that we wouldn't be standing here were it not for dedicated people, like Holly Schauer, who manage research grants and keep us from falling off those shoulders. Holly died on July 30, 2006, after a long struggle with multiple sclerosis, and with her passing plant scientists lost one of their most enthusiastic and dedicated supporters.

Anne Holiday (Holly) Schauer

I first met Holly in 1977, when I was a beginning assistant professor at Purdue University. I had been invited to attend a developmental biology meeting at University of California San Diego, and it just so happened that Holly and Mary Clutter, who at that time was program director for developmental biology at the National Science Foundation, were in attendance. A few weeks earlier, my first grant proposal to NSF had been rejected, so I really needed the advice that Holly and Mary provided on how to get a grant funded. Later, Holly told me to revise my proposal and send it back to them as soon as possible. A few months later I was notified that the grant was funded by the Developmental Biology Program for two years at $50,000. It wasn't a lot of money, but it was absolutely essential to get my career started. I have since learned that many beginning scientists owe their first grant to Holly Schauer's support and mentoring.

Anne Holiday (Holly) Schauer was born in Baltimore, Maryland, and grew up in the Washington, DC area. She received a bachelor's degree from Grinnell College in 1960 and an MS in paleobotany from the University of Minnesota in 1962. She worked as a research assistant in Dr. Willie Smith's laboratory at NIH during the summers of her undergraduate years, but her scientific career evolved rapidly into research grants management. In the mid-1960s, she began working at NSF, where she was the associate director for the Developmental Biology Program. While in that position she mentored and trained many rotating program directors and provided continuity to investigators in the

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continued from page 57

developmental biology community, who were dependent on NSF support. Holly was a friend of all the grantees in developmental biology, and she and her husband Ron provided generous voluntary help to the Society for Development Biology by transforming its membership lists and documents into computer files. In 1977, Holly moved to the USDA to set up the newly created Competitive Research Grants Office (CRGO). She began as associate program manager for the Genetic Mechanisms Program and in 1981 was appointed associate chief scientist of CRGO. In reality, she was the individual who established the office, along with Joe Key, the founding chief scientist.

Holly is remembered fondly by her associates at NSF and USDA as a wonderful colleague and friend and a major contributor to the granting process. Her knowledge and expertise were essential to launch CRGO, and her role in this process was greatly appreciated by the early CRGO chiefs: Joe Key, David Krogman, and David Timothy. As Joe Key recalls, "It was a godsend to have Holly join CRGO because she brought a wealth of knowledge of the granting process, panel operations, people in the field, and a true and genuine concern about fairness to the PIs. I saw how genuinely concerned she was about the openness and fairness of the evaluation process, always looking for the good in a proposal and a scientist(s) even when things did not look good or fare well for the PI. She was devoted to the job and worked tirelessly to make the process better. She was an advocate (28 years ago!) for minorities and women who were struggling to get into the 'male science club.' She would not compromise excellence, but everything else being equal, she would go the minority route. She was a great friend and advocate for plant biologists, especially at NSF, where in the 60s, 70s, maybe 80s, from her perspective, plant biology didn't get what it deserved. It was amazing how well she knew scientists in the multiple fields represented in the CRGO program, and their strengths and weaknesses relative to their potential value as panel members or program managers."

Holly's administrative talents became clearly evident in November 1985, when Congress appropriated over a threefold increase in budget that specified new research areas, several dealing with animal growth, development, and disease, as well as other new programs in such things as alcohol fuels and small business endeavors. She used her incredible ability in working with and around the multiple layers of administrative requirements for space, computer equipment, furniture, and additional personnel. With great effort and determination, she obtained a group of well-known program managers and their associated research panels to comply with the criteria for soliciting, reviewing, and granting awards. Consequently, CRGO was awarded the USDA Certificate of Appreciation in 1985. Holly's influence in melding both the new and existing scientific and secretarial personnel into a highly efficient and congenial unit was widely recognized. She earned the respect and affection of everyone who worked with and for her. Long after she retired, former associates at CRGO would call her when they needed to remember a certain person or an incident that had happened while Holly was there. She always knew the answer as if it had happened only yesterday.

If Holly's life could be measured by those who admired, loved, and respected her, then it was a stunning success. She had a sincere and instant smile, a passionate quest for truth, and a warm heart. She was a genuinely good person, and she truly made a major impact on developmental biology and agricultural research in general.

Brian Larkins
University of Arizona

New Staff

Jotee Pundu

Jotee Pundu joined ASPB in August as junior accountant. Previously she worked in the same capacity at NCSI, Rockville, a subsidiary of National Flood Services insurance company. For the past 10 years she has held several positions in accounting and finance in both the government and the private sector. She has a bachelor's degree in economics and social studies from Wellesley College in Boston and lives in Clarksburg, Maryland, with her husband Kishore and daughter Mayuri. She enjoys listening to Indian and French music and likes to read as time permits. Jotee notes that now that she is part of the ASPB team, she is looking forward to contributing to the continued growth of the Society.

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